A63 Castle Street Improvements, Hull
Environmental Statement

Volume 3 Appendix 3.1
CONSIDERATION OF ALTERNATIVES – TECHNICAL APPRAISAL REPORT OCTOBER 2008

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HIGHWAYS AGENCY

Highways Agency
Project Support Framework
A63 Castle Street Improvements, Hull

Technical Appraisal Report

Document Reference: W11189/VDH/11
Final Revision 1

October 2008

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PROJECT SUPPORT FRAMEWORK

A63 CASTLE STREET IMPROVEMENTS, HULL

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1 INTRODUCTION

1.1 Introduction

1.1.1 Pell Frischmann Consultants Ltd (PFC) have been appointed by the Highways Agency to investigate options for the improvement of the A63, Castle Street, in Kingston upon Hull.

1.1.2 The study area, which encompasses the project site at Castle Street, is located within Hull City centre close to the Rivers Humber and Hull. The entire study area lies within the administrative boundary of Kingston upon Hull City Council.

1.1.3 The section of the A63 Castle Street which is the subject of this report is a dual carriageway which runs on an east-west alignment to the south of Hull city centre between Porter Street and Myton Bridge for a distance of approximately 1.5km. The existing route forms a link between the M62 Motorway and the Humber Bridge to the west and Hull Docks to the east. Under previous commissions, a large number of scheme options for the improvement of this part of the A63 through Hull have been developed. These have now been reduced to six options – three underground and three overground options.

1.1.4 The scheme brief requires that all feasible options to increase the carriageway capacity of the existing road and to provide grade separation at Mytongate Junction should be investigated.

1.1.5 The purpose of this report is to collate and document all relevant factors necessary for a technical appraisal of the proposed scheme, to identify all feasible solutions and to evaluate and compare them on engineering, traffic, environmental and economic grounds under the terms of reference set out in the planning brief and also to provide a basis for consultation with the general public.

2 PLANNING BRIEF

2.1 Introduction

2.1.1 The Highways Agency study brief is to investigate a range of options and to identify a preferred option for inclusion into the Roads Programme. The assessment was to determine three levels of scheme provision:

i) A Base scheme that is economically justified;

ii) A higher level of provision that goes some way towards meeting the aspirations of key stakeholders, and

iii) A scheme to aid the regeneration of both the immediate and surrounding area.

2.1.2 The scheme options developed also had to meet the following key objectives which are listed below

- To improve access to the docks
- Relieve congestion
- Improve safety
- Reduce severance

3 EXISTING CONDITIONS

3.1 Description of Locality

3.1.1 The A63 Castle Street is located to the south of Hull city centre, close to the River Humber, and forms an important part of the main west to east through traffic route linking the M62, Humber Bridge and A15 to the west with the developments and docks to the east. It is also part of the European transport network route E20.

3.1.2 To the north of Castle Street lies the city centre and main shopping area, much of which has been pedestrianised. To the south are the Humber Dock and Railway Dock marinas and several recent developments providing shops, offices, tourist and recreational facilities.

3.2 Existing Highway Network

3.2.1 The A63 Castle Street is located within Hull city centre, close to the River Humber, and forms an important part of the main west to east through traffic route linking the M62, Humber Bridge and A15 to the west with the developments and docks to the east. It is also part of the European transport network route E20.

3.2.2 It is the busiest section of road in the whole of the East Riding of Yorkshire, carrying daily flows in excess of those recorded on the M62 within the region. The existing daily flows are in excess of 53,000 AADT two way flows. A location plan showing the existing street names, limit of works and buildings of interest is included in Appendix A.

3.2.3 To the north of Castle Street lies the major shopping areas within the city centre, much of which has been pedestrianised. To the south are the Humber Dock and Railway Dock marinas and several recent developments providing shops, offices, tourist and recreational facilities.

3.2.4 By virtue of its position in the local and regional road network Castle Street attracts large volumes of traffic, both cars and HGV’s. These comprise:-

- Regional traffic from the development and dock areas to the east of the city heading to the M62 and Humber Bridge to the west.

- Local through traffic, in particular, commuters travelling between the western residential areas and their places of work to the east of the city.

- Local commuter, shopping, business and recreational traffic with destinations in and around the city centre.

3.2.5 Castle Street is approached from the west on the A63 Clive Sullivan Way and Hessle Road. These are both two lane dual carriageways with grade separated junctions which form part of the A63. Hessle Road becomes Castle Street close to the western end of the proposed improvement at Mytongate Junction, near Porter Street. To the east Castle Street becomes Garrison Road at its junction with Market St/Queen St whereupon the A63 crosses the River Hull on Myton Swing Bridge.

3.2.6 As taken from the Pell Frischmann, 2004 TPI report, Volume 1, paragraph 2.6 : 'The swing bridge operates about three times a day depending upon river traffic flow and the tide, the opening of the bridge for sea/river traffic taking precedence over road traffic.'

3.2.7 Beyond Myton Swing Bridge the A63 Garrison Road continues to a roundabout at its junction with Mount Pleasant/Hedon Road. To the east of this junction the A63 proceeds now as Hedon Road to a roundabout junction with Northern Gateway and the A1033 Hedon Road, beyond this point the road remains as the A1033 Hedon Road.

3.2.8 The eastbound carriageway of Castle Street provides direct access to a number of side streets that serve the City Centre and residential developments. These include Ferensway, Prince's Dock Street, Dagger Lane, Fish Street, Vicar Lane and Market Place. Prince's Dock Street and Myton Street provide the principal access to Prince's Quay Shopping Centre.

3.2.9 The westbound carriageway provides direct access to Queen Street, Humber Dock Street, Commercial Road and Spruce Road as well as access into the Holiday Inn Hotel.

3.2.10 At present, major traffic congestion occurs at the two major junctions; Commercial Road/Ferensway and Market Place/Queen St. Recent improvements to the Market Place junction have mitigated some of the congestion problem by eliminating the

North/South movement between Queen Street and Market Place. However this interim scheme has not allowed the removal of the traffic signals from the junction and the traffic signals still stop the mainline to allow access from the side roads. Although the presence of the signals will continue to cause traffic build up, this will be to a much lesser degree than before the interim scheme was implemented.

3.2.11 In addition, further delays are attributable to the pelican crossings near St. James Street and Fish Street and also, but to a lesser extent, by Myton Swing Bridge.

3.2.12 There are a number of bus stops along the route, although at the time of writing they are not used. Generally, footpaths are immediately adjacent to the main road and in some cases access to both residential and commercial properties is gained directly across the footpath.

3.2.13 The A63 segregates the Marinas (Humber Dock and Railway Dock), fruit market and office developments from the city centre and amenities. There are four signalised crossings available along the 1.3km stretch of road.

3.2.14 There are two private accesses affected within the works. The first one on the east bound carriageway affords access to the eastern end of property No 65. There does not however appear to be a direct route past or through the building, its use therefore is interpreted as being for unloading purposes only. On the west bound carriageway a private access is afforded to the Holiday Inn. The access is a left in/left out arrangement. An alternative access to Holiday Inn is located to the rear of the hotel and provides access on to Commercial Road.

3.3 Traffic

3.3.1 The 2004 'base year' AADT flows, average traffic speeds (km/hr) and percentage heavy goods vehicles (HGV %) data were provided for the following roads within the existing Hull AQMA.

TABLE 3.1: AADT FLOWS FOR EXISTING CONDITIONS (2004 BASE YEAR)

Link Number	Description	2004 AADT flow	Ave. speed	HGV (%)
1	Madeley Street	6,762	70	12
2	Clive Sullivan Way	54,079	66	23

TABLE 3.1: AADT FLOWS FOR EXISTING CONDITIONS (2004 BASE YEAR)

Link Number	Description	2004 AADT flow	Ave. speed	HGV (%)
3	Hessle Road	7,871	46	11
4	Rawling Way	15,973	39	10
5	Daltry Street (South)	3,339	72	13
6	Daltry Street (North)	5,520	48	10
7	Slip Road (Hessle Road Westbound)	7,258	71	11
8	Slip Road (Hessle Road Eastbound)	10,744	47	7
9	Clive Sullivan Way/Hessle Road Combined	71,826	60	20
10	English Street	4,336	50	9
11	Anlaby Road West	24,823	49	5
12	Anlaby Road Central	22,387	49	3
13	Anlaby Road East	15,802	52	3
14	Carr Lane	10,479	36	6
15	Osbourne Street	9,846	38	5
16	Ferensway	19,735	38	8
17	Commercial Road	4,930	49	8
18	Castle Street	74,557	60	18
19	Myton Street	15,586	36	3
20	Princes Dock Street	157	41	0
21	Posterngate	69	41	0
22	Humber Dock Street	2,323	40	14
23	Queen Street	7,509	36	10
24	Garrison Road	61,479	69	19
25	High Street	1,949	37	15
26	Market Place	13,336	31	11
27	Alfred Gelder Street East	4,793	39	11
28	Alfred Gelder Street West	2,765	39	4

3.3.2 Table 3.1 shows that the busiest sections of the study area are found on the A63 itself; the A63 (Clive Sullivan Way) in the west of the study area has an AADT flow of 54,079 vehicles. In its central sections, the A63 has an AADT flow of 71,826 vehicles (Clive Sullivan Way and Hessle Road combined) and 74,557 vehicles (Castle Street, adjacent to Princes Quay Shopping Centre). Leaving the Hull AQMA to the east, the A63 (Garrison Road), has an AADT flow of 61,479 vehicles.

3.3.3 AADT flows peak at approximately 74,500 vehicles on the section of the A63 (Castle Street) for which the proposed scheme options have been developed.

3.3.4 The average % HGV within the Hull AQMA is approximately 10% of total road traffic. The % HGV on the A63 is above average, ranging from 20.8% to 26.3% of total road traffic.

3.3.5 The road network in the study area is subject to a range of speed limits. In particular, the A63 is subject to a speed limit of 40 mph (64 km/h) within the study area. Reported speeds are in excess of the speed limit in some locations throughout the study area.

3.3.6 Traffic data was also provided for twenty-four sub links within the Hull AQMA and twenty-three road links (links A-W) outside the AQMA. The full base year (2004) traffic data set is provided for reference in Appendix B1 of the Environmental Assessment Report.

3.4 Accidents and Journey Time Reliability

3.4.1 Accident Analysis

3.4.1.1 An accident analysis has been undertaken using COBA 11.10 and incorporating into the overall scheme economic assessment.

3.4.1.2 Traffic flows have been taken from the TRIPS model developed for the scheme for each opening year. Traffic growth rates have been derived using the NTM forecasts for all roads within the Yorkshire and Humber area.

3.4.1.3 The latest complete five year period of accident records (01 January 2003 to 31 December 2007) supplied to Pell Frischmann by Hull City Council have been used I this assessment. The records show there have been 257 Personal Injury Accidents (PIAs) within the confines of the study area. The proportion of KSI accidents is 10.9%. Table 3.4.1 shows the breakdown of accidents by severity and year

Table 3.4.1: Casualty Split by Severity and Year

Year	2003	2004	2005	2006	2007	Total
Fatal	0	0	1	0	0	1
Serious	6	3	5	6	7	27
Slight	55	58	37	45	34	229
Total	61	61	43	51	41	257

3.4.2 Journey Time Surveys

3.4.2.1 Table 3.4.2 below shows the recorded journey times in the AM Peak, Interpeak and PM Peak for the Eastbound and Westbound.

Table 3.4.2: Average Journey Time for each Route

	Route 1		Route 2		Route 3	
	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound
AM Peak	00:18:17	00:24:54	00:29:05	00:20:55	00:37:07	00:36:49
Inter-peak	00:15:31	00:16:01	00:22:01	00:22:27	00:32:13	00:34:17
PM Peak	00:21:22	00:23:42	00:22:30	00:25:11	00:35:04	00:37:50
Average	00:18:23	00:21:32	00:24:32	00:22:51	00:34:48	00:36:19

3.4.2.2 The full results of the journey time surveys are included as Appendix E of Pell Frischmann's Traffic Survey Report (PF, 2004) to this report.

Route 1

3.4.2.3 Figures 3.4.1 and 3.4.2 overleaf illustrate the recorded and average journey times on Route 1 for each run, in both eastbound and westbound directions.

3.4.2.4 Figure 3.4.3 overleaf shows the average journey time by km in an eastbound direction for each of the three time periods.

3.4.2.5 Figure 3.4.3 overleaf shows the average journey time by km in a westbound direction for each of the three time periods.

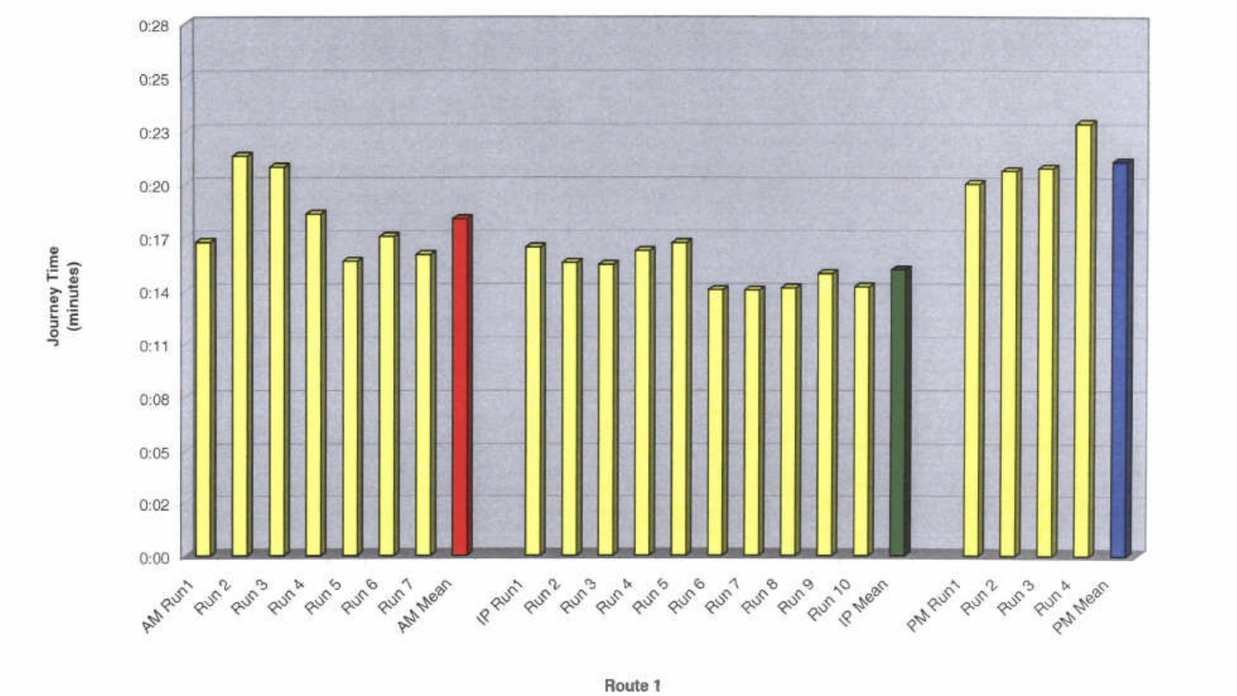


Figure 3.4.1: Route 1 (Yellow) Journey Time Survey – Eastbound

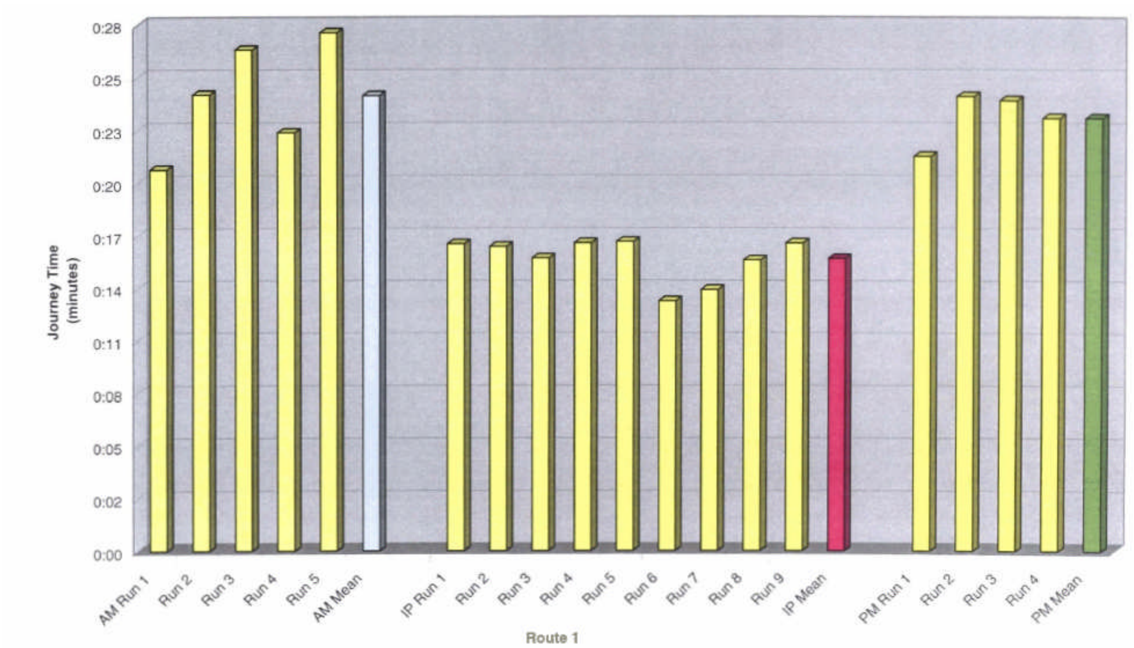


Figure 3.4.2: Route 1 (Yellow) Journey Time Survey – Westbound

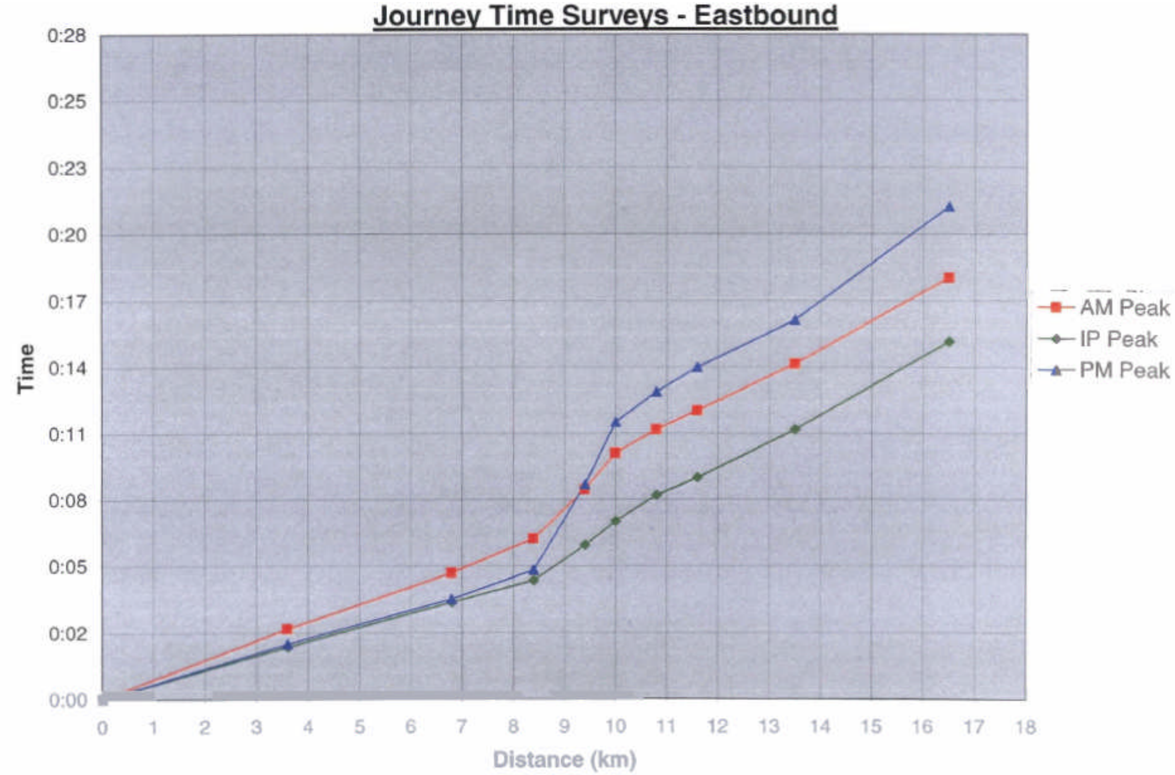


Figure 3.4.3: Time Distance Diagram of Route 1

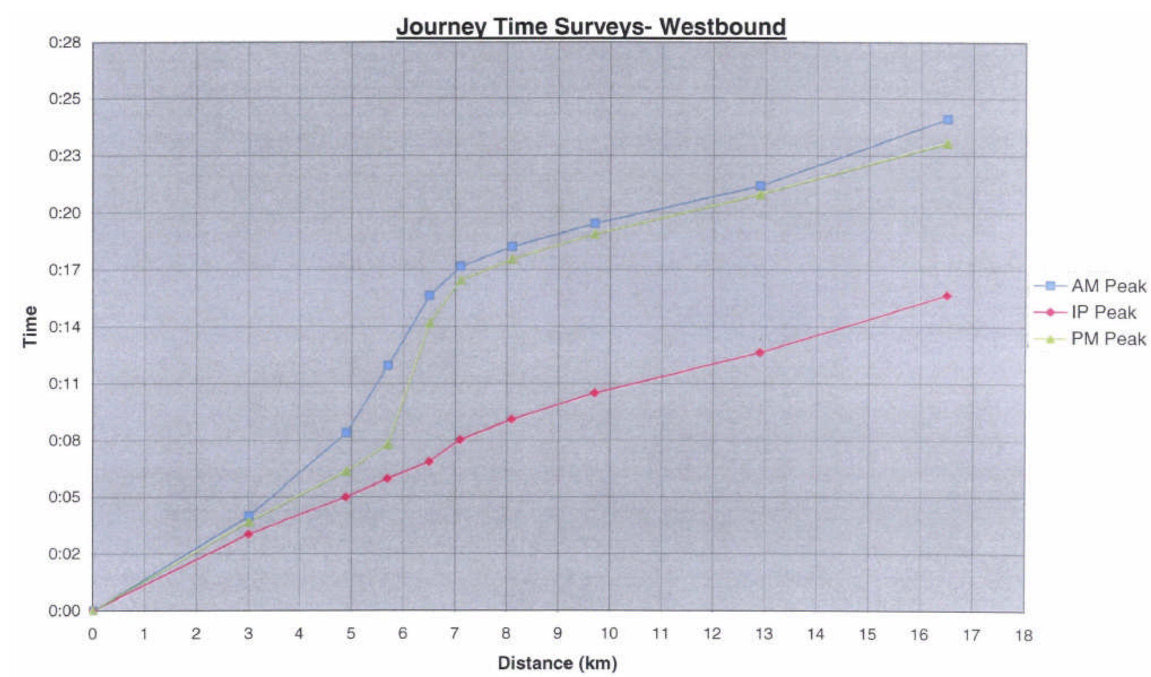


Figure 3.4.4: Time Distance Diagram of Route 1

Route 2

3.4.2.6 Figures 3.4.5 and 3.4.6 below illustrate the recorded and average journey times on Route 2 for each run, in both eastbound and westbound directions.

3.4.2.7 Figure 3.4.7 overleaf shows the average journey time by km in an eastbound direction for each of the three time periods.

3.4.2.8 Figure 3.4.8 overleaf shows the average journey time by km in a westbound direction for each of the three time periods

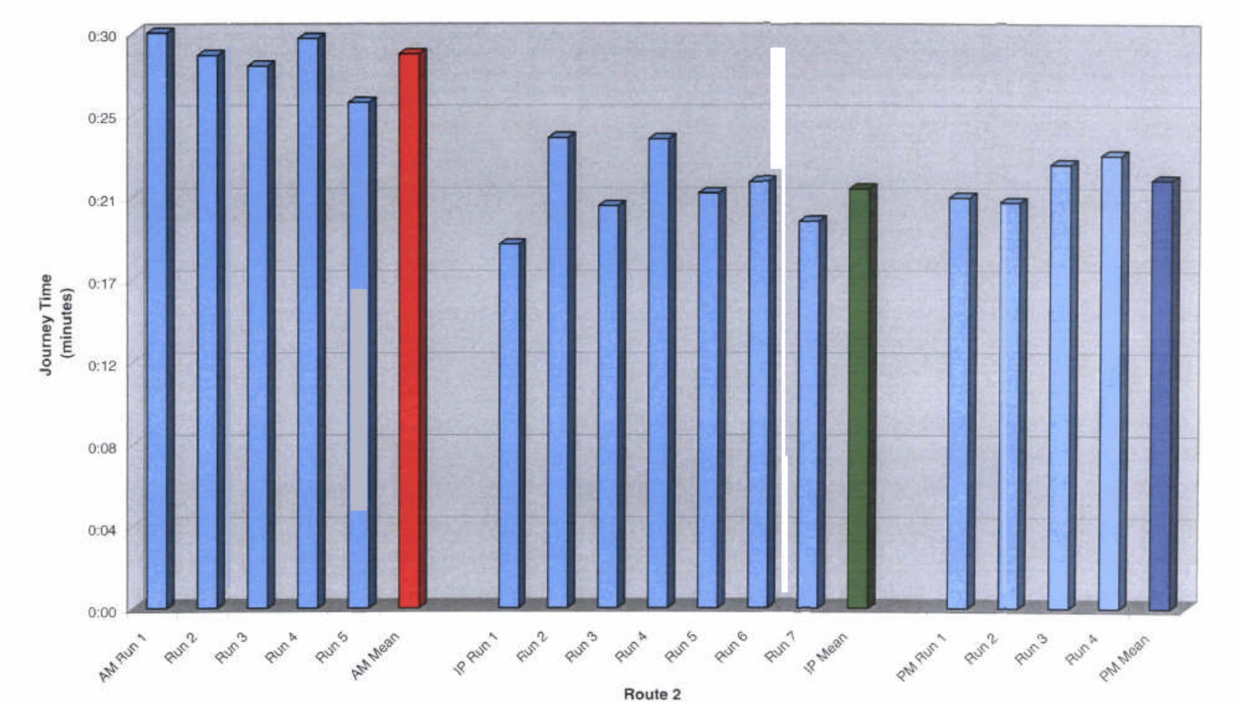


Figure 3.4.5: Route 2 (Blue) Journey Time Survey – Eastbound

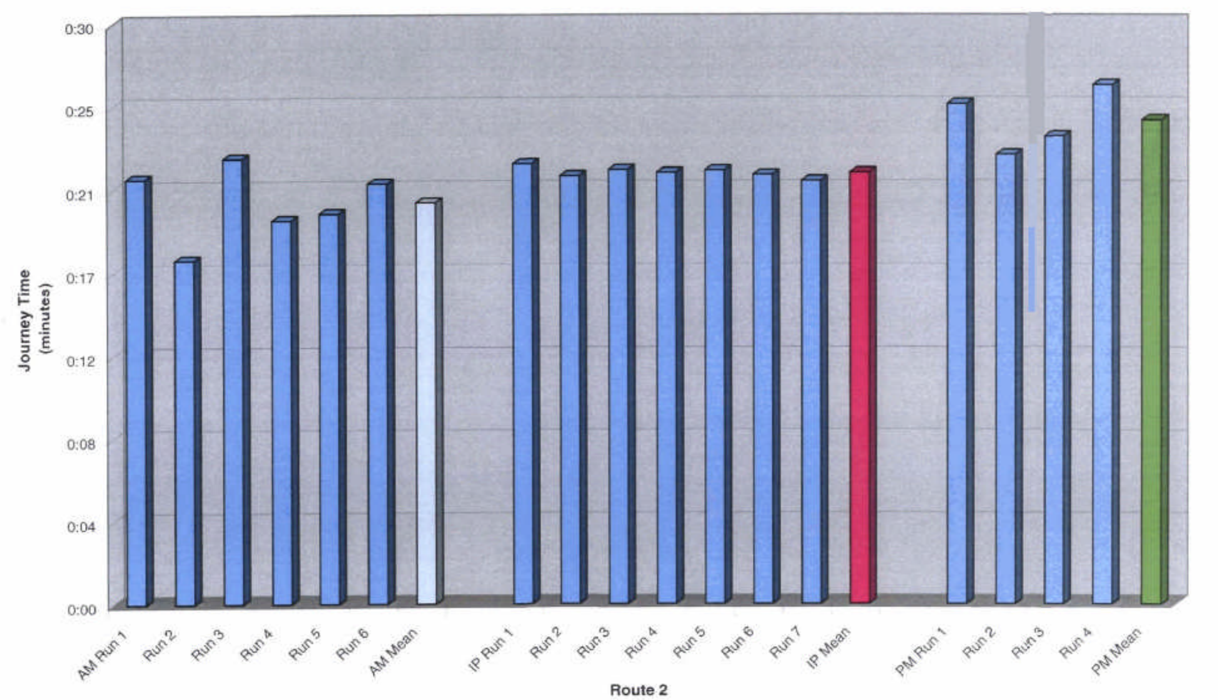


Figure 3.4.6: Route 2 (Blue) Journey Time Survey – Westbound

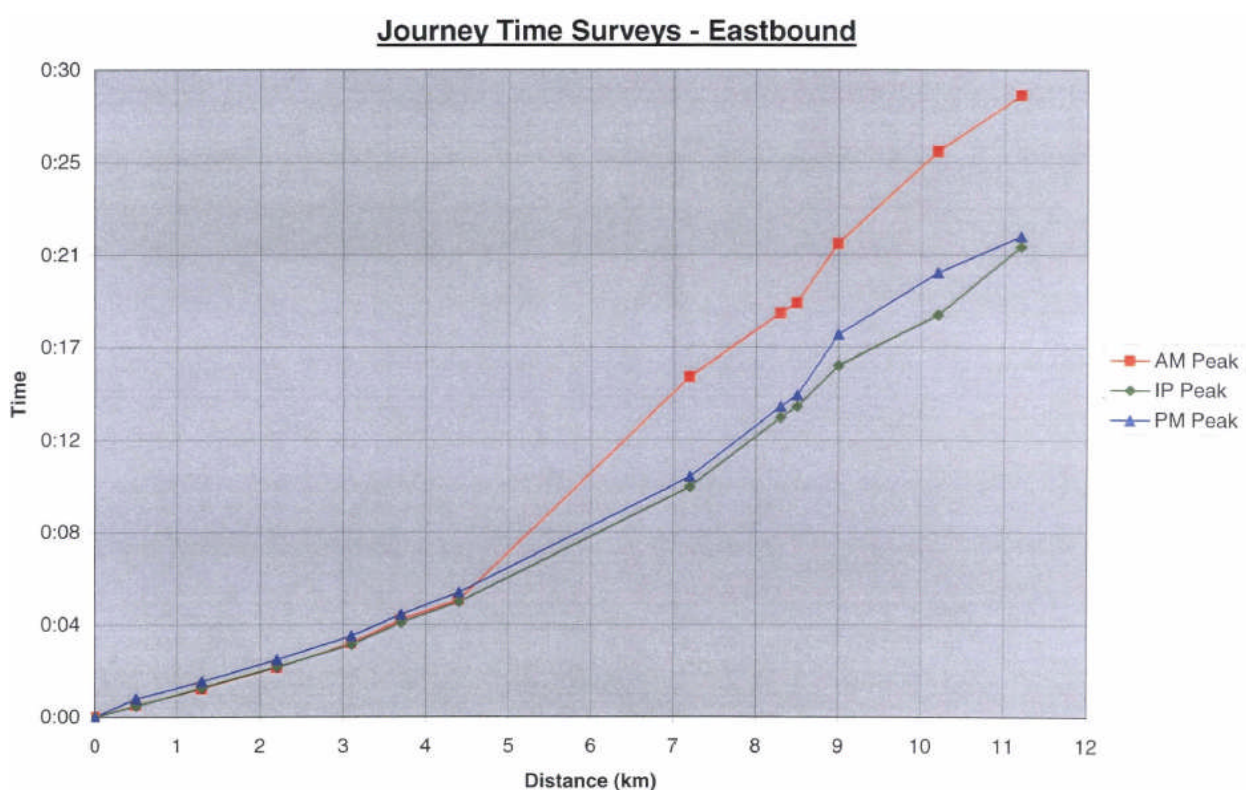


Figure 3.4.7: Time Distance Diagram of Route 2

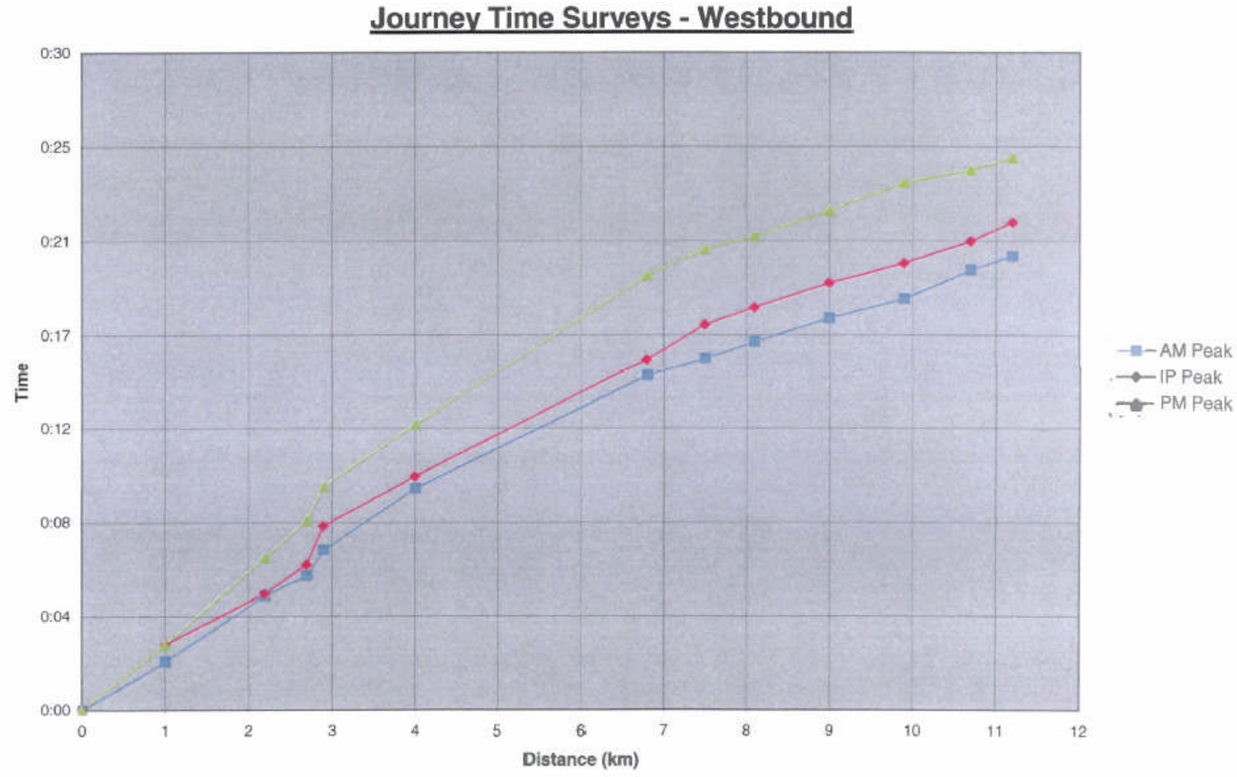


Figure 3.4.8: Time Distance Diagram of Route 2

Route 3

3.4.2.9 Figures 3.4.9 and 3.4.10 overleaf illustrate the recorded and average journey times on Route 2 for each run, in both eastbound and westbound directions.

3.4.2.10 Figure 3.4.11 overleaf shows the average journey time by km in an eastbound direction for each of the three time periods.

3.4.2.11 Figure 3.4.12 overleaf shows the average journey time by km in a westbound direction for each of the three time periods.

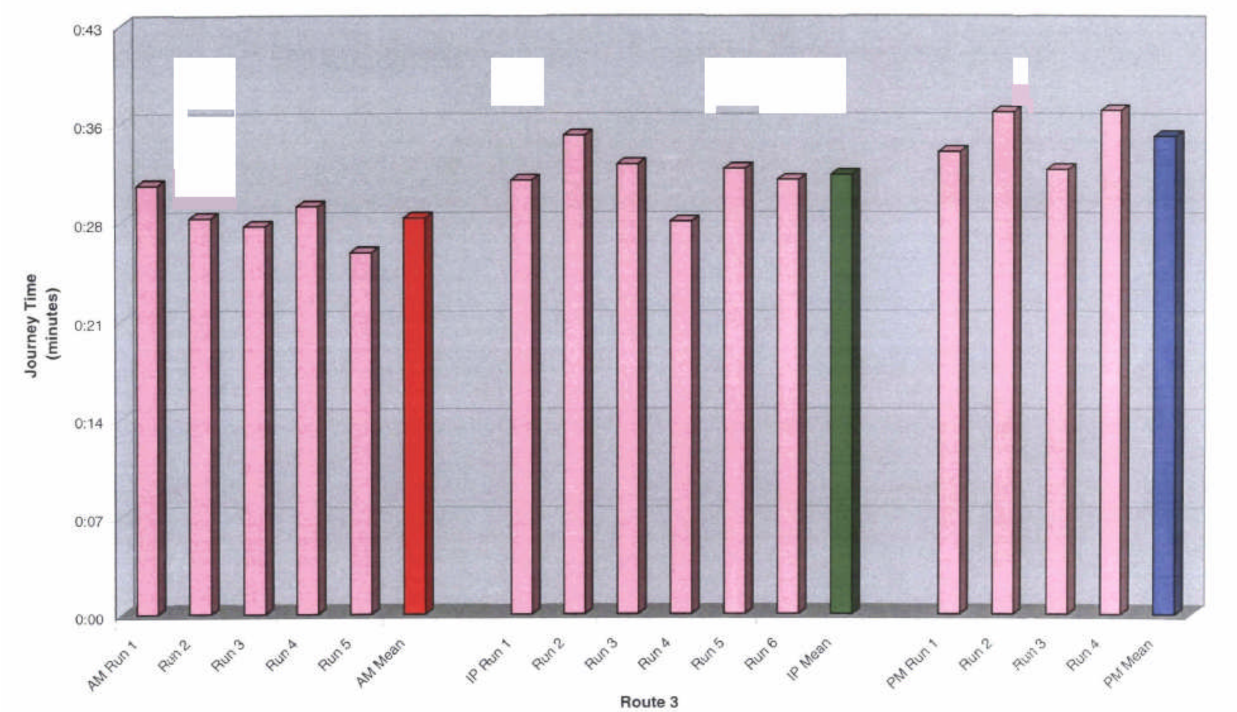


Figure 3.4.9: Route 3 (Pink) Journey Time Survey – Eastbound

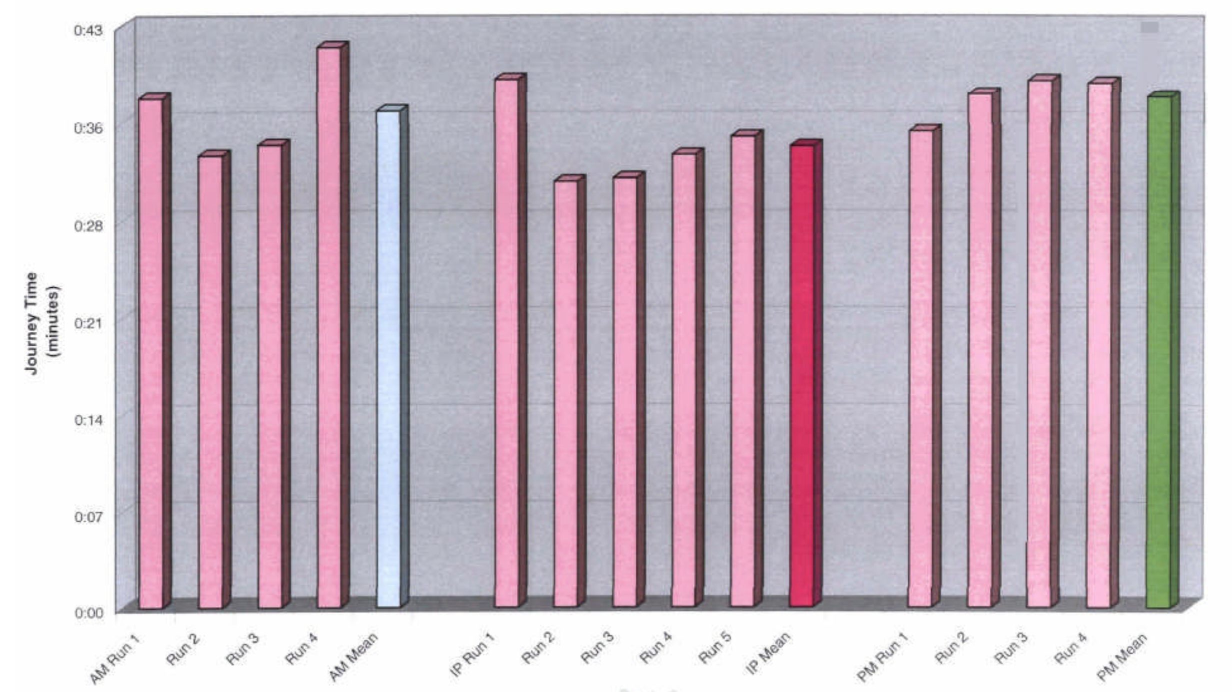


Figure 3.4.10: Route 3 (Pink) Journey Time Survey – Westbound

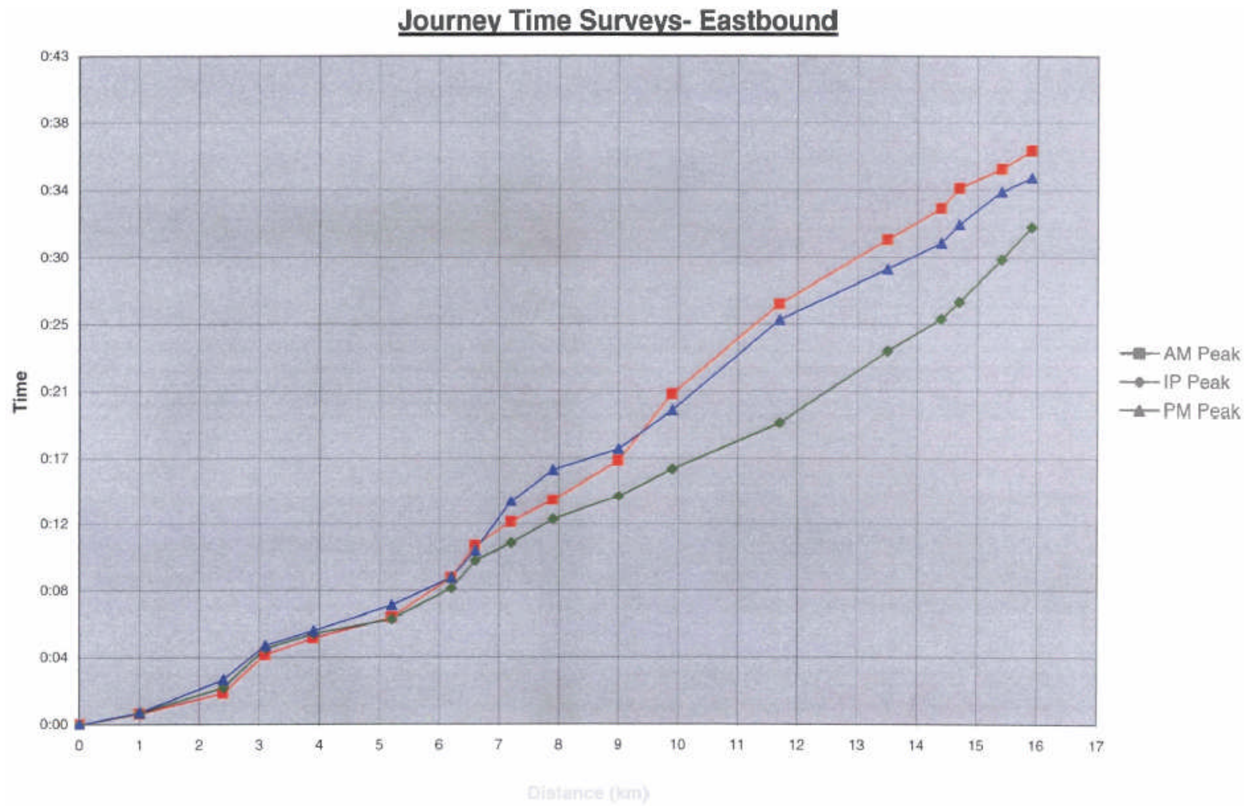


Figure 3.4.11: Time Distance Diagram of Route 3

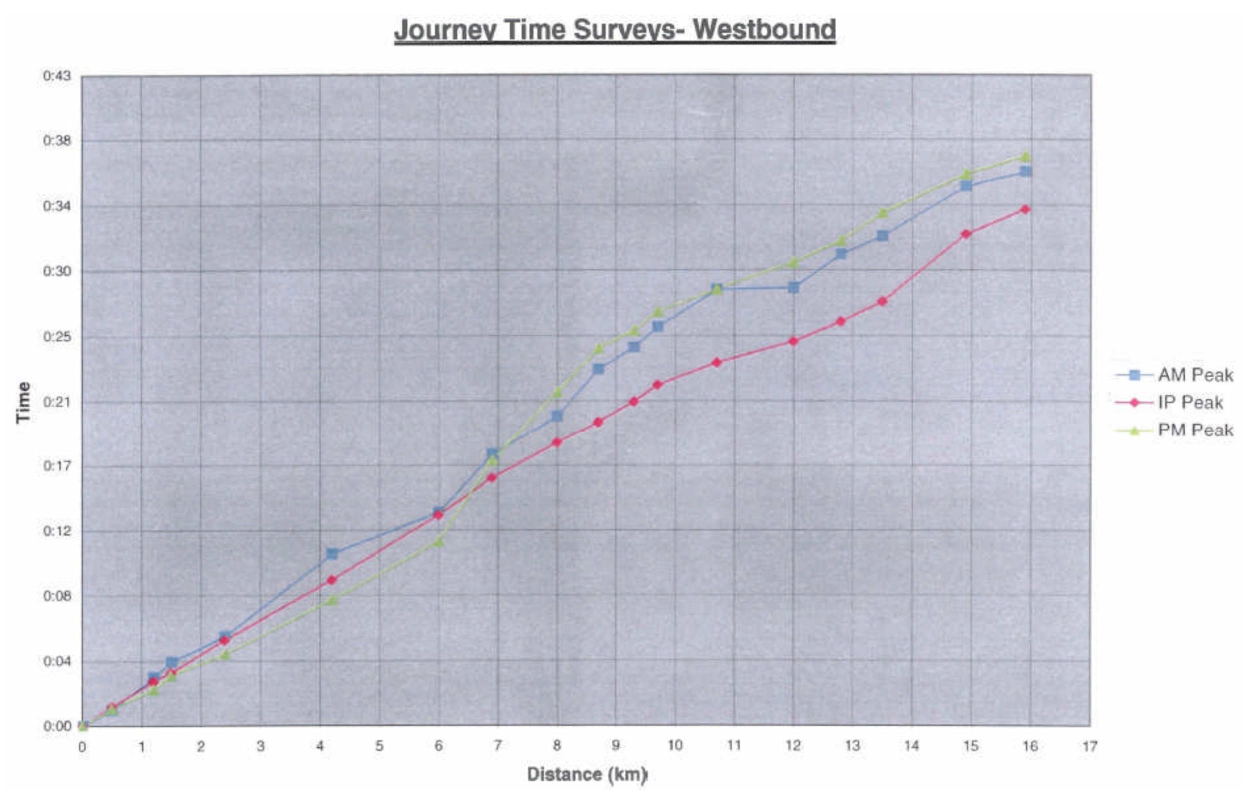


Figure 3.4.12: Time Distance Diagram of Route 3

3.5 Topography, Land Use, Property and Industry

3.5.1 Topography

3.5.1.1 Castle Street runs across level ground, between three and four metres above Ordnance Datum (aOD). The street runs parallel to the Humber Estuary, some 400 metres to the south and at a right angles to the River Hull some 300 metres before this joins the Humber. The original course of the River Hull crossed the Commercial Street Junction. There are no topographical features of note, the character of the street being determined by land use and condition and the form and quality of surrounding buildings.

3.5.2 Land Use

3.5.2.1 The pattern of land use in the area divides into two halves, west and east of Humber Dock/Princes Dock. The western portion has a coarse grained pattern of land use with a great deal of open space. The eastern portion has a much finer grained mosaic of properties enclosing the highway and reflecting the grid pattern of the Old Town.

3.5.2.2 The western portion of Castle Street is dominated by the open spaces adjoining the Commercial Road Roundabout. South of the junction are the extensive car parks of the Kingston Retail Park which contains the superstores Toys-R-Us/Childrens World and Great Mills DIY. Across Commercial Road the Forte Crest Hotel grounds and car park are partly separated from Castle Street by the public open space of the Holy Trinity Burial Ground. Between the A63 and the northern arm of the roundabout (Ferensway) is a residential area of three and four storey courtyard flats with the seven storey William Booth House, a Salvation Army Hostel close to the roundabout. From Ferensway to Waterhouse Lane the immediate frontage is vacant land used for car parking pending a commercial development. Behind this area the property is in a variety of commercial uses including British Telecom and Royal Mail depots, DIY and electrical suppliers and empty offices.

3.5.2.3 From Castle Buildings (currently empty) at the corner of Waterhouse Land to Warehouse 6 adjoining Prince’s Dock Street is a strip of vacant land broken only by the Earl de Gray Public House. Behind this frontage strip is a 1000 space multi-storey car park serving the 200,000 square foot Prince's Quay retail and leisure development. Outline planning permission has been granted for commercial development between Warehouse 6 and the Earl de Gray. This has not been implemented to date but provides for the construction of a brick warehouse to match the existing warehouse on the corner of Prince's Dock Street, linked by a row of single storey craft workshops. The City Council intend to promote a commercial development off Waterhouse Lane retaining the Earl de Gray and Castle Buildings as anchor points.

3.5.2.4 The eastern portion of Castle Street is composed of a mix of small offices and residential properties. Those on the north side, within the Old Town Conservation Area are predominantly residential of two to three storeys. On the south side the office development of Marina Court takes up rather less than half of the frontage. The remainder is used as temporary car parking, pending agreement on redevelopment proposals.

3.5.3 Property

3.5.3.1 Approaching the Commercial Road Roundabout for the west the residential area of courtyard flats to the north, which includes William Booth House, has a consistent character to red brick blocks, service streets and shrubs/grass areas making up utilitarian townscape.

3.5.3.2 Beyond William Booth House a small park provides a buffer between the roundabout and the properties on Great Passage Street.

3.5.3.3 South of the A63 the Kingston Retail Park has little character. Large retail warehouses dominate an expanse of car parking.

3.5.3.4 Between Ferensway and Prince's Dock the street scene is dominated by the open areas used for temporary car parks, pending redevelopment. The two remaining properties, Castle Building and the Earl de Gay Public House are both grade II listed buildings.

3.5.3.5 A concrete multi storey car park of mediocre appearance effectively separates the aforementioned area from the Prince's Dock and the metal and glass clad bulk of Prince's Quay Shopping Centre.

3.5.3.6 South of Castle Street, the Hotel dominates the area between the Holy Trinity Burial Ground and the Marina (formally the Humber Dock).

3.5.3.7 Between Prince's Dock and Market Place, the Old Town Conservation Area presents a continuous frontage to Castle Street, and includes three listed buildings. This frontage has a great deal of recent infill development which reflects the older property by its form, material and scale.

3.5.3.8 The properties adjoining the intersection of Castle Street with Market Place/Queen Street include another nondescript multi-storey car park and a collection of light industrial warehouses.

3.5.3.9 The listed gilded statue of King William III dominates the Market Place entrance to the Old Town, but the immediate surroundings provide a poor setting for an historic memorial.

3.5.4 Industry

3.5.4.1 The Industrial Revolution led to a rapid expansion of the town beyond the walls and a demand for increased wharfage. An arc of dock basins was constructed to the west and North of the Old Town along the line of the 16th and 17th Century fortifications. The Humber Dock was built in 1809, the Prince's Dock in 1829 and the Railway Dock in 1846, together these formed the Town Docks.

3.5.4.2 The Old Town suffered a steady decline from the mid 19th Century onwards. Its importance declined as further docks were built along the Humber foreshore. The city centre and the docks were heavily damaged in the Second World War.

3.5.4.3 Post war redevelopment was concentrated elsewhere and the deterioration of the Old Town Docks Continued throughout the 1950s and 1960s.

3.5.4.4 The Town Docks ceased commercial operation in 1967. Development proposals were drawn up to safeguard the long term future of the historic elements by ensuring that they had a functional role. This has brought investment from outside the area and provided a leisure and tourist industry.

3.5.4.5 Expansion of the Docks to the East of Hull is however anticipated, with new roll-on/roll-off facilities planned and trade with Eastern Europe expected to rise. Between 1982 and 1987 trade passing through Hull docks increased from 4 to 5.6 million tonnes and passenger traffic rose from 435,000 in 1983 to 730,000 in 1988.

3.6 Climate

3.6.1 The following details have been obtained from the Meteorological Office website for the A63 Castle Street locality. Averages and extremes taken for the last 30 year period between January 1971 and December 2000 are as follows;

- Average annual rainfall (mm) – 644.0
- Annual average number of rainy days (>=10mm) - 13.8
- Annual average number of rainy days (>=1mm) – 115.2
- Annual average number of rainy days (>=0.2mm) – 162.9
- Annual mean daily maximum temperature – 13.5^{o}C
- Annual mean daily minimum temperature – 6.6^{o}C
- Annual Mean Temperature – 10.0^{o}C
- Annual average number of days with sunshine – 60.9
- Annual average number of days with ground frost – 86.7
- Annual average number of days with an air frost – 30.7
- Annual average number of days with sleet/snow fall – 24.2
- Annual average number of days with snow lying – 8.4
- Annual average days with hail – 5.0
- Annual number of days with thunder heard – 11.1

3.7 Drainage

3.7.1 Overview and Baseline Conditions

3.7.1.1 The site typically comprises low lying land varying around 3-5m aOD rising to a maximum of 11m aOD as the A63 approaches the River Hull. The River Hull lies immediately east of the site and the Humber estuary lies approximately 300m south.

3.7.1.2 The drainage in the district is into the Humber Estuary via the River Hull, in the area of Kingston upon Hull, with Hull itself being located on the floodplain of the River Hull. Spring tides in the Humber Estuary rise to 3.6m aOD. The lower reaches of the River Hull in the vicinity of the site are tidal.

3.7.1.3 The groundwater vulnerability map indicates that the soils are unclassified. Typically soil information from urban areas is unreliable and based on fewer observations than in rural areas, in these cases the worse case is assumed and the land is classified as high leaching potential (HU) until proved otherwise.

3.7.1.4 The published geology indicates that the site is underlain by the Upper Cretaceous Chalk of the Burnham Formation. In the vicinity of the site the chalk is classified as a non-aquifer. However it should be noted that the chalk in the vicinity of the site is classified as a non aquifer due to saline intrusion from the North Sea and the Humber Estuary rather than because the unit has poor water yields or low flows. To the west where the saline intrusion is not present the chalk is classified as a major aquifer. The Scheme is not in an area classified as a groundwater Source Protection Zone.

3.7.1.5 Information obtained in the Preliminary Sources Study report indicate that there are no licensed surface or groundwater abstractions and one consent to discharge within 250m of the site.

3.7.1.6 A Flood Risk Assessment (Pell Frischmann report R10021Y001/E) has been undertaken for the scheme. Full details of the flooding risk of the site can be found in the aforementioned report. A summary of the baseline conditions in the vicinity of the site is given in Section 3.10.9 Water Environment

3.7.1.7 The Environment Agency reports that there are no records of any flooding occurring on the lower reaches of the River Hull since 1980, when the tidal surge barrier was completed.

3.7.1.8 In June 2007 severe flooding occurred within Hull causing the flooding of 23,000 homes. None of the local rivers burst their banks despite unofficial figures from Hull University stating that "117mm of rain fell on Hull in the 24 hours between 25th and 26th June 2007." (NCE, 12 July 2007). The flooding was mainly confined to the northern parts of the city and consequently the area around Castle Street was unaffected by the flooding. Correspondence with the Maintaining Agent Contractor, Carillion WSP confirmed no flooding occurred on the trunk road network.

3.7.1.9 The FRA report concluded the following:

- The site is protected from flooding by the existing River Hull and River Humber flood defences. These protect the City of Hull from flood events arising once in 100 and once in 200 years respectively.

- The whole site is within the indicative 1 in 100 year flood plain (in the theoretical absence of the existing flood defences), and the eastern half of the site is within the area that was flooded during the 1969 flood event that occurred before the installation of the tidal surge barrier on the River Hull.

- PPS 25 indicates that the site is located within flood Zone 3a and has a high probability of flooding. PPS 25 advice indicates that these areas may be suitable for essential infrastructure such as that which is proposed provided the exception test is passed and the FRA justifies that the risk of flooding to the site is sufficiently low. As identified in the Flood Risk Assessment Report, the site is protected by flood defences serving the City of Hull. It is highly unlikely that these would be abandoned, and therefore it can be considered that the site would be protected for its lifetime.

3.7.2 Existing Drainage and Pipelines

3.7.2.1 Examination of the as-built drawings from the Southern Orbital Road Scheme which included Castle Street and Market Place indicate that the road drainage is drained to a storm water sewer.

3.7.2.2 Liaison with the HA Maintaining Agent Contractor (MAC) confirm that the majority of the storm water sewers are public sewers, however there are likely to be small lengths of private highway drainage in some areas.

3.7.2.3 It is not known what the existing flows and capacities of the sewers are at present.

3.8 Geology

3.8.1 General Ground Conditions

3.8.1.1 The geology along the site has been determined from available geological publications and site observations, together with local borehole information obtained from previous ground investigations. These include the site investigations undertaken by Allied Exploration and Geotechnical Ltd (AEG) in 1994 for the improvement of the A63 Trunk Road, Castle Street, Hull. In addition, we have referred to a number of boreholes and trial pits undertaken by Soil Mechanics as part of the redevelopment of Prince's Quay, which lies adjacent to site.

3.8.1.2 Existing records have revealed that the study area is underlain by solid rocks of the Cretaceous Period. The superficial deposits overlying the bedrock have been shown to consist of Alluvium over Glacial Till over Glacio-Lacustrine and Head deposits. Made Ground is present along the majority of the study area.

3.8.1.3 The following sections provide information on the descriptions of anticipated soil materials determined from the previous site investigations, geotechnical reports and published information.

3.8.2 Made Ground

3.8.2.1 Made Ground is expected to be encountered throughout the length of the site. Previous intrusive investigations have proven variable Made Ground in all of the boreholes. The Made Ground varies in depth across the site ranging from a minimum depth of 0.3m below ground level (bgl) to a maximum of 9.6m bgl. It is predominantly cohesive in nature; however granular fill material was encountered in a number of the exploratory holes.

3.8.2.2 Cohesive Made Ground was encountered in the majority of the exploratory holes covering the study area. Where the exploratory holes were undertaken on areas of no hard-standing the Made Ground is generally present immediately underlying topsoil at depths of around 0.1m to 0.3m bgl. However, in a few of the exploratory holes cohesive Made Ground was encountered at depths of around 0.9m to 1.2m bgl beneath a layer of granular Made Ground. The depth of the cohesive Made Ground varied between 0.3m bgl to 5.0m bgl, with an average thickness of 2.2m.

3.8.2.3 The cohesive Made Ground typically comprises soft to stiff, brown, occasionally mottled orange brown or with grey veining, sandy, gravelly clay with occasional cobbles. The gravel comprises angular to subrounded, fine to coarse chalk, chert, flint, sandstone, coal, brick and concrete plus occasional gravel of sandstone and limestone. Cobbles typically comprise chalk, brick or concrete.

3.8.2.4 Granular Made Ground was found to be present in a number of the exploratory holes. The composition of this stratum varied between brick and concrete fill or hardcore under areas of hard-standing to loose to dense, clayey, sandy gravel with occasional to some cobbles. The gravel comprises fine to coarse angular to subangular chalk, limestone, brick and flint. The cobbles typically comprised brick, concrete, wood, dolomite and sandstone.

3.8.2.5 The thickness of the granular Made Ground deposits ranged between 0.1m and 9.4m, although typically the thickness of the granular Made Ground varies between 0.1m and 2.4m, with an average thickness of 1.2m. Thicker deposits of Made Ground are present in the vicinity of Humber and Prince's Docks. These deposits are in the range of 8.6m to 9.4m thick and are overlain by a thin layer (0.5m - 0.65m) of cohesive Made Ground.

3.8.2.6 Old walls, floors and foundations were encountered within the Made Ground between depths of 0.5m and 2.2m bgl during the excavation of some of the trial pits. A number of old service pipes were also encountered as well as an old brick culvert, which was damaged during excavation of a trial pit at the north side of Commercial Road roundabout.

3.8.2.7 Trial pits undertaken in the area between Castle Street and Prince's Dock also encountered stone walls, large timbers, concrete footings, a sandstone block (possibly part of a tie back system) and a brick counterfort.

3.8.2.8 Wood, clay pipes, tiles and household waste was encountered locally in the vicinity of Mytongate roundabout.

3.8.2.9 The cohesive Made Ground material is anticipated to be unsuitable for reuse as engineering fill, although with limited processing, the granular Made Ground material may be suitable for reuse as engineering fill.

3.8.3 Alluvium

3.8.3.1 Alluvium is present in all of the exploratory holes underlying the Made Ground. At the eastern end of the site the alluvial deposits are principally cohesive in nature. Thin granular bands are present underlying the cohesive Alluvium in the vicinity of the proposed Ferensway / A63 grade separated junction. Towards the west of the site, the granular Alluvium bands become thicker with the deposits lying between two cohesive Alluvium horizons in the vicinity of Humber and Prince's Dock.

3.8.3.2 The cohesive Alluvium deposits typically comprise very soft to stiff, grey brown and black, sandy, thinly laminated clay, occasionally interbedded with loose silt or peat. The clay typically has a high silt content, occasional to some decomposed organic matter and decayed wood fragments. The cohesive Alluvium is generally present immediately below the Made Ground at depths ranging from 0.3m to 9.6m bgl, with an average depth of 2.8m bgl. Typically the thickness of the cohesive Alluvium varies between 1.6m and 11.3m, with an average thickness of 7.6m. In the vicinity of Humber and Prince's Dock, a second cohesive layer is encountered below a layer of granular Alluvium. This layer is generally encountered between 13.5m and 21.8m bgl and has a thickness in the region of 0.9m to 5.2m.

3.8.3.3 Granular Alluvium is typically found in the central to eastern section of the study area underlying the cohesive Alluvium. This stratum is generally encountered at around 9.6m to 11.3m bgl. The thickness of the stratum appears to increase to the west of the site with thicknesses, in the vicinity of Ferensway, of between 1.1m and 3.4m increasing to between 8.6m and 10.5m in the area of the Humber and Prince's Dock.

This stratum typically comprises clayey silty sand with occasional gravel. Peat deposits are present within the Alluvium throughout the site.

3.8.3.4 The test results showing the properties of Alluvium determined from various investigations are summarised in the Preliminary Sources Study Report (PSSR).

3.8.3.5 The cohesive Alluvium is anticipated to be unsuitable for reuse as an engineering fill whereas the granular Alluvium is anticipated to meet the requirements of a Class 1 or Class 2 material for reuse in accordance with Table 6/1 of the Specification for Highway Works (SHW).

3.8.4 Peat

3.8.4.1 This material typically comprises soft to firm, occasionally stiff, brown, clayey, sandy peat. Occasional layers are interbedded with soft to firm, grey and brown, thinly laminated clay.

3.8.4.2 Peat is present in eight of the exploratory holes as a thin layer between 0.3m and 2.5m thick and was encountered at depths ranging from 9.0m to 21.3m bgl.

3.8.4.3 This material is anticipated to be unsuitable for reuse in accordance with Table 6/1 of the Specification for Highway Works (SHW).

3.8.5 Glacial Deposits

3.8.5.1 These deposits are present in the western section of the site up to Ferensway junction. The Glacial Till is found underlying the Alluvial deposits and is underlain in turn by Glacio-Lacustrine deposits. In a limited number of exploratory holes head deposits were also encountered below the cohesive glacial deposits.

3.8.5.2 Glacial Till was encountered, underlying the Alluvium, in the majority of the exploratory holes and typically comprises firm to very stiff, brown, occasionally with grey veining, sandy gravelly clay. The deposit is generally present at depths ranging from 8.5m to 15.8m bgl. Typically the thickness of the Glacial Till varies from 1.1m to 6.1m, with an average thickness of 3.6m. Generally the deposit is thicker to the west of the site and wedges out between Ferensway Junction and Prince’s Dock.

3.8.5.3 Glacio-Lacustrine deposits were encountered in the majority of the exploratory holes from Ferensway Junction to the western end of the site. It typically underlies the Glacial Till but occasionally immediately underlies the Alluvium. It typically comprises stiff to very stiff, brown, thinly laminated, sandy clay with sand and silt on partings and occasionally interbedded with medium dense to dense, brown silt. In one of the exploratory holes this stratum comprised dense to very dense, fine to medium sand, interbedded with stiff, brown, sandy clay. These deposits are typically present at depths ranging from 13.7m to 18.1m bgl. In the majority of the exploratory holes, the base of this stratum was not proved, however in the vicinity of Ferensway Junction the stratum was found to be around 6.7m to 8.6m thick.

3.8.5.4 The Head deposits typically comprise medium dense to dense, brown, sandy gravel or gravelly sand. The gravel is predominantly fine to coarse, sub-angular to angular, flint and sub-rounded chalk. It was encountered in three boreholes undertaken at Ferensway Junction and in two holes drilled in the vicinity of Prince's Dock. The gravel was encountered at depths of between 20.4m bgl and 25.0m bgl and varied in thickness from 0.3m to 7.4m, with an average thickness of 3.8m.

3.8.5.5 The test results showing the properties of the glacial and head deposits determined from various investigations are summarised in the Preliminary Sources Study Report (PSSR).

3.8.6 Chalk

3.8.6.1 Chalk was proven in seven of the exploratory holes studied as part of this desk study. It comprises weak to moderately strong, fresh to slightly weathered, yellowish white, fine-grained, well-cemented Chalk, with very thin horizontal fractures and vertical jointing. The Chalk was found to contain strong flint nodules.

3.8.6.2 Rockhead was encountered between 22.9m and 32.4m below ground level along the length of the site. This corresponds to an ordnance datum level of between 9.2m aOD and -20.7m aOD from the western end of the study area to the proposed A63 / Ferensway grade separated junction and between -26.8m aOD to -27.5m aOD from Prince's Dock to the River Hull.

3.8.7 Groundwater

3.8.7.1 The site investigation undertaken by AEG (1994) undertook both groundwater monitoring and tidal monitoring. A summary of the results obtained by AEG is included within the PSSR.

3.8.7.2 From the groundwater monitoring results obtained during the AEG Site Investigation, it is evident that groundwater levels vary significantly (from 0.2m to 13.8m bgl) throughout the study area. However, the groundwater would typically be expected to be present within 1.5 to 4m of the ground surface.

3.8.7.3 Tidal monitoring over a 12 hour cycle was undertaken in four boreholes in three different strata (cohesive Alluvium, granular Alluvium and Chalk). Only the readings in the Chalk showed fluctuations linked to tidal effects in the estuary. Comparison of these readings with water levels in the Humber Estuary over the monitoring time period indicates there is a time lag in the order of 40 to 60 minutes. It was suggested in a previous report by Acer (1990) that the lack of tidal effects in the other boreholes is probably due to their low permeability. The reports note that higher spring and neap tidal changes may have an effect on the groundwater levels in these strata.

3.8.8 Gas

3.8.8.1 No gas monitoring was undertaken during the investigations studied as part of the PSSR, so it is not possible to define any ground gas regime in the study area. However, the presence of highly organic material and Peat in the Alluvium could potentially result in the production of gas in the ground.

3.8.9 Contaminated Land (Areas and Types of Contamination)

3.8.9.1 An Envirocheck Report (Envirocheck, 2004), GroundSure Report (2008) and site walkovers did not indicate a significant risk to the development from contaminated land, however a number of potentially contaminating sources have occurred on or in the vicinity of the site. These are sites, where previous uses and guises include timber works, saw mill, metal (brass) works, warehouses, cattle and pig markets as well as the disused burial ground. In addition Made Ground is expected to be present throughout the site.

3.8.9.2 Limited chemical testing was undertaken in the vicinity of the burial ground as part of the Acer Investigation. The results of these tests showed elevated levels, in excess of 1000mg/kg, of Toluene Extractable Matter (TEM). No Total Petroleum Hydrocarbons (TPH) tests were undertaken in association and it is likely that organics within the alluvial deposits would have affected these figures so the elevated TEM results may be misleading. However, hydrocarbon odour was noted in the associated trial pits.

3.8.9.3 No records of a landfill site were revealed by the environmental search undertaken as part of the Envirocheck and GroundSure reports. However, domestic waste was encountered in a number of the trial pits in the vicinity of Commercial Road roundabout.

3.8.10 Landfill Regulations

3.8.10.1 The EU Landfill Directive (99/31/EC) is currently being implemented in England and Wales via the Landfill Regulations. The Landfill Regulations were rolled out between 2002 and 2007. The 2004 regulations enforced the new landfill licences that classify landfills as Inert, Non-hazardous or Hazardous with the purpose of ending the co-disposal of wastes. The latest issue of the Landfill Regulations 2005 implement new Waste Acceptance Criteria (WAC) and Waste Acceptance Procedures (WAP). WAC and WAP were enforced with the 2005 regulations as of 16th July 2006. Following the implementation of this legislation, all waste destined for disposal at a licensed waste management facility now requires to be characterised and classified in accordance with the legislation and associated guidance documents.

3.8.10.2 After these measures have been put in place and any contaminated material and interred remains from the graveyard removed the residual risk of encountering these types of material is likely to be considered as low.

3.8.10.3 The enforcement of Regulation 10 (waste which may be accepted in the different classes of landfill) will have an effect on the proposed schemes primarily in terms of material re-use. Consideration should be given to the potential to recycle and reuse material where appropriate to minimise waste production.

3.8.11 Faulting

3.8.11.1 The geological map indicates that there are no known faults within the vicinity of the study area.

3.8.11.2 Intrusive information obtained during a recent investigation has also not encountered any indication of faulting. Therefore, the risk of encountering and the scheme options being affected by any faults is considered to be low and no mitigation measures are required.

3.8.12 Groundwater

3.8.12.1 The Cretaceous Chalk in the East Yorkshire area is classified as a major aquifer. However in the vicinity of the study area, this stratum is overlain by Glacial Till which is classified as a non-aquifer.

3.8.12.2 The Chalk aquifer is not expected to be penetrated by the piles for the viaduct structure and the secant piles for the underground structures and it is likely that groundwater in the aquifer is present under sub-artesian or artesian pressure.

3.8.12.3 Groundwater was encountered at depths from 0.2m to 13.8m below ground level across the study area, although this includes seepages. Groundwater levels are typically expected to be present within 1.5m to 4m of the ground surface. The high groundwater levels could lead to potential problems with failure or collapse of earthworks, excessive water in the excavations and pile bores or even piping of the excavation base.

3.8.12.4 There is a risk of washing-out of fines from the alluvial deposits and the Made Ground into any deep excavations if the retaining wall is not significantly water-tight. This could lead to settlement of the surrounding ground and any adjacent buildings on shallow footings.

3.8.12.5 There is also a potential for piling induced vibrations to result in liquefaction of the soils leading to settlement of adjacent structures.

3.8.12.6 Therefore, problems associated with the groundwater beneath the site are likely and it is considered to be medium risk.

3.8.12.7 Mitigation measures in the form of recommended areas of further site investigation and groundwater monitoring are discussed further in the Annex A to the PSSR.

3.8.13 Contaminated Land

3.8.13.1 The Envirocheck report and site walkover did not indicate a significant risk to the development from contaminated land. Nevertheless, because there is no contamination testing of any note and hydrocarbon odours were detected in one of the trial pits undertaken on the site, it is considered that the risk of encountering contaminated material is high.

3.8.13.2 Mitigation measures in the form of further site investigation followed by contamination testing of the underlying materials and groundwater are required to prove any existing contaminated material. Any material found to be contaminated will be required to be removed in accordance with the Waste Acceptance Criteria (WAC) and Waste Acceptance Procedures (WAP). After these measures have been put in place and any contaminated material and interred remains have been removed in the appropriate manner the residual risk is likely to be considered as low.

3.9 Mining

3.9.1 The site is not affected by any underground coal mining and the Envirocheck report identifies that risk due to mining subsidence to be very low.

3.9.2 The geological memoir indicates that quarrying has taken place within the Cretaceous Chalk; however no former quarries in the vicinity of the site have been identified.

3.10 Public Utilities

3.10.1 Introduction

3.10.1.1 As part of the previous Preliminary Sources Study the statutory undertakers were approached to obtain service plans showing the location of apparatus running through or across the study area. These records were updated as part of the current study.

3.10.1.2 The locations of services potentially affected by the proposed improvements are shown on drawings W11189/05/01 - 02 in Appendix F and are summarised below.

3.10.2 Yorkshire Water - Sewers

3.10.2.1 There are a number of sewers in the vicinity of Porter Street. A combined brick culverted sewer runs north-south across the junction. There is also a combined brick sewer extending along the southern verge from Clive Sullivan Way. Just short of the junction, the sewer forks and one branch of the sewer heads off northeast along Porter Street with the second branch proceeding east along Waverley Street.

3.10.2.2 A combined sewer is present running along the central reservation of Hessle Road starting at Porter Street and terminating approximately 35m west of Cogan Street. This sewer has a connection crossing the A63 and running south into Spruce Road.

3.10.2.3 A combined sewer from Waverley Street crosses Spruce Road and then runs parallel to Hessle Road. It crosses the A63 at Cogan Street then proceeds up Cogan Street.

3.10.2.4 There are a number of storm and combined sewers within the vicinity of Commercial Road Roundabout. A combined brick sewer cuts across the southern end of Ferensway at its junction with Mytongate and runs along the northern verge of the roundabout towards the Castle Street Junction. A second combined brick sewer navigates northwards along Commercial Road to the roundabout and then along the southern verge of the roundabout towards the Castle Street Junction outfalling in the previous sewer. The sewer subsequently intersects Castle Street and proceeds up Waterhouse Lane with a branch connection to Castle Street. This branch comprises a concrete sewer that crosses the northern carriageway and runs along the central reservation terminating at Prince's Dock. There is a connection from this sewer crossing the A63 at the Hotel and turning east along the southern verge for a distance of around 50m.

3.10.2.5 A concrete storm water sewer originates adjacent to Warehouse No 6 and runs under the northern carriageway of Castle Street. At the junction of Prince's Dock Street and Humber Dock Street the sewer splits and changes to a combined sewer. One branch proceeds north along Prince's Dock Street, a second continues along the northern carriageway to Daggers Lane before turning into the northern verge and continuing within the verge to the junction with Market Place. The final branch extends along the southern carriageway/verge of the A63 to the junction with Queen Street.

3.10.2.6 At Dagger Lane and Fish Street, there are connections from both of the sewers, which head northwards along the respective streets. There is also a connection from the southern drain to the sewer in Finkle Street and from the northern drain to the sewer in Vicar Lane.

3.10.2.7 At the Market Place/Queen Street Junction, the two Castle Street sewers connect in to a 1200mm diameter concrete sewer that runs north-south across the junction.

3.10.2.8 There is a large 3600mm diameter overflow that flows west-east across the area. The sewer runs partially through Albert Dock, and then runs in a northeast direction until it reaches English Street, where it runs along the southern verge. It continues along the southern verge and the carriageway of Kingston Street, and crosses the Humber Dock to Humber Dock Street. It subsequently runs along the carriageway of Blanket Row and Blackfriargate and through the River Hull.

3.10.3 Yorkshire Water - Water Mains

3.10.3.1 There are a number of water mains crossing the A63 in the vicinity of Porter Street. At this location the mains turn along either Porter Street, Waverley Street or down St James Street.

3.10.3.2 At Spruce Road, a water mains pipe diverges from the junction and proceeds along the southern verge of Hessle Road up the roundabout and then progresses down Commercial Road. There are two feeds of the main on Hessle Road, both running into the retail park.

3.10.3.3 At the Cogan Street/William Street Junction, two mains merge and continue along the northern verge of the A63 to the roundabout. The main partly circles round the verge of the roundabout and along the western verge of Ferensway. A second main runs down the eastern verge of Ferensway and turns east along Castle Street to Waterhouse Lane where it advances up Waterhouse Lane and Myton Street.

3.10.3.4 A water mains pipe is present in the eastern verge of Commercial Road. This main runs up the southern verge of Mytongate, skirting Trinity Burial Ground and into Castle Street. At the junction there is a branch connection which crosses the A63 to the main pipe in the northern verge. The main continues along Castle Street until it reaches Queen Street. There are several feeds from this line. One branch connection crosses the A63 immediately east of Waterhouse Lane, with a second crossing at Prince's Dock Street and a final one approximately 40m before the Queen Street Junction. There are two private feeds, one to the electricity sub-station and the second to the hotel. There are also connections into Humber Street, Sewer Lane and two into Finkle Street.

3.10.3.5 At Waterhouse Lane, a main proceeds down the eastern verge and emerges onto Castle Street where it turns east running along the northern verge to the Market Place. There is one private connection into the Earl de Grey pub and branch connections, one into Prince's Dock Street, Fish Street and Vicarage Lane and two into Dagger Lane.

3.10.3.6 At Market Place/Queen Street Junction the mains in the north and south verges of Castle Street turn north running up the Market Place and south running down Queen Street respectively.

3.10.3.7 A second main traverses north-south from Market Place to Queen Street in the eastern verge, crossing the A63 immediately east of the junction.

3.10.4 Transco

3.10.4.1 All of the gas mains in the vicinity of the site are classified as low pressure gas mains.

3.10.4.2 There are a number of mains crossing the A63 in the vicinity of Porter Lane. One of the mains runs up Porter Street and a second main is present running along the southern verge of the A63 Hessle Road for a short distance before turning into Waverley Street. At Spruce Road, the main turns back onto Hessle Road, continuing up to the junction with Mytongate, before running round Mytongate and down Commercial Road.

3.10.4.3 There is also a branch connection crossing the A63 before the junction and splitting to head west to Cogan Street and northeast around the roundabout. This subsequently cuts across Ferensway and runs down past the eastern side of the junction along the northern verge of Castle Street. The main cuts across Waterhouse Lane and then terminates near the Earl de Grey Public House. The main also crosses the A63 just past Waterhouse Lane feeding into the electricity sub-station.

3.10.4.4 Another main starts in the vicinity of Warehouse No 6 running east along Castle Street and across Prince's Dock Street. It proceeds along Castle Street to the Market Place with a number of feeds to the housing estate to the north and one crossing to Humber Dock Street.

3.10.4.5 At the Market Place the main turns both north and south to feed along the western verge of both Market Place and Queen Street.

3.10.5 Cable and Wireless

3.10.5.1 In 2004 we received information detailing that there were three Cables originating in Market Place, one in the centre and two which are connected on the east and west of Market Place. All three cables proceed down Market Place, cutting across Castle Street then down Queen Street. Cables also extend down Blanket Row and Blackfriargate.

3.10.5.2 However, in 2007, we received confirmation that there is no longer any apparatus belonging to Cable & Wireless in the region of the A63.

3.10.6 Yorkshire Electricity

3.10.6.1 There are a number of electricity cables that cross the A63 Hessle Road in the vicinity of Porter Street. The cables then progress north towards Lovat Close, northeast along Porter Street and east along Waverley Street. Approximately half way along Waverley Street there is a spur of the cable that runs along the southern verge of Hessle Road for around 50m. There is a second spur off at Spruce Road that runs along the A63 and into Kingston Retail Park.

3.10.6.2 There is an electricity cable extending along the central reservation of Hessle Road, which is believed to be for street lighting.

3.10.6.3 There are several cables that cross the A63 from the Retail Park and head northeast to Cogan Street with two branches. There are two branches either side of the A63, both of which proceed along the verges of Hessle Road toward Commercial Road Roundabout.

3.10.6.4 At the roundabout, the cable in the northern verge turns south and crosses the road and merges with the cable in the southern verge. It then proceeds along the southwest verge of the roundabout with the majority of the cables south along Commercial Road.

3.10.6.5 Two cables run south along Ferensway to the roundabout, one in each verge. The western cable terminates in the vicinity of the junction, with the eastern cable extending along the northern verge of the northeast quadrant of the roundabout to Castle Street.

3.10.6.6 At the Castle Street junction, several cables cross the A63 and run in the north and south verges. Some of the cables in the southern verge intersect the A63 but the majority run parallel to the A63 to a nearby sub-station. The majority of the cables in the northern verge turn north along Waterhouse Lane with one branch continuing along the northern verge and a second extending along the central reservation of Castle Street. The cable in the central reservation diverges and turns both north and south adjacent to the Multi-storey car park. The cable in the northern verge continues eastwards along Castle Street towards Prince's Dock Street with two branches running in the central reservation.

3.10.6.7 At Prince's Dock Street, some of the cables continue along Castle Street with two turning northwards along Prince's Dock Street, one crossing into the central reservation and continuing down Castle Street towards Market Place and a third crossing and heading south into Humber Street. At Dagger Lane, a cable from the northern verge intersects the A63 and turns east running along the southern verge all the way to Queen Street.

3.10.6.8 At the Market Place / Queen Street Junction a number of cables cross the junction running from north to south. There are also cables in the majority of the verges around the junction.

3.10.7 Kingston Communications

3.10.7.1 The communication cable ducts run along both the northern and southern verge of Hessle Road up to Porter Street. At St James Street, the cable within the southern verge continues east into Waverley Street for a short distance with a branch connection to the cable in the northern verge. A second cable also runs north up St James Street crossing the A63 and heading along Porter Street. On the northern verge the cable continues along Hessle Road with a branch connection line running up Porter Street.

3.10.7.2 Upon reaching the junction, the cable on the northern verge, cuts across Hessle Road and terminates upon reaching the southern verge, the line also proceeds through Mytongate and up into Ferensway. There is also a connection, which runs across Ferensway and southwards crossing Castle Street, partially encircling Mytongate and then southwards down Commercial Road. The cable subsequently intersects Commercial Road immediately south of the junction and heads back along Mytongate towards Castle Street. The cable duct then skirts the periphery of the Trinity Burial Ground, the southern verge of the A63 Castle Street and then turns obliquely towards the hotel.

3.10.7.3 At Waterhouse lane, two cables proceed southwards to Castle Street, the first in the direction of the roundabout, where it terminates and the second running along the northern verge of Castle Street towards the Market Place. There are several off shoots of this cable between Prince’s Dock Street and Market Place at Dagger Lane, Fish Street and Victor Lane. It also intersects Castle Street at two locations progressing into Humber Street and Finkle Street. On the southern verge the line starts west of Humber Dock along Castle Street and down into Humber Dock Street, it also cuts across the entrance to Humber Dock Street and continues into Marina court.

3.10.7.4 At Market Place, the cable crosses both Market Place and the A63 proceeding southwards into Queen Street. To the east, the cable duct flanks both sides of Garrison Road and continues over Myton Bridge.

3.10.8 British Telecom

3.10.8.1 There is one cable in the eastern limits of the proposed scheme boundary, which crosses Hessle Road from the south and proceeds northwards along Porter Street.

3.10.8.2 At Commercial Road Roundabout, two cables parallel to each other proceed northwards along Commercial Road and subsequently curve to the northeast along Mytongate. They both cross Castle Street and proceed along either side of Waterhouse Lane.

3.10.8.3 In 2004, it was revealed that there were two cables either side of Prince's Dock Street progressing southwards to Castle Street, again one in each verge. The eastern cable crossed the A63 and continued down Humber Street. The western cable crossed the northern carriageway of the A63 and continued obliquely towards the east along the central reservation and terminated at Market Place. Upon reinvestigation, however, this plant is now redundant.

3.10.8.4 Also in 2004, BT had an additional cable crossing the A63 at the Magistrates Court, and which ran north-south along the eastern verge of Queen Street and Market Place. This is also now redundant.

3.11 ENVIRONMENTAL STATUS

3.11.1 Air Quality Management Area (AQMA)

3.11.1.1 Hull Air Quality Management Area (AQMA) was formally declared on 1 August 2005. It incorporates the area bordered by the centre line of Rawlings Way to the west, Anlaby Road, Carr Lane, Whitefriargate, Silver Street and Scale Lane to the north, the River Hull to the east and the River Humber to the south.

3.11.1.2 The AQMA is outlined on Figure 3.11.1 below.

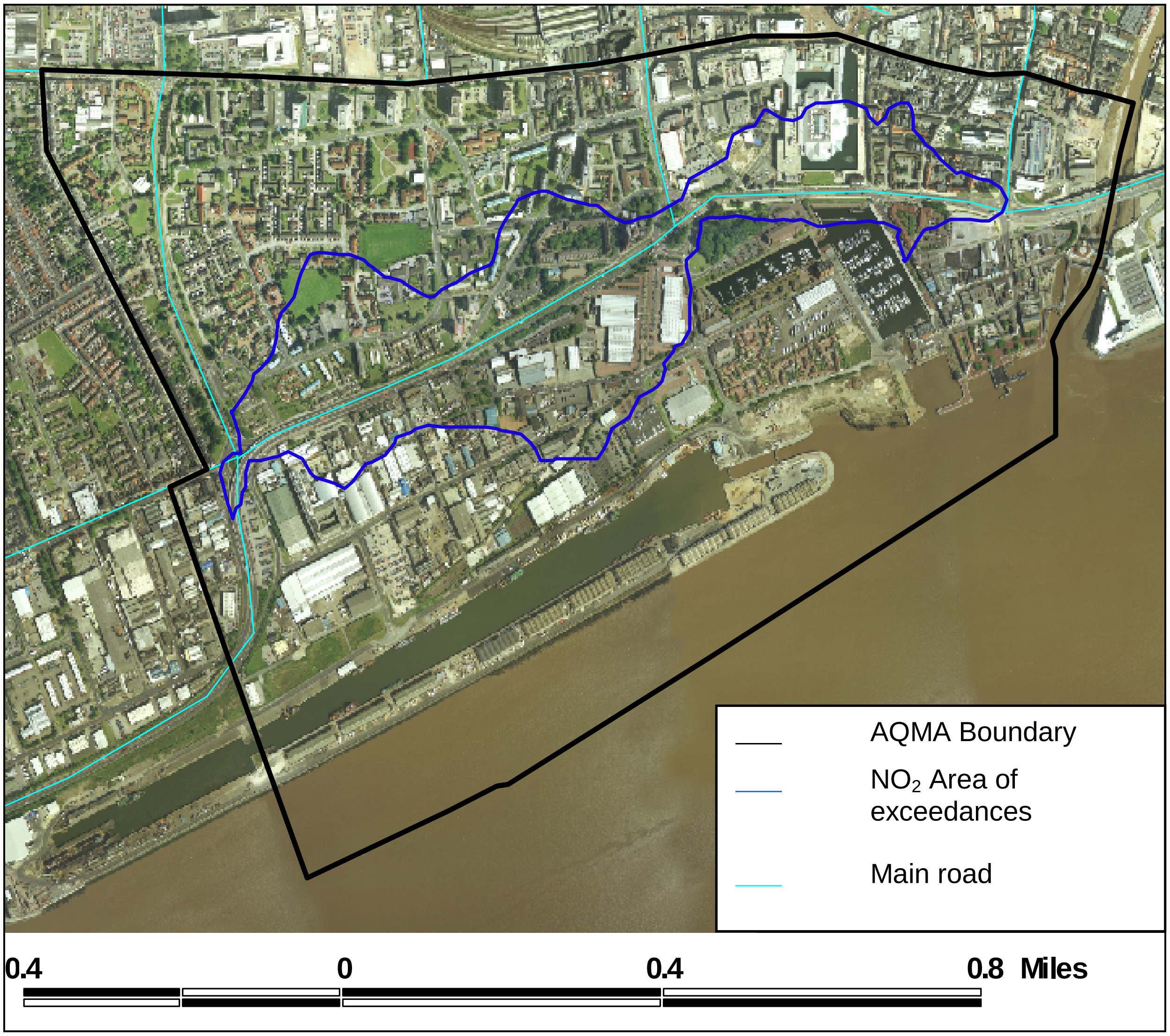


Figure 3.11.1 Kingston Upon Hull - Air Quality Management Area

3.11.2 Conservation Area

3.11.2.1 The study area is typical of an urban area; however the area has the added features of a river front location, a historical core and a number of historical docks. The area contains a variety of land use including residential (both small and large scale), retail, commercial and public open space. The A63 runs through a section of the Old Town Conservation Area which contains buildings and area of townscape and historic merit. The city has developed out from this historic core, however, many areas suffered extensive bomb damage during the Second World War and this is seen in the wide-ranging post war styles of buildings.

3.11.2.2 Due to the size and diversity of the Conservation Area it is split into three area descriptions (Area A - central/eastern, Area B - western/northern, and Area C - southern). The Conservation Area boundary extends through the study area from the western side at Commercial Road, to the south of Mytongate roundabout, around Trinity Burial Ground and east along Castle Street until it meets Humber Dock and Princes Quay, before heading north along Princes Dock Street. The eastern boundary of the Old Town Conservation Area follows the course of the River Hull at the boundary of the study area. The boundary of the conservation area is shown in the Figure 3.11.1.2 below.

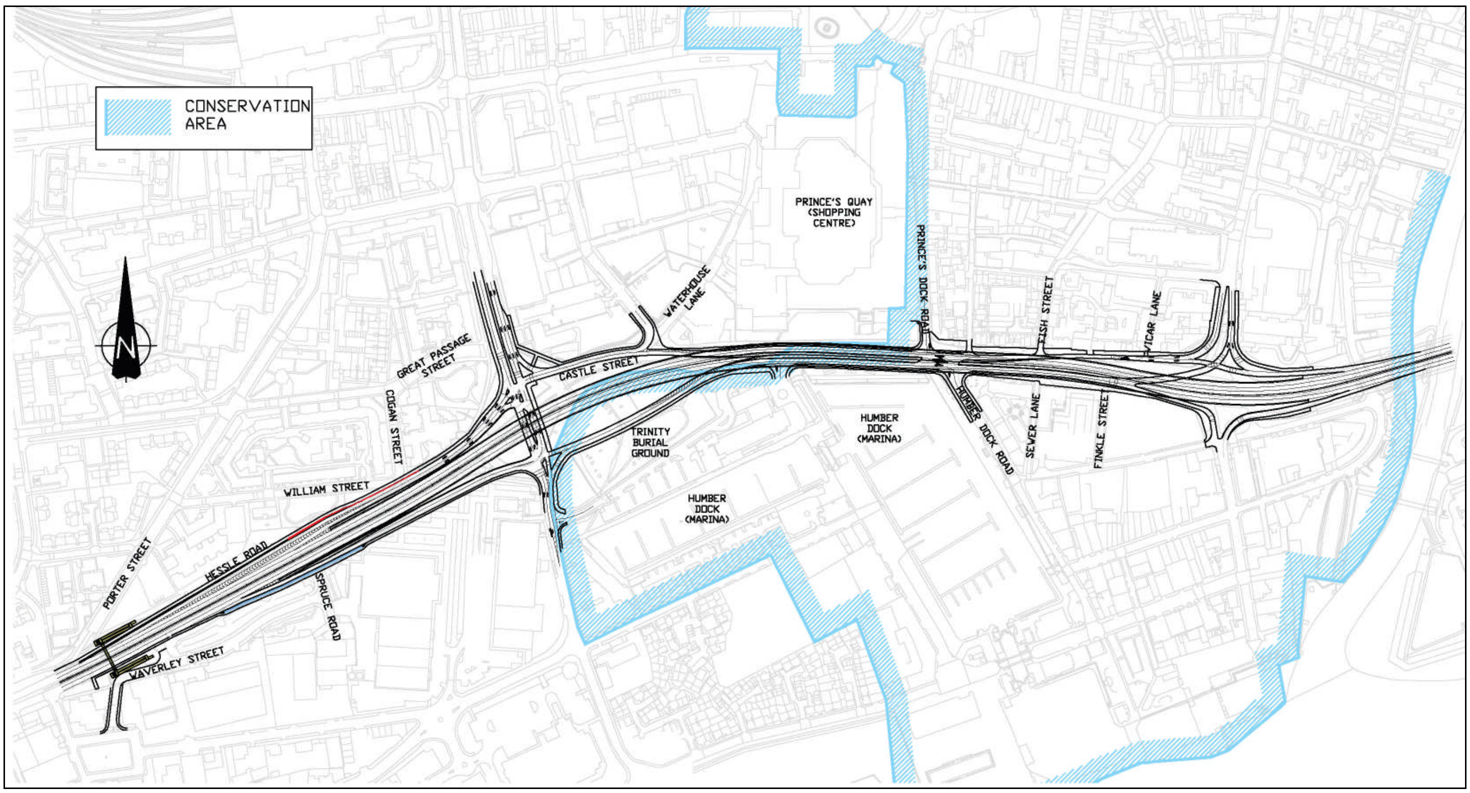


Figure 3.11.2 Old Town Conservation Area

3.11.2.3 An assessment of the Conservation Area and the impact due to the proposed schemes are given in sections 3.12 Environment (Baseline) and 9.0 Environmental Assessment of this report.

3.11.3 Heritage Sites

3.11.3.1 There are no Scheduled Monuments within the study area. The nearest lies on the east bank of the River Hull, and comprises the below ground remains of some of the

Henrician defences, namely the castle, the south blockhouse and part of the late 17th century Citadel fort (SM 34710). The castle and south blockhouse were first scheduled on 16 March 1972, but the extent of the SM was expanded and enhanced on 11 August 2003 to cover a much larger area which included parts of the Citadel. There are no Historic Battlefields, Registered Parks and Gardens or areas of National Trust inalienable land within or immediately adjacent to the study area; the nearest National Trust property is Maister House, located at 160 High Street.

3.11.3.2 There are a number of Listed Buildings that are located in close proximity to the road and have the potential to be either directly or indirectly affected by the scheme development, including:

- Grade I – King William III statue and lamps.
- Grade II - Humber Dock including north and east walls of tidal basin, Castle Buildings, Earl De Grey, Warehouse No. 6 and the Market Place toilets.

3.11.3.3 There are a number of other Listed Buildings within the study area e.g. Holy Trinity Church and these are dealt with in detail in the Cultural Heritage section of the Environmental Assessment Report (PF, 2008).

3.11.4 Statutory Nature Conservation Sites

3.11.4.1 The Humber Estuary Site of Special Scientific Interest (SSSI) lies within 0.5km of the site. This has been designated for its nationally important habitats, which include coastal saltmarsh, intertidal mudflats and sandflats, saline lagoons and sand dunes. The estuary supports nationally important numbers of many wintering wildfowl and waders, a breeding colony of grey seals, and various other animals and plants. In addition to SSSI status, the Humber Estuary is designated as a Special Protection Area (SPA) and Special Area of Conservation (SAC) under the Conservation (Natural Habitats & c.) Regulations 1994, as amended 2007 and forms part of the European Natura 2000 network. Further, the Humber Estuary is a Wetland of International Importance under the Ramsar Convention 1971, and is known as a Ramsar site.

3.11.5 Non-statutory Nature Conservation Sites

3.11.5.1 There are a number of non-statutory nature conservation sites, or SNCIs (Sites of Nature Conservation Importance). The following SNCIs lie within 1km of the site boundary:

- Land to the East of the Circle Cricket Ground (Site Code 86), Grid Ref TA080289
- Trinity Burial Ground, Castle Street (site code 369), Grid Ref TA094283;
- Mudflats to South of Sammy's Point (site code 255), Grid Ref TA101281
- River Hull (including banks) (site code 168), Grid Ref TA093320

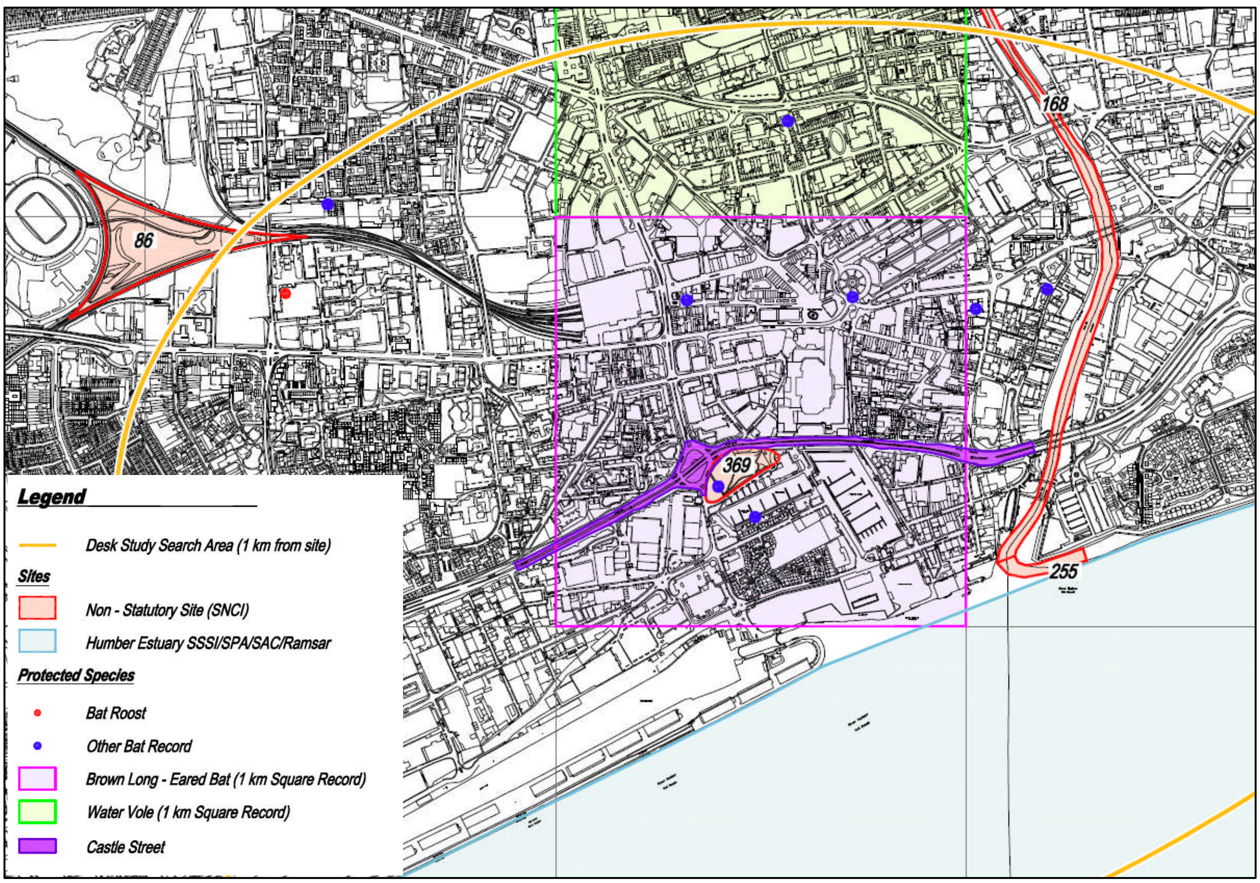


Figure 3.11.3 Designated Sites and Locations of Protected Species

3.11.5.2 The Trinity Burial Ground SNCI lies partly within the site.

3.11.5.3 Further details of the environmental baseline of the study area are given in Section 3.12 of this report, with the Environmental Assessment presented in Section 9.

3.12 ENVIRONMENT

3.12.1 Introduction

3.12.1.1 An Environmental Assessment has been carried out for the scheme in accordance with the Design Manual for Roads and Bridges (DMRB). The outcome of the Assessment is detailed in the report ‘A63 Castle Street, Environmental Assessment (Options Identification Stage)’ dated September 2008.

3.12.1.2 A summary of the existing environmental conditions within the study area are summarised in the following sections.

3.12.2 Noise

3.12.2.1 The baseline assessment considers the noise from traffic flows on the existing road network for a range of scenarios. As the proposed road options will be constructed over different time periods the resulting year for the scheme opening will be dependent upon the complexity of the option. Therefore a range of do-minimum scenarios have been considered which relate to the proposed opening year for all options and 15 Years After Opening in addition to the baseline (2004) scenario. The scheme options considered and the proposed opening year and long term (15 Years After Opening) are summarised below in Table 3.2.

Table 3.2 Scheme Options and Proposed Year Opening and Long Term Assessment Dates

Scheme Option	Year Opening Date	15 Years After Opening Date
Option 1 – Underground Base	2018	2033
Option 2 – Underground Landbridge	2018	2033
Option 3 – Cut & Cover Tunnel	2020	2035
Option 4 – Overground Base	2017	2032
Option 5 – Overground Landbridge	2017	2032
Option 6 – Extended Viaduct	2018	2033

3.12.2.2 The scenarios therefore consider natural traffic growth on the existing road network. A summary of the number of residential and commercial properties falling into each of the noise bands is given below in Table 3.3.

Table 3.3 Assessment of Baseline Case – Do Minimum

Noise Band	Existing	Year Opening			Long Term		
	2004	2017	2018	2020	2032	2033	2035
Residential							
<50	10	7	8	6	8	8	8
50-<60	585	549	533	510	515	528	511
60-<70	1076	1029	978	1000	985	976	985
≥70	408	494	560	563	571	567	575
Commercial							
<50	54	48	45	26	27	22	23
50-<60	178	147	137	135	127	138	134
60-<70	147	150	156	169	162	165	163
≥70	135	169	176	184	198	189	194

3.12.2.3 It can be seen from the above table that there is a natural trend for properties to fall within higher noise level bands with the progression of time owing to the increase in flows as a result of natural traffic growth.

3.12.2.4 An assessment of the number of people 'bothered very much or quite a lot' for each of the baseline years is presented below in Table 3.4.

Table 3.4: Assessment of Baseline Case – Do Minimum – Number of People 'Bothered Very Much or Quite A Lot' By Road Traffic Noise

Noise Band	Existing	Year Opening			Long Term		
	2004	2017	2018	2020	2032	2033	2035
<50	1	1	1	1	1	1	1
50-<60	132	127	118	119	118	121	117
60-<70	540	531	499	535	493	487	497
≥70	415	496	556	498	565	562	571
Total	1088	1154	1173	1152	1177	1171	1186

3.12.2.5 Table 3.4 indicates a net trend for an overall increase in the number of people 'bothered very much or quite a lot' with the progression of time as would be expected.

3.12.2.6 It should be noted that the residential property counts given in Table 3.3 and the number of people 'bothered very much or quite a lot' in Table 3.4 include all residential properties within 300m of the schemes. However Option 3, the Cut and Cover Tunnel, and Option 6, the Extended Viaduct, proposed to demolish residential receptors. Therefore, in the assessments for each of these two schemes those particular residential properties have not been included within the baseline assessment as this would bias the results.

3.12.3 Air Quality

Hull City Air Quality Review and Assessment

3.12.3.1 The study area lies within the local authority boundary of Hull City Council (HCC). HCC has carried out significant work with respect to air quality; a summary of the air quality actions taken by the council is provided in Table 3.5.

TABLE 3.5 - SUMMARY OF HULL CITY COUNCIL AIR QUALITY ACTIONS

Year	HCC Action
1999/2000	**First Round of Review and Assessment**[1,2] 3 tiered assessment against relevant National Air Quality Objectives (AQO). Work included monitoring to assess current conditions and dispersion modelling to predict future pollution levels. Findings showed there were no breaches or predicted breaches of National AQO within the city; however Nitrogen dioxide (NO_2) levels assessed as nearing National AQO at two locations in city centre.
2001	**Air Quality Monitoring Programme Undertaken** Monitoring in the two identified areas has taken place since May 2001. Results used to inform further assessment work.
2003	**Update and Screening Assessment (USA)**[3] Addressed monitoring data and National AQO, alongside any new potential contributory sources and changes to existing sources. Findings were similar to those of the first round of review and assessments; exceptions included the fact that Daltry Street Flyover of the A63 Castle Street was close to exceeding the NO_2 National AQO. A more detailed assessment was therefore required. Increased emissions from existing sources and variability in traffic levels were also investigated. Conclusions stated that detailed assessments would be required for four pollutants: NO_2, Carbon monoxide (CO), Sulphur dioxide (SO_2), and particulates (PM_{10}).

[1] “Air Quality Review & Assessment Stage 1”, Hull City Council, January 1999
[2] “Air Quality Review & Assessment Stages 2,3 combined”, Hull City Council, December 2000
[3] “Update and Screening Assessment of Air Quality in Kingston upon Hull”, Hull City Council, May 2003

TABLE 3.5 - SUMMARY OF HULL CITY COUNCIL AIR QUALITY ACTIONS	
Year	**HCC Action**
2004	**Detailed Assessment**[4] Detailed assessments carried out for NO_2, SO_2 and PM_{10} in areas of the city where National AQO were likely to be exceeded or areas where point sources or traffic sources varied from initial assessments. Results of modelling using ADMS Urban and monitored data compared to the National AQO. Modelled results, confirmed by monitoring, showed that the area was subject to levels of up to 45µg/m^3 while the annual mean National AQO for NO_2 is 40 µg/m^3. It was proposed to declare an AQMA for annual mean NO_2 for the stretch of the trunk road from the Daltry Street interchange to the Lowgate Junction.
2005	**Declaration of AQMA** Formally came into effect on the 1 August 2005. **Progress Report**[5] Reported on progress on implementing LAQM and in achieving and maintaining concentrations below NAQO. Levels of SO_2, PM_{10} and CO reported as being below the National AQO and continuing to fall; however results from NO_2 diffusion tubes at Lowgate showed that the National AQO continued to be exceeded.
2006	**Air Quality Update and Screening Assessment**[6] HCC were in the process of developing an action plan to suggest measures to improve air quality within the AQMA. Monitoring results showed that with the exception of two NO_2 diffusion tubes on Castle Street, annual mean NO_2 concentrations were predicted to continue to be below the AQO; action plan update reports and Stage 4 reports were to be produced, as opposed to a further detailed assessment being undertaken. Detailed assessments were not required for SO_2, PM_{10}, or CO. Action Plan[7] Suggests measures which could be taken to improve air quality within Hull AQMA. Tackles how to raise awareness of air quality and pollutants, source reduction measures, minimising emissions and demand management. Top 5 options were chosen as; traffic control schemes, implementing idling vehicles legislation, use of quality bus corridors, a park and ride scheme and low emission buses.
2007	**Air Quality Annual Progress Report**[8] Council notification of upcoming development schemes that may impact on air quality.

3.12.3.2 The Stage 1 and 2 Air Quality Review and Assessments undertaken by Kingston upon Hull in 1999 predicted that it was unlikely that National AQO for NO_2, CO, SO_2, and PM_{10} would be exceeded by 2005. A programme of monitoring was started in

[4] "Detailed Assessment of Air Quality in Hull", Hull City Council, April 2004
[5] "Progress Report on Air Quality in Hull", Hull City Council, April 2005
[6] "Update and Screening Report 2006", Hull City Council, August 2006
[7] "Kingston Upon Hull Air Quality Action Plan", Hull City Council, August 2006
[8] "Kingston Upon Hull Air Quality Annual Progress Report", Hull City Council, April 2007

2001. Detailed dispersion modelling using ADMS Urban was used to predict future pollutant levels, and these results along with the monitor pollutant levels were fed into an Update and Screening Assessment (USA) in 2003. This concluded a more detailed assessment was required, which was subsequently undertaken in 2004. The detailed assessment proposed that an AQMA be declared for annual mean NO_2 concentrations at two locations along the A63.

3.12.3.3 Hull AQMA was formally declared on 1 August 2005. Subsequently, two progress reports, an USA and an action plan have been produced to reflect the ongoing progress towards improving air quality in the city; however the original boundary of the AQMA has not been altered to date.

3.12.3.4 Hull AQMA incorporates the area bordered by the centre line of Rawlings Way to the west, Anlaby Road, Carr Lane, Whitefriargate, Silver Street and Scale Lane to the north, the River Hull to the east and the River Humber to the south.

3.12.3.5 It should be noted that the area of modelled AQS exceedence(s) for NO_2 does not extend to the full area of the AQMA. Rather, NO_2 exceedences were originally predicted along the line of the A63. An illustration of the original areas of predicted exceedences is included on Figure 3.12.3.1 overleaf for information.

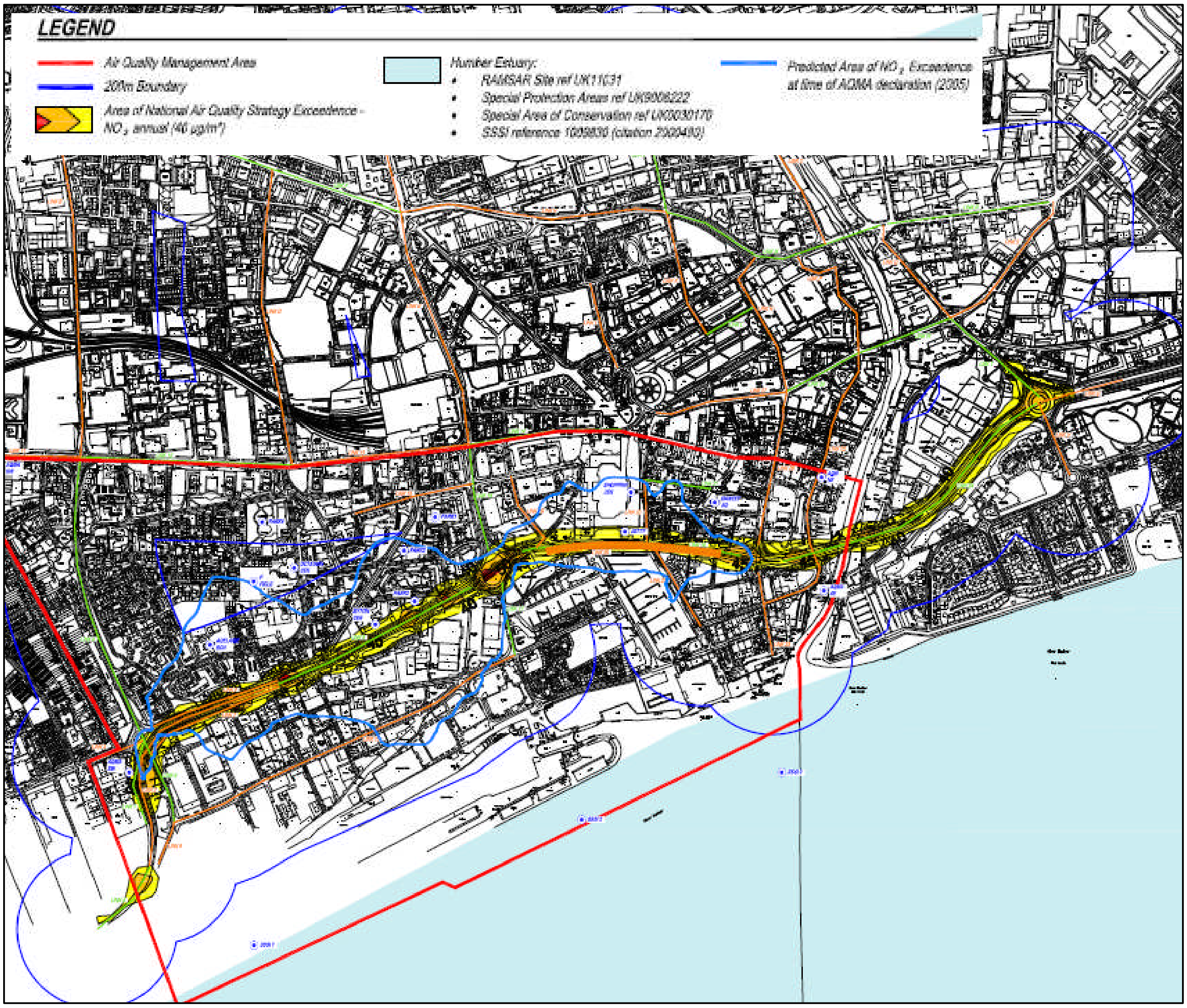


Figure 3.12.3.1 Original Areas of Predicted Exceedences

Road Traffic Contributions to Local Air Quality

3.12.3.6 The main source of emissions to air within the study area is considered likely to be from road vehicles using the local road network. Additional sources comprise local commercial, light industrial and domestic premises.

3.12.3.7 The HCC Air Quality Draft Action Plan (2006) states that analysis of inventory data on the area of the AQMA shows that the largest single source of emissions of oxides of nitrogen (NO_x) is road traffic (responsible for approximately 64% of emissions).

Other sources are considered to comprise emissions from a variety of sectors including “*domestic, commercial, industrial and minor roads*.”

3.12.3.8 The 2006 Draft Action Plan further states that the largest proportion of the road traffic contribution comes from the area around the A63. Sensitivity analysis work showed that HGV traffic on roads (reported as making up approximately 15% of total road traffic) constituted approximately 60% of the total NO_x emissions from traffic in the area.

3.12.3.9 Traffic data provided for the ‘base year’ of 2004 for the A63 and surrounding study area shows the above to be the case and demonstrates that the A63 is the busiest section of road within the study area.

Background Air Quality within the Study Area

3.12.3.10 Information relating to background air quality within the study area has been gathered using a variety of techniques, with particular focus on the AQMA. Sources include:

- Desk based research and review of publicly available information; and
- Detailed consultation with HCC Environmental Health.

3.12.3.11 For the Simple assessment the ADMS-Roads model (instead of the DMRB screening tool) was used as a quantitative tool to generate predicted concentrations at sensitive receptors within the study area. As such, annual mean background concentrations of NO_x, NO_2, O_3, SO_2 and PM_{10} were required to run the model. The concentrations were sourced from a number of locations, full details of which are given as part of the ADMS-Roads Model report included as Annex B1 in the Environmental Assessment Report (PF, 2008).

3.12.3.12 The annual average values for base year 2004 (and other available years, as applicable) were projected forward using the methodology and calculator available from the UK Air Quality Archive (NETCEN) website[9].

[9] http://www.airquality.co.uk/archive/

3.12.3.13 No projection factors are provided by NETCEN for annual average levels of O_3 or SO_2. As such, the measured O_3 and estimated SO_2 annual average background values for 2004, 45.0µg/m^3 and 5.6µg/m^3 respectively, were carried forward to 2010, 2017, 2018 and 2020, as agreed with HCC Environmental Health. Maintaining the 2004 level for these pollutants is considered to be conservative as background levels, in particular SO_2, are likely to lower in future years owing to the implementation of improved emission control measures.

3.12.3.14 The 2004, 2010, 2017, 2018 and 2020 annual mean background concentrations for all substances are detailed in Table 3.6.

TABLE 3.6 – ANNUAL AVERAGE BACKGROUND CONCENTRATIONS					
Substance	**Annual Mean Background Concentrations (ug/m3)***				
	2004	**2010**	**2017**	**2018**	**2020**
NOX	24.40	19.70	18.31	18.26	18.23
NO2	17.72	18.27	16.99	16.94	16.91
O3	45.00	45.00	45.00	45.00	45.00
SO2	5.60	5.60	5.60	5.60	5.60
PM10	18.50	17.10	16.20	16.11	15.94
*Refer to the Environmental Assessment Report (PF, 2008) for data sources and full details of method used to obtain projected years background concentrations.					

3.12.4 Greenhouse Gases

3.12.4.1 As part of its Climate Change Programme, the Government is committed to reducing emissions of the gases responsible for climate change. CO_2 is considered to be the most important greenhouse gas and, therefore, has been used as the key indicator for the purposes of assessing the impacts of transport options on climate change.

3.12.4.2 The method for assessing Greenhouse Gases in TAG is broadly consistent with the regional impact in DMRB in terms of carbon emission rates. Neither require the assessment of the baseline conditions as the assessment of CO_2 emissions are considered in terms of the change in the equivalent tonnes of carbon released as a result of implementing a transport scheme, i.e. carbon emissions are estimated for the 'with scheme' and 'without scheme' options for each year of the appraisal period starting with the opening year.

3.12.4.3 Carbon emissions should be estimated for the 'with scheme' and 'without scheme' options for each year of the appraisal period. Where information for each of the years is not available, emissions should be estimated for a number of modelled years and interpolation and extrapolation techniques used to extend estimates of the change in carbon emissions across the whole appraisal period. Cost Benefit Analysis describes the factors that should be considered when interpolating between modelled years and extrapolating beyond the last modelled year. It is important that the assumptions used to extrapolate and interpolate modelled estimates of the change in carbon emissions across the whole appraisal period are consistent with those used for other economic benefits (e.g. changes in vehicle operating costs).

3.12.5 Landscape

3.12.5.1 As the site lies within an urban environment i.e. the city centre of Kingston upon Hull the landscape assessment has been undertaken in conjunction with the townscape assessment as outlined in Section 3.12.6.

3.12.6 Townscape

3.12.6.1 The study area is typical of an urban area; however the area has the added features of a river front location, a historical core and number of historic docks. The area contains a variety of land uses including residential (both small and large scale), retail, commercial and public open space. The A63 runs through a section of the Old Town Conservation Area which contains buildings and areas of townscape and historic merit. The city has developed out from this historic core, however, many areas suffered extensive bomb damage during the Second World War and this is seen in the wide-ranging post war styles of buildings. In recent years a number of regeneration initiatives have started to come to fruition in the city centre including the construction of the iconic aquarium ‘The Deep’ (to the east of the study area, and the St Stephens retail development on Ferensway (to the north of the study area). High quality office accommodation has recently been constructed overlooking Humber Dock surrounded by new areas of open space combined with the restoration of one of the historic lock swing bridges.

3.12.6.2 To illustrate the context of Castle Street within the surrounding city centre, an aerial photograph of the study area is shown below. The red line indicates the townscape study area boundary.

Figure 3.12.6.1:Townscape Study Area

Settlement and Landscape

3.12.6.3 Hull was established on the site of the present Old Town around 750 years ago. The present day city of Kingston upon Hull developed from a small 12th century settlement known as Wyke upon Hull. The original location of the settlement is unknown but it was probably situated at the mouth of the 'Auld Hull' (thought to be somewhere between Commercial Road/Manor House Street and Railway Street).

3.12.6.4 Around about the mid-13th century the River Hull changed its main course, probably through artificial channelling, from the 'Auld Hull' in the west, to Sayer Creek in the east (which broadly followed the course of the modern River Hull). Archaeological evidence also suggests that the settlement of Wyke changed its location at about this time to what is now the Old Town. (Adopted from the Hull City Council, Old Town (southern part) Conservation Area Appraisal, November 2005.)

3.12.6.5 During the Second World War (1939-45), enemy air raids left their mark in the central area of the city. One of the worst hit areas was around Humber Street with widespread destruction of buildings. After the Second World War, neglect and shifts in economic focus led the number of people living and working in the Old Town to fall dramatically. Many buildings in the area subsequently became redundant and derelict, much of the southern part of the Old Town was gradually cleared.

3.12.6.6 Its decline was also exacerbated by the blighting effect of post-war development plans which envisaged considerable redevelopment within the area. In the event, only limited reconstruction and redevelopment work took place. Other factors contributing to its decline included the closure of the town docks in the late 1960s and the opening of Castle Street, part of Abercrombie's post-war development plan, in 1981. (Adopted from the Hull City Council, Old Town (southern part) Conservation Area Appraisal; November 2005.)

<u>Vegetation Cover</u>

3.12.6.7 Vegetation cover is limited along the A63 corridor and the study area as a whole due to its built up nature. Vegetation along the roadside is fragmented in structure consisting of individual trees within the verge and pavements. Detailed descriptions of the vegetation cover within the study area are discussed in the Ecology Section of the Environmental Assessment report (PF, 2008).

3.12.6.8 The Kingston Park retail development to the southwest of Mytongate roundabout is bordered by a linear block of ornamental shrub planting interspersed with trees, however views are still possible between the car park and the road. To the northwest of Mytongate roundabout are two medium rise tower blocks; Melbourne House and Sydney House. The communal areas between the blocks contain areas of mature shrub and tree planting, and the flats are buffered from the A63 by a newly constructed (William Street) Pocket Park, found alongside William Street. The park, approximately 0.1 hectares in size, contains a number of seating areas fronting a lawn backed by ornamental shrub and tree planting with views to the A63 part screened by a wall.

3.12.6.9 To the north of the A63 and adjacent to William Booth House flats is (Great Passage Street) Pocket Park containing open grassed mounded areas with mature trees, seating areas and paths. The park is surrounded by metal railings allowing views towards sections of the Mytongate Junction. The park, at approximately 0.2 hectares in size, is the largest public open area of green space on the northern side of the A63 within the study area.

3.12.6.10 The ‘hamburger’ arrangement of Mytongate Roundabout results in two isolated areas of trees, shrub and grass planting in the middle of the junction. The prominent mixed shrub and tree planting on elevated earth mounds acts as a visual barrier between Ferensway to the north and the Commercial Road area to the south and is inaccessible to pedestrians.

3.12.6.11 East of Mytongate Roundabout and south of the A63 is Trinity Burial Ground; this is the largest area of green space within the study area and the southern half of the city centre. The historic burial ground, no longer an active cemetery, contains areas of mature trees and shrubs combined with open grass areas with gravel footpaths through. The area is surrounded by an attractive, historic red brick wall (the same material as the nearby dock buildings) which also acts as a retaining structure in some sections, as the ground level is lower within the burial ground than the surrounding areas. The burial ground has some interesting historic features such as an original gas street lamp. Bordering the burial ground, to the west, is a large area of open grass that leads up to Commercial Road and the entrance to the Holiday Inn car park. To the north of the burial ground beyond the boundary wall there is a wedge of land that fronts Castle Street containing mature trees and grass with the A63 pedestrian footpath running along the northern side, separated from the carriageway by pedestrian railings.

3.12.6.12 To the south of the burial ground is the Holiday Inn Hotel and Railway Dock. The car parking areas of the hotel are surrounded by ornamental shrub and tree planting.

3.12.6.13 To the south of Railway Dock are a number of small scale residential areas containing a number of private gardens planted with trees.

3.12.6.14 To the northeast of Mytongate Roundabout around the golf shop is a strip of ornamental screen planting and grass verge between the car park and A63. This grass verge leads into a small shrub bed at the Waterhouse Lane Junction in front of the Castle Buildings. The car park behind Castle Buildings also contains one medium sized tree within the A63 pavement.

3.12.6.15 As the A63 passes between Humber Dock and Princes Quay there is an area of open grass to both sides. To the Humber Dock side the raised grass bank contains areas of ornamental bedding with two small shrub beds at either end of the dock. To the southern boundary of Prince's Quay, between the multi storey car park and Warehouse No. 6, are a number of shrub planting beds running alongside the road backed by an area of grass which; in part, screen views between the road and surrounding areas

3.12.6.16 No other planting is found around Prince's Quay, however Humber Dock is bordered by a pedestrianised area to its east which contains a number of trees and seating areas along the dock side promenade.

3.12.6.17 To the north of the A63 alongside Dagger Lane is the Trinity Court residential area. This closely fronts the road but has an internal court yard containing ornamental shrub and tree planting areas around the car park. To the south of the A63 alongside Humber Dock Street is the Marina Court office development which fronts the A63 with areas of tree planting contained by the pavement between the buildings and the A63. The development also contains a rear courtyard with seating areas surrounded by small trees and shrubs linked to the car parking area.

3.12.6.18 Between Vicar Lane and Market Place, north of the A63, is an area devoid of vegetation apart from the grass verge. A building has been restored in this area (number 82) as part of the city wide regeneration. The building has open areas surrounding it which would offer the potential for planting with vegetation.

3.12.6.19 To the east of Market Place and north of the A63 is the recently constructed Magistrates Court. This is buffered from the road with a wide area of ornamental shrub and tree planting. To the south between the A63 and Blackfriargate is an area of grass verge and overgrown shrub planting. The A63 then rises to cross the High Street and River Hull past an area of shrub and tree planting surrounding the works yard on the corner of Blackfriargate and the High Street.

3.12.6.20 In the Holy Trinity Church area there a number of large mature trees found within the church grounds, more recent tree planting has also taken place within Trinity Square which fronts the church. The residential areas to the north of the A63 in the vicinity of the church also contain a number of semi-private court yards containing shrub and small tree planting.

3.12.6.21 The Nelson Street riverfront area to the south of the study area fronting the River Humber and Hull contains a number of large mature trees within the promenade area.

3.12.6.22 Within the wider city centre there are few areas of public green space however Queens Gardens is the largest, approximately 350m north of the A63 at its closest point. Outside of the city centre there are a number of large historic public parks including East and West Parks and Pearson Park in addition to large areas of public allotments.

Tree Preservation Orders

3.12.6.23 Hull City Council confirmed that there are no TPOs within the road corridor likely to be affected by the proposed works. A section of the A63, however, runs through the Old Town Conservation Area; all trees that are to be removed or require works within this area would require Conservation Area Consent.

Conservation Areas and Listed Buildings

3.12.6.24 There are a number of Listed Buildings that are located in close proximity to the road and have the potential to be either directly or indirectly affected by the scheme development, including:

- Grade I – King William III statue and lamps.
- Grade II - Humber Dock including north and east walls of tidal basin, Castle Buildings, Earl De Grey, Warehouse No. 6 and the Market Place toilets.

3.12.6.25 There are a number of other Listed Buildings within the study area (but these are not affected by the proposals) e.g. Holy Trinity Church and these are discussed in the Cultural Heritage Report.

3.12.6.26 The A63 runs through the Old Town Conservation Area as defined in the Hull Local Plan. Due to the size and diversity of the Conservation Area it is split into three area descriptions (Area A - central/eastern, Area B - western/northern, and Area C - southern). The conservation area boundary extends through the study area from the western side at Commercial Road, to the south of Mytongate roundabout, around Trinity Burial Ground and east along Castle Street until it meets Humber Dock and Princes Quay, before heading north along Princes Dock Street. The eastern boundary of the Old Town Conservation area follows the course of the River Hull at the boundary of the study area. The boundary of the conservation area is shown as described in section 3.11.2.

3.12.6.27 The southern part of the Old Town Conservation Area Character Appraisal was undertaken by Hull City Council and adopted in November 2005. The western and northern part of the Old Town Conservation Area Character Appraisal was undertaken by Hull City Council and adopted in October 2004 and the central and eastern area of the Old Town Conservation Character Appraisal was undertaken by Hull City council and adopted in March 1999. The A63 runs through all three character area appraisal boundaries.

3.12.6.28 The Conservation Area Character Appraisal defines what makes the Old Town an “area of special architectural or historic interest”. The appraisal forms the basis for the formulation of proposals for the preservation or appearance of the area. The single most significant feature of the Old Town is that the medieval street pattern is still largely intact; except for Castle Street which was added as part of Abercrombie’s post war development plan in 1981, and broadly followed the alignment of the former Mytongate.

<u>Landscape Character</u>

3.12.6.29 The landscape character setting of Hull is defined by three countryside character areas that surround the city to the east, north and west and the Humber Estuary. The countryside character areas (CCAs) were defined in 1996 by the Countryside Commission and are identified at a national level in England.

3.12.6.30 Countryside Character Area 27 ‘Yorkshire Wolds’ is found to the west of the city; this area is characterised by the escarpment and foothills rising from the Vales of York and Pickering and falling to the plain of Holderness. The area is generally a large-scale landscape of rounded, rolling hills, with expansive skies and distant views from the escarpment and plateaux, contrasting with the more enclosed, sheltered valleys.

3.12.6.31 Countryside Character Area 40 is located to the north and northeast of the city. The area is characterised by the low lying, predominantly flat or gently undulating plateau, jutting into the North Sea and dividing it from the Humber Estuary with high quality agricultural land, used predominantly for large scale arable cultivation and intensive livestock farming. Vernacular buildings are of red brick and red pantile, with some older buildings, especially churches, built in limestone, and with use of cobbles near the coast.

3.12.6.32 Countryside Character Area 41 is found to the east of the city. The area is characterised by expansive, flat, low-lying, sometimes remote estuarine landscape dominated by the Humber and its ever changing character due to tidal influences. There are a number of urban and industrial influences especially around Hull which combine with the dominance of sky and open views over the estuary, mudflats and salt marshes, where flood embankments allow.

<u>Townscape Character Areas</u>

3.12.6.33 Townscape character areas are geographically specific areas of a townscape type, which have their own individual character or ‘sense of place’. Within the study area different character areas have being identified and are described below. The character boundaries are shown Figure 8.1 of the EAR, reproduces as Figure 3.12.6.2 overleaf.

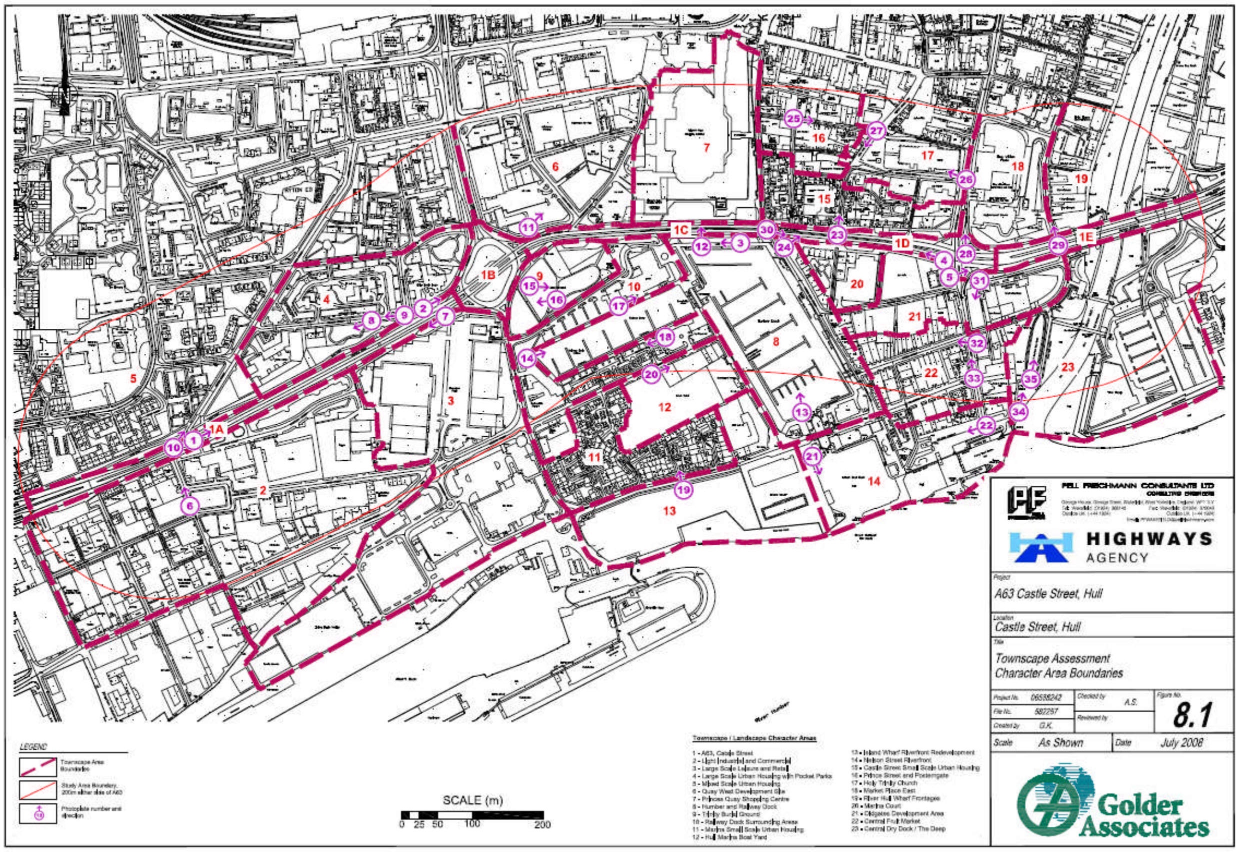


Figure 3.12.6.2: Townscape Character Areas

3.12.6.34 A detailed description of each of the townscape character areas is given in Section 8.0 of the Environmental Assessment report (PF, 2008)

<u>Townscape and Landscape Quality</u>

3.12.6.35 The following table provides a summary of the townscape and landscape quality within the study area. A more detail description of the townscape/landscape quality is given in Section 8.0 of the Environmental Assessment Report (PF, 2008)

Table 3.12.6.1: Summary of Townscape Quality in the Study Area	
Quality	**Townscape Area**
High	Area 16 - Prince Street and Posterngate Area 17 - Holy Trinity Church.

Table 3.12.6.1: Summary of Townscape Quality in the Study Area	
Quality	**Townscape Area**
Very Attractive	Area 8 - Humber and Railway Dock, Area 9 - Trinity Burial Ground, Area 14 - Nelson Street riverfront Area 23 - Central Dry Dock/The Deep
Good	Area 1C - Mytongate roundabout to Humber Dock Street, Area 1D - Humber Dock Street to Market Place, Area 7 - Prince's Quay shopping centre, Area 10 - Railway Dock and surrounding areas, Area 11 - Marina small scale urban housing, Area 15 - Castle Street small scale urban housing, Area 20 - Marina Court, and Area 22 - Central Fruit Market.
Ordinary	Area 1A - St James Street to Mytongate Roundabout Area 1B - Mytongate Roundabout, Area 1E - Market Place to Myton Bridge, Area 3 - large scale leisure and retail, Area 4 - large scale urban housing and pocket parks, Area 5 - mixed scale urban housing, Area 12 - Hull Marina Boat Yard, Area 13 - Island Wharf riverfront redevelopment, Area 18 - Market Place East, Area 19 - River Hull wharf frontages, and Area 21 - Oldgates development area.
Poor	Area 2 - Light Industrial and Commercial; and Area 6 - Quay West development site.

Night Time Baseline Character

3.12.6.36 Currently the section of Castle Street within the study area is illuminated with street lighting. It is envisaged that new lighting will also be implemented as part of the new scheme proposals. At the time of the assessment, information relating to the proposed lighting strategy was not available. The existing highway is illuminated along the whole length by single column double sided lighting columns which are located within the central reservation and around the perimeter of Mytongate junction.

3.12.7 Heritage and Historic Resources

3.12.7.1 For the purposes of the environmental assessment, Cultural Heritage is defined as comprising archaeological remains, historic buildings and historic landscapes (DOT

2007, Section 2). The study area was defined as being a 250 m wide strip of land centred on the proposed new alignment of Castle Street, which accords with, and allows comparison between, previous studies. A total of 231 cultural heritage sites were identified within the overall study area.

Archaeological and Historical Background

3.12.7.2 An assessment of archaeological and historical context of the study area is provided in Section 5.0 of the Environmental Assessment Report (PF, 2008). Hull has a considerable archaeological and historic heritage, and it was included within the English Heritage Urban Archaeological Strategies programme in 1997, although the strategy for Hull has not yet been started.

Previous Scheme-Specific Archaeological Reports and Surveys

3.12.7.3 There has been some previous archaeological research carried out in relation to the current scheme, details of the previous assessments are given in the Environmental Assessment Report (PF, 2008).

Identified Cultural Heritage Sites

3.12.7.4 A total of 231 cultural heritage sites or areas have been identified within the defined study corridor, as set out in Table 1 in Appendix C. The locations of these sites are shown on Figure 3.12.7.1 overleaf while full details of each site are given in the site gazetteer which appears as Appendix C1 of the Environmental Assessment Report PF, 2008). In accordance with the new DMRB, the cultural heritage assets are divided into archaeological remains, historic buildings and historic landscapes (HA 2007a, 2/1).

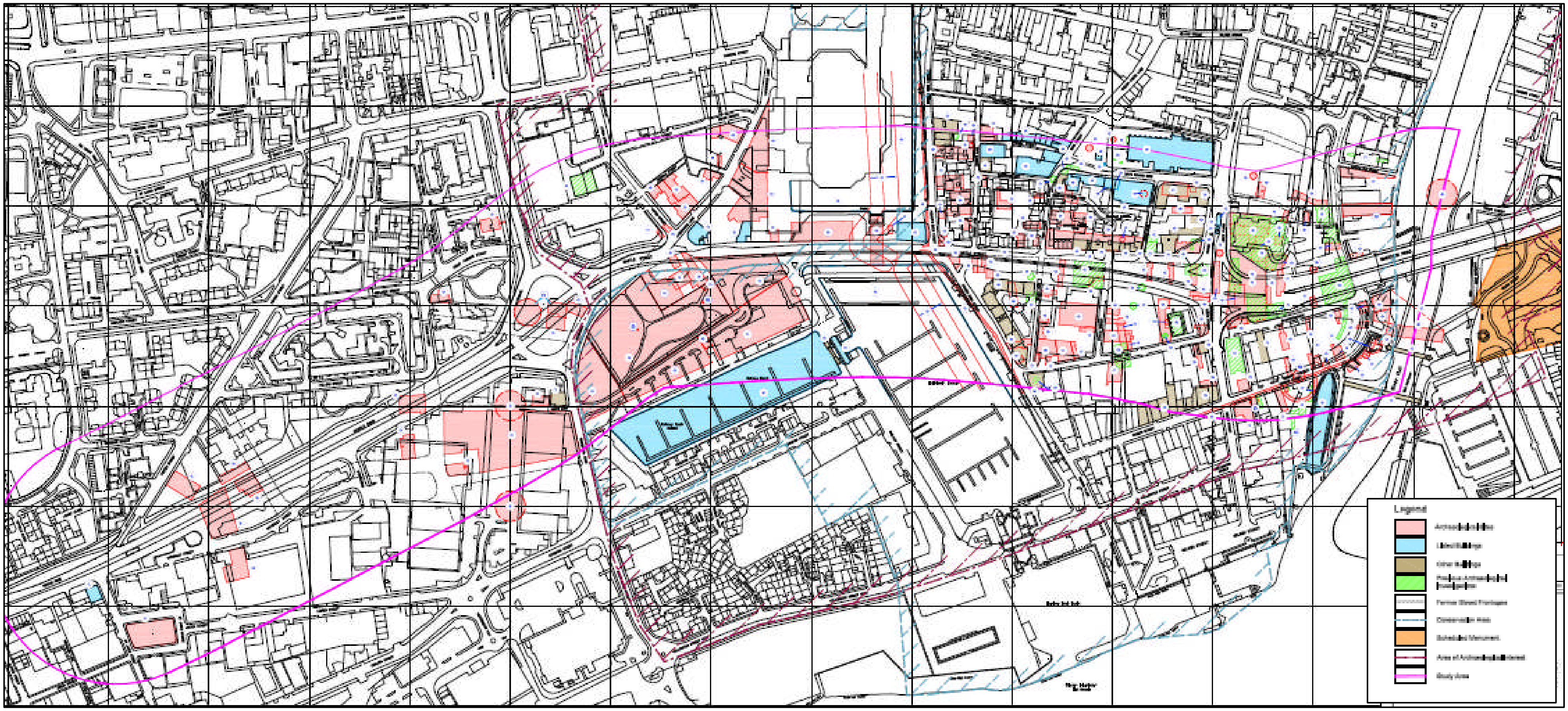


Figure 3.12.7.1: Identified Cultural Heritage Sites

Archaeological Remains

3.12.7.5 There are no SMs within the study area. The nearest lies on the east bank of the river Hull, and comprises the below ground remains of some of the Henrician defences, namely the castle, the south blockhouse and part of the late 17th century Citadel fort (SM 34710). The castle and south blockhouse were first scheduled on 16 March 1972, but the extent of the SM was expanded and enhanced on 11 August 2003 to cover a much larger area which included parts of the Citadel.

3.12.7.6 The Old Grammar School (Site 39), on South Church Side, was previously a SM, but this was removed from the schedule on January 1997; it remains a Grade II* Listed Building. The buried remains of the medieval town walls, and their associated gates, towers and posterns, are also considered to be of schedulable quality. It was previously reported that these remains were being considered for protection as SMs (Evans 1995, 10), although this has not, as yet, occurred. Virtually the whole of the study area, with the exception of the westernmost section (i.e. east from Ferrensway/Mytongate/Commercial Road) lies within the "Area of Archaeological Interest" as defined by Policy BE31 of the Hull City Plan (HCC 2000, 155).

3.12.7.7 The date-range of the remains identified within the gazetteer of sites is primarily based on the HSMR entries, and so is skewed towards the latest phase of post-medieval occupation, as the while the type of sites encountered are characteristic of an urban context. Nevertheless, as previously highlighted, there are indications of earlier, pre-medieval, activity. For example, a few Roman artefacts have been recovered from excavations in Fish Street (Site 37), High Street (Site 132) and Humber Street (Site 59), and Roman coins have been dredged from the river Hull (Site 142). However, although large parts of the modern town may have been suitable for Roman occupation (Didsbury 1990, 203), evidence is currently limited and it may be that some remains are sealed at depth beneath alluvium and riverine deposits. The same can be said for any pre-Roman activity (Evans 2000, 193). Evidence for Anglo-Saxon and Viking material is similarly rare, although it is possible that some deposits of this date may have been found but misidentified during some of the Old Town excavations (Evans 2000, 200).

3.12.7.8 Despite the numerous excavations undertaken in the Old Town, evidence for the prosperous and important 12th century medieval town of Wyke still remains illusive.

As has been noted above, it is possible that this lies further to the north and west beyond the Old Town (Evans 2004b, 51). Nevertheless, the Old Town seems to have been occupied from the mid 13th onwards. Some early remains dating to the 1260s, i.e. 30 years before the foundation of the King's Town, were uncovered in the Magistrates Courts excavations (Site 106 - see below), and existing housing along the side of the Market Place was cleared away for the establishment of the Augustinian Friary in 1316-17 (Evans & Steedman 1997, 156-158). In general, all that can be said at present is that the town lay on the west side of the river Hull, centred on High Street and Market Place. However, many of the medieval plots to the east of Finkle Street (named as "Hale Street" in the medieval period; Horrox 1978, 155) relate to tenements which were also established before 1293, and possibly as early as the 1270s, and so these could also relate to the earliest town (Evans 2004a). Mytongate (the current Castle Street) (Site 225) was also documented early on, and was known as Lisle or Lyle Street, from the Anglicised name of Roger de Insula who was a Royal Commissioner in 1293 (Markham 1987, 42).

3.12.7.9 The impact of the construction of the South Orbital Road (the present A63 and Garrison Road) through the centre of the Old Town in the late 1970s was estimated to affect some thirty 14th century properties, of which twenty had 13th century antecedents, a large part of the Augustinian friary and areas of the Henrician defences on the east bank of the river Hull, as well as passing through six medieval streets, the town walls and ditch, and the Civil War earthworks (Loughlin 1975); surprisingly, no mention is made of the demolition of numerous standing buildings, some of which could have dated to the 17th century or earlier. As a result of the below-ground archaeological impacts, several large-scale excavations were undertaken between 1972 and 1976 in advance of road construction, and these provide a valuable insight into the medieval and early-post medieval town and its inhabitants. Within the present study area, excavations were carried out on Sewer Lane (Armstrong 1977 - Site 67), on the south side of Mytongate (Ayers & Roney 1993 - Site 61), at South Church Side/Fish Street (Site 37), at the south end of Vicar Lane (Marsh 1993 - Site 78), at the junction of Queen Street and Mytongate (Eddy & Barnard 1993 - Site 83), on the north side of Blackfriargate (Armstrong & Ayers 1987 - Site 112), at Grimsby Lane (Armstrong 1973 - Site 133), and at the High Street/Blackfriargate Junction (Armstrong & Ayers 1987 - Site 132). Summaries of these excavations appear under the relevant site numbers in the gazetteer of identified sites which is present in Appendix C1 of the Environmental Assessment Report (PF, 2008).

3.12.7.10 These excavations generally indicate intensive medieval occupation from the mid 13th century onwards, particularly along the main thoroughfares such as Castle Street (which forms the line of the medieval Mytongate), Blackfriargate (the medieval Monkgate) and High Street. Well stratified archaeological deposits extending to depths of c.3m were frequently encountered and, even where Victorian cellars truncated the upper layers, early post-medieval and medieval deposits were shown to survive intact beneath. Because of the waterlogged nature of the underlying alluvial clays, archaeological preservation is generally excellent in all levels below 1m of the present ground surface, with timber, leather and textile artefacts surviving well, in addition to the more usual range of metalwork, stonework, bone (both human and animal), pottery and structural remains. There is also a very high potential for palaeo-environmental and palaeo-ecological deposits. The availability of detailed documentary records (e.g. Bilson 1929; Horrox 1978 & 1983) allows the history of landownership of individual plots to be examined, which provides a secure context for the archaeological discoveries. Hollar's 1640 panorama of Hull provides a detailed view of Mytongate and adjacent areas.

3.12.7.11 The High Street/Blackfriargate excavations (Armstrong & Ayers 1987 - Site 132) were particularly important in that two medieval tenements were able to be examined in their entirety. On one property, a late 13th century timber-framed aisled hall measuring 26.8m by 13.4m was uncovered, built on stone foundations and with its pebble floor and six stone column-bases surviving. On the other, a late 13th century timber-framed stone-paved hall, 22m long by 7.3m wide, was replaced in c.1400 by two buildings constructed on chalk foundations and separated by a passage, the latter being subsequently sub-divided into three brick-built properties. These excavations provide valuable and important evidence for the changing methods of house construction during the later medieval and early post-medieval periods (Evans 2001). Other excavations, for example on Sewer Lane (Site 67) and further west on Mytongate (Site 61), show that development was generally slower and later in these areas, confirming the documentary evidence of a gradual expansion of settlement from the early medieval core around High Street and Market Place. The documents also reveal that the town was frequently flooded between the 13th to 17th centuries, and many of the excavated sites show that internal floor levels were continuously being raised out of the water while the use of sill walls in the later medieval houses meant that the timber superstructures stayed well above ground level.

3.12.7.12 Apart from the Magistrate's Courts site noted below, more recent investigations within the Old Town have tended to be smaller, localised and more piecemeal, reflecting the fact that modern archaeological work is generally confined to specific development sites (e.g. Sites 38, 70 and 96). One exception however, is recent work on Blanket Row (Site 105) where the foundations of four medieval buildings, two on each side of the road, were excavated in 1998 (Evans & Steedman 2001, 113-118; Lee 1999). Other trial trenching work on the north side of Blanket Row (Site 100), but further to the east, showed that some areas in the Old Town remained as open ground until the 16th century, although this site did contain evidence for a range of industrial or craft activities (Tibbles & Steedman 1999; Evans & Steedman 2001, 135-136), while investigations on the east side of Queen Street (Site 113) showed that medieval and later buildings were demolished and the area given over to gardens in the 17th century (Atkinson et al 1990).

3.12.7.13 The study area contains three sections of the medieval town wall, that between the Myton Gate and the Beverley Gate (Site 28) which is aligned along Prince's Dock Street, that between the Myton Gate and the Hessle Gate (Site 24) which follows Humber Dock Street, and that between the Hessle Gate and the South End Tower (Site 59) which runs along the south side of Humber Street; the various early plans of the defences depict four towers in the northern section, three in the central section, and some seven or eight along Humber Street. A number of excavations have been cut across these defences and these, together with the more detailed excavations at the Beverley Gate and limited observations at the Myton Gate (Site 52), coupled with recent documentary research, means that considerable detail is known about the form and construction of the walls (e.g. Evans & Stitch 1990; Howes & Foreman 1999; Ayers & Evans 2001). More importantly, the excavations have shown that, when the town docks were built along the line of the medieval town ditch (see below), the walls were simply levelled to a specific height, and their lower sections remain buried beneath the upcast material. The investigations revealed that the rear of the brick-built town wall was initially set into the front of the 1321-24 clay rampart while the front was set on shallow chalk rubble foundations. The bottom 1.2m of the external face of the wall rises in a gentle batter, with each brick course set back slightly from that below; above this the wall rises vertically. The bricks are laid in an English bond pattern and putlog (scaffolding) holes have been infilled with half bricks. The external U-shaped water-filled ditch on the west side of the wall was c.12m wide in front of the gates, widening to c.18.5m elsewhere, and was c.6m deep in the middle. The original 1321-24 rampart was formed from the upcast from the ditch excavation, and it has been found to survive to a height of 2.45m with the remains of 17th-18th century features cut into the top. The presumed alignment of the town walls has been picked out in differential paving along Prince's Dock Street and Humber Dock Street, although this is not based on any excavated evidence and there may be a slight discrepancy between the presumed and actual course; a part of the alignment for example, may lie under Warehouse No. 6 (Site 47).

3.12.7.14 The Myton Gate (Site 52) lies directly under Castle Street, on the west side of the Castle Street/Prince's Dock Street Junction, and its uppermost levels were revealed during the building of the eastbound A63 carriageway in July 1976 (Ayers & Evans 2001). Although only limited archaeological recording was permitted at the time, part of the structure was revealed including the central, formerly arched, c.4m wide passageway flanked on either side by brick walls with forward projecting buttresses. The south wall of the passage stood 1.95 m high and was exposed for a length of 10.2m. In front of the passage were the remains of the counterweight pit for the drawbridge – this was brick lined and measured 4.27m by 2.13m externally. The top of the drawbridge pit was c.1.95m below the top of the carriageway, while the top of the south flanking wall survived to within 0.3m of the modern road surface; the new carriageway was simply laid over the top of the remains. Excavations at the Beverley Gate further to the north revealed the remains of a substantial timber trestle bridge over the town ditch, and the earlier timber gate which was subsequently replaced in brick (Evans & Stitch 1990), and it is to be expected that similar structures will survive under the present A63 at the Myton Gate.

3.12.7.15 Excavations in Humber Street in 1964 were thought to have uncovered the line of the medieval town wall (Site 59), but the brick-built structures are now thought to represent one of the 17th century rectangular interval towers constructed against the outside of the medieval wall (George & Brigham 2006, Site 22). Little is currently known about the medieval defences towards the east end of Humber Street, although excavations next to the Central Dry Dock in 2004 and 2006 have provided some new information (George 2005 & 2007). A massive medieval brick gatehouse, the Humber Gate (Site 226), was located just to the northwest of the dock, which gave access through the southern town walls to the Foreland. The gatehouse spanned Humber Street and is shown on Hollar's panorama of 1640. Just to the east of here was the Water Gate (Site 126), a postern providing access from the shore into the east side of the town via a flight of steps in the river wall and a passage called Little Lane (Wrigglesworth 1992, 93-94). The arched building was sketched in c.1885 (Aldridge 1989, 63) and later photographed (Wilkinson & Watkins 1999, 3) and may be depicted on the c.1538-39 view of the town; part of it remained until the mid 1960s when it was demolished to make way for a lorry park. Further east again was the three storey round South End Tower (Site 127) which later acted as an anchor point for an anti-shipping chain which extended across the mouth of the river Hull; this is also shown on many of the early plans but was demolished in 1839 (HCC 2005, 21). There was also a small fort or artillery ground near the later Graving Dock, a forerunner of the 17th century South End Fort (Site 120 – see below).

3.12.7.16 The largest archaeological excavation to have been undertaken in the Old Town since the 1970s took place over much of the Augustinian Friary (Site 106), located in the northeast angle of Castle Street and Market Place, in advance of the construction of the new Magistrates Courts. These investigations were carried out between May and November 1995, and expanded upon previous smaller excavations undertaken here in 1976-77 (Ayers 1993; Evans & Steedman 1997, 156-158 & 165-166); the 1995 excavation covered an area c.45m square. The Augustinian friars held property in Hull from at least 1303, and in 1317 Geoffrey de Hotham and John de Wetwang sold the friars a messuage and a plot of land, measuring 250 feet by 115 feet (c.76m by c.35m), for the friary and the building of an oratory and living accommodation. The excavations showed that the existing houses on the site were simply cleared away to accommodate the new friary.

3.12.7.17 The excavations recovered the plan of the greater part of the friary buildings, including the church and three sides of the cloister range (Evans & Steedman 1997, 156-158). The church, located on the north side of the cloister, originated as a narrow timber structure which was then replaced in brick and stone in the 14th/15th century. Towards the end of the Middle Ages, side chapels were added on either side of the choir and the church was extended to the east. The cloisters and cloister walk cover a large rectangular area to the south of the church. The west range was built in two phases, a major rebuilding brought about by subsidence on the site. The east range was similarly complex, and it appeared to have been built in individual sections rather than being planned as a unitary whole. In its final form, the east range comprised four separate rooms, one of which saw some industrial use, as evidenced by the remains of a chalk-paved furnace base and a tile-lined fizz tank. The excavations also recovered important and rare evidence for temporary timber buildings on the site, which were occupied during construction of the main complex, and a total of 244 burials of which 44 were in oak coffins. The previous 1970s excavations also identified the friary gardens to the south of the complex, covering the area noted in the documentary sources; they formed a series of at least four interconnecting and stepped rectangular plots which were probably covered with grass or were used as herb gardens (Ayers 1993, 67-73).

3.12.7.18 The friary was dissolved in 1539 at which date the site consisted of a house and garden in Blackfriargate measuring 49 by 33 yards (c.44m by c.30m). The remaining parts of the friary buildings were demolished around 1796. Even at this date, they were still relatively substantial, comprising a square six-storied tower with Gothic windows on the east side of the Market Place near the old Guildhall, and a long range of buildings lying north-south which had been incorporated into the Tiger Inn (Wrigglesworth 1992, 53); in 1806 when the old Guildhall was demolished, part of the cloisters of the friary was found to be incorporated into it.

3.12.7.19 As far as can be determined from the available evidence, there do not appear to be any other major monastic sites within the study area, although it is possible that some elements remain to be uncovered. A priest's house (Site 35), mentioned in c.1400, is thought to lie on the east side of King Street close to Holy Trinity Church, but nothing more is known of it. Similarly, although it is thought that the former monastic grange of Myton (Site 8) lies in the area to the west of Commercial Road, its location has not been confirmed. The former site of a charity hall (Site 139), mentioned in 1307, is thought to lie to the southeast of the Augustinian Friary, and there is reputed to be a chapel at the east end of Humber Street (Site 128).

3.12.7.20 The medieval Town Gaol (Site 104) stood at the south end of the Market Place next to the Guildhall (Site 103 - see below), and it took the form of a multi-storey tower shown on Hollar's panorama and which remained standing until 1792 (Evans 2004b, 69). It was first mentioned in 1313 and was continually in use until 1785, when a new facility was built on the then outskirts of the town, at Mytongate (Site 15); parts of the earlier gaol, which was demolished by 1792, were excavated in 1976 (Eddy 1993). Thew's 1784 map shows the new site of the "Intended Gaol" beyond the city walls to the west (see Figure 5.6); it was a substantial structure of three, and in parts four, storeys, divided by 1810 into six large rooms and an attic. After initial criticism of the internal arrangements, the gaol was partly reconstructed and an average of 30 prisoners were housed there between 1802-09. However, Hull was one of the towns brought within the provisions of the Gaol Act of 1823, and the Corporation decided to rebuild on a new site in Kingston Street in 1827-30 (Allison 1969a, 437-438). The site of the 18th century gaol lies on the south side of the present Mytongate, in an area of paving and grass adjacent to the Holy Trinity Burial Ground, and it is depicted on Cragg's plan of 1817 but not the later plan of 1842.

3.12.7.21 Other medieval administrative and judicial institutions include the Guildhall (Site 103), which was located at the south end of Marketgate and is documented from 1333 onwards. This structure survived until the 18th century, but a new guildhall was built between 1633-36 just to the north (Evans 2004b, 68). In the same area of the town were all the various structures associated with the markets and fairs, such as the halls (Site 108), the butter and poultry markets (Site 110), the bull ring (Site 134) and the market cross (Site 148) (Evans 1999, 89-91).

3.12.7.22 Little is known about the 17th century Civil War defences (Site 20) which were built west of the town walls and ditch. They are depicted on various plans, including that produced by Captain Phillips in 1715 and Thew in 1784, the latter showing an earthwork battery (also called a half-moon or "hornwork") in front of the Myton Gate. This battery was linked with others by means of a breastwork in front (west) of which was a wide outer ditch known in part as Bush Dike or Ditch. The earthworks were levelled at the same time as the town walls, although it is possible that some elements remain under Castle Street between the Humber and Prince's Docks.

3.12.7.23 South End Fort (Site 120) was built in 1627 at the east end of Humber Street on the Foreland, as a defence against the Spaniards (amongst others). It is depicted as a brick-built D-shaped structure on several early plans and was demolished c.1855 (Howse & Foreman 1999, 23; Allison 1969c, 415 & 417). Recent excavations in 2004 and 2006 in advance of redevelopment proposals have uncovered significant remains of the site, including walls, gun embrasures and internal cobbled surfaces (George 2005 & 2007). Nothing now survives of the 18th century shipyards which formerly existed along the south side of Humber Street (e.g. Site 227) either side of the fort, although the Central Dry Dock (Site 122) provides a reminder of this industry (see Built Environment below).

3.12.7.24 The Holy Trinity Burial Ground (Site 12) lies on the southeast side of the Mytongate Junction. It was opened in 1783, when the churchyard around Holy Trinity Church in the Old Town was full, and burials continued until 1860 when the cemetery was closed by an Order in Council under the Burial Act of 1853. There are c.552 surviving grave markers in the whole of the cemetery, unevenly distributed and ranging in date from 1789 to 1867 (EYFHS 1998). The number of burials is estimated at between 2,200 and 8,800, although parish records show that an average of 450 people were dying in the parish each year, providing a potential total of c.35,550 burials during the 79 years that the cemetery was open (YAT 1994b). The burial ground is controlled and managed as a Public Open Space by Hull City Council, but it is still owned by the church and so is still consecrated ground. The majority of the original brick-built boundary walls, in places up to 1.8m high and over 1.0m thick, still survive around the burial ground, and a part of the inside face in the northeast corner retains a thick coating of plaster where it was once was butted by a mausoleum (Site 13). The present entrances into the burial ground are all recent – the original entrance was from the north via the mausoleum. The interior of the cemetery is mostly grassed with trees and shrubs, and a large number of headstones have been broken. The monuments have been largely cleared from the east part, while the west part retains various brick chest tombs and headstones, including several noteworthy 19th century examples of persons associated with Hull shipping or the docks. The interior also contains two types of gas lamp standard, and two examples have recently been added to the local buildings list (see Built Environment below). The boundary walls of the burial ground are designated as an "unlisted building of historic townscape value", although they are not included on the current local buildings list.

3.12.7.25 Prince's Dock, originally called Junction Dock, and renamed as a result of the Prince Consort's visit to the town in 1854, lies on the north side of Castle Street while Humber Dock lies to the south. Humber Dock (Site 49) was opened in 1809 and was built at a cost of £233,000 to the designs of John Rennie and William Chapman. Prince's Dock (Site 46) opened in 1829 with much public celebration, as it provided a much needed expansion to the port facilities and a link between the Humber and the Old Dock (Queen's Dock) to the northeast. The connections between the docks were provided by locks, and that between the Humber and Prince's Docks (Site 46) apparently survives beneath the present alignment of Castle Street. As noted above, the docks were excavated out of the medieval town ditch and Civil War earthworks. The Railway Dock (Site 51), lying on the west side of the Humber Dock, was opened in 1846 and was designed by John Hartley. As might be expected, the docks generated their own infrastructure, and were surrounded by numerous warehouses (e.g. Sites 44 and 47), timber yards (e.g. Sites 213, 214, 251, 216, 218 and 222) and other related support activities such as foundries and iron, copper, brass and engine works (e.g. Sites 18, 21, 22, 27 and 48). Relatively little of this infrastructure now remains, certainly above ground and possibly also below ground, although some of the dockside furniture has been preserved. One of the largest warehouses (No. 7 – Site 44), measuring 200 feet by 60 feet (c.61m by c.18m) and five storeys high, was demolished in 1971, despite being called the "most noteworthy of all Hull's warehouse buildings" (Arschaver 1958-61; Pevsner & Neave 1995, 528; Chamberlain & Hall 1969, 455-456). The three docks in the study area are all Listed Buildings, as is one of the remaining warehouses (see Built Environment below).

3.12.7.26 The post-medieval buildings excavated on the Magistrates Courts site did much to clarify the extensive but often contradictory documentary evidence for the subsequent development of this area (Evans & Steedman 1997, 165-166). Most of the friary walls appear to have been left standing until at least the 17th century, and in 1724 there are the earliest documentary references to a public house here; this may be the predecessor to The Tiger Inn which reputedly occupied the nave, tower and west range of the former monastery. In about 1792 the church tower and adjacent structures were demolished to make way for the new market hall (the

Shambles - Site 108), which was completed by 1824. The Shambles were then extended to the north to form a new market hall, which opened in 1887 – the building measured 196 feet long by 86 feet wide (c.60m by c.26m), and was described as having a Flemish Renaissance style with towers at two corners; it contained 64 open stalls as well as butchers and dairy shops and cost about £20,000 to construct (Wrigglesworth 1992, 53). In the area to the north of the market shambles, a large coaching inn called the Cross Keys (Site 107), was built over the site of the former monastic church and the northern third of the cloister; in 1830 workmen digging new cellars at the inn uncovered a large quantity of human bones (Hull Advertiser 12th March 1830). In between the Cross Keys and the Shambles, a new street was established in 1796 (Fetter Lane), which led to the House of Correction (Site 109). A row of buildings was erected along its northern side during the next 20 years, and by 1817 Nos 2-3 Fetter Lane had become the Marrow Bone and Cleaver Public House (Site 191). The Cross Keys was pulled down in 1938, partly as a result of subsidence, and its site was bombed during the Second World War, together with the old Market Hall. The Marrow Bone and Cleaver closed in 1957, was demolished in 1958 and the site was converted into a car park in the late 1970s (Gibson & Wilkinson 1999, 16).

3.12.7.27 Organised nonconformity in Hull had its origins amongst the Puritan and independent minded merchant community in the early 17th century, and by the mid 17th century Independents, Presbyterians and Quakers were holding religious meetings in the town (Neave 1991, 4-5). There are several chapels and meeting houses in the study area, most of which have now been demolished, for example the Ebenezer Chapel and Mariner's Church on Prince's Dock Street (Site 31), the Jewish synagogue on Robinson Row (Site 33), the Independent Chapel on Fish Street (Site 54), and Salem Chapel in Nile Street (Site 143). Those chapels which remain are discussed in the Built Environment section below. St James's Church, a large and well appointed structure in St James's Square at the west end of Lister Street, was built in 1829 but was demolished in 1957 (Ingram 1969, 295).

3.12.7.28 There are several later post-medieval hospitals and almshouses within the study area, such as Weaver's Hospital (Site 30), Crookhaye's Hospital (Site 40) in Vicar Lane, Lister's Hospital (Site 41), Riplingham's Hospital (Site 56) on the south side of South Church Side and Crowle's Hospital (Site 68) on Sewer Lane; the latter was founded in 1661 and was demolished after 1902 (Allison 1969d, 342-343). Many of these sites are depicted on the 1850s maps of the town, and several are illustrated in paintings and drawings (e.g. Aldridge 1989), although most were demolished around the turn of the 20th century.

3.12.7.29 There are the sites of two other public buildings within the study area which are worthy of mention, the former Theatre Royal (Site 72) and the Assembly Rooms (Site 223). The theatre moved to Finkle Street from Lowgate in 1768, and was built by Tate Wilkinson, then the manager of the company. It is said to have had a “piazza” at the front and separate entrances for each section of the house while inside the walls were lined with boxes, fenced off from the pit, and linked by a gallery. The pantomimes were a speciality of the house, and were frequently enlivened by local allusions, for example in 1782 when the stage represented the Market Place and an actor vaulted over King William’s statue! The building was demolished in c.1810 and the company moved to a new site on the south side of Humber Street (Allison 1969a, 418). The site is now used as a car park. The Assembly Rooms were built in 1752 in Dagger Lane, but the site was abandoned and used as a warehouse from 1824 (Allison 1969a, 420), and has since been replaced by new development.

3.12.7.30 A large number of post-medieval sites in the study area have also been demolished, either as a result of the construction of the South Orbital road or other road improvements such as the Mytongate Junction, or for more recent development. For example, the construction of the Lisle development on the north side of Castle Street between Dagger Lane and Fish Street resulted in the demolition of a Jewish synagogue (Site 33) and four public houses (Sites 183, 184, 185 and 186), in addition to the other houses and properties that formerly occupied this area. The proposed redevelopment around Trundle Street has meant the demolition of three public houses (Sites 178, 179 and 180), a copper and brass works (Site 21) and a cable and anchor works (Site 22). The clearance of the unsanitary slums and densely occupied areas of housing from the early 20th century means that virtually all of the courts, alley ways and interconnecting passages, which dominated the Old Town in the 19th century, particularly to the south of Castle Street around Humber Street and Blanket Row, have been removed (see Figures 5.10 and 5.11). As noted above, the last surviving example of a court, Scott’s Square on Humber Street, only disappeared in 1993 (HCC 2005, 5), although the arched passageway from the street still survives.

3.12.7.31 Of the 231 identified Cultural Heritage sites, a large percentage are demolished post-medieval structures, predominantly public houses, hotels and inns, as well as industrial complexes such as breweries (Sites 4, 149 and 205), saw mills and timber yards (Sites 14, 173, 213, 214, 215, 261, 218 and 222), warehouses (Sites 44, 165, 176 and 220), brass, copper and iron works (or similar) (Sites 18, 21, 22, 27, 48, 73 and 135), malt houses (Sites 26 and 111) and even a soda water works (Site 125), a perambulator and cabinet works (Site 177) and a confectionery works (Site 217).

<u>Historic Buildings</u>

3.12.7.32 The study area contains twenty-one Listed Buildings. Seventeen of these are Grade II, but there are also two Grade II* buildings (The Old Grammar School - Site 39 and Minerva Lodge on Dagger Lane - Site 99), and two Grade I structures (Holy Trinity Church - Site 88 and King William III statue - Site 102). There are also six locally listed buildings (Sites 11, 57, 78, 229, 230 and 231), as well as several others which are described as being “unlisted buildings of historic townscape value” in the Old Town Conservation Area character appraisals (HCC 1999; HCC 2004b; HCC 2005).

3.12.7.33 The present Holy Trinity Church (Site 88) was begun in 1285. It is the largest non-collegiate church in Great Britain and the oldest brick-built church in England. The transepts, choir and lower part of the tower were the first parts to be constructed before 1340, the stone nave was consecrated in March 1425, and the upper stages of the tower were finally raised 100 years later still (Pevsner & Neave 1995, 505-509). The chantry chapel was destroyed in the Reformation and during the Commonwealth period a wall was built across the church to divide it into two separate congregations, the Independents to the east and the Presbyterians to the west. During the early part of the 19th century galleries were built round the walls to provide extra seating, but these were taken down some 50 years later when new pews and a new high altar were introduced. In 1846 the crypt was built underneath the existing nave and a steel grillage was built under the tower to prevent subsidence. Since then, new foundations have been provided for all the columns of the nave, the chancel and nave roofs have been renewed, and in 1982 the east end wall was stabilised by tying it back to the main structure (Armstrong et al 1984, 7-8; Ingram 1969, 287-293). In addition to the main body of the church, the churchyard walls and the adjacent electric lamps are also Listed Buildings (Site 93).

3.12.7.34 King William III's statue (Site 102) is an important, prominent and popular feature in the Market Place. It was created by Peter Scheemakers in 1734, but was only gilded from 1768 and is a larger than life-size gilt statue of the king in Roman dress, on a rectangular ashlar pedestal with a cornice and an iron guard rail (Pevsner & Neave 1995, 540). It also contains a drinking fountain, and is placed on a stepped oval base with four pedestals with plinths and cornices, each carrying a late 19th century cast-iron globe lamp by King and Peace of Hull. Greenwood (1835, 137) notes that the statue was originally railed in a large square, but the stones obstructed the carriages in the Market Place and so the corners were cut off.

3.12.7.35 The Old Grammar School (Site 39) lies on South Church Side. This is not only the oldest school in Hull, but for its first 300 years it was the only school in Hull. It was in operation from c.1340 but the present structure was built in 1583-85. The building is a plain rectangular structure of two storeys, lit by ranges of wide windows with brick mullions and transoms. The entrance doorway is simple and as unadorned as the rest of the fabric. A contribution towards the cost of the building was made by Alderman William Gee and his merchant's mark, with the date 1583, appears externally on the ground floor; the town arms, with the date 1585, are on the upper story. A detailed publication describing the history of the building has been produced, and surveys were undertaken in 1985-86 prior to restoration (Fleming 1988).

3.12.7.36 The other Grade II* Listed Building is the Minerva Lodge on Dagger Lane (Site 99). This opened in 1698 and was built in the meeting house tradition, but it was much altered in 1783 when it became Swedenborgian. They used it until 1840-41, when it became a Presbyterian chapel, and it was subsequently used as a synagogue and in 1964 it was a warehouse. It was acquired by the Minerva Lodge of the Freemasons who had been using the adjoining schoolroom in Prince Street since 1809. The outside walls were rebuilt in 1978 but the interior retains much of the original arrangements and Masonic devices (Neave 1991, 10).

3.12.7.37 The majority of the Grade II Listed Buildings lie to the west and south of Holy Trinity Church, along South Church Side (Sites 89, 90, 91 and 138), King Street (Sites 94 and 95) and Prince Street (Site 92). The walls and associated dock-side furniture at Prince's Dock (Site 46), Humber Dock (Site 49) and Railway Dock (Site 51) are all Grade II Listed, as is Warehouse No. 6 (Site 47) which lies in the southeast corner of Prince's Dock and the public toilets (Site 101) in the Market Place. Warehouse No. 6 was started in 1830 and completed in 1846, and was probably designed by Edward Welsh, resident engineer of the Dock Company (Chamberlain & Hall 1969, 455). It is three storeys high, seven bays by five, and built in brick with stone in the eaves cornice and window sills, with a slate roof. In the absence of continuous loading bays rising through the floors, there are twelve separate loading doors. The building has recently been converted to a bar/restaurant.

3.12.7.38 The Grade II Listed South End Graving Dock (Site 122) is a reminder of Hull's shipbuilding past. The present structure is actually the third dock on the site. Thew's plan of 1784 shows a dock in this area, which had been formed out of the wooden hull of an old ship, where Thos Gleadah (or Gleadow) is recorded as a shipbuilder. Bower's later plan of 1791 shows a dry dock in a shipyard here, and it is also shown on Goodwill and Lawson's map of 1842. In 1843 the dry dock was replaced by the larger South End Graving Dock which obliterated the site of the older dock and jetty. It was completed in 1844 at a cost of £10,000 and was the largest graving dock in Hull. It was enlarged in 1883, and the new Hull Central Dry Dock was extended north as far as Humber Street. The old river stairs, part of the original medieval route into the town via the Water Gate (Site 126) (see above), were found during its construction, together with the remains of a wooden boat which may well have been the first dry dock on the site (George 2005, 15-18). The dock has a pointed north end and ashlar stepped sides with some concrete patching, and 20th century iron gates to the south entrance. The adjoining offices and workshops were recently demolished, apparently without record, in advance of archaeological investigations.

3.12.7.39 There are also two Grade II Listed Buildings adjacent to Castle Street, to the west of the docks, Castle Street Chambers (Site 19) and the Earl de Grey Public House (Site 42). The former was an office building and shop dating to c.1890 which was built in the Renaissance Revival style; it was undergoing renovation at the time of the site visit and no detailed inspection was possible. Similarly, little could be seen of the Earl de Grey, as it was boarded up and to let at the time of both site visits, but it is reputed to be of late 18th century date, and rises to three storeys. The green tile shop front has a black moulded plinth and cornice, with an inscribed frieze, and the bays are divided by Ionic pilasters on pedestals.

3.12.7.40 Within the study area, there are six buildings which appear on the local buildings list (revised January 2008), namely the Whittington and Cat Public House (Site 11) on Commercial Road, the former telephone exchange on Castle Street (Site 57), Burnett House on Castle Street (Site 78) and two lamp posts in the Holy Trinity Burial Ground (Sites 229 and 230). Burnett House has recently been renovated and is currently not available for external inspection. The Whittington and Cat is a late 19th century Renaissance Revival public house, built of brick and glazed brick with sandstone dressings, and of three storeys, with a slate roof and tall brick stacks. The structure was designed to give maximum impact on a corner site when viewed from the south or southeast, although post-war demolition has now left it isolated and the only remaining feature of the late 19th century urban street scene at this end of Commercial Street. The former telephone exchange is a distinctive brick and terracotta building opened by the National Telephone Company in 1911, which was then taken over and used by the Hull Corporation Telephone Department from 1914 to 1963, and subsequently Kingston Communications (Hull) plc. It represents a significant part of the history of Hull's unique municipally owned telephone system (HCC 2008). The two lampposts in the burial ground are cast-iron and early to mid 19th century in date. The sixth locally listed building is a post-war warehouse on High Street (Site 231).

3.12.7.41 Several of the "unlisted buildings of historic townscape value" do not appear on the current local buildings list (HCC 2008), although this may be remedied as and when the list is updated. Perhaps the most notable of these are two groups of buildings on the north side of Humber Street (Sites 75 and 76) which, together with other structures on the same street, form one of the most important surviving and unaltered parts of the urban landscape in Hull. These buildings, which comprise late 18th and 19th century shops and offices, preserve important architectural information illustrating the change from residential to commercial use of the area; furthermore, as part of the Fruit Market, they form an important remnant of the wholesale retailing industry which linked the docks to the commercial consumption centres of the town.

Although the rear yards were not accessible at the time of the site visit, they are likely to retain important structural information relating to the development of this area, information which may well be illustrative of the development of similar (now demolished) districts in Hull as a whole. Another distinctive group of buildings lies in the centre of Prince's Dock Street (Site 155), and comprises three mid to late 19th/early 20th century offices (Dundee Chambers, now part of the Waterfront Hotel, East Anglian Buildings and Kingston Chambers). The East Anglian Buildings is of five bays and three storeys with a hipped slate roof, and the roof apparently has a flattened summit enclosed by a post and rail wooden balustrade with ornamental finials to the posts; might this be a viewing platform to the dock? The group value of these properties is considerable, especially when compared to the adjacent modern development at the south end of Prince's Dock Street. It is also clear that some of the "unlisted buildings of historic townscape value" have considerable architectural potential, and may well contain remnants of earlier structures, for example the King William Hotel (Sites 79/158) on the west side of Market Place.

3.12.7.42 Other buildings are designated as "unlisted modern buildings of positive townscape value" in the Conservation Area appraisals. These include the modern bridges over the Railway Dock entrance (Site 50) and the river Hull (Site 154), and the tidal surge barrier (Site 151). The latter was built in 1980 and designed by Oliver Cox of Shankland Cox Associates. It is an elegant arch over 37 m high framing the entrance to the river Hull, and tall white concrete towers stand on either side of the river supporting the broad 202 tonne barrier (Pevsner & Neave 1995, 525).

3.12.7.43 The large numbers of demolished sites within the study area have already been mentioned above, but in general the historic street pattern has been retained, even if some streets, such as Sewer Lane, Finkle Street and Trundle Street are now no more than cul-de-sacs for access purposes. However, there are some exceptions. Between Blackfriargate and Liberty Lane, war damage and more recent wholesale redevelopment has removed virtually all of the historic street pattern, including Fetter Lane, Grimsby Lane and Church Lane. Similarly, the creation of Hessle Road and the Mytongate Junction has removed Nile Street, Wood's Street, Great Thornton Street and parts of Waverley Street and Cogan Street.

Historic Landscapes

3.12.7.44 There are no Historic Battlefields, Registered Parks and Gardens or areas of National Trust inalienable land within or immediately adjacent to the study area; the nearest National Trust property is Maister House, located at 160 High Street.

3.12.7.45 The central and eastern part of the study area falls within the Old Town Conservation Area (Site 224) which was initially designated in 1973 but which was extended 1981, 1986 and 1994. The Conservation Area is divided into three parts, the Southern, the Central and Eastern, and the Western and Northern parts. The Southern part lies on the south side of the A63 and extends between Commercial Road and the river Hull, and incorporates the Holy Trinity Burial Ground, the Railway and Humber Docks and Queen Street, Humber Street and Nelson Street. The other two parts lie on the north side of the A63, the division between the two roughly parallel to and just to the west of Market Place and Lowgate. The west side of the Western and Northern part coincides with the edge of Prince's Quay, while the Central and Eastern part encompasses Market Place and High Street. The whole of the Old Town Conservation Area covers c.54 hectares and contains 158 Listed Buildings, representing c.35% of Hull's total stock of Listed Buildings, as well as numerous other unlisted buildings of historic townscape value; it is also a major area of archaeological interest. Conservation Area character appraisals have been produced for all three parts of the Old Town Conservation Area (HCC 1999, 2004 & 2005).

3.12.8 Biodiversity

3.12.8.1 The 'site' refers to the footprint of the scheme. The study area is the area from which ecological records of sites and species have been requested during the biodiversity assessment i.e. 1km from the site.

Statutory Nature Conservation Sites

3.12.8.2 The Humber Estuary Site of Special Scientific Interest (SSSI) lies within 0.5km of the site. This has been designated for its nationally important habitats, which include coastal saltmarsh, intertidal mudflats and sandflats, saline lagoons and sand dunes. The estuary supports nationally important numbers of many wintering wildfowl and waders, a breeding colony of grey seals, and various other animals and plants. In addition to SSSI status, the Humber Estuary is designated as a Special Protection Area (SPA) and Special Area of Conservation (SAC) under the Conservation (Natural Habitats & c.) Regulations 1994, as amended 2007 and forms part of the European Natura 2000 network. Further, the Humber Estuary is a Wetland of International Importance under the Ramsar Convention 1971, and is known as a Ramsar site.

Non-statutory Nature Conservation Sites

3.12.8.3 There are a number of non-statutory nature conservation sites, or SNCIs (Sites of Nature Conservation Importance). The following SNCIs lie within 1km of the site boundary:

TABLE 3.12.8.1: NON-STATUTORY NATURE CONSERVATION SITES WITHIN 1 KM OF THE SITE

Site Code	Site Name	Grid Ref.
86	Land to the East of the Circle Cricket Ground	TA080289
369	Trinity Burial Ground, Castle Street	TA094283
255	Mudflats to South of Sammy's Point	TA101281
168	River Hull (including banks)	TA093320

3.12.8.4 The Trinity Burial Ground SNCI lies partly within the site. Locations of SNCIs are given in Figure 3.11.3.

Species

3.12.8.5 North and East Yorkshire Ecological Data Centre (NEYEDC) provided various species records. These were mostly botanical however, there were records of bat roosts (species unknown). None of these lie within 1km of the site boundary.

3.12.8.6 Records received from the East Yorkshire Bat Group included those of various roost sites as well as grounded and foraging bats. The only roost within 1km of the scheme was that of pipistrelle, recorded in 1994 approximately 1km to the northwest of the site. Several grounded bats and foraging areas have been identified within 1km of the scheme. Trinity Burial Ground, on Castle Street, has been identified as a bat foraging area.

3.12.8.7 The National Biodiversity Network (NBN) Gateway supplied the following UK Biodiversity Action Plan (BAP) Priority Species records for the search area:

TABLE 3.12.8.2: UK BAP PRIORITY SPECIES RECORDS FROM THE NBN GATEWAY WITHIN 1KM OF THE SITE

Species	Grid Reference	Year
Brown hare	TA12	1976
Water vole	TA0929	1969
Grey Seal	TA12	1993
Otter	TA02	1902
Brown long-eared bat	TA0928	1985
Common pipistrelle	TA102288	1992

3.12.8.8 The record of brown long-eared bat was from within the 1 km square TA0928. It is not known what type of record this was (i.e. bat in flight or roost). Castle Street runs through the centre of this square. The records of brown hare, grey seal and otter are to a resolution of 10 km, therefore their locations are rather vague and it is impossible to know from these records whether or not they were recorded within close proximity to the site.

3.12.8.9 According to the Hull BAP (Hull Biodiversity Partnership, 2002), at the time of publication of the Hull LBAP the song thrush had been recently recorded at Trinity Burial Ground.

Habitats

3.12.8.10 The study area is bordered on its eastern edge by the River Hull and on the western edge by the end of Clive Sullivan Way. Most of the habitats that surround the route are amenity grassland strips with areas of scattered scrub, ornamental shrubs and trees. Figures 3.12.8.1a and 3.12.8.1b overleaf show the habitats present.

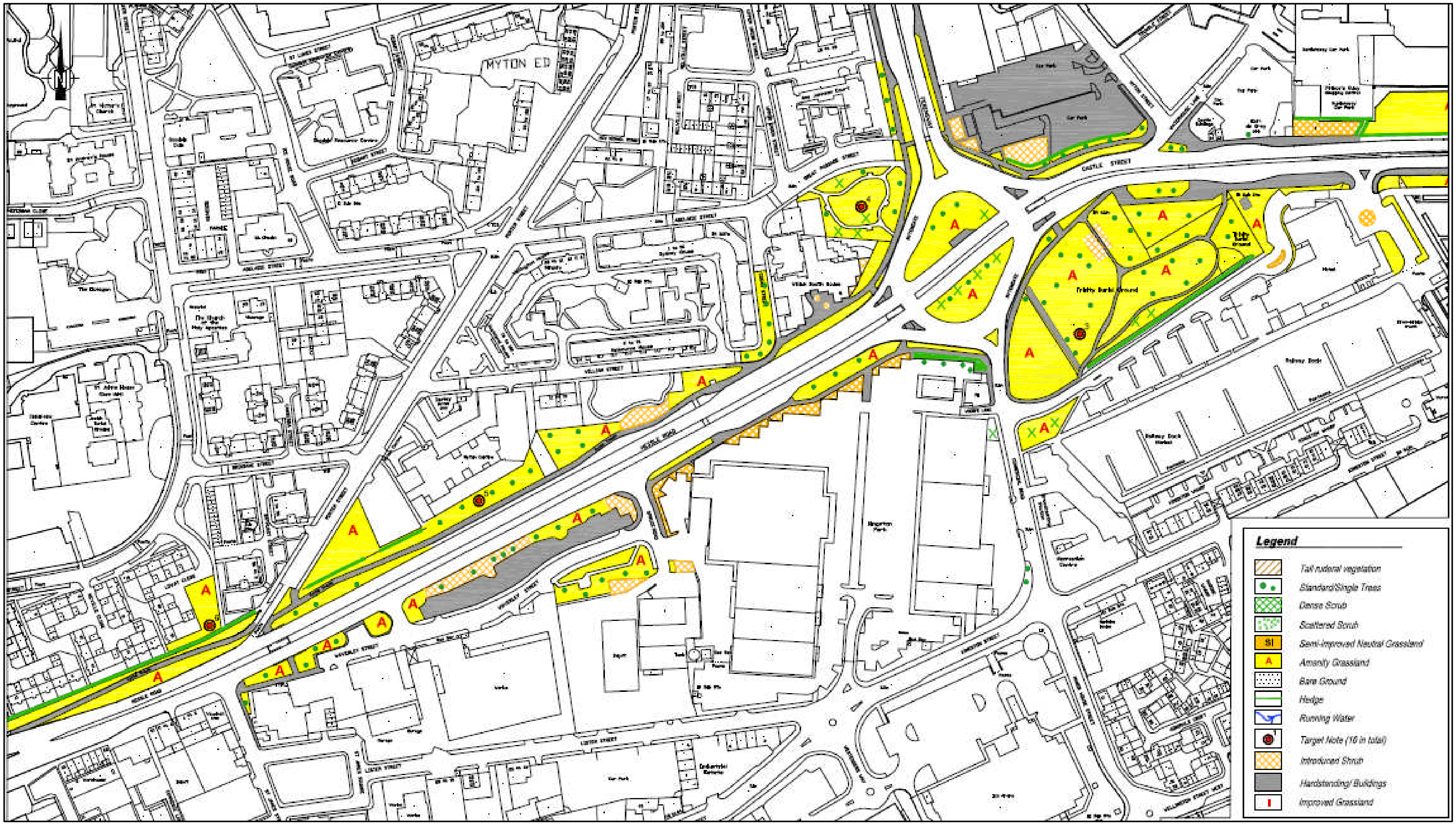


Figure 3.12.8.1a: Phase 1 Habitat Survey (Sheet 1 of 2)

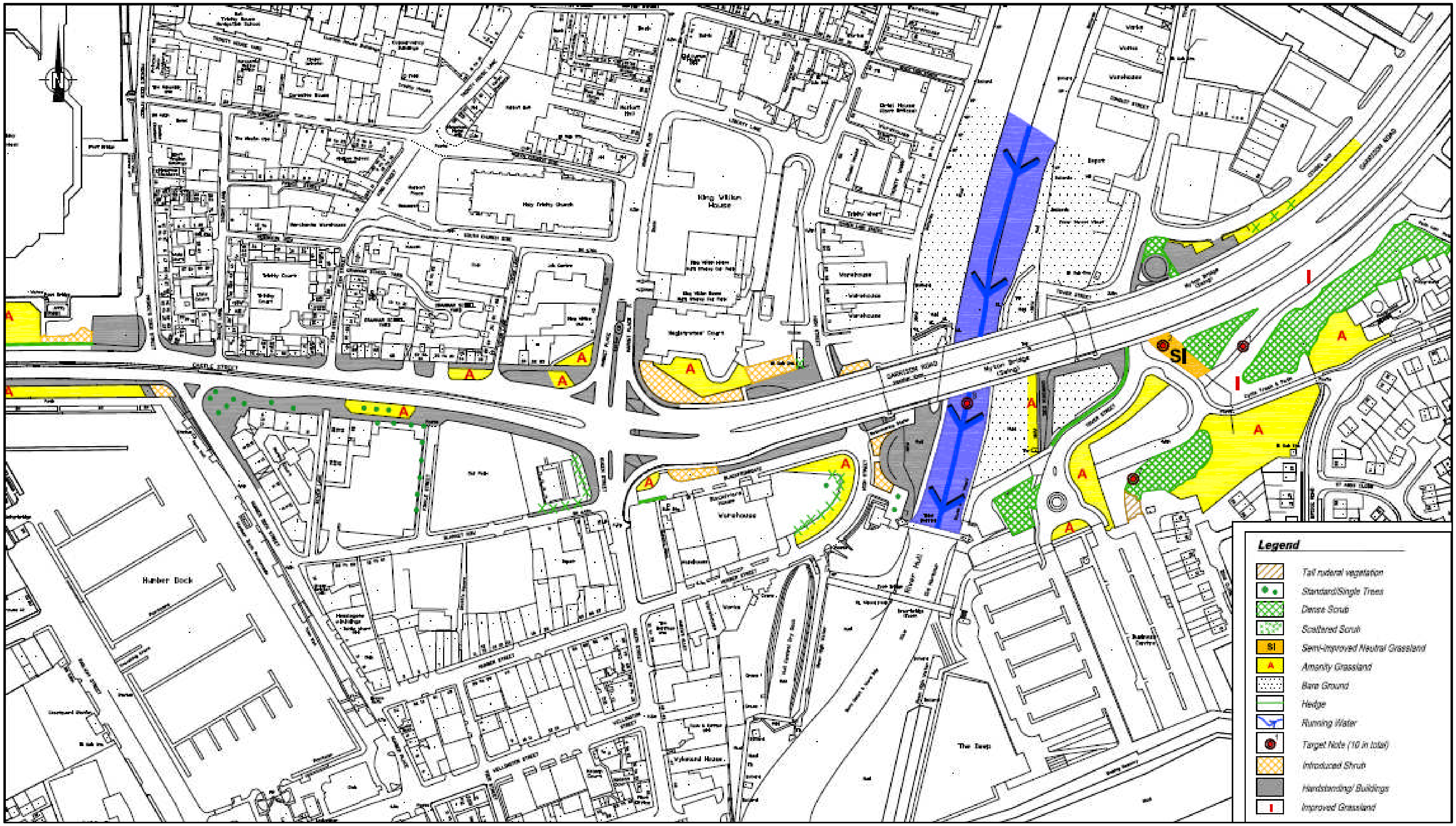


Figure 3.12.8.1b: Phase 1 Habitat Survey (Sheet 2 of 2)

Clive Sullivan Way to Ferensway/Commercial Road Junction

3.12.8.11 At the western edge of the scheme, starting from the end of Clive Sullivan Way lines of mature trees such as cherries Prunus sp., sycamore Acer pseudoplatanus and poplar Populus sp. are situated on closely mown amenity grassland. Two sections of ornamental hedge are found along this stretch on the northern side. The remainder of the habitat is amenity grassland with sections of ornamental shrubs and further trees at the front of the retail park.

Ferensway/Commercial Road Junction

3.12.8.12 Pocket Park is situated on the western side of this junction and Trinity Burial Grounds are on the eastern side. Pocket Park is situated adjacent to Great Passage Way and is made up of mown amenity grassland interspersed with paths, a few shrubs and scattered trees. The traffic islands in the middle of the junction support some large mature trees including poplar Populus sp., silver birch Betula pendula and Scots Pine Pinus sylvestris. Trinity Burial Ground is the cemetery which comprises several areas of amenity grassland, many mature trees and areas of native and ornamental shrubs. Several small areas of amenity grassland are situated adjacent to the pavements surrounding the junction.

Ferensway/Commercial Road Junction to Garrison Road

3.12.8.13 From the junction up to the River Hull, there are areas of pavement alongside strips of amenity grassland with scattered trees. Areas of native scrub are present and extensive areas of ornamental shrubs outside the Princes Quay Shopping Centre and the Magistrates Court. The River itself is surrounded by areas of bare ground and silty mud. To the east of the river there are further areas of amenity grassland and native scrub and an area of species-rich semi-improved grassland surrounded by native scrub and areas of improved grassland, on the southern side of the road.

<u>Fauna</u>

Bats

3.12.8.14 The bat roost potential survey revealed a number of features present with moderate and high bat roost potential. These were mostly mature trees (see Table 3.12.8.3), however two walls and the Castle Buildings also had bat roost potential (see Table 3.12.8.4). The Environmental Assessment Report (PF, 2008) contains results of the assessment of all trees surveyed, whilst Figure 3.12.8.1a shows the locations of trees and other features in the vicinity of Trinity Burial Ground. All trees and buildings at the site outside of Trinity Burial Ground were assessed as having low or negligible bat roost potential.

TABLE 3.12.8.3: TREES ASSESSED AS HAVING MODERATE OR HIGH BAT ROOST POTENTIAL					
No.	**Species**	**DBH**	**Grid Reference**	**Features of roost potential**	**Assessment**
1	Sycamore	0.4	TA0949328432	Covered with ivy	Moderate
3	Ash (weeping)	0.7	TA0949628405	Rot holes (up and down), cavities, crevices, lost limbs	Moderate
8	Ash	1.0	TA0947828389	Rot holes (up)	Moderate
14	Sycamore (x10)	0.2	TA0947728411	Multistemmed - covered with ivy	Moderate
19	Poplar sp.	1.1	TA0942028404	Pollarded - Rot holes (up), loose bark, ivy	High
20	Ash (weeping)	0.7	TA0942428412	Rot holes (up), crevices, bat box, lost limbs	High
25	Ash	0.7	TA0942728359	Rot holes (up and down)	Moderate
30	Sycamore	0.7	TA0940028347	Ivy	Moderate
32	Sycamore	0.8	TA0939328353	Ivy	Moderate
33	Sycamore	0.7	TA0938428374	Ivy	Moderate
37	Ash	0.7	TA0940328404	Ivy	Moderate
43	Ash	0.7	TA0941928382	Rot holes (up), bird box	Moderate

DBH – Diameter at Breast Height

TABLE 3.12.8.4: OTHER FEATURES ASSESSED AS HAVING MODERATE BAT ROOST POTENTIAL			
Feature	**Grid reference**	**Features of roost potential**	**Assessment**
Wall 1	TA0943228416	Lots of ivy	Moderate
Wall 2	TA0939528355	Lots of ivy	Moderate
Castle Buildings (Waterhouse Lane)	TA09502848	Gaps under eaves and tiles	Moderate

3.12.8.15 Two trees (Trees 19 and 20) were assessed as having high potential for roosting bats. These were, therefore, subject to emergence surveys, however, no bats were recorded emerging from either tree. The results are summarised in Table 3.12.8.5.

Although no bats were recorded emerging from either of the trees surveyed, several common pipistrelles were noted foraging in the vicinity on both survey visits.

TABLE 3.12.85: RESULTS OF BAT EMERGENCE SURVEYS				
Feature	**Date**	**Time of survey**	**Weather**	**Results**
Tree 19	1/5/07	20:15 – 21:30	Cloudy, no rain, moderate winds, 10^{o}C	No bats emerged
	8/5/07	20:35 – 21:45	Clear sky, no rain, light winds, 10^{o}C	No bats emerged
Tree 20	1/5/07	20:15 – 21:30	Cloudy, no rain, moderate winds, 10^{o}C	No bats emerged
	8/5/07	20:30 – 21:45	Clear sky, no rain, light winds, 10^{o}C	No bats emerged

3.12.8.16 Bat surveys of a number of buildings in the area were commissioned by Hendersons (owners of the nearby Princess Quay Shopping Centre) in 2005, in connection with other development proposals. These surveys have identified a pipistrelle bat roost within the Castle Buildings on Waterhouse Lane (WSP Environmental, 2005). A common pipistrelle was recorded roosting in the building on two occasions (possibly the same bat recorded twice). The building appeared to be used by one or very few bats as a non-breeding summer roost.

3.12.9 Water Environment

3.12.9.1 The following sources were consulted on water related issues for this scheme:

- Environment Agency;
- Highways Agency;
- Ordnance Survey;
- British Geological Survey;
- Envirocheck Report;
- Groundsure Environmental Data Report;
- CIRIA report 142, 1994. Control of Pollution from Highway Drainage Discharges; and

- CIRIA, 2000. Environmental Good Practice Guide;

Current Road Drainage and Sewer System

3.12.9.2 At present the road network drains into the local sewerage system. There are a number of sewers in the vicinity of Porter Street. A combined brick culverted sewer runs north-south across the junction. There is also a combined brick sewer extending along the southern verge from Clive Sullivan Way. Just short of the junction, the sewer forks and one branch of the sewer heads off northeast along Porter Street with the second branch proceeding east along Waverley Street.

3.12.9.3 A combined sewer is present running along the central reservation of Hessle Road starting at Porter Street and terminating approximately 35m west of Cogan Street. This sewer has a connection crossing the A63 and running south into Spruce Road.

3.12.9.4 A combined sewer from Waverley Street crosses Spruce Road and then runs parallel to Hessle Road. It crosses the A63 at Cogan Street then proceeds up Cogan Street.

3.12.9.5 There are a number of storm and combined sewers within the vicinity of Commercial Road Roundabout. A combined brick sewer cuts across the southern end of Ferensway at its junction with Mytongate and runs along the northern verge of the roundabout towards the Castle Street Junction. A second combined brick sewer navigates northwards along Commercial Road to the roundabout and then along the southern verge of the roundabout towards the Castle Street Junction outfalling in the previous sewer. The sewer subsequently intersects Castle Street and proceeds up Waterhouse Lane with a branch connection to Castle Street. This branch comprises a concrete sewer that crosses the northern carriageway and runs along the central reservation terminating at Prince's Dock. There is a connection from this sewer crossing the A63 at the Hotel and turning east along the southern verge for a distance of around 50m.

3.12.9.6 A concrete storm water sewer originates adjacent to Warehouse No 6 and runs under the northern carriageway of Castle Street. At the junction of Prince's Dock Street and Humber Dock Street the sewer splits and changes to a combined sewer. One branch proceeds north along Prince's Dock Street, a second continues along the northern carriageway to Daggers Lane before turning into the northern verge and continuing within the verge to the junction with Market Place. The final branch extends along the southern carriageway/verge of the A63 to the junction with Queen Street.

3.12.9.7 At Dagger Lane and Fish Street, there are connections from both of the sewers, which head northwards along the respective streets. There is also a connection from the southern drain to the sewer in Finkle Street and from the northern drain to the sewer in Vicar Lane.

3.12.9.8 At the Market Place/Queen Street Junction, the two Castle Street sewers connect in to a 1200mm diameter concrete sewer that runs north-south across the junction.

3.12.9.9 There is a large 3600mm diameter overflow that flows west-east across the area. The sewer runs partially through Albert Dock, and then runs in a northeast direction until it reaches English Street, where it runs along the southern verge. It continues along the southern verge and the carriageway of Kingston Street, and crosses the Humber Dock to Humber Dock Street. It subsequently runs along the carriageway of Blanket Row and Blackfriargate and through the River Hull.

Hydrology / Surface Water

3.12.9.10 The nearest surface watercourses are the Humber Estuary, which is located to the south of the scheme and whose flows are subject to tidal influences, and the River Hull, located to the east of the scheme. The River Hull flows in a southerly direction before converging with the Humber, however the stretch adjacent to the proposed scheme is subject to tidal flows. Both the River Humber and the River Hull are open watercourses.

3.12.9.11 Runoff from the scheme area will flow into the Humber.

3.12.9.12 There are no surface abstractions within 1km of the site.

Flooding

3.12.9.13 Environment Agency Data indicates that the scheme is situated within Flood Zone 3 and has a high probability of flooding. With regard to flooding from rivers, the whole scheme is within the indicative 1 in 100 year floodplain (in the theoretical absence of the existing flood defences). With regard to flooding from the sea, the site is situated within an indicative 1 in 200 year floodplain (in the theoretical absence of the existing flood defences). The eastern portion of the scheme is situated within the area that was flooded during the 1969 flood event that occurred prior to the installation of the tidal surge barrier on the River Hull.

3.12.9.14 The site is currently protected from flooding by the existing River Hull and River Humber flood defences. These protect the City of Hull from flood events arising once in 100 and once in 200 years respectively.

3.12.9.15 The Environment Agency's flood map of the area is shown in the Figure below. The areas shaded blue shows the area that could be affected by a 1 in 100 year flood, the pink outline shows the location of flood defences in relation to the scheme, the black hatching shows the areas that benefit from flood defences.

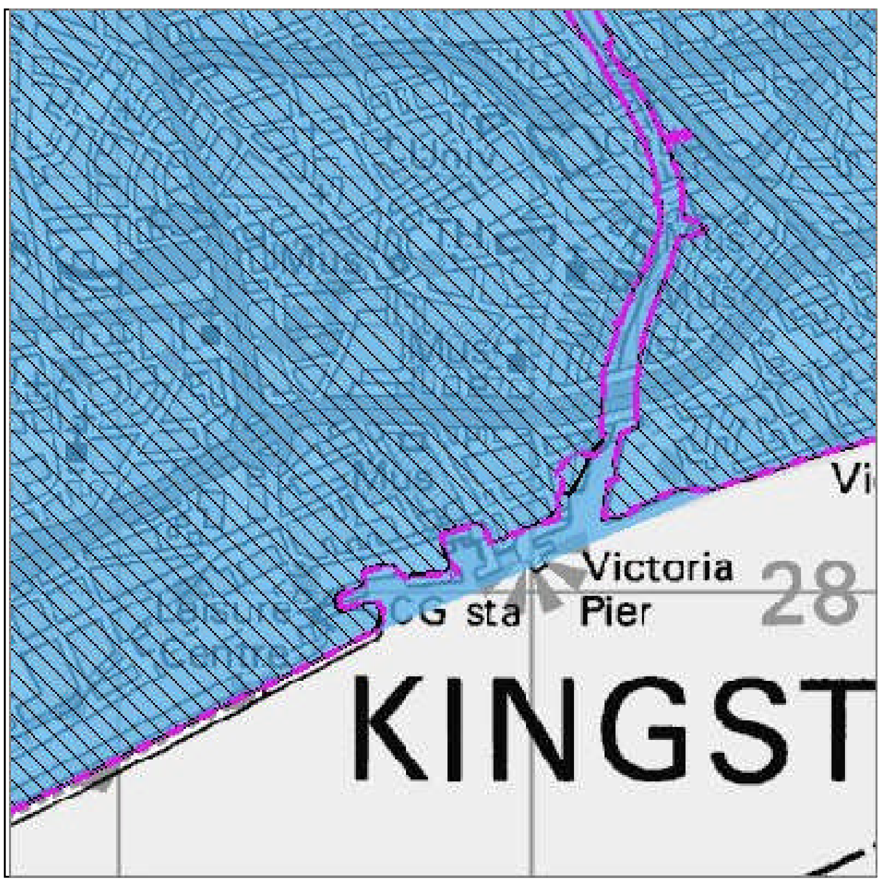


Figure 3.12.9.1 – Environment Agency Flood map

3.12.9.16 A Flood Risk Assessment (Pell Frischmann report R10021Y001/E) has been undertaken for scheme.

River Quality

3.12.9.17 Details of the Water Quality of the River Humber and associated tributaries, as provided by the Environment Agency, are summarised in Table 3.12.9.1 below:

TABLE 3.12.9.1 – RIVER WATER QUALITY WITHIN THE STUDY AREA			
Location	**General Quality Assessment ***	**Classification of Estuaries Working Party**	**River Quality Objective**
River Humber	-	Grade A	RE1,
River Hull	Grade B	-	RE2,

Fisheries

3.12.9.18 There are no fisheries within close proximity to the proposed improvement scheme.

Geology

3.12.9.19 The underlying ground conditions across the site can be summarised as follows:

- Made Ground to depths of between 0.3m and 9.6m below ground level (bgl);
- Cohesive and/or Granular Alluvium varying in thickness from 1.6m to 11.3m and from 1.1m to 10.5m respectively;
- Peat in some areas in thicknesses of between 0.3m and 2.5m and at depths ranging from 9.0m to 21.3m bgl;
- Glacial Deposits comprising Glacial Till, Glacio-lacustrine deposits and Glacial Head;
- Chalk rockhead encountered at depths of between 22.9m and 32.4m bgl (-19.2m aOD and -20.7m aOD from the western end of the study area to the proposed A63 / Ferensway grade separated junction and between -26.8m aOD to -27.5m aOD from Prince's Dock to the River Hull);

- Groundwater varies from 0.2m to 13.8m bgl although typically found at 1.5m to 4m bgl.

3.12.9.20 A detailed assessment of the underlying geology is Section 13 Geology and Soils of the Environmental Assessment Report (PF, 2008).

Hydrogeology

3.12.9.21 The Environment Agency (EA) Groundwater Vulnerability Map and Regional Appendices, which make up part of the published 'Policy and Practice for the Protection of Groundwater', divide the underlying strata in England and Wales into major, minor and non aquifers dependent upon their potential for potable water supply. The overlying soils are given a 'soil vulnerability classification' based on their physical and chemical properties, which will affect the downward passage of water and contaminants.

3.12.9.22 The underlying Geology has been classified as a Non Aquifer. Non-Aquifers are described as 'formations which are generally regarded as containing insignificant quantities of groundwater from a third group. However, groundwater flow through such rock, although imperceptible, does take place and needs to be considered in assessing the risk associated with persistent pollutants. Some Non-Aquifers can yield water in sufficient quantities for domestic use and provide base flow to rivers. Major or Minor Aquifers may occur Non-Aquifers.'

3.12.9.23 The study area is not situated within a Groundwater Source Protected Zone and is therefore not considered to be of high sensitivity with respect to groundwater.

3.12.9.24 There are three active groundwater abstractions within 1km of the site, none of which are located within the study area. Details of the abstractions are given in Table 3.12.9.2.

TABLE 3.12.9.2 GROUNDWATER ABSTRACTION				
Location (approx)	**Use**	**Source**	**Distance & Direction**	**Operator**
508660, 427850	Cooling	Groundwater	339 SW	T.J Smith and Nephew Ltd
510400, 428900	General Industrial	Groundwater	493 NE	R H M Flour Mills Ltd

TABLE 3.12.9.2 GROUNDWATER ABSTRACTION				
Location (approx)	**Use**	**Source**	**Distance & Direction**	**Operator**
508800, 428900	Cooling	Groundwater	668 NW	Northern Diaries Ltd

Environmentally Sensitive Areas

3.12.9.25 The Scheme is not located within any statutory designated areas, however the several designations exist on the Humber Estuary and lower reaches of the River Hull into which the A63 drains. These are detailed in Table 3.12.9.3 below.

TABLE 3.12.9.3 DETAILS THE DESIGNATIONS THAT HAVE BEEN PLACED ON THE HUMBER ESTUARY	
Designation	**Details**
Ramsar Site	The Estuary has been designated as a Wetland of International Importance
Special Protection Area (SPA)	The Estuary has been designated because of its importance to the bird populations which it supports.
Special Area of Conservation (SAC)	The Estuary has been designated as an SAC because of its tidal rivers, mud flats, sand flats, lagoons (including saltwork basins), salt marshes, salt pastures, salt steppes, coastal sand dunes, sand beaches, machair, bogs, marshes, water fringed vegetation and fens.
Site of Special Scientific Interest (SSSI)	The Humber Estuary is of national importance with a series of nationally important habitats and features of national geological importance.

3.12.9.26 A detailed assessment of the sensitive land uses is given in Section 7 Ecology and Nature Conservation of the Environmental Assessment Report (PF, 2008).

3.12.10 Physical Fitness

Existing Rights Of Way

3.12.10.1 There are footways on both sides of the A63 except on the south side between St James Street and Spruce Road which has a grassed verge. To the south of the A63, between St James Street and Spruce Road, Waverley Street provides a suitable route for pedestrians.

3.12.10.2 There is a shared pedestrian and cycle route on the north side of Hessle Road, commencing approximately 400 metres west of Porter Street at Rawling Way and continuing to Ferensway. Further shared pedestrian and cycle routes are provided on the northeast, southeast and southwest sides of the Mytongate junction. On all these shared routes pedestrian and cycle use is segregated by a white line.

3.12.10.3 The High Street crossing beneath the A63 is unaffected by the proposals but provides a suitable alternative route for pedestrians and cyclists for options affecting the Market Place junction. The footway forms part of the Trans-Pennine Way linking Liverpool to Hull, via Manchester, and is part of European Path E8 that stretches for 2750 miles between Cork and Istanbul

3.12.10.4 There are several designated crossing points of the A63. Crossing at intermediate positions is restricted in places by means of pedestrian guard rails located along the footways and in the central reserve. The designated crossing points of the A63 are as follows;

- A63 crossing adjacent to Porter Street - signal controlled, pedestrian only
- A63 crossing adjacent to Spruce Road/Kingston Retail Park - uncontrolled crossing
- Mytongate West Crossing - signal controlled, Toucan crossing
- Mytongate East Crossing - signal controlled, Toucan crossing
- A63 crossing adjacent to Prince's Dock West - signal controlled, pedestrian only
- A63 adjacent to Humber Dock Street - signal controlled, pedestrian only
- Market Place Junction - signal controlled, pedestrian only
- High Street - footway under the A63 prior to the Myton Bridge (European Path E8)

3.12.10.5 Other designated crossings of side roads adjacent to the A63 are as follows:-

- Ferensway - uncontrolled crossing
- Commercial Road - uncontrolled crossing

- Myton Street/Waterhouse Lane - uncontrolled crossing
- Private access, Holiday Inn - uncontrolled crossing
- Prince’s Dock Street - uncontrolled crossing
- Humber Dock Street - uncontrolled crossing
- Dagger Lane - uncontrolled crossing
- Fish Street - uncontrolled crossing
- Vicar Lane - uncontrolled crossing
- Market Place (northbound) - signal controlled, pedestrian only
- Market Place (southbound) - signal controlled, pedestrian only
- Queen Street (southbound) - signal controlled, pedestrian only
- Queen Street (northbound) - signal controlled, pedestrian only

3.12.10.6 There are numerous other points along the route by which the public could gain access to the A63 footways, notably by using the car parks belonging to commercial premises such as Kingston Retail Park. These latter routes are not shown on the drawing.

3.12.10.7 There are understood to be no bridleways in the area.

3.12.10.8 There is evidence suggesting that there is a pedestrian short cut in use between the Prince’s Quay shopping area and the A63 Prince’s Dock West Crossing. Pedestrians appear to be cutting across the grassed area between the multi-storey car park and the warehouse, thus shortening the route between the perimeter walkway to Prince’s Dock and the A63 crossing.

3.12.10.9 The Market Place junction has recently been improved for the benefit of pedestrians. The central reserve of the A63 has been made continuous and widened through the junction. Triangular splitter islands have been provided to the north and south. Signal controlled pedestrian crossings have been provided across both carriageways of the A63 and across each exit and entry slip road.

Pedestrian Flows

3.12.10.10 Pedestrian movement counts were carried out in March 2004 with further counts at additional sites in May 2004. The pedestrian movements were observed during a 12-hour period between 07:00 and 19:00 on a weekday. The counts at the two sites at Prince's Dock Street were extended to midnight to observe the pedestrian movements from the city centre to and from the recreational areas at the waterfront area to the south. The results are contained in the report by Count on Us 'Hull Traffic Survey – Survey Report March 2004'.

3.12.10.11 The following sites along the A63 were included in the pedestrian count and are listed below, together with the total two-way pedestrian flow between 07:00 and 19:00:-

- Porter Street Crossing – 190 pedestrians
- Spruce Road Crossing – 16 pedestrians
- Mytongate West Crossing – 1229 pedestrians
- Mytongate East Crossing – 531 pedestrians
- Prince's Dock West Crossing – 798 pedestrians
- Prince's Dock East Crossing – 892 pedestrians
- Market Place West Crossing– 442 pedestrians
- High Street (Under A63) – 915 pedestrians

3.12.10.12 The Prince's Dock crossings were surveyed until midnight to observe the pedestrian movements from the city centre to and from the recreational areas at the waterfront area to the south. The results are indicated in Table 11.1.

TABLE 11.1 RESULTS OF EXTENDED PEDESTRIAN COUNT		
Time period beginning	**Prince's Dock East**	**Prince's Dock West**
19:00	28	6
20:00	8	18
21:00	16	6
22:00	23	9
23:00	6	12

<u>Cycle Flows</u>

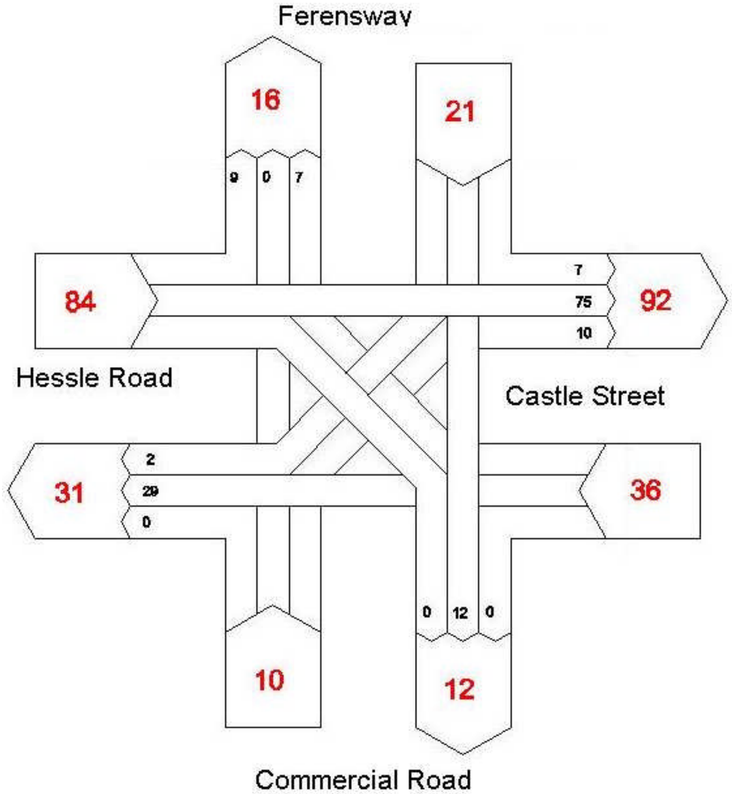
3.12.10.13 A survey of pedal cycle movements was carried out in March 2004. The pedal cycle movement counts were undertaken during a 12-hour period between 07:00 and 19:00 on a weekday.

3.12.10.14 The survey included the following sites along the A63:

- Mytongate Junction
- Myton Street
- Humber Dock Street
- Dagger Lane
- Fish Street
- Vicar lane
- Prince's Dock Street
- Market Place Junction

3.12.10.15 The numbers of movements to/from the side roads adjoining the A63 between the junctions at Mytongate and Market Place were very small, with the largest being at Prince's Dock Street where four cyclists left the A63 and six joined.

3.12.10.16 The majority of movements occurred at the junctions at Mytongate and Market Place. Figure 3.12.10.1 indicates diagrammatical representation showing the total movements over a 12-hour period at both junctions.



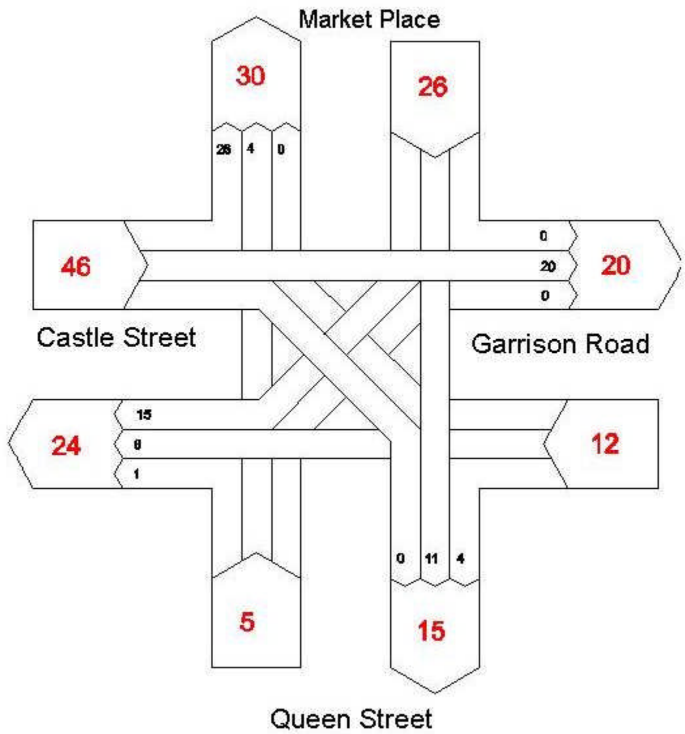


Figure 3.12.10.1: Cycle flows at Mytongate and Market Place junctions

Trip Generators

3.12.10.17 The current likely generators of pedestrian and cycle traffic across the A63 would appear to be:

- The residential area around Porter Street;
- Paragon Interchange on Ferensway;
- The commercial and entertainments area south of Hessle Road, including Kingston Retail Park and the Hull Arena;
- City centre shopping and commercial areas in the Prince's Quay area, including the Prince's Quay Shopping Centre;
- The Humber Marina area with nearby residential areas;
- The mixed residential, shopping and commercial area to the east of Prince's Quay, including the indoor market;
- The commercial and tourist attractions adjoining the River Humber including The Deep;
- Marina Court commercial development area.

3.12.10.18 The Hull City Masterplan and the emerging planning documents contained within the Local Development Framework envisage significant changes to areas around the scheme corridor by 2016 that could generate additional pedestrian and cycle traffic. The changes south of the A63 at Humber Quays and The Fruit Market Area would be likely to have the most effect on pedestrians and cyclists crossing the A63 as there are proposals for significant new office, retail, leisure and residential developments, including 450 dwellings at Humber Quays and 400 at The Fruit Market Area.

3.12.10.19 About 500 metres north of the Mytongate junction on Ferensway is the Hull Paragon Interchange opened in September 2007. This Interchange provides access to train, bus and coach services together under the same roof. Facilities for passengers include improved information points and combined travel centre, toilet facilities, a waiting room, shops and refreshment bars, security staff and 24 hour CCTV. There are 30 bus and four coach bays. These are used by East Yorkshire Motor Services, Stagecoach and National Holidays. Northern Trains, Hull Trains and First Transpennine continue to use the railway station as usual, offering services across to Manchester, London, the East Coast and stations in between. There are drop-off points for cars and taxis, a dedicated area for cyclists to leave their bikes and better access for pedestrians.

3.12.11 Journey Ambience

Traveller Care

3.12.11.1 The main users of the existing travel network at the A63 are vehicle travellers. Cyclists and walkers are also users of the area.

3.12.11.2 The en-route facilities for road users are limited to standard directional road signage. There are footways on both sides of the A63 except on the south side between St James Street and Spruce Road which has a grassed verge. There is a shared pedestrian and cycle route on the north side of Hessle Road and further shared pedestrian and cycle routes are provided on the northeast, southeast and southwest sides of the Mytongate Junction. There are several designated at-grade crossing points along the A63.

3.12.11.3 Further details of the pedestrian crossings and cycling routes are given in Section 3.12.10 Physical Fitness.

3.12.11.4 There are no existing facilities (fuel, rest areas, food etc) present along the short length of highway improvement under consideration. Given the urban nature of the study area and the short length of the scheme this is not considered to be a major issue.

Travellers Views

3.12.11.5 Vehicle travellers presently experience views into the surrounding urban areas whilst travelling along the scheme corridor. At the western end of the study area between Porter Street and Mytongate Junction the road travels at existing ground level, channelled through the surrounding townscape.

3.12.11.6 Views are possible to the north of the A63 into the mixed scale residential areas between the verge-side trees. This area is of an ordinary townscape quality. Views to the south of the A63 are intermittent and restricted by verge-side screening vegetation into the light industrial, poor quality townscape areas around Waverley Street. However, views are possible to the south into the Kingston Retail Park area, which is of an ordinary townscape quality, on the approach to Mytongate Junction. The angle of the carriageway through Mytongate Junction prevents distant views along the carriageway whilst travelling in both an east and west direction.

3.12.11.7 At Mytongate Junction views are restricted, north onto Ferensway and south down Commercial Road by the two wedges of vegetation growing on either side of the throughabout. Views are also restricted by the large number of road signs and barriers in this cluttered area.

3.12.11.8 Between Mytongate Junction and the docks there are open views south of the road towards the large mature trees within Trinity Burial Ground. This area is an attractive and rare green space within the wider urban setting and classed as a very attractive townscape quality. There are also open views to the north of the carriageway into the retail and derelict areas around Myton Street. The listed Castle Buildings and Earl de Grey Pub are prominent alongside the A63 in what is otherwise an ordinary area of townscape quality.

3.12.11.9 Between Prince's Dock and Humber Dock the road travels in slight cutting providing a restricted view to the dock areas either side of the carriageway. Prince's Dock is classified as attractive townscape quality and Humber Dock is classed as very attractive townscape quality. Distant views are possible north to the Prince's Quay shopping centre and south to the masts of the yachts within Humber Dock. The red brick listed Warehouse No. 6 to the north of the carriageway by Prince's Dock Street is a prominent feature.

3.12.11.10 Between Prince's Dock Street and Fish Street the road is at ground level and channelled between the surrounding good quality residential and office developments restricting views to along the road corridor only. The residential areas north of the carriageway form a uniform appearance allowing only glimpsed views north along the side roads that link into Castle Street. This contrasts with the open and partly derelict areas to the south of the carriageway around Finkle Street, classed as ordinary landscape quality. Views south are partially screened by a brick wall but it is still possible to see the upper areas of the Fruit Market warehouses beyond.

3.12.11.11 At the Junction between Market Place and Queen Street the built areas alongside the road open out allowing open views north along Market Place towards the good quality townscape areas around the listed King William III statue, and south along Queen Street towards the warehouses of the Fruit Market. When travelling east it is possible to see the road rising up towards the Myton swing bridge, and when travelling west towards the Market Place Junction, views are channelled along the A63 corridor towards the docks and over the derelict Fruit Market areas.

3.12.11.12 The elevated section of Myton swing bridge provides extensive open views over the flat city centre. Views are possible north along the River Hull corridor and northwest towards the tower of Trinity Church, a high quality townscape area. Open views are possible south towards 'The Deep' and the River Hull tidal barrier, a very attractive townscape quality area, and over the Fruit Market area to the southwest.

Traveller Stress

3.12.11.13 Driver stress is defined for the purposes of environmental assessment as the adverse mental and physiological effects experienced by a driver traversing a road network. The main three components of driver stress are:

- Frustration
- Fear of potential accidents
- Uncertainty relating to the route being followed.

3.12.11.14 Frustration is caused by a driver's inability to drive at a speed consistent with their wishes in relation to the general standard of the road. Congestion can lead to frustration by creating a situation in which the driver does not feel in control.

3.12.11.15 Fear of potential accidents is heightened where there is increased likelihood of pedestrians stepping onto the road and where the proposition of heavy goods vehicles (HGV) is high.

3.12.11.16 Route uncertainty is caused primarily by signing that is inadequate for the individual's purposes.

3.12.11.17 At present the Mytongate Junction and its approaches are likely to cause driver stress and uncertainty as a result of the layout of the junction, the low traffic speeds in relation to the design speed of the approach roads, the amount of congestion particularly during peak periods and the difficulty in entering the circulatory flow on the roundabout. Drivers approaching the junction from the east and wishing to turn right onto Commercial Road are required to enter the left hand lane on approach to the junction, and go around the roundabout. No right hand turn is possible from the main A63 carriageway. This may cause confusion and stress to drivers not familiar with the junction. There is also the potential for accidents with drivers attempting to change lanes at the 'last minute'.

3.12.11.18 Drivers faced with the difficulty of merging with the circulatory traffic on the roundabout are likely to fear a potential accident. This fear may be worsened by potential contact with pedestrians.

3.12.11.19 Alongside major traffic congestion at the Mytongate Junction, the other major junction on the route – Market Place/Queen Street (Market Place Junction) is also problematic and liable to cause driver stress. However, recent improvements to the Market Place Junction have mitigated some of the congestion problems.

3.12.11.20 Generally, footpaths are immediately adjacent to the carriageway, along the whole of the proposed route and in some cases access to both residential and commercial properties is gained directly from the footpath. There are a number of at-grade designated crossing points along the whole length of the scheme which could potentially bring vehicle travellers and pedestrians into conflict. The changing of pedestrian crossing lights also results in an interruption in the flow of traffic.

3.13 Accessibility

3.13.1 Option values

3.13.1.1 The Hull East-West Corridor Multi Modal Study (HUMMS) proposed a number of options for the improvement and integration of transport and infrastructure around Hull, part of which includes options for the A63 Castle Street Area. The proposals for

Castle Street in this study have been further developed and expanded resulting in the present proposals.

3.13.1.2 The proposed improvements being considered have come out of part of the HUMMS study not relating to public transport issues, and therefore do not include proposals for existing public transport within the study corridor.

3.13.1.3 Option Values are therefore not a consideration for the proposed improvements.

3.13.2 Severance

Methodology

3.13.2.1 The severance sub-objective is outlined in TAG Unit 3.6.2. Severance assessments look at how non-motorised users, especially pedestrians, are affected. Cyclists and equestrians are less susceptible to severance because they can travel more quickly than people on foot, although there may still be significant impacts on these groups

3.13.2.2 Severance may be classified according to the following four broad levels.

- None - Little or no hindrance to pedestrian movement.
- Slight - All people wishing to make pedestrian movements will be able to do so, but there will probably be some hindrance to movement.
- Moderate - Some people, particularly children and old people, are likely to be dissuaded from making journeys on foot. For others, pedestrian journeys will be longer or less attractive.
- Severe - People are likely to be deterred from making pedestrian journeys to an extent sufficient to induce a reorganisation of their activities. In some cases, this could lead to a change in the location of centres of activity or to a permanent loss of access to certain facilities for a particular community. Those who do make journeys on foot will experience considerable hindrance.

3.13.2.3 To ensure a consistent approach, classification should be based on pedestrians only. The impact of severance on cyclists and equestrians will differ for two reasons: they travel more quickly; and crossing facilities may not be available to them.

Interpretation of these levels for individual modes is discussed in WEBTAG Unit 3.6.2.

3.13.2.4 It will usually be appropriate to assess severance at a number of locations across a network. This is likely to lead to a range of assessments. Some locations in a network may experience reductions in severance, others may experience increases. Some locations may experience greater changes in severance than others. For each level of change in severance, the numbers of people affected should be accumulated to provide the entries required for webtag worksheet. An overall assessment for the option should then be based on the following guidelines (in each case, the assessment is *beneficial* if severance is reduced, *adverse* if severance is increased):

- the overall assessment is likely to be Neutral if increases in severance are broadly balanced by relief of severance;
- the overall assessment is likely to be Slight where change in severance is slight or the total numbers of people affected across all levels of severance is low (less than 200 per day, say);
- the overall assessment is likely to be Large where change in severance is large, and affects a moderate or high number of people or the total numbers of people affected across all levels of severance is high (greater than 1000, say); and
- the overall assessment is likely to be Moderate in all other cases.

<u>Baseline</u>

3.13.2.5 Details of the public rights of way, including designated crossing points, pedestrian flows, trip generators and desire lines for the A63 Castle Street are outlined in Section 3.12.10 Physical Fitness of this report.

3.13.2.6 In summary, there are eight designated crossing points of the A63 situated at the following locations:

- A63 crossing adjacent to Porter Street - signal controlled, pedestrian only
- A63 crossing adjacent to Spruce Road/Kingston Retail Park - uncontrolled crossing

- Mytongate West Crossing - signal controlled, Toucan crossing
- Mytongate East Crossing - signal controlled, Toucan crossing
- A63 crossing adjacent to Prince's Dock West - signal controlled, pedestrian only
- A63 adjacent to Humber Dock Street - signal controlled, pedestrian only
- Market Place Junction - signal controlled, pedestrian only
- High Street - footway under the A63 prior to the Myton Bridge (European Path E8)

Conflict Points and Impact

3.13.2.7 The current heavy motorised traffic flows along the A63 east-west route corridor cut across the city centre and result in severance along most of its length.

3.13.2.8 Designated crossing points have been provided at intervals along the route corridor with pedestrian guard railing along certain sections of the A63 between the crossing points. The A63 crossing provisions are generally located on or close to the main desire lines and all, except for Spruce Road, are signal controlled. The A63 crossing locations, together with the associated junctions at Mytongate and Market Place, constitute the principal conflict points between pedestrians and cyclists with motorised vehicles. The conflict points are discussed below.

Porter Street Crossing

3.13.2.9 The present number of pedestrians crossing at this signal controlled crossing is relatively light compared to the nearby crossings at Mytongate Junction, with the morning, lunchtime and evening peak flows being about 25 pedestrians per hour. Future pedestrian numbers are likely to rise in view of strategic plans for development south of the A63, however, no predicted flows are presently available.

3.13.2.10 The traffic counts carried out in 2004 indicates that the morning and evening peaks in motorised traffic flows are about 4500 vehicles per hour along the A63. These are predicted to rise to about 6500 by 2017 without the scheme.

3.13.2.11 For the scheme options the maximum peak flow is predicted to be about 7600 vehicles per hour in the opening year 2017.

3.13.2.12 The provision of a footbridge in place of the existing signalised crossing may increase journey times slightly for pedestrians and particularly for those who are disabled. The footbridge will improve safety by reducing the exposure of pedestrians to vehicular traffic. However having to use a footbridge to cross the A63 may be perceived as a reduction in personal security. The amenity of the crossing is unlikely to be changed. Traffic flows along the A63 at this location will increase by 17% as a result of the scheme. Overall there is unlikely to be change in community severance. The provision of a footbridge in terms of creating new severance is no more than that severance created by the signalised at-grade crossing.

Mytongate Junction Crossings

Do-minimum

3.13.2.13 The shared pedestrian and cycle crossings of the A63 at Mytongate Junction are signal controlled with the west crossing having the highest usage by pedestrians of any crossing along the scheme corridor. The west crossing is used by about twice as many pedestrians than the east crossing. The west and east crossings have peaks in the morning, lunchtime and evening. The number of pedestrians crossing the A63 at Mytongate Junction in the morning and evening peaks is about 150 and 200 per hour respectively and nearly 250 per hour at lunchtimes. The number of cyclists crossing the A63 is about 4 per hour in the morning and evening peaks.

3.13.2.14 Pedestrians and cyclists have to negotiate present morning and evening peak motorised traffic flows of about 4500 vehicles per hour along the A63 at the junction. These are predicted to rise to about 6700 by 2017 without the scheme. Of the two other major roads at this junction, Ferensway and Commercial Road, Ferensway is the busier and will see a rise in peak traffic from about 1200 vehicles per hour to about 1550 in 2017 without the scheme. Pedestrians presently crossing Ferensway and Commercial Road have to negotiate uncontrolled crossings.

3.13.2.15 Future pedestrian numbers negotiating the junction are likely to rise in view of strategic plans for development south of the A63, however, no predicted flows are presently available.

Option 1: Underground Base

3.13.2.16 Ferensway/Commercial Road will cross above the A63 which will be in a cutting. Pedestrians and cyclists will avoid their present conflict with A63 traffic. Pedestrians and cyclists travelling along Ferensway/Commercial Road will be using shared facilities on the east side and will need to cross slip roads. Those crossing Ferensway will see a rise in peak hour traffic to a maximum of about 1950 vehicles. All crossings will be signal controlled.

3.13.2.17 This option removes conflicts between pedestrians and cyclists with traffic travelling along the A63. Ferensway/Commercial Road will remain at ground level. Pedestrians and cyclists may need to cross Ferensway/Commercial Road where traffic flows will increase by 26%. However current uncontrolled crossings will be replaced by signalised crossings forming part of the junction. Pedestrian delays are likely to be reduced as a result.

3.13.2.18 Pedestrians and cyclists will cross over above the A63 on a shared wide footway on the east side of Ferensway/Commercial Road. This will offer scope to enhance the amenity of the journey through this junction. Pedestrians and cyclists will need to cross the eastern slip roads of the A63 which will be lightly trafficked and signalised. Generally journey times through the junction between Commercial Street and Ferensway (north-south trips) should be reduced. Increases may only occur for those pedestrians whose trips crossing the A63 both originate and end either on the west or the east sides of this junction.

3.13.2.19 The replacement of the existing signalised crossings of the A63 by other signalised crossings is unlikely to result in a change of community severance but offers scope for improved amenity value for journeys particularly as users remain at ground level through the junction.

Option 2: Underground Landbridge

3.13.2.20 Ferensway/Commercial Road will cross above the A63 which will be in a cutting. Pedestrians and cyclists will avoid their present conflict with A63 traffic. Pedestrians and cyclists travelling along Ferensway/Commercial Road will be using shared facilities on the east side and will need to cross slip roads. Those crossing Ferensway will see a rise in peak hour traffic to a maximum of about 2250 vehicles per hour. All crossings will be signal controlled.

3.13.2.21 This option removes conflicts between pedestrians and cyclists with traffic travelling along the A63. Ferensway/Commercial Road will remain at ground level. Pedestrians and cyclists may need to cross Ferensway/Commercial Road where traffic flows will increase by 45%. However current uncontrolled crossings will be replaced by signalised crossings forming part of the junction. This should mitigate any additional potential pedestrian delays due to increased traffic flow.

3.13.2.22 Pedestrians and cyclists will cross over above the A63 on a shared wide footway on the east side of Ferensway/Commercial Road. This will offer scope to enhance the amenity of the journey through this junction. Pedestrians and cyclists will need to cross the eastern slip roads of the A63 which will be lightly trafficked and signalised. Generally journey times through the junction between Commercial Street and Ferensway (north-south trips) should be reduced. Increases may only occur for those pedestrians whose trips crossing the A63 both originate and end either on the west or the east sides of this junction.

3.13.2.23 The replacement of the existing signalised crossings of the A63 by other signalised crossings is unlikely to result in a change of community severance but offers scope for improved amenity value for journeys particularly as users remain at ground level through the junction.

Option 3: Underground Cut & Cover Tunnel

3.13.2.24 Ferensway/Commercial Road will cross above the A63 which will be in a cutting. Pedestrians and cyclists will avoid their present conflict with A63 traffic. Pedestrians and cyclists using shared facilities travelling along Ferensway/Commercial Road on the west side will need to cross the new local access road which is predicted to have a peak flow of about 1950 vehicles per hour in the opening year 2020.

3.13.2.25 This option removes conflicts between pedestrians and cyclists with traffic travelling along the A63. Ferensway/Commercial Road will remain at ground level. Pedestrians and cyclists may need to cross Ferensway/Commercial Road where traffic flows will increase to a maximum of about 2070 vehicles per hour, an increase of 34%. However current uncontrolled crossings will be replaced by signalised crossings forming part of the junction. This should mitigate any additional potential pedestrian delays due to increased traffic flow.

3.13.2.26 Pedestrians and cyclists will cross over above the A63 on a shared wide footway on the east side of Ferensway/Commercial Road. This will offer scope to enhance the amenity of the journey through this junction. Pedestrians and cyclists will need to cross the new local access road that links to the Market Place junction. This will carry flows of 1950 vehicles per hour but a signalised crossing will be provided. Generally journey times through the junction between Commercial Street and Ferensway (north-south trips) should be reduced. Increases may only occur for those pedestrians whose trips crossing the A63 both originate and end either on the west or the east sides of this junction.

3.13.2.27 The replacement of the existing signalised crossings of the A63 by other signalised crossings is unlikely to result in a change of community severance but offers scope for improved amenity value for journeys particularly as users remain at ground level through the junction.

Option 4: Overground Base

3.13.2.28 The A63 will cross above Ferensway/Commercial Road. Pedestrians and cyclists will avoid their present conflict with the A63. Pedestrians and cyclists travelling along Ferensway/Commercial Road will be able to use the shared facilities on the east side which will involve them crossing the slip roads. Those crossing Ferensway will see a rise in peak hour traffic to a maximum of about 1950 vehicles per hour for the Base Scheme option. All crossings will be signal controlled.

3.13.2.29 This option removes conflicts between pedestrians and cyclists with traffic travelling along the A63. Ferensway/Commercial Road will remain at ground level. Pedestrians and cyclists may need to cross Ferensway/Commercial Road where traffic flows will increase by 26%. However current uncontrolled crossings will be replaced by signalised crossings forming part of the junction. Pedestrian delays are likely to be reduced as a result.

3.13.2.30 Pedestrians and cyclists will cross beneath the A63 on a shared wide footway on the east side of Ferensway/Commercial Road. Pedestrians and cyclists will need to cross the eastern slip roads of the A63 which will be lightly trafficked and signalised. The headroom clearance offered by the viaduct carrying the A63 provides opportunities for either formal or informal footways beneath the viaduct for a distance of about 120 metres either side of the junction. This will offer scope to enhance the amenity of the journeys through this junction. Generally journey times through the junction between Commercial Street and Ferensway (north-south trips) should be reduced and because of the additional opportunities available to walk or cycle beneath the viaduct there are unlikely to be increases for those pedestrians whose trips crossing the A63 both originate and end either on the west or the east sides of this junction.

3.13.2.31 The replacement of the existing signalised crossings of the A63 by other signalised crossings is unlikely to result in a change of community severance and combined with the additional space beneath the viaduct offers scope for improved amenity value for journeys particularly as users remain at ground level through the junction.

Option 5: Overground Landbridge Equivalent

3.13.2.32 The A63 will cross above Ferensway/Commercial Road. Pedestrians and cyclists will avoid their present conflict with the A63. Pedestrians and cyclists travelling along Ferensway/Commercial Road will be able to use the shared facilities on the east side which will involve them crossing the slip roads. Those crossing Ferensway will see a rise in peak hour traffic to a maximum of about 2250 vehicles per hour. All crossings will be signal controlled.

3.13.2.33 This option removes conflicts between pedestrians and cyclists with traffic travelling along the A63. Ferensway/Commercial Road will remain at ground level. Pedestrians and cyclists may need to cross Ferensway/Commercial Road where traffic flows will increase by 45%. However current uncontrolled crossings will be replaced by signalised crossings forming part of the junction. This should mitigate any additional potential pedestrian delays due to increased traffic flow.

3.13.2.34 Pedestrians and cyclists will cross beneath the A63 on a shared wide footway on the east side of Ferensway/Commercial Road. Pedestrians and cyclists will need to cross the eastern slip roads of the A63 which will be lightly trafficked and signalised. The headroom clearance offered by the viaduct carrying the A63 provides opportunities for either formal or informal footways beneath the viaduct for a distance of about 120 metres on the west side of the junction (offering direct links across the slip roads between Cogan Street and the retail park) and about 250 metres on the east side of the junction. Further opportunities are afforded to pedestrians to cross underneath part of the westbound exit slip road to the east of the junction. This will offer scope to enhance the amenity of the journeys through this junction. Generally journey times through the junction between Commercial Street and Ferensway (north-south trips) should be reduced and because of the additional opportunities available to walk or cycle beneath the viaduct there are unlikely to be increases for those pedestrians whose trips crossing the A63 both originate and end either on the west or the east sides of this junction.

3.13.2.35 The replacement of the existing signalised crossings of the A63 by other signalised crossings is on its own unlikely to result in a change of community severance. However when combined with the additional space beneath the viaduct which offers scope for improved amenity value and more direct routes for journeys for users at ground level through the junction.

Option 6: Overground Extended Viaduct

3.13.2.36 The A63 will cross over Ferensway/Commercial Road. Pedestrians and cyclists will avoid their present conflict with A63 traffic. Pedestrians and cyclists using shared facilities travelling along Ferensway/Commercial Road on the west side will need to cross the new local access road which is predicted to have a peak flow of about 1950 vehicles per hour in the opening year 2018.

3.13.2.37 This option removes conflicts between pedestrians and cyclists with traffic travelling along the A63. Ferensway/Commercial Road will remain at ground level. Pedestrians and cyclists may need to cross Ferensway/Commercial Road where traffic flows will increase by 34%. However current uncontrolled crossings will be replaced by signalised crossings forming part of the junction. This should mitigate any additional potential pedestrian delays due to increased traffic flow.

3.13.2.38 Pedestrians and cyclists will cross beneath the A63 on a shared wide footway on the east side of Ferensway/Commercial Road. Pedestrians and cyclists will need to cross the local access road, which will be signalised, which links to the Market Place junction. The headroom clearance offered by the viaduct carrying the A63 provides opportunities for either formal or informal footways beneath the viaduct for a distance of about 120 metres on the west side of the junction (offering direct links across the slip roads between Cogan Street and the retail park) and eastwards as far as the Market Place junction. Further opportunities are afforded to pedestrians to cross the local access road to the east of the junction. This will offer scope to enhance the amenity of the journeys through this junction. Generally journey times through the junction between Commercial Street and Ferensway (north-south trips) should be reduced and because of the additional opportunities available to walk or cycle beneath the viaduct, particularly on the east side, there are unlikely to be increases for those pedestrians whose trips crossing the A63 both originate and end either on the west or the east sides of this junction.

3.13.2.39 The replacement of the existing signalised crossings of the A63 by other signalised crossings is on its own unlikely to result in a change of community severance. However the additional space beneath the viaduct will offer scope for improved amenity value and more direct routes for journeys for users at ground level through the junction.

<u>Prince's Dock Crossings</u>

Do-minimum

3.13.2.40 The combined number of pedestrians using the existing two signal controlled crossings at Prince's Dock is the second highest on the route corridor, with combined peak hourly flows of about 150, 225 and 200 at morning, lunchtime and evening peaks respectively. The motor vehicle related accidents involving pedestrians at this location have led to a significantly higher proportion of serious casualties than elsewhere along the route corridor. Current peak hour traffic flows along this section of the A63 are about 4500 vehicles per hour, predicted to rise up to 6800 in 2017.

3.13.2.41 Future pedestrian numbers crossing in the area are likely to rise significantly in view of strategic plans for development south of the A63, however, no predicted flows are presently available.

Option 1: Underground Base Option

3.13.2.42 The A63 remains at ground level. Pedestrians will be provided with a footbridge in place of the two signalised crossing points. The footbridge will be located about 70 metres west of the junction of Prince's Dock Street with Castle Street (A63). The maximum peak flow along the A63 is predicted to be about 7000 vehicles per hour in the opening year 2018.

3.13.2.43 The provision of a footbridge in place of the existing two signalised crossing locations will increase journey times for pedestrians and particularly for those who are disabled. The footbridge will improve safety by reducing the exposure of pedestrians to vehicular traffic but this should be set against a perceived reduction in personal safety and security. Users of the footbridge will still be affected by the presence of traffic walking to and from the bridge. The amenity of the crossing is therefore unlikely to be changed. Traffic flows along the A63 at this location will increase by 3% as a result of the scheme. Overall there is unlikely to be change in community severance. There is likely to be a need to provide barriers to ensure pedestrians do not attempt to cross the A63 by avoiding the footbridge. The provision of a footbridge, the longer diversions, and consequential barriers is likely to create new severance.

Option 2: Underground Landbridge

3.13.2.44 The A63 would be in a cutting. Pedestrians would therefore be prevented from crossing the A63 by barriers along the tops of the retaining walls and would instead cross at a new 25m wide pedestrian landbridge to be constructed near the site of the present west crossing opposite Prince's Quay shopping centre. The maximum peak flow along the A63 is predicted to be about 7000 vehicles per hour in the opening year 2018.

3.13.2.45 The provision of a landbridge in place of the existing two signalised crossing locations will increase journey times for pedestrians and particularly for those who are disabled. The landbridge will improve safety by reducing the exposure of pedestrians to vehicular traffic but this should be set against a perceived reduction in personal safety and security which may arise but may be less than that created by a footbridge. The landbridge will be at a height of about 3 metres above surrounding footway levels. Users of the landbridge will still be affected by the presence of traffic walking to and from the landbridge. The amenity of the crossing is therefore unlikely to be changed. Traffic flows along the A63 at this location will increase by 3% as a result of the scheme. Overall there is unlikely to be change in community severance. There is likely to be a need to provide barriers to ensure pedestrians do not attempt to cross the A63 by avoiding the landbridge. The provision of a landbridge, the longer diversions, and consequential barriers is likely to create new severance.

Option 3: Underground Cut and Cover Tunnel

3.13.2.46 The A63 will be in a tunnel at this location with a new local access road at ground level. Pedestrians will therefore no longer have to negotiate the A63 but will instead have to negotiate the new local access road which will have predicted peak traffic flows at a maximum in the morning rush hour of about 1950 vehicles per hour near Mytongate Junction and 1475 near Market Place.

3.13.2.47 The traffic flow along the local road will be a reduction of 71% over that if the scheme did not proceed. Pedestrian crossing points will be provided. Delays to pedestrians crossing the road, even at informal points, will be greatly reduced over those experienced currently with the signalised crossings. The reduction in traffic and complete removal of A63 traffic, together with wider footways, will increase the amenity value of the area and reduce community severance. The reduction in traffic by more than 60% represents a substantial relief from severance.

Option 4: Overground Base

3.13.2.48 The A63 remains at ground level. Pedestrians will be provided with a footbridge in place of the two signalised crossing points. The footbridge will be located about 70 metres west of the junction of Prince's Dock Street with Castle Street (A63). The maximum peak flow along the A63 is predicted to be about 7000 vehicles per hour in the opening year 2017.

3.13.2.49 The provision of a footbridge in place of the existing two signalised crossing locations will increase journey times for pedestrians and particularly for those who are disabled. The footbridge will improve safety by reducing the exposure of pedestrians to vehicular traffic but this should be set against a perceived reduction in personal safety and security. Users of the footbridge will still be affected by the presence of traffic walking to and from the bridge. The amenity of the crossing is therefore unlikely to be changed. Traffic flows along the A63 at this location will increase by 3% as a result of the scheme. Overall there is unlikely to be change in community severance. There is likely to be a need to provide barriers to ensure pedestrians do not attempt to cross the A63 by avoiding the footbridge. The provision of a footbridge, the longer diversions, and consequential barriers is likely to create new severance.

Option 5: Overground Landbridge Equivalent

3.13.2.50 The A63 would be on a viaduct. A new 25m wide pedestrian crossing beneath the viaduct is to be provided near the site of the present west signalised crossing opposite Prince's Quay shopping centre. The A63 carriageway will be about 4 metres above ground level at this location. Due to headroom requirements the floor of the underpass will be at least a metre below ground level. The maximum peak flow along the A63 is predicted to be about 7000 vehicles per hour in the opening year 2017.

3.13.2.51 The provision of a crossing in place of the existing two signalised crossing locations will increase journey times for pedestrians and particularly for those who are disabled. This crossing will improve safety by reducing the exposure of pedestrians to vehicular traffic but this should be set against a perceived reduction in personal safety and security which may arise from this crossing. This crossing, 25 metres wide and 33 metres long with a headroom of about 2.6 metres, will have a floor over a metre below ground level. Consequently direct views from within the crossing outwards may not be possible resulting in the crossing being perceived as a wide underpass with low headroom. Users of this crossing will still be affected by the presence of traffic walking to and from this crossing. The amenity on the approaches to the crossing is unlikely to be changed. Within the underpass amenity will be very dependant on what the space is used for and how well it is maintained. Potentially amenity could be reduced. Traffic flows along the A63 at this location will increase by 3% as a result of the scheme. Overall there is unlikely to be change in community severance. There is likely to be a need to provide barriers to ensure pedestrians do not attempt to cross the A63. The provision of this crossing, the longer diversions, and consequential barriers is likely to create new severance.

Option 6: Overground Extended Viaduct

3.13.2.52 The A63 will be on a viaduct at this location with a new local access road at ground level. Pedestrians will therefore no longer have to negotiate the A63 but will instead have to negotiate the new local access road beneath the viaduct which will have predicted peak traffic flows at a maximum in the morning rush hour of about 1950 vehicles per hour near Mytongate Junction and 1475 near Market Place.

3.13.2.53 The traffic flow along the local road will be a reduction of 71% over that if the scheme did not proceed. Pedestrian crossing points will be provided. Delays to pedestrians crossing the road, even at informal points, will be greatly reduced over those experienced currently with the signalised crossings. The reduction in traffic and complete removal of A63 traffic, together with wider footways, will increase the amenity value of the area and reduce community severance. The reduction in traffic by more than 60% represents a substantial relief from severance. However above this area will be the A63 traffic carried on a viaduct some 9 to 10 metres above ground level. Whilst pedestrian movement will not be impaired, there will still be an awareness of the presence of this major trunk route which will slightly reduce the extent of the improvements enjoyed.

Market Place Junction Crossing

Do-minimum

3.13.2.54 The signalised pedestrian crossing of the A63 at Market Place Junction is much less used than at the nearby Prince's Dock crossings with peak flows of about 50 to 75 pedestrians per hour. The survey, which was carried out before the current junction arrangement was in place, indicated cycle usage between Queen Street and Market Place and also the A63. Now with only left turns permitted for traffic, including cyclists, and pedestrian crossings provided it is not clear how the new junction arrangement has affected cycle activity through the junction. Current A63 peak hour traffic flow on the west side of the junction is about 4500 vehicles per hour, predicted to rise to a maximum of about 6200 in 2017.

3.13.2.55 Of the two other major roads at this junction, Market Place and Queen Street, Market Place is the busier with a peak traffic flow of about 1500 vehicles per hour. This is predicted to fall to about 800 in 2017 without the scheme. Traffic along Queen Street is expected to rise from a maximum peak of about 200 vehicles per hour to about 450 vehicles per hour in 2017.

3.13.2.56 Future pedestrian numbers crossing in the area are likely to rise significantly in view of strategic plans for development south of the A63, however, no predicted flows are presently available.

Option 1 Underground Base and Option 2 Landbridge

3.13.2.57 In both these options the junction layout would be similar to the existing layout. A footbridge would be provided to replace the current signalised pedestrian crossing over the A63. Although peak traffic flows on the A63 would rise to about 6800 vehicles per hour, the conflict with NMUs would be removed as they will be expected to use the new footbridge on the west side of the junction. NMUs crossing Market Place and Queen Street would need to negotiate maximum peak vehicle flows of about 1300 and 750 vehicles respectively. It is assumed that the signalised crossings of both these roads would remain.

3.13.2.58 The provision of a footbridge in place of the existing signalised crossing may increase journey times slightly for pedestrians and particularly for those who are disabled. The footbridge will improve safety by reducing the exposure of pedestrians to vehicular traffic. However having to use a footbridge to cross the A63 may be perceived by pedestrians as a reduction in personal security. The large traffic islands and localised widening of the central reserve at the existing signalised crossing results in a higher amenity value for pedestrians than at the other signalised crossings. The provision of a footbridge may therefore be perceived as a slight reduction in amenity of the crossing due to the need to use steps or ramps, and because of the increased distance. Traffic flows along the A63 at this location will increase by 10% as a result of the scheme. Overall there is unlikely to be change in community severance.

3.13.2.59 The provision of a footbridge in terms of creating new severance is no more than that severance created by the signalised at-grade crossing.

Option 3: Underground Cut and Cover Tunnel

3.13.2.60 Under the Tunnel Option the A63 would be retained in cutting through the junction. Pedestrians crossing the A63 would need to use either the existing underpass at High Street (approximately 150m to the east) or the new crossing point over the new local access road at the tunnel portal (approximately 100m to the west) both these providing a route for cyclists. Peak vehicle flows along the local access road at this location are predicted to be about 1475 vehicles per hour. NMUs crossing Market Place and Queen Street would need to negotiate maximum peak vehicle flows of about 1175 and 425 vehicles respectively. However signalised crossing points are to be retained across Market Place.

3.13.2.61 The presence of the A63 retained in cut through the junction will lead to diversions in excess of 250 metres for pedestrians and cyclists travelling between Market Place and Queen Street. However the amenity of the route may be slightly improved over that currently available. There may be an increase in community severance for some users but any increase would depend on their start and end points of the journey.

Option 4: Overbridge Base and Option 5 Landbridge Equivalent)

3.13.2.62 In both these options the junction layout would be similar to the existing layout. A footbridge would be provided to replace the current signalised pedestrian crossing over the A63. Although peak traffic flows on the A63 would rise to about 6800 vehicles per hour, the conflict with NMUs would be removed as they will be expected to use the new footbridge on the west side of the junction. NMUs crossing Market Place and Queen Street would need to negotiate maximum peak vehicle flows of about 1300 and 750 vehicles respectively. It is assumed that the signalised crossings of both these roads would remain.

3.13.2.63 The provision of a footbridge in place of the existing signalised crossing may increase journey times slightly for pedestrians and particularly for those who are disabled. The footbridge will improve safety by reducing the exposure of pedestrians to vehicular traffic. However having to use a footbridge to cross the A63 may be perceived by pedestrians as a reduction in personal security. The large traffic islands and localised widening of the central reserve at the existing signalised crossing results in a higher amenity value for pedestrians than at the other signalised crossings. The provision of a footbridge may therefore be perceived as a slight reduction in amenity of the crossing due to the need to use steps or ramps, and because of the increased distance. Traffic flows along the A63 at this location will increase by 10% as a result of the scheme. Overall there is unlikely to be change in community severance.

3.13.2.64 The provision of a footbridge in terms of creating new severance is no more than that severance created by the signalised at-grade crossing.

Option 6: Overbridge Extended Viaduct

3.13.2.65 The A63 would be on a viaduct at this junction. Pedestrians crossing the A63 would walk beneath the viaduct with signalised crossings provided across Market Place, Commercial Street and a new local access road linking to Mytongate junction. Peak vehicle flows along the local access road at this location are predicted to be about 1475 vehicles per hour. The maximum peak hourly vehicle flows along Market Place and Queen Street would be about 1175 and 425 vehicles respectively.

3.13.2.66 This junction is at the eastern end of the viaduct carrying the A63 and so the level of the A63 above the ground reduces from west to east as it passes the junction. Headroom for pedestrians and cyclists will only be available on the west side of the junction. On the east side of the junction the A63 is likely to be supported on retained fill. Pedestrians and cyclists travelling between Market Place and Queen Street will be able to pass beneath the viaduct crossing only local roads under signal control. The length of the route will be similar to that of the existing route and delays will be reduced. The wide large footway areas created offer scope to enhance the amenity of the crossing which will be improved over that currently available. There may be a slight reduction in community severance at this junction because of the reduction in journey delays and improvement in amenity.

3.13.2.67 Although the provisions made for pedestrians are likely to result in providing relief from existing severance this should be set against the fact that A63 traffic will still be visible and audible to those using the area.

<u>High Street Crossing</u>

3.13.2.68 The High Street crossing beneath the A63 is unaffected by the proposals but provides a suitable alternative route for pedestrians and cyclists for options affecting the Market Place junction. The footway forms part of the Trans-Pennine Way linking Liverpool to Hull, via Manchester, and is part of European Path E8 that stretches for 2750 miles between Cork and Istanbul.

3.13.3 Access to transport system

3.13.3.1 The improvement scheme does not include proposals for public transport nor does it directly affect access to existing public transport within the A63 corridor. Access to the transport system is therefore not considered at this stage.

3.14 Integration

3.14.1 Transport interchange

3.14.1.1 The Scheme does not include for any interchange between different modes of transport and therefore will have no affect on passengers and/or freight shifting to other modes of transport. The overall impact of the Scheme to transport interchange is considered to be neutral.

3.14.2 Land use policy

Introduction

3.14.2.1 The purpose of this section is to describe the Development Plan framework and policies together with other relevant spatial policies which are relevant to the study area. A detailed Planning and Policies assessment has been undertaken and the outcome of the Assessment is detailed in the report 'A63 Castle Street, Environmental Assessment (Options Identification Stage)' dated October 2008.

3.14.2.2 The following sections set a summary of the relevant plans and policies referred to within the Policies and Plans Assessment together with a judgement as to whether the scheme further, hinders or has no effect on the specific policies. For ease of reference this is shown in a series of tables (Table 3.14.2.1 – 3.14.2.5) at the end of this section. The determination of development proposals are guided by national, regional and local planning policies plus an evaluation of other material considerations that must be taken into account. This requires that in addition to statutory development plans reference must also be made to a range of both statutory and non-statutory documents which are of relevance to the study area.

Key Considerations

3.14.2.3 The study area is located within what is defined as the Yorkshire and the Humber region of the United Kingdom. Planning policy documents reflect the various tiers of Central, Regional and Local government involvement in the planning system. Additional policies are also important – such as the relevant community plan which under the new spatial planning regime (set up by the 2004 Planning and Compulsory Purchase Act) must be taken into account by the statutory planning system.

3.14.2.4 The policy framework in the area is complex, however the May 2008 Regional Spatial Strategy (RSS) provides, recent statutory guidance at the regional level. In line with the 2004 Planning and Compulsory Purchase Act the approved Local Plan is being replaced by the new Local Development Framework (LDF) which is still subject to consultation. The approved statutory planning documents (the approved RSS and the "saved" policies of the Joint Structure Plan and the Adopted Local Plan are key documents. However a considerable number of other more recent documents, while not formally approved, form “material considerations” which can be taken into account. The weight to be attached to these documents will increase with the progression of the plan towards adoption. There are a considerable number of documents which need to be taken into account when assessing the planning policy background to this scheme.

3.14.2.5 In essence all planning and related policy documents recognise the poor economic situation of the City of Hull. Hull is recognised in the RSS as one of four regional cities in the region alongside Leeds, Bradford and Sheffield.

3.14.2.6 Multiple deprivation is marked in Hull. It is one of the most deprived areas of the country with over half of the wards in the City falling within the most deprived 10% of wards in England. From international to the most local policies the intention is to promote the economic regeneration of Hull and to promote the City as a focus for significant development and regeneration. A key element of this is considered to be to improve access to the docks which requires improvements to A63 Castle Street. The Hull Masterplan, (which is not a planning documents itself but is approved by the City Council, and has formed a significant input into the new LDF documents), endorses the view that solutions will be needed to improve Castle Street. It is also one of the Masterplan’s three objectives to re-unite the City Centre with its River Humber waterfront.

3.14.2.7 The aims of the project are to reduce congestion on the A63 Castle Street, which is the key access to Hull Docks, whilst also reducing severance. These are also key ambitions in terms of planning and regeneration policy. It is widely considered that these aims will support a step change in the economic fortunes of the City. It is therefore the case that the regeneration priority and aims for Hull are inextricably linked with and reflected in the transport policies relevant to this road scheme. While transport and regeneration policies are considered separately there is very considerable overlap which is reflected in both sets of policies.

Policy Documents

3.14.2.8 The Policy documents relevant to this assessment are :

- National Planning Policy – Set out in Planning Policy Guidance Notes (PPG's) and Planning Policy Statements (PPS's)
- The Yorkshire and the Humber Region Objective 2 Programme 2000-2006
- Regional Spatial Strategy (RSS)
- Local Planning Policies

Planning Implications of Scheme Options

3.14.2.9 It is important to also be aware of and take into account recent planning decisions which may impact upon the scheme.

3.14.2.10 There has been a recent decision by Hull City Council on a major redevelopment at Quay West. This takes its access from Castle Street. All options have been designed to facilitate this development. However the application involves the restoration and bringing into use of the Castle Buildings and the Earl De Grey – both listed buildings which are proposed for demolition in all the road scheme options.

3.14.2.11 Burnetts House (on the Castle Street/Market Place junction) has been recently restored at considerable public expense (heritage lottery fund/Citybuild funding). It is not a listed building but is of considerable local interest and is within the Conservation Area. It would seem imprudent to significantly adversely affect this building. An application has been made recently in connection with the additional development of this site. Currently this is the subject of a holding direction issued by the Highways Agency.

3.14.2.12 All five Strategic Development Areas in the City are currently limited in growth and development by the existing capacity of Castle Street. It is likely that the Highways Agency would object to any additional major schemes that would raise the estimated traffic generation above this threshold.

3.14.2.13 The roadline is currently protected in the Local Plan but there is some confusion as to the exact line that the Highways Agency currently wants to see protected.

3.14.2.14 The Development Brief for the Fruit Market Area is currently being drawn up.

3.14.2.15 The Old Town Conservation Area includes all the road and considerable amounts of land adjoining the road to the east of the western extreme of Warehouse 6 (Ask). To the South of the road the Area runs along the road from the Marina to the roundabout and South down Manor House Street. Therefore the only parts not within the Conservation Area comprise Princes Quay and the Quay West Sections and the road adjoining this area. Any road proposals needs to take account of the importance of listed buildings – including the listed docks and any structure linking them, which may also be considered as listed structures, and the additional protection given to other buildings within the Conservation Area. Impacts on the setting of these buildings/structures should be regarded as material considerations.

3.14.2.16 A form of landbridge was proposed in a similar location to the one put forward in the relevant current option 2 in 2002 by Citybuild but was refused consent by Members against officer advice, due to its impact on listed buildings (Warehouse 6 and the two listed docks). The impact on listed buildings in terms of visual impact and also impact during construction need to be taken into account in any scheme together with the need for any mitigation measures.

3.14.2.17 It should be noted that the City Council has confirmed that there are no designated Town and Village Greens in the area that could be affected by any of the options.

Policy Compliance

3.14.2.18 The general aim of the policies assessment is to consider the proposed A63 Castle Street improvement works options against the background of the Development Plan Policies and guidance set out by Central and Local Government at national, regional and local levels, and to assess the scheme to establish if it meets the objectives of those plans and their policies.

3.14.2.19 For the purpose of this assessment the proposal is considered under the following headings:

- Transport;
- Regeneration and Economy; and
- Natural and Built environment.

3.14.2.20 The breadth of the topics are indicative of the importance and wide implications such proposals have in promoting movement and growth, as well as the physical relationship with the environment of the area. Urban design issues are dealt with separately.

3.14.2.21 The A63 Castle Street is a Strategic Transport Corridor in the Yorkshire and the Humber region - and also internationally through the Port of Hull. It is recognised as having a major part to play in the regeneration and economic growth of the City.

3.14.2.22 Governmental guidance in the White papers 'A New Deal for Transport – Better for Everyone' and 'The Future of Transport' gives priority to improving existing transport routes rather than building new ones and recognises the challenge in securing transport improvements while minimising the impact on the environment. This has recently been endorsed by "Towards a Sustainable Transport System Supporting Economic Growth in a Low Carbon World" where top priority is given to maintaining and managing the existing road network and getting it to work better. Priority is also to be given to congested cities and international gateways.

3.14.2.23 Improvements to Castle Street have been long considered. This section of road is recognised as being at capacity with congestion and delays at peak times effecting the performance of the road network to provide an adequate transport route to Hull Docks. Specific support for a scheme to address these issues and those of regeneration and severance can be found in a wide range of inter regional, regional and more local policies. Notably improvements are proposed as a high priority at inter regional policy – including in the Northern Way, as a first priority at regional level in the approved Regional Spatial Strategy which includes the Regional Transport Strategy. The Regional Transport Board has also endorsed the scheme.

3.14.2.24 At a local level improvements to the A63 Castle Street are strongly promoted in both the adopted Local Plan and in the draft of the relevant part of the new Local Development Framework. The Local Plan sets out a protected line to be used for improvements to Castle Street and this policy is carried forward in the new draft Local Development Framework (LDF) Documents. It is considered therefore that the proposal is in principle consistent with and in accordance with, and promoted by, the relevant planning strategies concerning transport policies at all levels. There is also strong policy support for the road in regeneration and economic development terms as it is widely anticipated that it is central to the successful performance of Hull Docks which has international as well as national and local implications. At a local level it is expected that a reduction in both congestion and severance will be fundamental elements in an upturn in the city's economic growth and a catalyst in reducing the high levels of multiple deprivation in the city.

3.14.2.25 The proposal is considered to be in accordance with these principles of the Development Plan framework with regard to transport and regeneration, the focus of which is to promote economic growth. All options however do not wholly address issues of severance successfully.

3.14.2.26 However, it is essential that any objective assessment of the proposal considers the environmental impacts of the scheme on the area. The site lies within the city centre where there are significant issues around, for example archaeology and ecology.

3.14.2.27 However the adopted Local Plan protects the assumed line of the road from development which would have an adverse impact on the future development of the road. It should be noted that this includes the northern section of the Trinity Burial Ground. The adopted Plan will have been subject to extensive consultation and the loss of this section of open space and a whole range of other potential disbenefits will have been considered at this stage. This means that on balance, when the Plan was adopted the benefits of the road were considered to outweigh the disbenefits in relation to the built and natural environment as the proposals map and commitment to the road indicates. It should also be noted that many of the environmental policies have caveats which allow development to take place, even if there are negative impacts on the environment, provided that significant community benefits will accrue.

3.14.2.28 The Development Plan documents and the national planning policy framework set out a comprehensive and inclusive list of policies that define issues of environmental importance and which are material considerations to the determination of the proposal. All are dealt with in specific sections of the policies assessment and the effects on particular aspects of the environment resulting from the scheme, together with any mitigation works are outlined. By keeping environmental impacts of new and existing transport infrastructure to a minimum by employing 'the precautionary principle' and ensuring that mitigation measures are implemented to a high standard, the policy requirements of the listed Development Plans and guidance provided in PPGs, PPSs and other statutory and non-statutory guidance of this development can, on balance be met.

3.14.2.29 As set out above the improvements scheme has been considered against the hierarchy of development plan documents that exist to guide and add predictability to the outcome of development proposals for the use of land. These exist in a range of documents that reflect the land use and development strategies in descending levels of interest from central to local government.

3.14.2.30 In the case of the overall improvements scheme that strategy is set out in a range of inter-regional, regional and more local policy documents as set out above. There is also a range of ancillary guidance contained in White Papers, Government Guidance, Planning Policy Guidance Notes and Statements and ancillary transport plans.

3.14.2.31 The attached schedule of policies and plans shows how all options has been evaluated against each policy to ascertain if it 'furthers' or 'hinders' each topic. The proposal is a scheme which has been identified to remediate a specific problem in the transport network.

3.14.2.32 Generally the improvements scheme is considered to further policies on transport as an efficient strategic network is a key objective in transport planning. The scheme is also considered to further the group of policies relating to regeneration and employment.

3.14.2.33 An objective assessment of the impact of the scheme options on the group of environmental policies is however considered to be that they are likely to hinder them, in part because in the main they seek to protect static assets sensitive to change. Whilst there may be some adverse environmental impacts including significant impact on archaeology, these will have been debated in principle in the plan decision making process. The inclusion of the highway scheme in these plans shows, that, on balance, the benefits to the transport network in this area and the perceived advantages to regeneration and employment brought about by the road are considered to outweigh the adverse effects on the environment. The plans and policies do however outline the requirements for appropriate mitigation and the importance of such works in reducing any perceived impacts.

3.14.2.34 On balance therefore all options will have the effect of furthering the overall policy objectives and having a beneficial effect at a national, regional and local level for all options. Therefore the assessment is beneficial overall for all options. It should be noted however that improvements could be made in townscape terms if the proposed footbridges at Market Place and Porter street were removed and sensitively designed structures used where applicable – landbridges or viaducts. Issues of severance also need to be reassessed and more focus directed towards pedestrian and cycle provision.

3.14.2.35 The assessment of the policies in the documents below applies to all six options unless otherwise indicated.

Table 3.14.2.1: European Dimension			
Authority	**Policy**	**Interest**	**Effect**
European Union	Within former Objective 2 area	Increasing economic performance and reduce social exclusion.	Furthered

Table 3.14.2.2: Transport Policies			
Authority	**Policy**	**Interest**	**Effect**
National Government	White Paper ‘A New Deal for Transport: Better for Everyone’	Provision of an integrated transport system sustaining the economy and promoting accessibility.	Furthered

Table 3.14.2.2: Transport Policies			
Authority	**Policy**	**Interest**	**Effect**
National Government	White Paper 'The Future of Transport'	Prepares for long term transport needs and provides opportunity for economic growth. Need to plan ahead to get best out of transport system.	Furthered
National Government	Eddington Transport Report	Action should be prioritised on those parts of the system where networks are critical in supporting economic growth.	Furthered
National Government	Towards a Sustainable Transport System Supporting Economic Growth in a Low Carbon World	Top priority is given to maintaining and managing the existing road network and getting it to work better. Priority is also to be given to congested cities and international gateways.	Furthered
National Government	Manual For Streets	Streets should give a high priority to pedestrians. Not applicable to trunk roads	Neutral
National Government	PPG 13 Transport	Recognises quality of life depends on transport and access we need a safe, efficient and integrated transport system to promote sustainability and accessibility. Land use is a key to delivering an integrated transport strategy.	Furthered
Inter-Regional	The Northern Way Growth Strategy Sept 2004	A key objective in relation to Hull is addressing specific road bottlenecks to the port – such as the A63 Castle Street.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy HE1	Aims to increase road accessibility to Hull in line with priorities in the Regional Transport strategy	Furthered

Table 3.14.2.2: Transport Policies			
Authority	**Policy**	**Interest**	**Effect**
Regional	Regional Transport Strategy which is embodied within the Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy T7	This policy specifically supports improvements to the A63 Castle Street to aid access to the Port of Hull	Furthered
Regional	Regional Transport Strategy which is embodied within the Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy T9	This policy sets out transport investment priorities. "Improved quality of road access to Hull and the Port of Hull" is listed as a Category A – highest priority, scheme.	Furthered
Regional	Joint Structure Plan Adopted June 2005 Policy EC 2	The policy sets out that the east-west multi-modal freight transport corridor should provide a focus for the movement of freight and new employment development	Furthered
Regional	Joint Structure Plan Adopted June 2005 Policy T 3	The highway network should be improved to facilitate the movement of people and freight.	Furthered
Regional	Hull and Humber Ports City Region (Part of Northern Way Initiative)	A 63 Castle Street improvement is a main priority action. With a Cut and Cover tunnel being favoured at this time.	Furthered
Regional	Regional Transport Board	The Board consider that the scheme will facilitate economic growth and regeneration. It is within the Board's Priority Transport Scheme list.	Furthered

Table 3.14.2.2: Transport Policies			
Authority	**Policy**	**Interest**	**Effect**
Local	Hull City Council Local Transport Plan 2006-2011	The Plan sets out that improvements from the Port of Hull to the national transport system are vital and lists as a major objective both long and short term improvements to the A63 Castle Street. While the published Plan favours the Cut and Cover option the City Council has reserved it position and will give its formal view as part of the Highways Agencies public consultation on options. There is therefore an in principle support for all options	Furthered for all options
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M1	Promotes a balanced transport system – including walking and cycling.	The impact is considered to be adverse for options 1,2,4 and 5. On balance it is considered that Options 3 and 6 are neutral.
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M9	Encourages improved facilities for cyclists and pedestrians	The impact is considered to be adverse for options 1,2,4 and 5. On balance it is considered that Options 3 and 6 are neutral.
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M11	The design of cycle and pedestrian routes and pedestrian areas are expected to take into account cycle and pedestrian access and personal safety and the needs of the mobility impaired.	There is considered to be an adverse impact for all options.

Table 3.14.2.2: Transport Policies			
Authority	**Policy**	**Interest**	**Effect**
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M12 (a)	Cycle and footpath/footbridge schemes are indicated for Castle Street, Porter Street/St James Street Princes Dock Street/Humber Dock Street is programmed to have a cycle and pedestrian underpass and the land required will be protected from other development).	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy BE7	Cycle and pedestrian routes will take account of safety and needs of all users	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M16	Road schemes will be encouraged if they are part of the primary road network.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M18	Land needed for Castle Street improvement is identified.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M37	Developing regional, national and international transport links serving Hull will be encouraged.	Furthered
Local	City Centre Masterplan (endorsed by City Council)	This is an investment framework. It has the aims of reducing congestion and severance in relation to A63 Castle Street.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 - Saved Policy M18 (a)	Land needed for Castle Street improvement is identified and protected.	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 39	Contributing to public realm in the city centre by accommodating or contributing to strategic walks and footbridges	Neutral

Table 3.14.2.2: Transport Policies			
Authority	**Policy**	**Interest**	**Effect**
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 40	Proposes short term transport measures for Castle Street. Longer term proposals will need to take these measures into account.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 41	City centre developments are to contribute to transport improvements to the A63	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 43	Development will not be allowed within the indicative protected line of long term improvements to the A63 – or any other line determined at a later date.	Furthered
Local	Hull East-West Corridor Multi-Modal Study July 2002	This included a specific requirement to address the problems of congestion and severance. The principle of an on- line scheme to improve Castle Street was endorsed.	Furthered

Table 3.14.2.3: Regeneration and Economy			
Authority	**Policy**	**Interest**	**Effect**
National Government	PPS 1 Delivering Sustainable Development	Aim of maintenance of high and stable levels of economic growth and employment	Furthered
National Government	PPG 4 Industry	Links transport and economic development. Transport systems can offer locational advantage to industry. Good access is a commercial priority.	Furthered
National Government	PPS 6 Planning for Town Centres	Town centres are to grow and improved accessibility to them is a specific objective.	Furthered

Table 3.14.2.3: Regeneration and Economy			
Authority	**Policy**	**Interest**	**Effect**
Inter-Regional	The Northern Way Growth Strategy Sept 2004	Key objectives are to develop the Humber Trade zone – including the Port of Hull and promoting the renaissance of Hull city centre.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy YH1	This policy cites Hull as a Regeneration Priority Area where economic conditions are to be transformed. Opportunities provide by the Humber Ports as an international gateway are to be optimised.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy YH4	Hull is one of four regional cities which are expected to be the prime focus for housing, employment, shopping, leisure, education, health and cultural activities and facilities in the region. It is expected to be transformed into an attractive, cohesive and safe place where people want to live, work, invest, and spend time in.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy HE1	This policy aims to transform the role of Hull as a regional city making the most of the multimodal transport links, ports and city centres.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy E1	The role of ports as significant economic drivers is recognised and this role promoted	Furthered
Regional	Regional Economic Strategy 2006-15	Has the objectives of connecting people to good jobs and having good transport connections to existing infrastructure.	Furthered

Table 3.14.2.3: Regeneration and Economy			
Authority	**Policy**	**Interest**	**Effect**
Regional	Joint Structure Plan Adopted June 2005 Policy EC2	Promotes a regional east-west multi-modal freight transport corridor.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000	Aims of the Plan include: • to promote urban regeneration; • to support and develop the local economy; • to protect, support and develop the role of the city centre; and • to promote the growth of the Port.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy E6	Port related development will be encouraged	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy UR1	Development assisting urban regeneration will be encouraged	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy UR2	This sets out regeneration priority areas which abut the A63 Castle Street.	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 6	Development that contributes to the regeneration of the city centre will be encouraged.	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 20	This sets out the objectives for regenerating the city centre, which as the proposals map and other policies indicate the promoting of the roadscheme must, on balance, support this scheme in principle.	Furthered

Table 3.14.2.3: Regeneration and Economy			
Authority	**Policy**	**Interest**	**Effect**
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 31	This policy relates to Quay West - a large area to the north of the road on which the council has resolved to support the grant planning permission subject to a Section 106 Agreement. This agreement is now signed and any roadscheme proposed will need to take into account the access arrangements for this development.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 33	This policy relates to Fruit Market - a large area to the south of the road. No development that poses a risk to the redevelopment of the area will be permitted.	Neutral
Local	City Centre Masterplan (endorsed by City Council)	This is an investment framework with the objective of regenerating the city centre. The document is clear that solutions will be needed to the existing problems at A63 Castle Street. It foresees a solution which separates local and through traffic and therefore specifically supports the “cut and cover” option.	Furthered for Options 3 an 6, Options 1, 2, 4 and 5 are neutral
Local	Hull Community Strategy 2006-2011	This has an objective of enhancing the competitiveness of Hull’s businesses.	Furthered

Table 3.14.2.4: Natural Environment			
Authority	**Policy**	**Interest**	**Effect**
National Government	PPS 9 Biodiversity and Geological Conservation	A key objective is to ensure biological and geological diversity are conserved and enhanced as part of economic development.	Hindered
National Government	PPS 25 Planning and Pollution Control	Decisions must be taken subject to full account of environmental impacts being satisfied.	Neutral

Table 3.14.2.4: Natural Environment			
Authority	**Policy**	**Interest**	**Effect**
National Government	PPG 24 Planning and Noise	Noise can be a material consideration in the planning process. However much development in relation to essential infrastructure will generate noise. Unjustifiable obstacles should not be placed in the way of such development.	Furthered
National Government	PPS 25 Planning and Flood Risk	Development should not be located or designed in a way that exacerbates flood risk. Development proposals in at-risk areas should be accompanied by a risk assessment – including mitigation measures.	Neutral
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy HE1	This seeks to protect and enhance the biodiversity and landscape character of the Humber estuary and increase tree planting. Air quality should be improved and the Cities economic assets protected from flooding.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV1	This sets out provisions in relation to flood risk and requires a sequential approach to be taken to flood risk and assessments where necessary. Development of land in the City will be facilitated.	Neutral
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV3	High levels of water quality should be maintained and pollution of surface and underground water resources should be prevented.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV6	Conserve, enhance and increase planting especially in urban areas	Hindered

Table 3.14.2.4: Natural Environment			
Authority	**Policy**	**Interest**	**Effect**
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV8	Safeguard and enhance biodiversity and geological heritage	Neutral
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV11	This relates to Health and recreation. It encourages economic development in Hull covers maximising opportunities for walking and cycling in the city.	Neutral
Regional	Joint Structure Plan Adopted June 2005 Policy ENV3	Development will need to prove an overriding need if it has an adverse impact on specific species previously identified.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 CC1 (a)	Development within the city centre will be allowed subject to a range of issues including, impact on amenity, impact on the built and natural environment and the risk of pollution.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE6 (a)	A good standard of landscape will be required	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE22	A tree or group of trees of significant amenity value will be retained unless the works are necessary in the public interest	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE1	Development of urban greenspace will be allowed if there is overriding justification.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE3	Development of designated urban greenspace will not be allowed if adversely affected.	Neutral

Table 3.14.2.4: Natural Environment			
Authority	**Policy**	**Interest**	**Effect**
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE 17	Development having a significant adverse effect on nationally or locally significant sites for nature conservation will not be allowed.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE 18	Development resulting in loss of trees of significant amenity value will not be allowed	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE 20	Development adversely affecting a species protected by legislation will not be allowed. Managing and improving Urban Greenspace for the benefit of both the community and wildlife will be supported.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME2	Development will not be allowed if it has an unacceptable pollution impact	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME3	Development near to a known or potential source of pollution will not be allowed unless the risk is acceptable.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME4	Development on contaminated land will be supported.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME14	Protecting and managing trees will be encouraged.	Hindered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 2	Development will be permitted if detailed planning considerations are acceptable. These include: natural and built environment, pollution, air quality and flood risk	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 20	Development will be permitted if detailed planning considerations are acceptable. These include: natural and built environment, pollution, air quality and flood risk	Neutral

Table 3.14.2.5: Built Environment			
Authority	**Policy**	**Interest**	**Effect**
National Government	PPG 15 Planning and the Historic Environment	There should be effective protection of all aspects of the historic environment – including Conservation Areas and Listed Buildings.	Hindered
National Government	PPG.16 'Archaeology and Planning'	Recognises that archaeological remains are irreplaceable. Is a finite and now renewable resource. Preservation of identified deposits must be weighed against the need for the proposed development.	Hindered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV 9	This aims to safeguard and enhance the historic environment, and ensure that historical context informs decisions about development and regeneration.	Hindered
Regional	Joint Structure Plan Adopted June 2005 Policy ENV 6	The setting, character or appearance of strategically important buildings, features or areas of historic or architectural interest should be protected and where appropriate enhanced.	Hindered
Regional	Joint Structure Plan Adopted June 2005 Policy ENV 7	Nationally important archaeological remains and their settings will be preserved and development that is likely to have an adverse impact should not be allowed. Archaeological remains will be protected unless an overriding need for the development is demonstrated.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 CC1 (a)	Development will be allowed if detailed planning considerations are acceptable – this includes impact on the built and natural environment.	Neutral

Table 3.14.2.5: Built Environment			
Authority	**Policy**	**Interest**	**Effect**
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE1(a)	A high standard of design will be sought for all developments.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 18	There will be special regard paid to preserving or enhancing the character or appearance of a designated Conservation Area.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 19	Development should preserve or enhance the character or appearance of a designated Conservation Area.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 20	Demolishing a building in a Conservation Area if redevelopment produces substantial community benefits.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 21	Development adversely affecting the views or setting of a Conservation Area will not be allowed.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 25	Special regard will be had to retaining Listed Buildings	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 28	Development within the setting of a Listed Building will not be allow if it adversely affects or is not in keeping with the Listed Building.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 30 (a)	Demolishing a Listed Building will not be allowed unless redevelopment will produce substantial community benefits.	Furthered

Table 3.14.2.5: Built Environment			
Authority	**Policy**	**Interest**	**Effect**
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 31 (a)	Important archaeological remains will be preserved.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 32	Archaeological assessment will be required for potentially archaeologically valuable sites	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 34	If development is accepted as outweighing the loss of important archaeological remains adequate provision must be made for recording the remains.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 2	Development will be permitted if detailed planning considerations are acceptable. These include the built environment.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 3	High standards of design will be required for development in the city centre.	Neutral

3.14.2.36 Reference is made to the impact of the overall improvements scheme on individual policies in the context of 'Furthered' or 'Hindered'. However it should be acknowledged that the listing of the improvements scheme in the Programme of Improvements to the Strategic Highway Network in the Regional Transport Strategy (RTS) – which is part of the Regional Spatial Strategy - and the recognition of the scheme in the LTP, the adopted Local Plan and the more recent LDF documents, is indicative that the projects impact on Development Plan policies has been evaluated and its environmental impact balanced against the transport and regeneration requirements for the scheme. Whilst there may be some adverse environmental impacts these will have been considered during the extensive plan preparation process, and the scheme's specific inclusion in these documents. This shows that the benefits of all options are considered at the time to outweigh any adverse effects on the environment.

3.14.2.37 On balance therefore all options will have the effect of furthering the policies of the relevant plans overall. However it should be noted that all options do not appear to fully address the needs of non motorised users and there are still issues around severance, namely the effectiveness of pedestrian movements through the provision of overbridges that need to be considered. In addition, visual impact of the overbridges is a disbenefit in terms of a scheme options overall acceptability. Options 3 and 6 are more favoured given that they make better provision for pedestrians and cyclists together with a separation of local and through traffic. However it should be noted that the assessment system does not allow for grades of "beneficial" and therefore all options score beneficial for each element and overall.

3.14.3 Other government policies

Introduction

3.14.3.1 The assessment of this proposal against the policies contained in the documents referred to above has been undertaken on a subjective basis. In determining the subject areas that need to be assessed, the Local Plan, the Proposals map, and the existence, on the ground, of existing features have been taken into consideration. Consequently, the following policy areas will be considered:

- Transport policies
- Strategic Patterns of Development Policies
- Townscape Policies
- Ecology and Nature Conservation Policies
- Cultural Heritage Policies

Transport Policies

3.14.3.2 The Department for Transport works towards the priority of:

'Improving access to jobs and services, particularly for those most in need, in ways that are sustainable: improved public transport - reduced problems of congestion and reduced problems of congestion, pollution and safety.'

3.14.3.3 National Planning Policy for Transport can be found in PPG 13. Its objectives are to integrate planning and transport at the national, regional, strategic and local level and to promote more sustainable transport choices both for carrying people and for moving freight.

3.14.3.4 The White paper "A New Deal for Transport: Better for Everyone", presented to Parliament in July 1998 gives "top priority to improving the maintenance and management of existing roads before building new ones".

3.14.3.5 Decisions on when and where to invest in network improvement, including measures to manage traffic, will be based on the following criteria:

- **Integration** – ensuring that all decisions are taken in the context of the integrated transport policy;
- **Safety** – to improve safety for all road users;
- **Economy** – supporting sustainable economic activity in appropriate locations and getting good value for money;
- **Environmental impact** – protecting the built and natural environment; and
- **Accessibility** – improving access to everyday facilities and reducing community severance.

3.14.3.6 The White Paper also emphasises that whilst it is important to upgrade the existing network, decisions should be made in the context of an integrated transport policy and the regional planning process. It aims to extend choice in transport and secure mobility in a way that supports sustainable development and introduces the concept of the Regional Transport Strategy (RTS) which should provide the context for integrating land use and transport policy identifying regional transport management and investment priorities. The White Paper also reaffirmed the important contribution cycling can make in an integrated transport system.

3.14.3.7 A further White Paper entitled "The Future of Transport" was published on 20 July 2004. This set out how the Government will respond to the increasing demand for transport by maximising the benefits of transport while minimising the negative impact on people and the environment. It sets out that transport is vital to the economy and the way we live and that decisions that we take now will have an impact for decades to come. It is essential that decisions on transport take a long term view.

3.14.3.8 The White Paper emphasises that the ability to travel offers all of us very real benefits. It stresses that the transport system helps to underpin the international competitiveness of the economy. However it acknowledges that mobility comes at a cost, whether financial, social or environmental. The challenge is to ensure that we can benefit from mobility and access while minimising the impact on other people and the environment both now and in the future.

3.14.3.9 The White Paper is based on the premise that the UK economy is growing and this benefits all of us. However, as the economy grows, people's needs and desire to travel, for business or leisure, will also increase. As people become better off they can afford to travel further and more often. There is a need to recognise this, and the pressures it can create, and plan ahead to get the best out of our transport system without damaging the overall quality of life.

3.14.3.10 People today are becoming more accustomed to travelling further and now often commute long distances to work. The Government acknowledges that its transport system has to recognise that demand for travel will increase in the future and there is a need to anticipate and manage the pressures that we will face over the next 20 to 30 years. There is therefore a requirement for a transport network that can meet the challenges of a growing economy and the increasing demand for travel, but can also achieve our environmental objectives.

3.14.3.11 Ambitions for 2030 include a coherent transport networks with:

- the **road** network providing a more reliable and freer-flowing service for both personal travel and freight, with people able to make informed choices about how and when they travel;

- making **walking** and **cycling** a real alternative for local trips; and
- **ports** and **airports** providing improved international and domestic links.

3.14.3.12 The Government acknowledges that additional infrastructure will be necessary. However this must be balanced with the damage to the environment. The strategy is built around 3 central themes:

- **Sustained** investment over the long term with a commitment to deliver sustained improvements to transport networks;
- **Improvements** in transport management; and
- **Planning** ahead involving a debate on road pricing.

3.14.3.13 Underlining these themes is the important objective of balancing the need to travel with the need to improve quality of life. This means seeking solutions that meet long term economic, social and environmental goals.

3.14.3.14 The Eddington Transport Study, published in December 2006 sets out a proposed programme of action for dealing with the current transport situation. The brief had been to advise the Government on the long-term links between transport and the UK's economic productivity, growth and stability, within the context of the Government's commitment to sustainable development. The study demonstrates that the performance of the UK's transport networks will be a crucial enabler of sustained productivity and competitiveness. It was found that good transport systems support the productivity of urban areas. Transport corridors were seen as the arteries of domestic and international trade, boosting the competitiveness of the UK economy. The growth in international trade makes a very significant contribution to the UK's economy. The Port of Hull is clearly important as an international trading port.

3.14.3.15 The study showed that the strategic economic priorities for long term transport policy should be growing and congested urban areas and their catchments; the key inter-urban corridors; and the key international gateways. In terms of these criteria it is clear that all options score highly.

3.14.3.16 Key Findings of the report were that there is clear evidence that a comprehensive and high-performing transport system is an important enabler of sustained economic prosperity and that transport corridors are the arteries of domestic and international trade. However, emissions from the transport sector are a significant and growing contributor to environmental quality it is therefore essential, both from an economic and environmental perspective that the environmental impacts of transport are fully reflected in decision making and the transport sector should meet its full environmental costs.

3.14.3.17 The study found that Government should prioritise action on those parts of the system where networks are critical in supporting economic growth, and there are clear signals that these networks are not performing. On this basis, the strategic economic priorities for long-term transport policy should be those located in growing and congested urban areas, the key inter-urban corridors and the key international gateways that are showing signs of increasing congestion and unreliability. As these are the places where transport constraints have significant potential to hold back economic growth.

3.14.3.18 Towards a Sustainable Transport System Supporting Economic Growth in a Low Carbon World – was presented to Parliament by the Minister of State for Transport in October 2007. This document endorses the view set out in the Eddington study that there is a vital link between transport and the economy. It supports a focused approach, targeted on congested and growing cities and their catchment areas, and key inter-urban links and international gateways where congestion poses the most serious threat to economic growth. It agrees with the study that investment in new infrastructure will sometimes be the only answer to a transport problem.

3.14.3.19 The document had three aims. Firstly, it set how the Government is responding to the recommendations made in the Eddington study to improve transport's contribution to economic growth and productivity, and how it is ensuring that transport will play its part in delivering the overall level of reductions in carbon emissions recommended by the Stern Review of the Economics of Climate Change. Secondly, it details out the Department for Transport's policy and investment plans for the period to 2013-2014. Finally, it proposes a new approach to longer term transport strategy, building on the model recommended by Sir Rod Eddington.

3.14.3.20 Manual for Streets (MfS) was published in March 2007 by the Department for Communities and Local Government and the Department for Transport. The guidance focuses on lightly-trafficked residential streets, but many of its key principles may be applicable to other types of street, for example high streets. While the document does not apply to the trunk road network it could be applicable to the local access roads that would be formed in Options 3 and 6. The main principle of the document is that there is a need to bring about a transformation in the quality of streets. This requires a fundamental culture change in the way streets are designed and adopted.

3.14.3.21 For new streets, MfS advocates a return to more traditional patterns which are easier to assimilate into existing built-up areas. Streets should not be designed just to accommodate the movement of motor vehicles.

3.14.3.22 It is important that designers place a high priority on meeting the needs of pedestrians, cyclists and public transport users, so that growth in these modes of travel is encouraged. None of the options, at this stage appear to give this priority to these groups.

3.14.3.23 The principles of MfS will need to be considered in the design of any local access roads/pedestrian interface.

<u>Strategic Patterns of Development Policies</u>

The Northern Way: A Growth Strategy - September 2004

3.14.3.24 This is a strategy produced as a joint venture by partners from the North’s three regions following an invitation by the then Deputy Prime Minister to address the economic disparity in output between the North of England and the rest of the UK. The analysis focused on eight City regions in the North including Hull and the Humber Ports. These were identified as being key to any effort to accelerate the economic growth of the North Humber Ports.

3.14.3.25 Whilst not a statutory planning document the Strategy forms an important consideration in the spatial planning system. The Northern Way is an ambitious economic strategy, driven by the three northern Regional Development Agencies and their partners. It aims to improve the economy of the North of England, by building upon and adding value to the substantial impact that the three Regional Economic Strategies and Regional Spatial Strategies will bring. It is therefore applicable to both the transport and regeneration sections.

3.14.3.26 Hull and the Humber ports is one of eight City Regions covered by the Northern Way. The document has three broad themes including improving connectivity by tackling transport bottlenecks to the Humber ports.

3.14.3.27 The Hull and the Humber ports City Region Development Programme sets out that in terms of main priority actions and investments it sees as a main programme priority to improve road and rail access to the Humber Ports. In terms of A63 Castle Street the Programme proposes the implementation of a "cut and cover scheme". They see this as to enabling the Port of Hull to grow and to regenerate the city centre in accordance with Hull City Centre Master Plan. It would also in the document's view have a Pan-Northern significance by improving access to the North's sea ports, capturing a larger share of global trade and addressing worklessness and sustainable communities through the transformation of the city centre and marketing the North to the world.

3.14.3.28 The approved Regional Spatial Strategy (RSS) - May 2008 embodies the Regional Transport Strategy (RTS). The RTS sets out that "The Regional Economic Strategy observes that transport, access and connectivity in the Region are not good enough to support the regional economy." The integration of transport planning with land-use planning and other policy areas therefore determines the policy direction of the RTS. So the RTS supports the wider RSS but also provides a strategic steer on transport investment and management in a more operational setting, including delivery.

3.14.3.29 The RTS sets out that all the transport investment and management priorities are priorities in their own right and that these priorities will help to deliver the spatial strategy for the region. The outcomes have been banded according to the degree to which they support the spatial objectives of the Plan and the transport objectives of the RTS. Three bands are identified: A, B and C. Achieving the transport outcomes in Band A priorities will make the greatest contribution to delivering the spatial strategy for the Region. Addressing traffic growth and congestion are cited as being major issues for the Plan. Improving journey time reliability is also considered to be important. The A63 is detailed as being part of the strategic highway network for the region.

Townscape Policies

3.14.3.30 Planning policies exist to protect the character and appearance of townscapes with a high architectural quality or historic interest. The local plan has designated such a townscape in the locality of the A63 Castle Street: the Old Town Conservation Area. Planning policies give greater protection to the areas' character and appearance, for example, by controls over demolition. Encouragement is given to high standards of design particularly in the predominantly commercial conservation areas such as the Old Town, making them attractive places to live and work.

3.14.3.31 The Planning (Listed Buildings and Conservation Areas) Act 1990 requires local authorities to have regard to the fact that there is a conservation area when exercising any of their functions under the Planning Acts. Although a local designation, conservation areas may be of national importance and significant developments are referred to English Heritage.

3.14.3.32 Four local plan policies relate to the Old Town Conservation Area in particular. The policies affecting the listed buildings which contribute to the character and appearance of the townscape in the study corridor are discussed in Cultural Heritage Policies section in the Environmental Assessment Report (PF, 2008).

Ecology and Nature Conservation Policies

3.14.3.33 There is one site designated as a Site Nature Conservation by Kingston upon Hull in the study area. This is the southern section of the Holy Trinity Burial Ground which lies immediately adjacent to the proposed improvement scheme. In addition, the River Hull which lies immediately east of the study area is also designated as a Site Nature Conservation.

3.14.3.34 National Planning Guidance is provided by PPG9 (Nature Conservation, October 1994). It stresses the importance of early consultation with English Nature and the need for proper assessment and recording of ecological features that may be affected by development.

3.14.3.35 Whilst the linear nature of the green space on either side of the A63 in the study area has some value in terms of wildlife corridors, the potential value of it is limited by the fact that most of the tree and shrub species are ornamental.

Cultural Heritage Policies

3.14.3.36 Planning policies exist at all levels that seek to protect archaeological remains and features as well as listed buildings and conservation areas. The Local Plan Proposals Map identifies Ancient Monuments, Listed Buildings and Conservation Areas either within the study area or immediately adjacent.

3.14.3.37 National Planning Guidance is provided by PPG15 (Planning and the Historic Environment, September 1994) and PPG16 (Archaeology and Planning November 1990). Both stress the importance of early consultation with English Heritage and The County Council's Archaeological Officer, and the need for proper assessment and recording of historic and archaeological features that may be affected by development.

3.14.3.38 Planning Policy Guidance Note 16 (PPG 16) states that 'where planning authorities decide that the physical preservation in situ of archaeological remains is not justified in the circumstances of the case and that development resulting in the destruction of the archaeological remains should proceed, it would be entirely reasonable for the planning authority to satisfy itself before granting planning permission, that the developer has made appropriate and satisfactory provision for the excavation and recording of the remains. Such excavation and recording should be carried out before development commences, working to a brief prepared by the planning authority and taking advice from archaeological consultants.'

3.14.3.39 Town and Country Planning Act 1990 together with relevant Planning Policy Guidance Notes, allows Local Authorities to protect a range of archaeological remains. If a development threatens to destroy or damage some remains, the Authority can require appropriate investigation through a planning condition or legal agreement. Development Plans should include policies for the protection, enhancement and preservation of sites of archaeological interest, and of their settings. A mitigation strategy should be drawn up, in consultation with the Local Authority if any archaeological remains are identified prior to or during the development. Where the development proposals have the potential to cause adverse impact on archaeological sites, mitigation strategies should favour changing the layout of the development in order to avoid the impact (thereby ensuring the physical preservation of the site), as being preferable to securing in situ preservation; the detailed excavation and recording of a site (preservation by record) should be viewed only as the last resort, as it accepts the destruction of those parts of a site which are recorded in this way.

3.14.3.40 Planning (Listed Buildings and Conservation Area) Act 1990 protects any building with 'special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance.' Listed Buildings and structures are subject to regulations regarding their maintenance and preservation; any negative impacts from development, whether direct or indirect, can be subject to significant penalties.

3.14.3.41 The Kingston upon Hull City Council Local Plan (adopted May 2000) includes four archaeological policies, and six policies related to Listed Buildings, which are relevant to the current options.

3.14.3.42 It is clear that there are a number of archaeological sites which may potentially be affected by the proposed improvement scheme. However it is believed that the archaeological implications of the development could be accommodated by various watching briefs and recording exercises, under a standard PPG16 condition.

3.14.3.43 The presence of archaeological remains may only become apparent once development has commenced. PPG 16 states that that 'Where fresh archaeological discoveries are deemed by the Secretary of State, on English Heritage's advice, to be of national importance, in accordance with published criteria, the Secretary of State for National Heritage has the power to schedule the remains. In that event, developers would need to seek separate scheduled monument consent before they continue work. It is also open to the planning authority of the Secretary of State to revoke a planning permission if deemed necessary, in which case there is provision for compensation. In the majority of cases, however, it should prove possible for the parties to resolve their differences through voluntary discussion and for a satisfactory compromise to be reached.'

Other Issues

3.14.3.44 Ancient Monuments and Archaeological Areas Act 1979: This provides legislative protection for archaeological sites and monuments that have been identified as being of national importance. Although there are no Scheduled Ancient Monuments that would be affected by these options, nor is the Old Town Hull designated an Area of Archaeological Importance (AEI) under the provisions of this Act. However it is designated an AEI within the Local Plan.

3.14.3.45 Other national and local policies seek to control, avoid and mitigate air and water pollution, flooding and noise pollution, resulting from new development. At a National level these policies are included in PPG23 (Planning and Pollution Control, 1994), PPG24 (Planning and Noise, 1994) and PPG25 (Development and Flood Risk 2001). As such, noise, other forms of pollution and flooding constitute a material consideration when determining planning applications.

3.14.3.46 There are no watercourses within the study area likely to be affected by the works. However the study area lies within the flood plain of the Humber Estuary. The issue of flooding is particularly relevant given the depth of cuttings being proposed as part of the grade separated junction at Mytongate.

3.14.3.47 In respect of noise pollution, there are a number of properties in the area where the level of noise experienced is likely to change as a result of the road improvement.

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3.14.3.48 The impact of the road proposals on other Government policies has been considered, in order to assess the effect on overall policy integration within Government. A review has been carried out to identify whether the strategy or plan as a whole either (a) contributes to and is consistent with, (b) has no overall contribution or (c) is inconsistent with other Government policies beyond transport.

3.14.3.49 Government policies that are either benefited or hindered are listed as part of the worksheet for this impact.

4 PLANNING FACTORS

4.1 Option Constraints

4.1.1 Constraints impacting on the scheme options are that:

- The scheme will require the approval from Yorkshire and Humberside Transport Board;
- Castle Street lies within an Air Quality Management Area in Hull and as such has more stringent requirements with regards to Air Quality Assessments;
- There is extensive known archaeology along the route of Castle Street which will require extensive advance works to record significant features that will be lost upon completion of the scheme;
- Current advice form Network Operations (HA) is that two lane running in each direction on castle street will be maintained throughout the construction period;
- All the scheme options are to be online improvements,
- The limit of the scheme options extends only from Porters Street to Myton Swing Bridge;
- There is the problem of local access roads which open on to the A63;
- Demolition of Grade II listed Earl de Gray PH and Castle Buildings.

4.2 Strategy

4.2.1 The city of Kingston upon Hull forms part of the administrative County of Humberside. In accordance with the Town and Country Planning Act 1971, a Structure Plan was published in 1979 which covered the strategic planning policy for the area. The entire contents of the 1979 Plan were superseded by the Humberside Structure Plan (1998) and its Alteration No. 1 (March 1991).

4.2.2 There are six broad aims to the present Structure Plan which are:

- To encourage economic activity and seek the creation of new jobs;
- To meet Humberside's housing needs, giving people a choice of where to live within the existing settlement pattern;

- To make the best use of existing resources and encourage investment where it is most needed;
- To secure a coordinated transport system which will serve industry, commerce and the social needs of the county;
- To ensure that as many people as possible have access to a wide range of services, including shopping, leisure and community facilities;
- To make the best use of Humberside's environment taking account of the need to conserve and enhance it.

4.2.3 The Humberside Structure Plan recommends that transport policies give priority to the resolution of problems of accessibility, safety and the environment. The plan stresses the importance of improving access to major areas of new development and regeneration.

4.2.4 The structure Plan provides broad frame work for land and transport throughout the County over a ten to fifteen year period. It does not refer to specific sites. That is the job of local plans, which are normally prepared by the District Councils and which should be in line with the Structure Plan.

4.2.5 The District Councils also have a major role in putting the Plan in to effect as they decide almost all the applications for planning permission. In doing so they should seek to achieve the Structure Plan's general objectives.

4.3 City Centre Plan

4.3.1 Local Plans are produced within the ambit of the County Plan to promote economic development and to improve the quality of life for the residents of the area.

4.3.2 Hull City Council's Department of Planning and Design have provided extracts form their draft Transportation and City Centre Positions Statements which have been put forward to be included within the City Centre Plan. Relevant paragraphs highlight the existing problems along Castle Street for pedestrians and road users, and outline the Departments of Transport's proposed Improvement Scheme as presented at Public Consultation. They reiterate that their long term objective would be the provision of a tunnel, to extend from Commercial Road, beneath and beyond the river Hull.

5 DESCRIPTION OF ROUTE OPTIONS

5.1 General

5.1.1 On 9 July 2003, the Secretary of State made a formal response to the Hull Multi-Modal Study. He accepted the study's recommendation that improved access through Hull to the port should be provided by on line improvements to the A63. The secretary of state asked the Highways Agency (HA) to develop further on line improvement schemes for the A63 which relieve congestion on the A63, improve access to the port and reduce severance between the city centre and the waterfront.

5.1.2 Following the Secretary of States announcement the HA have developed six scheme options which have been assessed in accordance with current guidelines.

5.1.3 The six scheme options developed consist of three Underground and three Overground Options. These are listed as follows and briefly described in the subsequent paragraphs

- Option 1: Underground Base
- Option 2: Underground Landbridge
- Option 3: Underground Cut and Cover Tunnel
- Option 4: Overground Base
- Option 5: Overground Equivalent Landbridge
- Option 6: Extended Viaduct Option

5.2 Proposed Scheme

5.2.1 Option 1: Underground Base Option

5.2.1.1 Drawing No. W11189/09/01 Rev E titled "Underground Base Option" shows the scheme proposals and is included in Appendix A.

5.2.1.2 This option consists of lowering the level of the existing A63 in the vicinity of Mytongate Junction (Ferensway/Commercial Road) by approximately 6.8m and raising and carrying Ferensway and Commercial Road across the A63 on a new overbridge. Both Ferensway and Commercial Road, along with the eastbound entry & exit and westbound entry & exit slip roads, would be raised by approximately 0.7m in the vicinity of the junction.

5.2.1.3 Between Mytongate Junction and Market Place, the eastbound carriageway would be widened to three lanes, with the nearside lane being marked for local weaving traffic. The westbound carriageway would remain at two lanes.

5.2.1.4 The realigned A63 and the westbound exit slip road to Commercial Road would pass through the northern section of the Trinity Burial Ground, significantly affecting the Burial Ground.

5.2.1.5 Proceeding eastwards from Mytongate Junction the A63 would tie back in to existing ground level where a pedestrian footbridge would be provided directly in front of Prince's Quay Shopping Centre and the Humber Dock Marina. This bridge would be approximately 7.0m above existing road level and would allow pedestrians to cross unobstructed above Castle Street, eliminating the current pedestrian/vehicle conflict.

5.2.1.6 Currently the junction at Market Place is signal controlled and following previous improvement works the gap in the central reserve was closed. Under these newest proposals the signals are to remain and the restricted vehicular movements would be as existing:

- No westbound right turns from the A63 onto Market Place
- No eastbound right turns out of Queen Street onto the A63
- No straight through traffic between Market Place and Queen Street
- No eastbound right turn from the A63 onto Queen Street
- No westbound right turns onto the A63 from Market Place

5.2.1.7 In order to construct the eastbound entry slip road, the local weaving lane eastbound and to improve the horizontal alignment of the A63 to current standards, properties would require demolition. These are the Castle Buildings and the former Earl de Grey Public House, both are grade II listed buildings.

5.2.1.8 It would be necessary to close the access to the Holiday Inn Hotel from the A63. On safety grounds it would also be necessary to close Spruce Road and Waverley Street as they would open out onto or very close to the proposed westbound entry slip road. Alternative access will be provided for the Hotel from Commercial Road and access to Spruce Road/Waverley Street will be via a new road off St James Square/St James Street.

5.2.1.9 In addition to the pedestrian bridge opposite Prince's Quay and to improve pedestrian facilities, footbridges are to be provided near Porter Street and at Market Place. Replacement footways would also be provided along the scheme with a replacement cycleway to the north of the A63.

5.2.2 Option 2: Underground Landbridge

5.2.2.1 Drawing No W11189/09/02 Rev D titled "Underground Landbridge Option" shows the scheme proposals and is included in Appendix A.

5.2.2.2 This option consists of lowering the level of the existing A63 in the vicinity of Mytongate Junction (Ferensway/Commercial Road) by approximately 6.8m and raising and carrying Ferensway and Commercial Road across the A63 on a new overbridge. Both Ferensway and Commercial Road, along with the eastbound entry & exit and westbound entry & exit slip roads, would be raised by approximately 0.7m in the vicinity of the junction.

5.2.2.3 Between Mytongate Junction and Market Place, the eastbound carriageway would be widened to three lanes, with the nearside lane being marked for local weaving traffic. The westbound carriageway would remain at two lanes. The realigned A63 and the westbound exit slip road to Commercial Road would pass through the northern section of the Trinity Burial Ground. These proposals would significantly affect the Burial Ground.

5.2.2.4 Proceeding eastwards from Mytongate Junction the A63 continues at a lower level to pass under an approximately 25 metre wide Pedestrian Landbridge directly in front of Prince's Quay Shopping Centre and the Humber Dock Marina. This bridge would be approximately 3.5m above existing road level and would allow pedestrians to cross unobstructed above Castle Street, eliminating the current pedestrian/vehicle conflict.

After passing under the bridge the new vertical alignment would rise until it reached existing level to the west of Prince's Dock Street.

5.2.2.5 Currently the junction at Market Place is signal controlled and following previous improvement works the gap in the central reserve was closed. Under these newest proposals the signals are to be remain and the restricted vehicular movements would be as existing:

- No westbound right turns from the A63 onto Market Place
- No eastbound right turns out of Queen Street onto the A63
- No straight through traffic between Market Place and Queen Street
- No eastbound right turn from the A63 onto Queen Street
- No westbound right turns onto the A63 from Market Place

5.2.2.6 In order to construct the east bound entry and west bound exit slip roads, the local weaving lane eastbound and to improve the horizontal alignment of the A63 to current standards, properties would require demolition. To the north of Castle Street these comprise the Castle Buildings and the former Earl de Grey Public House, both of which are grade II listed. To the south these included the hotel and three office blocks which form the northern section of Marina Court.

5.2.2.7 It would be necessary to close Humber Dock Street and the access to the Holiday Inn Hotel from the A63. On safety grounds it would also be necessary to close Spruce Road and Waverley Street as they would open out onto or very close to the proposed entry slip road. Alternative access will be provided for the Hotel from Commercial Road and access to Spruce Road/Waverley Street will be via a new road off St James Square/St James Street. Access to Humber Dock Street will be maintained via Queen Street and other local routes.

5.2.2.8 In addition to the Pedestrian Landbridge and to improve pedestrian facilities, footbridges would be provided near Porter Street and at Market Place. Replacement footways would also be provided along the scheme with a replacement cycleway to the north of the A63.

5.2.3 Option 3: Cut and Cover Tunnel

5.2.3.1 Drawing Nos. W11189/09/01/03 Rev C titled “Underground Cut and Cover Tunnel” shows the scheme proposals, and is included in Appendix A

5.2.3.2 This option consists of lowering the level of the existing A63 in the vicinity of Mytongate Junction (Ferensway/Commercial Road) by approximately 6.8m and raising and carrying Ferensway and Commercial Road across the A63 on a new overbridge. Both Ferensway and Commercial Road, along with the eastbound exit and westbound entry slip roads, would be raised by approximately 0.7m in the vicinity of the junction.

5.2.3.3 The A63 would continue at low level before entering a tunnel between Myton Street and Finkle Street, and then rising to tie into existing levels at the approach to the Myton Swing Bridge. The horizontal and vertical alignment would be designed to comply with current standards.

5.2.3.4 While the A63 remains as a dual 2 lane all purpose carriageway, a single carriageway Local Access Road is proposed to run above the tunnel, at existing ground level, from Ferensway to Market Place. Except for Spruce Road & Waverley Street, local roads which at present connect to the A63 would be served by the new access road connecting to the A63 by means of new slip roads west of Ferensway and taper junctions east of Market Place. Access to Prince’s Quay would be maintained on the Myton Street one way system via a left and right turn from the new Local Access Road. For safety reasons, Spruce Road & Waverley Street would be closed, alternative access will be provided via a new road off St James Square/St James Street.

5.2.3.5 The Market Place/Queen Street Junction with the A63 will be completely closed except for the eastbound entry onto the A63 and the westbound exit onto Queen Street. Westbound traffic from Market Place would use the new local access road, and westbound traffic from Queen Street would be diverted through other local roads onto Humber Dock Street which provides direct access onto the Local Access Road.

5.2.3.6 In order to construct the tunnel and local access road, properties would require demolition. These comprise the Castle Buildings and the former Earl de Grey Public

House, both of which are grade II listed and property to the north of Castle Street between Dagger Lane and Vicar Lane (property nos. 16-64 and 65).

5.2.3.7 The realigned A63 would pass through the northern section of the Trinity Burial Ground. These proposals would significantly affect the Burial Ground.

5.2.3.8 To improve pedestrian facilities across the A63 a footbridge would be provided near Porter Street. Although pedestrians would be segregated from vehicular traffic on the A63 they would still have to cross the Local Access Road in order to pass from north to south, this would be achieved by crossing at designated crossing points. Replacement footways would also be provided along the scheme with a replacement cycleway to the north of the A63 and Local Access Road.

5.2.4 Option 4: Overground Base

5.2.4.1 Drawing Nos. W11189/09/01/11 Rev C titled “Overground Base Option” shows the scheme proposals, and is included in Appendix A.

5.2.4.2 This option raises the level of the existing A63 in the vicinity of Mytongate Junction (Ferensway/Commercial Road) by approximately 7.8m with Ferensway and Commercial Road remaining at grade and passing beneath the A63 bridge.

5.2.4.3 Between Mytongate Junction and Market Place, the eastbound carriageway would be widened to three lanes, with the nearside lane being marked for local weaving traffic. The westbound carriageway would remain at two lanes.

5.2.4.4 The realigned A63 and the westbound exit slip road to Commercial Road would pass over/through the northern section of the Trinity Burial Ground, significantly affecting the Burial Ground.

5.2.4.5 Proceeding eastwards from Mytongate Junction the A63 would tie back in to existing ground level where a pedestrian footbridge would be provided directly in front of Prince’s Quay Shopping Centre and the Humber Dock Marina. This bridge would be approximately 7.0m above existing road level and would allow pedestrians to cross unobstructed above Castle Street, eliminating the current pedestrian/vehicle conflict.

5.2.4.6 Currently the junction at Market Place is signal controlled and following previous improvement works the gap in the central reserve was closed. Under these newest proposals the signals are to be remain and the restricted vehicular movements would be as existing:

- No westbound right turns from the A63 onto Market Place
- No eastbound right turns out of Queen Street onto the A63
- No straight through traffic between Market Place and Queen Street
- No eastbound right turn from the A63 onto Queen Street
- No westbound right turns onto the A63 from Market Place

5.2.4.7 In order to construct the slip roads, properties would require demolition. These are the Castle Buildings and the former Earl de Grey Public House, both are grade II listed buildings.

5.2.4.8 It would be necessary to close the access to the Holiday Inn Hotel from the A63. On safety grounds it would also be necessary to close Spruce Road and Waverley Street as they would open out onto or very close to the proposed entry slip road. Alternative access will be provided for the Hotel from Commercial Road and access to Spruce Road/Waverley Street will be via a new road off St James Square/St James Street.

5.2.4.9 In addition to the pedestrian bridge opposite Prince's Quay and to improve pedestrian facilities, footbridges would be provided near Porter Street and at Market Place. Replacement footways would also be provided along the scheme with a replacement cycleway to the north of the A63.

5.2.5 Option 5: Overground Landbridge Equivalent

5.2.5.1 Drawing Nos W11189/09/12 Rev C titled "Overground Landbridge Equivalent Option" shows the scheme proposals and is included in Appendix A.

5.2.5.2 This option consists of raising the level of the existing A63 in the vicinity of Mytongate Junction (Ferensway/Commercial Road) by approximately 7.8m with

Ferensway and Commercial Road remaining at grade and passing beneath the new A63 bridge.

5.2.5.3 The realigned A63 and the westbound exit slip road to Commercial Road would pass over/through the northern section of the Trinity Burial Ground. These proposals would significantly affect the Burial Ground.

5.2.5.4 Between Mytongate Junction and Market Place, the eastbound carriageway would be widened to three lanes, with the nearside lane being marked for local weaving traffic. The westbound carriageway would remain at two lanes.

5.2.5.5 Proceeding eastwards from Mytongate Junction the A63 continues at a raised level to pass over an approximately 25 metre wide pedestrian walkway approximately 1.0m below existing ground level directly in front of Prince's Quay Shopping Centre and the Humber Dock Marina. The A63 will be raised approximately 4.1m above existing road level and would allow pedestrians to cross unobstructed below the A63 Castle Street, eliminating the current pedestrian/vehicle conflict. After passing over the landbridge the new vertical alignment would fall until it reached existing ground level in the location of Prince's Dock Street.

5.2.5.6 Currently the junction at Market Place is signal controlled and following previous improvement works the gap in the central reserve was closed. Under these newest proposals the signals are to be remain and the restricted vehicular movements would be as existing:

- No westbound right turns from the A63 onto Market Place
- No eastbound right turns out of Queen Street onto the A63
- No straight through traffic between Market Place and Queen Street
- No eastbound right turn from the A63 onto Queen Street
- No westbound right turns onto the A63 from Market Place

5.2.5.7 In order to construct the sliproad, the viaduct and to improve the horizontal alignment of the A63 to current standards, properties would require demolition. To the north of the A63 these include the Castle Buildings and the former Earl de Grey Public House, both are grade II listed. To the south of the A63 this includes the hotel.

5.2.5.8 It would be necessary to close Humber Dock Street and the access to the Holiday Inn Hotel from the A63. On safety grounds it would also be necessary to close Spruce Road and Waverley Street as they would open out onto or very close to the proposed entry slip road. Alternative access will be provided for the Hotel from Commercial Road and access to Spruce Road/Waverley Street will be via a new road off St James Square/St James Street. Access to Humber Dock Street will be maintained via Queen Street and other local routes.

5.2.5.9 In addition to the pedestrian walkway and to improve pedestrian facilities, footbridges would be provided near Porter Street and at Market Place. Replacement footways would also be provided along the scheme with a replacement cycleway to the north of the A63.

5.2.6 Option 6: Overground Extended Viaduct

5.2.6.1 Drawing Nos W11189/09/01/13 Rev C R1 titled “Overground Full Viaduct Option” shows the scheme proposals, and is included in Appendix A.

5.2.6.2 This option consists of raising the level of the existing A63 in the vicinity of Mytongate Junction (Ferensway/Commercial Road) by approximately 9.9m creating a viaduct with Ferensway and Commercial Road remaining at grade and passing beneath the new A63 bridge.

5.2.6.3 The A63 would continue on the viaduct at this elevated level to around Vicar Lane, falling to tie into existing levels at the approach to the Myton Swing Bridge. The horizontal and vertical alignment would be designed to comply with current standards.

5.2.6.4 While the A63 remains as a dual carriageway, a single carriageway Local Access Road is proposed to run below the viaduct, at existing ground level, from Ferensway to Market Place. Except for Spruce Road & Waverley Street, local roads which at present connect to the A63 would be served by the new access road connecting to the A63 by means of slip roads west of Ferensway and taper junctions east of Market Place. Access to Prince’s Quay would be maintained on the Myton Street one way system via a left and right turn from the new Local Access Road. For safety reasons, Spruce Road & Waverley Street would be closed, alternative access will be provided via a new road off St James Square/St James Street

5.2.6.5 The Market Place/Queen Street Junction with the A63 will be completely closed except for the eastbound entry onto the A63 and the westbound exit onto Queen Street. Westbound traffic from Market Place would use the new local access road, and westbound traffic from Queen Street would be diverted through other local roads onto Humber Dock Street which provides direct access onto the Local Access Road.

5.2.6.6 In order to construct the viaduct properties would require demolition. To the north of the A63 these include the Castle Buildings and the former Earl de Grey Public House, both are grade II listed and property to the north of Castle Street between Dagger Lane and Vicar Lane (property nos 16-64 and 65). To the south of the A63 these include three office blocks which form the northern section of Marina Court and existing temporary buildings and car park on the corner of Castle Street and Queen Street. The realigned A63 also passes through a corner of the Trinity Burial Ground.

5.2.6.7 To improve pedestrian facilities across the A63 a footbridge would be provided near Porter Street. Although pedestrians would be segregated from vehicular traffic on the A63 they would still have to cross the Local Access Road in order to pass from north to south, this would be achieved by crossing at designated points. Replacement footways would also be provided along the scheme with a replacement cycleway to the north of the A63 and Local Access Road.

6 TRAFFIC ANALYSIS

6.1 Traffic Data

6.1.1 PF updated and recalibrated the TRIPS model, developed as part of the Hull Multi-Modal Study (HUMMS), in 2004 as part of a previous commission. Transport surveys were carried out to provide and input to the updating process, details can be found the Survey Report produced in December 2004 (ref. W10021/16/01). A Local Model Validation Report was produced in December 2004 (ref. W10021/16/02) detailing the updates. The A63 Castle Street TRIPS model includes the AM, Interpeak and PM peak periods, and has a 2004 base year. The model is multimodal in nature, although the public transport element of the model was not updated in 2004.

6.1.2 For this commission, it has been agreed with the HA's Traffic, Appraisal, Modelling and Economics (TAME) department, that the model updated in 2004 is an appropriate tool for providing traffic forecasts for scheme options up to public consultation. A multi-modal SATURN/TRIPS model is currently under development, with an extensive survey programme being undertaken in Autumn 2008, to take the scheme assessment forward post public consultation.

6.2 Traffic Analysis

6.2.1 In order to carry out the economic, environmental and operational assessments of the six scheme options, traffic forecasts have been produced for the six scheme options for the appropriate opening and design years as presented in Table 5.1. Future year traffic flows have been calculated from the 2004 base year matrices (developed by PF in 2004) for the TRIPS model.

Table 6.1. Scheme opening and design years.

Scheme Option	Opening Year	Design Year
Option 1: Underground Base	2018	2033
Option 2: Underground Landbridge	2018	2033
Option 3: Underground Cut and Cover Tunnel	2020	2035
Option 4: Overground Base	2017	2032
Option 5: Overground Landbridge Equivalent	2017	2032
Option 6: Overground Extended Viaduct	2018	2033

6.2.2 Traffic growth factors for the scenario years will take account of three main effects:

- TEMPRO growth for cars taking into account local growth variations
- National Transport Model (NTM) growth for other vehicle types
- Strategic Development Areas (SDA) development growth focussed in specific areas of Hull.

6.2.3 Paragraph 5.28 of the TEMPRO Guidance Note suggests that an appropriate allowance should be used to compensate for economic uncertainty. The guidance suggests a range about the central forecast of ± 2.5% for forecasts one year ahead, rising to ± 15% for forecasts 36 years ahead.

6.2.4 The following two equations have been applied, in accordance with the TEMPRO guidance notes, to produce 'Optimistic' and 'Pessimistic' growth scenarios:

$$GrowthFactor_{2024}^{HighLevel} = GrowthFactor_{2024}^{CentralLevel} * \left(\sqrt{N} * +2.5\%\right)$$

Equation 3.2

$$GrowthFactor_{2024}^{LowLevel} = GrowthFactor_{2024}^{CentralLevel} * \left(\sqrt{N} * -2.5\%\right)$$

Equation 3.3

where,

N is the number of years (Future Year (2024)- Base Year (2004)).

6.2.5 The Base or Do Nothing (DN) networks comprise the highway networks as they stood in 2004, the year in which Pell Frischmann undertook the TRIPS model updates.

6.2.6 The Do Minimum (DM) network comprises the highway as it was in 2004, with the exception of the Market Place improvement. This scheme was opened to traffic late in 2006 and comprises the banning of right turns from Castle Street into Market Place and Queen Street, and the provision of a pedestrian crossing across Castle Street.

6.2.7 The future year scenario matrices have been assigned to the Do Minimum (DM) and the six Do Something (DS) option networks to create forecast year assignments. Full details of the forecasting methodology and the forecasts can be found in the Forecasting Report produced in September 2008 (ref. W11189/VDT/03).

6.2.8 In order to understand the implications of development aspirations within the centre of Hull on the three scheme options, sensitivity tests have been carried out, and forecasts produced for a series of development based assumptions.

6.2.9 The City Centre Masterplan is the overall vision of Hull's Urban Regeneration Company CityBuild, in guiding inward investment into Hull City Centre. Citybuild was established by Kingston upon Hull City Council, Yorkshire Forward and English Partnerships to work with the private sector in facilitating the physical regeneration of the city centre and west Hull.

6.2.10 The plan sets out seven strategic objectives, which are expected to be achieved by 2016. These objectives are as follows:

- Create a unified and compact City Centre
- Re-Unite the City Centre with its River Humber waterfront
- Create a concentration of prime offices
- Provide for a sustainable City Centre population
- Create a strong retail circuit and provide for the fourth retail anchor needed to achieve it
- Create a lively River Hull corridor within the compact City Centre
- Bold gestures – in new architecture and public realm, art and facilities – to lift the heart, transform the image and rejuvenate the economy

6.2.11 In delivering these objectives the Masterplan identifies 5 Strategic Development Areas (SDAs) for regeneration within the city centre area and these are listed below. An aerial photograph showing the location of these areas can be seen in Figure 6.1.

- Albion Square
- Quay West
- Humber Quays
- Fruit Market
- East Bank

Figure 6.1 – Aerial Photograph of Strategic Development Areas

6.2.12 In 2005 Hull City Council produced a series of documents reviewing its own planning policies, in support of the City Centre Masterplan. These were produced under the heading "City Centre - Area Action Plan" (AAP) and make up the spatial planning strategy for Hull.

6.2.13 The AAP highlighted the need for improvements to Castle Street both in the short term and long term in order to facilitate the regeneration of the city centre:

"Castle Street is at or near to capacity along most of its length. The dilemma is that the city centre very urgently needs to regenerate – and in doing so will unavoidably create more traffic".

"The short term measures need to include solutions to the severance caused by Castle Street that better balance the needs of the port and east Hull with more efficient, attractive and safer pedestrian crossings of Castle Street."

"The regeneration of the waterfront, and in turn of the City Centre as a whole, is not achievable without the inclusion of the waterfront and the improved connections that will allow the whole of the city to function coherently, safely and competitively".

6.2.14 The AAP therefore suggests that without improvements to Castle Street the city centre will not be able to regenerate to its full potential.

6.2.15 In order to implement a quanta of development agreed with the Highways Agency, Hull City Council intends to implement a series of short term measures to mitigate against development in advance of the implementation of the long term scheme. The improvements consist of the following:

- Improvements to the at-grade signal controlled pedestrian crossing facilities on Castle Street,
- Provision of an additional lane in each direction on the A63 through the Mytongate junction,
- Minor capacity improvements at the Garrison Road roundabout.

6.2.16 Traffic generation estimates for the five SDAs has been provided by Hull City Council. The forecast generated traffic has been applied to the base year light vehicle matrices, and the matrices then factored to TEMPRO matrix totals, resulting in 'skewed' growth, but matrices with the same total trip numbers as the mainstream forecasts. Matrices including development traffic have been developed for opening and design years.

6.2.17 The do minimum network for the sensitivity tests has been amended to include the ‘short term’ measures that would be implemented prior to the opening year of the A63 Castle Street scheme. The do something networks for each option include the short term measures where they are not replaced by the A63 Castle Street scheme.

6.2.18 The matrices including the development growth were assigned to the development related networks for the do minimum and the three scheme options, for the most likely growth scenario. The sensitivity test forecasts are illustrated in the Forecasting Report.

6.3 Road Layout and Standards

6.3.1 Design Elements and Assumptions

6.3.1.1 The A63 mainline has been designed in accordance with standards set out in TD9/93 with a speed limit of 70kph and identified as a primary road network, in the area of the works, and the slip roads designed to a speed of 60kph.

6.3.1.2 The A63 was checked against the HA’s National Trunk Road Network – Heavy and High Loads, it was found that no part of the Heavy and High Load network ran along the A63. Though Ferensway/Beverley Road is indicated as forming part of the Heavy Load Network.

6.3.1.3 Local widening on the mainline has been applied to meet visibility standards where the horizontal curves are required.

6.3.1.4 Standards for Road Restraint Systems (RRS) are currently under review (June 2007). The guidance that remains is ambiguous but suggests it is the designer’s choice whether to use RRS on sub 50 mph roads. However, it does recommend they be used when high volumes of traffic are present.

6.3.1.5 Interim Advice Note IAN44/05 Road Restraint Systems states, all new contracts must comply with the Highways Agency’s Road Restraint System list. This means that the system suggested in the TPI entry report (Nov 2004) is now invalid, as it was designed in line with Non-Proprietary Safety Barrier Systems (NPSBS). The new suggested RRS will aim to meet the same standard as of that suggested in the TPI entry report, being a minimum of N2W2 in the central reserve.

6.3.1.6 The ultimate conclusion was for the use of Vertical Concrete Barriers with the corresponding VCB plinths for lighting columns.

6.3.1.7 It has been assumed standards should be maintained where possible and previously designed, despite the changes that have arisen and the detrimental affect these will have upon the listed buildings and Holiday Inn road.

6.3.1.8 Mytongate junction slip roads have been designed in accordance with TD22/06, and the market place junction layout has been based on guidance from TD42/95 which covers major/minor junctions since it is not a grade separated junction.

6.3.1.9 Diverge tapers were identified for use at Market Place but merge tapers are generally only used for 85 kph roads. However, merge tapers have been used where possible to allow traffic to enter the carriageway at a safer speed.

6.3.1.10 The design/assessment has been carried out in accordance with the Design Manual for Road and Bridgeworks, Advice Notes and British Standards. Primary design parameters and methods are taken from TD9/93 for the trunk road and where appropriate other sources, mainly Design Bulletin 32 – Residential Roads and Footpaths for the LAR's. A formal Hull City Design Guide document was not available at the time of this work being carried out, and DB32 was in the process of being superseded by the new 'Manual For Streets'.

6.3.1.11 DB32 and TD42 were used for the minor roads design, though in some cases the design retains the existing parameters since they must have been fit for purpose.

6.3.1.12 The kerbs along the central reserve and the lane layout are to be adjusted at Myton Swing Bridge; Pell Frischmann's structural engineers have indicated that this is possible. Although the verge side kerblines had to be tied in to existing before the bridge span joint, otherwise structural works to widen the bridge would be required.

6.3.1.13 It was assumed that the requirements in the Design Manuals for Roads and Bridges are not the most appropriate for local access roads and that a best practice and tested approach can be taken.

6.3.1.14 The following design standards have been used and referenced;

- TD9/93 – Highway Link Design
- TD22/06 – Layout of Grade Separated Junction
- DB32 – Residential Roads and Footpaths
- TD42/95 – Geometric Design of Major/Minority Priority Junctions
- TD41/95 – Vehicular Access to All Purpose Trunk Roads
- TD27/05 – Cross Sections and Headrooms

6.3.1.15 Scheme Standards;

- Dual 2 lane carriageway at 40mph (as existing), therefore design speed equivalent to 70kph
- Mainline carriageway desirable max gradient of 4%
- All other roads including Local Access Road (Tunnel option only) taken as 30mph, therefore design speed equivalent to 60kph
- Minor road desirable max gradient of 6% (steeper than 8% is considered a departure).
- Refer to Figure 1 (overleaf) for more extracted elements of Table 3 - TD 9/93.

DESIGN SPEED kph	70kph	60kph
STOPPING SIGHT DISTANCE (m)		
Desirable minimum	120	90
One step below desirable minimum	90	70
HORIZONTAL CURVATURE (m)		
Minimum R without elimination of adverse camber and transitions	1020	720
Minimum R with superelevation of 2.5%	720	510
Minimum R with superelevation of 3.5%	510	360
Desirable Minimum R with superelevation of 5%	360	255
One step below Desirable Minimum R with superelevation of 7%	255	180
Two steps below Desirable Minimum R with superelevation of 7%	180	127
VERTICAL CURVATURE		
Desirable minimum crest K value	30	17
One step below Desirable minimum crest K value	17	20
Desirable minimum crest K value	20	13
Absolute minimum sag K value		

Figure 1 Design Speed Parameters

(Extracted elements from Table 3, TD 9/93)

6.3.2 Underground Base Scheme

6.3.2.1 On the 2004 Base Scheme Waverley Street was previously left open to access the A63 mainline, however it has now been closed due to safety concerns about its proximity to the slip road. Access to the properties it served shall now be via St James square as were designs W11189/09/02 Landbridge Scheme and W11189/09/03 Cut and Cover Tunnel Scheme.

6.3.2.2 Several road closures were proposed at the 2004 TPI Entry stage following the work under Task Order number 5. No changes to the 2004 work are recommended though an additional road closure, Waverley Street, is included. The following roads are to be closed:

- Waverley Street
- Spruce Road

- Waterhouse Lane, currently the existing road is closed by bollards. It is proposed to take the footpath across junction mouth.
- Humber Dock Street

6.3.2.3 On the under ground Base scheme there are three horizontal radii 520m, and 720m located at chainages 500 to 780 and 1020 to 1060 respectively that require increased superelevation in accordance with TD9/93 Table 3, these are not relaxations or departures.

6.3.3 Underground Landbridge

6.3.3.1 Several road closures were proposed at the 2004 TPI Entry stage following the work under Task Order number 5. No changes to the 2004 work are recommended though an additional road closure, Waverley Street, is included. The following roads are to be closed:

- Waverley Street
- Spruce Road
- Waterhouse Lane, currently the existing road is closed by bollards. It is proposed to take the footpath across junction mouth.
- Humber Dock Street
- Holiday Inn Hotel Access

6.3.3.2 On the under ground Landbridge scheme there are three horizontal radii 520m, and 720m located at chainages 500 to 780 and 1020 to 1060 respectively that require increased superelevation in accordance with TD9/93 Table 3, these are not relaxations or departures.

6.3.4 Cut and Cover

6.3.4.1 Road Closures were proposed at the TPI Entry stage which are still included for closing at this design review, we assume this is still acceptable. The following are to be closed:

- Waverley Street
- Spruce Road
- Access to Castle Street via Queen Street
- Access to Market Place via Castle Street
- Access to Commercial Road via Castle Street/Mytongate
- Waterhouse Lane, currently the existing road is closed by bollards. It is proposed to take the footpath across junction mouth.

6.3.4.2 It is assumed that there will be a minimum of 0.3m cover to finished road surface on top of the tunnel slab. The long section shows the central reserve profile only, which will differ at the edge of carriageway due to crossfall.

6.3.4.3 The tunnel portal placement locations are essential to the validity of the scheme. The requirements and key design points are as follows:-

- West Portal

  The LAR requires a 9m carriageway and a 2m footpath width (minimum) when passing the portal. The LAR alignment is located over the top of the tunnel which prevents a clash with the listed buildings nearby. These two elements limit the tunnel portal from being moved farther eastwards.

- East Portal

  This portal has the least amount of flexibility for its positioning, having to consider the LAR, adjacent buildings and the mainline (tunnels) carriageway rising back up to existing levels.

  The portal sits on a 6% gradient which is already in excess of the 4% desirable maximum (TD9/93: 4.1) so further increases had to be avoided. If the portal was moved eastwards this would increase the height by which it rises above existing ground. If it was moved West then the LAR would be affected, reducing the width and capacity to accommodate the traffic flows into and out of

Market Place. In its current position the portal raises the finished surface level above the existing ground, in this way the portal can be accommodated.

6.3.4.4 The local access road has been identified as a local distributor type. High traffic flows are expected.

6.3.4.5 DB32 and TD42 have been checked again as part of the design process for the local access road. Some existing elements were retained due to limited space, it is assumed these are suitable for current needs as they were for previous requirements.

6.3.4.6 The hardstanding central reserve in the LAR (2004 scheme) was removed at the start of the project as it is not the intention to promote a recreational use by pedestrians between two busy lanes of a carriageway. The LAR can now be crossed adequately by use of zebra crossings and the extra width recovered has been used to increase the pedestrian area to the south and provide ghost island turning facilities along the LAR.

6.3.4.7 The junction of the LAR with Myton Street shows two lanes, these are both entries onto the One-Way Myton Street. The use of a second access allows the traffic to flow freely when under other circumstances it might have been queuing.

6.3.4.8 There are three horizontal radii 520m, 600m, and 360m located at chainages 500 to 780, 1010 to 1060, and 1160 to 1270 respectively that require increased superelevation in accord with TD9/93 Table 3, these are not relaxations or departures.

6.3.5 Overground Base Scheme

6.3.5.1 On the 2004 Base Scheme Waverley Street was previously left open to access the A63 mainline, however it has now been closed due to safety concerns about its proximity to the slip road. Access to the properties it served shall now be via St James square as were designs W11189/09/02 Landbridge Scheme and W11189/09/03 Cut and Cover Tunnel Scheme.

6.3.5.2 Several road closures were proposed at the 2004 TPI Entry stage following the work under Task Order number 5. No changes to the 2004 work are recommended though an additional road closure, Waverley Street, is included. The following roads are to be closed:

- Waverley Street
- Spruce Road
- Waterhouse Lane, currently the existing road is closed by bollards. It is proposed to take the footpath across junction mouth.
- Humber Dock Street

6.3.5.3 On the over ground Base scheme there are three horizontal radii 520m, and 720m located at chainages 500 to 780 and 1020 to 1060 respectively that require increased superelevation in accordance with TD9/93 Table 3, these are not relaxations or departures.

6.3.6 Overground Landbridge Equivalent

6.3.6.1 Several road closures were proposed at the 2004 TPI Entry stage following the work under Task Order number 5. No changes to the 2004 work are recommended though an additional road closure, Waverley Street, is included. The following roads are to be closed:

- Waverley Street
- Spruce Road
- Waterhouse Lane, currently the existing road is closed by bollards. It is proposed to take the footpath across the junction mouth.
- Humber Dock Street
- Holiday Inn Hotel Access

6.3.6.2 On the over ground Landbridge scheme there are three horizontal radii 520m, and 720m located at chainages 500 to 780 and 1020 to 1060 respectively that require increased superelevation in accordance with TD9/93 Table 3, these are not relaxations or departures.

6.3.7 Overground Extended Viaduct

6.3.7.1 Road Closures were proposed at the TPI Entry stage which is still included for closing at this design review; we assume this is still acceptable. The following are to be closed:

- Waverley Street
- Spruce Road
- Access to Castle Street via Queen Street
- Access to Market Place via Castle Street
- Access to Commercial Road via Castle Street/Mytongate
- Waterhouse Lane, currently the existing road is closed by bollards. It is proposed to take the footpath across junction mouth.

6.3.7.2 The viaduct portal placement locations are essential to the validity of the scheme. The requirements and key design points are as follows:-

- West Portal

  The LAR requires a 9m carriageway and a 2m footpath width (minimum) when passing the portal. The LAR alignment is located over the top of the tunnel which prevents a clash with the listed buildings nearby. These two elements limit the tunnel portal from being moved farther eastwards.

- East Portal

  This portal has the least amount of flexibility for its positioning, having to consider the LAR, adjacent buildings and the mainline (tunnels) carriageway rising back up to existing levels.

  The portal sits on a 6% gradient which is already in excess of the 4% desirable maximum (TD9/93: 4.1) so further increases had to be avoided. If the portal was moved eastwards this would increase the height by which it rises above existing ground. If it was moved West then the LAR would be affected, reducing the width and capacity to accommodate the traffic flows into and out of Market Place. In its current position the portal raises the finished surface level above the existing ground, in this way the portal can be accommodated.

6.3.7.3 The local access road has been identified as a local distributor type. High traffic flows are expected.

6.3.7.4 DB32 and TD42 have been checked again as part of the design process for the local access road. Some existing elements were retained due to limited space; it is assumed these are suitable for current needs as they were for previous requirements.

6.3.7.5 The hardstanding central reserve in the LAR (2004 scheme) was removed at the start of the project as it is not the intention to promote a recreational use by pedestrians between two busy lanes of a carriageway. The LAR can now be crossed adequately by use of zebra crossings and the extra width recovered has been used to increase the pedestrian area to the south and provide ghost island turning facilities along the LAR.

6.3.7.6 The junction of the LAR with Myton Street shows two lanes, these are both entries onto the One-Way Myton Street. The use of a second access allows the traffic to flow freely when under other circumstances it might have been queuing.

6.3.7.7 There are three horizontal radii 520m, 600m, and 360m located at chainages 500 to 780, 1010 to 1060, and 1160 to 1270 respectively that require increased superelevation in accord with TD9/93 Table 3, these are not relaxations or departures.).

6.4 Conclusions

6.4.1 Traffic forecasts have utilised the 2004 base matrices and taken account of the main growth effects for the study area including TEMPRO and NTM forecasts to produce the most likely traffic, pessimistic and optimistic forecasts for the peak hours and AADT using the TRIPS models.

6.4.2 Traffic forecasts were created a number of years; 2017, 2018, 2020, 2032, 2033 and 2035 representing different scheme opening years and design years. Additional scenarios were created testing for lower and higher traffic growth (pessimistic and optimistic respectively).

6.4.3 Overall it is considered that the assumptions adopted for traffic provided a robust case in the updating of the forecasts, to represent the likely conditions at A63 Castle Street in the future year scenarios.

7 ECONOMIC ASSESSMENT

7.1 Application of TUBA/COBA

7.1.1 The various aspects of the economic assessment have been undertaken using a combination of counts conducted in 2007 and forecast traffic flows calculated in 2007 from the A63 TRIPS model for the schemes which was updated and revalidated in 2004. The overall benefits of the improvement scheme and the results have been presented in the relevant WebTAG worksheets. The assessment compares the benefits and costs of each of the six scheme options against the Do Minimum scenario. The benefits include journey time benefits and vehicle operating costs, accident benefits attributable to the scheme, and delays and accidents during construction and maintenance. The scheme costs include construction, land, preparation and supervision costs, risk, optimism bias (in accordance with the 2003 Green Book guidance), and compensation costs. The updated schemes have been modelled using the A63 TRIPS model and forecasts produced for the opening and design years.

7.1.2 This assessment is based on 2002 prices and values and is a 60 year appraisal, with a 3.5% discount rate reducing to 3% after 30 years and is on based on the 2003 Green Book guidance. The six scheme options opening years are Cut and Cover – 2020, underground landbridge – 2018, Underground base scheme – 2018. Full details of the economic assessment can be found in the Economic Assessment Report produced in September 2008, ref. W11189/VDT/04.

7.2 Networks and Printouts

7.2.1 Transport User Benefits

7.2.1.1 The journey time benefits and vehicle operating costs have been calculated using the computer programme TUBA (Transport Users Benefit Appraisal) in accordance with the WebTAG Guidance.

7.2.1.2 TUBA appraisals have been carried out for each of the six schemes for the most likely growth scenario. The outputs are in the form of Transport Economic Efficiency (TEE) tables.

7.2.1.3 TUBA requires as input, a standard economics file which includes the latest transport economics values as quoted in the Transport Economics Note (TEN), trip and skim matrices from the TRIPS model, and a text input file detailing all aspects of the scheme including costs, input matrices, and annualisation factors.

7.2.1.4 Trip matrices, and distance and cost skim matrices for the opening and design years of the scheme have been obtained from the TRIPS model for the most likely, growth scenarios. The annualisation factors applied to TUBA are detailed in Table 7.1 below. The economic reference values utilised by the TUBA program have been taken from the latest WebTAG guidance.

Table 7.1 – TUBA Annualisation Factors

No.	Duration (Minutes)	Annualisation	Description
1	120	252	am peak weekdays (0700-0959)
2	120	252	pm peak weekdays (1600-1859)
3	360	252	inter-peak weekdays (1000-1559)
4	720	365	nightime all week (1900 - 0659)
5	540	113	week-end and BH (1000 - 1859)

7.2.2 COBA

7.2.2.1 The latest version of the COBA11 computer program in ‘accident only mode’ has been used to calculate the accident benefits brought about by the six schemes. The assessment has been carried out in accordance with WebTAG.

7.2.2.2 Forecast traffic flows have been taken from the A63 TRIPS model for the opening years of each of the schemes. The forecast growth rates applied to COBA have been taken from the forecasts developed for this assessment and detailed in the Traffic Forecasting Report (ref. W11189/VDT/T03).

7.2.2.3 The Do Minimum COBA network covers the central area of Hull, the A63, A1079 Ferensway, A165 Freetown Way to the north and Wilberforce Drive/ Market Place to the east.

7.2.2.4 Traffic flows have been taken from the TRIPS model developed for the schemes for each opening year. Traffic growth rates have been derived using the NTM forecasts for all roads within the Yorkshire and Humber area. The latest complete five-year period of accident records (01/01/2003 to 31/12/2007), supplied to Pell Frischmann by Hull City Council, have been used in this assessment. The records show there have been 257 Personal Injury Accidents (PIAs) within the confines of the study area. The proportion of KSI accidents is 10.9%.

7.2.2.5 The accident data entered into COBA was separated into accidents on links and accidents at nodes for the Do Minimum scenario. Accident records were not entered by severity, but for the total number of accidents per year for each link and node. The Do Something scenario uses a mixture of default rates and existing rates. The default rates have been used where new links have been added to the network. Other Do Something links have been coded with the same accident rate as in the Do Minimum scenario.

7.2.3 QUADRO

7.2.3.1 The QUADRO4 computer program has been used to assess the journey time benefits, vehicle operating costs and accident benefits during construction and maintenance for the three schemes when compared to the do minimum scenario. Flows have been taken from the link count conducted on the A63 Castle Street to the West of the Holiday Inn access. The count was conducted on Wednesday 21st November 2007 between 06:00-22:00. Traffic growth factors for 2007-2031 were obtained for each vehicle class from the National Traffic Model (NTM). Zero growth has been assumed from 2032.

7.2.3.2 The timescales for the construction of the above phases are summarised below:

- **Underground Base Option (Option 1)** – Construction time is estimated to be 2 Years and 1 month. In addition there are 8 months of advanced works. Two lanes of traffic will be running in both directions throughout the entire construction. Construction is estimated to finish in February 2018
- **Underground Landbridge Option (Option 2)** – Construction time is estimated to be 3 Years. In addition there are 14 months of advanced works. Two lanes of

traffic will be running in both directions throughout the entire construction. Construction is estimated to finish in August 2018

- **Underground Cut and Cover Tunnel Option (Option 3)** - Construction time is estimated to be 4 Years and 3 months. In addition there are 20 months of advanced works. Two lanes of traffic will not be maintained throughout the construction. When constructing the westbound tie-in, only 1 lane westbound and 2 lanes eastbound will be open. When constructing the eastbound tie-in it will only be possible to have 1 lane eastbound and 2 lanes westbound open. Construction is estimated to finish in July 2020.

- **Overground Base Option (Option 4).** Construction time is estimated to be 2 Years In addition there are 8 months of advanced works. Two lanes of traffic will be running in both directions throughout the entire construction. Construction is estimated to finish in July 2017

- **Overground Landbridge Option (Option 5).** Construction time is estimated to be 2 Years and 5 months. In addition there are 14 months of advanced works. Two lanes of traffic will be running in both directions throughout the entire construction. Construction is estimated to finish in December 2017.

- **Full Viaduct Option (Option 6).** Construction time is estimated to be 3 Years. In addition there are 20 months of advanced works. Two lanes of traffic will not be maintained throughout the construction. Construction is estimated to finish in August 2018.

7.2.3.3 The Do Minimum maintenance profile consists of any works needed on the A63 Castle Street without the implementation of an improvement scheme. The Do Minimum assumptions are based on costs provided by the Highway Agency (HA) in June 2007. The do something profiles consist of the works required to build the scheme together with the future maintenance of the proposed scheme. The Do Minimum and Do Something construction schedules are presented with construction phasing drawings in the Economic Assessment Report.

7.3 Discussion of TUBA/COBA/QUADRO Results

7.3.1 TUBA

7.3.1.1 The TRIPS models for the Do Minimum and Do Something scenarios have been run for an opening year and a design year. The opening and design years for the schemes are as follows:

- Underground Base (Option 1): Opening year 2018 design year 2033
- Underground Landbridge (Option 2): Opening year 2018 design year 2033
- Cut and Cover Tunnel (Option 3): Opening year 2020, design year 2035
- Overground Base (Option 4): Opening year 2017 design year 2032
- Overground Landbridge (Option 5): Opening year 2017 design year 2032
- Full Viaduct (Option 6): Opening year 2018 design year 2033

7.3.1.2 The results of the TUBA assessments for the Most Likely growth scenario are summarised in Table 7.2. The detailed Transport Economic Efficiency (TEE) webtag tables are presented in Appendix E of this report.

Table 7.2 – TUBA Assessment, Summary of Results				
Scheme		**Net Present Value (NPV)**	**Present Value of Cost (PVC)**	**Benefit to Cost Ratio (BCR)**
Underground	Option 1: Base	120,714	78,015	2.547
	Option 2: Landbridge	-6,394	153,315	0.958
	Option 3: Cut and Cover Tunnel	47,513	182,408	1.260
Overground	Option 4: Base	134,024	72,035	2.861
	Option 5: Landbridge Eq	22,478	133,632	1.168
	Option 6: Extended Viaduct	18,264	193,020	1.095

Cost in multiples (£1000s)

7.3.2 COBA

7.3.2.1 An accident only analysis has been undertaken using COBA 11.10 and incorporated into the overall scheme economic assessment.

7.3.2.2 Table 7.3 shows the accidents benefits (most likely growth scenario) as a result of improving the A63 Castle Street.

Table 7.3. Accident Benefits – Most Likely Growth Scenario

	Underground Options			Overground Options		
	Base (Option 1)	Landbridge (Option 2)	Cut and Cover (Option 3)	Base (Option 4)	Landbridge (Option 5)	Full Viaduct (Option 6)
No. of Accidents	92	129	118	94	130	88
Fatal Casualties	1	1	1	1	1	1
Serious Casualties	10	14	13	10	14	10
Slight Casualties	115	164	150	119	166	111
Accident Costs	4,376	6,107	5,469	4,554	6,295	4,354

Cost in multiples (£1000s)

7.3.3 QUADRO

7.3.3.1 The benefits associated with construction delays and future maintenance for all six scheme options are summarised in Table 7.4.

Table 7.4: Benefits of Schemes

Under/Overground	Scheme	Benefits (£m)
Underground	Base (Option 1)	36.91
	Landbridge (Option 2)	35.77
	Cut and Cover (Option 3)	1.32
Overground	Base (Option 4)	36.83
	Landbridge (Option 5)	34.23
	Full Viaduct (Option 6)	4.14

7.3.3.2 Table 7.4 shows that the out of the underground options the base scheme gives the highest benefits, closely followed by the Landbridge scheme. The base option also gives the highest benefits out of the overground scheme option. All schemes give a positive benefit, which range from £36.91m to £1.32m.

7.3.3.3 The under and overground base and landbridge options have two lanes of traffic running in both directions and have similar time scales which would account for the similar benefits obtained for these schemes. The cut and cover and full viaduct schemes obtain the lowest benefits due to not being able to keep two lanes of traffic running in both directions throughout the entire construction process.

7.3.3.4 A summary of the results obtained from QUADRO for accident impacts during the construction of the schemes and the maintenance of the completed schemes are shown in Table 7.5 -7.6.

Table 7.5 QUADRO Accident Assessment Underground Option

	Scheme	Total Accident Impact				
		Casualties			Number of Personal Injury Accidents	Benefits (£M) in 2002 prices Discounted using a 3.5% discount rate
		Fatal	Serious	Slight		
Accident Impact During Construction	Base (Option 1)	0.01	-0.05	-0.13	-0.04	-0.09
	Landbridge (Option 2)	-0.02	-0.39	-6.04	-4.57	-0.32
	Cut and Cover (Option 3)	-0.12	-1.39	-21.15	-20.65	-0.88
Accident Impact During Maintenance	Base (Option 1)	0.01	0.32	5.04	3.48	0.22
	Landbridge (Option 2)	0.02	0.30	5.30	3.84	0.23
	Cut and Cover (Option 3)	0.02	0.01	-0.95	4.29	0.12

7.3.3.5 Table 7.5 shows that all underground schemes results in disbenefits during construction. Overall benefits occur for all of the underground schemes during maintenance. Slight injuries do increase slightly during maintenance for the cut and cover schemes but an overall benefit is obtained due to less fatal and serious casualties

Table 7.6 QUADRO Accident Assessment Overground Option							
	Scheme	Total Accident Impact					
		Casualties			Number of Personal Injury Accidents	Benefits (£M) in 2002 prices discounted using a 3.5% discount rate	
		Fatal	Serious	Slight			
Accident Impact During Construction	Base (Option 4)	0.00	-0.03	-0.28	-0.29	-0.10	
	Landbridge (Option 5)	-0.02	-0.22	-3.19	-2.41	-0.21	
	Full Viaduct (Option 6)	0.01	-0.43	-6.32	-4.79	-0.34	
Accident Impact During Maintenance	Base (Option 4)	0.01	0.32	5.04	3.65	0.22	
	Landbridge (Option 5)	0.02	0.32	5.32	3.84	0.23	
	Full Viaduct (Option 6)	0.01	-0.01	-0.25	-0.2	0.14	

7.3.3.6 Table 7.6 shows that all underground schemes result in disbenefits during construction. Overall benefits occur for all of the underground schemes during maintenance. Serious and Slight injuries do increase slightly during the maintenance for the full viaduct schemes but an overall benefit is derived due to less fatal accidents

7.3.3.7 The accident impact during construction and maintenance for each scheme option and growth scenario is included in the Accident worksheets along with the COBA results.

7.3.4 TRANSPORT ECONOMIC EFFICIENCY

7.3.4.1 The TUBA assessments have been run for the six scheme options and three cost estimate ranges (P10, P50 and, P90). These are summarised in Table 7.7 below.

Table 7.7. TUBA Only Assessments				
Scheme		**P10**	**P50**	**P90**
Underground Base (Option 1)	PVB	198,221	198,729	198,729
	PVC	67,255	78,015	88,504
	NPV	130,966	120,714	110,223
	BCR	**2.947**	**2.547**	**2.245**

Table 7.7. TUBA Only Assessments				
Scheme		**P10**	**P50**	**P90**
Underground Landbridge (Option 2)	PVB	146,921	146,921	146,931
	PVC	135,676	153,315	170,960
	NPV	11,245	-6,394	-24,029
	BCR	**1.083**	**0.958**	**0.859**
Cut & Cover Tunnel (Option 3)	PVB	229,921	229,921	229,921
	PVC	156,234	182,408	208,661
	NPV	73,687	47,513	21,260
	BCR	**1.472**	**1.260**	**1.102**
Over Ground Base (Option 4)	PVB	206,059	206,059	206,059
	PVC	64,814	72,035	79,045
	NPV	141,245	134,024	127,014
	BCR	**3.179**	**2.861**	**2.607**
Over Ground Landbridge (Option 5)	PVB	156,110	156,110	155,954
	PVC	117,966	133,632	149,308
	NPV	38,144	22,478	6,646
	BCR	**1.323**	**1.168**	**1.045**
Full Viaduct (Option 6)	PVB	211,285	211,284	211,285
	PVC	169,170	193,020	216,884
	NPV	42,115	18,264	-5,599
	BCR	**1.249**	**1.095**	**0.974**

Cost in multiples (£1000s)

7.3.4.2 This section combines the results of the TUBA and QUADRO assessments to give economic performance of the six schemes for the most likely traffic growth scenario. The construction and maintenance results in delays and thus results in a disbenefit to the overall scheme. Table 7.8 presents the results.

Table 7.8. TUBA and QUADRO Assessments.				
Scheme		**P10**	**P50**	**P90**
Underground Base (Option 1)	PVB	179,361	179,869	179,869
	PVC	67,948	78,708	89,197
	NPV	111,413	101,161	90,672
	BCR	**2.640**	**2.285**	**2.017**
Underground Landbridge (Option 2)	PVB	126,522	126,522	126,532
	PVC	136,449	154,088	171,733
	NPV	-9,927	-27,566	-45,201
	BCR	**0.927**	**0.821**	**0.737**

Table 7.8. TUBA and QUADRO Assessments.				
Scheme		**P10**	**P50**	**P90**
Cut & Cover Tunnel (Option 3)	PVB	166,504	166,504	166,504
	PVC	156,893	183,067	209,320
	NPV	9,611	-16,563	-42,816
	BCR	**1.061**	**0.910**	**0.795**
Over Ground Base (Option 4)	PVB	187,073	187,073	187,073
	PVC	65,508	72,729	79,739
	NPV	121,565	114,344	107,334
	BCR	**2.856**	**2.572**	**2.346**
Over Ground Landbridge (Option 5)	PVB	135,281	135,281	135,125
	PVC	118,733	134,399	150,075
	NPV	16,548	882	-14,950
	BCR	**1.139**	**1.007**	**0.900**
Full Viaduct (Option 6)	PVB	150,668	150,667	150,668
	PVC	169,861	193,711	217,575
	NPV	-19,193	-43,044	-66,907
	BCR	**0.887**	**0.778**	**0.692**

Cost in multiples (£1000s)

7.3.5 Analysis of Monetised Costs and Benefits

7.3.5.1 Table 7.9 shows the overall performance of the schemes with accident benefits included. It can be seen from Table 7.9 that the benefits from the appraisal outweigh the costs with a BCR ranging from 0.935 to 2.637 in the most likely scenario.

Table 7.9. Analysis of Monetised Benefits and Costs including COBA and QUADRO Assessments (Most Likely)						
	Underground			**Overground**		
	Base (Option 1)	**Landbridge (Option 2)**	**Cut and Cover (Option 3)**	**Base (Option 4)**	**Landbridge (Option 5)**	**Full Viaduct (Option 6)**
Accidents	4,506	6,017	4,709	4,674	6,315	4,194
Net Consumer Benefits	73,349	47,692	64,616	76,470	52,309	62,086
Net Business Impact	106,168	78,719	101,801	110,336	82,886	88,673
Carbon Benefits	352	111	87	267	86	-92
Total Benefits	184,375	132,539	171,213	191,747	141,596	154,861
Present Value of Costs	78,708	154,088	183,067	72,729	134,399	193,711
BCR	**2.343**	**0.860**	**0.935**	**2.636**	**1.054**	**0.799**

Cost in multiples (£1000s)

7.3.5.2 An alternative presentation of the economic assessment is often quoted which relates to the expenditure of the HA rather than the Treasury. In order to present these results, the indirect tax effect associated with the scheme is removed from the Present Value of Costs (PVC). The overall results for this alternative assessment are presented in Table 7.10.

Table 7.10 Alternative Economic Assessment - Analysis of Monetised Benefits and Costs including COBA and QUADRO Assessments

	Underground			Overground		
	Base (Option 1)	**Landbridge (Option 2)**	**Cut and Cover (Option 3)**	**Base (Option 4)**	**Landbridge (Option 5)**	**Full Viaduct (Option 6)**
Present Value of Benefits	184,396	132,539	171,213	191,767	141,596	154,861
Present Value of Costs	76,706	153,269	181,813	71,143	133,705	192,154
BCR	**2.404**	**0.865**	**0.942**	**2.696**	**1.059**	**0.806**

8 ENVIRONMENTAL ASSESSMENT

8.1 Introduction

8.1.1 Pell Frischmann Consultants Ltd (PFC) was appointed by the Highways Agency (HA) to investigate options for the improvement of the A63, Castle Street, in Kingston upon Hull. As part of this investigation PF were required to undertake a full Environmental Assessment in accordance with the guidelines provided in Volume 11 of the Design Manual for Roads and Bridges (DMRB).

8.1.2 The four key objectives of the scheme options under consideration are to

- Improve access to the docks
- Relieve congestion
- Improve Safety
- Reduce Severance

8.1.3 The objective of the assessment is to ensure that any adverse impacts of the scheme proposals on the environment are minimised.

8.1.4 The results of the Environmental Assessment are presented in the Environmental Assessment Report (Options Identification Stage). A summary of the methodology used and the conclusions of the Environmental Assessment are outline in the following sections.

8.2 Noise

8.2.1 Overview

8.2.1.1 The scope of the study area has been defined by the requirements within DMRB Volume 11, Section 3, Part 7. The scheme roads have been included to define the study area in addition to any roads determined as significant links. Significant links are identified as link roads where road traffic flows increase by 25% or more or decrease by 20% or more in the proposed year of opening.

8.2.1.2 The resulting significant links, along with the proposed A63 alternations, have been used to define the study area which incorporates all areas within 300m of the respective road links.

8.2.2 Methodology (DMRB Environmental Assessment)

8.2.2.1 The assessment of the environmental noise impact has been undertaken with regard to Stage 2 of the DETR's Design Manual for Roads and Bridges (DMRB) Volume 11 (Environmental Assessment), Section 3, Part 7.

8.2.2.2 Significant links within each of the proposed options have been identified whereby changes in traffic flows are anticipated to bring about perceptible changes in the noise level. DMRB defines a significant change in traffic flow as an increase in the 18-hour traffic flow of equal to or greater than 25%, or a decrease equal to or greater than 20%. It is considered that a change in traffic flow greater than the above parameters will lead to a greater than 1 dB(A) change in the noise level. Changes in the noise level of less than 1 dB(A) are considered to be imperceptible to the human ear.

8.2.2.3 The results of the DMRB assessment seek to identify significant changes in noise levels, both to local residents and sensitive receptors, associated with each of the route options under consideration. Possible vibration impacts should be assessed, where relevant. The assessment should also seek to identify any routes that would require extensive mitigation as a result of noise level increases.

8.2.2.4 An assessment to meet the requirements of Stage 2 DMRB would require for each route option, a map with 300m wide bands either side which would then be subdivided to 0-50m, 50-100m, 150-200m and 200-300m from the road centreline for urban schemes. The number of properties is then estimated for each option within each of the subdivided distance bands. Noise levels for typical locations along the route are predicted to give an indication of the number of properties exposed to road traffic noise.

8.2.2.5 However, the strict application of Stage 2 DMRB would be inappropriate for the consideration of variations in noise levels for the proposed A63 schemes. This assertion is a result of there being very little horizontal realignment of the proposed routes. There is however, considerable difference in the vertical alignment between the existing and the proposed options, and each of the proposed options. The inclusion of the road within a cutting or cut and cover tunnel (Option 3) would provide considerable screening which is also likely to vary significantly along the route of each of the proposed options. Consequently, it is expected that noise levels within a distance band of the road centreline may vary considerably depending upon their location along the scheme route. This would be expected to result in significant inaccuracies in the property counts within distance bands.

8.2.2.6 Therefore, rather than using distance bands from the road centreline the resulting noise bands have been calculated using computer modelling software to determine the number of premises that fall within each noise level band. The DMRB bands are classified as being <50dB(A), 50-<60dB(A), 60-<70 dB(A), and ≥70 dB(A) and properties within 300m of the scheme and any significant links have been included within this assessment to ensure robust reporting. The assessment has included the mitigation that will be afforded by the retaining walls for the schemes in cuttings and from the screening close to the road for the options that are elevated above ground level.

8.2.2.7 In addition changes in the road traffic noise levels have been determined for each of the scheme options which indicate areas of noise increases and decreases. The noise maps indicate the variation in noise levels, comparing the Do Minimum Year of Opening levels with the Do Something noise levels for each option 15 Years After Opening. Owing to the different construction time for each scheme the year opening dates vary and will be dependent upon the scheme considered. The assessment dates for each scheme are given in Table 3.2. The worst case traffic flows within the 15 years after opening of each option is considered to be the 15th Year After Opening in all cases.

8.2.2.8 The assessment of the route options has been undertaken using a more detailed approach than required by Stage 2 of DMRB at this project stage in order to provide the necessary outputs for the TAG appraisal. Consequently, as a more detailed assessment has been produced it has been possible to assess the resulting impacts of each option incorporating the annoyance response of local residents to noise and vibration. It should be noted that this information is not normally produced until a detailed Stage 3 assessment of the chosen route option, but is considered useful in the decision making process with regard to the impacts of each option proposed at this stage. It should also be borne in mind that the information used for each of the option assessments has been produced for the purposes of a Stage 2 DMRB assessment.

8.2.2.9 TAG and DMRB differ in their assessment of traffic noise impact in a number of ways and the output of the DMRB assessment shows different figures to that of the TAG assessment. The following is a summary of the main differences:

8.2.2.10 Noise levels in TAG are expressed as LAeq,18hr whereas DMRB expresses them as LA10,18hr.

8.2.2.11 TAG requires an estimate of the population exposed to noise levels in defined noise bands whereas DMRB uses an estimate of the number of properties exposed to noise levels and changes. The DMRB property data can be converted to population by assuming an average household size which in this assessment has been taken as 2.36 (from Census 2001).

8.2.2.12 TAG requires an estimate of the number of people annoyed by noise in the longer term whereas DMRB assesses the change in nuisance level. TAG therefore requires a new assessment rather than relying on converting data from DMRB.

8.2.2.13 DMRB suggests that unscreened properties within 40m of a road are assessed with regard to the potential for vibration nuisance. However, for the purposes of this assessment it should be noted that the noise level outputs for all buildings within 300m of the scheme and significant links have been used to determine changes in the number of people ‘‘bothered very much or quite a lot’ by vibration.

8.2.3 Calculation of Road Traffic Noise (CRTN)

8.2.3.1 Noise from a flow of road traffic is generated by a range of sources including vehicles' engines, exhausts, inductions, transmissions and the interaction of tyres with the road surface. The traffic noise level at a receptor, for example residents within a property neighbouring a road, is influenced by a number of factors. These include the magnitude of the traffic flow, speed, composition (in the form of % HGV), gradient, type of road surface, distance and the presence of any obstructions or areas of ground absorption between the road and the receptor, and reflections from buildings on the far side of the road.

8.2.3.2 Noise from a stream of traffic is not constant. Therefore, to assess the noise impact a single figure representation of the overall noise level is necessary. The index adopted by the Government (in 'The Calculation of Road Traffic Noise' (CRTN) (1988, first issued in 1975)) to assess traffic noise is the LA10,18h, which is the arithmetic mean of the noise levels exceeded for 10% of the time in each of the eighteen 1-hour periods between the hours of 06.00 and 24.00. A reasonably good correlation has been shown to exist between this index and residents' perception of traffic noise over a wide range of exposures.

8.2.3.3 CRTN provides a standard methodology for predicting the LA10,18h road traffic noise level. This methodology has been used to predict road traffic noise levels for the environmental assessment of the proposed route options using CADNA noise modelling software which implements the CRTN methodology.

8.2.4 Modelling Assumptions

8.2.4.1 The noise models for each of the options have incorporated a number of assumptions. The resulting assumptions made are tabulated as an overview in Table 8.2.1 and discussed in more detail below, where appropriate.

Table 8.2.1: Assumptions for Calculating Road Traffic Noise Levels

Parameter	Data Source	Assumptions
AAWT traffic flow	Pell Frischmann	No assumptions made
Average traffic speed	Pell Frischmann	No assumptions made
Percentage HGVs	Pell Frischmann	No assumptions made
Road surface type	No data provided	All existing and scheme roads assumed to be impervious bitumen
Receptor locations	GIS address data, site walkover and aerial photos	See below
Ground heights	Digital Terrain Model (DTM) grid height points at 10 m intervals	No assumptions made
Building heights	1999 LIDAR DEM aerial survey	See below
Ground absorption	Aerial photos and OS landline data	Default ground absorption assumed to be 0, areas of

Table 8.2.1: Assumptions for Calculating Road Traffic Noise Levels		
Parameter	**Data Source**	**Assumptions**
		apparent ground absorption digitised from data sources and assumed to be 1
Gradient	Pell Frischmann and DTM	Existing roads fitted to DTM. Proposed options digitised from elevation information provided by Pell Frischmann. Myton swing bridge digitised from DEM data
Reflections	Calculated	Calculated according to CRTN
Road tunnel portals (Cut and Cover Tunnel Option)	No data provided	See below
Barriers	Scheme retaining walls	Digitised from elevation information provided by Pell Frischmann
Mitigation	No data provided	No specific mitigation has been included within the assessments. The options with the road in a cutting have assessed the attenuation provided by the retaining walls.

8.2.4.2 The traffic data was supplied by Pell Frischmann following modelling of the road network. The model was built using the TRIPS software suite including the CUBE interface, and updated using data collected in March 2004. TEMPRO was used to identify the estimated numbers of trips by production and attraction for Hull, the East Riding of Yorkshire and the UK for the each of the opening years.

8.2.4.3 The use of TEMPRO only traffic growth was agreed with the Highways Agency following discussions with Hull City Council and the HA regarding the status of the development within Hull. Given the uncertainty of the developments, it was assumed to use TEMPRO only forecasts in the model and run TEMPRO plus development forecasts as a sensitivity test. Forecasts have been developed for a ‘Most Likely’ scenario which represent the likely traffic conditions in Hull.

8.2.4.4 No mitigation has been included within the noise assessment, for example specific noise barriers. However, where the road is within a cutting the retaining walls are included within the assessment and will provide acoustic screening of road traffic noise is such cases. In addition, where the road is elevated in the form of a flyover the road will provide screening of noise levels at locations close to the structure owing to the road deck obscuring the direct line of sight to the road traffic. In both cases the attenuation offered by screening effects has been considered within the noise models.

8.2.4.5 No data is available for the existing and proposed road surface type for the scheme at this time. Therefore all of the assessments have assumed an impervious bitumen road surface which will give rise to the highest predicted noise levels compared with other low noise road surface types. This is considered to be a worst case assessment in terms of the likely noise impact. However, as all options have been treated in the same way this is unlikely to affect the option selection process as the relative difference in impacts between each scheme is key to the process.

8.2.4.6 The scheme options incorporate a number of residential receptors in relatively close proximity within a typically inner city urban setting. Receptors that have been identified as single dwelling houses have been modelled using a building evaluation parameter. In such cases that model has calculated the noise levels on all exposed facades and the maximum noise level used in the resulting assessment.

8.2.4.7 In the case of low rise buildings that have been identified to contain multiple occupancies from the address data points, for example flats, the building evaluation parameter has been used. However, the number of residential dwellings has been attributed to the resulting noise level. Consequently, the resulting noise levels are considered to be worst case as all premises would be attributed with the highest noise level predicted at 1m from the building façade.

8.2.4.8 In the case of high rise buildings discrete receptor points have been digitised to represent each residential flat or apartment. The number of dwellings within a building has been determined from Geographic Information System (GIS) address data information and receptor locations identified from the site walkover, aerial photographs and building height information. Receptor points have been chosen in an attempt to ensure that their location would result in the highest noise level prediction for the façade of an individual flat or apartment.

8.2.4.9 Building heights have been calculated from Digital Elevation Model (DEM) data provided from an aerial LIDAR survey undertaken in 1999 by Infoterra. The data supplied contains grid height points at 2m intervals. Building heights have been calculated by taking the arithmetic average of all DEM height points that fall within the building footprint.

8.2.4.10 This data has also been used for digitising the relative height of the Myton Swing Bridge above the prevailing ground level. An additional width to the sides of the road has been included to be representative of the pavements over the bridge in order to accurately assess the correct edge line of the bridge for the diffraction of traffic noise.

8.2.4.11 It was noted that some of the buildings within the scheme boundary have been constructed since the LIDAR survey undertaken in 1999. In such cases, for example the Hull Magistrates Court, the building height has been either estimated from site walkover photographs, aerial photos or assumed to be a height of 6m above the prevailing Digital Terrain Model (DTM) which is equivalent to the height of a two storey dwelling.

8.2.4.12 The assessment of commercial and industrial buildings falling within noise level bands has been undertaken by property counts from the LA10,18h façade corrected noise level maps predicted at a height of 4m above the prevailing DTM. The assessment of sensitive receptors has been determined from grid reference points from the LA10,18h free field noise level maps. Open spaces, for example parks, are quoted as being free-field noise levels. Buildings identified as sensitive receptors have been assessed with regard to the highest noise level at the façade and have had a façade correction applied (+2.5 dB).

8.2.4.13 An overview of the sensitive receptor locations chosen within 300m for the scheme and any significant links is summarised below in Table 8.2.2.

Table 8.2.2: Sensitive Receptors

Location	Grid Reference		Description
	x	y	
Park 1	509192	428521	Green open space bordered by Melville Street
Park 2	509114	428437	Green open space bordered by Porter Street and Adelaide Street
Park 3	509141	428310	Green open space bordered to the north by William Street and the A63 to the south
Park 4	508760	428509	Green open space bordered to the north by Great Thornton Street

Table 8.2.2: Sensitive Receptors

Location	Grid Reference		Description
	x	y	
Myton Centre*	509042	428252	Riverside area children and family resource centre bordering William street to the north and the A63 to the south
Octagon Centre*	508839	428394	Conference centre and community fitness centre located on Walker Street
Playing Field	508738	428360	Playing field located to the west of the Octagon Centre
Jetty	509666	428485	Public open space to the south of the Princes Quay Shopping Centre bordered to the south by the A63
Shopping Centre*	509628	428509	Princes Quay Shopping Centre
Naval School*	509744	428514	Hull Trinity House School located on Prince's Dock Street
Market Square	509891	428558	Located between North Church side and South Church side to the west of Holy Trinity Parish Church

Note: * - Noise levels façade corrected all others are taken to be free field

8.2.4.14 Option 3 incorporates a section of the A63 road within a cut and cover tunnel. The passage of traffic within the tunnel will create noise that will reflect off the road, walls, and roof of the tunnel. The level of reverberant noise that will build up within the tunnel will be dependant upon the magnitude of the traffic flow, the cross sectional size and length of the tunnel, and the degree of acoustic absorption within the tunnel itself. The resulting reverberant noise within the tunnel will lead to increased levels of noise at the tunnel portals and, consequently needs to be considered as part of the impact assessment.

8.2.4.15 The Calculation of Road Traffic Noise does not contain any methodology for the calculation of noise from roads within tunnels. Therefore, a methodology has been used using basic acoustic principles.

8.2.4.16 The sections of road that lie within the proposed tunnel have been digitised in a separate model. The corresponding flows (AAWT), percentage HGV and speed have been incorporated into the corresponding westbound and eastbound lanes. The tunnel walls have been digitised as tall non-reflecting barriers. The noise levels, in terms of the LA10,18h, have been calculated for an array of 49 defined receptor points at each of the tunnel portals.

8.2.4.17 The calculated noise levels have been energy averaged to give the resulting direct field noise level at each of the tunnel portals. The energy average noise level for each of the tunnel portals has been used to calculate the equivalent line source sound power level (Lw) for the roads.

8.2.4.18 In order to consider the reverberant field component of the noise the tunnel has been considered as a room. The road, walls, and roof have each been attributed with an absorption coefficient of 0.02, equivalent to the mid frequency absorption coefficient of concrete. The tunnel portals have been considered as being totally acoustically absorbent, with an absorption coefficient of 1, e.g. the no acoustic energy is reflected at the tunnel portals. Using the plans and elevation supplied by Pell Frischmann the Room Constant (Rc) has been determined from the surface areas and absorption coefficient.

8.2.4.19 The calculated line source sound power level equivalent of the road has been used to calculate the reverberant noise level resulting from the enclosure of the road within the tunnel. The reverberant field component has been logarithmically added to the direct field component to give the average noise level at each of the tunnel portals. The area sound power level for the tunnel portal has been calculated using the surface area of the portals, determine from plans and elevations.

8.2.4.20 The calculated sound power level of the tunnel portals, in terms of vertical area sources, has been included within the model. It should be noted that the sound power level of the portals has been determined in terms of the LA10,18h to allow inclusion with the CRTN calculations undertaken for the roads within the model. The vertical area sound power levels have assumed all of the acoustic energy to be within the 500Hz octave band. The test calculations indicate typically a 5 to 6 dB(A) increase around the tunnel portals, which appears to be consistent with published material on noise increases around road traffic tunnel portals, whereby noise level changes are not evident at a distance of 15 to 20m from the tunnel portal.

8.2.4.21 The cut and cover tunnel may include a number of shafts for ventilation purposes, although no detailed design of the tunnel ventilation has been finalised. The inclusion of ventilation shafts may result in increased noise levels to the top of the tunnel area. However, for the purposes of this assessment it should be borne in mind that no assessment of the noise from potential ventilation shafts has been undertaken.

8.2.4.22 It is expected that the shafts could contain acoustic absorption as part of the shaft lining and outlets could contain cowls and even acoustic splitters. The cowls could be directed to point away from sensitive locations, if required. Overall it is considered that the inclusion of any ventilation shafts would be unlikely to have any material impact, if carefully located and designed.

8.2.5 Summary - Net Noise and Vibration Changes

8.2.5.1 The six proposed schemes each indicate a net change in the road traffic noise for the local community compared with the relevant Do Minimum case depending upon the Year Opening.

8.2.5.2 An overview of the net changes for each scheme option is summarised below in Table 8.2.3. It should be noted that in the year of opening the number of people ‘bothered very much or quite a lot’ by road traffic noise is determined from the abrupt change in noise relationship. For the period 15 Years After Opening the number of people ‘bothered very much or quite a lot’ by road traffic noise has been determined from the steady state response relationship.

Table 8.2.3: Summary of the Variation of the Number of People ‘Bothered Very Much or Quite A Lot’ By Road Traffic Noise

Scheme	Year Opening	Long Term (+15 Years)
Option 1	-752	-4
Option 2	-868	-70
Option 3	-642	-66
Option 4	-641	+8
Option 5	-651	-1
Option 6	-532	+35

8.2.5.3 It can be seen that all options are predicted to bring about net benefits in the short term, with a reduction in the local population being annoyed by road traffic noise. In the longer term Options 1, 2, 3 and 5 indicate a net benefit resulting in a reduction in the number of people bothered by road traffic noise. Options 4 and 6 indicate a slight increase in the number of people bothered by road traffic noise in the longer term.

The most favourable scheme is Option 2 which indicates the greatest reduction in the population annoyed for both the short and long term.

8.2.5.4 A similar trend is indicated in the estimation of the number of people 'bothered very much or quite a lot' by vibration from road traffic. A summary of the impact is included below in Table 8.2.4.

Table 8.2.4: Summary of the Variation of the Number of People 'Bothered Very Much or Quite A Lot' By Vibration

Scheme	Year Opening	Long Term (+15 Years)
Option 1	-2	-2
Option 2	-10	-9
Option 3	-8	-9
Option 4	+1	0
Option 5	-14	-13
Option 6	0	-1

8.2.5.5 Options 1, 2, 3, 5 and 6 show a slight reduction in the number affected by vibration from road traffic, indicating a net benefit to the local community. Option 4 indicates a predicted increase of one person bothered by vibration in the year opening and a neutral impact within 15 years after opening.

8.3 Air Quality

8.3.1 Assessment Methodology

8.3.1.1 The Air Quality Assessment has been undertaken using the DETR (since replaced by DEFRA) DMRB methodology (Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 1, HA 207/07 Air Quality – May 2007).

8.3.1.2 The DMRB method allows the calculation of concentrations of the common road traffic related air pollutants, namely carbon monoxide (CO), nitrogen dioxide (NO_2), the hydrocarbons benzene and 1,3-butadiene and particulate matter (PM_{10}). In addition, the DMRB method facilitates direct comparison with current UK National Air Quality Strategy (UKNAQS) standards and objectives, set to protect human health.

8.3.1.3 DMRB is accepted as the UK standard methodology for evaluating the air quality impacts associated with new road schemes. The methodology is in effect a screening tool which is frequently used by local authorities for assessing air quality impacts in relation to road transport sources as part of the Local Air Quality Management (LAQM) regime.

8.3.1.4 For the scheme options a Scoping assessment was initially undertaken which determined that local receptors could be susceptible to significant changes to local air quality brought about by the options proposed. Following scoping, the assessment progressed to a Simple level.

8.3.1.5 The Simple assessment comprised the prediction of pollutant concentrations at identified receptors and comparison against statutory objectives for human health. Due to prevailing concerns with local air quality along the A63 and the surrounding area an ADMS Roads dispersion model was used to predict potential air quality impacts. The use of this model over the DMRB spreadsheet tool was considered to be more appropriate for the assessment given the current air quality climate.

8.3.1.6 With respect to potential air quality impacts associated with the construction of the scheme, which will pose a risk of dust generation as an inevitable consequence of the works, the level of impact will be dependant on controlling measures employed during the construction phase. An assessment of the potential of such impacts on local receptors has not been undertaken as part of the Simple assessment as detailed construction methods have not yet been confirmed. However, the potential key construction effects on the local environment have been identified and considered within the Environmental Assessment report (PF, 2008).

8.3.1.7 The DMRB was principally designed by the Highways Agency (HA) to assess the impact of new road schemes and projects in relatively rural areas. For complex roads schemes which are non-rural, involve bridges or tunnels, and/or are proposed in an Air Quality Management Area (AQMA), more detailed dispersion modelling is often required for the Local Air Quality Assessment.

8.3.1.8 Kingston upon Hull City Council (HCC) declared an AQMA for NO_2 in 2000 in the area of the A63. The presence of the AQMA means that relatively small changes in air quality brought about by the changes in traffic flow are potentially important. Ideally, any road improvement scheme undertaken within an AQMA should not lead to deterioration in air quality.

8.3.1.9 ADMS-Roads dispersion modelling has been undertaken in order to predict, quantitatively, any minor changes in pollutant concentrations within the study area. Model setup, input data and resultant predicted pollutant concentrations are detailed in the Environmental Assessment Report, Annex B1 (PF, 2008).

8.3.2 Receptors and Their Sensitivities

8.3.2.1 The DMRB 'Simple' Assessment method focuses on properties lying within 200m of the road centre, as identified on Figure 3.12.3.1.

8.3.2.2 The National AQS and AQO apply at locations where the public may possibly be exposed to pollution for a sufficient period for there to be any measurable health effect. For the road traffic pollutants assessed (NO_2 and PM_{10}), typical locations for sensitive receptors include residential properties, schools and hospitals for long-term impacts (i.e. annual), and kerbside sites, outdoor locations such as residential gardens and/or parks, and areas to which the public might reasonably expected to have access for short-term impacts.

8.3.2.3 Air quality monitoring and investigations undertaken by HCC have shown that long term (i.e. annual mean) concentrations of NO_2 are in excess of the long term AQO at some locations within the study area. However, the monitoring also shows that short term concentrations of NO_2 are within the prescribed AQO for human receptors, and there is no short term AQO for ecological receptors. As such only the impact of long term pollutant concentrations on human and ecological receptors has been considered within this assessment.

8.3.2.4 For the assessment, a receptor grid covering the study area was built into the dispersion model which also included a range of discrete receptor locations situated at 20m from each affected road link identified as having the potential to exceed AQS in the Hull AQMA declaration documents (i.e. Links 1, 2, 7, 8, 9, 18 and 24). These locations have been chosen to reflect those locations that are likely to have the highest concentrations and/or largest change in pollutant concentrations as a result of the proposals.

8.3.2.5 'Sensitive' receptors have been identified and included within the model as discrete receptors, and represent large numbers of residential properties and/or those that house the young, the old or other susceptible populations. Table 8.3.1 provides details of sensitive receptors identified within Hull AQMA.

TABLE 8.3.1 – LOCATION OF IDENTIFIED SENSITIVE RECEPTORS (AQMA)

No.	Receptor Name	Grid Reference (NGR)	
		x	y
1	AQMA NW	508104	428643
2	AQMA NE	510157	428621
3	AQMA SE	510163	428337
4	AQMA SW	508427	427881
5	PARK1	509192	428521
6	PARK2	509114	428437
7	PARK3	509141	428310
8	PARK4	508760	428509
9	MYTON CENTRE	509042	428252
10	OCTAGON CENTRE	508839	428394
11	PLAYING FIELD	508738	428360
12	ADELAIDE SCHOOL	508629	428201
13	JETTY	509666	428485
14	SHOPPING CENTRE	509681	428584
15	MARKET SQUARE	509891	428558
16	SSSI_1	508739	427447
17	SSSI_2	509558	427762
18	SSSI_3	510058	427881

8.3.3 Traffic Data

8.3.3.1 Baseline traffic data has been generated by Pell Frischmann. The reported base year is 2004, which represents the most recent year with actual (traffic count) rather than estimated traffic flow data for the study area. Traffic data has been supplied for fifty-one roads (links) and twenty-four smaller or ‘sub’ links within the study area. Future Conditions.

8.3.3.2 Traffic count data from the base year (2004) has been used by Pell Frischmann to forecast AADT flows, speeds (km/h) and the proportion of HGVs (%) for each of the three proposed opening years.

8.3.3.3 Traffic data has been generated for the 'Do Minimum' (i.e. existing situation) and 'Do-Something' (i.e. scheme options) for the Years 2017, 2018 and 2020, representing the relevant opening year for each scheme option.

8.3.3.4 Full details of the traffic data used in the Environmental Assessment can be found in the Environmental Assessment Report (PF, 2008).

8.3.3.5 A summary of the opening years for the schemes is given in Table 8.3.2 below.

Table 8.3.2: Summary of Proposed Scheme Opening years	
Opening year	**Schemes**
2017	Option 4: Overground Base Option 5: Overground Landbridge Equivalent
2018	Option 6: Overground Extended Viaduct Option 1: Underground Base Option 2: Underground Landbridge
2020	Option 3: Underground Cut and Cover Tunnel

8.3.4 DMRB Local Air Quality – 'Simple' Assessment Results

8.3.4.1 The ADMS-Roads model was used to predict the concentration of annual mean ground level NO_2 and PM_{10} concentrations at a range of receptors within the Hull AQMA and the wider study area for each of the proposed scheme options.

8.3.4.2 The model was also run for the 'Do-Minimum' (no change to existing layout) option for each of the opening years so that a comparison could be made between the 'with' and 'without' scheme options.

8.3.4.3 The model predicted annual mean NO_2 and PM_{10} ground level concentrations at identified sensitive receptors within the Hull AQMA are given overleaf in Tables 8.3.3 and 8.3.4 respectively.

8.3.4.4 Full details of model results for all sensitive receptors assessed within the study area have been included in the Environmental Assessment Report (PF, 2008).

TABLE 8.3.3 – PREDICTED ANNUAL MEAN NO_2 GROUND LEVEL CONCENTRATIONS AT IDENTIFIED RECEPTORS (WITHIN HULL AQMA)										
Receptor Reference	2017 Concentration (µg/m^3)			2018 Concentration (µg/m^3)				2020 Concentration (µg/m^3)	
	DM	Base Overground	Landbridge Overground	DM	Extended Viaduct	Base Underground	Landbridge Underground	DM	C+C Tunnel
1. AQMA NW	24.22	24.21	24.30	24.19	24.11	24.19	24.21	24.17	24.12
2. AQMA NE	27.94	27.96	27.96	27.85	27.81	27.83	28.00	27.77	27.49
3. AQMA SE	27.61	27.68	27.66	27.53	27.52	27.57	27.45	27.35	27.03
4. AQMA SW	28.32	28.33	28.35	28.11	28.21	28.22	28.29	27.95	28.10
5. PARK1	26.64	26.45	26.41	26.57	26.50	26.55	26.52	26.45	26.89
6. PARK2	26.59	26.48	26.42	26.53	26.52	26.54	26.48	26.39	26.77
7. PARK3	30.45	29.85	29.69	30.40	30.58	30.56	29.74	30.14	30.73
8. PARK4	25.04	25.01	25.02	24.98	24.91	24.94	24.97	24.89	24.93
9. MYTON CENTRE	30.89	31.09	30.91	30.84	31.06	31.03	30.91	30.57	31.05
10. OCTAGON CENTRE	25.50	25.53	25.51	25.45	25.42	25.44	25.48	25.33	25.45
11. PLAYING FIELD	25.31	25.35	25.34	25.26	25.23	25.26	25.30	25.14	25.24
12. ADELAIDE SCHOOL	26.04	26.14	26.14	25.99	25.98	26.03	26.09	25.85	25.98
13. JETTY	32.25	31.32	30.45	32.07	32.09	32.16	28.57	31.92	28.31
14. SHOPPING CENTRE	27.67	27.48	27.29	27.59	27.57	27.58	26.94	27.48	26.88
15. MARKET SQUARE	27.98	27.89	27.87	27.90	27.87	27.90	27.29	27.81	26.76
16. SSSI_1	24.27	24.30	24.28	24.21	24.20	24.20	24.23	24.12	24.16
17. SSSI_2	24.22	24.25	24.21	24.18	24.16	24.16	24.18	24.09	24.16
18. SSSI_3	24.23	24.25	24.23	24.18	24.17	24.17	24.19	24.10	24.10

TABLE 8.3.4 – PREDICTED ANNUAL MEAN GROUND LEVEL PM_{10} CONCENTRATIONS AT IDENTIFIED RECEPTORS (WITHIN HULL AQMA)

RECEPTOR REFERENCE	2017 Concentration (µg/m^3)			2018 Concentration (µg/m^3)				2020 Concentration (µg/m^3)	
	DM	Base Overground	Landbridge Overground	DM	Extended Viaduct	Base Underground	Landbridge Underground	DM	C+CTunnel
1. AQMA NW	16.29	16.29	16.29	16.20	16.20	16.20	16.20	16.03	16.03
2. AQMA NE	16.42	16.42	16.42	16.33	16.33	16.33	16.34	16.16	16.15
3. AQMA SE	16.38	16.38	16.38	16.28	16.29	16.29	16.29	16.11	16.10
4. AQMA SW	16.55	16.55	16.56	16.45	16.46	16.46	16.47	16.27	16.28
5. PARK1	16.34	16.33	16.33	16.25	16.25	16.25	16.25	16.08	16.12
6. PARK2	16.33	16.33	16.32	16.24	16.24	16.24	16.24	16.07	16.09
7. PARK3	16.62	16.59	16.58	16.52	16.56	16.56	16.50	16.36	16.42
8. PARK4	16.27	16.27	16.27	16.18	16.18	16.18	16.18	16.01	16.01
9. MYTON CENTRE	16.67	16.70	16.69	16.58	16.62	16.62	16.61	16.42	16.46
10. OCTAGON CENTRE	16.28	16.29	16.28	16.19	16.19	16.19	16.20	16.02	16.03
11. PLAYING FIELD	16.28	16.28	16.28	16.19	16.19	16.19	16.19	16.02	16.02
12. ADELAIDE SCHOOL	16.32	16.32	16.32	16.23	16.23	16.23	16.23	16.05	16.06
13. JETTY	16.76	16.67	16.63	16.66	16.65	16.67	16.43	16.50	16.24
14. SHOPPING CENTRE	16.37	16.37	16.36	16.28	16.28	16.28	16.27	16.11	16.10
15. MARKET SQUARE	16.39	16.38	16.39	16.30	16.29	16.30	16.29	16.13	16.10
16. SSSI_1	16.24	16.24	16.24	16.15	16.15	16.15	16.15	15.98	15.98
17. SSSI_2	16.23	16.23	16.23	16.14	16.14	16.14	16.15	15.97	15.98
18. SSSI_3	16.23	16.23	16.23	16.14	16.14	16.14	16.14	15.97	15.98

2017 Opening Year

8.3.4.5 For all sensitive receptors identified within the study area, including those located within 20m from the road centre, the predicted annual mean NO_2 concentrations for the 'Do Minimum' and each of the proposed scheme options (Base Overground and Landbridge Overground) show no exceedence of the National AQO (40µg/m^3).

8.3.4.6 Generally, it is predicted that all the improvement options will slightly lower the annual mean concentrations of NO_2 experienced at identified receptors. However, the difference between predicted concentrations at receptors for the 'Do-Minimum' and either of the proposed improvement options is only greater than 1µg/m^3 at the jetty location and so is not considered significant.

8.3.4.7 For all sensitive receptors identified within the study area, the predicted annual mean PM_{10} concentrations for the 'Do Minimum' and each of the proposed scheme options (Base Overground and Landbridge Overground) show no exceedence of the National AQO (40µg/m^3).

8.3.4.8 Similarly to model predictions for NO_2, the improvement options are predicted to result in a slight lowering of annual mean PM_{10} concentrations at identified receptors. However, the difference between predicted concentrations at receptors for the 'Do-Minimum' and either of the proposed improvement options is less than 1µg/m^3 at all locations assessed.

2018 Opening Year

8.3.4.9 For all sensitive receptors identified within the study area, including those located within 20m from the road centre, the predicted annual mean NO_2 concentrations for the 'Do Minimum' and each of the proposed scheme options (Base Underground, Landbridge Underground and Extended Viaduct) show no exceedence of the National AQO (40µg/m^3).

8.3.4.10 Improvement Options Base Underground and Landbridge Underground are predicted to result in an overall slight increase in annual mean NO_2 concentrations at identified receptors. However, the difference between predicted concentrations at receptors for the 'Do-Minimum' and either of these two proposed improvement options is less than 1µg/m^3 at all locations assessed.

8.3.4.11 The Extended Viaduct Option is predicted to result in an overall decrease in annual mean NO_2 concentrations. However, the difference between predicted concentrations at receptors for the 'Do-Minimum' and the extended viaduct option is only greater than 1µg/m^3 at the jetty location.

8.3.4.12 For all sensitive receptors identified within the study area, the predicted annual mean PM_{10} concentrations for the 'Do Minimum' and each of the proposed scheme options (Base Underground, Landbridge Underground and Extended Viaduct) show no exceedence of the National AQO (40µg/m^3).

8.3.4.13 As with the modelled NO_2 results for 2018, both the Base Underground and Landbridge Underground Improvement Options slightly increase overall annual mean concentrations of PM_{10} at identified receptors, and the Extended Viaduct Option slightly decreases overall annual mean concentrations of PM_{10} at identified receptors. In all cases, the difference between the 'Do-Minimum' and each of the proposed improvement options is less than 1µg/m^3 at all of the locations assessed.

<u>2020 Opening Year</u>

8.3.4.14 For all sensitive receptors identified within the study area, including those located within 20m from the road centre, the predicted annual mean NO_2 concentrations for the 'Do Minimum' and the proposed scheme option (Cut and Cover Tunnel) show no exceedence of the National AQO (40µg/m$_3$).

8.3.4.15 Generally, the Cut and Cover Tunnel Option slightly lowers annual mean concentrations of NO_2 at identified receptors. However, the difference between predicted concentrations at receptors for the 'Do-Minimum' and the Cut and Cover Tunnel Option is only greater than 1µg/m^3 at the Jetty and Market Square locations.

8.3.4.16 For all sensitive receptors identified within the study area, the predicted annual mean PM_{10} concentrations for the 'Do Minimum' and the proposed scheme option (Cut and Cover Tunnel) show no exceedence of the National AQO (40µg/m^3).

8.3.4.17 Generally, the Cut and Cover Tunnel Option slightly lowers annual mean concentrations of PM_{10} at identified receptors. However, the difference between predicted concentrations at receptors for the 'Do-Minimum' and the Cut and Cover Tunnel Option is less than 1µg/m^3 at all locations assessed.

8.3.5 Regional Assessment

8.3.5.1 The DMRB Regional Air Quality Assessment focuses on the longer term assessment of total pollutant outputs from the proposed improvement scheme options. The 'Regional' application of the DMRB model is used for this assessment.

8.3.5.2 The DMRB 'Simple' Assessment method calculates the change in total air emissions that would result from a proposed scheme, as compared with the 'Do-Minimum' alternative.

8.3.5.3 The results of the DMRB Regional Air Quality 'Simple' Assessment are presented in Appendix B6 of the Environmental Assessment Report (PF, 2008).

8.3.5.4 For the purposes of this assessment, NO_x and PM_{10} are taken to be indicators of the potential for regional air pollution impacts arising from options, as these pollutants are strongly linked with transport and are transboundary pollutants which are not easily destroyed or react in the atmosphere to form a secondary pollutant. NO_x have a lifetime of approximately 1 day with respect to conversion to nitric acid. The nitric acid is removed from the atmosphere by direct deposition to the ground or via aqueous droplets, therefore contributing to acid deposition. The atmospheric lifetime of PM_{10} is strongly related to particle size but may be as long as ten days for a 1 micron diameter.

8.3.5.5 The regional assessment has calculated that the annual emissions of NO_x and PM_{10} from road vehicles due to the proposed road improvement scheme will change as follows for each of the options assessed:

<u>2017 Opening Year</u>

8.3.5.6 The Base Overground Option will result in an increase of 1.58 tonnes NO_x and an increase of 0.007 tonnes PM_{10} when compared to the 2017 'Do Minimum' alternative.

8.3.5.7 The Landbridge Overground Option will result in an increase of 0.58 tonnes NO_x and a decrease of 0.005 tonnes PM_{10} when compared to the 2017 'Do Minimum' alternative.

2018 Opening Year

8.3.5.8 The Extended Viaduct Option will result in a decrease of 2.98 tonnes NO_x and a decrease of 0.02 tonnes PM_{10} when compared to the 2018 'Do Minimum' alternative.

8.3.5.9 The Base Underground Option will result in a decrease of 3.69 tonnes NO_x and a decrease of 0.06 tonnes PM_{10} when compared to the 2018 'Do Minimum' alternative.

8.3.5.10 The Landbridge Underground Option will result in a decrease of 2.72 tonnes NO_x and a decrease of 0.05 tonnes PM_{10} when compared to the 2018 'Do Minimum' alternative.

2020 Opening Year

8.3.5.11 The Cut and Cover Tunnel Option will result in a decrease of 2.77 tonnes NO_x and a decrease of 0.04 tonnes PM_{10} when compared to the 2020 'Do Minimum' alternative.

8.3.6 Summary

8.3.6.1 For all sensitive receptors within the study area, including those located at 20m from the road centre, the predicted annual mean NO_2 and PM_{10} concentrations for the 'Do-Minimum' and each of the proposed scheme options in the opening show no exceedence of the long term National AQO (40µg/m^3 for NO_2 and PM_{10}).

8.3.6.2 An assessment of all modelled grid points within the modelled domain has been undertaken. Note that in this assessment, areas of exceedence are included even when they are in locations with no residential receptors and are therefore not considered significant for DMRB.

8.3.6.3 For information and comparison only, the modelled grid point assessment showed that only the 2017 Landbridge Overground Option and the 2018 Extended Viaduct Option result in fewer areas of exceedence than their respective 'Do-Minimum Options'. All other options maintain or increase the areas of exceedence.

8.3.6.4 Within the regional assessment, the 2018 Base Underground has the most significant positive impact on total emissions of NO_2 (decrease of 3.69 tonnes per year) and PM_{10} (decrease of 0.06 tonnes per year) in comparison with the Do-Minimum Option.

8.3.6.5 Table 8.3.5 summarises the results of both the DMRB 'Simple' Assessments for local air quality and regional impacts and provides a ranking of the scheme options based on the assessment findings.

TABLE 8.3.5 – SUMMARY OF DMRB LOCAL AND REGIONAL SIMPLE AIR QUALITY ASSESSMENT RESULTS

Scheme Option	DMRB Local Air Quality Assessment				DMRB Regional Air Quality Assessment		Preferred Scheme Option Ranking[2]
	Number of AQO exceedences predicted at designated receptors.		Number of AQO exceedences predicted anywhere within modelled study area[1]		Change in total annual emissions (tonnage) with respect to 'Do Minimum' option		
	NO_2	PM_{10}	NO_2	PM_{10}	NO_2	PM_{10}	
2017 Opening Year							
2017 Do-Minimum	0	0	7	0	n/a	n/a	n/a
Base Overground	0	0	7	0	+1.58	-0.007	5
Landbridge Overground	0	0	5	0	+0.58	-0.005	2
2018 Opening Year							
2018 Do-Minimum	0	0	6	0	n/a	n/a	n/a
Extended Viaduct	0	0	5	0	-2.98	-0.02	1
Base Underground	0	0	7	0	-3.69	-0.06	3
Landbridge Underground	0	0	8	0	-2.72	-0.05	4
2020 Opening Year							
2020 Do-Minimum	0	0	4	0	n/a	n/a	n/a
Cut and Cover Tunnel	0	0	9	0	-2.77	-0.04	6

1 Exceedences included in this column are NOT at identified receptors (i.e. they occur on roads / areas where humans will only spend short durations (kerbs, footpaths) and thus will only have minimal impact on human health). See Figures 4.6-4.14 in the Environmental Assessment Report for model dispersal outputs); the total number of exceedences is shown for information/comparison only.

2 Ranking reflects a qualitative review of DMRB Local and Regional results, and predicted contour plots

8.4 Greenhouse Gases

8.4.1 Methodology

8.4.1.1 Although the assessments focus on Carbon dioxide (CO_2) emissions, these are considered in terms of the change in the equivalent tonnes of carbon released as a result of implementing a transport scheme. For the purposes of these calculations, it has been assumed that all carbon present in the fuel will be released as CO_2, although in reality, some of the carbon will be released as particles or hydrocarbons.

8.4.1.2 The amount of fuel consumed, and therefore the amount of carbon emitted, per vehicle kilometre varies considerably by vehicle type. Therefore, for both road and rail schemes, predictions of emissions will be more accurate the more disaggregated the data is on traffic flow by vehicle type. For example, for rail, data disaggregated by individual engine types will lead to more accurate estimates of emissions. Similarly for roads, more disaggregated data on traffic flow by vehicle type (e.g. car, light goods vehicle, rigid HGV, articulated HGV and coaches/buses) will lead to more accurate estimates. Grossly aggregated data can lead to significant errors and expert opinion may be required in order to determine the validity of any conclusions drawn from numerical differences in calculated emissions.

8.4.1.3 Changes in carbon emissions for the opening year and over the whole appraisal period, as well as the monetary value for carbon emissions over the whole appraisal period, should be clearly documented, alongside qualitative comments and data sources.

8.4.1.4 The TAG Assessment method of Greenhouse Gases is broadly consistent with the regional impact assessment in DMRB 11.3.1 in terms of carbon emission rates. However, the regional impact assessment is carried out for the opening year only whereas the greenhouse gas assessment is for the whole of the 60 year appraisal period as well as the opening year. The assessment goes further than the DMRB regional assessment by estimating the net present monetary value of the total change in carbon emissions between the 'with scheme' and 'without scheme' scenarios over the whole appraisal period.

8.4.1.5 Carbon emissions for the 'with scheme' and 'without scheme' scenarios can be estimated using the DMRB 11.3.1 spreadsheet and then entered into the TAG global emissions excel spreadsheet to obtain the value of the change in carbon emissions if COBA or TUBA are not used. As only the opening year will have been assessed as part of the DMRB regional assessment, a forecast year will also have to be estimated and information for other years derived by interpolation and extrapolation

8.4.1.6 Carbon emissions are estimated for the 'with scheme' and without' scheme' options for each year in the 60 year appraisal period and are used for the monetary valuation exercise, where a net present value (NPV) of the change in carbon emissions over the appraisal period is derived.

8.4.2 Net Present Value

8.4.2.1 Estimates of the value of the additional global damage arising from an additional tonne of carbon being emitted into the atmosphere are referred to as estimates of the Social Cost of Carbon (SCC). The values to be used in appraisal follow the current Defra guidance Valuing the social cost of carbon emissions and originate from the GES working paper 140 Estimating the Social Cost of Carbon Emissions, (Clarkson & Deyes, January 2002). The paper suggested an illustrative per tonne of carbon estimate of £70/tC as a central estimate within the range of £35 to £140/tC in 2000 prices for the global damage cost of carbon emissions. These values rise by £1/tC per year in real terms to reflect the increasing marginal cost of emissions over time.

8.4.2.2 Table 9.4.1 below presents the central, upper bound and lower bound estimates for the cost per tonne of carbon released into the atmosphere from 2000 to 2060 for various chosen years. For the purpose of appraisal, these have been adjusted to represent 2002 prices and values rather than 2000 prices and values. Hence each year there will be an increase in the SCC of £1.035/tC.

Table 8.4.1 Social cost (£) per tonne of carbon in 2002 prices - examples for chosen years							
Year	**2000**	**2002**	**2006**	**2010**	**2020**	**2040**	**2060**
Central Estimate	72.45	74.52	78.66	82.80	93.15	113.85	134.55
Upper bound	144.90	146.97	151.11	155.25	165.60	186.30	207.00
Lower bound	36.23	38.30	42.44	46.58	56.92	77.62	98.32

8.4.2.3 Generally, only the central estimate for the central SCC value will be required. However, where a scheme is particularly large or the impact on carbon emissions is likely to be disproportionately high the appraiser should also present the potential range of net present values using the upper and lower bound values.

8.4.3 Summary

8.4.3.1 A summary of the results are given in Table 8.4.2 below, full results can be found in the WEBTAG tables presented at the end of this report.

Table 8.4.2: Summary of Greenhouse Gas Emissions			
Scheme	**Whole Appraisal period Tonnes of C**	**Scheme opening year Tonnes of C**	**NVP**
Underground Base (Option 1)	-14,555	-237	£421,869
Underground Landbridge (Option 2)	-12,664	-207	£367,268
Cut and Cover Tunnel (Option 3)	-10,939	-176	£302,424
Overground base (Option 4)	4275	67	-£126,250
Overground Landbridge Equivalent (Option 5)	-789	-16	£23,921
Overground Extended Viaduct (Option 6)	-5,447	-80	£155,907

8.4.3.2 The total change in tonnes of carbon emitted between the with scheme and without scheme scenarios for the whole appraisal year and scheme opening year has been calculated. A positive number will suggest an increase in carbon emissions (relative to the 'without scheme' case), i.e. the scheme has an adverse impact on the greenhouse gas sub-objective. Alternatively a negative number will suggest that the scheme tends to reduce carbon emissions from the 'without scheme' case and hence there is a relative improvement on the greenhouse gas objective.

8.4.3.3 From the above table it can be seen that the carbon emission reduce for all schemes except the Overground Base Scheme where a net increase of 4,275 tonnes of carbon are recorded for the whole appraisal period and 67 tonnes of carbon in the opening year.

8.5 Landscape

8.5.1 As the site lies within an urban environment i.e. the city centre of Kingston upon Hull the landscape assessment has been undertaken in conjunction with the townscape assessment as outlined in Section 8.6 Townscape

8.6 Townscape

8.6.1 Methodology

8.6.1.1 This study has been carried out in accordance with the Design Manual for Roads and Bridges (DMRB) Volume 11: Environmental Assessment, Section 3, Part 5 Landscape Effects and Interim advice note (IAN) 81/06. Methods for assessing landscape and visual impact are provided by the Landscape Institute with the Institute of Environmental Management and Assessment, “Guidelines for Landscape and Visual Impact Assessment, second edition, 2002” (GLVIA 2002). In addition the Countryside Agency and Scottish Natural Heritage have published “Landscape Character Assessment Guidance for England and Scotland, 2002”. The guidance in these publications has been used to augment the method outlined in DMRB Volume 11 Section 3, Part 5. When assessing townscape character and quality there is an absence of specific guidance however the above guidance can be tailored for an urban setting with particular reference to Chapter 8 ‘Variations for Urban Schemes’ of DMRB Volume 11 Section 3, Part 5.

8.6.1.2 Transport appraisal is required to be carried out at all stages of the development of a road scheme. Transport appraisal is concerned with, among other things, the environmental effects of a proposed development. Transport analysis guidance (TAG) is provided on the world-wide web http://www.webtag.org.uk/index.htm and includes guidance for the appraisal of both landscape (TAG Unit 3.3.7) and townscape (3.3.8). The Landscape/Townscape and Visual Impact Assessment take into account this guidance and the findings of the assessment were used to complete the TAG worksheets for landscape and townscape.

8.6.1.3 There is a distinction to be made between landscape/townscape impact and visual impact:

- Landscape/townscape impacts are the result of a change to the fabric, character or quality of the landscape or townscape as a result of development. They do not have to be seen; and
- Visual impact results from a change to / from a view.

8.6.1.4 There may therefore be substantial landscape impact but little visual impact if the site is remote with no residential properties, public rights of way or other public access areas to view it. Alternatively, there may be visual impacts and few landscape impacts if a development does not result in a change to physical elements, for example, in a landscape with similar development that is already characteristic.

8.6.1.5 For the purposes of this assessment undertaken for an urban area the term 'urban landscape' will be expressed as 'townscape'. The assessment has examined impacts on both landscape and townscape.

8.6.2 Assessment of Landscape/Townscape Impacts

8.6.2.1 The criteria used to define potential adverse (negative) or beneficial (positive) impacts upon the landscape/townscape character are as follows:

- The character of the existing landscape/townscape (based on the Countryside Agency (CA) Guidelines) (local historic studies/conservation area appraisals);
- The quality (or condition) and value of the existing landscape/townscape (when making judgements);
- The ability of the landscape/townscape to accommodate change as a result of the proposed development without adverse effects on its character (based on the sensitivity of the landscape/townscape); and

- The nature of predicted impacts (scale or magnitude of the impact). This is generally based on the scale or degree of change to the landscape/ townscape resource i.e. major, moderate, minor, negligible or no change and the nature of the effect i.e. negative (adverse) or positive (beneficial) and its duration i.e. short, medium, long term, permanent or temporary.

8.6.2.2 Landscape/townscape quality has been assessed based on the five point scale given in DMRB using the criteria set out in Table 8.6.1.

Table 8.6.1: Assessment of Landscape/Townscape Quality

Landscape/ Townscape Quality	Description
1 - High Quality	Landscapes that are internationally and/or nationally recognised with National Park or Area of Outstanding Natural Beauty or World Heritage site status. Townscapes with National area / feature designation and assemblage of important listed historical and rich cultural features including Conservation Areas, Listed Buildings, valued modern building. Well maintained unified townscape with attractive visual detail and no detractors. Unique sense of place. Negligible pedestrian and traffic conflict.
2 - Very attractive	Landscapes that are attractive and diverse with few visual detractors, often designated locally as Special Landscape Areas or similar for their quality. Features worthy of conservation. Townscapes with a harmonious relationship between buildings and hierarchy of publicly accessible spaces. Several Listed Buildings or local area / feature designations may apply including features of regional interest. Highly permeable, well maintained and no significant townscape detractors. Townscape promotes social interaction and pedestrian movement dominates traffic circulation with few conflicts. Strong sense of place
3 - Good	Pleasant landscapes with some distinctive qualities. Occasional detractors are present. Townscapes that are locally distinctive with vernacular or planned layout and well maintained. Occasional degrading by unsympathetic modern development. Retaining essential characteristics worthy of conservation with potential for enhancement. Townscape supports social interaction and pedestrian movement co-exists with traffic movement with few conflicts. Sense of place
4 - Ordinary	Average landscape with no particularly distinctive features and visual detractors present. Townscapes of little local distinctiveness, Lack of sense of place. although occasional feature worthy of conservation. Few opportunities for social interaction, limited to specific ‘community’ locations. Traffic circulation usually controls pedestrian movement.

Table 8.6.1: Assessment of Landscape/Townscape Quality	
Landscape/ Townscape Quality	**Description**
5 - Poor	Unattractive landscapes with many visual detractors and no distinctive sense of place. Townscape in poor condition or decline, unwelcoming with a lack of opportunity for social interaction and features worthy of conservation. Pedestrian movement may be inhibited / severely constrained by major transport barrier.

8.6.2.3 The value placed on landscape differs from quality and depends upon the role the landscape plays and how it is viewed by stakeholders, as well as its quality. For example a landscape assessed to be of medium quality may have a high value if it is an area appreciated by local people for the role it plays in providing a distinctive setting for a town and informal recreation.

8.6.2.4 "The sensitivity of the landscape/townscape to change is reflected in the degree to which the landscape is able to accommodate change (due to the type of development or land use change) without adverse effects on its character. This may be influenced by the extent of existing or new landform and/or existing vegetation or new planting. These and other factors determine the visibility of the proposed development and therefore influence the extent of its effect on the perceived character and visual amenity of the surrounding landscape." (GLVIA 2002.)

8.6.2.5 Sensitivity of the townscape and landscape of Hull City Centre to the proposed improvements at Castle Street has been assessed by determining the ability of the landscape/townscape to accept change as a result of the proposed development without detriment to quality or value. Factors that influence the sensitivity of the area to change include the following: the potential for substitution (or replacement) of the characteristics affected; the rarity of the townscape; townscape features; existing land use pattern; layout and scale; views and distribution of visual receptors; the scope for mitigation in character with the area; and the quality and value placed on the landscape or townscape.

8.6.2.6 Sensitivity has been described using guidance on the terminology contained in IAN81/06 and adapted for landscape and townscape assessment. This is highlighted in Table 8.6.2.

Table 8.6.2: Assessment of Landscape/Townscape Sensitivity	
Landscape/ Townscape Sensitivity	**Description**
Very High	Generally higher quality/higher value landscapes/townscapes which cannot accommodate the proposed development without detrimental impact upon character. No substitutability and limited mitigation potential. The proposed development is uncharacteristic. International or national scale e.g. AONB, SAMs, NMR, Listed Buildings and Conservation Areas.
High	Good to higher quality and high value landscapes/townscapes with very limited substitutability where the proposed development is uncharacteristic and the potential for mitigation is limited. National, regional, district or local scale e.g. Conservation Areas, Listed Buildings, TPOs
Medium	Generally high quality, attractive or good quality landscapes/townscapes where the proposed development shares some characteristics with the surrounding area and where there is scope for mitigation in character with the area. There is some substitutability among the features and elements that contribute to character. Regional, district or local scale. Generally undesignated but value expressed through local designations and cultural associations. May contain Listed Buildings and TPOs
Low (or Lower)	The proposed development is characteristic of the area and there is a high degree of substitutability and potential for mitigation. District or local scale, townscape would benefit from restoration or enhancement
Negligible	Landscapes that the ability to accommodate the proposed development without changing the character of the area because the development is characteristic and the landscape of lower quality.

8.6.2.7 Scale or magnitude of landscape/townscape impact could be adverse (negative), negligible or beneficial (positive). The magnitude of impact criteria has been developed from GLVIA 2002 and IAN 81/06 and will be measured as summarised in Table 8.6.3.

Table 8.6.3: Magnitude of Landscape/ Townscape Impact	
Magnitude	**Description**
Major	The proposals are the dominant feature and there is severe damage (or major improvement) to key characteristics, features and elements that contribute to landscape/townscape.
Moderate	The proposal forms a visible and immediately apparent new feature that results in partial damage to (or addition of) key characteristics, elements and features that contribute to landscape/townscape.
Minor	Some measurable change where the proposal constitutes a minor feature in the landscape/townscape and results in loss (or addition) of one (or maybe more) key characteristics.

Table 8.6.3: Magnitude of Landscape/ Townscape Impact	
Magnitude	**Description**
Negligible	The proposal results in very minor loss (or benefit) to the characteristics, features and elements that contribute to character.
No change	No loss or alternation of characteristics or elements which contribute to landscape/townscape.

8.6.2.8 The significance of the predicted impact of the proposed development will depend upon the magnitude of the impact and the sensitivity of the receptor. Highly sensitive areas where the magnitude of change is predicted to be minor would result in a moderate significance for example. Significance of the impact may be positive or beneficial and will be assessed using the significance categories identified in IAN 81/06 and TAG Units 3.3.7 and 3.3.8. These are summarised in Table 8.6.4a and 8.6.4b below.

TABLE 8.6.4a: DETERMINATION OF THE SIGNIFICANCE OF THE PREDICTED IMPACT						
ENVIRONMENTAL VALUE (SENSITIVITY)	**Very High**	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight
		No change	**Negligible**	**Minor**	**Moderate**	**Major**
	MAGNITUDE OF IMPACT (DEGREE OF CHANGE)					

Table 8.6.4b: Significance of Landscape / Townscape Impact	
Impact	**Description**
Very Large	Only adverse effects are normally assigned this level of significance. The effects are generally, but not exclusively, associated with sites that have a high sensitivity to change where the magnitude of change is major. Proposals are dominant very damaging to character with no mitigation possibilities.

Table 8.6.4b: Significance of Landscape / Townscape Impact	
Impact	**Description**
Large	Adverse (or beneficial) effects where development destroys the integrity and range of characteristics (or provides opportunities to enhance and restore character) Beneficial – enhance the layout, mix, scale, appearance, human interaction and cultural aspects of the townscape. Enable restoration of highly valued features or elements. Proposals would enable a very strong sense of place, scale and quality to be restored or enhanced to a high quality. Adverse – proposals are in conflict to layout mix, scale, appearance, human interaction and cultural aspects. Proposals cannot be adequately mitigated and are likely to degrade or even destroy the integrity of townscape features. Proposals would substantially damage a high quality townscape causing a decrease in quality.
Moderate	Adverse (or beneficial) effects where development is out of scale or at odds with character and it is not possible to fully mitigate (or provides an opportunity to enhance and/or restore the character of the area through design and mitigation. Beneficial – proposals fit very well with the layout, mix, scale, appearance, human interaction and cultural aspects of the townscape. Enable restoration of characteristic features or elements. Enable a sense of place, scale and quality to be restored or enhanced. Adverse - proposals are out of scale to layout mix, scale, appearance, human interaction and cultural aspects. Proposals cannot be fully mitigated and would have an adverse impact on a townscape of recognised quality or on characteristic features.
Slight	Adverse (or beneficial) effects where the proposal does not quite fit with character and cannot be completely mitigated (or fits well with character and offers some restoration opportunities). Beneficial - proposals fit well with the layout, mix, scale, appearance, human interaction and cultural aspects of the townscape. Incorporate mitigation that blends well with surrounding townscape. Maintain or enhance existing townscape character. Adverse - proposals do not quite fit the layout, mix, scale, appearance, human interaction and cultural aspects of the townscape. Proposals cannot be completely mitigated and affect existing townscape quality and character.
Neutral	The proposal compliments and fits with existing character, hence character is maintained. Proposals complement the existing layout, mix, scale, appearance, human interaction and cultural aspects of the townscape. Incorporate mitigation to ensure the scheme blends with the surrounding townscape whilst maintaining existing townscape character.

8.6.3 Cumulative Impacts

8.6.3.1 The cumulative effects of the scheme have been assessed looking at additional changes that may result from the development as a result of other developments either associated with it or separate to it.

8.6.4 Assessment Scenarios (Temporal Scope)

8.6.4.1 The assessment of landscape and townscape impacts of the proposed junction improvements is based on three stages of development; during the construction stage, at completion (i.e. Opening Year 0) and then at 15 years after completion. This method of assessment serves to provide a greater level of understanding of any likely landscape and visual impact through a period of time and considers the development of mitigation proposals; particularly screen planting which takes a period of time to establish.

8.6.5 Landscape and Townscape Impacts

8.6.5.1 The predicted landscape and townscape impacts of each of the six scheme options are described in detailed in Section 8.0 of the Environmental Assessment Report (PF, 2008) and a summary is given below.

8.6.5.2 The significance of the predicted impact of the proposed development would depend upon the *magnitude* of the impact and the *sensitivity* of the receptor.

<u>Option 1 – Underground Base</u>

8.6.5.3 The magnitude of the townscape and landscape impact is assessed to be *moderate adverse*. This is largely due to the effects upon the historic structures, Listed Buildings and Trinity Burial Ground. There would however be the opportunity to reduce the scale of this impact through the redesign/removal of the three pedestrian footbridges that have a significant negative impact on the character of the surrounding areas.

8.6.5.4 There are a range of landscape/townscape sensitivities found throughout the study area. Taking these results into account, the significance of impact of the proposed scheme option on the townscape and landscape is assessed to be **moderate adverse**.

<u>Option 2 – Underground Land Bridge</u>

8.6.5.5 The magnitude of the townscape and landscape impact is assessed to be *major adverse.* This is due to demolition of the Listed Buildings and structures and Holiday

Inn and Marina Court buildings. The Landbridge structure would also be highly prominent and out of scale; negatively impacting the surrounding sensitive townscape. There would be the opportunity to reduce the scale of this impact by the redesign/removal of the two pedestrian footbridges that have a significant negative impact on the character of the surrounding areas.

8.6.5.6 There are a range of landscape/townscape sensitivities found throughout the study area. Taking these results into account the significance of impact of the proposed scheme option on the townscape and landscape is assessed to be **large adverse**.

Option 3 – Underground Cut and Cover Tunnel

8.6.5.7 The magnitude of the townscape and landscape impact is assessed to be *major adverse.* There would be the opportunity to reduce the scale of this impact by the redesign/removal of the Porter Street pedestrian footbridge and avoiding the demolition of properties that front the A63, particularly the Listed Buildings.

8.6.5.8 There are a range of landscape/townscape sensitivities found throughout the study area. Taking these results into account, the significance of impact of the proposed scheme option on the townscape and landscape is assessed to be **large adverse**

Option 4 – Over Ground Base

8.6.5.9 The magnitude of the townscape and landscape impact is assessed to be *moderate adverse*. There would be the opportunity to reduce the scale of this impact by the redesign/removal of the three pedestrian footbridges that have a significant impact on the character of the surrounding areas and through the avoidance of the demolition of the Listed Buildings.

8.6.5.10 There are a range of landscape/townscape sensitivities found throughout the study area. Taking these results into account, the significance of impact of the proposed scheme option on the townscape and landscape is assessed to be **moderate adverse**.

Option 5 – Over Ground Land Bridge Equivalent

8.6.5.11 The magnitude of the townscape and landscape impact is assessed to be *major adverse*. The most significant impact of this option is the extended section of viaduct required to cross over the 'landbridge' area. The viaduct and 'landbridge' would also impact on a number of historic structures and Listed Buildings, impacting upon the settings and in severe cases resulting in demolition.. There would be the opportunity to reduce the scale of this impact by the redesign/removal of the two pedestrian footbridges (at either end of the scheme) and the redesign of the large footprint to the pedestrian 'landbridge' area that would have a significant impact on the character of the surrounding townscape areas.

8.6.5.12 There are a range of landscape/townscape sensitivities found throughout the study area. Taking these results into account, the significance of impact of the proposed scheme option on the townscape and landscape is assessed to **very large adverse**.

Option 6 – Over Ground Full Viaduct

8.6.5.13 The magnitude of the townscape and landscape impact is assessed to be *major adverse*. Option 6 has the largest impact on the area of Trinity Burial Ground and Listed Buildings and a large number of properties are demolished due to the proposals. The LAR does, however, offer potential for improved connectivity and new streetscape design within the area at ground level but this is countered by the dominating viaduct structure along the whole length of the route shading the areas below.

8.6.5.14 There are a range of landscape/townscape sensitivities found throughout the study area. Taking these results into account, the significance of impact of the proposed scheme option on the townscape and landscape is assessed to **very large adverse**.

8.6.6 Significance of Impact During Construction

8.6.6.1 Overall for all six scheme Options there would be a **very large adverse** impact during construction. There would be widespread disruption to the road network and associated construction structures and compound areas impacting on the scale and functionality of the study area. The high townscape / landscape impact results from the immediate effects of demolition of buildings and loss of open space and vegetation.

8.6.7 Significance of Impact Fifteen Years After Opening

8.6.7.1 If the proposed mitigation measures, as outlined in Section 8.7, are implemented, the opportunity to reduce the significance of the landscape and townscape impacts of the scheme could be achieved. Proposed urban street tree planting would mature over a period of time and users would become more familiar with the appearance of the area. New proposals for development in the surrounding townscape areas should also have taken account of the scheme to help to integrate it into the surrounding townscape.

8.6.7.2 Table 8.6.5 indicates the potential significance of townscape and landscape impact after fifteen years:

TABLE 8.6.5 Potential Significance of Townscape and Landscape Impact after Fifteen Years

SIGNIFICANCE	YEAR 1	YEAR 15
OPTION 1	Moderate Adverse	Slight Adverse
OPTION 2	Large Adverse	Moderate Adverse
OPTION 3	Large Adverse	Slight Adverse
OPTION 4	Moderate Adverse	Slight Adverse
OPTION 5	Very Large Adverse	Large Adverse
OPTION 6	Very Large Adverse	Very Large Adverse

8.6.8 Visual

8.6.8.1 The predicted visual impacts of each of the six scheme options are described in detailed in Section 8.0 of the Environmental Assessment Report (PF, 2008).

8.6.9 Mitigation

8.6.9.1 An assessment of mitigation has been undertaken as part of the landscape/townscape assessment within the Environmental Assessment Report (PF, 2008).

8.6.9.2 In addition to optimising the vertical and horizontal alignments, the following mitigation techniques have been proposed to achieve the required objectives:

- Tree and shrub planting;
- Retention of existing vegetation;
- Considerate use of building material to respect the areas heritage and other built style in the area; and
- High quality urban and landscape design within the public realm (including bridges, new public spaces, lighting, seating and shelters).

8.6.9.3 Full details of the proposed mitigation are given in the Environmental Assessment Report (PF, 2008)

8.6.10 Summary of Townscape/Landscape and Visual Impacts

8.6.10.1 For all six scheme options overall the predominant baseline quality of landscape / townscape is assessed to be **Ordinary to Good**. The landscape and townscape quality is generally ordinary with areas of very attractive and high quality in the central section of the study area, in the vicinity of the historic docks and Trinity Church (Old Town Conservation Area), in addition to ordinary and poor quality townscape areas; for example in the west of the study area.

8.6.10.2 For all six scheme options, the overall sensitivity of the existing landscape / townscape character to change would be **Medium**. It should be noted that this is overall assessment and there are areas of increased sensitivity in the central section of the study area around the Old Town Conservation Area; together with areas of lower sensitivity to the west of the study area.

<u>Options 1 - 3</u>

8.6.10.3 For Option 1, Underground Base, the significant new features and existing landscape and townscape features impacted upon include:

- the addition of three new pedestrian bridge structures at the western end, eastern end and central section;
- the removal of verge side vegetation between Porter Street and the Mytongate Junction;

- the removal of vegetation on the Mytongate Junction;
- the loss of an area of Trinity Burial Ground and associated mature trees and the new cutting taking the A63 under the Mytongate Junction;
- the demolition of the Listed Castle and Earl de Grey Buildings; and
- the construction new north wall to Humber Dock.

8.6.10.4 The predicted townscape impact of Option 1 is **moderate adverse**. This however could be reduced through the mitigation measures proposed and the long term townscape impact is predicted to be **slight adverse**.

8.6.10.5 Taking into account the magnitude of the townscape and landscape impact and the range of sensitivities found throughout the study area, the significance of impact from the proposed scheme option is assessed to be **moderate adverse**.

8.6.10.6 Overall for Option 1, the predicted visual impact is **moderate adverse**. A large number of residential properties would have views over the proposed Mytongate Junction and associated slip roads. These properties already have views over the existing road, however, the new road would be more visible due to the elevated junction with an increased presence in the townscape and be more obvious due to the removal of perimeter screening vegetation. A significant visual impact resulting from the scheme would be the three pedestrian footbridges. If these were to be removed / redesigned then the visual impact would be reduced accordingly. The visual impact could, however, be reduced over time if the mitigation measures proposed are implemented.

8.6.10.7 For Option 2, Underground Landbridge, the significant new features and existing landscape and townscape features impacted upon include:

- the addition of two new pedestrian footbridges at either end of the scheme, Porter Street and the Market Place Junction;
- the removal of verge side vegetation between Porter Street and the Mytongate Junction;
- the removal of vegetation on the Mytongate Junction;

- the loss of an area of Trinity Burial Ground and associated mature trees and the new cutting taking the A63 under the Mytongate Junction;
- the addition of a new pedestrian land bridge between Humber and Prince's Dock;
- a new northern retaining wall to Humber Dock;
- the loss of the Listed Castle Buildings and Earl De Grey Public House;
- the demolition of the northern leisure wing to the Holiday Inn; and
- the demolition of the northern wing of the Marina Court offices fronting the A63.

8.6.10.8 The predicted townscape impact of Option 2 is **major adverse**. This could however be reduced through the mitigation measures proposed, the long term townscape impact has the potential to be **moderate adverse.**

8.6.10.9 Taking into account the magnitude of the townscape and landscape impact and the range of sensitivities found throughout the study area the significance of impact resulting from this scheme option is assessed to be **large adverse**.

8.6.10.10 Overall for Option 2, the predicted visual impact is **large adverse**. Castle Street would be both widened and perimeter screening vegetation removed this increasing the visibility to a large number of receptors. New structures proposed, such as the pedestrian land bridge and Market Place footbridge, would be highly visible and potentially discordant. The visual impact could be reduced over time if the mitigation measures proposed are implemented.

8.6.10.11 For Option 3, Underground Cut and Cover Tunnel, the significant new features and existing landscape and townscape features impacted upon include:

- the addition of a new pedestrian footbridge at the Porter Street end of the scheme;
- the removal of verge side vegetation between Porter Street and the Mytongate Junction;

- the removal of vegetation on the Mytongate Junction;
- the loss of an area of Trinity Burial Ground and associated mature trees and the new cutting taking the A63 under the Mytongate Junction;
- the provision of a new local access road over the A63 in covered tunnel;
- the demolition of the Listed Castle and Earl de Grey Buildings;
- the construction new north wall to Humber Dock; and
- the demolition of properties/offices fronting Castle Street in the Trinity Court and Grammar School Yard areas.

8.6.10.12 The predicted townscape impact of Option 3 is **major adverse**. This impact could be reduced through the mitigation measures proposed and the long term townscape impact has the potential to be **neutral to slight beneficial.**

8.6.10.13 Taking into account the magnitude of the townscape and landscape impact and the range of sensitivities found throughout the study area, the significance of impact from the proposed scheme option is assessed to be **large adverse**.

8.6.10.14 Overall for Option 3, the predicted visual impact is **moderate to slight adverse**. The same visual factors as Options 1 and 2 apply with the exception of the omission of the Prince's Quay and Market Place footbridge. The central footbridge is replaced with a local access road running over the A63 in tunnel. The 'cut and cover' tunnel has the potential to visually improve the setting of the central area of the study area with the removal of traffic from the view of many receptors. The visual impact could, however, be further reduced over time if the mitigation measures proposed are implemented.

<u>Options 4 - 6</u>

8.6.10.15 For Option 4, Overground Base, the significant new features and existing landscape and townscape features impacted upon include:

- the new short viaduct section over Mytongate Junction and connecting slip roads;

- the addition of three new pedestrian bridge structures at the western end, eastern end and central section;
- the removal of verge side vegetation between Porter Street and the Mytongate Junction;
- the removal of vegetation on the Mytongate Junction;
- the loss of an area of Trinity Burial Ground and associated mature trees;
- the demolition of the Listed Castle and Earl de Grey Buildings; and
- the construction new north wall to Humber Dock.

8.6.10.16 The predicted townscape impact of Option 4 is considered to be **moderate adverse**. This impact could be reduced through the mitigation measures proposed and the long term townscape impact has the potential to be **slight adverse.**

8.6.10.17 Taking into account the magnitude of the townscape and landscape impact and the range of sensitivities found throughout the study area, the significance of impact resulting from this option is assessed to be **moderate adverse**.

8.6.10.18 Overall for Option 4, the predicted visual impact is **large adverse**. Surrounding residential properties would receive views towards the elevated junction and associated slip roads. Whilst these properties already have views to the A63, the elevated nature of the proposed junction, combined with the loss of perimeter vegetation, would increase the visibility of the road. A significant visual impact associated with this scheme option would be the three pedestrian footbridges. If these were to be removed/redesigned then the visual impact would be reduced accordingly. The visual impact could, however, be reduced over time if the mitigation measures proposed are implemented.

8.6.10.19 For Option 5, Overground Landbridge Equivalent Option, the significant new features and existing landscape and townscape features impacted upon include:

- the addition of two new pedestrian footbridges at either end of the scheme, Porter Street and the Market Place Junction;

- the removal of verge side vegetation between Porter Street and the Mytongate Junction;
- the removal of vegetation on the Mytongate Junction;
- the loss of an area of Trinity Burial Ground;
- the new viaduct structure over Mytongate Junction;
- the addition of a new pedestrian land bridge between Humber and Prince's Dock;
- the demolition of the Listed Castle and Earl de Grey Buildings;
- the construction new north wall to Humber Dock; and
- the demolition of the Holiday Inn Leisure Club.

8.6.10.20 The predicted townscape impact of Option 5 is **major adverse**. This could be reduced through the mitigation measures proposed and the long term townscape impact has the potential to be **moderate adverse.**

8.6.10.21 Taking into account the magnitude of the townscape and landscape impact and the range of sensitivities found throughout the study area, the significance of impact from this option is assessed to **very large adverse**.

8.6.10.22 Overall for Option 5, the predicted visual impact is **very large adverse**. Surrounding residential properties would have views towards the elevated junction, and associated slip roads, and elevated section further east. Whilst such properties already have views of Castle Street the elevated nature of the junction, combined with the loss of perimeter vegetation, would increase the visibility of the road. New structures proposed such as the pedestrian land bridge spanning an area underneath the viaduct and Market Place footbridge would be highly visible at sensitive locations. The visual impact could, however, be reduced over time if the mitigation measures proposed are implemented.

8.6.10.23 For Option 6, the Overground Full Viaduct Option, the significant new features and existing landscape and townscape features impacted upon include:

- the addition of a new pedestrian footbridge at the Porter Street end of the scheme;
- the removal of verge side vegetation between Porter Street and the Mytongate Junction;
- the removal of vegetation on the Mytongate Junction;
- the loss of an area of Trinity Burial Ground and associated mature trees and the new cutting taking the A63 under the Mytongate Junction;
- the creation of a large viaduct section between Mytongate and Myton Bridge;
- the provision of a new local access road below the A63 viaduct section;
- the demolition of the Listed Castle and Earl de Grey Buildings;
- the construction new north wall to Humber Dock;
- the demolition of the northern wing to Marina Court offices; and
- the demolition of properties/offices fronting Castle Street in the Trinity Court and Grammar School Yard areas.

8.6.10.24 The townscape impact of Option 6 is predicted to be **major adverse**. This impact could be reduced to some extent through the mitigation measures proposed, in particular an iconic structure design. The long term townscape impact has the potential to be **moderate to major adverse.**

8.6.10.25 Taking into account the magnitude of the townscape/landscape impact and the range of sensitivities found throughout the study area, the significance of impact from this scheme option is assessed to **very large adverse**.

8.6.10.26 Overall for Option 6, the predicted visual impact is **very large adverse**. The elevated viaduct structure along the length of the scheme would be highly visible from the largest number of receptors. The removal of much traffic from ground level would improve the visual amenity, however, this is offset by the towering viaduct structure and continued local traffic at ground level. It is unlikely that over time the visual impact could be reduced significantly by the mitigation measures proposed due to the high visibility of the structure. Improved and new uses of the spaces underneath the viaduct could be utilised though.

8.7 Heritage and Historic Resources

8.7.1 Information Sources

8.7.1.1 In line with standard archaeological practice, and the requirements of the Institute of Field Archaeologists (IFA 1999a) and the DMRB Interim Advice Note (DOT 2007, 5/6 & 6/6), the following sources of information were examined to produce this Heritage Assessment.

- Archaeological Databases
- Aerial Photographs
- Listed and Unlisted Buildings
- Previous Investigations and Research
- Printed and Manuscript Maps
- Published and Unpublished Documentary Sources
- Geological and Soil Surveys
- Preliminary Walkover Survey

8.7.1.2 More details of the information sources are given in Section 5.0 of the Environmental Assessment Report (PF, 2008)

8.7.2 Assessment Methodology

<u>Assessment of Value</u>

8.7.2.1 DMRB states that assessment of value should consider how far the particular cultural heritage asset will contribute to an understanding of the past, through individual or group qualities, either directly or potentially. This requires a consideration of whether the assets belong to a group or subject of study that is of acknowledge importance, and how far it retains the characteristics that can contribute to an understanding of that group or subject, or whether it offers the potential for such understanding. Although the assessment of value is partly a professional judgement, other factors should be considered, such as regional research frameworks, existing characterisation initiatives, the Secretary of State for Culture, Media and Sport's criteria for scheduling Monuments and Listing Buildings of Special Architectural or Historic Interest, and the criteria developed by English Heritage in their Monuments Protection Programme (i.e. period, rarity, documentation, group value, survival/condition, fragility/vulnerability, diversity and potential) (HA 2007a, 5/4-5/5).

8.7.2.2 Guidance given by DMRB suggests that a six tier value grading system can be applied to archaeological remains and historic buildings, while historic landscapes have a five tier system (HA 2007a, A5/6-A5/8, A6/5-A6/7 & A7/8-A7/10). This replaces the previous DMRB categories of National, Regional or County, District or Local importance, and sites which are so badly damaged that little now remains to justify their inclusion in a higher grade (e.g. DOT 1995, 4/7).

8.7.2.3 The factors taken into account when assessing the value of archaeological sites are summarised in Table 8.7.1.

TABLE 8.7.1: FACTORS FOR ASSESSING THE VALUE OF CULTURAL HERITAGE ASSETS	
Very High	*Archaeological Remains* • World Heritage sites. • Assets of acknowledged international importance. • Assets that can contribute significantly to acknowledged international research objectives. *Historic Buildings* • Structures inscribed as of universal importance as World Heritage sites. • Other buildings of recognised international importance. *Historic Landscape Units* • World Heritage sites inscribed for their historic landscape qualities. • Historic landscapes of international value, whether designated or not. • Extremely well preserved historic landscapes with exception coherence, time-depth, or other critical factor(s).
High	*Archaeological Remains* • Scheduled Monuments (including proposed sites). • Undesignated assets of schedulable quality and importance. • Assets that can contribute significantly to acknowledged national research objectives.

TABLE 8.7.1: FACTORS FOR ASSESSING THE VALUE OF CULTURAL HERITAGE ASSETS	
	Historic Buildings • Scheduled Monuments with standing remains. • Grade I and II* Listed Buildings. • Other Listed Buildings that can be shown to have exceptional qualities in their fabric or historical associations not adequately reflected in their listing grade. • Conservation Areas containing very important buildings. • Undesignated structures of clear national importance. *Historic Landscape Units* • Designated historic landscapes of outstanding interest. • Undesignated landscapes of outstanding interest. • Undesignated landscapes of high quality and importance, and of demonstrable national value. • Well preserved historic landscapes, exhibiting considerable coherence, time-depth of other critical factor(s).
Medium	*Archaeological Remains* • Designated or undesignated assets that contribute to regional research objectives. *Historic Buildings* • Grade II Listed Buildings. • Historic (unlisted) buildings that can be shown to have exceptional qualities in their fabric or historical associations. • Conservation Areas containing buildings that contribute significantly to its historic character. • Historic Townscape or built-up areas with important historic integrity in their buildings or built settings (e.g. including street furniture and other structures). *Historic Landscape Units* • Designated special historic landscapes. • Undesignated historic landscapes that would justify special landscape designation, landscapes of regional value. • Averagely well-preserved historic landscapes with reasonable coherence, time-depth of other critical factors.
Low	*Archaeological Remains* Designated or undesignated assets of local importance. • Assets compromised by poor preservation and/or poor survival of contextual associations. • Assets of limited value, but with potential to contribute to local research objectives. *Historic Buildings* • “Locally Listed” buildings. • Historic (unlisted) buildings of modest quality in their fabric or historical association. • Historic Townscape or built-up areas of limited historic integrity in their buildings or built settings (e.g. including street furniture and other structures). *Historic Landscape Units* • Robust undesignated historic landscapes. • Historic landscapes with importance to local interest groups. • Historic landscapes whose value is limited by poor preservation and/or poor survival of contextual associations.
Negligible	*Archaeological Remains* • Assets with very little or no surviving archaeological interest.

TABLE 8.7.1: FACTORS FOR ASSESSING THE VALUE OF CULTURAL HERITAGE ASSETS	
	Historic Buildings • Buildings of no architectural or historical note; buildings of an intrusive character. *Historic Landscape Units* • Landscapes with little or no significant historical interest.
Unknown	*Archaeological Remains* • The importance of the resource cannot be ascertained. *Historic Buildings* • Buildings with some hidden (i.e. inaccessible) potential for historic significance.

<u>Magnitude of Impact</u>

8.7.2.4 The magnitude of impact is defined as the degree of change that would be experienced by the cultural heritage asset and its setting if the proposed scheme was to be implemented. This assessment should take into account any mitigation that is proposed as part of the design. Sources of potential impacts, before mitigation, should be identified but the assessment of their magnitude should include the agreed mitigation (HA 2007a, 5/5).

8.7.2.5 There are numerous sources of impacts relating to a road scheme, and these are highlighted in detail in DMRB (HA 2007a, A5/9-A5/11, A6/8-A6/9 & A7/13-7/14). The following summarises the sources of information that need to be examined in order to determine the magnitude of impacts:

- General details contained in the scheme design about the nature and extent of the proposed groundworks and below-ground disturbance, including site investigations, site clearance, topsoil stripping, peat excavations, landscaping, drainage, planting, groundworks for services and lighting and the extent of landtake;
- Areas of previous or existing disturbance which may have already affected any assets;
- Design proposals which may have a direct impact, for example, increased pollution, noise, vibration, visual intrusion, or the possibility of collision damage;
- Off site works such as compounds, borrow pits, haul roads etc;

- Design proposals what may affect setting, context or legibility, such as lighting, signage or bunds;

- Aspects of the scheme that have the potential for indirect impacts, such as drainage that might alter the existing water table, or severance leading to decreased economic viability of historic resources and subsequent detrimental changes.

8.7.2.6 These sources have been consulted as part of the current assessment, where they currently exist.

8.7.2.7 The magnitude of impact (i.e. the degree of change) can be positive or negative, and is ranked without regard to the value of the asset. Therefore, the total destruction of a Low Value asset will have the same magnitude of impact as the total destruction of a High Value asset; the value of the asset is factored in later when the significance of the effect is assessed (see below). The magnitude of impact can be ranked according to a five tier scale (HA 2007a, A5/13, A6/11 & A7/16), as set out in Table 8.7.2.

TABLE 8.7.2: FACTORS IN THE ASSESSMENT OF MAGNITUDE OF IMPACTS	
Major	*Archaeological Remains* • Change to most of all key archaeological materials, such that the resource is totally altered. • Comprehensive changes to setting. *Historic Buildings* • Changes to key historic building elements, such that the resource is totally altered. • Comprehensive changes to the setting. *Historic Landscape Units* • Change to most or key historic landscape elements, parcels or components; extreme visual effects; gross change of noise or change to sound quality; fundamental changes to use or access; resulting in total change to the historic landscape character unit.
Moderate	*Archaeological Remains* • Changes to many key archaeological materials, such that the resource is clearly modified. • Considerable changes to setting that affect the character of the asset. *Historic Buildings* • Changes to many key historic building elements, such that the resource is significantly altered. • Changes to the setting of an historic building, such that it is significantly modified.

TABLE 8.7.2: FACTORS IN THE ASSESSMENT OF MAGNITUDE OF IMPACTS	
	Historic Landscape Units • Changes to many key historic landscape elements, parcels or components; visual change to many key aspects of the historic landscape; noticeable differences in noise or sound quality; considerable changes to use or access; resulting in moderate changes to historic landscape character.
Minor	*Archaeological Remains* • Changes to key archaeological materials, such that the asset is slightly altered. • Slight changes to setting. *Historic Buildings* • Changes to key historic building elements, such that the asset is slightly different. • Changes to setting of an historic building, such that it is noticeably changed. *Historic Landscape Units* • Changes to few key historic landscape elements, parcels or components; slight visual change to few key aspects of the historic landscape; limited changes to noise levels or sound quality; slight changes to use or access; resulting in limited changes to historic landscape character.
Negligible	*Archaeological Remains* • Very minor changes to archaeological materials, or setting. *Historic Buildings* • Slight changes to historic building elements or setting that hardly affect it. *Historic Landscape Units* • Very minor changes key historic landscape elements, parcels or components; virtually unchanged visual effects; very slight changes in noise levels or sound quality; very slight changes to use or access; resulting in a very small change to historic landscape character.
No change	*Archaeological Remains* • No change. *Historic Buildings* • No change to fabric or setting. *Historic Landscape Units* • No change to elements, parcels or components; no visual or audible changes; no changes arising in amenity or community factors.

Significance of Effects

8.7.2.8 By combining the magnitude of impact of the scheme proposals and the value of each affected asset, an assessment can then be made of the significance of the effects (i.e. the overall effect) on each identified cultural heritage asset. Following the advice in DMRB, these significances can be defined as being Very Large, Large, Moderate, Slight or Neutral (HA 2007a, 5/5); it should be noted that these significances can be adverse or beneficial, and that the agreed mitigation should be incorporated into the equation.

8.7.2.9 The process of assessing the significance of effects is best illustrated by the matrix below.

VALUE OF ASSET						
	Very High	Neutral	Slight	Moderate/Large	Large/ Very Large	Very Large
	High	Neutral	Slight	Moderate/Slight	Moderate/Large	Large/ Very Large
	Medium	Neutral	Neutral/Slight	Slight	Moderate	Moderate/Large
	Low	Neutral	Neutral/Slight	Neutral/Slight	Slight	Moderate/Slight
	Negligible	Neutral	Neutral	Neutral/Slight	Neutral/Slight	Slight
		No change	**Negligible**	**Minor**	**Moderate**	**Major**
		MAGNITUDE OF IMPACT				

8.7.2.10 This matrix is not intended to be a formulaic process, and there should also be an element of professional judgement, especially when considering the significance grades which are partially defined by a wide percentage of disturbance; this professional judgement will determine which of the two options are available in some of the boxes above.

<u>Overall Cultural Heritage Effect</u>

8.7.2.11 It is also necessary to produce an overview of the significance of effect on the combined cultural heritage resource (i.e. the sub-topics of archaeological remains, historic buildings and historic landscapes) for any proposed scheme as a whole. For an individual cultural heritage asset, there may be differing degrees of effect according to each sub-topic - for example, an historic structure in an industrial landscape may be more important in the historic landscape assessment than its relevance to archaeology. In these cases, the highest reading is taken as the significance of effect for that asset, and it is important that it is not “double counted”.

8.7.2.12 If all the effects on all assets are adverse, the highest Significance of Effect value would normally be taken to be the overall cultural heritage effect, although professional judgement should be used to ensure that this does not distort the assessment. Conversely, a scheme with wholly beneficial effects would not necessary be assessed at the highest beneficial value, in case this also distorts the assessment. When a combination of both adverse and beneficial effects are involved, as is often the case, this should be brought out in the assessment and recorded separately; they do not cancel each other out (HA 2007a, 5/14).

8.7.3 Principles of Mitigation

8.7.3.1 Mitigation aims to avoid, lessen or repair adverse impacts on the cultural heritage resource resulting from a scheme, and there is a presumption in favour of preservation in situ. Only for significant remains should the option of preservation by record (i.e. archaeological investigation or other recording) be adopted, and in these instances the mitigation would also include the analysis, interpretation and appropriate dissemination of the results. The increase in knowledge gained through such recording should not normally be counted as a benefit, but it should be offset against the loss of information that would otherwise occur if the site was to be damaged or destroyed unrecorded.

8.7.3.2 Once the presence and value of the cultural heritage assets have been established, or the potential for them, mitigation of any potential impacts is an iterative process, and mitigation measures should be considered at all stages of the scheme design.

8.7.4 Evaluation of the Cultural Heritage Assets

8.7.4.1 Using the data gathered by the current and previous desk-top research, an initial assessment of the value of each cultural heritage asset identified within the study area can be made. The criteria for assigning the various value grades is outlined above.

8.7.4.2 The grades of value given to the 231 identified cultural heritage sites are shown in Table C1 at the end of this report. From this, it can be seen that the study area contains ten sites of High value (namely sections of the medieval town defences- Sites 24, 28 and 59, The Old Grammar School - Site 39, the remains of Myton Gate - Site 52, Holy Trinity Church - Site 88, No. 7 Dagger Lane - Site 99, King William III statue - Site 102, the remains of the Augustinian Friary - Site 106, and the former course of Mytongate and its adjacent tenements - Site 225), 45 sites of Medium value, 89 sites of Low value, 85 sites of Negligible value and two sites of Unknown value. It should be noted that fully excavated sites are afforded a negligible value, as all archaeological deposits within the site will have been removed by the excavation.

It should further be noted that these grades may well change (either up or down) as more data is collected, particularly when assessing the archaeological sites.

8.7.5 Assessment of Impacts

Magnitude of Impact

8.7.5.1 The following discussion of the impacts of the development has been subdivided into six sections, reflecting the six proposed scheme options outlined above. In all cases, the impacts are discussed from west to east. Some of the impacts are the same for each option, but the explanatory text has been repeated for each case, to allow for direct and stand-alone comparisons.

8.7.5.2 It should also be noted that, in the absence of any detailed scheme design (which should not be expected at this stage of the project), for example, details on the depths of any excavations for new foundations and sub-bases for new carriageways especially when at grade, the precise impacts of development on the cultural heritage resource cannot be determined at this time; given the relatively shallow depths of below ground deposits in most parts of the proposed route corridors, the worst case scenario, i.e. the removal of all affected archaeological deposits has been assumed. Some information on the possible locations of site compounds and materials storage areas is available, and these have been included in the assessments below, but there is currently no information on drainage, new service works, statutory undertakers diversions and/or landscaping proposals, which could also have significant archaeological impacts. In addition, further research or archaeological evaluations of individual sites, or the option corridors as a whole, will provide additional information on the scale, extent and importance of the underlying archaeological deposits. It is therefore probable that the impacts of the various scheme options may change (either up or down), as more data on each identified site is collected or as detailed design progresses.

8.7.5.3 The criteria for assigning the various grades for the magnitude of impacts is outlined above.

Option 1: Underground Base

8.7.5.4 Based on the current state of knowledge and information, it is considered that this scheme option will have an impact on 44 identified Cultural Heritage sites. Within this group, there are four High value sites, namely the remains of the Myton Gate (Site 52), two sections of the medieval town defences (Sites 24 and 28) and the former course of Mytongate and its associated street frontage tenements (Site 225). There are also nine Medium grade sites, namely the Holy Trinity Burial Ground (Site 12), the former 18th century gaol (Site 15), Castle Street Chambers (Site 19), the Earl de Grey Public House (Site 42), the former lock between the Humber and Prince's Docks (Site 45), the Humber Dock itself (Site 49), Warehouse No. 6 (Site 47), the section of Civil War defences (Site 20) and the Hull Old Town Conservation Area (Site 224).

8.7.5.5 Of the 44 impacts, all of which are considered to be negative, 23 are considered to be Major, eight are thought to be Moderate, eight are thought to be Minor, three are considered to be Negligible, and two will experience No Change. Details of all the impacted assets are contained in Table C2 in Appendix C of the Environmental Assessment Report (PF, 2008).

Option 2: Underground Landbridge

8.7.5.6 Based on the current state of knowledge and information, it is considered that this scheme option will have an impact on 55 identified Cultural Heritage sites. Within this group, there are four High value sites, namely the remains of the Myton Gate (Site 52), two sections of the medieval town defences (Sites 24 and 28), and the former course of Mytongate and its associated street frontage tenements (Site 225). There are also eleven Medium grade sites, namely the Holy Trinity Burial Ground (Site 12), the former 18th century gaol (Site 15), Castle Street Chambers (Site 19), the Earl de Grey Public House (Site 42), the former lock between the Humber and Prince's Docks (Site 45), the Humber Dock itself (Site 49), Warehouse No. 6 (Site 47), the section of Civil War defences (Site 20), the site of the former Theatre Royal (Site 72), post-medieval occupation on the north side of Blanket Row (Site 100) and the Hull Old Town Conservation Area (Site 224).

8.7.5.7 Of the 55 impacts, all of which are considered to be negative, 33 are considered to be Major, eight are thought to be Moderate, eight are thought to be Minor, three are considered to be Negligible, and three will experience No Change. Details of all the impacted assets are contained in Table C2 in Appendix C of the Environmental Assessment Report (PF, 2008).

Option 3: Underground Cut and Cover Tunnel

8.7.5.8 Based on the current state of knowledge and information, it is considered that this scheme option will have an impact on 91 identified Cultural Heritage sites. Within this group, there are six High value sites, namely the remains of the Myton Gate (Site 52), sections of the medieval town defences either side of the Myton Gate (Sites 24 and 28), the unexcavated parts of Augustinian Friary (Site 106), the statue of King William III in the Market Place (Site 102), and the former course of Mytongate and its associated street frontage tenements (Site 225). There are also 16 Medium grade sites, namely the Holy Trinity Burial Ground (Site 12), the former 18th century gaol (Site 15), Castle Street Chambers (Site 19), the Earl de Grey Public House (Site 42), the former lock between the Humber and Prince's Docks (Site 45), the Humber Dock itself (Site 49), Warehouse No. 6 (Site 47), the section of Civil War defences (Site 20), medieval and later occupation either side of Burnett House (Site 97), the former Chequers Hotel site (Site 80), the site of the former Theatre Royal (Site 72), post-medieval occupation on the north side of Blanket Row (Site 100), the former Market Hall site (Site 108), the public toilets in the Market Place (Site 102), the medieval and later Town Gaol (Site 104), and the Hull Old Town Conservation Area (Site 224).

8.7.5.9 Eighty-nine of the 91 impacts are considered to be negative, 55 are considered to be Major, 13 are thought to be Moderate, nine are thought to be Minor, one is considered to be Negligible, and eleven will experience No Change. Two of the impacts will be positive, graded as Minor in both cases. Details of all the impacted assets are contained in Table C2 in Appendix C of the Environmental Assessment Report (PF, 2008).

Option 4: Overground Base

8.7.5.10 Based on the current state of knowledge and information, it is considered that this scheme option will have an impact on 44 identified Cultural Heritage sites. Within this group, there are four High value sites, namely the remains of the Myton Gate (Site 52), two sections of the medieval town defences (Sites 24 and 28), and the former course of Mytongate and its associated street frontage tenements (Site 225). There are also nine Medium grade sites, namely the Holy Trinity Burial Ground (Site 12), the former 18th century gaol (Site 15), Castle Street Chambers (Site 19), the Earl de Grey Public House (Site 42), the former lock between the Humber and Prince's Docks (Site 45), the Humber Dock itself (Site 49), Warehouse No. 6 (Site 47), the section of Civil War defences (Site 20), and the Hull Old Town Conservation Area (Site 224).

8.7.5.11 Of the 44 impacts, all of which are considered to be negative, 23 are considered to be Major, eight are thought to be Moderate, eight are thought to be Minor, three are considered to be Negligible, and two will experience No Change. Details of all the impacted assets are contained in Table C2 in Appendix C of the Environmental Assessment Report (PF, 2008).

Option 5: Overground Landbridge Equivalent

8.7.5.12 Based on the current state of knowledge and information, it is considered that this scheme option will have an impact on 54 identified Cultural Heritage sites. Within this group, there are four High value sites, namely the remains of the Myton Gate (Site 52), two sections of the medieval town defences (Sites 24 and 28), and the former course of Mytongate and its associated street frontage tenements (Site 225). There are also eleven Medium grade sites, namely the Holy Trinity Burial Ground (Site 12), the former 18th century gaol (Site 15), Castle Street Chambers (Site 19), the Earl de Grey Public House (Site 42), the former lock between the Humber and Prince's Docks (Site 45), the Humber Dock itself (Site 49), Warehouse No. 6 (Site 47), the section of Civil War defences (Site 20), the site of the former Theatre Royal (Site 72), post-medieval occupation on the north side of Blanket Row (Site 100) and the Hull Old Town Conservation Area (Site 224).

8.7.5.13 Of the 54 impacts, all of which are considered to be negative, 34 are considered to be Major, seven are thought to be Moderate, seven are thought to be Minor, three are considered to be Negligible, and three will experience No Change. Details of all the impacted assets are contained in Table C2 in Appendix C of the Environmental Assessment Report (PF, 2008).

Option 6: Overground Extended Viaduct

8.7.5.14 Based on the current state of knowledge and information, it is considered that this scheme option will have an impact on 92 identified Cultural Heritage sites. Within this group, there are six High value sites, namely the remains of the Myton Gate (Site 52), sections of the medieval town defences either side of the Myton Gate (Sites 24 and 28), the unexcavated parts of Augustinian Friary (Site 106), the statue of King William III in the Market Place (Site 102), and the former course of Mytongate and its associated street frontage tenements (Site 225). There are also 16 Medium grade sites, namely the Holy Trinity Burial Ground (Site 12), the former 18th century gaol (Site 15), Castle Street Chambers (Site 19), the Earl de Grey Public House (Site 42), the former lock between the Humber and Prince's Docks (Site 45), the Humber Dock itself (Site 49), Warehouse No. 6 (Site 47), the section of Civil War defences (Site 20), the former Chequers Hotel site (Site 80), medieval and later occupation either side of Burnett House (Site 97), the site of the former Theatre Royal (Site 72), post-medieval occupation on the north side of Blanket Row (Site 100), the former Market Hall site (Site 108), the public toilets in the Market Place (Site 101), the medieval and later Town Gaol (Site 104) and the Hull Old Town Conservation Area (Site 224).

8.7.5.15 Of the 92 impacts, all of which are considered to be negative, 55 are considered to be Major, 16 are thought to be Moderate, nine are thought to be Minor, one is considered to be Negligible, and eleven will experience No Change. Two of the impacts will be positive, graded as positive in both cases. Details of all the impacted assets are contained in Table C2 in Appendix C of the Environmental Assessment Report (PF, 2008).

<u>Comparison of Options</u>

8.7.5.16 The various impacts on the individual Cultural Heritage sites arising from the six scheme options are summarised in Table 8.7.5

TABLE 8.7.5: SUMMARY OF SCHEME IMPACTS

		Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
No of affected sites		**44**	**55**	**91**	**44**	**54**	**92**
Values of sites	High	4	4	6	4	4	6
	Medium	9	11	16	9	11	16

TABLE 8.7.5: SUMMARY OF SCHEME IMPACTS							
		Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
	Low	20	28	44	20	27	45
	Negligible	11	12	25	11	12	25
Magnitude of impacts	Major negative	23	33	55	23	34	55
	Moderate negative	8	8	13	8	7	16
	Minor negative	8	8	9	8	7	9
	Negligible negative	3	3	1	3	3	1
	No change	2	3	11	2	3	11
	Negligible positive	0	0	0	0	0	0
	Minor positive	0	0	2	0	0	0
	Moderate positive	0	0	0	0	0	0
	Major positive	0	0	0	0	0	0

Archaeological Potential

8.7.5.17 The archaeological potential of the proposed A63 Castle Street improvement scheme has already been highlighted by the previous desk-top surveys (e.g. YAT 1994a; Evans 2004a), and the current detailed assessment has found no evidence to refute or contradict these conclusions. Indeed, the current assessment, which is based on additional research, the results from more recent archaeological excavations and a re-interpretation of some of the earlier findings, suggests that some of the previous conclusions were slightly downplayed, and that the archaeological implications of the scheme will be very significant.

8.7.5.18 As has already been summarised, the Old Town has been subject to several large-scale archaeological investigations, and these generally indicate intensive medieval occupation from the mid 13th century onwards, particularly along the main thoroughfares such as High Street (formerly Hull Street), Blackfriargate/Blanket Row (Monkgate), and the east part of Humber Street. This will also apply to Castle Street which follows the line of the medieval Mytongate. Many of the development plots in the area to the east of Finkle Street were established before 1293, and possibly as early as the late 1260s or early 1270s. The previous Old Town excavations have already provided an indication of what to expect, namely well preserved stratified archaeological deposits extending to depths of c.3m, although a greater or lesser depth will occur in specific areas, depending on the extent of subsequent disturbance; in some cases archaeological deposits can be found less that 0.4m below the existing ground surface. Even where Victorian cellars are present, early post-medieval and medieval deposits frequently survive intact beneath. The high water table across the area and especially in the Old Town means that preservation of organic material is usually very good, and there is a high potential for palaeo-environmental and related deposits.

8.7.5.19 Nevertheless, despite the documentary and archaeological evidence, many aspects of the Old Town's history are unknown or unclear. For example, there is currently little evidence for the 12th century town of Wyke and even the location and form of this settlement is unknown in detail. There is also much uncertainty regarding the extent and location of other monastic property in the later town, and the locations of some of the medieval hospitals, maisons dieu and bedehouses are also unknown. Similarly, although the location of the Myton Gate is known, and the nature and character of the town walls are understood, their precise alignment and arrangement, together with the ditch and the Civil War defences on their western sides are unclear. The archaeological potential for most parts of the Old Town is therefore high, and this is reflected in the designation of the area as an "Area of Archaeological Interest" in the Hull City Plan (HCC 2000, 155).

8.7.5.20 The form and location of archaeological sites to the west of the Old Town is currently poorly understood. The locations of Myton Village (probably outside the present study area) and the monastic Myton Grange (Site 8) have still to be determined, and the very existence of the Old River Hull (Site 7) and any associated pre-medieval settlement is still the subject of debate. The limited understanding of the past topography here means that the historic utilisation of the land from the prehistoric periods to the early post-medieval period is still unclear. The archaeological potential of the study area to the west of the Old Town must therefore be classified as medium.

Initial Mitigation Recommendations

8.7.5.21 The results of the Detailed Cultural Heritage Assessment have provided an indication of the known cultural heritage resource within the study area. From this baseline information, recommendations can be made to mitigate the various proposed scheme options. At this stage of the project, when detailed designs have not yet been fully produced, it is difficult to suggest specific mitigation measures for individual sites, but general principles can be applied to the various scheme options as a whole. Further design work can then be assessed against the existing base-line data as the scheme develops, for example when considering statutory undertakers diversions, additional drainage works and/or landscape proposals. In addition, such further design work may lead to the requirement for differing mitigation and investigative works.

8.7.5.22 An outline assessment and initial recommendations for mitigation required as a result of the six options are given in Section 5.0 of the Environmental Assessment Report (PF 2008). The initial mitigation recommendations as currently proposed for each of the scheme options has been summarised in Table C3 in Appendix C of the Environmental Assessment Report. These recommendations may well change as scheme design progresses and/or peripheral works such as landscaping and drainage become formulated. Please note that Phase 4 and Phase 5 works have not been included in the initial recommendations.

8.7.6 Significance of Effects

8.7.6.1 As outlined in above, a combination of the magnitude of impact and the value of each affected asset allows an assessment to be made of the significance of the effects (i.e. the overall effect) on each cultural heritage asset. These significances, which should include the agreed mitigation, can be defined as being Very Large, Large, Moderate, Slight or Neutral, and they can be adverse or beneficial. Once again, the various limitations of the detailed design data which is available at this stage of the project needs to be considered and taken into account, and the significance of effects may change (either up or down), as more data on each identified site is collected or as detailed design progresses.

8.7.6.2 The following discussion of the impacts of the development has been subdivided into six sections, reflecting the six proposed scheme options. A summary of the impacts are given below, full details of all of the impacts are given within the Cultural Heritage assessment presented in the Environmental Assessment Report (PF, 2008)

Option 1: Underground Base

8.7.6.3 This scheme option is considered to result in four Large Adverse impacts (on the 18th century gaol (Site 15), on the two Listed Buildings (Sites 19 and 42), and on the site of the Myton Gate (Site 52)), 11 Moderate Adverse impacts (on Sites 143, 10, 12, 13, 18, 43, 44, 45, 20, 24 and 28), 24 Slight Adverse impacts and 5 neutral impacts. There are no beneficial impacts.

8.7.6.4 There will also be a further Slight adverse impact on the Old Town Conservation Area (Site 224) which primarily follows the south side of the scheme option.

8.7.6.5 Using the new DMRB guidance as outlined above, this scheme option is considered to have a Large Adverse overall assessment score, based on the current level of base-line data. However, this score might be reduced to Moderate Adverse if the demolition of the two Listed Buildings (Sites 19 and 42) could be avoided and if it could be shown that the disturbance to the other High values sites (Sites 24, 28 and 52) would be minimal. The archaeological potential of the scheme option is considered to be Medium.

Option 2: Underground Landbridge

8.7.6.6 This scheme option is considered to result in four Large Adverse impacts on the 18th century gaol (Site 15), on the two Listed Buildings (Sites 19 and 42), and on the Myton Gate (Site 52), 14 Moderate Adverse impacts (on Sites 143, 10, 12, 13, 18, 43, 44, 45, 20, 24, 28, 165, 72 and 100), 31 Slight Adverse impacts and 6 neutral impacts. There are no beneficial impacts.

8.7.6.7 There will be a further Slight adverse impact on the Old Town Conservation Area (Site 224) which follows the south side of the scheme option to the west but lies within it from Prince's Dock east.

8.7.6.8 This scheme option is considered to have a Large Adverse overall assessment score, based on the current level of base-line data. However, this score might be reduced to Moderate Adverse if the demolition of the two Listed Buildings (Sites 19 and 42) could be avoided, and if it could be shown that the disturbance to the High value sites (Sites 24, 28 and 52) would be minimal. The archaeological potential of the scheme option is also considered to be Medium.

Option 3: Underground Cut and Cover Tunnel

8.7.6.9 This scheme option is considered to result in three Very Large Adverse impacts (on the Myton Gate, Site 52, on the remains of the Augustinian Friary, Site 106, and on the former course of Mytongate and its associated tenements, Site 225), five Large Adverse impacts on the 18th century gaol (Site 15), on the two Listed Buildings (Sites 19 and 42), on the Market Hall (Site 108) and on the Town Gaol (Site 104), 20 Moderate Adverse impacts (on Sites 143, 10, 12, 13, 18, 43, 44, 45, 20, 24, 28, 57, 58, 97, 80, 85, 86, 72, 100 and 103), 46 Slight Adverse impacts and 15 neutral impacts. There are also two slight beneficial impacts, on Warehouse No. 6 (Site 47) and the Old Town Conservation Area (Site 224).

8.7.6.10 This scheme option is considered to have a Very Large Adverse overall assessment score, based on the current level of base-line data; the two Slight beneficial scores are easily outweighed by the cumulative loss of the archaeological sites. The archaeological potential of the scheme option is also considered to be High.

Option 4: Overground Base

8.7.6.11 This scheme option is considered to result in four Large Adverse impacts (on the 18th century gaol (Site 15), on the two Listed Buildings (Sites 19 and 42) and on the site of Myton Gate (Site 52)), 11 Moderate Adverse impacts (on Sites 143, 10, 12, 13, 18, 43, 44, 45, 20, 24 and 28), 24 Slight Adverse impacts and 5 neutral impacts.

8.7.6.12 There will also be a further Slight adverse impact on the Old Town Conservation Area (Site 224) which primarily follows the south side of the scheme option.

8.7.6.13 This scheme option is considered to have a Large Adverse overall assessment score, based on the current level of base-line data, based on the current level of base-line data. However, this score might be reduced to Moderate Adverse or even less if the demolition of the two Listed Buildings (Sites 19 and 42) could be avoided (although this would depend on the extent of the new visual intrusion), and if it could be shown that disturbance to the High and Medium value archaeological sites (e.g. Sites 24, 28, 52, 15, 45 and 20) would be less, by reducing the depths of construction and ensuring the viaduct was able to span the most important or sensitive deposits. The archaeological potential of the scheme option is considered to be Medium.

Option 5: Overground Landbridge Equivalent

8.7.6.14 This scheme option is considered to result in four Large Adverse impacts, on the 18th century gaol (Site 15), on the two Listed Buildings (Sites 19 and 42), and on the site of the Myton Gate (Site 52), 14 Moderate Adverse impacts (on Sites 143, 10, 12, 13, 18, 43, 44, 45, 20, 24, 28, 165, 72 and 100), 30 Slight Adverse impacts and 6 neutral impacts. There are no beneficial impacts. Details of the 54 impacts, all of which are considered to be adverse, are contained in Table C2 at the end of this report.

8.7.6.15 There will also be a further Slight adverse impact on the Old Town Conservation Area (Site 224) which primarily follows the south side of the scheme option.

8.7.6.16 This scheme option is considered to have a Large Adverse overall assessment score, based on the current level of base-line data. However, this score might be reduced to Moderate adverse or even less if the demolition of the two Listed Buildings (Sites 19 and 42) could be avoided (although this would depend on the extent of the new visual intrusion), and if it could be shown that the disturbance to the other High and Medium value archaeological sites (e.g. Sites 24, 28, 52, 15, 45 and 20) would be less, by reducing the depths of construction and ensuring the viaduct was able to span the most important or sensitive deposits. The archaeological potential of the scheme option is considered to be Medium.

Option 6: Overground Extended Viaduct

8.7.6.17 This scheme option is considered to result in eight Large Adverse impacts, on the 18th century gaol (Site 15), on the Castle Street Chambers (Site 19) and the former Earl de Grey Public House (Site 42), on the site of the Myton Gate (Site 52), on the remains of the Augustinian Friary (Site 106), on the site of the Market Hall (Site 108), on the site of the Town Gaol (Site 104) and on the former course of Mytongate and its street frontage properties (Site 225), 22 Moderate Adverse impacts (on Sites 143, 10, 12, 13, 18, 43, 44, 45, 47, 20, 24, 28, 57, 58, 80, 97, 85, 86, 72, 100, 103 and 224), 47 Slight Adverse impacts and 15 neutral impacts.

8.7.6.18 This scheme option is considered to have a Very Large Adverse overall assessment score, based on the current level of base-line data. It could be argued that, as the highest significance of effect is Large adverse, the overall assessment score should also be Large adverse. However, it is considered that the potential impacts of the viaduct supports on the former alignment of Mytongate and its associated street frontage properties (Site 225) will still be significant, and so the Very Large Adverse score should be retained for the present. *(Also need to add in visual effects)* Nevertheless, this overall score may be reduced, perhaps to Moderate adverse, if these impacts can be designed out, if the demolition of the two Listed Buildings (Sites 19 and 42) could be avoided (although this would depend on the extent of the new visual intrusion), and if it could be shown that the disturbance to the other High and Medium value archaeological sites (e.g. Sites 24, 28, 52, 15, 45, 20, 80 and 97) would be less, by reducing the depths of construction and ensuring the viaduct was able to span the most important or sensitive deposits. The archaeological potential of the scheme option is also considered to be High.

8.7.7 Comparison of Scheme Options

8.7.7.1 The various Overall Assessment Scores arising from the six scheme options are summarised in Table 8.7.6 below, while Table C4 in the Environmental Assessment Report (PF, 2008) allows for a detailed comparison of impacts on a scheme-by-scheme basis.

TABLE 8.7.6: OVERALL ASSESSMENT SCORES

Option	No of Affected Sites	Overall Cultural Heritage Effect	Order of Preference
Option 1: Underground Base Scheme	44	Large adverse	3
Option 2: Underground Landbridge	55	Large adverse	4
Option 3: Underground Cut and Cover Tunnel	91	Very Large adverse	6
Option 4: Overground Base Scheme	44	Large adverse	1
Option 5: Overground Medium Viaduct	54	Large adverse	2
Option 6: Overground Extended Viaduct	92	Very Large adverse	5

8.7.7.2 In terms of the three underground options, Options 1 and 2 both have a Large Adverse overall assessment score, with a medium grade of archaeological potential, while Option 3 has a Very Large Adverse overall assessment score, with a high potential for additional archaeological sites being found. All three underground options require the demolition of two Listed Buildings and the partial demolition of another, and all involve significance disturbance to the Holy Trinity Burial Ground.

8.7.7.3 Option 1 affects the least number of identified sites, 44 compared to 55 and 91 for the other 2 options. There is actually little difference between Option 1 and Option 2, with the additional number of affected sites largely resulting from the creation of a materials storage area between Blanket Row and Castle Street. However, Option 1 has slightly fewer impacts in terms of numbers and significance of effects, and has a slightly lower archaeological potential because of the shorter length of scheme, and this would be the preferred underground option from the Cultural Heritage point of view. Option 3 (the cut and cover tunnel) affects 91 identified sites and would result in three Very Large and five Large adverse impacts. This option is seen as being the least favoured, as this method of construction leaves no room for any archaeological preservation in situ, particularly as it passes through the deep and complex archaeological stratigraphy of the Old Town and its components such as the medieval town defences, the Augustinian friary, the Town Gaols, Guildhalls and Market Halls, and numerous medieval tenements along Mytongate. If this option was chosen, large parts of the scheme corridor would need to be archaeologically-excavated in advance of construction, which would have significant cost and timescale implications.

5.1.1.1 In terms of the three overground options, Options 4 and 5 both have a Large Adverse overall assessment score, with a medium grade of archaeological potential, whereas Option 6 currently has a Very Large Adverse overall assessment score, with a high potential for additional archaeological sites to be found. In addition, all three overground options require the demolition of two Listed Buildings and the partial demolition of another, and all involve significant disturbance to the Holy Trinity Burial Ground.

5.1.1.2 Option 4 affects the least number of identified sites, 44 compared to 54 and 92 for the other two options. Once again, there is little difference between Option 4 and Option 5, with the additional number of affected sites largely resulting from the creation of two materials storage areas in the Old Town. However, Option 4 has slightly fewer impacts in terms of numbers and significance of effects, and has a slightly lower archaeological potential because of the shorter length of scheme, and this would be the preferred overground option from the Cultural Heritage point of view. Option 6 (extended viaduct option) would result in eight Large adverse impacts, and this is seen as being the least favoured option. Although it is possible that some identified sites might be able to be spanned by the extended viaduct, and thus remain largely undisturbed, the number, size and spacing of the viaduct supports means that there will still be a significant amount of archaeological destruction, particularly in the Old Town, and some parts of the scheme corridor would need to be archaeologically-excavated in advance of construction. Nevertheless, there is more potential for the preservation in situ of archaeological deposits compared to the cut and cover tunnel (Option 3).

8.7.7.4 The various preferences for the scheme options are also shown in the table above. On the assumption that the amount of below-ground archaeological destruction will be reduced by the construction of a viaduct compared to a cut and cover tunnel, the two shorter overhead scheme options are generally favoured from a Cultural Heritage point of view - the shortest option (Option 4) is therefore preferred over the slightly longer option (Option 5). These are then followed in order of preference by the two shorter underground scheme options (Option 1 and then Option 2), as these do not extend into the area of highest archaeological importance and potential, the Old Town. The extended viaduct option (Option 6) and the cut and cover tunnel option (Option 3) are the least favoured. Although overground, Option 6 will still involve considerable damage to the archaeological resource, especially within the Old Town, due to the number and spacing of viaduct supports, as well as having significant visual impacts. Option 3 will have the greatest possible archaeological impact as a tunnel leaves no room for any archaeological preservation in situ, particularly as it passes through the deep and complex archaeological stratigraphy of the Old Town and its components such as the town defences, an Augustinian Friary, the Town Gaols, Guildhalls and Market Halls, and numerous medieval tenements.

8.8 Biodiversity

8.8.1 Scope and Limitations

8.8.1.1 This section outlines the ecological assessment undertaken for the proposed improvement of the A63 Castle Street, Hull, located at approximate National Grid Reference TA093283. The assessment was undertaken in accordance with the guidance set out in the Design Manual for Roads and Bridges Volume 11, Section 3, Part 4 (The Highways Agency, 1995) and associated Interim Advice Notes (IANs) – 76/06, 77/06, 78/06, 79/06, 80/06, 81/06, 82/06 (The Highways Agency, 2006) and 110/08 (The Highways Agency, 2008). The webTAG (Transport Analysis Guidance) provides detailed guidance on the appraisal of transport schemes and the framework for the Highways Agency nature conservation significance criteria (TAG, 2004).

8.8.1.2 The site exists within the city of Hull, in a built-up area consisting of industrial, commercial and residential buildings. There are several areas of green space in the locality, including the Trinity Burial Ground. A previous ecological assessment was carried out by Smeeden Foreman Partnership (2003). This included a Phase 1 Habitat Survey and assessment of potential for protected species. The assessment identified a number of mature trees and the potential for roosting bats. The following surveys were therefore carried out in 2007 and updated in 2008:

- Phase 1 Habitat Survey; and
- Bat Survey.

8.8.1.3 The aim of the Phase 1 Habitat Survey was to update the information from the previous survey.

8.8.1.4 The timing of the Phase 1 Habitat Survey was sub-optimal. For non-woodland habitats the optimal survey period is generally accepted as early June to late August. The survey was conducted in early May 2007 and updated in March 2008. Because of this, it is possible that some species will have been missed, however, it is unlikely that a survey later in the season would significantly affect the overall assessment of the habitats present at this site.

8.8.1.5 Limitations of the bat survey include the following:

- This survey was carried out in May and might not precisely reflect bat activity at other times of year. As the season progresses, different food sources become available and bats can alter their roosting and foraging patterns accordingly;

- Echolocation calls of some bats, such as Natterer's bat Myotis nattereri, or whiskered/Brandt's bats Myotis mystacinus/brandtii are very similar and as such are extremely difficult to distinguish from one another; and
- Brown long-eared bats Plecotus auritus echolocate at a very low volume and are rarely picked up on a detector. Consequently this species can easily be missed during bat detector surveys.

8.8.2 Desk Study

8.8.2.1 In order to find records of any designated sites, protected species or other features of nature conservation interest within 1km of the scheme, consultation was undertaken with the following organisations in December 2006, and updated in January 2008:

- North and East Yorkshire Ecological Data Centre (NEYEDC);
- East Yorkshire Bat Group; and
- National Biodiversity Network (NBN Gateway website).
- The following surveys were undertaken as part of the biodiversity assessment:

8.8.2.2 The following surveys were undertaken as part of the Desk Study

- Extended Phase I habitat Survey
- Bat Roost Potential Survey
- Bat Emergence Survey

8.8.2.3 Full details of the survey methodologies are given in the Environmental Assessment Report (PF, 2008).

8.8.3 Assessment Criteria

8.8.3.1 It is possible to place ecological importance on recognised site features, based upon the criteria defined in Ratcliffe (1977), namely: naturalness, size, rarity and diversity. Application of these criteria follows the principles described by the Nature

Conservancy Council (1989) that includes the attribute of 'non-recreatability' as a general integrating measure of nature conservation value.

8.8.3.2 The above criteria were used to assess the nature conservation value of site features within the study area, ranked on the scale below (IEEM, 2002). Transport Analysis Guidance (TAG) values are also included for reference (TAG, 2004):

Table 8.8.1: Assessment of Level of Value	
Level of value (tag level in parentheses)	**Examples**
International (very high)	An internationally designated site or candidate site (SPA, pSPA, SAC, cSAC, pSAC, Ramsar site, Biogenetic Reserve) or an area which the country agency has determined meets the published selection criteria for such designation, irrespective of whether or not it has yet been notified. A viable area of habitat type listed in Annex I of the Habitats Directive, or smaller areas of such habitat that are essential to maintain the viability of a larger whole. Any regularly occurring population of an internationally important species, which is threatened or rare in the UK i.e. it is a UK Red Data Book species or listed as occurring in 15 or fewer 10 km squares in the UK (Categories 1 and 2 in the UK BAP) or of uncertain conservation status or of global conservation concern in the UK BAP. A regularly occurring, nationally significant population/number of any internationally important species.
National (high)	A nationally designated site (SSSI, ASSI, NNR) or a discrete area, which the country conservation agency has determined meets the published selection criteria for national designation (e.g. SSSI selection guidelines) irrespective of whether or not it has yet been notified. A viable area of a priority habitat identified in the UK BAP, or of smaller areas of such habitat, which are essential to maintain the viability of a larger whole. Any regularly occurring population of a nationally important species that is threatened or rare in the region or county (see local BAP). A regularly occurring, regionally or county significant population/ number of any nationally important species. A feature identified as of critical importance in the UK BAP.
Regional (high/ medium)	Viable areas of key habitat identified in the Regional BAP or smaller areas of such habitat, which are essential to maintain the viability of a larger whole. Viable areas of key habitat identified as being of Regional value in the appropriate Natural Area profile. Any regularly occurring, locally significant population of a species listed as being nationally scarce which occurs in 16 - 100 10 km squares in the UK or in a regional BAP or relevant Natural Area on account of its regional rarity or localisation. A regularly occurring, locally significant number of a regionally important species. Sites which exceed the County-level designations but which fall short of SSSI selection guidelines, where these occur.

Table 8.8.1: Assessment of Level of Value	
Level of value (tag level in parentheses)	**Examples**
County/ Metropolitan (medium)	Semi-natural ancient woodland greater than 0.25 ha. County/Metropolitan sites and other sites that the designating authority has determined meet the published ecological selection criteria for designation, including LNRs selected on County/Metropolitan ecological criteria (County/Metropolitan sites will often have been identified in local plans). A viable area of habitat identified in the County BAP. Any regularly occurring, locally significant population of a species which is listed in a County/Metropolitan “red data book” or BAP on account of its regional rarity or localisation. A regularly occurring, locally significant number of a County/ Metropolitan important species.
District/ Borough (medium/ lower)	Semi-natural ancient woodland smaller than 0.25 ha. Areas of habitat identified in a sub-County (District Borough) BAP or in the relevant Natural Area profile. District sites that the designating authority has determined meet the published ecological selection criteria for designation, including LNRs selected on District/Borough ecological criteria (District sites, where they exist, will often have been identified in local plans). Sites/features that are scarce within the District/Borough or which appreciably enrich the District/Borough habitat resource. A diverse and/or ecologically valuable hedgerow network. A population of a species that is listed in a District/Borough BAP because of its rarity in the locality or in the relevant Natural Area profile because of its regional rarity or localisation. A regularly occurring, locally significant number of a District/Borough important species during a critical phase of its life cycle.
Parish/ Neighbourhood (lower)	Areas of habitat considered to appreciably enrich the habitat resource within the context of the Parish or neighbourhood, e.g. species-rich hedgerows. LNRs selected on Parish ecological criteria.
(negligible)	Very low importance and rarity. Examples include areas of amenity grassland, rye-grass leys or arable fields.

NB. Where species or habitats occur in more than one category above, the highest value is applicable.

SAC = Special Area of Conservation
cSAC = candidate Special Area of Conservation
pSAC = possible Special Area of Conservation
LNR = Local Nature reserve

SPA = Special Protection Area
pSPA = possible Special Protection Area
SSSI = Site of Special Scientific Interest
NNR = National Nature Reserve

8.8.4 Evaluation of Features

8.8.4.1 The Humber Estuary SSSI, SAP, SAC and Ramsar has been excluded from further consideration within the assessment. This is because there is no likelihood of a significant impact from the scheme proposals which would move the condition of the site away from favourable condition. The rationale for exclusion is derived from criteria within IEEM (2006). Details, along with a rationale for the decision to exclude this Humber Estuary from the assessment, are given in Table 8.8.2. Natural England were consulted in June 2008 regarding impacts of the proposed scheme, details of which are given in the Environmental Assessment report...

TABLE 8.8.2: ASSESSMENT OF ECOLOGICAL VALUE AND RATIONALE FOR EXCLUSION FROM THE ASSESSMENT PROCESS

Ecological Feature	Status	Level of Value	Impact (yes/ no)	Valued Ecological Feature (yes/ no)	Rationale for Exclusion
Humber Estuary	Nationally and internationally designated (SSSI, SPA, SAC & Ramsar)	International	No	Yes	Impacts will be confined to the immediate vicinity of the scheme; therefore the Humber Estuary will not be affected.

8.8.4.2 No direct impact upon the Humber Estuary SSSI/ SPA/ SAC has been assessed for any of the route options, however, dependent upon the option chosen as the preferred route further consultation would take place with Natural England to ascertain the need for any Appropriate Assessment, in accordance with the requirements of DMRB IAN 110/08 (Highways Agency, 2008).

8.8.4.3 Although the River Hull SNCI lies close to the scheme limits, no impacts are anticipated and therefore this has also been excluded from further consideration within the assessment.

8.8.4.4 The desk study provided a record of water vole, and in addition the Humber Estuary and River Hull have the potential to support water vole. The existing water vole record was a considerable distance from the scheme (at least 500 metres) and there are no impacts predicted for the Humber Estuary or the River Hull, therefore no further survey work for water vole is required and this species has been excluded from further consideration within the assessment.

8.8.4.5 Valued features which merit further assessment are described in more detail in the following sections.

Trinity Burial Ground

8.8.4.6 The Trinity Burial Ground SNCI lies immediately adjacent to the existing A63, east of the Mytongate Junction. A number of mature trees are present, including ash, poplar, lime, elm and sycamore. These trees have intrinsic value, however, they also provide a habitat for birds and potentially bats and other wildlife. The ivy-covered brick walls along the boundaries of the site also provide a habitat for wildlife. The grassland present is of low ecological value. The site designation as a SNCI has highlighted the value of the site in an inner-city context.

8.8.4.7 The Trinity Burial Ground SNCI is considered to be of medium ecological value.

Mature Trees

8.8.4.8 A number of mature trees have been identified within close proximity to the scheme, in particular at the Trinity Burial Ground. Several of these trees have holes, dead wood and other features which may be of value to bats, birds and invertebrates. The trees themselves have intrinsic value, especially in an urban environment where such features are rare. A habitat action plan for ‘Trees, Scrub and Hedgerow’ has been published within the Hull BAP.

8.8.4.9 The mature trees at the Trinity Burial Ground are considered to be of medium/lower ecological value.

Bats

8.8.4.10 Although no bat roosts were identified from the surveys, two trees were identified as having high bat roost potential and several were assessed as having moderate potential. In addition, two sections of wall and one building have been assessed as having moderate bat roost potential. The absence of bats at the time of survey of the two trees with high potential suggests that neither of these trees are currently used as maternity roosts, however, small numbers of bats may use one or more of these trees or other features as occasional roosts.

8.8.4.11 The desk study and previous surveys highlighted several areas that are used by foraging bats. Foraging of common pipistrelle bats was also noted during the emergence surveys. A species action plan for bats has been published within the Hull BAP.

8.8.4.12 Surveys carried out by WSP Environmental have identified a common pipistrelle bat roost (non-breeding) within the Castle Buildings.

8.8.4.13 The availability of suitable roost sites and foraging areas may be limiting factors for the bat populations in the area, therefore in the context of this site bats are considered to be of medium ecological value.

8.8.5 Ecological Impact Assessment

Introduction

8.8.5.1 This section identifies mitigation, environmental compensation measures where they are necessary to the scheme. The principal objectives of the ecological mitigation are to take measures to minimise adverse impacts of the proposals upon the existing nature conservation value of the site, both during the construction phase and when the scheme is operational. Where adverse impacts cannot be entirely avoided, it will be necessary to enhance the nature conservation value of the study corridor through the creation of compensatory habitats appropriate to the locality.

8.8.5.2 Having appraised all ecological features occurring on the site, features of enhanced nature conservation importance which may be impacted on by the development have been selected. The assessment goes on to assess the magnitude of impact anticipated to affect each of these features, firstly in the absence of mitigation measures. This takes into account of both direct loss of habitat and features through land-take, and perceived indirect impacts such as pollution and habitat fragmentation. There is then suggested mitigation and compensation measures which will reduce negative impacts, and an assessment of the residual ecological impact on the species and habitats is made taking these measures into consideration. Full details of the assessment are given in Section 7.0 of the Environmental Assessment Report (PF, 2008) and a summary of the impacts is given in the sections below.

8.8.5.3 The magnitude of the impact is determined using the criteria in Table 8.8.3 (derived from TAG, 2004):

Table 8.8.3: Assessment of the Magnitude of Impact	
Magnitude	**Criteria**
Major Negative	The proposal (either on its own or with other proposals) may adversely affect the integrity of the feature, in terms of the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the population levels of species of interest.
Intermediate Negative	The feature's integrity will not be adversely affected, but the effect on the feature is likely to be significant in terms of its ecological objectives. If, in the light of full information, it cannot be clearly demonstrated that the proposal will not have an adverse effect on integrity, then the impact should be assessed as major negative.
Minor Negative	Neither of the above applies, but some minor negative impact is evident.
Negligible	Very minor impact anticipated.
Neutral	No observable impact in either direction.
Positive	Impacts which provide a net gain for wildlife overall.

8.8.5.4 The significance of the impacts is determined using the value of the feature and the magnitude of the impact (Highways Agency, 2006), according to the matrix in Table 8.8.4:

Table 8.8.4: Assessment of Significance of Impacts						
Value of feature	Very high	Neutral	Slight	Moderate or large	Large or very large	Very large
	High	Neutral	Slight	Slight or moderate	Moderate or large	Large or very large
	Medium	Neutral	Neutral or slight	Slight	Moderate	Moderate or large
	Low	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or moderate
	Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight
		No change	Negligible	Minor	Intermediate	Major
		Magnitude of impact				

8.8.6 Summary of Ecological Impacts

8.8.6.1 Table 8.8.5 provides a summary of the predicted impacts of each of the proposed route options.

TABLE 8.8.5: SUMMARY OF IMPACTS FOR EACH ROUTE OPTION				
Route Option	Feature			
	Trinity Burial Ground SNCI	Mature Trees	Bats	Overall Assessment
Option 1 – Underground Base	Intermediate -ve	Intermediate -ve	Intermediate -ve	Intermediate -ve
Option 2 – Underground Land Bridge	Intermediate -ve	Intermediate -ve	Intermediate -ve	Intermediate –ve
Option 3 – Underground Cut and Cover	Intermediate -ve	Intermediate -ve	Intermediate -ve	Intermediate –ve
Option 4 – Overground Base	Intermediate -ve	Intermediate -ve	Intermediate -ve	Intermediate –ve
Option 5 – Overground Land Bridge	Intermediate -ve	Intermediate -ve	Intermediate -ve	Intermediate –ve
Option 6 – Overground Full Viaduct	Intermediate -ve	Intermediate -ve	Intermediate -ve	Intermediate -ve

8.8.6.2 The significance of impacts for all features for each option is given in Table 8.8.6.

TABLE 8.8.6: SIGNIFICANCE OF IMPACTS FOR EACH ROUTE OPTION				
Route Option	Feature			
	Trinity Burial Ground SNCI	Mature Trees	Bats	Overall Assessment
Option 1	Moderate	Slight or moderate	Moderate	Moderate
Option 2	Moderate	Slight or moderate	Moderate	Moderate
Option 3	Moderate	Slight or moderate	Moderate	Moderate
Option 4	Moderate	Slight or moderate	Moderate	Moderate
Option 5	Moderate	Slight or moderate	Moderate	Moderate
Option 6	Moderate	Slight or moderate	Moderate	Moderate

8.8.7 Possible Site Compound Locations

8.8.7.1 A number of potential areas have been proposed for the locations of site compounds. None of the areas would impact upon the Trinity Burial Ground SNCI, however some of the areas would have impacts upon mature trees and bats. Table 8.8.7 summarises the predicted impacts of each potential compound area.

TABLE 8.8.7: IMPACTS OF POSSIBLE SITE COMPOUND LOCATIONS			
Compound location	**Impacts upon features of ecological interest**		
	Trinity Burial Ground SNCI	**Mature Trees**	**Bats**
A	None	None	No roost sites or potential roost sites affected
B	None	Mature poplars adjacent to Hessle road would be affected	No roost sites or potential roost sites affected
C	None	None	No roost sites or potential roost sites affected
D	None	None	Confirmed roost (Castle Buildings) affected
E	None	None	No roost sites or potential roost sites affected
F	None	None	No roost sites or potential roost sites affected
G	None	None	No roost sites or potential roost sites affected
H	None	None	No roost sites or potential roost sites affected

8.8.8 Mitigation, Compensation and Enhancement

8.8.8.1 Full details of the proposed mitigation, compensation and enhancement for the proposed schemes are given in Section 7.0 of the Environmental Assessment Report (PF, 2008). A summary is given in Table 8.8.8 below

TABLE 8.8.8: Summary of Mitigation, Compensation and Enhancement	
Feature	**Mitigation, Compensation, Enhancement**
Trinity Burial Ground SNCI	Retain mature trees wherever possible.
	Plant new trees to compensate for those lost.
Mature Trees	Plant new trees to compensate for those lost.
Bats	Features with bat roost potential to be retained wherever possible. If removed, to be supervised by licensed bat worker.
	Erect bat boxes on mature trees to be retained.
	Demolition of confirmed roost(s) to be carried out under licence from Natural England.
Birds	Retain mature trees and other vegetation wherever possible.
	Vegetation removal to take place outside the bird breeding season (March to August) wherever possible. If removal required within the bird breeding season, area must be checked by an Ecologist beforehand.

TABLE 8.8.8: Summary of Mitigation, Compensation and Enhancement	
Feature	**Mitigation, Compensation, Enhancement**
	Bird boxes to be erected on retained mature trees.
Other habitats	Create species-rich neutral grassland on new road verges.
	Plant native trees and shrubs on new road verges.

8.8.8.2 The above recommendations for mitigation, compensation and enhancement would be suitable for inclusion within planning conditions for the scheme.

8.8.9 Conclusions

8.8.9.1 The site and surrounding land comprises a range of habitats including amenity grassland, scrub, introduced shrubs, tall ruderal vegetation, hedgerows and mature trees. Protected species identified within the study corridor include bats and nesting birds.

8.8.9.2 The proposed route options would have direct impacts upon several habitats of low or negligible ecological value, including amenity grassland and tall ruderal vegetation. The ecological impacts of these losses will be minimal. Loss of mature trees would, however, result in greater impacts. Destruction of habitat would incur losses of potential roost sites for bats and may affect nesting birds.

8.8.9.3 The loss of part of the Trinity Burial Ground cannot be adequately compensated for by habitat creation and therefore is a residual impact of the scheme. The significance of the impact would depend upon which scheme option is selected. Option 4 would have impact of lowest significance, requiring removal of fewer mature trees than the other options (at least 15). Option 6 would result in the greatest impact, requiring removal of at least 22 mature trees, whilst the other options would require an intermediate number of mature trees to be removed.

8.8.9.4 The ecological impacts of each route option could be partially offset by a series of mitigation measures to minimise the impacts. However, the removal of a number of mature trees required for each option cannot be satisfactorily mitigated against in the short term. This would result in an overall impact assessment for all options of intermediate negative.

8.9 Water Environment

8.9.1 Introduction

8.9.1.1 The assessment of the proposed road scheme has been undertaken in accordance with the DMRB Volume 11, Section 3, Part 10 Road Drainage and the Water Environment (Highways Agency, May 2006). The purpose of the assessment is to identify the key constraints and potential consequences of the proposed development on the water environment within the study area, including impacts on fisheries (and potential for flooding). It should e noted that the findings of this assessment, particularly those related to potential environmental effects, are based on the information obtained to date.

8.9.1.2 The methodology which has been employed to evaluate baseline conditions relating to the existing water environment of the site and the surrounding area includes the following:

- Consultation response from the Environment Agency including flooding, fisheries and river quality data;
- Searches for water quality data and flood sensitive zones on the Environment Agency website (www.environment-agency.gov.uk); and
- Searches for environmentally sensitive site on the Magic website (www.magic.gov.uk) and Natural England website (www.natureonthemap.org.uk).
- Consultation with the Highways Agency with regards to discharges to tidal waters.
- Results of traffic flow modelling (undertaken by Pell Frischmann) giving values of Average Annual Daily Traffic (AADT) and percentage of HGVs for each section of the routes; and
- Plans of the proposed layout of each route, indicating lengths and widths of each route and locations of features such as slip roads and side roads.

8.9.2 Water Quality and Drainage Assessment

8.9.2.1 The methodology outlined in DMRB Volume 11, Section 3, Part 10 Water Quality and Drainage includes a quantitative assessment of the impacts of the proposed routes on surface water and ground water quality under normal operating conditions and also the risk from accidental spillage.

8.9.2.2 Method A – Simple Assessment of Pollution Impact from Routine Runoff and Method B – Detailed Assessment of Pollution Impacts from Routine Runoff cannot be undertaken for this scheme because Q95 flow data for the River Humber is unavailable. This is due to the tidal nature of this stretch. Correspondence with the Highways Agency has confirmed that an assessment of the impacts of soluble pollutants in road run-off on receiving watercourses is therefore not possible for the proposed scheme.

8.9.2.3 Method D – Assessment of Pollution Impacts from Accidental Spillage has been undertaken, the findings of which are detailed in Section 13 Road Drainage and the Water Environment of the Environmental Assessment Report (PF, 2008). A summary of the conclusions of the assessment are given in the following paragraphs.

8.9.3 Discharges to Surface Waters and Groundwaters

8.9.3.1 The study area does not coincide with a groundwater sensitive area, therefore the requirement for a detailed study and investigation into the risk to controlled water with the proposed scheme is thought unlikely at this time. The applicant will need to ensure that List I and II substances are not discharged to groundwater in contradiction of the EC Groundwater Directive (80/68/EEC). Further assessments may therefore be recommended to determine the likely impacts of the proposed routes on the surrounding groundwater.

8.9.3.2 There are a number of potential runoff components which may be generated from construction, traffic, maintenance, accidental spillage and other sources such as atmospheric deposition. Contaminants that are considered to have the greatest potential impact on receiving waters include suspended solids, hydrocarbons, metals, pesticides and herbicides, de-icing agents, nutrients and those arising from accidental spillages.

8.9.3.3 There are no incidences in the literature of UK groundwater resources being significantly affected by salt in road runoff (CIRIA report 142, 1994) and concentrations of nutrients reported in literature are very low and ecological effects would rarely be expected. It has been found that atmospheric deposition was unrelated to the volume of traffic. All road schemes should maintain or improve road safety and therefore, new roads are designed to reduce the accident rate which usually leads to a reduction in the potential for accidental spillages.

8.9.3.4 As a result of these findings, metals are considered the most significant risk to waters and would usually be further assessed, using copper and zinc as representative elements. Due to a lack of Q95 data this assessment cannot be undertaken. Correspondence with the Highways Agency indicates that this assessment may not be appropriate. Where there are discharges to tidal estuaries it is standard practice to assume that the existing flows (even at low tidal conditions) will be significant enough to provide sufficient dilution within the estuary.

8.9.4 Spillage Risk

8.9.4.1 Spillage risk calculations have been undertaken for each section of the proposed routes, according to the Method D outlined in Annex I of the DMRB Volume 11, Section 3, Part 10 Water Quality and Drainage, and given the varying AADT and %HGV values obtained from traffic modelling. The risk calculations look at the vicinity of sliproads and access roads to each section of the proposed road, considered to give a higher risk of accident. Accident risk is translated into a pollution incident using a risk reduction factor, based on emergency services response times, which determine whether a serious spillage will cause a pollution incident.

8.9.4.2 All sensitive surface and groundwaters (including those used for water abstraction, used intensively for recreation, or having a high ecological value) should normally be protected such that the calculated risk of a pollution incident is less than once every 100 years. In the proposed scheme, spillage risks have been estimated at below this limit of 1 in 100 year return period.

8.9.4.3 A summary of the spillage calculations are given in Table 8.9.1 below

Table 8.9.1: Summary of Spillage Calculations			
Option	**Spillage Risk**	**Emergency Service response time**	**Less than 1%**
Underground Base (Option 1)	0.23%	20 mins (Urban Area)	Yes
Underground Landbridge (Option 2)	0.23%	20 mins (Urban Area)	Yes
Underground Cut and Cover (Option 3)	0.17%	20 mins (Urban Area)	Yes
Overground Base (Option 4)	0.25%	20 mins (Urban Area)	Yes
Overground Landbridge Eq.(Option 5)	0.18%	20 mins (Urban Area)	Yes
Overground Extended Viaduct (Option 6)	0.22%	20 mins (Urban Area)	Yes

8.9.4.4 All of the spillage risk calculations are less than 1%, so no further spillage risk measures will be required to reduce the risk of a serious pollution incident.

8.9.5 Potential Environmental Impacts

Construction Phase

8.9.5.1 There are many risks to the water environment that may be encountered during construction works. For example, site preparation and development has the potential to adversely impact on water quality due to generation and potential runoff of silty water and suspended solids during excavation, movement, storage and placement of spoil and general construction materials. Further potential for pollution exists from spillages of fuel or oil from construction vehicles and other chemicals that may be stored or handled on site. Impacts on groundwater levels are also possible from deep earthworks. These risks could have negative effects if contaminants enter surface waters or groundwater in the study area and surrounding region.

8.9.5.2 An environmental plan will be designed and implemented to avoid any adverse impacts to surface waters and groundwater during the construction phase. Environmental Good Practice on Site by CIRIA, 2000, provides general guidance on how to liaise with regulatory agents, and develop and carry out an on-site water management plan.

Operation Phase

8.9.5.3 The risk to the River Humber and the River Hull from Accidental Spillage has proved to be less than 1%. However correspondence with the Highways Agency has highlighted the remaining risk to the Humber Estuary given its environmental sensitivity and the presence of Statutory Designations in this watercourse.

8.9.5.4 As mentioned previously, where there are discharges to tidal estuaries it is standard practice to assume that the existing flows (even at low tidal conditions) will be significant enough to provide sufficient dilution within the estuary. Only in very unusual circumstances would there be a need to treat routine runoff to estuaries.

8.9.5.5 For all six options the risk to the Humber Estuary (and River Hull) from Accidental Spillage has proved to be less than 1%. However, considering the environmental sensitivity of the Humber Estuary and presence statutory designations, it may be considered prudent to implement some measures of spillage control and/or containment. This would recognise the sensitivity and importance of the receiving environment but must be commensurate with the identified risk.

8.10 Physical Fitness

8.10.1 Desire Lines

8.10.1.1 Being in a busy city centre, desire lines are not clearly defined due to the multitude of pedestrian routes approaching both sides of the A63 from trip generators. The present formal crossing locations on the A63 would dictate the pedestrian routes currently chosen on the approach to the A63.

8.10.1.2 The higher pedestrian usage at certain existing crossing points suggests that the routes approaching the crossings at Mytongate, Prince's Dock, Market Place and High Street are linked to the main desire lines. The main desire lines would appear to be:

- Along the A63 itself - Along the whole scheme length using either the north or south footways
- Commercial Road - Between the Mytongate crossings towards Albert Dock

- Ferensway - Between the Mytongate crossings and the Paragon Interchange and city centre
- Waterhouse Lane - Between the Mytongate crossings and the city centre
- Prince's Dock Street and Humber Dock Street - Linking the mixture of residential, leisure and commercial properties around the Marina with the city centre shopping areas
- Queen Street and Market Place - Linking the mixture of residential and commercial properties in the southern area of the old town with the city centre
- High Street - Providing an alternative route to that on Queen Street and Market Place

8.10.1.3 Pedestrians travelling between Kingston Retail Park and the city centre shopping areas / Paragon Interchange would presumably use the Ferensway and Waterhouse Lane routes.

8.10.1.4 Other pedestrian desire lines, possibly more lightly used, appear to include:

- Porter Street and St James Street - Between the residential areas north of the A63 and the residential/commercial area to the south
- Railway Street - Providing an alternative route to Humber Dock Street and Commercial Road towards the city centre at Prince's Quay

8.10.1.5 Future developments envisaged in the emerging Local Development Framework would be expected to generate additional pedestrian and cycle flows to and from the areas south of the A63. Although no details of expected flows are presently available it seems likely that significant numbers of additional pedestrians would be generated along the principal routes on Railway Street, Humber Dock Street and Queen Street which link with the city centre.

8.10.2 Impacts Assessment at Crossing Points

8.10.2.1 The current heavy motorised traffic flows along the A63 east-west route corridor cut across the city centre and result in severance along most of its length.

8.10.2.2 Designated crossing points have been provided at intervals along the route corridor with pedestrian guard railing along certain sections of the A63 between the crossing points. The A63 crossing provisions are generally located on or close to the main desire lines and all, except for Spruce Road, are signal controlled. The A63 crossing locations, together with the associated junctions at Mytongate and Market Place, constitute the principal conflict points between pedestrians and cyclists with motorised vehicles.

8.10.2.3 The conflict points are discussed in detail in Section 11.0 of the Environmental Assessment Report (PF, 2008), with a summary given in Table 8.10.1.

Table 8.10.1: Summary of Impacts at Crossing Points

Crossing Point(s)	Current Type	Proposed crossing	Effect on journey times/length
Porter Street	Signal controlled	Footbridge with all schemes	Slight increase in journey times / length with all schemes
Mytongate Junction – A63	Signal controlled	New shared footway on overbridge, crossings signal controlled with all schemes	Pedestrian delays likely to be reduced, generally reduction in journey time on all schemes, however possible increase in time/length for underground options for pedestrians whose trips originate and end either on the west or east sides of the junction.
Mytongate – Ferensway	Uncontrolled		
Mytongate – Commercial Rd	Uncontrolled		
Prince's Dock	2no signal controlled	UB/OB – footbridge UL: - landbridge over A63 OL – separated crossing under A63 CC/EV – 1no signal controlled crossing	UB/OB/UL/OL – increased journey times/length CC/EV – pedestrian delays reduced possible slight increase in journey times/length, dependant on final location of crossing.
Market Place Junction	Signal controlled,	Footbridge with all schemes	UB/UL/OB/OL Journey times/lengths may increase slightly CC – increase journey lengths in excess of 250m for pedestrians/cyclists moving between Market Place and Queen Street. EV – no change in journey length, delays will be reduced

UB	Underground Base	OB	Overground Base
UL	Underground Landbridge	OL	Overground Landbridge Equivalent
CC	Underground cut and cover	EV	Overground Extended Viaduct

8.11 Journey Ambience

8.11.1 Methodology

8.11.1.1 The methodology for assessing impacts for vehicle travellers (journey ambience) builds on techniques described in the Design Manual for Roads and Bridges, Volume 11 Section 3, Part 9, Chapter 2, View from the Road and Chapter 3 Driver Stress. In addition Webtag has introduced an appraisal of Traveller Care.

8.11.1.2 DMRB only provides significance criteria for driver stress for the 'open road' situation where consistent traffic flows and speeds exist over at least a one kilometre length of route.

8.11.2 Potential Impacts To Journey Ambience

<u>Traveller Care</u>

8.11.2.1 The road improvement proposals are likely to include improved signage and elevated pedestrian crossing facilities. The impact for traveller care is therefore likely to be better.

<u>View from the Road</u>

8.11.2.2 The view from the road is assessed individually for the six scheme options starting at the western end of the study area at Porter Street.

Option 1: Underground Base

8.11.2.3 The first discernable change would be the new footbridge over the carriageway linking Porter Street to Waverley Street. The road corridor is widened between Porter Street and Mytongate Junction due to the new eastbound exit and westbound entry slip roads. The removal of the verge-side vegetation along the line of the slip roads would open up views into the townscape areas to the north and south of the carriageway. After Spruce Road the carriageway descends into cutting resulting in there being no view out from the corridor and along the carriageway only.

8.11.2.4 The slip roads at the western side connecting into Ferensway and Commercial Road would be at ground level, allowing views into the A63 section in cutting and north and south into the surrounding townscape areas.

8.11.2.5 The new bridge at the Mytongate Junction (Mytongate bridge) would be elevated approximately 0.7m above the surrounding ground level which would allow views over the A63 cutting and into the surrounding townscape areas. Open views are likely to be possible eastwards to the area between Prince's Dock and Humber Dock.

8.11.2.6 East of the Mytongate bridge the eastbound entry slip road would be at existing ground level and open views would be possible to the south over the A63 towards the Trinity Burial Ground. The boundary and area of the burial ground is impacted by the scheme lessening its prominence within the urban townscape.

8.11.2.7 Sections of the westbound exit slip road would be in slight cutting restricting views to the south into the burial ground and distant views north beyond the carriageway in cutting would be restricted.

8.11.2.8 The carriageway rises out of cutting in front of the Holiday Inn where views to the north would be opened out due to the demolition of the Castle Buildings and Earl de Grey public house. Between Humber Dock and Prince's Dock a pedestrian footbridge would restrict views to the dock area north and south of the A63 and also along the road corridor.

8.11.2.9 Between Prince's Dock Street and Market Place the carriageway is widened to 3 lanes eastbound at existing ground level increasing the footprint of the road. Views from the road corridor would remain as existing with the exception of a new pedestrian footbridge between Market Place and Queen Street. The bridge would restrict views east towards the Myton swing bridge whilst also restricting views west from Myton swing bridge along the A63 corridor.

Option 2: Underground Landbridge

8.11.2.10 The views from the A63 remain the same as the underground base scheme option between Porter Street and the Mytongate bridge.

8.11.2.11 The new Mytongate bridge would be elevated approximately 0.7m above the surrounding ground level allowing views over the A63 cutting and into the surrounding townscape areas. Open views are likely to be possible east towards the landbridge structure between Prince's Dock and Humber Dock.

8.11.2.12 The eastbound entry slip at Mytongate Junction follows existing ground level before going into cutting to pass beneath the landbridge restricting views to the A63 corridor only. The westbound exit slip road is also in cutting before rising up to the existing ground level at Mytongate Junction; views are again restricted to the corridor only.

8.11.2.13 Due to lowered levels of the A63 as it passes under the landbridge, views are not possible over the attractive and good quality townscape areas of the docks. The A63 rises to join existing ground level at Prince's Dock Street. Views east and west towards Market Place and the new footbridge are as described for the underground base scheme option.

Option 3: Underground Cut and Cover Tunnel

8.11.2.14 The first discernable change would be the new footbridge over the carriageway linking Porter Street to Waverley Street. The road corridor would again be widened between Porter Street and Mytongate Junction due to the new eastbound exit and westbound entry slip roads.

8.11.2.15 The removal of the verge-side vegetation along the line of the slip roads would open up views into the townscape areas to the north and south of the carriageway. The slip roads at the western side would be elevated slightly above surrounding ground level increasing views into the areas north and south of the carriageway, and into the A63 cutting section. After Cogan Street the carriageway descends into cutting resulting in there being no view out of the corridor and along the carriageway only.

8.11.2.16 Travellers along the A63 would be in cutting followed by tunnel section and then into cutting again for the whole length of the scheme until Myton swing bridge, restricting views to the road corridor only.

8.11.2.17 Views east from Mytongate bridge would see the A63 in cutting and entering the tunnel entrance portal and the local access road (LAR) above. The LAR would follow existing ground level above the tunnel. The westbound slip road would have direct views south into Trinity Burial Ground, although the area of the burial ground would be dramatically reduced with fewer mature trees visible. Views would also be possible north into the upper sections of the A63 cutting. The eastbound LAR would be at ground level in front of the retail and derelict area around Mytongate.

8.11.2.18 East of Mytongate and Trinity Burial Ground, travellers on the LAR would pass above the tunnelled section of the A63 below; there would be extensive views over the good quality Prince’s Dock to the north and the very attractive Humber Dock to the south. Between Prince’s Dock Street and Market Place the LAR follows the northern side of Castle Street along the frontage of the demolished properties of Trinity Court and Grammar School Yard; views from this area would also be possible into the A63 cutting where it emerges from the eastern tunnel portal. The LAR connects into Market Place around the listed King William III statue.

8.11.2.19 Westbound travellers from Myton swing bridge would have extensive views over the A63 descending into cutting and the tunnel entrance portal with the LAR above.

Option 4: Overground Base

8.11.2.20 The first discernable change would be the new footbridge over the carriageway linking Porter Street to Waverley Street. The road corridor is widened between Porter Street and Mytongate Junction due to the new eastbound exit and westbound entry slip roads. Distant views east along the corridor would see the A63 start to rise up on a viaduct from the end of Spruce Road.

8.11.2.21 The removal of the verge-side vegetation along the line of the slip roads would open up views into the townscape character areas to the north and south of the carriageway. After Spruce Road the travellers on the slip roads would also have views up to the rising viaduct section of the A63 above them and underneath the viaduct towards the other slip road.

8.11.2.22 There would be open views to the north and south from the rising viaduct section as it approaches its high point over Mytongate Junction. Travellers travelling west would experience wide ranging views on the western side down slope of the viaduct in contrast to eastbound travellers experiencing open views on the eastern side down slope. At the high point over Mytongate Junction there would be open views along the road corridor below; north along Ferensway and south along Commercial Road.

8.11.2.23 Local road users exiting the A63 at the Mytongate Junction at existing ground level would be shaded by the viaduct section above; however, there would be open ground level views in all directions into the surrounding townscape areas.

8.11.2.24 The westbound exit slip road is elevated as it exits the A63 giving intermittent views into the internal areas of the Trinity Burial Ground to the south and west towards the local Mytongate Junction. The eastbound entry slip road is at existing ground levels and there would be open views to the south towards the A63 viaduct and the westbound slip road.

8.11.2.25 From the A63 carriageway at Mytongate Junction travelling east there would be open views south towards the upper sections of the trees of Trinity Burial Ground and into some of the internal sections. Views northeast would be over the open and derelict areas around Mytongate and the Prince's Quay shopping centre and car park in the background.

8.11.2.26 The road reaches existing ground level immediately west of Prince's Dock and Humber Dock. A pedestrian footbridge is proposed in this area and the views into the dock areas would be restricted by the structure in addition to views east along the corridor. Westbound travellers in the area between the docks would start to see the A63 carriageway rise towards the west which would screen further views in this direction.

8.11.2.27 Between Prince's Dock Street and Market Place the carriageway would be widened to 3 lanes eastbound at existing ground level increasing the footprint of the road. Views from the road corridor would remain as existing with the exception of a new pedestrian footbridge between Market Place and Queen Street. The bridge would restrict views east towards the Myton swing bridge whilst also restricting views west from Myton swing bridge along the A63 corridor.

Option 5: Overground Landbridge

8.11.2.28 Between Porter Street and Mytongate Junction the views from the road would remain the same as found for the overground base scheme option.

8.11.2.29 Users of the Mytongate Junction would have open views in all directions at ground levels into the surrounding townscape areas and there would be a particularly large open area to the east of the junction.

8.11.2.30 The westbound exit slip road to the south of the corridor would be elevated allowing intermittent views between the retained trees into the internal areas of Trinity Burial Ground to the south and open views to the north to the areas under the A63 viaduct and the eastbound entry slip road. Users of the eastbound entry slip road would be at existing ground levels initially before rising to connect with the carriageway and pass over the landbridge. There would be views north to the open areas around Mytongate and northeast towards the Prince’s Quay shopping centre and car park.

8.11.2.31 As the A63 passes between the docks it would be elevated to pass over the landbridge. There would be open views over Prince’s Quay and the shopping centre to the north and Humber Dock (and the river beyond) to the south. The boats of Humber Dock would provide an interesting view whilst travelling along the corridor.

8.11.2.32 From Prince’s Dock Street eastwards the views would be as described for the overground base scheme option. However, views west from Prince’s Dock Street would differ as the rising viaduct of the A63 would be more prominent, screening ground level views along the road corridor.

Option 6: Overground – Extended Viaduct

8.11.2.33 Between Porter Street and Spruce Road the views from the road are the same as previously described for the other overground options. From Spruce Road the A63 viaduct would start to rise, allowing open views from the elevated sections to the townscape areas to the north and south of the carriageway. The eastbound exit slip road would be elevated slightly allowing views to the northern housing areas whilst the westbound entry slip road follows existing ground level. The elevated viaduct section reaches its highest point over Mytongate Junction from which it stays at this level along the entire scheme corridor length to Myton swing bridge.

8.11.2.34 The LAR follows beneath the elevated viaduct at existing ground level; views would be similar to those presently experienced except the overall footprint of the road would be larger impacting the boundaries around Mytongate Junction. The westbound LAR borders Trinity Burial Ground and there would be open views south into this area and to the north over the open areas beneath the viaduct. The eastbound LAR would have open views to the south to the area beneath the viaduct and north into the open and derelict Mytongate area.

8.11.2.35 From the Holiday Inn to the area around Fish Street the LAR would follow existing ground levels but with the A63 viaduct section casting shade and a feeling of enclosure on the area. The properties of Trinity Court and Grammar School Yard fronting the northern side of Castle Street would be demolished which would create intermittent views into the area to the north. In the area around Market Place the LAR splits to provide different connections leaving a number of open areas between the various connecting lanes.

8.11.2.36 The viaduct section of the A63 would provide extensive views over the whole of the city centre to the north and over the docks to the south and River Humber beyond. Views would be at their most open in the area between the docks.

8.11.2.37 Views southeast from the viaduct at Mytongate Junction would be partly screened by the retained vegetation of Trinity Burial Ground. In the area between Prince’s Dock Street and Market Place views north would be restricted by the existing buildings. However, there would be views along the connecting roads and into the areas around Trinity Church and its clock tower would also stand more prominent on the sky line.

8.11.2.38 In the Market Place area from the viaduct there would be open views to the south over the Fish Market area and to the southeast towards the tidal barrier and ‘The Deep’. Ground level views to the west from the A63 at Myton swing bridge would be restricted by the rising viaduct of the A63.

8.11.3 Potential Changes to Driver Stress

<u>Potential Changes to Driver Stress</u>

8.11.3.1 All six of the proposed improvement plans for the A63 are designed to reduce traffic congestion.

8.11.3.2 Traffic modelling for proposed traffic flows has been undertaken for the A63 scheme. Although no scheme will completely eradicate problems in Hull, each of the schemes will significantly ease congestion along the route, particularly at Mytongate. It is likely that driver stress will reduce long term.

8.11.3.3 For all of the options, driver stress will undoubtedly increase during the construction stage. Lane closures and diversions will be in place which are likely to increase congestion and thus driver stress. This increase in driver stress is temporary and will be removed once the scheme opens.

8.11.3.4 The construction periods for each of the scheme options varies due to the varying complexity involved in building each option. The Overground Base Option has the shortest construction period (94 weeks) with the Cut and Cover Tunnel option having the longest (222 weeks). It can therefore be concluded that as the Overground Base Option has the shortest estimated period of disruption due to construction, driver stress for this scheme will be the lowest.

8.11.3.5 All of the improvement options include for the provision of a grade separated junction at Mytongate. The grade separated option would introduce a major change to the existing junction; however, this will be offset by improved signage. The removal of the at-grade junction will enable through traffic along the A63 to move at a more consistent vehicle speed with a consequential reduction in driver stress.

8.11.3.6 A brief summary of other improvements to help alleviate driver stress for all of the options are given below.

Option 1: Underground Base

8.11.3.7 The lowering of the level of the existing A63 in the vicinity of Mytongate Junction and the raising of Ferensway and Commercial Road across the A63 on a new overbridge will segregate the two traffic flows and ease congestion and thus driver stress.

8.11.3.8 A pedestrian footbridge will be provided directly in front of Prince's Quay Shopping entre and the Humber Dock Marina. This bridge would be approximately 7m above existing road level and would allow pedestrians to cross unobstructed above Castle Street, eliminating the current pedestrian/vehicle conflict. Further footbridges are to be provided along other parts of the scheme with a replacement cycleway to the north of the A63.

8.11.3.9 Any route uncertainty is likely to be alleviated by the proposed improvements to road markings and signage.

Option 2: Underground Landbridge

8.11.3.10 This option comprises the lowering of the level of the existing A63 in the vicinity of Mytongate Junction and raising and carrying Ferensway and Commercial Road across the A63 on a new overbridge. Again, this will segregate traffic in the area and reduce traffic congestion and driver stress.

8.11.3.11 An approximately 25m wide pedestrian landbridge is proposed directly in front of Prince's Quay Shopping Centre and the Humber Dock Marina. This bridge would be approximately 3.5m above existing road level and would allow pedestrians to cross unobstructed above Castle Street, eliminating the current pedestrian/vehicle conflict. Footbridges would be provided near Porter Street and at Market Place.

8.11.3.12 Any route uncertainty is likely to be alleviated by the proposed improvements to road markings and signage.

Option 3: Underground Cut and Cover

8.11.3.13 As with all of the options, the improved road network will help to alleviate the traffic flow problems in the area. Proposed works include raising and carrying Ferensway and Commercial Road across the A63 on a new overbridge. Traffic flow will be much improved leading to less congestion in the area.

8.11.3.14 A footbridge would be provided near Porter Street so that pedestrians would be segregated from vehicular traffic on the A63. However, they would still have to cross the Local Access Road in order to pass from north to south. Designated crossing points would be provided.

8.11.3.15 Any route uncertainty is likely to be alleviated by the proposed improvements to road markings and signage.

Option 4: Overground Base

8.11.3.16 Road improvements in this scheme include raising the level of the A63 in the vicinity of Mytongate Junction. Again, given the existing problems with traffic congestion in the area, the new layout will ease traffic flow and reduce driver stress.

8.11.3.17 A pedestrian footbridge would be provided directly in front of Prince's Quay Shopping Centre and the Humber Dock Marina. This would be approximately 7.0m above existing road level and would allow pedestrians to cross unobstructed above Castle Street, eliminating the current pedestrian/vehicle conflict.

8.11.3.18 Any route uncertainty is likely to be alleviated by the proposed improvements to road markings and signage.

Option 5: Overground Landbridge

8.11.3.19 This option consists of raising the level of the existing A63 in the vicinity of Mytongate Junction with Ferensway and Commercial Road remaining at-grade and passing beneath the new A63 viaduct. This will ease traffic flow at the existing busy junction and therefore ease driver stress.

8.11.3.20 This option includes construction of a 25m wide pedestrian walkway approximately 1.0m below existing ground level directly in front of Prince's Quay Shopping Centre and the Humber Dock Marina. Pedestrians will therefore cross below the A63 viaduct and the current pedestrian/vehicle conflict will be eliminated.

8.11.3.21 Any route uncertainty is likely to be alleviated by the proposed improvements to road markings and signage.

Option 6: Overground Extended Viaduct

8.11.3.22 Road improvements in this scheme include raising the level of the existing A63 in the vicinity of Mytongate Junction with Ferensway and Commercial Road remaining at-grade and passing beneath the new A63 viaduct.

8.11.3.23 A pedestrian footbridge would be provided near Porter Street. Although pedestrians would be segregated from vehicular traffic on the A63 they would still have to cross the Local Access Road in order to pass from north to south. Designated crossing points would be would be provided.

8.11.3.24 Any route uncertainty is likely to be alleviated by the proposed improvements to road markings and signage.

8.11.4 SUMMARY

8.11.4.1 The road improvements to the A63, whichever option is decided upon, will help to ease traffic congestion.

8.11.4.2 As a result of improved roads and signage, driver stress would be reduced. The construction period for each of the six schemes is different. The scheme with the shortest construction period is the Overground Base Scheme (94 weeks). It can therefore be concluded that driver stress for this scheme will be the lowest of all the schemes.

8.11.4.3 More detailed analysis of view from the road and traveller care would be possible following further work regarding the positioning and number of signage and traffic signals, pedestrian crossing locations and any cycle facilities.

8.11.4.4 Overall, the works to improve the A63 would be expected to fulfil its intended purpose and improve road capacity and safety, particularly at peak periods, resulting in a reduction in driver stress.

9 ASSESSMENT SUMMARY

9.1 Appraisal Summary Tables

9.1.1 The Appraisal Summary Tables (AST) for each of the scheme options are included in Appendix D.

9.2 Summary of Consultation with Public Bodies

9.2.1 Value Management Workshop

9.2.1.1 A Stakeholder's Value Management Workshop was held on the 8th April 2008. The workshop was an opportunity for the HA to provide stakeholders with an overview of the development of the project and for stakeholders to review the various options so that they could contribute to the overall opinion assessment process by considering the relative strengths and weaknesses of the various options.

9.2.1.2 The following stakeholders were invited to attend (*indicates the stakeholders who attended the workshop).

- Kingston upon Hull City Council*
- Hull City Build*
- Yorkshire Forward
- Hull Chamber of Commerce*
- Associated British Port
- Humberside Police
- Humberside Ambulance Service
- Humberside Fire Department*
- Humberside Archaeological Partnership
- Natural England

- Urban Conservation and Design Team*
- National Trust
- Environment Agency*
- Holy Trinity Church*
- English Partnerships
- Environmental Health Services*
- Freight Transport Association
- Road Haulage Association
- Humber Economic Partnership*
- Hull Civic Society*
- English Heritage*
- One Hull
- CABE
- Carillion WSP*

9.2.2 Air Quality

9.2.2.1 Consultation with regards to the air quality model and assessment has been undertaken. A summary of the consultation is given in Table 9.1 overleaf.

TABLE 9.1: AIR QUALITY CONSULTATION				
SENT BY	**SENT TO**	**DATE**	**FORMAT**	**ISSUES RAISED**
Dave White, Hull City Council	Katherine Hauser, Golder	04.08.08	Letter	HCC had reviewed the findings of the Golder Air Quality Assessment and thought the findings to be similar to those of their own work. Golder model outputs were considered to be acceptable. One difference was that unlike Golder, HHC had not predicted an NO_2 exceedence on the A63 to the east side of the River Hull. This difference attributed to possible slight differences in background and meteorological data used.
Katherine Hauser, Golder	Dave White, Hull CC	17/07/08	Letter	An explanation what background air quality data was used in modelling and what assumptions were applied to the data. Included a copy of the ADMS Roads model output contour plots for HCC to comment on.
Dave White, Hull CC	Sam Arnold, Golder	Not dated	Email	Confirmation that HCC were satisfied with the proposed use of ADMS roads for modelling work.
Sam Arnold, Golder	Dave White, Hull CC	08/02/07	Email	Requesting input of HCC Environmental Health department into selecting options for dispersion modelling, as outlined in the correspondence. Initial confirmation that ADMS Roads model considered acceptable for AQ study
GAUK	HCC	06.02.07	Memo	Data Request for AQ study
GAUK	HCC	02.03.07	Memo	Additional information request and cheque (AQ study)
GAUK	HCC	13.06.08	Meeting	Consultation re: approach and method to be undertaken/reported for AQ study
GAUK	HCC-	04.08.08	Letter	Confirmation that the GAUK model used in the AQ study is acceptable

9.2.3 Cultural Heritage

9.2.3.1 Both English Heritage and the Humber Archaeology Partnership (HAP) are involved in the scheme as Cultural Heritage consultees. English Heritage is a statutory consultee on road schemes, whereas HAP is not. Both organisations were invited to the Stakeholder workshop; however HAP did not attend this event. A subsequent separate meeting was held with HAP.

9.2.3.2 A copy of the Cultural Heritage Detailed Assessment was issued to both consultees on the 7th August 2008, requesting comments. A reply was received from HAP on the 1st October; and from English Heritage on the 28th October 2008.

Humber Archaeology Partnership

9.2.3.3 Many of HAP's comments were factual stemming from their detailed knowledge of the study area; these comments were very useful and amendments were made to the Cultural Heritage chapter as necessary.

9.2.3.4 Significant comments, and HAP's especial reservations over the scoring system used to assess the impacts of the scheme options, related to the fact that specific individual medieval properties within the Old Town were not identified or itemised in the site gazetteer, and that the proposed excavations within the Holy Trinity burial ground were too large and they might detract from the amount of excavation required in the Old Town. Detailed responses to all these comments have been prepared - it is acknowledged that the impact scoring system needs to be amended in the light of the new DMRB; medieval properties within the Old Town are not specifically itemised in the HAP records and this level of detail is not appropriate to this stage of work and the amount of excavation proposed within the burial ground is in accordance with English Heritage guidance.

9.2.3.5 HAP did not seem unduly concerned about the proposed demolition of the Listed Buildings, and questioned whether there was actually any viable future for the Earl de Grey public house. HAP is more concerned about the impacts on the underlying archaeology within the Old Town. Apart from the above regarding the burial ground, no significant comments were received concerning the scale and scope of the proposed mitigation strategy, and there was little comment regarding the impacts on the built environment, townscape and Conservation Area, or the visual impacts.

English Heritage

9.2.3.6 English Heritage took a wider perspective, and indeed questioned the whole rationale behind the scheme. English Heritage confirmed that they concurred with the HAP's comments regarding the below-ground archaeology and that there needed to be an appropriate mitigation strategy - no specific comments were made on the proposed strategy.

9.2.3.7 English Heritage was much more concerned about the above ground impact. They thought that greater mention should be made of the impacts on the Conservation Area/townscape, and this is an accepted omission in the cultural heritage report. In particular, English Heritage could not support the demolition of the various Listed Buildings, and did not consider that these demolitions could be justified. As a result, English Heritage could not support or endorse any of the proposed six scheme options, and they requested an urgent meeting to discuss these issues further. English Heritage also questioned the feasibility of keeping the A63 open during construction.

9.2.4 Ecology

9.2.4.1 Telephone Consultation was undertaken with Natural England regarding the potential effects on ecology. A summary of the discussion is given below

9.2.4.2 Chris McGregor, of the Natural England (North and East Yorkshire Team) was consulted by telephone in June 2008. Ecological surveys carried out by Golder Associates and the results of those surveys were discussed. Natural England did not consider the scheme likely to have significant effects on wildlife, however it was pointed out that appropriate surveys and mitigation must be put in place, in particular in relation to the confirmed bat roost. Natural England would be supportive of any ecological enhancements that could be incorporated into the scheme.

9.2.4.3 Further to the telephone consultation, Golder Associates sent a 1:50,000 scale map showing the approximate scheme location. Chris McGregor forwarded this to Tim Page of the Natural England Humber to Pennines Team. The response was that potential disturbance to Humber Estuary SPA/SSSI/Ramsar birds should be considered and that this may require an assessment of Likely Significant Effect (LSE) and Appropriate Assessment. Natural England is satisfied that Golder Associates has incorporated into the scheme assessment report the potential need for further assessment at a later stage.

9.2.5 Landscape

9.2.5.1 A meeting was undertaken with the head of urban design and conservation at Hull City Council: Richard Wilson in July 2008.

Water

9.2.5.2 The Environment Agency was contacted by e-mail to obtained water quality data on the River Hull, River Humber and Humber Dock Marina, as well as information on any fisheries which may be affected by the proposed scheme. However flow data for the Humber Estuary was not available.

9.2.5.3 As flow data was not available contact was made with Network Services (NS) to seek advice on how to proceed with the assessment in the absence of flow data for the Humber Estuary.

9.2.5.4 A response was received from NS and a copy is included in Appendix J2.

Policies and Plans

9.2.5.5 A list of contact with Statutory Consultees in relation to the Policy and Plans Section is given below. It should be noted that contact was made with officers of Hull City Council only and that all contact was by phone.

- Legal officer 26.7.08 Confirmation that Town or Village Green had been designated in the area.
- Policy Planning Officer 22.7.08 - Confirmation that all the plans selected were correct at the time of writing
- Head of Development Control 6.8.08 - Detailed current position concerning relevant planning applications in the surrounding area and any know potential land use conflicts.
- Transportation Officer 15.7.08 - Details of current progress on road schemes in the City.

9.3 Comparison of Options

9.3.1 Each scheme has been ranked from 1 to 6 for each environmental sub objective from the AST. A score of 1 indicates the least impact on the sub-objective by the scheme proposals and a score of 6 indicates the biggest impact on the sub-objectives by the scheme proposals.

9.3.2 The scores for each sub-objective are added together to give an overall score for each scheme options. The lowest overall score is deemed to have the lowest impact on the environmental sub-objectives. A summary of the scheme scores are shown on Table 9.2.

9.4 Comparison of Options Table

Table 9.2 OVERALL ASSESSMENT SCORES – ENVIRONMENTAL SUB-OBJECTIVES

Option	Noise			Air Quality					Greenhouse Gases			Townscape			Heritage			Biodiversity			Water Environment			Physical Fitness		Journey Ambience		
	Significance of Noise Impact	Overall Assessment Score Significance of Vibration Impact	Order of Preference	No of AQO exceedences at designated receptors modelled (anywhere in study area)		Change in total emissions ~(tonnage) with respect to 'do-min'		Order of Preference	Whole appraisal period (tonnes of C)	Scheme Opening Year (tonnes of C)	Order of Preference	Townscape Impact	Visual Impact	Order of Preference	No of Affected Sites	Overall Assessment Score	Order of Preference	No. features affected	Overall Assessment Score	Order of Preference	Spillage risk	Overall Assessment Score	Order of Preference	Overall Assessment Score	Order of Preference	Overall Assessment Score	Order of Preference	Sum of Rankings
				NO_2	PM_{10}	NO_2	PM_{10}																					
Option 1: Underground Base	Neutral	Neutral	4	0 (7)	0 (0)	-3.69	-0.06	3	-14,555	-237	1	Moderate Adverse	Moderate Adverse	1	44	Large adverse	3	28	Intermediate negative	4	0.23%	Neutral	1	Slight beneficial	3	Moderate beneficial	3	23
Option 2: Underground Landbridge	Slight beneficial	Slight beneficial	1	0 (8)	0 (0)	-2.72	-0.05	4	-12,664	-207	2	Large Adverse	Large Adverse	4	55	Large adverse	4	28	Intermediate negative	4	0.23%	Neutral	1	Beneficial	1	Moderate Beneficial	3	24
Option 3: Underground Cut and Cover Tunnel	Slight beneficial	Slight beneficial	1	0 (9)	0 (0)	-2.77	-0.04	6	-10,939	-176	3	Large Adverse	Moderate to Slight Adverse	2	91	Very Large adverse	6	24	Intermediate negative	1	0.17%	Neutral	1	Slight Beneficial	3	Moderate Beneficial	3	26
Option 4: Overground Base Scheme	Slight beneficial	Slight beneficial	1	0 (7)	0 (0)	+1.58	-0.007	5	4,275	67	6	Moderate Adverse	Large Adverse	3	44	Large adverse	1	27	Intermediate negative	2	0.25%	Neutral	1	Beneficial	1	Large Beneficial	1	21
Option 5: Overground Landbridge Equivalent	Neutral	Neutral	4	0 (5)	0 (0)	+0.58	-0.005	2	-789	-16	5	Very Large Adverse	Very Large Adverse	5	54	Large adverse	2	29	Intermediate negative	3	0.18%	Neutral	1	Neutral	5	Large Beneficial	1	28
Option 6: Overground Extended Viaduct	Slight adverse	Slight adverse	6	0 (5)	0 (0)	-2.98	-0.02	1	-5,447	-80	4	Very Large Adverse	Very Large Adverse	6	92	Very Large adverse	5	33	Intermediate negative	5	0.22%	Neutral	1	Slight Disbenefit	6	Large Beneficial	1	35

[1]Exceedences included in brackets are NOT identified receptors ie they occur on roads / areas where humans will only spend a short duration (kerbs, footpaths) and thus will only have minimal impact on human health; the total number of exceedences is shown for information / comparison only.

10 PROGRAMME

10.1 The key dates for the scheme are shown in Table 10.1 below:

Table 10.1: Key Dates	
Milestone	**Date**
Recommendation of schemes to be taken forward to Public Consultation	September 2008
Public Consultation Exhibition	March 2009
Preferred Route Announcement	January 2010
Award ECI Contract	January 2011
Draft Orders and Environmental Statement Published	March 2012
Public Enquiry	December 2012
Orders Made	November 2013
Start of Works	September 2014

10.2 Due to the extensive investigation works required in relation to the archaeology within the site, the investigation work will take place in advance of the main construction works. Table 10.2 shows the time periods that have been allowed for the archaeological investigation works within the overall programme.

Table 10.2: Timescales for Archaeological Investigation Works	
Scheme Option	**Timescale**
Underground Base (Option 1) Overground Base (Option 4)	8 Months
Underground Landbridge (Option 2) Overground Landbridge (Option 5)	14 Months
Cut and Cover Tunnel (Option 3) Long Viaduct (Option 6)	20 Months

10.3 The anticipated opening years for each scheme option are shown in Table 10.3 below:

Table 10.3: Timescales for Opening Years	
Scheme Option	**Opening Year**
Underground' Base (Option 1)	2018
Underground' Landbridge (Option 2)	2018
Cut and Cover Tunnel (Option 3)	2020

Table 10.3: Timescales for Opening Years	
Scheme Option	**Opening Year**
Overground' Base (Option 4)	2017
Overground' Landbridge (Option 5)	2017
Long Viaduct (Option 6)	2018

11 CONCLUSION OF RECOMMENDATIONS

11.1 Options for public consultation

11.1.1 As can be seen in Section 5.7.14 of this report (Analysis of Monetised Costs and Benefits, the calculated Benefit Cost Ratios for the Cut and Cover Tunnel (Option 3), the Underground Landbridge (Option 2) and the Long Viaduct (Option 6) all have BCRs of less than 1.0. The Overground Landbridge (Option 5) has a BCR of 1.054.

11.1.2 Options 2, 3, 5 and 6 also have a greater adverse impact on the environmental sub-objectives included in the appraisal process Section as shown in section 9.3 of this report.

11.1.3 The Overground Base Scheme (Option 4) and the Underground Base Scheme (Option 1) have BCRs of 2.637 and 2.343 respectively. Both options also have the least impact on the environmental sub-objectives included in the appraisal process as shown in section 9.3.

11.1.4 The value for money (VFM) guidance advice to ministers classifies BCR scores as follows:

- BCR > 2.0 represents high VFM.
- BCR 1.5 – 2.0 represents medium VFM.
- BCR 1.0 – 1.5 represents low VFM.
- BCR < 1.0 represents poor VFM.

11.1.5 The advice states that purely on the basis of VFM, no projects with a poor VFM should be funded, very few projects with a low VFM should be funded, some but by no means all projects with a medium VFM should be funded and most if not all projects with a high VFM should be funded.

11.1.6 On the basis of the healthy BCR scores and the relatively low impact on the environmental sub-objectives as described above, it is recommended that the Overground Base Option (Option 4) and the Underground Base Option (Option 1) are taken forward to Public Consultation.

11.1.7 A summary of the scheme BCRs and impact on the environment is shown in Table 11.1 below.

Table 11.1: Summary of Scheme BCRs and Environmental Ranking score		
Option	**BCR**	**Environmental Score**
Underground Base (Option 1)	2.343	23
Underground Landbridge (Option 2)	0.860	24
Cut and Cover Tunnel (Option 3)	0.935	26
Overground Base (Option 4)	2.637	21
Overground Landbridge (Option 5)	1.054	28
Long Viaduct (Option 6)	0.799	35

11.2 Preferred Solution

11.2.1 As can be seen from Table 11.1 above, Option 4 and Option 1 represent similar value for money in terms of the calculated BCRs, and both schemes have similar environmental impacts. As such, the HA will await the outcome of the public consultation exercise before determining the preferred solution.

12 DETAILED COST ESTIMATE

12.1 Completed Annex 5 Forms are included in Appendix B for each scheme option.

12.2 A breakdown of the scheme costs is included on Table 12.1 overleaf.

Table 12.1: A63 CASTLE STREET SCHEME COST SUMMARY – SEPTEMBER 2008

Scheme		Works Estimate	Land Costs	Uncertainty	Risk	Programme Risk	Inflation	Scheme Total	Current Range Estimate	BCR
Overground Base (4)	Min	£42.3m	£14.9m	£17.0m	£6.1m	*£7.0m*	*£34.0m*	£121.3m		2.637
	Expected	£45.6	£14.9m	£18.5m	£13.5m	*£12.0m*	*£42.0m*	£146.7m		
	Max	£51.2m	£14.9m	£20.0m	£20.8m	*£17.0m*	*£49.0m*	£172.9m		
Underground Base (1)	Min	£49.7m	£13.8m	£12.8m	£6.4m	*£7.0m*	*£34.0m*	£123.7m	*£118.0m*	2.343
	Expected	£52.4m	£13.8m	£13.4m	£14.7m	*£12.0m*	*£42.0m*	£148.3m	*£155.0m*	
	Max	£57.3m	£13.8m	£14.0m	£21.8m	*£17.0m*	*£49.0m*	£172.9m	*£192.0m*	
Overground Land Bridge (5)	Min	£59..9m	£56.4m	£25.5m	£6.0m	*£9.0m*	*£51.0m*	£207.8m		1.054
	Expected	£68.4m	£56.4m	£28.0m	£12.7m	*£17.0m*	*£61.0m*	£243.5m		
	Max	£78.4m	£56.4m	£30.4m	£15.9m	*£25m*	*£71.0m*	£277.1m		
Cut and Cover Tunnel (3)	Min	£126.1m	£27.4m	£32.9m	£21.2m	*£14.0m*	*£88.0m*	£309.6m	*£277.0m*	0.935
	Expected	£136.9m	£27.4m	£34.4m	£40.6m	*£26.0m*	*£106.0m*	£371.3m	*£353.0m*	
	Max	£141.4m	£27.4m	£35.9m	£91.1m	*£37.0m*	*£123.0m*	£455.8m	*£431.0m*	
Underground Landbridge (2)	Min	£69.1m	£76.4m	£18.5m	£8.3m	*£9.0m*	*£51.0m*	£232.3m	*£176.0m*	0.860
	Expected	£78.9m	£76.4m	£19.4m	£16.0m	*£17.0m*	*£61.0m*	£268.7m	*£226.0m*	
	Max	£92.1m	£76.4m	£20.2m	£21.8m	*£25m*	*£71.0m*	£306.5m	*£276.0m*	
Long Viaduct (6)	Min	£82.9m	£87.9m	£33.0m	£8.7m	*£14.0m*	*£88.0m*	£314.5m		0.799
	Expected	£95.9	£87.9m	£36.5m	£18.3m	*£26.0m*	*£106.0m*	£340.6m		
	Max	£113.4m	£87.9m	£39.9m	£23.6m	*£37.0m*	*£123.0m*	£424.8m		

The figures in italic were generated by the estimate review team in March 2008.

13 LIST OF ENCLOSURES

13.1 Appendix A – Scheme Options Drawings

13.2 Appendix B – Annex 5 Forms; Detailed Scheme Options Cost Estimates

13.3 Appendix C – List of Identified Cultural Heritage Sites

13.4 Appendix D – Webtag Worksheets

13.5 Appendix E - Appraisal Summary Tables (AST)

13.6 Appendix F – Statutory Bodies Information

Appendix A – Scheme Options Drawings

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Client: HIGHWAYS AGENCY

Project: A63, CASTLE STREET IMPROVEMENTS, HULL

Drawing Title: SITE LOCATION PLAN

	Name	Date
Drawn	AD	APRIL 07
Designed	GG	APRIL 07
Checked	GG	APRIL 07
Approved	AG	APRIL 07

Scale: NOT TO SCALE

File No.: W11189

Drawing Status: FINAL

Drawing No.: FIGURE 1

Revision:

Longsection Scale H 1:1250 V 1:250 Slope Units =%

REV	DESCRIPTION	DRN	CHK	APP	DATE
A	Survey amended to include WSP Marketplace layout, xrefs SS'd, changed to remove m'place sliproads.	MLB	MLB		29/02/08

Pell Frischmann
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Architect/Client/Contractor

HIGHWAYS AGENCY

Project

A63 CASTLE STREET IMPROVEMENTS, HULL

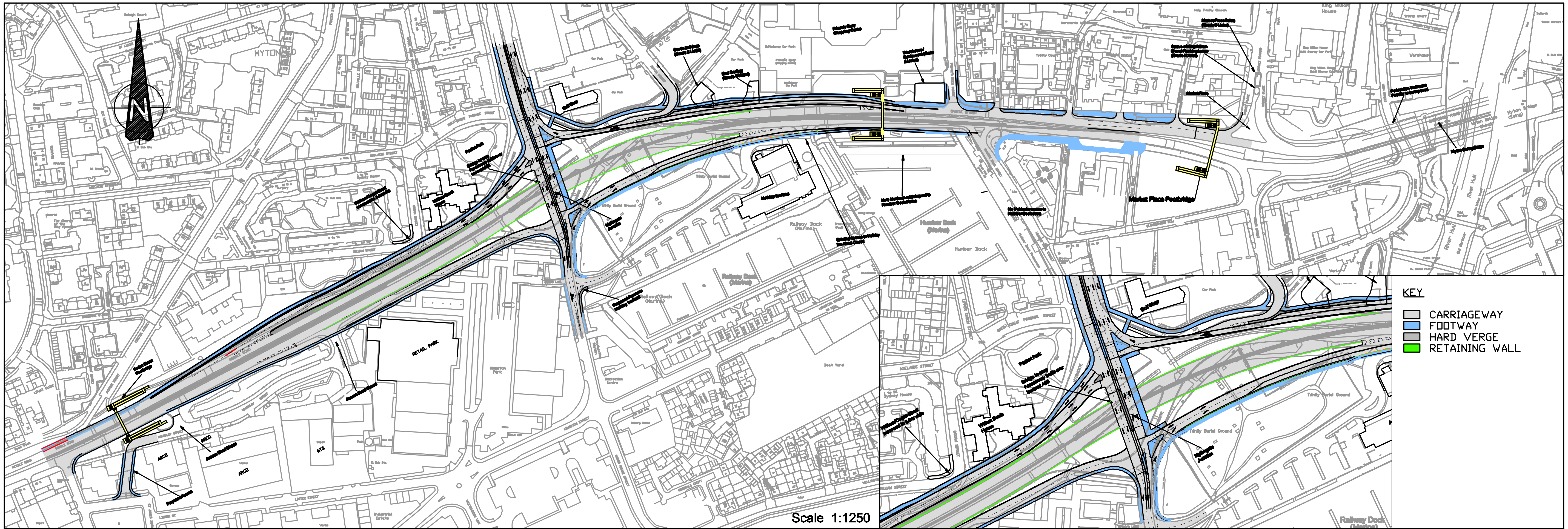
Drawing Title

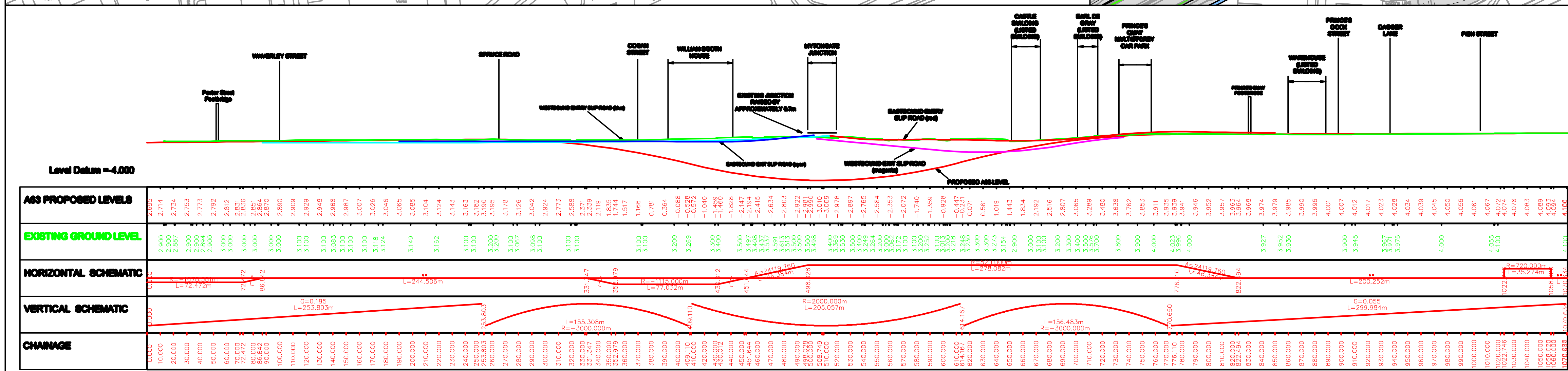
UNDERGROUND CUT & COVER OPTION

	Name	Date	
Drawn	AR	MAY 08	Scale AS SHOWN
Designed	AR	MAY 08	File No. W11189-09-03 C.dwg
Checked	NR	MAY 08	Drawing Status FOR REVIEW
Approved			

Drawing No. W11189/09/03 Revision C

P:\pbh\W10---\W11189 - PSF - A63 Castle Street\DWI Drawings\Under ground options\Cut and Cover Scheme\Long sect\W11189-09-03 C.dwg Plotted on 17/06/08 at 11:44 by RSteeker





Longsection

Scale H 1:1250 V 1:250 Slope Units =%

Poll Frischmann

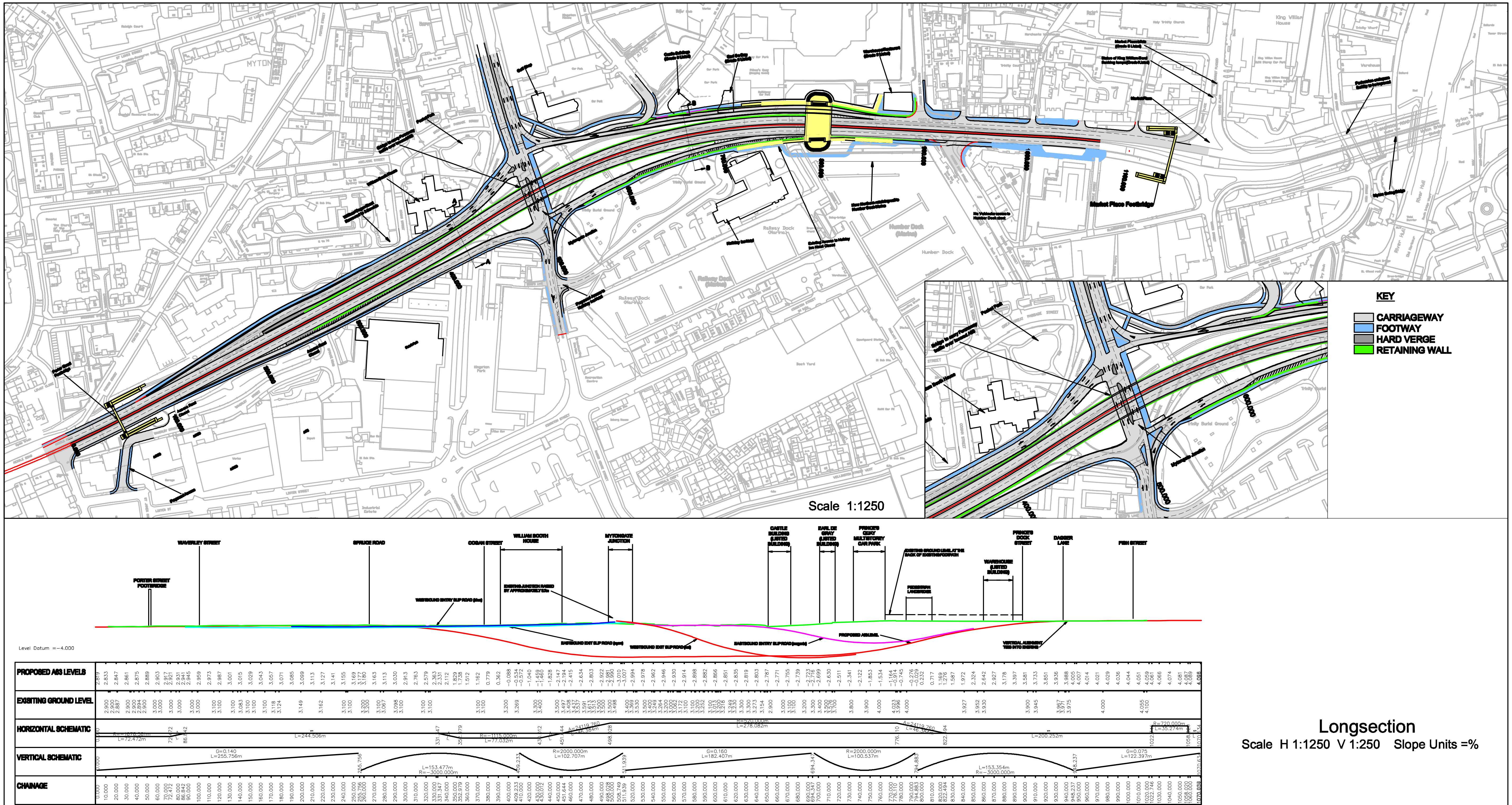
HIGHWAYS AGENCY

A63 CASTLE STREET IMPROVEMENTS, HULL

GRADE SEPARATION OF MYTONGATE JUNCTION - BASE SCHEME

W11169/09/01

E



Pell Frischmann

HIGHWAYS AGENCY

Project
A63 CASTLE STREET IMPROVEMENTS, HULL

Drawing Title
UNDERGROUND LANDBRIDGE OPTION

Drawing No.
W11189/09/02

Revision
D

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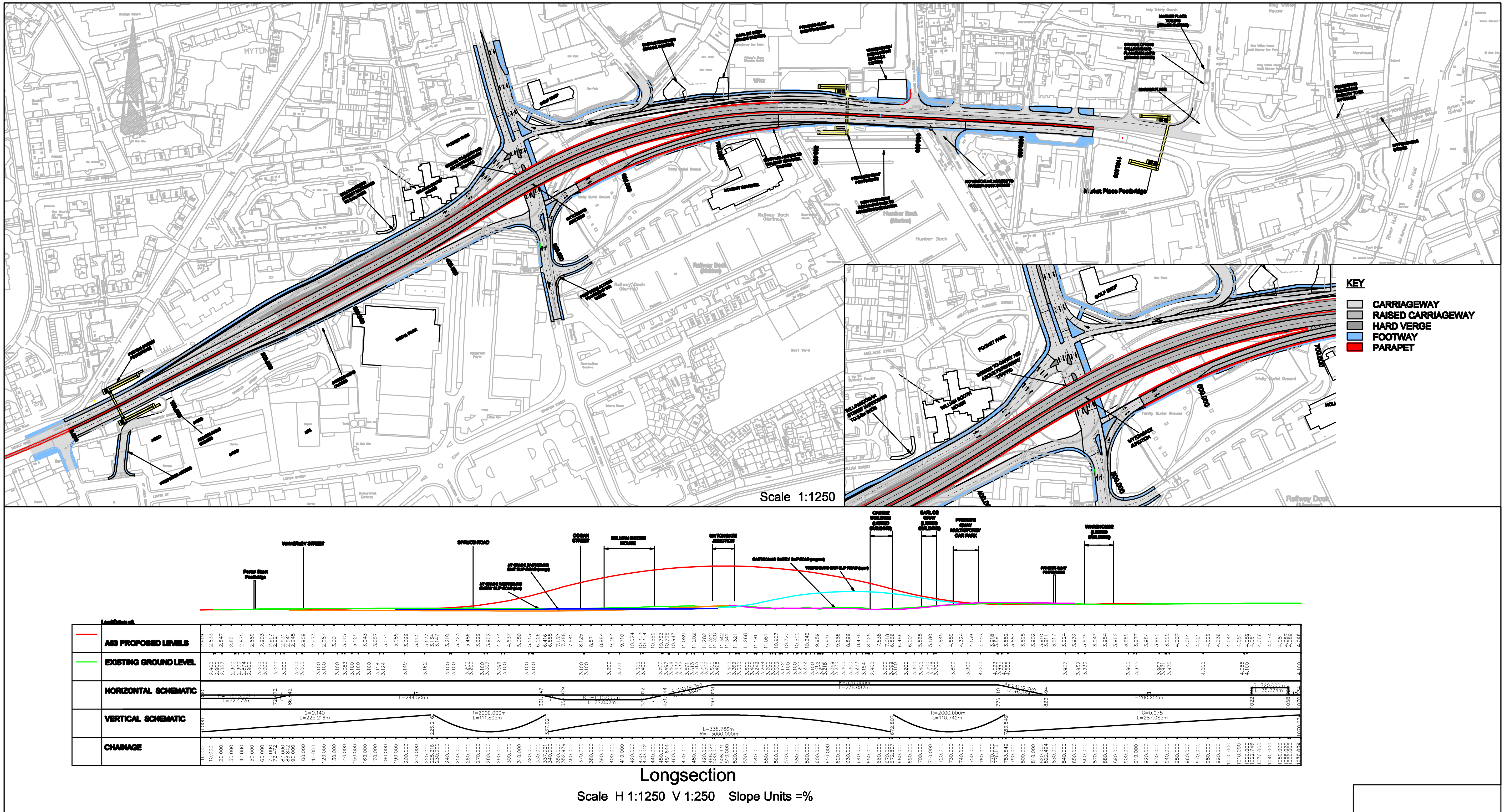

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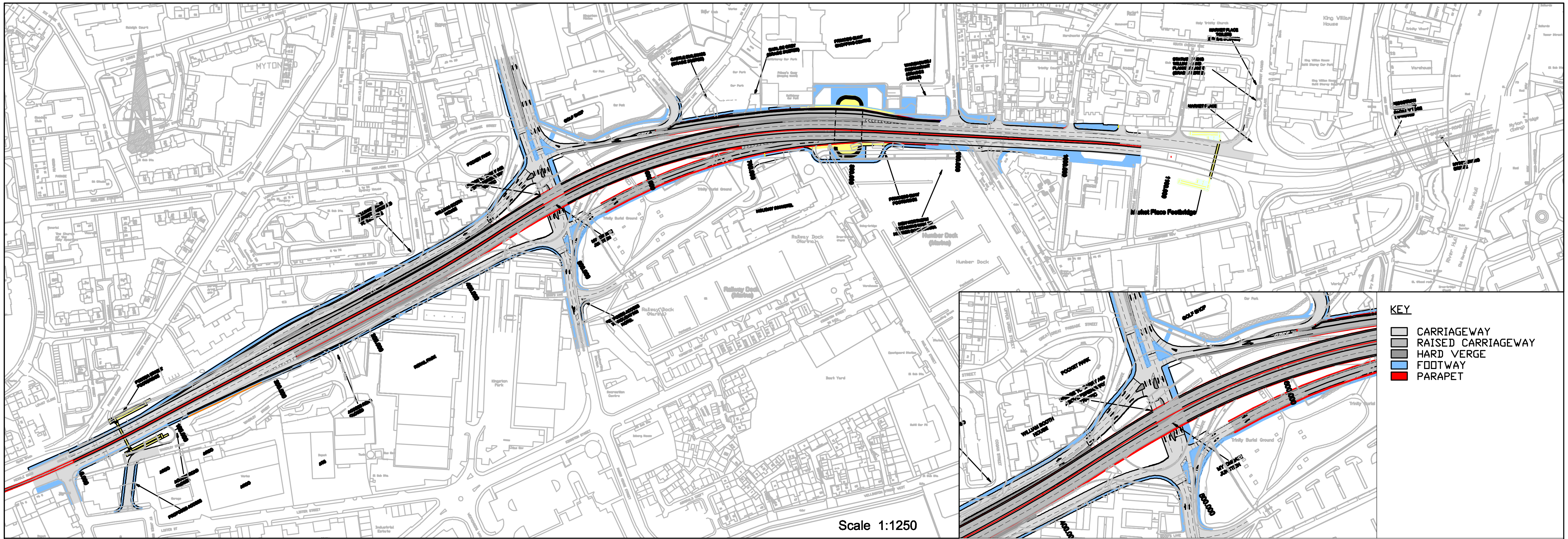
HIGHWAYS AGENCY

Project
A63 CASTLE STREET IMPROVEMENTS, HULL

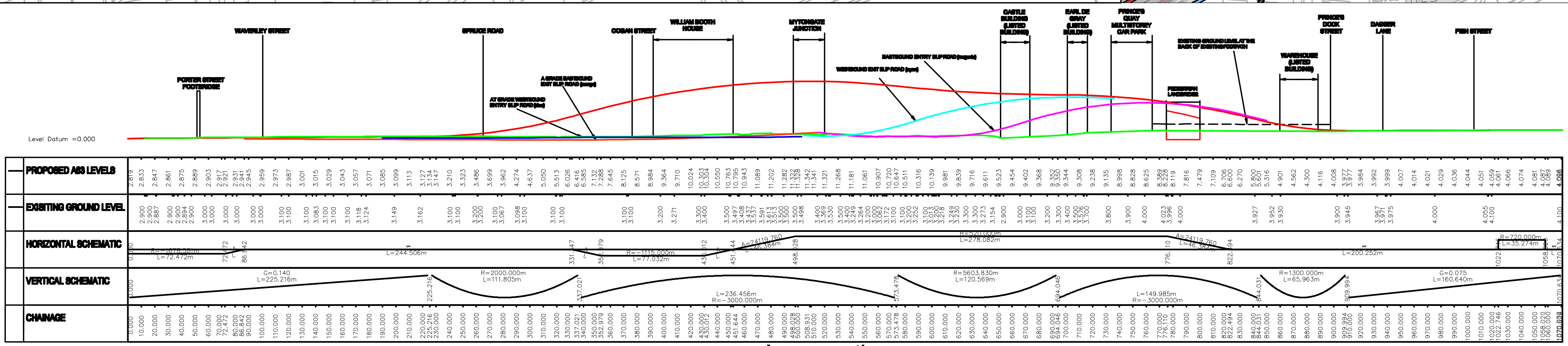
Drawing Title
OVERGROUND
BASE SCHEME OPTION

Drawing No.
W11169/09/11

Revision
C



Scale 1:1250



Longsection

Scale H 1:1250 V 1:250 Slope Units =%

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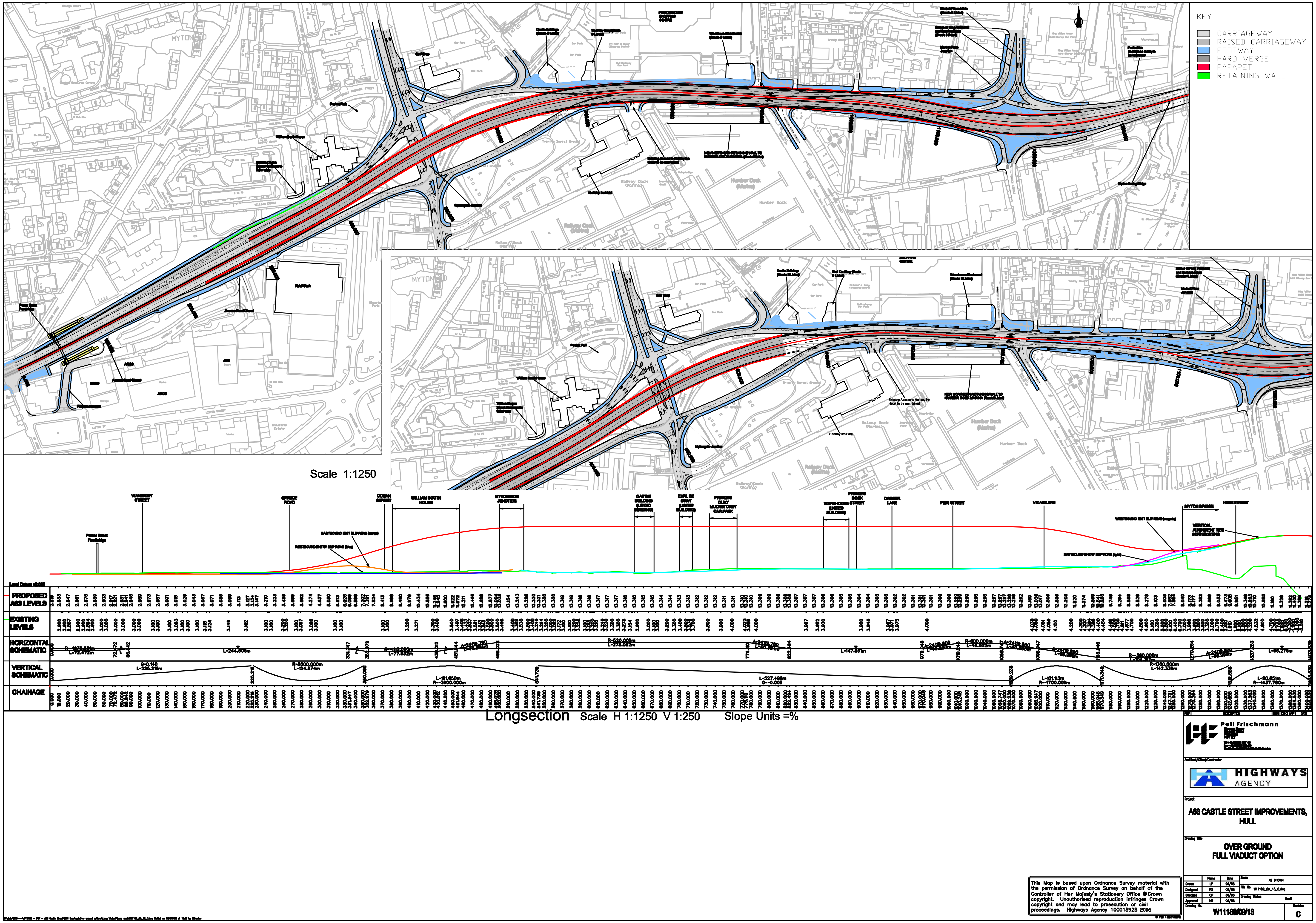
HIGHWAYS AGENCY

Project: A63 CASTLE STREET IMPROVEMENTS, HULL

Drawing Title: OVERGROUND LANDBRIDGE EQUIVALENT OPTION

Drawing No. W1118909/12

Revision C


KEY
CARRIAGEWAY
RAISED CARRIAGEWAY
FOOTWAY
HARD VERGE
PARAPET
RETAINING WALL
Scale 1:1250
WAVERLEY STREET
SPRUCE ROAD
COGAN STREET
WILLIAM BOOTH HOUSE
MYTONGATE JUNCTION
CASTLE BUILDINGS (LISTED BUILDING)
EARL DE GRAY (LISTED BUILDING)
PRINCE'S QUAY MULTISTOREY CAR PARK
WAREHOUSE (LISTED BUILDING)
PRINCE'S DOCK STREET
DAGGER LANE
FISH STREET
VICAR LANE
MYTON BRIDGE
HIGH STREET
PROPOSED A63 LEVELS
EXISTING LEVELS
HORIZONTAL SCHEMATIC
VERTICAL SCHEMATIC
CHAINAGE
Longsection Scale H 1:1250 V 1:250 Slope Units =%
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HIGHWAYS AGENCY
A63 CASTLE STREET IMPROVEMENTS, HULL
OVER GROUND FULL VIADUCT OPTION
W11169/09/13
C

Appendix B – Annex 5 Forms; Detailed Scheme Options Cost Estimates

Underground Base Option (Option 1) Estimate

	ESTIMATE			RISK			UNCERTAINTY		
Description	Expected Value £000's	Minimum Plausible £000's	Maximum Plausible £000's	Expected Risk	Minimum Plausible Risk	Maximum Plausible Risk	Percentage Uncertainty	Final Minimum	Final Maximum
Options Phase									
Land Cost in Phase (blight)	£2,500,000	£2,250,000	£2,750,000	£3,740,101	£2,304,934	£9,913,077			
Environmental Assessment									
Business Case Preparation									
Studies									
Prep and Supervision	£1,435,232	£1,435,232	£1,435,232						
Estimating and Reviews									
Options Phase Total	£3,935,232	£3,685,232	£4,185,232	£3,740,101	£2,304,934	£9,913,077			
Development Phase									
Land Cost in Phase (acquisition)	£10,000,000	£9,000,000	£11,000,000	£509,778	£314,163	£1,351,158			
High Level Design Costs									
Environmental Statement									
Draft Orders									
Appointment of Contractor - Cost									
Contractor ECI Costs	£3,705,896	£3,705,896	£3,705,896						
Public Inquiry									
Prep and Supervision	£1,063,135	£1,063,135	£1,063,135						

	ESTIMATE			RISK			UNCERTAINTY		
Description	Expected Value £000's	Minimum Plausible £000's	Maximum Plausible £000's	Expected Risk	Minimum Plausible Risk	Maximum Plausible Risk	Percentage Uncertainty	Final Minimum	Final Maximum
Designers Cost									
Estimating and Reviews									
Surveys									
Others									
Development Phase Total	£14,769,031	£13,769,031	£15,769,031	£509,778	£314,163	£1,351,158	£0	£0	£0
Options and Development Phase Totals	£18,704,263	£17,454,263	£19,954,263	£4,249,879	£2,619,098	£11,264,236	£0	£0	£0
Project Overheads	£12,121,058	£12,121,058	£13,333,164	£23,267	£14,339	£61,669			
Method Related Cost	£3,561,915	£3,561,915	£3,918,107	£2,306,969	£1,421,727	£6,114,584		£1,173,780	£1,291,158
Site clearance	£158,159	£156,382	£174,937		£0	£0			
Fencing					£0	£0			
Road Restraint Systems	£467,295	£457,981	£476,609	£129,089	£79,554	£342,148		£120,596	£126,572
Drainage and Ducts	£1,130,624	£1,076,936	£1,184,311		£0	£0		£323,081	£355,293
Earthworks	£5,031,264	£4,466,352	£5,596,176	£576,796	£355,465	£1,528,788		£7,572,237	£8,259,250
Pavement	£2,839,918	£2,702,015	£2,977,821	£61,768	£38,066	£163,715		£686,370	£756,128
Kerbs, footways,	£723,798	£658,135	£789,460		£0	£0		£71,814	£85,546
Traffic Signs (and markings)	£212,790	£202,657	£222,923		£0	£0		£203,460	£223,806
Road lighting	£125,973	£125,973	£138,570		£0	£0		£31,493	£34,642
Electrical Work for Lighting and signs	£125,973	£125,973	£138,570		£0	£0		£56,688	£62,356
Communications	£170,000	£170,000	£187,000		£0	£0		£34,000	£37,400
Piling and embedded	£10,179,572	£9,686,076	£10,673,069	£38,510	£23,733	£102,070		£1,018,608	£1,122,307

	ESTIMATE			RISK			UNCERTAINTY		
Description	Expected Value £000's	Minimum Plausible £000's	Maximum Plausible £000's	Expected Risk	Minimum Plausible Risk	Maximum Plausible Risk	Percentage Uncertainty	Final Minimum	Final Maximum
retaining walls									
Landscape and Ecology					£0	£0			
Maintenance Painting of Steelwork					£0	£0			
Structures	£3,439,522	£3,439,522	£3,783,475	£900,430	£554,912	£2,386,575		£505,692	£556,261
Accommodation Works	£2,270,825	£2,270,825	£2,497,908		£0	£0		£567,706	£624,477
Contractor Fee					£0	£0			
BASE COST ESTIMATE TOTAL	£42,558,686	£41,221,801	£46,092,098	£5,095,475	£2,487,797	£10,699,550		£12,365,524	£13,535,197
Ancillary									
Statutory Undertakers	£2,118,589	£2,118,589	£2,118,589	£553,999	£341,416	£1,468,365			
RA & LA									
NR VAT (20% of works subject to VAT)	£1,489,554	£1,442,763	£1,613,223	£178,342	£87,073	£374,484		£432,793	£473,732
Risk Not Allocated Elsewhere									
TOTAL WORKS COST	£64,871,092	£62,237,416	£69,778,173	£10,077,695	£5,535,383	£23,806,636		£12,798,318	£14,008,929
Remaining Land Costs (part 1 claims)	£1,280,430	£1,280,430	£1,280,430						
Total Scheme Cost	£66,151,522	£63,517,846	£71,058,603	£10,077,695	£5,535,383	£23,806,636		£12,798,318	£14,008,929

Underground Landbridge Option (Option 2) Estimate

	ESTIMATE			RISK			UNCERTAINTY		
Description	Expected Value £000's	Minimum Plausible £000's	Maximum Plausible £000's	Expected Risk	Minimum Plausible Risk	Maximum Plausible Risk	Percentage Uncertainty	Final Minimum	Final Maximum
Options Phase									
Land Cost in Phase (blight)	£62,000,000	£55,800,000	£68,200,000						
Environmental Assessment									
Business Case Preparation									
Studies									
Prep and Supervision	£2,202,821	£2,202,821	£2,202,821						
Estimating and Reviews									
Options Phase Total	£64,202,821	£58,002,821	£70,402,821						
Development Phase									
Land Cost in Phase (acquisition)	£12,000,000	£10,800,000	£13,200,000	£936,970	£577,432	£2,483,424			
High Level Design Costs									
Environmental Statement									
Draft Orders									
Appointment of Contractor - Cost									
Contractor ECI Costs	£5,553,794	£5,553,794	£5,553,794						
Public Inquiry									
Prep and Supervision	£1,631,719	£1,631,719	£1,631,719						

	ESTIMATE			RISK			UNCERTAINTY		
Description	Expected Value £000's	Minimum Plausible £000's	Maximum Plausible £000's	Expected Risk	Minimum Plausible Risk	Maximum Plausible Risk	Percentage Uncertainty	Final Minimum	Final Maximum
Designers Cost									
Estimating and Reviews									
Surveys									
Others									
Development Phase Total	£19,185,513	£17,985,513	£20,385,513	£936,970	£577,432	£2,483,424	£0	£0	£0
Options and Development Phase Totals	£83,388,334	£75,988,334	£90,788,334	£936,970	£577,432	£2,483,424	£0	£0	£0
Project Overheads	£18,759,450	£18,759,450	£20,635,395	£26,990	£16,633	£71,537			
Method Related Cost	£7,648,666	£7,648,666	£8,413,533	£4,465,864	£2,752,205	£11,836,701		£1,832,328	£2,015,561
Site clearance	£258,159	£256,382	£284,937		£0	£0			
Fencing					£0	£0			
Road Restraint Systems	£591,730	£582,416	£601,044	£141,267	£87,059	£374,426		£145,483	£151,459
Drainage and Ducts	£1,758,478	£1,674,369	£1,842,587		£0	£0		£502,311	£552,776
Earthworks	£7,417,101	£6,570,254	£8,263,948	£1,689,727	£1,041,338	£4,478,594		£11,364,389	£12,396,219
Pavement	£2,864,854	£2,725,743	£3,003,965	£87,556	£53,959	£232,066		£705,371	£777,037
Kerbs, footways,	£700,801	£640,000	£761,602		£0	£0		£70,000	£82,760
Traffic Signs (and markings)	£219,369	£208,923	£229,816		£0	£0		£203,460	£223,806
Road lighting	£125,973	£125,973	£138,570		£0	£0		£31,493	£34,642
Electrical Work for Lighting and signs	£125,973	£125,973	£138,570		£0	£0		£56,688	£62,356
Communications	£170,000	£170,000	£187,000		£0	£0		£34,000	£37,400
Piling and embedded	£16,983,759	£16,159,609	£17,807,910	£57,109	£35,195	£151,366		£1,665,961	£1,835,791

	ESTIMATE			RISK			UNCERTAINTY		
Description	Expected Value £000's	Minimum Plausible £000's	Maximum Plausible £000's	Expected Risk	Minimum Plausible Risk	Maximum Plausible Risk	Percentage Uncertainty	Final Minimum	Final Maximum
retaining walls									
Landscape and Ecology					£0	£0			
Maintenance Painting of Steelwork					£0	£0			
Structures	£3,754,463	£3,754,463	£4,129,909	£1,316,057	£811,054	£3,488,188		£537,186	£590,905
Accommodation Works	£2,758,767	£2,758,767	£3,034,644		£0	£0		£689,692	£758,661
Contractor Fee					£0	£0			
BASE COST ESTIMATE TOTAL	£64,137,544	£62,160,987	£69,473,429	£7,784,570	£4,797,444	£20,632,877		£17,838,361	£19,519,374
Ancillary									
Statutory Undertakers	£2,520,671	£2,520,671	£2,520,671	£819,571	£505,082	£2,172,260			
RA & LA									
NR VAT	£2,806,018	£2,719,543	£3,039,463	£272,460	£167,911	£722,151		£624,343	£683,178
Risk Not Allocated Elsewhere									
TOTAL WORKS COST	£152,852,566	£143,389,535	£165,821,897	£9,813,571	£6,047,868	£26,010,712		£18,462,704	£20,202,552
Remaining Land Costs (part 1 claims)	£2,400,000	£2,160,000	£2,640,000						
Total Scheme Cost	£155,252,566	£145,549,535	£168,461,897	£9,813,571	£6,047,868	£26,010,712		£18,462,704	£20,202,552

Cut and Cover Tunnel Option (Option 3) Estimate

	ESTIMATE			RISK			UNCERTAINTY		
Description	Expected Value £000's	Minimum Plausible £000's	Maximum Plausible £000's	Expected Risk	Minimum Plausible Risk	Maximum Plausible Risk	Percentage Uncertainty	Final Minimum	Final Maximum
Options Phase									
Land Cost in Phase (blight)	£13,500,000	£12,150,000	£14,850,000	£3,410,580	£2,101,859	£9,039,687			
Environmental Assessment									
Business Case Preparation									
Studies									
Prep and Supervision	£3,649,805	£3,284,825	£4,014,786						
Estimating and Reviews									
Options Phase Total	£17,149,805	£15,434,825	£18,864,786	£3,410,580	£2,101,859	£9,039,687			
Development Phase									
Land Cost in Phase (acquisition)	£11,500,000	£6,094,163	£6,094,163	£1,269,510	£782,369	£3,364,816			
High Level Design Costs									
Environmental Statement									
Draft Orders									
Appointment of Contractor - Cost									

	ESTIMATE			RISK			UNCERTAINTY		
Description	Expected Value £000's	Minimum Plausible £000's	Maximum Plausible £000's	Expected Risk	Minimum Plausible Risk	Maximum Plausible Risk	Percentage Uncertainty	Final Minimum	Final Maximum
Contractor ECI Costs	£9,137,652	£9,137,652	£9,137,652						
Public Inquiry									
Prep and Supervision	£2,703,560	£2,703,560	£2,703,560						
Designers Cost									
Estimating and Reviews									
Surveys									
Others									
Development Phase Total	£23,341,212	£17,935,375	£17,935,375	£1,269,510	£782,369	£3,364,816	£ -	£ -	£ -
Options and Development Phase Totals	£40,491,017	£33,370,200	£36,800,161	£4,680,090	£2,884,227	£12,404,503	£ -	£ -	£ -
Project Overheads	£31,475,652	£31,475,652	£34,623,217	£27,608	£17,014	£73,175			
Method Related Cost	£6,806,015	£6,806,015	£7,486,617	£11,370,341	£7,007,268	£30,136,905		£2,110,340	£2,321,374
Site clearance	£1,008,159	£1,006,382	£1,109,937		£ -	£ -		£1,500,000	£1,650,000
Fencing					£ -	£ -			
Road Restraint Systems	£447,539	£436,658	£458,419	£351,365	£216,538	£931,287		£133,657	£138,009
Drainage and Ducts	£1,199,194	£1,141,423	£1,256,964		£ -	£ -		£342,427	£377,089

	ESTIMATE			RISK			UNCERTAINTY		
Description	Expected Value £000's	Minimum Plausible £000's	Maximum Plausible £000's	Expected Risk	Minimum Plausible Risk	Maximum Plausible Risk	Percentage Uncertainty	Final Minimum	Final Maximum
Earthworks	£10,512,921	£9,305,557	£11,720,284	£4,770,562	£2,939,983	£12,644,298		£17,050,336	£18,526,987
Pavement	£3,739,815	£3,558,399	£3,921,231	£79,058	£48,722	£209,542		£889,732	£980,104
Kerbs, footways,	£972,536	£875,112	£1,069,961		£ -	£ -		£93,511	£113,596
Traffic Signs (and markings)	£246,374	£234,642	£258,107		£ -	£ -		£204,001	£224,401
Road lighting	£125,973	£125,973	£138,570		£ -	£ -		£31,493	£34,642
Electrical Work for Lighting and signs	£125,973	£125,973	£138,570		£ -	£ -		£56,688	£62,356
Communications	£170,000	£170,000	£187,000		£ -	£ -		£34,000	£37,400
Piling and embedded retaining walls	£38,153,148	£36,897,808	£39,408,489	£260,196	£160,353	£689,645		£4,589,781	£4,930,849
Landscape and Ecology					£ -	£ -			
Maintenance Painting of Steelwork					£ -	£ -			
Structures	£16,206,225	£15,561,225	£17,117,347	£1,272,215	£784,036	£3,371,985		£4,213,786	£4,635,164
Accommodation Works	£2,320,283	£2,320,283	£2,552,311		£ -	£ -		£580,071	£638,078
Contractor Fee					£ -	£ -			
BASE COST ESTIMATE	£113,509,806	£110,041,101	£121,447,024	£18,131,345	£11,173,913	£48,056,838		£31,829,822	£34,670,050

	ESTIMATE			RISK			UNCERTAINTY		
Description	Expected Value £000's	Minimum Plausible £000's	Maximum Plausible £000's	Expected Risk	Minimum Plausible Risk	Maximum Plausible Risk	Percentage Uncertainty	Final Minimum	Final Maximum
TOTAL									
Ancillary						£ -			
Statutory Undertakers	£3,878,878	£3,878,878	£3,878,878	£1,415,694	£872,458	£3,752,274			
RA & LA									
NR VAT	£3,972,843	£3,851,439	£4,250,646	£634,597	£391,087	£1,681,989		£1,114,044	£1,213,452
Risk Not Allocated Elsewhere									
TOTAL WORKS COST	£161,852,545	£151,141,617	£166,376,708	£24,861,726	£15,321,685	£65,895,604		£32,943,866	£35,883,501
Remaining Land Costs (part 1 claims)	£2,400,000	£2,400,000	£2,400,000						
Total Scheme Cost	£164,252,545	£153,541,617	£168,776,708	£24,861,726	£15,321,685	£65,895,604		£32,943,866	£35,883,501

Overground Base Option (Option 4) Estimate

	ESTIMATE			RISK			UNCERTAINTY		
Description	Expected Value £000's	Minimum Plausible £000's	Maximum Plausible £000's	Expected Risk	Minimum Plausible Risk	Maximum Plausible Risk	Percentage Uncertainty	Final Minimum	Final Maximum
Options Phase									
Land Cost in Phase (blight)	£2,500,000	£2,250,000	£2,750,000	£3,776,697	£2,327,488	£10,010,074			
Environmental Assessment									
Business Case Preparation									
Studies									
Prep and Supervision	£968,324	£968,324	£968,324						
Estimating and Reviews									
Options Phase Total	£3,468,324	£3,218,324	£3,718,324	£3,776,697	£2,327,488	£10,010,074			
Development Phase									
Land Cost in Phase (acquisition)	£10,000,000	£9,000,000	£11,000,000	£553,081	£340,851	£208,672			
High Level Design Costs									
Environmental Statement									
Draft Orders									
Appointment of Contractor - Cost	£1,435,232	£1,435,232	£1,435,232						
Contractor ECI Costs	£1,063,135	£1,063,135	£1,063,135						
Public Inquiry									
Prep and Supervision	£717,616	£717,616	£717,616						
Designers Cost									
Estimating and Reviews									

	ESTIMATE			RISK			UNCERTAINTY		
Description	Expected Value £000's	Minimum Plausible £000's	Maximum Plausible £000's	Expected Risk	Minimum Plausible Risk	Maximum Plausible Risk	Percentage Uncertainty	Final Minimum	Final Maximum
Surveys									
Others									
Development Phase Total	£13,215,983	£12,215,983	£14,215,983	£553,081	£340,851	£208,672	£0	£0	£0
Options and Development Phase Totals	£16,684,307	£15,434,307	£17,934,307	£4,329,778	£2,668,338	£10,218,746	£0	£0	£0
Project Overheads	£12,121,058	£12,121,058	£13,333,164	£20,979	£12,929	£7,915			
Method Related Cost	£3,561,915	£3,561,915	£3,918,107	£1,936,078	£1,193,158	£730,462		£1,173,780	£1,291,158
Site clearance	£158,159	£156,382	£174,937		£0	£0			
Fencing					£0	£0			
Road Restraint Systems	£503,827	£494,513	£513,141	£154,056	£94,941	£58,124		£127,903	£133,878
Drainage and Ducts	£495,345	£471,677	£519,013		£0	£0		£141,503	£155,704
Earthworks	£1,306,904	£1,166,851	£1,446,956	£881,579	£543,296	£332,611		£1,882,657	£2,053,464
Pavement	£2,043,819	£1,944,749	£2,142,888	£84,395	£52,011	£31,841		£535,168	£589,418
Kerbs, footways,	£1,016,336	£948,615	£1,119,965		£0	£0		£94,862	£111,997
Traffic Signs (and markings)	£286,107	£272,483	£299,731		£0	£0		£204,909	£225,400
Road lighting	£125,973	£125,973	£138,570		£0	£0		£31,493	£34,642
Electrical Work for Lighting and signs	£125,973	£125,973	£138,570		£0	£0		£56,688	£62,356
Communications	£170,000	£170,000	£187,000		£0	£0		£34,000	£37,400
Piling and embedded retaining walls				£39,441	£24,307	£14,881			
Landscape and Ecology					£0	£0			
Maintenance Painting of Steelwork					£0	£0			
Structures	£13,479,958	£12,126,490	£15,115,170	£418,113	£257,673	£157,750		£11,560,580	£14,024,101

	ESTIMATE			RISK			UNCERTAINTY		
Description	Expected Value £000's	Minimum Plausible £000's	Maximum Plausible £000's	Expected Risk	Minimum Plausible Risk	Maximum Plausible Risk	Percentage Uncertainty	Final Minimum	Final Maximum
Accommodation Works	£2,270,825	£2,270,825	£2,497,908		£0	£0		£567,706	£624,477
Contractor Fee					£0	£0			
BASE COST ESTIMATE TOTAL	£37,666,198	£35,957,503	£41,545,119	£3,534,641	£2,178,314	£1,333,583		£16,411,248	£19,343,995
Ancillary									
Statutory Undertakers	£2,118,589	£2,118,589	£2,118,589	£586,103	£361,201	£221,131			
RA & LA									
NR VAT	£1,647,896	£1,573,141	£1,817,599	£123,712	£76,241	£46,675		£574,394	£677,040
Risk Not Allocated Elsewhere									
TOTAL WORKS COST	£58,116,990	£55,083,540	£63,415,614	£8,574,234	£5,284,095	£11,820,135		£16,985,641	£20,021,035
Remaining Land Costs (part 1 claims)	£2,400,000	£2,160,000	£2,640,000						
Total Scheme Cost	£60,516,990	£57,243,540	£66,055,614	£8,574,234	£5,284,095	£11,820,135		£16,985,641	£20,021,035

Overground Landbridge Option (Option 5) Estimate

	ESTIMATE			RISK			UNCERTAINTY		
Description	Expected Value £000's	Minimum Plausible £000's	Maximum Plausible £000's	Expected Risk	Minimum Plausible Risk	Maximum Plausible Risk	Percentage Uncertainty	Final Minimum	Final Maximum
Options Phase									
Land Cost in Phase (blight)	£42,000,000	£37,800,000	£46,200,000						
Environmental Assessment									
Business Case Preparation									
Studies									
Prep and Supervision	£1,352,118	£1,352,118	£1,352,118						
Estimating and Reviews									
Options Phase Total	£43,352,118	£39,152,118	£47,552,118						
Development Phase									
Land Cost in Phase (acquisition)	£12,000,000	£10,800,000	£13,200,000	£894,067	£550,992	£2,369,710			
High Level Design Costs									
Environmental Statement									
Draft Orders									
Appointment of Contractor - Cost	£2,202,821	£2,202,821	£2,202,821						
Contractor ECI Costs	£1,631,719	£1,631,719	£1,631,719						
Public Inquiry									
Prep and Supervision	£1,101,410	£1,101,410	£1,101,410						

	ESTIMATE			RISK			UNCERTAINTY		
Description	Expected Value £000's	Minimum Plausible £000's	Maximum Plausible £000's	Expected Risk	Minimum Plausible Risk	Maximum Plausible Risk	Percentage Uncertainty	Final Minimum	Final Maximum
Designers Cost									
Estimating and Reviews									
Surveys									
Others									
Development Phase Total	£16,935,950	£15,735,950	£18,135,950	£894,067	£550,992	£2,369,710	£0	£0	£0
Options and Development Phase Totals	£60,288,068	£54,888,068	£65,688,068	£894,067	£550,992	£2,369,710	£0	£0	£0
Project Overheads	£18,759,450	£18,759,450	£18,759,450	£50,835	£31,328	£134,737			
Method Related Cost	£7,648,666	£7,648,666	£8,413,533	£3,288,836	£2,026,831	£8,717,007		£1,832,328	£2,015,561
Site clearance	£281,595	£263,818	£319,372		£0	£0			
Fencing					£0	£0			
Road Restraint Systems	£490,127	£480,813	£499,441	£158,263	£97,534	£419,474		£125,163	£131,138
Drainage and Ducts	£1,536,799	£1,463,547	£1,610,050		£0	£0		£439,064	£483,015
Earthworks	£1,041,749	£929,745	£1,153,753	£1,420,868	£875,647	£3,765,988		£1,502,085	£1,638,913
Pavement	£1,773,663	£1,687,762	£1,859,564	£86,949	£53,585	£230,457		£494,573	£544,635
Kerbs, footways,	£737,512	£656,662	£818,361		£0	£0		£65,666	£81,836
Traffic Signs (and markings)	£278,500	£265,238	£291,762		£0	£0		£203,460	£223,806
Road lighting	£125,973	£125,973	£138,570		£0	£0		£31,493	£34,642
Electrical Work for Lighting and signs	£125,973	£125,973	£138,570		£0	£0		£56,688	£62,356
Communications	£170,000	£170,000	£187,000		£0	£0		£34,000	£37,400
Piling and embedded				£62,320	£38,406	£165,178			

	ESTIMATE			RISK			UNCERTAINTY		
Description	Expected Value £000's	Minimum Plausible £000's	Maximum Plausible £000's	Expected Risk	Minimum Plausible Risk	Maximum Plausible Risk	Percentage Uncertainty	Final Minimum	Final Maximum
retaining walls									
Landscape and Ecology					£0	£0			
Maintenance Painting of Steelwork					£0	£0			
Structures	£21,398,196	£18,990,214	£24,049,008	£774,538	£477,329	£2,052,900		£19,117,114	£23,354,961
Accommodation Works	£2,758,767	£2,758,767	£3,034,644		£0	£0		£689,692	£758,661
Contractor Fee					£0	£0			
BASE COST ESTIMATE TOTAL	£57,126,969	£54,326,627	£61,273,078	£5,842,609	£3,600,660	£15,485,741		£24,591,325	£29,366,925
Ancillary									
Statutory Undertakers	£2,520,671	£2,520,671	£2,520,671	£790,622	£487,241	£2,095,531			
RA & LA									
NR VAT	£2,499,305	£2,376,790	£2,680,697	£204,491	£126,023	£542,001		£860,696	£1,027,842
Risk Not Allocated Elsewhere									
TOTAL WORKS COST	£122,435,012	£114,112,156	£132,162,514	£7,731,789	£4,764,916	£20,492,983		£25,452,021	£30,394,767
Remaining Land Costs (part 1 claims)	£2,400,000	£2,160,000	£2,640,000						
Total Scheme Cost	£124,835,012	£116,272,156	£134,802,514	£7,731,789	£4,764,916	£20,492,983		£25,452,021	£30,394,767

Overground Full Viaduct Option (Option6) Estimate

	ESTIMATE			RISK			UNCERTAINTY		
Description	Expected Value £000's	Minimum Plausible £000's	Maximum Plausible £000's	Expected Risk	Minimum Plausible Risk	Maximum Plausible Risk	Percentage Uncertainty	Final Minimum	Final Maximum
Options Phase									
Land Cost in Phase (blight)	£73,500,000	£66,150,000	£80,850,000						
Environmental Assessment									
Business Case Preparation									
Studies									
Prep and Supervision	£2,096,458	£2,096,458	£2,096,458						
Estimating and Reviews									
Options Phase Total	£75,596,458	£68,246,458	£82,946,458						
Development Phase									
Land Cost in Phase (acquisition)	£12,000,000	£10,800,000	£13,200,000	£1,318,857	£812,780	£3,495,609			
High Level Design Costs									
Environmental Statement									
Draft Orders									
Appointment of Contractor - Cost	£3,649,805	£3,649,805	£3,649,805						
Contractor ECI Costs	£2,703,560	£2,703,560	£2,703,560						
Public Inquiry									
Prep and Supervision	£1,845,750	£1,845,750	£1,845,750						
Designers Cost									

	ESTIMATE			RISK			UNCERTAINTY		
Description	Expected Value £000's	Minimum Plausible £000's	Maximum Plausible £000's	Expected Risk	Minimum Plausible Risk	Maximum Plausible Risk	Percentage Uncertainty	Final Minimum	Final Maximum
Estimating and Reviews									
Surveys									
Others									
Development Phase Total	£20,199,115	£18,999,115	£21,399,115	£1,318,857	£812,780	£3,495,609	£0	£0	£0
Options and Development Phase Totals	£95,795,573	£87,245,573	£104,345,573	£1,318,857	£812,780	£3,495,609	£0	£0	£0
Project Overheads	£31,475,652	£31,475,652	£34,623,217	£33,369	£20,565	£88,444			
Method Related Cost	£6,074,598	£6,074,598	£6,682,058	£5,132,964	£3,163,323	£13,604,838		£1,360,340	£1,496,374
Site clearance	£1,108,159	£1,106,382	£1,219,937		£0	£0			
Fencing					£0	£0			
Road Restraint Systems	£699,062	£687,790	£710,334	£358,173	£220,733	£949,332		£166,558	£173,317
Drainage and Ducts	£625,595	£595,488	£655,702		£0	£0		£178,646	£196,711
Earthworks	£1,595,672	£1,423,754	£1,767,589	£944,416	£582,021	£2,503,159		£2,291,388	£2,499,881
Pavement	£2,320,118	£2,207,726	£2,432,509	£84,881	£52,310	£224,976		£612,525	£674,579
Kerbs, footways,	£1,024,269	£917,421	£1,131,118		£0	£0		£91,742	£113,112
Traffic Signs (and markings)	£242,283	£230,746	£253,821		£0	£0		£204,794	£225,273
Road lighting	£125,973	£125,973	£138,570		£0	£0		£31,493	£34,642
Electrical Work for Lighting and signs	£125,973	£125,973	£138,570		£0	£0		£56,688	£62,356
Communications	£170,000	£170,000	£187,000		£0	£0		£34,000	£37,400
Piling and embedded retaining walls				£245,637	£151,380	£651,057			
Landscape and Ecology					£0	£0			
Maintenance Painting of					£0	£0			

	ESTIMATE			RISK			UNCERTAINTY		
Description	Expected Value £000's	Minimum Plausible £000's	Maximum Plausible £000's	Expected Risk	Minimum Plausible Risk	Maximum Plausible Risk	Percentage Uncertainty	Final Minimum	Final Maximum
Steelwork									
Structures	£30,356,753	£26,762,201	£34,155,221	£1,436,797	£885,464	£3,808,207		£26,276,630	£32,376,668
Accommodation Works	£2,320,283	£2,320,283	£2,552,311		£0	£0		£580,071	£638,078
Contractor Fee					£0	£0			
BASE COST ESTIMATE TOTAL	£78,264,389	£74,223,985	£86,647,956	£8,236,237	£5,075,795	£21,830,013		£31,884,874	£38,528,391
Ancillary									
Statutory Undertakers	£3,878,878	£3,878,878	£3,878,878	£1,366,993	£842,445	£3,623,193			
RA & LA									
NR VAT	£3,424,067	£3,247,299	£3,790,848	£288,268	£177,653	£764,050		£1,115,971	£1,348,494
Risk Not Allocated Elsewhere									
TOTAL WORKS COST	£181,362,908	£168,595,736	£198,663,255	£11,210,355	£6,908,673	£29,712,866		£33,000,845	£39,876,885
Remaining Land Costs (part 1 claims)	£2,400,000	£2,160,000	£2,640,000						
Total Scheme Cost	£183,762,908	£170,755,736	£201,303,255	£11,210,355	£6,908,673	£29,712,866		£33,000,845	£39,876,885

Appendix C – List of Identified Cultural Heritage Sites

TABLE 1: LIST OF IDENTFIED CULTURAL HERITAGE SITES

Site No:	*Site Name:*	*Value of site:*
1	Vauxhall Tavern public house, south side of Hessle Road (LB II)	Medium
2	St James' Church (site of), St James Square	Low
3	St James's National School (site of), east side of Porter Street	Low
4	Tower Brewery (site of), north side of Waverley Street	Negligible
5	Livestock markets (site of), west of Commercial Road	Negligible
6	Commercial Inn (site of), south of Hessle Road	Negligible
7	Streams and ditches (sites of), west of Commercial Road	Unknown
8	Myton Grange (site of), west of Commercial Road	Medium
9	Mission Room and Chapel (site of), north of Great Passage Street	Negligible
10	Chapel and Lutheran Churches (sites of), Mytongate junction	Low
11	Whittington and Cat public house, west side of Commercial Road	Low
12	Holy Trinity Burial Ground, south-east side of Mytongate	Medium
13	Mortuary (site of), Holy Trinity Burial Ground, south-east of Mytongate	Low
14	Saw mill (site of), south side of Castle Street	Low
15	18th century goal (site of), south side of Castle Street	Medium
16	Smithy (site of), Castle Street	Negligible
17	Post Office (site of), north side of Castle Street	Negligible
18	Humber Brass and Copper Works (site of), Castle Street	Low
19	Castle Street Chambers and adjoining building to east, north side of Castle Street (LB II)	Medium
20	Section of Civil War defences (site of), Prince's Dock and Humber Dock	Medium
21	Alexander Copper and Brass Works (site of), north side of Waterhouse Lane	Negligible
22	Chain Cable and Anchor Works (site of), south side of Trundle Street	Negligible
23	19th century occupation (finds), west of Myton Street	Negligible
24	Section of medieval town defences (remains of), Humber Dock Street	High
25	Smithy (site of), north side of Trundle Street	Negligible
26	Kiln and malthouse (remains of), west side of Waterhouse Lane	Low
27	Junction Foundry and Engine Works (site of), east side of Waterhouse Lane	Low

Site No:	***Site Name:***	***Value of site:***
28	Section of medieval town defences (remains of), Prince's Dock Street	High
29	19th century occupation (finds), 16 Prince's Dock Street	Negligible
30	Weaver's Hospital (site of), west side of Dagger Lane	Low
31	Ebenezer Chapel and the Mariner's Church (sites of), east side of Prince's Dock Street	Negligible
32	Providence Bakery (site of), west side of Dagger Lane	Negligible
33	Jewish synagogue (site of), south of Robinson Row	Low
34	Bay and Barrel public house (site of), west side of Dagger Lane	Negligible
35	Priest's House (site of), east side of King Street	Unknown
36	Medieval wall (excavation), South Church Side	Negligible
37	Unpublished excavations (finds), east side of Fish Street	Negligible
38	Wall alignment (finds), South Church Side	Low
39	Old Grammar School, south side of South Church Side (LB II*)	High
40	Crookhaye's Hospital (site of), Vicar Lane	Low
41	Lister's Hospital (site of), south side of South Church Side	Low
42	Earl de Grey public house, north side of Castle Street (LB II)	Medium
43	Commercial Hotel (site of), north side of Castle Street	Low
44	Warehouse No 7 (site of), north side of Castle Street	Low
45	Lock and swing bridge, between Prince's and Humber Docks (sites of), Castle Street	Medium
46	Prince's Dock, north of Castle Street (LB II)	Medium
47	Warehouse No 6, west side of Prince's Dock Street (LB II)	Medium
48	Navigation Iron Works (site of), north side of Railway Dock	Low
49	Humber Dock, south swing bridge and lock, south side of Castle Street (LB II)	Medium
50	"Dutch" footbridge, east end of Railway Dock	Low
51	Railway Dock and connection to Humber Dock, and swing bridge (LB II)	Medium
52	Myton Gate (remains of), Castle Street	High
53	No 44 Mytongate (site of), Castle Street	Low
54	Independent Chapel (site of), east side of Fish Street	Negligible
55	Fish Street Sunday School (site of), Grammar School Yard	Negligible
56	Riplingham's Hospital (site of), north side of Castle Street	Low
57	No 65 Castle Street (former Telephone Exchange)	Low
58	Nos 74 to 76 Mytongate, north side of Castle Street	Low

Site No:	*Site Name:*	*Value of site:*
59	Section of town defences (remains of), between Hessle Gate and the Foreland, Humber Street	High
60	Post-medieval occupation (evaluation), south side of Castle Street	Low
61	Medieval and later occupation (excavations), Mytongate	Negligible
62	Prince Blucher's public house (site of), west side of Finkle Street	Negligible
63	Wellington Hotel public house (site of), Castle Street	Low
64	Turk's Head public house (site of), Castle Street	Low
65	Smithy (site of), south of Castle Street	Low
66	Temperance Hall (site of), west of Sewer Lane	Low
67	Post-medieval occupation (excavation), Sewer Lane	Negligible
68	Crowle's Hospital (site of), east side of Sewer Lane	Medium
69	Hide and Skin market (site of), west side of Finkle Street	Low
70	Medieval and post-medieval occupation (evaluation), west end of Blanket Row	Negligible
71	Police Station (site of), south side of Blanket Row	Low
72	Theatre Royal (site of), east side of Finkle Street	Medium
73	Kingston Chain Works (site of), north side of Blanket Row	Low
74	Smithy (site of), east side of Finkle Street	Low
75	Nos 14 to 23 Humber Street	Medium
76	Nos 24 to 29 Humber Street	Medium
77	Medieval and later occupation (excavation), south end of Vicar Lane	Negligible
78	Burnett House (formerly Britannia Hotel), nos 82-83 Castle Street	Medium
79	King William Hotel, no 41 Market Place	Medium
80	The Chequers Hotel (site of), north side of Castle Street	Medium
81	Coach and Horses Inn (site of), Castle Street	Low
82	Black Swan Inn (site of), Castle Street	Low
83	Medieval and later occupation (excavation), junction of Queen Street and Mytongate	Negligible
84	Burials and foundations (evaluation), Holy Trinity churchyard	Medium
85	No 85 Queen Street (site of), Castle Street	Low
86	No 84 Queen Street (site of), Castle Street	Low
87	Meat market (site of), Queen Street	Negligible
88	Holy Trinity Church, east side of King Street (LB I)	High
89	Former Fish Street Day School, south side of South Church Side (LB II)	Medium

Site No:	***Site Name:***	***Value of site:***
90	Wool Exchange, south side of South Church Side (LB II)	Medium
91	Kings Market, south side of South Church Side (LB II)	Medium
92	Statue of Andrew Marvell, west of Holy Trinity Church (LB II)	Medium
93	Electric lamp at SW corner of Holy Trinity Churchyard, north side of South Church Side (LB II)	Medium
94	Former warehouse at corner of Robinson Row (LB II)	Medium
95	Nos 9 1/2 to 11 King Street (LB II)	Medium
96	19th century occupation (finds), north side of Blanket Row	Low
97	Medieval and later occupation (evaluation), either side of Burnett House, north side of Castle Street	Medium
98	Nos 3 and 6 to 12 Princes Street (LB II)	Medium
99	No 7 Dagger Lane (Minerva Lodge) (LB II*)	High
100	Post medieval occupation (evaluation), north of Blanket Row	Medium
101	Public toilets, Market Place (LB II)	Medium
102	Statue of King William III, Market Place (LB I)	High
103	Guildhall (sites of), Market Place	Medium
104	Medieval and later Town goal (site of), Market Place	Medium
105	Medieval and later occupation (excavation), Blanket Row	Negligible
106	Augustinian Friary (excavations), east side of Market Place	High
107	Cross Keys Hotel (site of), east side of Market Place	Negligible
108	Market Hall (sites of), Queen Street	Medium
109	House of Correction and lock-up (sites of), east side of Market Place	Negligible
110	Butter and Poultry market (site of), north side of Castle Street	Negligible
111	Malt kiln (site of), Castle Street	Low
112	Medieval and post-medieval occupation (excavation), Blackfriargate	Negligible
113	Medieval and post-medieval occupation (evaluation), east side of Queen Street	Medium
114	Alexandra Hotel (site of), Humber Street	Low
115	London Hotel (remains of?), south side of Humber Street	Negligible
116	Princess Royal public house (site of), east side of Prince's Dock Street	Low
117	Medieval and later occupation (evaluation), 61-69 High Street	Medium
118	Society Hotel (remains of), north side of Prince Street	Low
119	Holy Trinity School (site of), south side of Humber Street	Negligible
120	South End Battery (site of), south side of Humber Street	Medium

Site No:	Site Name:	Value of site:
121	Crane (site of), north end of Central Dry Dock	Negligible
122	Central Dry Dock, south side of Humber Street (LB II)	Medium
123	No 21 Blackfriargate	Low
124	Public house (site of), east side of Prince's Dock Street	Low
125	Soda Water Works (site of), south side of Blackfriargate	Low
126	Water Gate (site of), north side of Humber Street	Medium
127	South End Tower (site of), The Foreland	Medium
128	Chapel (site of), east side of High Street, south of Castle Street	Negligible
129	Dog and Duck public house (site of), east side of High Street	Negligible
130	De La Pole House and public house (sites of), east side of High Street	Negligible
131	South Bridge (site of), east end of Humber Street	Negligible
132	Medieval and post-medieval occupation (excavation), High Street / Blackfriargate	Negligible
133	Medieval and later occupation (excavation), High Street (Grimsby Lane)	Negligible
134	Market Cross (site of), Market Place	Negligible
135	Kingston Iron Works (site of), west of High Street	Low
136	Grimsby's Hospital (site of), east of Market Place	Negligible
137	No 62 High Street	Negligible
138	Building between Kings Market and Wool Exchange, south side of South Church Side (LB II)	Medium
139	Charity Hall (site of), Castle Street	Negligible
140	Unpublished sewer trench excavations, High Street	Negligible
141	17th century finds (finds), west side of Dagger Lane	Low
142	Various finds including Roman and 17th century coins, and cannon (finds), river Hull	Negligible
143	Salem Chapel (site of), Castle Street	Low
144	Occupation (finds), west of Vicar Lane	Negligible
145	Chapel (site of), Barkers Court, north side of Blanket Row	Low
146	Holy Trinity Maison Dieu (site of), Holy Trinity churchyard	Negligible
147	Ferry (site of), Garrison Pier to Rotenhering Staith	Negligible
148	Bull rings (sites of), Market Place	Negligible
149	Lion Brewery (site of), south side of Waverley Street	Negligible
150	No 76 Queen Street	Low
151	Tidal Surge Barrier across River Hull	Low

Site No:	***Site Name:***	***Value of site:***
152	Nos 10-10b Humber Dock Street	Low
153	Marina Court, north end of Humber Dock Street	Low
154	Millennium footbridge over River Hull	Low
155	Offices, east side of Prince's Dock Street	Low
156	Prince of Wales public house (site of), north side of Blanket Row	Low
157	Building in angle of Dagger Lane and Robinson Row	Low
158	No 43 Market Place	Medium
159	Employment Exchange, south side of South Church Side	Low
160	Nos 1 to 11 Fish Street	Low
161	Nos 30 to 52 Castle Street	Low
162	Nos 60 to 64 Grammar School Yard	Low
163	Durham Ox public house (site of), south side of Blanket Row	Low
164	Unicorn Tavern public house (site of), west side of Queen Street	Low
165	Warehouse (site of), north side of Blanket Row	Low
166	Golden Lion public house (site of), west side of Queen Street	Low
167	Flying Horse public house (site of), east side of Sewer Lane	Negligible
168	Tap and Barrel public house (site of), east side of Sewer Lane	Negligible
169	Hamburg Castle and Steam Packet Tavern public house (site of), west side of Sewer Lane	Negligible
170	Public house (site of), east side of Humber Dock Street	Negligible
171	Golden Cup public house (site of), north side of Blanket Row	Low
172	Hamburg Tavern public house (site of), north side of Blanket Row	Low
173	Dominian warehouse and saw mills (sites of), north side of Blanket Row	Low
174	Leeds Tavern public house (site of), north side of Blanket Row	Low
175	Ship Victory public house (site of), west side of Finkle Street	Low
176	Warehouse (site of), south of Hessle Road	Negligible
177	Kingston Perambulator and Cabinet Works (site of), north side of Hessle Road	Negligible
178	Royal William public house (site of), south side of Trundle Street	Low
179	Robin Hood public house (site of), Myton Street	Negligible
180	Shepherdess public house (site of), south side of Trundle Street	Negligible
181	Office (site of), south side of Prince's Dock	Negligible
182	Phoenix Tavern public house (site of), south side of Castle Street	Low
183	Golden Cup public house (site of), north side of Castle Street	Negligible

Site No:	Site Name:	Value of site:
184	Commercial Tavern public house (site of), north side of Castle Street	Negligible
185	Public house (site of), west side of Fish Street	Negligible
186	Public house (site of), west side of Fish Street	Negligible
187	Public house (site of), south side of South Church Side	Negligible
188	Fleece Inn public house (site of), west of Market Place	Low
189	Bull and Sun Hotel public house (site of), Castle Street	Low
190	Public house (site of), north side of Blackfriargate	Low
191	Marrow Bone and Cleaver public house (site of), Magistrate Courts site	Negligible
192	Public house (site of), Magistrates Courts site	Negligible
193	York Arms public house (site of), west of High Street	Negligible
194	Saracens Head public house (site of), east of Market Place	Negligible
195	George and Dragon public house (site of), west of High Street	Low
196	Crown and Anchor public house (site of), north side of Humber Street	Low
197	Two public houses (sites of), north side of Humber Street	Low
198	King William public house (site of), north side of Humber Street	Low
199	Lugger Inn public house (site of), south side of Humber Street	Negligible
200	George and Dragon public house (site of), west side of High Street	Negligible
201	Public house (site of), south side of Blackfriargate	Low
202	Duke of York public house (site of), south side of Blackfriargate	Negligible
203	Public house (site of), Castle Street	Low
204	Brass Founders Arms (site of), east side of Dagger Lane	Negligible
205	Brewery (site of), east side of Sewer Lane	Low
206	Fisherman’s Arms public house (site of), east side of Finkle Street	Low
207	Blue Ball public house (site of), Castle Street	Negligible
208	White Swan public house (site of), east side of High Street	Negligible
209	Public house (site of), west side of High Street	Negligible
210	Custom House and Watch House (site of), east end of Humber Street	Negligible
211	Two public houses (sites of), west side of High Street	Negligible
212	Royal Oak public house (site of), Castle Street	Negligible
213	Timber yard (site of), south side of Castle Street	Negligible
214	Timber yard and warehouses (site of), north side of Railway Dock	Negligible

Site No:	Site Name:	Value of site:
215	Timber yard (site of), north side of Railway Dock	Low
216	Timber yard and warehouse (sites of), south side of Mytongate	Low
217	Albert Confectionery Works (site of), Mytongate Junction	Low
218	Timber yard and warehouse (sites of), Mytongate Junction	Negligible
219	Robinson Crusoe public house (site of), east side of Cogan Street	Negligible
220	Warehouse (site of), north side of Wood's Lane	Negligible
221	Stone yard (site of), Hessle Road	Negligible
222	Timber yard (site of), east side of Waterhouse Lane	Negligible
223	Assembly Rooms and warehouse (sites of), west side of Dagger Lane	Low
224	Old Town Conservation Area	Medium
225	Former course of Mytongate, Castle Street	Medium
226	Humber Gate (site of), Humber Street	Medium
227	Nicholson’s shipyard (site of), south side of Humber Street	Low
228	Excavations adjacent to Central Dry Dock	Medium
229	Lamp post at Holy Trinity Burial Ground	Low
230	Lamp post at Holy Trinity Burial Ground	Low
231	Warehouse, Nos 68-69 High Street	Low

Appendix D – Webtag Worksheets

NOISE

APPRAISAL - NOISE POLLUTION

Option 1 - Underground Base Scheme Option

Proposal Opening Year: 2018

Average Household Size: 2.36

Project (Road or Rail): Road

No. of households experiencing 'Do Minimum' & 'Do Something' noise levels (given in dB_{Leq}) in Opening Year

Do Minimum \ Do Something	<45	45-47.9	48-50.9	51-53.9	54-56.9	57-59.9	60-62.9	63-65.9	66-68.9	69-71.9	72-74.9	75-77.9	78-80.9	81+
<45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-47.9	0	2	2	0	0	0	0	0	0	0	0	0	0	0
48-50.9	0	0	78	32	0	0	0	0	0	0	0	0	0	0
51-53.9	0	0	5	158	28	0	0	0	0	0	0	0	0	0
54-56.9	0	0	0	24	240	57	0	0	0	0	0	0	0	0
57-59.9	0	0	0	1	49	288	21	2	0	0	0	0	0	0
60-62.9	0	0	0	0	8	46	462	19	0	0	0	0	0	0
63-65.9	0	0	0	0	1	11	69	345	21	0	0	0	0	0
66-68.9	0	0	0	0	0	2	13	77	253	17	0	0	0	0
69-71.9	0	0	0	0	0	0	3	4	21	301	70	0	0	0
72-74.9	0	0	0	0	0	0	0	1	2	66	76	33	0	0
75-77.9	0	0	0	0	0	0	0	0	1	2	11	40	5	0
78-80.9	0	0	0	0	0	0	0	0	0	0	0	0	9	0
81+	0	0	0	0	0	0	0	0	0	0	0	0	0	41

No. of households experiencing 'Do Minimum' & 'Do Something' noise levels (given in dB_{Leq}) in 15th Year After Opening

Do Minimum \ Do Something	<45	45-47.9	48-50.9	51-53.9	54-56.9	57-59.9	60-62.9	63-65.9	66-68.9	69-71.9	72-74.9	75-77.9	78-80.9	81+
<45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-47.9	0	2	1	0	0	0	0	0	0	0	0	0	0	0
48-50.9	0	0	72	34	0	0	0	0	0	0	0	0	0	0
51-53.9	0	0	0	161	43	0	0	0	0	0	0	0	0	0
54-56.9	0	0	0	2	234	92	0	0	0	0	0	0	0	0
57-59.9	0	0	0	0	13	268	81	1	1	0	0	0	0	0
60-62.9	0	0	0	0	4	17	478	23	0	0	0	0	0	0
63-65.9	0	0	0	0	0	6	40	389	25	0	0	0	0	0
66-68.9	0	0	0	0	0	2	5	49	247	10	0	0	0	0
69-71.9	0	0	0	0	0	0	2	3	24	299	86	0	0	0
72-74.9	0	0	0	0	0	0	0	1	1	15	144	0	0	0
75-77.9	0	0	0	0	0	0	0	0	0	3	9	75	4	0
78-80.9	0	0	0	0	0	0	0	0	0	0	0	0	10	0
81+	0	0	0	0	0	0	0	0	0	0	0	0	0	41

Net Present Value of Noise of Proposal (60 Year Period) -£290,829.96 *positive value reflects a **net benefit** (i.e. noise reduction)

Estimated Population Annoyed (Do-Minimum): 1851

Estimated Population Annoyed (Do-Something): 1867

Net Noise Annoyance Change in 15th Year After Opening (no. of people): 15 *positive value reflects an **increase** in people annoyed by noise

Traffic Data Sources: Traffic flows (AAWT), average speeds and percentage HGV composition supplied by Pell Frischmann

Population Data Sources: The national average of 2.36 people per household has been used within the assessment (Census 2001)

Assumptions:	All existing and proposed roads assumed to be constructed from impervious bitumen Discrete receptor locations have been used for apartments within high rise resdiential blocks in locations representative of worst case road traffic flows The highest façade noise level for the whole building has been sued to represent noise levels for all properties within low rise multi occupancy buildings. For example three storey building containing three dwellings Road gradients calculated for existing roads from fitting to Digital Terrain Model Proposed scheme road gradients calculted from inputted data from design scheme elevation diagrams Building heights determined from LIDAR data (1999) as the averge height for all points (2m grid spacing) within the building footprint Default ground absorption within study area assumed to be 0. Areas of grass or vegetation digitised from OS landline with reference to aerial photographs and assumed to have an absorption of 1 No mitigation measures (for example noise barriers) have been included within the assessment
Assessment scores:	The scheme will result in slight net increase of 15 people annoyed by traffic noise with 1851 people annoyed without the scheme and 1867 annoyed with the scheme. The present value of noise of the propsoed scheme indicates a net cost of £0.291m
Qualitative Comments:	946 people will experience a noise increase, 5711 will experience no change, and 463 will experience a noise decrease with regard to chnages defined by the worksheet noise bands

Worksheet 1 Environment: Noise - Plan Level
Calculation of Estimated Population Annoyed (EPA) by Noise

Option Name: ________________ Year: ________ Mode: ___________					
	Opening Year			15th Year After Opening	
Noise Level ($L_{Aeq,18hr}$ dB)	Estimated Population Annoyed – Without scheme	Estimated Population Annoyed – With scheme		Estimated Population Annoyed – Without scheme	Estimated Population Annoyed – With scheme
<45	0	0		0	0
45<48	0	0		0	0
48<51	14	11		14	9
51<54	35	39		37	36
54<57	81	82		83	74
57<60	125	140		126	133
61<63	249	265		243	282
63<66	275	275		283	286
66<69	286	236		248	236
69<72	395	382		410	324
72<75	214	188		193	287
75<78	83	103		128	106
78<81	14	22		16	22
81+	71	71		71	71
Totals :	**1843**	**1815**		**1851**	**1867**

APPRAISAL - NOISE POLLUTION

Option 2 - Underground Landbridge Scheme Option

Proposal Opening Year: 2018

Average Household Size: 2.36

Project (Road or Rail): Road

No. of households experiencing 'Do Minimum' & 'Do Something' noise levels (given in dB_{Leq}) in Opening Year

Do Minimum \ Do Something	<45	45-47.9	48-50.9	51-53.9	54-56.9	57-59.9	60-62.9	63-65.9	66-68.9	69-71.9	72-74.9	75-77.9	78-80.9	81+
<45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-47.9	0	4	0	0	0	0	0	0	0	0	0	0	0	0
48-50.9	0	1	103	6	0	0	0	0	0	0	0	0	0	0
51-53.9	0	0	11	167	13	0	0	0	0	0	0	0	0	0
54-56.9	0	0	0	52	242	27	0	0	0	0	0	0	0	0
57-59.9	0	0	0	2	106	228	24	1	0	0	0	0	0	0
60-62.9	0	0	0	0	8	134	383	10	0	0	0	0	0	0
63-65.9	0	0	0	0	0	16	155	267	9	0	0	0	0	0
66-68.9	0	0	0	0	0	6	41	110	174	31	0	0	0	0
69-71.9	0	0	0	0	0	0	1	23	67	231	77	0	0	0
72-74.9	0	0	0	0	0	0	0	0	6	80	59	33	0	0
75-77.9	0	0	0	0	0	0	0	0	0	3	17	35	4	0
78-80.9	0	0	0	0	0	0	0	0	0	0	0	0	9	0
81+	0	0	0	0	0	0	0	0	0	0	0	0	12	29

No. of households experiencing 'Do Minimum' & 'Do Something' noise levels (given in dB_{Leq}) in 15th Year After Opening

Do Minimum \ Do Something	<45	45-47.9	48-50.9	51-53.9	54-56.9	57-59.9	60-62.9	63-65.9	66-68.9	69-71.9	72-74.9	75-77.9	78-80.9	81+
<45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-47.9	0	3	0	0	0	0	0	0	0	0	0	0	0	0
48-50.9	0	2	99	5	0	0	0	0	0	0	0	0	0	0
51-53.9	0	0	8	184	12	0	0	0	0	0	0	0	0	0
54-56.9	0	0	0	33	271	24	0	0	0	0	0	0	0	0
57-59.9	0	0	0	1	72	253	23	15	0	0	0	0	0	0
60-62.9	0	0	0	0	4	120	374	7	17	0	0	0	0	0
63-65.9	0	0	0	0	0	14	165	273	8	0	0	0	0	0
66-68.9	0	0	0	0	0	0	13	123	167	10	0	0	0	0
69-71.9	0	0	0	0	0	0	1	14	80	296	23	0	0	0
72-74.9	0	0	0	0	0	0	0	0	6	29	126	0	0	0
75-77.9	0	0	0	0	0	0	0	0	0	3	13	72	3	0
78-80.9	0	0	0	0	0	0	0	0	0	0	0	0	10	0
81+	0	0	0	0	0	0	0	0	0	0	0	0	6	35

Net Present Value of Noise of Proposal (60 Year Period) £2,956,480.96 *positive value reflects a **net benefit** (i.e. noise reduction)

Estimated Population Annoyed (Do-Minimum): 1851

Estimated Population Annoyed (Do-Something): 1763

Net Noise Annoyance Change in 15th Year After Opening (no. of people): -89 *positive value reflects an **increase** in people annoyed by noise

Traffic Data Sources: Traffic flows (AAWT), average speeds and percentage HGV composition supplied by Pell Frischmann

Population Data Sources: The national average of 2.36 people per household has been used within the assessment (Census 2001)

Assumptions:	All existing and proposed roads assumed to be constructed from impervious bitumen Discrete receptor locations have been used for apartments within high rise resdiential blocks in locations representative of worst case road traffic flows The highest façade noise level for the whole building has been sued to represent noise levels for all properties within low rise multi occupancy buildings. For example three storey building containing three dwellings Road gradients calculated for existing roads from fitting to Digital Terrain Model Proposed scheme road gradients calculted from inputted data from design scheme elevation diagrams Building heights determined from LIDAR data (1999) as the averge height for all points (2m grid spacing) within the building footprint Default ground absorption within study area assumed to be 0. Areas of grass or vegetation digitised from OS landline with reference to aerial photographs and assumed to have an absorption of 1 No mitigation measures (for example noise barriers) have been included within the assessment
Assessment scores:	The scheme will result in a net decrease of 89 people annoyed by traffic noise with 1851 people annoyed without the scheme and 1763 annoyed with the scheme. The present value of noise of the propsoed scheme indicates a net benefit of £2.956m
Qualitative Comments:	347 people will experience a noise increase, 5105 will experience no change, and 1669 will experience a noise decrease with regard to chnages defined by the worksheet noise bands

Worksheet 1 Environment: Noise - Plan Level
Calculation of Estimated Population Annoyed (EPA) by Noise

Option Name: ________________ Year: ________ Mode: ___________					
	Opening Year			15th Year After Opening	
Noise Level ($L_{Aeq,18hr}$ dB)	Estimated Population Annoyed – Without scheme	Estimated Population Annoyed – With scheme		Estimated Population Annoyed – Without scheme	Estimated Population Annoyed – With scheme
<45	0	0		0	0
45<48	0	0		0	0
48<51	14	15		14	14
51<54	35	41		37	41
54<57	81	93		83	91
57<60	125	142		126	142
61<63	249	281		243	268
63<66	275	253		283	266
66<69	286	203		248	220
69<72	395	341		410	335
72<75	214	184		193	194
75<78	83	96		128	101
78<81	14	40		16	30
81+	71	50		71	60
Totals :	**1843**	**1739**		**1851**	**1763**

APPRAISAL - NOISE POLLUTION

Option 3 - Underground Cut & Cover Tunnel Scheme Option

Proposal Opening Year: **2020**

Average Household Size: **2.36**

Project (Road or Rail): **Road**

No. of households experiencing 'Do Minimum' & 'Do Something' noise levels (given in dB_{Leq}) in Opening Year

Do Minimum \ Do Something	<45	45-47.9	48-50.9	51-53.9	54-56.9	57-59.9	60-62.9	63-65.9	66-68.9	69-71.9	72-74.9	75-77.9	78-80.9	81+
<45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-47.9	0	4	0	0	0	0	0	0	0	0	0	0	0	0
48-50.9	0	1	106	15	0	0	0	0	0	0	0	0	0	0
51-53.9	0	0	11	165	23	0	0	0	0	0	0	0	0	0
54-56.9	0	0	0	47	229	67	0	0	0	0	0	0	0	0
57-59.9	0	0	0	1	61	230	42	11	2	0	0	0	0	0
60-62.9	0	0	0	0	5	73	371	62	16	0	0	0	0	0
63-65.9	0	0	0	0	0	6	121	296	20	22	1	0	0	0
66-68.9	0	0	0	0	0	0	40	57	202	19	0	0	0	0
69-71.9	0	0	0	0	0	0	0	11	34	305	105	0	0	0
72-74.9	0	0	0	0	0	0	0	0	2	13	78	34	0	0
75-77.9	0	0	0	0	0	0	0	0	0	11	8	35	5	0
78-80.9	0	0	0	0	0	0	0	0	0	0	0	0	9	0
81+	0	0	0	0	0	0	0	0	0	0	0	6	0	0

No. of households experiencing 'Do Minimum' & 'Do Something' noise levels (given in dB_{Leq}) in 15th Year After Opening

Do Minimum \ Do Something	<45	45-47.9	48-50.9	51-53.9	54-56.9	57-59.9	60-62.9	63-65.9	66-68.9	69-71.9	72-74.9	75-77.9	78-80.9	81+
<45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-47.9	0	3	0	0	0	0	0	0	0	0	0	0	0	0
48-50.9	0	0	88	18	0	0	0	0	0	0	0	0	0	0
51-53.9	0	0	13	167	24	0	0	0	0	0	0	0	0	0
54-56.9	0	0	0	51	226	51	0	0	0	0	0	0	0	0
57-59.9	0	0	0	1	67	244	30	21	1	0	0	0	0	0
60-62.9	0	0	0	0	5	91	345	61	20	0	0	0	0	0
63-65.9	0	0	0	0	0	9	151	278	10	11	1	0	0	0
66-68.9	0	0	0	0	0	0	47	73	183	10	0	0	0	0
69-71.9	0	0	0	0	0	0	0	15	76	267	56	0	0	0
72-74.9	0	0	0	0	0	0	0	0	2	16	143	0	0	0
75-77.9	0	0	0	0	0	0	0	0	0	12	9	66	4	0
78-80.9	0	0	0	0	0	0	0	0	0	0	0	0	10	0
81+	0	0	0	0	0	0	0	0	0	0	0	6	0	0

Net Present Value of Noise of Proposal (60 Year Period) £1,464,776.80 *positive value reflects a **net benefit** (i.e. noise reduction)

Estimated Population Annoyed (Do-Minimum): **1791**
Estimated Population Annoyed (Do-Something): **1735**

Net Noise Annoyance Change in 15th Year After Opening (no. of people): -56 *positive value reflects an **increase** in people annoyed by noise

Traffic Data Sources: Traffic flows (AAWT), average speeds and percentage HGV composition supplied by Pell Frischmann

Population Data Sources: The national average of 2.36 people per household has been used within the assessment (Census 2001)

Assumptions:

All existing and proposed roads assumed to be constructed from impervious bitumen
Discrete receptor locations have been used for apartments within high rise resdiential blocks in locations representative of worst case road traffic flows
The highest façade noise level for the whole building has been sued to represent noise levels for all properties within low rise multi occupancy buildings. For example three storey building containing three dwellings
Road gradients calculated for existing roads from fitting to Digital Terrain Model
Proposed scheme road gradients calculted from inputted data from design scheme elevation diagrams
Building heights determined from LIDAR data (1999) as the averge height for all points (2m grid spacing) within the building footprint
Default ground absorption within study area assumed to be 0. Areas of grass or vegetation digitised from OS landline with reference to aerial photographs and assumed to have an absorption of 1
No mitigation measures (for example noise barriers) have been included within the assessment

Assessment scores:

The scheme will result in a net decrease of 56 people annoyed by traffic noise with 1791 people annoyed without the scheme and 1735 annoyed with the scheme. The present value of noise of the propsoed scheme indicates a net benefit of £1.465m

Qualitative Comments:

750 people will experience a noise increase, 4767 will experience no change, and 1520 will experience a noise decrease with regard to chnages defined by the worksheet noise bands

Worksheet 1 Environment: Noise - Plan Level
Calculation of Estimated Population Annoyed (EPA) by Noise

Option Name: ________________ Year: ________ Mode: ___________					
	Opening Year			15^{th} Year After Opening	
Noise Level ($L_{Aeq,18hr}$ dB)	Estimated Population Annoyed – Without scheme	Estimated Population Annoyed – With scheme		Estimated Population Annoyed – Without scheme	Estimated Population Annoyed – With scheme
<45	0	0		0	0
45<48	0	0		0	0
48<51	14	15		14	14
51<54	35	41		37	41
54<57	81	93		83	91
57<60	125	142		126	142
61<63	249	281		243	268
63<66	275	253		283	266
66<69	286	203		248	220
69<72	395	341		410	335
72<75	214	184		193	194
75<78	83	96		128	101
78<81	14	40		16	30
81+	71	50		71	60
Totals :	**1843**	**1739**		**1851**	**1763**

APPRAISAL - NOISE POLLUTION

Option Do Something 4 - Overground Base Scheme

Proposal Opening Year: **2017**

Average Household Size: **2.36**

Project (Road or Rail): **Road**

No. of households experiencing 'Do Minimum' & 'Do Something' noise levels (given in dB_{Leq}) in Opening Year

Do Minimum \ Do Something	<45	45-47.9	48-50.9	51-53.9	54-56.9	57-59.9	60-62.9	63-65.9	66-68.9	69-71.9	72-74.9	75-77.9	78-80.9	81+
<45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-47.9	0	1	4	0	0	0	0	0	0	0	0	0	0	0
48-50.9	0	0	88	29	0	0	0	0	0	0	0	0	0	0
51-53.9	0	0	0	155	36	0	0	0	0	0	0	0	0	0
54-56.9	0	0	0	2	230	96	0	0	0	0	0	0	0	0
57-59.9	0	0	0	0	3	282	92	17	0	0	0	0	0	0
60-62.9	0	0	0	0	0	15	433	67	0	0	0	0	0	0
63-65.9	0	0	0	0	0	0	30	391	14	0	0	0	0	0
66-68.9	0	0	0	0	0	0	0	19	312	29	0	0	0	0
69-71.9	0	0	0	0	0	0	0	0	17	363	16	0	0	0
72-74.9	0	0	0	0	0	0	0	0	0	3	140	32	0	0
75-77.9	0	0	0	0	0	0	0	0	0	0	2	49	0	0
78-80.9	0	0	0	0	0	0	0	0	0	0	0	1	8	0
81+	0	0	0	0	0	0	0	0	0	0	0	0	0	41

No. of households experiencing 'Do Minimum' & 'Do Something' noise levels (given in dB_{Leq}) in 15th Year After Opening

Do Minimum \ Do Something	<45	45-47.9	48-50.9	51-53.9	54-56.9	57-59.9	60-62.9	63-65.9	66-68.9	69-71.9	72-74.9	75-77.9	78-80.9	81+
<45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-47.9	0	1	2	0	0	0	0	0	0	0	0	0	0	0
48-50.9	0	0	90	15	0	0	0	0	0	0	0	0	0	0
51-53.9	0	0	0	170	33	0	0	0	0	0	0	0	0	0
54-56.9	0	0	0	8	231	87	0	0	0	0	0	0	0	0
57-59.9	0	0	0	0	19	268	66	1	0	0	0	0	0	0
60-62.9	0	0	0	0	0	67	380	70	0	0	0	0	0	0
63-65.9	0	0	0	0	0	0	82	354	26	0	0	0	0	0
66-68.9	0	0	0	0	0	0	5	59	256	15	0	0	0	0
69-71.9	0	0	0	0	0	0	0	2	63	351	51	0	0	0
72-74.9	0	0	0	0	0	0	0	0	0	8	71	22	0	0
75-77.9	0	0	0	0	0	0	0	0	0	0	47	46	0	0
78-80.9	0	0	0	0	0	0	0	0	0	0	0	2	8	0
81+	0	0	0	0	0	0	0	0	0	0	0	0	24	17

Net Present Value of Noise of Proposal (60 Year Period) £44,819.62 *positive value reflects a **net benefit** (i.e. noise reduction)

Estimated Population Annoyed (Do-Minimum): **1847**
Estimated Population Annoyed (Do-Something): **1837**

Net Noise Annoyance Change in 15th Year After Opening (no. of people): -10 *positive value reflects an **increase** in people annoyed by noise

Traffic Data Sources: Traffic flows (AAWT), average speeds and percentage HGV composition supplied by Pell Frischmann

Population Data Sources: The national average of 2.36 people per household has been used within the assessment (Census 2001)

Assumptions:	All existing and proposed roads assumed to be constructed from impervious bitumen Discrete receptor locations have been used for apartments within high rise resdiential blocks in locations representative of worst case road traffic flows The highest façade noise level for the whole building has been sued to represent noise levels for all properties within low rise multi occupancy buildings. For example three storey building containing three dwellings Road gradients calculated for existing roads from fitting to Digital Terrain Model Proposed scheme road gradients calculted from inputted data from design scheme elevation diagrams Building heights determined from LIDAR data (1999) as the averge height for all points (2m grid spacing) within the building footprint Default ground absorption within study area assumed to be 0. Areas of grass or vegetation digitised from OS landline with reference to aerial photographs and assumed to have an absorption of 1 No mitigation measures (for example noise barriers) have been included within the assessment
Assessment scores:	The scheme will result in a net decrease of 10 people annoyed by traffic noise with 1847 people annoyed without the scheme and 1837 annoyed with the scheme. The present value of noise of the propsoed scheme indicates a net benefit of £0.044m
Qualitative Comments:	916 people will experience a noise increase, 5293 will experience no change, and 911 will experience a noise decrease with regard to chnages defined by the worksheet noise bands

Worksheet 1 Environment: Noise - Plan Level
Calculation of Estimated Population Annoyed (EPA) by Noise

Option Name: ________________ Year: ________ Mode: ___________					
	Opening Year			**15th Year After Opening**	
Noise Level ($L_{Aeq,18hr}$ dB)	**Estimated Population Annoyed – Without scheme**	**Estimated Population Annoyed – With scheme**		**Estimated Population Annoyed – Without scheme**	**Estimated Population Annoyed – With scheme**
<45	0	0		0	0
45<48	0	0		0	0
48<51	15	12		14	12
51<54	35	34		37	35
54<57	83	68		82	71
57<60	136	136		122	146
61<63	240	259		241	248
63<66	267	304		284	299
66<69	285	271		265	273
69<72	392	391		462	370
72<75	210	190		121	203
75<78	72	116		131	99
78<81	14	13		16	51
81+	71	71		71	29
Totals :	**1821**	**1863**		**1847**	**1837**

APPRAISAL - NOISE POLLUTION

Option 5 - Overground Landbridge Scheme Option

Proposal Opening Year: **2017**

Average Household Size: **2.36**

Project (Road or Rail): **Road**

No. of households experiencing 'Do Minimum' & 'Do Something' noise levels (given in dB_{Leq}) in Opening Year

Do Minimum \ Do Something	<45	45-47.9	48-50.9	51-53.9	54-56.9	57-59.9	60-62.9	63-65.9	66-68.9	69-71.9	72-74.9	75-77.9	78-80.9	81+
<45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-47.9	0	1	4	0	0	0	0	0	0	0	0	0	0	0
48-50.9	0	0	109	8	0	0	0	0	0	0	0	0	0	0
51-53.9	0	0	4	164	23	0	0	0	0	0	0	0	0	0
54-56.9	0	0	0	9	253	66	0	0	0	0	0	0	0	0
57-59.9	0	0	0	0	18	288	88	0	0	0	0	0	0	0
60-62.9	0	0	0	0	0	58	393	64	0	0	0	0	0	0
63-65.9	0	0	0	0	0	0	122	288	25	0	0	0	0	0
66-68.9	0	0	0	0	0	0	0	80	253	27	0	0	0	0
69-71.9	0	0	0	0	0	0	0	0	41	345	10	0	0	0
72-74.9	0	0	0	0	0	0	0	0	0	13	148	14	0	0
75-77.9	0	0	0	0	0	0	0	0	0	0	7	44	0	0
78-80.9	0	0	0	0	0	0	0	0	0	0	0	8	1	0
81+	0	0	0	0	0	0	0	0	0	0	0	0	41	0

No. of households experiencing 'Do Minimum' & 'Do Something' noise levels (given in dB_{Leq}) in 15th Year After Opening

Do Minimum \ Do Something	<45	45-47.9	48-50.9	51-53.9	54-56.9	57-59.9	60-62.9	63-65.9	66-68.9	69-71.9	72-74.9	75-77.9	78-80.9	81+
<45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-47.9	0	1	2	0	0	0	0	0	0	0	0	0	0	0
48-50.9	0	0	90	15	0	0	0	0	0	0	0	0	0	0
51-53.9	0	0	1	166	36	0	0	0	0	0	0	0	0	0
54-56.9	0	0	0	10	212	99	5	0	0	0	0	0	0	0
57-59.9	0	0	0	0	15	248	87	4	0	0	0	0	0	0
60-62.9	0	0	0	0	0	43	386	88	0	0	0	0	0	0
63-65.9	0	0	0	0	0	0	121	293	48	0	0	0	0	0
66-68.9	0	0	0	0	0	0	0	98	204	33	0	0	0	0
69-71.9	0	0	0	0	0	0	0	0	45	370	52	0	0	0
72-74.9	0	0	0	0	0	0	0	0	0	8	74	19	0	0
75-77.9	0	0	0	0	0	0	0	0	0	0	47	46	0	0
78-80.9	0	0	0	0	0	0	0	0	0	0	0	2	8	0
81+	0	0	0	0	0	0	0	0	0	0	0	0	41	0

Net Present Value of Noise of Proposal (60 Year Period) £273,010.50 *positive value reflects a **net benefit** (i.e. noise reduction)

Estimated Population Annoyed (Do-Minimum): **1847**

Estimated Population Annoyed (Do-Something): **1847**

Net Noise Annoyance Change in 15th Year After Opening (no. of people): 0 *positive value reflects an **increase** in people annoyed by noise

Traffic Data Sources: Traffic flows (AAWT), average speeds and percentage HGV composition supplied by Pell Frischmann

Population Data Sources: The national average of 2.36 people per household has been used within the assessment (Census 2001)

Assumptions:	All existing and proposed roads assumed to be constructed from impervious bitumen Discrete receptor locations have been used for apartments within high rise resdiential blocks in locations representative of worst case road traffic flows The highest façade noise level for the whole building has been sued to represent noise levels for all properties within low rise multi occupancy buildings. For example three storey building containing three dwellings Road gradients calculated for existing roads from fitting to Digital Terrain Model Proposed scheme road gradients calculted from inputted data from design scheme elevation diagrams Building heights determined from LIDAR data (1999) as the averge height for all points (2m grid spacing) within the building footprint Default ground absorption within study area assumed to be 0. Areas of grass or vegetation digitised from OS landline with reference to aerial photographs and assumed to have an absorption of 1 No mitigation measures (for example noise barriers) have been included within the assessment
Assessment scores:	The scheme will result in no change in the number of people annoyed by traffic noise with 1847 people annoyed without the scheme and 1847 annoyed with the scheme. The present value of noise of the propsoed scheme indicates a net benefit of £0.273m
Qualitative Comments:	1152 people will experience a noise increase, 4951 will experience no change, and 1017 will experience a noise decrease with regard to chnages defined by the worksheet noise bands

Worksheet 1 Environment: Noise - Plan Level
Calculation of Estimated Population Annoyed (EPA) by Noise

Option Name: ________________ Year: ________ Mode: ___________					
	Opening Year			**15^{th} Year After Opening**	
Noise Level ($L_{Aeq,18hr}$ dB)	**Estimated Population Annoyed – Without scheme**	**Estimated Population Annoyed – With scheme**		**Estimated Population Annoyed – Without scheme**	**Estimated Population Annoyed – With scheme**
<45	0	0		0	0
45<48	0	0		0	0
48<51	15	15		14	12
51<54	35	33		37	35
54<57	83	74		82	66
57<60	136	142		122	135
61<63	240	281		241	279
63<66	267	266		284	297
66<69	285	252		265	235
69<72	392	381		462	407
72<75	210	198		121	208
75<78	72	93		131	94
78<81	14	67		16	79
81+	71	0		71	0
Totals :	**1821**	**1803**		**1847**	**1847**

APPRAISAL - NOISE POLLUTION

Option 6 - Overground Extended Viaduct Scheme Option

Proposal Opening Year: 2018

Average Household Size: 2.36

Project (Road or Rail): Road

No. of households experiencing 'Do Minimum' & 'Do Something' noise levels (given in dB_{Leq}) in Opening Year

Do Minimum	Do Something	<45	45-47.9	48-50.9	51-53.9	54-56.9	57-59.9	60-62.9	63-65.9	66-68.9	69-71.9	72-74.9	75-77.9	78-80.9	81+
<45		0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-47.9		0	4	0	0	0	0	0	0	0	0	0	0	0	0
48-50.9		0	1	107	2	0	0	0	0	0	0	0	0	0	0
51-53.9		0	0	22	141	28	0	0	0	0	0	0	0	0	0
54-56.9		0	0	0	20	214	87	0	0	0	0	0	0	0	0
57-59.9		0	0	0	0	24	238	81	6	10	2	0	0	0	0
60-62.9		0	0	0	0	0	36	388	51	14	46	0	0	0	0
63-65.9		0	0	0	0	0	0	120	285	28	2	11	1	0	0
66-68.9		0	0	0	0	0	0	0	71	257	34	0	0	0	0
69-71.9		0	0	0	0	0	0	0	0	41	310	46	2	0	0
72-74.9		0	0	0	0	0	0	0	0	0	18	160	0	0	0
75-77.9		0	0	0	0	0	0	0	0	0	0	19	40	0	0
78-80.9		0	0	0	0	0	0	0	0	0	0	0	6	3	0
81+		0	0	0	0	0	0	0	0	0	0	0	0	6	0

No. of households experiencing 'Do Minimum' & 'Do Something' noise levels (given in dB_{Leq}) in 15th Year After Opening

Do Minimum	Do Something	<45	45-47.9	48-50.9	51-53.9	54-56.9	57-59.9	60-62.9	63-65.9	66-68.9	69-71.9	72-74.9	75-77.9	78-80.9	81+
<45		0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-47.9		0	3	0	0	0	0	0	0	0	0	0	0	0	0
48-50.9		0	1	99	6	0	0	0	0	0	0	0	0	0	0
51-53.9		0	0	19	147	38	0	0	0	0	0	0	0	0	0
54-56.9		0	0	0	15	208	104	1	0	0	0	0	0	0	0
57-59.9		0	0	0	0	27	221	84	23	7	2	0	0	0	0
60-62.9		0	0	0	0	0	36	373	36	31	46	0	0	0	0
63-65.9		0	0	0	0	0	0	133	266	47	13	1	0	0	0
66-68.9		0	0	0	0	0	0	0	79	221	13	0	0	0	0
69-71.9		0	0	0	0	0	0	0	0	46	321	47	0	0	0
72-74.9		0	0	0	0	0	0	0	0	0	69	90	2	0	0
75-77.9		0	0	0	0	0	0	0	0	0	0	48	43	0	0
78-80.9		0	0	0	0	0	0	0	0	0	0	0	4	6	0
81+		0	0	0	0	0	0	0	0	0	0	0	0	6	0

Net Present Value of Noise of Proposal (60 Year Period) -£734,136.85 *positive value reflects a **net benefit** (i.e. noise reduction)

Estimated Population Annoyed (Do-Minimum): 1791

Estimated Population Annoyed (Do-Something): 1813

Net Noise Annoyance Change in 15th Year After Opening (no. of people): 22 *positive value reflects an **increase** in people annoyed by noise

Traffic Data Sources: Traffic flows (AAWT), average speeds and percentage HGV composition supplied by Pell Frischmann

Population Data Sources: The national average of 2.36 people per household has been used within the assessment (Census 2001)

Assumptions:	All existing and proposed roads assumed to be constructed from impervious bitumen Discrete receptor locations have been used for apartments within high rise resdiential blocks in locations representative of worst case road traffic flows The highest façade noise level for the whole building has been sued to represent noise levels for all properties within low rise multi occupancy buildings. For example three storey building containing three dwellings Road gradients calculated for existing roads from fitting to Digital Terrain Model Proposed scheme road gradients calculted from inputted data from design scheme elevation diagrams Building heights determined from LIDAR data (1999) as the averge height for all points (2m grid spacing) within the building footprint Default ground absorption within study area assumed to be 0. Areas of grass or vegetation digitised from OS landline with reference to aerial photographs and assumed to have an absorption of 1 No mitigation measures (for example noise barriers) have been included within the assessment
Assessment scores:	The scheme will result in a net increase of 22 people annoyed by traffic noise with 1797 people annoyed without the scheme and 1813 annoyed with the scheme. The present value of noise of the propsoed scheme indicates a net cost of £0.734m
Qualitative Comments:	1182 people will experience a noise increase, 4715 will experience no change, and 1140 will experience a noise decrease with regard to chnages defined by the worksheet noise bands

Worksheet 1 Environment: Noise - Plan Level
Calculation of Estimated Population Annoyed (EPA) by Noise

Option Name: ________________   Year: ________   Mode: ___________

	Opening Year		**15th Year After Opening**	
Noise Level ($L_{Aeq,18hr}$ dB)	**Estimated Population Annoyed – Without scheme**	**Estimated Population Annoyed – With scheme**	**Estimated Population Annoyed – Without scheme**	**Estimated Population Annoyed – With scheme**
<45	0	0	0	0
45<48	0	0	0	0
48<51	14	17	14	15
51<54	35	30	37	31
54<57	81	67	83	69
57<60	125	125	126	125
61<63	249	274	243	275
63<66	275	254	283	248
66<69	286	277	248	279
69<72	395	408	410	459
72<75	214	283	193	223
75<78	83	69	128	69
78<81	14	14	16	19
81+	10	0	10	0
Totals :	**1782**	**1819**	**1791**	**1813**

AIR QUALITY

Environment: Local Air Quality - Plan Level Summary Table: 2018 Base Underground

(Tag Unit 3.3.3 Worksheet 1b)

Long Term (annual) NO_2

NO_2, SUMMARY OF ROUTE: THE AGGREGATED TABLE	0-50 m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Total properties across all routes (min)	1970	1776	1013	785	5544
Total properties across all routes (some)	1970	1776	1013	785	5544
Do-minimum NO_2 assessment across all routes	53231.29	46179.35	25789.41	19900.2	Total assessment NO_2 (I) 145100.25
Do-something NO_2 assessment across all routes	53047.03	46077.86	25734.49	19852.46	Total assessment NO_2 (II) 144711.84
NET TOTAL ASSESSMENT FOR NO_2, all routes (II-I)					-388.41
Number of properties with an improvement					4327
Number of properties with no change					0
Number of properties with a deterioration					1217

Reference Sources	Concentrations: ADMS ROADS v2.3 (model: 2017BASEOG) Property counts: manual estimation from base plan (refer to Figure 1)
Quantitative Measures	To avoid double counting of properties, bandwidths were altered based on relative impact of links. Refer to Section 2.4 in text.
Assessment Scores	As reported.
Qualitative Comments	Demolition requirements: Castle Buildings (Grade II Listed); Earl de Grey PH (Grade II Listed). This option does not result in an exceedence of either the annual AQS for NO_2 (40 μg/m^3) at 20 m from the road centre. No exceedences of the AQS for NO_2 are predicted at any of assessed locations (20 m, 70 m, 115 m, and 175 m from road centre).

Environment: Local Air Quality - Plan Level Summary Table: 2018 Base Underground

(Tag Unit 3.3.3 Worksheet 1b)

Long Term (annual) PM_{10}

PM_{10}, SUMMARY OF ROUTE: THE AGGREGATED TABLE	0-50 m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Total properties across all routes (min)	1970	1776	1013	785	5544
Total properties across all routes (some)	1970	1776	1013	785	5544
Do-minimum PM_{10} assessment across all routes	32265.24	28871.61	16428.41	12721	Total assessment PM_{10} (I) 90286.26
Do-something PM_{10} assessment across all routes	32258.8	28871.55	16428.06	12720.07	Total assessment PM_{10} (II) 90278.47
NET TOTAL ASSESSMENT FOR PM_{10}, all routes (II-I)					-7.79
Number of properties with an improvement					3497
Number of properties with no change					0
Number of properties with a deterioration					2047

Reference Sources	Concentrations: ADMS ROADS v2.3 (model: 2017BASEOG) Property counts: manual estimation from base plan (refer to Figure 1)
Quantitative Measures	To avoid double counting of properties, bandwidths were altered based on relative impact of links. Refer to Section 2.4 in text.
Assessment Scores	As reported.
Qualitative Comments	Demolition requirements: Castle Buildings (Grade II Listed); Earl de Grey PH (Grade II Listed). This option does not result in an exceedence of either the annual AQS for PM_{10} (40 µg/m^3) at 20 m from the road centre. No exceedences of the AQS for PM_{10} are predicted at any of assessed locations (20 m, 70 m, 115 m, and 175 m from road centre).

PM_{10}, SUMMARY OF ROUTES: THE AGGREGATED TABLE	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Total properties across all routes (min)	1970	1776	1013	785	5544
Total properties across all routes (some)	1970	1776	1013	785	5544
Do-minimum **PM_{10} assessment** ***across all routes***	32265.24	28871.61	16428.41	12721	Total assessment PM_{10} **(I)**: 90286.2644
Do-something **PM_{10} assessment** ***across all routes***	32258.8	28871.55	16428.06	12720.07	Total assessment PM_{10} **(II)**: 90278.4723
Net total assessment for PM_{10}, all routes (II-I)					-7.7921
Number of properties with an improvement					***3497***
Number of properties with no change					***0***
Number of properties with a deterioration					***2047***

Reference Sources:

Quantitative Measures:

Assessment Scores:

Qualitative Comments:

PM_{10}, ROUTE 1. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.40	At 70m: 16.72	At 115m: 16.39	At 175m: 16.30	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.41	At 70m: 16.76	At 115m: 16.39	At 175m: 16.30	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 2. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.99	At 70m: 16.44	At 115m: 16.36	At 175m: 16.32	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.08	At 70m: 16.45	At 115m: 16.36	At 175m: 16.31	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 3. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	23	7	6	0	36
Properties (asome)	23	7	6	0	36
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.30	At 70m: 16.25	At 115m: 16.26	At 175m: 16.28	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.31	At 70m: 16.25	At 115m: 16.26	At 175m: 16.28	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	374.8724	113.7255	97.5666	0	Total route assess PM_{10} **(I)**: 586.1645
Do-something* PM_{10} assessment *(c = asome*bsome)	375.0656	113.7437	97.5792	0	Total route assess PM_{10} **(II)**: 586.3885
Net total route assessment for PM_{10} (II-I)	0	0	36		0.224

PM_{10}, ROUTE 4. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	169	232	246	73	720
Properties (asome)	169	232	246	73	720
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.37	At 70m: 16.22	At 115m: 16.19	At 175m: 16.18	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.37	At 70m: 16.22	At 115m: 16.19	At 175m: 16.18	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	2767.155	3763.04	3983.847	1181.352	Total route assess PM_{10} **(I)**: 11695.394
Do-something* PM_{10} assessment *(c = asome*bsome)	2766.327	3762.715	3983.675	1181.33	Total route assess PM_{10} **(II)**: 11694.047
Net total route assessment for PM_{10} (II-I)	720	0	0		-1.347

PM_{10}, ROUTE 5. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.78	At 70m: 16.53	At 115m: 16.28	At 175m: 16.21	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.78	At 70m: 16.53	At 115m: 16.28	At 175m: 16.21	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 6. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.42	At 70m: 16.48	At 115m: 16.42	At 175m: 16.41	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.43	At 70m: 16.49	At 115m: 16.43	At 175m: 16.42	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 7. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.77	At 70m: 16.38	At 115m: 16.27	At 175m: 16.28	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.84	At 70m: 16.39	At 115m: 16.28	At 175m: 16.26	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 8. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	24	75	25	16	140
Properties (asome)	24	75	25	16	140
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.54	At 70m: 16.40	At 115m: 16.30	At 175m: 16.27	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.61	At 70m: 16.41	At 115m: 16.31	At 175m: 16.27	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	421.0128	1230.113	407.6	260.312	Total route assess PM_{10} (I): 2319.0373
Do-something PM_{10} assessment *(c = asome*bsome)*	422.5344	1231.005	407.6925	260.2512	Total route assess PM_{10} (II): 2321.4831
Net total route assessment for PM_{10} (II-I)	0	0	140		2.4458

PM_{10}, ROUTE 9. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	51	160	113	103	427
Properties (asome)	51	160	113	103	427
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.86	At 70m: 16.36	At 115m: 16.28	At 175m: 16.26	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.94	At 70m: 16.38	At 115m: 16.29	At 175m: 16.26	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	859.7427	2617.984	1839.832	1674.996	Total route assess PM_{10} (I): 6992.5551
Do-something PM_{10} assessment *(c = asome*bsome)*	863.8941	2621.008	1840.601	1674.265	Total route assess PM_{10} (II): 6999.7676
Net total route assessment for PM_{10} (II-I)	0	0	427		7.2125

PM_{10}, ROUTE 10. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.29	At 70m: 16.26	At 115m: 16.31	At 175m: 16.60	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.27	At 70m: 16.27	At 115m: 16.32	At 175m: 16.65	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 11. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	36	10	8	3	57
Properties (asome)	36	10	8	3	57
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.34	At 70m: 16.18	At 115m: 16.16	At 175m: 16.15	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.33	At 70m: 16.18	At 115m: 16.16	At 175m: 16.15	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	588.1032	161.825	129.2664	48.4476	Total route assess PM_{10} **(I)**: 927.6422
Do-something PM_{10} assessment *(c = asome*bsome)*	587.8548	161.805	129.2568	48.4455	Total route assess PM_{10} **(II)**: 927.3621
Net total route assessment for PM_{10} (II-I)	57	0	0		-0.2801

PM_{10}, ROUTE 12. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	199	240	57	67	563
Properties (asome)	199	240	57	67	563
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.36	At 70m: 16.21	At 115m: 16.19	At 175m: 16.18	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.33	At 70m: 16.20	At 115m: 16.18	At 175m: 16.17	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	3255.361	3891.168	922.659	1083.752	Total route assess PM_{10} **(I)**: 9152.9402
Do-something PM_{10} assessment *(c = asome*bsome)*	3249.431	3889.056	922.374	1083.645	Total route assess PM_{10} **(II)**: 9144.5058
Net total route assessment for PM_{10} (II-I)	563	0	0		-8.4344

PM_{10}, ROUTE 13. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	164	82	3	37	286
Properties (asome)	164	82	3	37	286
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.32	At 70m: 16.22	At 115m: 16.21	At 175m: 16.20	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.28	At 70m: 16.21	At 115m: 16.20	At 175m: 16.20	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	2676.185	1329.646	48.6246	599.5295	Total route assess PM_{10} **(I)**: 4653.9853
Do-something PM_{10} assessment *(c = asome*bsome)*	2669.723	1328.851	48.612	599.4888	Total route assess PM_{10} **(II)**: 4646.675
Net total route assessment for PM_{10} (II-I)	286	0	0		-7.3103

PM_{10}, ROUTE 14. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.33	At 70m: 16.29	At 115m: 16.33	At 175m: 16.36	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.33	At 70m: 16.29	At 115m: 16.32	At 175m: 16.35	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 15. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	218	0	0	0	218
Properties (asome)	218	0	0	0	218
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.27	At 70m: 16.24	At 115m: 16.49	At 175m: 16.28	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.26	At 70m: 16.23	At 115m: 16.40	At 175m: 16.29	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	3546.097	0	0	0	Total route assess PM_{10} **(I)**: 3546.097
Do-something PM_{10} assessment *(c = asome*bsome)*	3544.68	0	0	0	Total route assess PM_{10} **(II)**: 3544.68
Net total route assessment for PM_{10} (II-I)	218	0	0		-1.417

PM_{10}, ROUTE 16. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	47	31	38	44	160
Properties (asome)	47	31	38	44	160
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.51	At 70m: 16.35	At 115m: 16.41	At 175m: 16.31	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.53	At 70m: 16.35	At 115m: 16.39	At 175m: 16.31	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	775.9089	506.8624	623.7206	717.7192	Total route assess PM_{10} **(I)**: 2624.2111
Do-something* PM_{10} assessment *(c = asome*bsome)	776.7455	506.7384	622.782	717.4948	Total route assess PM_{10} **(II)**: 2623.7607
Net total route assessment for PM_{10} (II-I)	0	0	160		-0.4504

PM_{10}, ROUTE 17. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	9	16	8	33
Properties (asome)	0	9	16	8	33
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.36	At 70m: 16.29	At 115m: 16.30	At 175m: 16.31	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.33	At 70m: 16.29	At 115m: 16.30	At 175m: 16.33	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	146.6271	260.76	130.5184	Total route assess PM_{10} **(I)**: 537.9055
Do-something* PM_{10} assessment *(c = asome*bsome)	0	146.6307	260.8448	130.604	Total route assess PM_{10} **(II)**: 538.0795
Net total route assessment for PM_{10} (II-I)	33	0	0		0.174

PM_{10}, ROUTE 18. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	63	49	0	0	112
Properties (asome)	63	49	0	0	112
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.97	At 70m: 16.39	At 115m: 16.30	At 175m: 16.25	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.96	At 70m: 16.39	At 115m: 16.30	At 175m: 16.25	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	1069.242	802.9924	0	0	Total route assess PM_{10} **(I)**: 1872.2347
Do-something* PM_{10} assessment *(c = asome*bsome)	1068.455	802.8748	0	0	Total route assess PM_{10} **(II)**: 1871.3296
Net total route assessment for PM_{10} (II-I)	112	0	0		-0.9051

PM_{10}, ROUTE 19. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.48	At 70m: 16.61	At 115m: 17.01	At 175m: 16.94	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.46	At 70m: 16.53	At 115m: 16.75	At 175m: 16.63	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 20. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	61	0	0	0	61
Properties (asome)	61	0	0	0	61
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.38	At 70m: 16.38	At 115m: 16.38	At 175m: 16.39	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.37	At 70m: 16.38	At 115m: 16.38	At 175m: 16.39	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	998.997	0	0	0	Total route assess PM_{10} (I): 998.997
Do-something PM_{10} assessment *(c = asome*bsome)*	998.814	0	0	0	Total route assess PM_{10} (II): 998.814
Net total route assessment for PM_{10} (II-I)	61	0	0		-0.183

PM_{10}, ROUTE 21. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	43	0	0	0	43
Properties (asome)	43	0	0	0	43
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.28	At 70m: 16.34	At 115m: 16.54	At 175m: 16.90	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.28	At 70m: 16.34	At 115m: 16.53	At 175m: 16.91	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	700.0873	0	0	0	Total route assess PM_{10} (I): 700.0873
Do-something PM_{10} assessment *(c = asome*bsome)*	699.9669	0	0	0	Total route assess PM_{10} (II): 699.9669
Net total route assessment for PM_{10} (II-I)	43	0	0		-0.1204

PM_{10}, ROUTE 22. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.36	At 70m: 16.53	At 115m: 17.74	At 175m: 16.67	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.39	At 70m: 16.54	At 115m: 17.71	At 175m: 16.67	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 23. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	70	0	0	0	70
Properties (asome)	70	0	0	0	70
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.28	At 70m: 16.24	At 115m: 16.23	At 175m: 16.22	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.28	At 70m: 16.24	At 115m: 16.23	At 175m: 16.23	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	1139.621	0	0	0	Total route assess PM_{10} (I): 1139.621
Do-something PM_{10} assessment *(c = asome*bsome)*	1139.761	0	0	0	Total route assess PM_{10} (II): 1139.761
Net total route assessment for PM_{10} (II-I)	0	0	70		0.14

PM_{10}, ROUTE 24. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	17	48	67	132
Properties (asome)	0	17	48	67	132
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.85	At 70m: 16.34	At 115m: 16.27	At 175m: 16.24	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.88	At 70m: 16.35	At 115m: 16.28	At 175m: 16.24	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	277.8123	781.1232	1088.12	Total route assess PM_{10} (I): 2147.0557
Do-something PM_{10} assessment *(c = asome*bsome)*	0	277.9415	781.32	1088.261	Total route assess PM_{10} (II): 2147.5224
Net total route assessment for PM_{10} (II-I)	0	0	132		0.4667

PM_{10}, ROUTE 25. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	128	92	0	0	220
Properties (asome)	128	92	0	0	220
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.27	At 70m: 16.30	At 115m: 16.72	At 175m: 16.26	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.27	At 70m: 16.30	At 115m: 16.72	At 175m: 16.26	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	2082.522	1499.802	0	0	Total route assess PM_{10} **(I)**: 3582.324
Do-something* PM_{10} assessment *(c = asome*bsome)	2082.701	1499.747	0	0	Total route assess PM_{10} **(II)**: 3582.448
Net total route assessment for PM_{10} (II-I)	0	0	220		0.124

PM_{10}, ROUTE 26. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.47	At 70m: 16.32	At 115m: 16.35	At 175m: 16.30	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.47	At 70m: 16.32	At 115m: 16.35	At 175m: 16.31	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 27. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.33	At 70m: 16.25	At 115m: 16.25	At 175m: 16.28	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.33	At 70m: 16.25	At 115m: 16.25	At 175m: 16.28	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 28. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	68	30	0	0	98
Properties (asome)	68	30	0	0	98
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.27	At 70m: 16.26	At 115m: 16.23	At 175m: 16.23	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.27	At 70m: 16.26	At 115m: 16.23	At 175m: 16.22	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	1106.299	487.878	0	0	Total route assess PM_{10} **(I)**: 1594.1768
Do-something* PM_{10} assessment *(c = asome*bsome)	1106.231	487.896	0	0	Total route assess PM_{10} **(II)**: 1594.1268
Net total route assessment for PM_{10} (II-I)	98	0	0		-0.05

PM_{10}, ROUTE 29. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 0	At 70m: 0	At 115m: 0	At 175m: 0	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 0	At 70m: 0	At 115m: 0	At 175m: 0	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 30. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.89	At 70m: 16.34	At 115m: 16.25	At 175m: 16.20	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.89	At 70m: 16.35	At 115m: 16.25	At 175m: 16.20	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 31. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	58	79	62	72	271
Properties (asome)	58	79	62	72	271
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.29	At 70m: 16.19	At 115m: 16.17	At 175m: 16.16	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.29	At 70m: 16.19	At 115m: 16.17	At 175m: 16.16	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	944.646	1278.781	1002.528	1163.606	Total route assess PM_{10} (I): 4389.5609
Do-something PM_{10} assessment *(c = asome*bsome)*	944.6576	1278.734	1002.478	1163.534	Total route assess PM_{10} (II): 4389.4035
Net total route assessment for PM_{10} (II-I)	0	0	271		-0.1574

PM_{10}, ROUTE 32. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	49	150	151	154	504
Properties (asome)	49	150	151	154	504
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.38	At 70m: 16.20	At 115m: 16.17	At 175m: 16.16	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.37	At 70m: 16.20	At 115m: 16.17	At 175m: 16.16	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	802.4828	2430.735	2442.214	2488.286	Total route assess PM_{10} (I): 8163.7172
Do-something PM_{10} assessment *(c = asome*bsome)*	802.0908	2430.375	2441.987	2488.209	Total route assess PM_{10} (II): 8162.6617
Net total route assessment for PM_{10} (II-I)	504	0	0		-1.0555

PM_{10}, ROUTE 33. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	71	66	72	32	241
Properties (asome)	71	66	72	32	241
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.25	At 70m: 16.19	At 115m: 16.18	At 175m: 16.17	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.26	At 70m: 16.19	At 115m: 16.18	At 175m: 16.17	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	1153.913	1068.263	1164.629	517.5136	Total route assess PM_{10} (I): 3904.3185
Do-something PM_{10} assessment *(c = asome*bsome)*	1154.212	1068.296	1164.622	517.5104	Total route assess PM_{10} (II): 3904.6393
Net total route assessment for PM_{10} (II-I)	0	0	241		0.3208

PM_{10}, ROUTE 34. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	110	50	1	0	161
Properties (asome)	110	50	1	0	161
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.46	At 70m: 16.25	At 115m: 16.22	At 175m: 16.20	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.50	At 70m: 16.26	At 115m: 16.22	At 175m: 16.20	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	1810.842	812.56	16.2163	0	Total route assess PM_{10} (I): 2639.6183
Do-something PM_{10} assessment *(c = asome*bsome)*	1815	813.055	16.2214	0	Total route assess PM_{10} (II): 2644.2764
Net total route assessment for PM_{10} (II-I)	0	0	161		4.6581

PM_{10}, ROUTE 35. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	24	20	13	12	69
Properties (asome)	24	20	13	12	69
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.40	At 70m: 16.23	At 115m: 16.21	At 175m: 16.20	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.39	At 70m: 16.23	At 115m: 16.20	At 175m: 16.20	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	393.5856	324.632	210.6663	194.3832	Total route assess PM_{10} **(I)**: 1123.2671
Do-something* PM_{10} assessment *(c = asome*bsome)	393.3672	324.584	210.6507	194.3748	Total route assess PM_{10} **(II)**: 1122.9767
Net total route assessment for PM_{10} (II-I)	69	0	0		-0.2904

PM_{10}, ROUTE 36. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	29	18	47
Properties (asome)	0	0	29	18	47
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.40	At 70m: 16.22	At 115m: 16.19	At 175m: 16.18	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.40	At 70m: 16.22	At 115m: 16.19	At 175m: 16.18	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	469.4694	291.2202	Total route assess PM_{10} **(I)**: 760.6896
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	469.4578	291.2004	Total route assess PM_{10} **(II)**: 760.6582
Net total route assessment for PM_{10} (II-I)	0	0	47		-0.0314

PM_{10}, ROUTE 37. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	58	184	41	18	301
Properties (asome)	58	184	41	18	301
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.42	At 70m: 16.24	At 115m: 16.22	At 175m: 16.22	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.41	At 70m: 16.24	At 115m: 16.22	At 175m: 16.23	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	952.2324	2987.258	665.0241	292.0302	Total route assess PM_{10} **(I)**: 4896.5451
Do-something* PM_{10} assessment *(c = asome*bsome)	951.664	2987.295	665.1553	292.1328	Total route assess PM_{10} **(II)**: 4896.2473
Net total route assessment for PM_{10} (II-I)	301	0	0		-0.2978

PM_{10}, ROUTE 38. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	2	0	0	0	2
Properties (asome)	2	0	0	0	2
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.26	At 70m: 16.20	At 115m: 16.19	At 175m: 16.19	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.26	At 70m: 16.20	At 115m: 16.19	At 175m: 16.20	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	32.5244	0	0	0	Total route assess PM_{10} **(I)**: 32.5244
Do-something* PM_{10} assessment *(c = asome*bsome)	32.5166	0	0	0	Total route assess PM_{10} **(II)**: 32.5166
Net total route assessment for PM_{10} (II-I)	2	0	0		-0.0078

PM_{10}, ROUTE 39. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	38	21	39	50	148
Properties (asome)	38	21	39	50	148
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.19	At 70m: 16.16	At 115m: 16.16	At 175m: 16.16	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.18	At 70m: 16.16	At 115m: 16.16	At 175m: 16.16	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	615.0414	339.3894	630.1464	807.92	Total route assess PM_{10} **(I)**: 2392.4972
Do-something* PM_{10} assessment *(c = asome*bsome)	614.9882	339.3726	630.123	807.895	Total route assess PM_{10} **(II)**: 2392.3788
Net total route assessment for PM_{10} (II-I)	148	0	0		-0.1184

PM_{10}, ROUTE 40. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	10	1	0	1	12
Properties (asome)	10	1	0	1	12
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.26	At 70m: 16.25	At 115m: 16.38	At 175m: 16.43	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.25	At 70m: 16.25	At 115m: 16.37	At 175m: 16.42	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	162.593	16.2549	0	16.429	Total route assess PM_{10} **(I)**: 195.2769
Do-something* PM_{10} assessment *(c = asome*bsome)	162.539	16.2503	0	16.4172	Total route assess PM_{10} **(II)**: 195.2065
Net total route assessment for PM_{10} (II-I)	12	0	0		-0.0704

PM_{10}, ROUTE 41. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.22	At 70m: 16.22	At 115m: 16.23	At 175m: 16.32	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.22	At 70m: 16.22	At 115m: 16.23	At 175m: 16.32	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 42. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	21	80	14	0	115
Properties (asome)	21	80	14	0	115
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.49	At 70m: 16.26	At 115m: 16.22	At 175m: 16.25	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.47	At 70m: 16.25	At 115m: 16.21	At 175m: 16.24	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	346.2627	1300.416	227.0422	0	Total route assess PM_{10} **(I)**: 1873.7209
Do-something* PM_{10} assessment *(c = asome*bsome)	345.9645	1300.056	227.0016	0	Total route assess PM_{10} **(II)**: 1873.0221
Net total route assessment for PM_{10} (II-I)	115	0	0		-0.6988

PM_{10}, ROUTE 43. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	2	0	0	0	2
Properties (asome)	2	0	0	0	2
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.35	At 70m: 16.24	At 115m: 16.23	At 175m: 16.23	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.34	At 70m: 16.24	At 115m: 16.23	At 175m: 16.23	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	32.7054	0	0	0	Total route assess PM_{10} **(I)**: 32.7054
Do-something* PM_{10} assessment *(c = asome*bsome)	32.683	0	0	0	Total route assess PM_{10} **(II)**: 32.683
Net total route assessment for PM_{10} (II-I)	2	0	0		-0.0224

PM_{10}, ROUTE 44. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	21	52	0	0	73
Properties (asome)	21	52	0	0	73
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.23	At 70m: 16.20	At 115m: 16.21	At 175m: 16.25	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.23	At 70m: 16.19	At 115m: 16.21	At 175m: 16.25	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	340.8132	842.2024	0	0	Total route assess PM_{10} **(I)**: 1183.0156
Do-something* PM_{10} assessment *(c = asome*bsome)	340.8216	842.114	0	0	Total route assess PM_{10} **(II)**: 1182.9356
Net total route assessment for PM_{10} (II-I)	0	0	73		-0.08

PM_{10}, ROUTE 45. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	76	0	0	0	76
Properties (asome)	76	0	0	0	76
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.25	At 70m: 16.25	At 115m: 16.25	At 175m: 16.40	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.25	At 70m: 16.24	At 115m: 16.25	At 175m: 16.39	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	1234.863	0	0	0	Total route assess PM_{10} (I): 1234.8632
Do-something PM_{10} assessment *(c = asome*bsome)*	1234.833	0	0	0	Total route assess PM_{10} (II): 1234.8328
Net total route assessment for PM_{10} (II-I)	76	0	0		-0.0304

PM_{10}, ROUTE 46. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.38	At 70m: 16.25	At 115m: 16.23	At 175m: 16.27	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.37	At 70m: 16.25	At 115m: 16.23	At 175m: 16.28	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 47. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.28	At 70m: 16.22	At 115m: 16.22	At 175m: 16.25	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.27	At 70m: 16.22	At 115m: 16.22	At 175m: 16.25	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 48. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	1	1	12	1	15
Properties (asome)	1	1	12	1	15
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.26	At 70m: 16.21	At 115m: 16.21	At 175m: 16.31	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.26	At 70m: 16.21	At 115m: 16.21	At 175m: 16.30	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	16.2604	16.2077	194.5764	16.3097	Total route assess PM_{10} (I): 243.3542
Do-something PM_{10} assessment *(c = asome*bsome)*	16.2574	16.2057	194.5476	16.3038	Total route assess PM_{10} (II): 243.3145
Net total route assessment for PM_{10} (II-I)	15	0	0		-0.0397

PM_{10}, ROUTE 49. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	4	5	0	0	9
Properties (asome)	4	5	0	0	9
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.44	At 70m: 16.26	At 115m: 16.23	At 175m: 16.23	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.43	At 70m: 16.26	At 115m: 16.23	At 175m: 16.23	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	65.7524	81.321	0	0	Total route assess PM_{10} (I): 147.0734
Do-something PM_{10} assessment *(c = asome*bsome)*	65.7088	81.307	0	0	Total route assess PM_{10} (II): 147.0158
Net total route assessment for PM_{10} (II-I)	9	0	0		-0.0576

PM_{10}, ROUTE 50. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.63	At 70m: 16.28	At 115m: 16.23	At 175m: 16.20	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.62	At 70m: 16.28	At 115m: 16.23	At 175m: 16.20	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 51. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	20	21	19	9	69
Properties (asome)	20	21	19	9	69
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.32	At 70m: 16.32	At 115m: 16.36	At 175m: 16.51	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.33	At 70m: 16.33	At 115m: 16.37	At 175m: 16.52	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	326.486	342.6948	310.8989	148.5567	Total route assess PM_{10} (I): 1128.6364
Do-something PM_{10} assessment *(c = asome*bsome)*	326.622	342.8376	311.0756	148.7052	Total route assess PM_{10} (II): 1129.2404
Net total route assessment for PM_{10} (II-I)	0	0	69		0.604

PM_{10}, ROUTE 52. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	41	12	0	0	53
Properties (asome)	41	12	0	0	53
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.42	At 70m: 16.79	At 115m: 16.42	At 175m: 16.30	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.41	At 70m: 16.75	At 115m: 16.41	At 175m: 16.30	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	673.0314	201.42	0	0	Total route assess PM_{10} (I): 874.4514
Do-something PM_{10} assessment *(c = asome*bsome)*	672.6911	201.054	0	0	Total route assess PM_{10} (II): 873.7451
Net total route assessment for PM_{10} (II-I)	53	0	0		-0.7063

NO_2, SUMMARY OF ROUTES: THE AGGREGATED TABLE	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Total properties across all routes (min)	1970	1776	1013	785	5544
Total properties across all routes (some)	1970	1776	1013	785	5544
Do-minimum* NO_2 assessment *across all routes	53231.29	46179.35	25789.41	19900.2	Total assessment NO_2 **(I)**: 145100.2526
Do-something* NO_2 assessment *across all routes	53047.03	46077.86	25734.49	19852.46	Total assessment NO_2 **(II)**: 144711.8377
Net total assessment for NO_2, all routes (II-I)					-388.4148957
Number of properties with an improvement					***4327***
Number of properties with no change					***0***
Number of properties with a deterioration					***1217***

Reference Sources:

Quantitative Measures:

Assessment Scores:

Qualitative Comments:

NO_2, ROUTE 1. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 36.92	At 70m: 30.45	At 115m: 28.74	At 175m: 27.64	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 37.11	At 70m: 30.65	At 115m: 28.83	At 175m: 27.62	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 2. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 34.19	At 70m: 29.44	At 115m: 28.38	At 175m: 27.73	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 34.58	At 70m: 29.55	At 115m: 28.44	At 175m: 27.69	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 3. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	23	7	6	0	36
Properties (asome)	23	7	6	0	36
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.04	At 70m: 25.85	At 115m: 26.13	At 175m: 26.52	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.14	At 70m: 25.89	At 115m: 26.15	At 175m: 26.53	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	598.9221	180.9729	156.7506	0	Total route assess NO_2 **(I)**: 936.6455604
Do-something* NO_2 assessment *(c = asome*bsome)	601.3145	181.2061	156.8899	0	Total route assess NO_2 **(II)**: 939.4104775
Net total route assessment for NO_2 (II-I)	0	0	36		2.76491705

NO_2, ROUTE 4. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	169	232	246	73	720
Properties (asome)	169	232	246	73	720
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.76	At 70m: 24.95	At 115m: 24.81	At 175m: 24.78	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.59	At 70m: 24.86	At 115m: 24.74	At 175m: 24.73	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	4353.933	5788.3	6102.312	1808.786	Total route assess NO_2 **(I)**: 18053.33074
Do-something* NO_2 assessment *(c = asome*bsome)	4324.598	5767.531	6085.848	1804.958	Total route assess NO_2 **(II)**: 17982.93584
Net total route assessment for NO_2 (II-I)	720	0	0		-70.39490367

NO_2, ROUTE 5. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 32.58	At 70m: 29.29	At 115m: 26.51	At 175m: 25.56	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 32.53	At 70m: 29.30	At 115m: 26.52	At 175m: 25.53	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 6. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 37.12	At 70m: 29.85	At 115m: 29.30	At 175m: 29.15	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 37.25	At 70m: 29.97	At 115m: 29.38	At 175m: 29.22	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 7. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 39.02	At 70m: 28.56	At 115m: 27.26	At 175m: 26.92	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 39.20	At 70m: 28.60	At 115m: 27.21	At 175m: 26.67	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 8. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	24	75	25	16	140
Properties (asome)	24	75	25	16	140
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 38.18	At 70m: 29.11	At 115m: 27.78	At 175m: 27.08	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 38.42	At 70m: 29.18	At 115m: 27.78	At 175m: 26.98	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	916.4129	2183.433	694.5643	433.2358	Total route assess NO_2 **(I)**: 4227.646125
Do-something NO_2 assessment *(c = asome*bsome)*	921.9808	2188.224	694.6247	431.7177	Total route assess NO_2 **(II)**: 4236.54755
Net total route assessment for NO_2 (II-I)	0	0	140		8.90142533

NO_2, ROUTE 9. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	51	160	113	103	427
Properties (asome)	51	160	113	103	427
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 33.46	At 70m: 28.77	At 115m: 27.54	At 175m: 26.90	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 33.79	At 70m: 28.85	At 115m: 27.53	At 175m: 26.72	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	1706.295	4603.102	3112.503	2771.185	Total route assess NO_2 **(I)**: 12193.08559
Do-something NO_2 assessment *(c = asome*bsome)*	1723.336	4615.879	3110.378	2751.922	Total route assess NO_2 **(II)**: 12201.51357
Net total route assessment for NO_2 (II-I)	0	0	427		8.42797991

NO_2, ROUTE 10. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.97	At 70m: 27.12	At 115m: 27.96	At 175m: 31.29	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.64	At 70m: 27.05	At 115m: 27.99	At 175m: 31.52	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 11. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	36	10	8	3	57
Properties (asome)	36	10	8	3	57
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.24	At 70m: 24.13	At 115m: 23.91	At 175m: 23.80	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.06	At 70m: 24.06	At 115m: 23.86	At 175m: 23.76	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	908.5221	241.3423	191.2784	71.41292	Total route assess NO_2 **(I)**: 1412.555646
Do-something* NO_2 assessment *(c = asome*bsome)	902.02	240.5889	190.8463	71.28337	Total route assess NO_2 **(II)**: 1404.738543
Net total route assessment for NO_2 (II-I)	57	0	0		-7.81710293

NO_2, ROUTE 12. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	199	240	57	67	563
Properties (asome)	199	240	57	67	563
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.15	At 70m: 25.04	At 115m: 24.83	At 175m: 24.76	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.83	At 70m: 24.89	At 115m: 24.73	At 175m: 24.69	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	5203.744	6008.448	1415.358	1658.9	Total route assess NO_2 **(I)**: 14286.45063
Do-something* NO_2 assessment *(c = asome*bsome)	5140.076	5972.893	1409.764	1654.247	Total route assess NO_2 **(II)**: 14176.9803
Net total route assessment for NO_2 (II-I)	563	0	0		-109.4703316

NO_2, ROUTE 13. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	164	82	3	37	286
Properties (asome)	164	82	3	37	286
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.24	At 70m: 25.58	At 115m: 25.55	At 175m: 25.62	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.86	At 70m: 25.42	At 115m: 25.45	At 175m: 25.56	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	4303.349	2097.232	76.65013	947.9019	Total route assess NO_2 **(I)**: 7425.132786
Do-something* NO_2 assessment *(c = asome*bsome)	4241.195	2084.523	76.34312	945.7443	Total route assess NO_2 **(II)**: 7347.805994
Net total route assessment for NO_2 (II-I)	286	0	0		-77.32679185

NO_2, ROUTE 14. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.09	At 70m: 27.07	At 115m: 27.52	At 175m: 28.20	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.10	At 70m: 27.04	At 115m: 27.44	At 175m: 28.08	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 15. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	218	0	0	0	218
Properties (asome)	218	0	0	0	218
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.29	At 70m: 26.22	At 115m: 27.35	At 175m: 27.35	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.18	At 70m: 26.17	At 115m: 26.75	At 175m: 27.37	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	5730.384	0	0	0	Total route assess NO_2 **(I)**: 5730.383811
Do-something* NO_2 assessment *(c = asome*bsome)	5708.234	0	0	0	Total route assess NO_2 **(II)**: 5708.234424
Net total route assessment for NO_2 (II-I)	218	0	0		-22.14938642

NO_2, ROUTE 16. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	47	31	38	44	160
Properties (asome)	47	31	38	44	160
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 29.16	At 70m: 28.17	At 115m: 28.51	At 175m: 27.85	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 29.14	At 70m: 28.08	At 115m: 28.32	At 175m: 27.79	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1370.295	873.3699	1083.551	1225.299	Total route assess NO_2 **(I)**: 4552.514551
Do-something* NO_2 assessment *(c = asome*bsome)	1369.381	870.3602	1076.316	1222.766	Total route assess NO_2 **(II)**: 4538.823195
Net total route assessment for NO_2 (II-I)	160	0	0		-13.69135649

NO_2, ROUTE 17. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	9	16	8	33
Properties (asome)	0	9	16	8	33
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.12	At 70m: 27.70	At 115m: 27.84	At 175m: 28.12	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.72	At 70m: 27.62	At 115m: 27.80	At 175m: 28.14	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	249.3396	445.3684	224.947	Total route assess NO_2 **(I)**: 919.6550155
Do-something* NO_2 assessment *(c = asome*bsome)	0	248.6219	444.849	225.0832	Total route assess NO_2 **(II)**: 918.5539869
Net total route assessment for NO_2 (II-I)	33	0	0		-1.10102853

NO_2, ROUTE 18. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	63	49	0	0	112
Properties (asome)	63	49	0	0	112
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 34.60	At 70m: 29.22	At 115m: 27.88	At 175m: 26.95	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 34.64	At 70m: 29.23	At 115m: 27.88	At 175m: 26.94	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	2180.1	1431.797	0	0	Total route assess NO_2 **(I)**: 3611.897383
Do-something* NO_2 assessment *(c = asome*bsome)	2182.079	1432.132	0	0	Total route assess NO_2 **(II)**: 3614.211234
Net total route assessment for NO_2 (II-I)	0	0	112		2.31385154

NO_2, ROUTE 19. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 30.02	At 70m: 31.20	At 115m: 33.67	At 175m: 33.26	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 29.77	At 70m: 30.54	At 115m: 32.03	At 175m: 31.33	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 20. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	61	0	0	0	61
Properties (asome)	61	0	0	0	61
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 29.07	At 70m: 29.14	At 115m: 29.16	At 175m: 29.19	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 29.05	At 70m: 29.15	At 115m: 29.17	At 175m: 29.19	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	1773.513	0	0	0	Total route assess NO_2 (I): 1773.513181
Do-something NO_2 assessment *(c = asome*bsome)*	1772.295	0	0	0	Total route assess NO_2 (II): 1772.29542
Net total route assessment for NO_2 (II-I)	61	0	0		-1.2177613

NO_2, ROUTE 21. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	43	0	0	0	43
Properties (asome)	43	0	0	0	43
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.61	At 70m: 28.64	At 115m: 30.94	At 175m: 33.70	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.54	At 70m: 28.63	At 115m: 30.97	At 175m: 33.97	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	1187.051	0	0	0	Total route assess NO_2 (I): 1187.051269
Do-something NO_2 assessment *(c = asome*bsome)*	1184.051	0	0	0	Total route assess NO_2 (II): 1184.051311
Net total route assessment for NO_2 (II-I)	43	0	0		-2.99995864

NO_2, ROUTE 22. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.69	At 70m: 30.61	At 115m: 39.47	At 175m: 32.22	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 29.06	At 70m: 30.73	At 115m: 39.53	At 175m: 32.23	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 (I): 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 (II): 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 23. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	70	0	0	0	70
Properties (asome)	70	0	0	0	70
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.81	At 70m: 26.59	At 115m: 26.55	At 175m: 26.47	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.83	At 70m: 26.59	At 115m: 26.54	At 175m: 26.45	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	1876.431	0	0	0	Total route assess NO_2 (I): 1876.430899
Do-something NO_2 assessment *(c = asome*bsome)*	1878.145	0	0	0	Total route assess NO_2 (II): 1878.144591
Net total route assessment for NO_2 (II-I)	0	0	70		1.7136917

NO_2, ROUTE 24. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	17	48	67	132
Properties (asome)	0	17	48	67	132
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 33.81	At 70m: 28.76	At 115m: 27.64	At 175m: 26.93	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 33.77	At 70m: 28.72	At 115m: 27.60	At 175m: 26.89	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	488.9153	1326.851	1804.333	Total route assess NO_2 (I): 3620.099329
Do-something NO_2 assessment *(c = asome*bsome)*	0	488.249	1324.869	1801.398	Total route assess NO_2 (II): 3614.515489
Net total route assessment for NO_2 (II-I)	132	0	0		-5.58384008

NO_2, ROUTE 25. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	128	92	0	0	220
Properties (asome)	128	92	0	0	220
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.03	At 70m: 27.16	At 115m: 29.22	At 175m: 26.94	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.99	At 70m: 27.09	At 115m: 29.08	At 175m: 26.90	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	3460.157	2498.346	0	0	Total route assess NO_2 (I): 5958.502893
Do-something NO_2 assessment *(c = asome*bsome)*	3454.468	2492.333	0	0	Total route assess NO_2 (II): 5946.801457
Net total route assessment for NO_2 (II-I)	220	0	0		-11.70143576

NO_2, ROUTE 26. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.83	At 70m: 28.00	At 115m: 28.38	At 175m: 28.14	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.75	At 70m: 27.95	At 115m: 28.34	At 175m: 28.10	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 (I): 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 (II): 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 27. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.79	At 70m: 26.47	At 115m: 26.62	At 175m: 27.09	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.80	At 70m: 26.45	At 115m: 26.59	At 175m: 27.05	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 (I): 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 (II): 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 28. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	68	30	0	0	98
Properties (asome)	68	30	0	0	98
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.44	At 70m: 26.58	At 115m: 26.31	At 175m: 26.37	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.38	At 70m: 26.52	At 115m: 26.25	At 175m: 26.32	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	1797.983	797.2784	0	0	Total route assess NO_2 (I): 2595.261822
Do-something NO_2 assessment *(c = asome*bsome)*	1793.639	795.6614	0	0	Total route assess NO_2 (II): 2589.30078
Net total route assessment for NO_2 (II-I)	98	0	0		-5.96104138

NO_2, ROUTE 29. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 0	At 70m: 0	At 115m: 0	At 175m: 0	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 0	At 70m: 0	At 115m: 0	At 175m: 0	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 (I): 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 (II): 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 30. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 32.70	At 70m: 27.70	At 115m: 26.31	At 175m: 25.36	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 32.71	At 70m: 27.69	At 115m: 26.30	At 175m: 25.35	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 31. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	58	79	62	72	271
Properties (asome)	58	79	62	72	271
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 24.71	At 70m: 24.22	At 115m: 24.13	At 175m: 24.10	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 24.74	At 70m: 24.21	At 115m: 24.11	At 175m: 24.07	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1433.315	1913.56	1496.061	1735.251	Total route assess NO_2 **(I)**: 6578.186679
Do-something* NO_2 assessment *(c = asome*bsome)	1434.747	1912.564	1494.511	1732.717	Total route assess NO_2 **(II)**: 6574.538018
Net total route assessment for NO_2 (II-I)	0	0	271		-3.64866082

NO_2, ROUTE 32. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	49	150	151	154	504
Properties (asome)	49	150	151	154	504
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.61	At 70m: 24.46	At 115m: 24.13	At 175m: 23.96	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.49	At 70m: 24.39	At 115m: 24.08	At 175m: 23.93	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1254.882	3668.282	3643.554	3689.18	Total route assess NO_2 **(I)**: 12255.89748
Do-something* NO_2 assessment *(c = asome*bsome)	1249.146	3659.125	3636.542	3685.911	Total route assess NO_2 **(II)**: 12230.72418
Net total route assessment for NO_2 (II-I)	504	0	0		-25.17330102

NO_2, ROUTE 33. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	71	66	72	32	241
Properties (asome)	71	66	72	32	241
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.14	At 70m: 24.69	At 115m: 24.61	At 175m: 24.61	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.04	At 70m: 24.62	At 115m: 24.55	At 175m: 24.56	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1785.079	1629.716	1772.229	787.627	Total route assess NO_2 **(I)**: 5974.650929
Do-something* NO_2 assessment *(c = asome*bsome)	1777.753	1624.925	1767.713	785.9594	Total route assess NO_2 **(II)**: 5956.349416
Net total route assessment for NO_2 (II-I)	241	0	0		-18.30151288

NO_2, ROUTE 34. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	110	50	1	0	161
Properties (asome)	110	50	1	0	161
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.04	At 70m: 25.73	At 115m: 25.41	At 175m: 25.21	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.39	At 70m: 25.86	At 115m: 25.47	At 175m: 25.23	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	2974.416	1286.528	25.40589	0	Total route assess NO_2 **(I)**: 4286.349718
Do-something* NO_2 assessment *(c = asome*bsome)	3012.718	1292.79	25.47208	0	Total route assess NO_2 **(II)**: 4330.980302
Net total route assessment for NO_2 (II-I)	0	0	161		44.6305839

NO_2, ROUTE 35. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	24	20	13	12	69
Properties (asome)	24	20	13	12	69
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.63	At 70m: 25.30	At 115m: 24.98	At 175m: 24.82	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.20	At 70m: 25.11	At 115m: 24.86	At 175m: 24.74	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	639.0458	505.989	324.7842	297.878	Total route assess NO_2 **(I)**: 1767.697041
Do-something* NO_2 assessment *(c = asome*bsome)	628.6968	502.2023	323.1369	296.8593	Total route assess NO_2 **(II)**: 1750.895298
Net total route assessment for NO_2 (II-I)	69	0	0		-16.8017437

NO_2, ROUTE 36. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	29	18	47
Properties (asome)	0	0	29	18	47
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.51	At 70m: 25.09	At 115m: 24.73	At 175m: 24.49	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.43	At 70m: 25.03	At 115m: 24.68	At 175m: 24.44	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	717.2819	440.8482	Total route assess NO_2 **(I)**: 1158.130179
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	715.6365	439.9442	Total route assess NO_2 **(II)**: 1155.58076
Net total route assessment for NO_2 (II-I)	47	0	0		-2.54941848

NO_2, ROUTE 37. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	58	184	41	18	301
Properties (asome)	58	184	41	18	301
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.83	At 70m: 25.57	At 115m: 25.41	At 175m: 25.45	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.68	At 70m: 25.54	At 115m: 25.43	At 175m: 25.51	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1556.238	4704.127	1041.908	458.0228	Total route assess NO_2 **(I)**: 7760.296477
Do-something* NO_2 assessment *(c = asome*bsome)	1547.255	4699.526	1042.537	459.1348	Total route assess NO_2 **(II)**: 7748.453617
Net total route assessment for NO_2 (II-I)	301	0	0		-11.84285998

NO_2, ROUTE 38. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	2	0	0	0	2
Properties (asome)	2	0	0	0	2
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.68	At 70m: 25.29	At 115m: 25.22	At 175m: 25.25	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.62	At 70m: 25.25	At 115m: 25.19	At 175m: 25.27	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	51.35247	0	0	0	Total route assess NO_2 **(I)**: 51.35246584
Do-something* NO_2 assessment *(c = asome*bsome)	51.2495	0	0	0	Total route assess NO_2 **(II)**: 51.24949724
Net total route assessment for NO_2 (II-I)	2	0	0		-0.1029686

NO_2, ROUTE 39. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	38	21	39	50	148
Properties (asome)	38	21	39	50	148
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 24.44	At 70m: 24.29	At 115m: 24.28	At 175m: 24.30	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 24.40	At 70m: 24.26	At 115m: 24.24	At 175m: 24.26	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	928.6034	510.166	947.0044	1214.949	Total route assess NO_2 **(I)**: 3600.722549
Do-something* NO_2 assessment *(c = asome*bsome)	927.0383	509.3804	945.521	1213.015	Total route assess NO_2 **(II)**: 3594.955257
Net total route assessment for NO_2 (II-I)	148	0	0		-5.7672923

NO_2, ROUTE 40. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	10	1	0	1	12
Properties (asome)	10	1	0	1	12
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.69	At 70m: 25.84	At 115m: 26.83	At 175m: 27.19	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.61	At 70m: 25.75	At 115m: 26.69	At 175m: 27.04	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	256.9388	25.84456	0	27.18777	Total route assess NO_2 **(I)**: 309.9711718
Do-something* NO_2 assessment *(c = asome*bsome)	256.072	25.7501	0	27.03605	Total route assess NO_2 **(II)**: 308.8581653
Net total route assessment for NO_2 (II-I)	12	0	0		-1.11300651

NO_2, ROUTE 41. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.59	At 70m: 25.69	At 115m: 25.91	At 175m: 26.70	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.53	At 70m: 25.64	At 115m: 25.87	At 175m: 26.70	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 42. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	21	80	14	0	115
Properties (asome)	21	80	14	0	115
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.50	At 70m: 25.84	At 115m: 25.48	At 175m: 25.57	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.34	At 70m: 25.75	At 115m: 25.41	At 175m: 25.50	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	577.4611	2067.27	356.7489	0	Total route assess NO_2 **(I)**: 3001.48018
Do-something* NO_2 assessment *(c = asome*bsome)	574.0697	2059.798	355.7104	0	Total route assess NO_2 **(II)**: 2989.577745
Net total route assessment for NO_2 (II-I)	115	0	0		-11.90243467

NO_2, ROUTE 43. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	2	0	0	0	2
Properties (asome)	2	0	0	0	2
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.78	At 70m: 26.02	At 115m: 25.88	At 175m: 25.89	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.55	At 70m: 25.90	At 115m: 25.78	At 175m: 25.83	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	53.55095	0	0	0	Total route assess NO_2 **(I)**: 53.55095052
Do-something* NO_2 assessment *(c = asome*bsome)	53.10377	0	0	0	Total route assess NO_2 **(II)**: 53.1037726
Net total route assessment for NO_2 (II-I)	2	0	0		-0.44717792

NO_2, ROUTE 44. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	21	52	0	0	73
Properties (asome)	21	52	0	0	73
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.34	At 70m: 25.10	At 115m: 25.27	At 175m: 25.74	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.31	At 70m: 25.04	At 115m: 25.20	At 175m: 25.65	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	532.1887	1305.245	0	0	Total route assess NO_2 **(I)**: 1837.433949
Do-something* NO_2 assessment *(c = asome*bsome)	531.4827	1302.202	0	0	Total route assess NO_2 **(II)**: 1833.684631
Net total route assessment for NO_2 (II-I)	73	0	0		-3.74931788

NO_2, ROUTE 45. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	76	0	0	0	76
Properties (asome)	76	0	0	0	76
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.04	At 70m: 26.05	At 115m: 26.11	At 175m: 27.67	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.03	At 70m: 25.98	At 115m: 26.00	At 175m: 27.36	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	1978.791	0	0	0	Total route assess NO_2 **(I)**: 1978.791335
Do-something NO_2 assessment *(c = asome*bsome)*	1978.536	0	0	0	Total route assess NO_2 **(II)**: 1978.535805
Net total route assessment for NO_2 (II-I)	76	0	0		-0.25553024

NO_2, ROUTE 46. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.67	At 70m: 26.25	At 115m: 25.89	At 175m: 26.11	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.36	At 70m: 26.09	At 115m: 25.80	At 175m: 26.20	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 47. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.03	At 70m: 25.75	At 115m: 25.92	At 175m: 26.39	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.93	At 70m: 25.63	At 115m: 25.78	At 175m: 26.21	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 48. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	1	1	12	1	15
Properties (asome)	1	1	12	1	15
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.07	At 70m: 25.65	At 115m: 25.59	At 175m: 26.19	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.87	At 70m: 25.52	At 115m: 25.48	At 175m: 26.09	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	26.0672	25.65018	307.0506	26.18982	Total route assess NO_2 **(I)**: 384.9578351
Do-something NO_2 assessment *(c = asome*bsome)*	25.87271	25.51957	305.7142	26.09157	Total route assess NO_2 **(II)**: 383.1980177
Net total route assessment for NO_2 (II-I)	15	0	0		-1.75981743

NO_2, ROUTE 49. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	4	5	0	0	9
Properties (asome)	4	5	0	0	9
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.65	At 70m: 26.90	At 115m: 26.65	At 175m: 26.62	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.27	At 70m: 26.69	At 115m: 26.56	At 175m: 26.56	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	114.619	134.4773	0	0	Total route assess NO_2 **(I)**: 249.0963551
Do-something NO_2 assessment *(c = asome*bsome)*	113.0829	133.4555	0	0	Total route assess NO_2 **(II)**: 246.538426
Net total route assessment for NO_2 (II-I)	9	0	0		-2.55792915

NO_2, ROUTE 50. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 31.04	At 70m: 27.24	At 115m: 26.33	At 175m: 25.73	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 30.88	At 70m: 27.14	At 115m: 26.24	At 175m: 25.64	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 51. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	20	21	19	9	69
Properties (asome)	20	21	19	9	69
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.05	At 70m: 28.39	At 115m: 29.06	At 175m: 30.79	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.99	At 70m: 28.33	At 115m: 29.01	At 175m: 30.74	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	560.9701	596.1344	552.1961	277.0664	Total route assess NO_2 **(I)**: 1986.367044
Do-something* NO_2 assessment *(c = asome*bsome)	559.8773	595.0003	551.2698	276.6749	Total route assess NO_2 **(II)**: 1982.822403
Net total route assessment for NO_2 (II-I)	69	0	0		-3.54464152

NO_2, ROUTE 52. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	41	12	0	0	53
Properties (asome)	41	12	0	0	53
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.82	At 70m: 30.37	At 115m: 28.01	At 175m: 26.88	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.55	At 70m: 29.78	At 115m: 27.67	At 175m: 26.66	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1140.684	364.4794	0	0	Total route assess NO_2 **(I)**: 1505.163026
Do-something* NO_2 assessment *(c = asome*bsome)	1129.513	357.4149	0	0	Total route assess NO_2 **(II)**: 1486.928232
Net total route assessment for NO_2 (II-I)	53	0	0		-18.23479343

Environment: Local Air Quality - Plan Level Summary Table: 2018 LandBridge Underground

(Tag Unit 3.3.3 Worksheet 1b)

Long Term (annual) NO_2

NO_2, SUMMARY OF ROUTE: THE AGGREGATED TABLE	0-50 m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Total properties across all routes (min)	1970	1776	1013	785	5544
Total properties across all routes (some)	1970	1776	1013	785	5544
Do-minimum NO_2 assessment across all routes	53231.29	46179.35	25789.41	19900.2	Total assessment NO_2 (I) 145100.25
Do-something NO_2 assessment across all routes	53174.83	46138.78	25776.91	19872.32	Total assessment NO_2 (II) 144962.83
NET TOTAL ASSESSMENT FOR NO_2, all routes (II-I)					-137.42
Number of properties with an improvement					3328
Number of properties with no change					0
Number of properties with a deterioration					2216

Reference Sources	Concentrations: ADMS ROADS v2.3 (model: 2017BASEOG) Property counts: manual estimation from base plan (refer to Figure 1)
Quantitative Measures	To avoid double counting of properties, bandwidths were altered based on relative impact of links. Refer to Section 2.4 in text.
Assessment Scores	As reported.
Qualitative Comments	Demolition requirements: Castle Buildings (Grade II Listed); Earl de Grey PH (Grade II Listed); Marina Court Hotel and Office Blocks (x3). This option does not result in an exceedence of either the annual AQS for NO_2 (40 μg/m^3) at 20 m from the road centre. No exceedences of the AQS for NO_2 are predicted at any of assessed locations (20 m, 70 m, 115 m, and 175 m from road centre).

Environment: Local Air Quality - Plan Level Summary Table: 2018 LandBridge Underground

(Tag Unit 3.3.3 Worksheet 1b)

Long Term (annual) PM_{10}

PM_{10}, SUMMARY OF ROUTE: THE AGGREGATED TABLE	0-50 m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Total properties across all routes (min)	1970	1776	1013	785	5544
Total properties across all routes (some)	1970	1776	1013	785	5544
Do-minimum PM_{10} assessment across all routes	32265.24	28871.61	16428.41	12721	Total assessment PM_{10} (I) 90286.26
Do-something PM_{10} assessment across all routes	32263.87	28872.33	16428.73	12720.32	Total assessment PM_{10} (II) 90285.25
NET TOTAL ASSESSMENT FOR PM_{10}, all routes (II-I)					-1.02
Number of properties with an improvement					2723
Number of properties with no change					0
Number of properties with a deterioration					2821

Reference Sources	Concentrations: ADMS ROADS v2.3 (model: 2017BASEOG) Property counts: manual estimation from base plan (refer to Figure 1)
Quantitative Measures	To avoid double counting of properties, bandwidths were altered based on relative impact of links. Refer to Section 2.4 in text.
Assessment Scores	As reported.
Qualitative Comments	Demolition requirements: Castle Buildings (Grade II Listed); Earl de Grey PH (Grade II Listed); Marina Court Hotel and Office Blocks (x3). This option does not result in an exceedence of either the annual AQS for PM_{10} (40 µg/m^3) at 20 m from the road centre. No exceedences of the AQS for PM_{10} are predicted at any of assessed locations (20 m, 70 m, 115 m, and 175 m from road centre).

PM_{10}, SUMMARY OF ROUTES: THE AGGREGATED TABLE	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Total properties across all routes (min)	1970	1776	1013	785	5544
Total properties across all routes (some)	1970	1776	1013	785	5544
Do-minimum **PM_{10} assessment *across all routes***	32265.24	28871.61	16428.41	12721	Total assessment PM_{10} **(I)**: 90286.2644
Do-something **PM_{10} assessment *across all routes***	32263.87	28872.33	16428.73	12720.32	Total assessment PM_{10} **(II)**: 90285.2474
Net total assessment for PM_{10}, all routes (II-I)					-1.017
Number of properties with an improvement					***2723***
Number of properties with no change					***0***
Number of properties with a deterioration					***2821***

Reference Sources:

Quantitative Measures:

Assessment Scores:

Qualitative Comments:

PM_{10}, ROUTE 1. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.40	At 70m: 16.72	At 115m: 16.39	At 175m: 16.30	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.41	At 70m: 16.76	At 115m: 16.39	At 175m: 16.30	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 2. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.99	At 70m: 16.44	At 115m: 16.36	At 175m: 16.32	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.06	At 70m: 16.45	At 115m: 16.36	At 175m: 16.31	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 3. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	23	7	6	0	36
Properties (asome)	23	7	6	0	36
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.30	At 70m: 16.25	At 115m: 16.26	At 175m: 16.28	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.31	At 70m: 16.25	At 115m: 16.26	At 175m: 16.28	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	374.8724	113.7255	97.5666	0	Total route assess PM_{10} (I): 586.1645
Do-something PM_{10} assessment *(c = asome*bsome)*	375.0403	113.743	97.5786	0	Total route assess PM_{10} (II): 586.3619
Net total route assessment for PM_{10} (II-I)	0	0	36		0.1974

PM_{10}, ROUTE 4. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	169	232	246	73	720
Properties (asome)	169	232	246	73	720
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.37	At 70m: 16.22	At 115m: 16.19	At 175m: 16.18	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.39	At 70m: 16.22	At 115m: 16.20	At 175m: 16.18	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	2767.155	3763.04	3983.847	1181.352	Total route assess PM_{10} (I): 11695.394
Do-something PM_{10} assessment *(c = asome*bsome)*	2769.116	3763.898	3984.413	1181.461	Total route assess PM_{10} (II): 11698.8881
Net total route assessment for PM_{10} (II-I)	0	0	720		3.4941

PM_{10}, ROUTE 5. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.78	At 70m: 16.53	At 115m: 16.28	At 175m: 16.21	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.78	At 70m: 16.53	At 115m: 16.28	At 175m: 16.21	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 6. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.42	At 70m: 16.48	At 115m: 16.42	At 175m: 16.41	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.43	At 70m: 16.49	At 115m: 16.43	At 175m: 16.42	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 7. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.77	At 70m: 16.38	At 115m: 16.27	At 175m: 16.28	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.82	At 70m: 16.39	At 115m: 16.28	At 175m: 16.27	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 8. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	24	75	25	16	140
Properties (asome)	24	75	25	16	140
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.54	At 70m: 16.40	At 115m: 16.30	At 175m: 16.27	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.59	At 70m: 16.41	At 115m: 16.31	At 175m: 16.27	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	421.0128	1230.113	407.6	260.312	Total route assess PM_{10} (I): 2319.0373
Do-something PM_{10} assessment *(c = asome*bsome)*	422.2032	1230.84	407.6725	260.2528	Total route assess PM_{10} (II): 2320.9685
Net total route assessment for PM_{10} (II-I)	0	0	140		1.9312

PM_{10}, ROUTE 9. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	51	160	113	103	427
Properties (asome)	51	160	113	103	427
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.86	At 70m: 16.36	At 115m: 16.28	At 175m: 16.26	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.93	At 70m: 16.38	At 115m: 16.29	At 175m: 16.26	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	859.7427	2617.984	1839.832	1674.996	Total route assess PM_{10} (I): 6992.5551
Do-something PM_{10} assessment *(c = asome*bsome)*	863.5932	2620.768	1840.533	1674.327	Total route assess PM_{10} (II): 6999.2207
Net total route assessment for PM_{10} (II-I)	0	0	427		6.6656

PM_{10}, ROUTE 10. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.29	At 70m: 16.26	At 115m: 16.31	At 175m: 16.60	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.27	At 70m: 16.27	At 115m: 16.32	At 175m: 16.65	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 11. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	36	10	8	3	57
Properties (asome)	36	10	8	3	57
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.34	At 70m: 16.18	At 115m: 16.16	At 175m: 16.15	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.33	At 70m: 16.18	At 115m: 16.16	At 175m: 16.15	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	588.1032	161.825	129.2664	48.4476	Total route assess PM_{10} (I): 927.6422
Do-something PM_{10} assessment *(c = asome*bsome)*	587.9556	161.814	129.2616	48.4482	Total route assess PM_{10} (II): 927.4794
Net total route assessment for PM_{10} (II-I)	57	0	0		-0.1628

PM_{10}, ROUTE 12. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	199	240	57	67	563
Properties (asome)	199	240	57	67	563
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.36	At 70m: 16.21	At 115m: 16.19	At 175m: 16.18	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.33	At 70m: 16.20	At 115m: 16.18	At 175m: 16.17	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	3255.361	3891.168	922.659	1083.752	Total route assess PM_{10} (I): 9152.9402
Do-something PM_{10} assessment *(c = asome*bsome)*	3249.431	3889.128	922.3854	1083.678	Total route assess PM_{10} (II): 9144.6227
Net total route assessment for PM_{10} (II-I)	563	0	0		-8.3175

PM_{10}, ROUTE 13. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	164	82	3	37	286
Properties (asome)	164	82	3	37	286
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.32	At 70m: 16.22	At 115m: 16.21	At 175m: 16.20	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.27	At 70m: 16.20	At 115m: 16.21	At 175m: 16.20	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	2676.185	1329.646	48.6246	599.5295	Total route assess PM_{10} (I): 4653.9853
Do-something PM_{10} assessment *(c = asome*bsome)*	2668.329	1328.777	48.6153	599.5184	Total route assess PM_{10} (II): 4645.2401
Net total route assessment for PM_{10} (II-I)	286	0	0		-8.7452

PM_{10}, ROUTE 14. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.33	At 70m: 16.29	At 115m: 16.33	At 175m: 16.36	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.32	At 70m: 16.29	At 115m: 16.32	At 175m: 16.34	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 15. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	218	0	0	0	218
Properties (asome)	218	0	0	0	218
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.27	At 70m: 16.24	At 115m: 16.49	At 175m: 16.28	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.27	At 70m: 16.23	At 115m: 16.38	At 175m: 16.29	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	3546.097	0	0	0	Total route assess PM_{10} (I): 3546.097
Do-something PM_{10} assessment *(c = asome*bsome)*	3546.751	0	0	0	Total route assess PM_{10} (II): 3546.751
Net total route assessment for PM_{10} (II-I)	0	0	218		0.654

PM_{10}, ROUTE 16. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	47	31	38	44	160
Properties (asome)	47	31	38	44	160
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.51	At 70m: 16.35	At 115m: 16.41	At 175m: 16.31	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.51	At 70m: 16.34	At 115m: 16.39	At 175m: 16.31	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	775.9089	506.8624	623.7206	717.7192	Total route assess PM_{10} (I): 2624.2111
Do-something PM_{10} assessment *(c = asome*bsome)*	775.9042	506.633	622.8124	717.5212	Total route assess PM_{10} (II): 2622.8708
Net total route assessment for PM_{10} (II-I)	160	0	0		-1.3403

PM_{10}, ROUTE 17. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	9	16	8	33
Properties (asome)	0	9	16	8	33
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.36	At 70m: 16.29	At 115m: 16.30	At 175m: 16.31	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.33	At 70m: 16.29	At 115m: 16.30	At 175m: 16.32	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	146.6271	260.76	130.5184	Total route assess PM_{10} (I): 537.9055
Do-something PM_{10} assessment *(c = asome*bsome)*	0	146.6289	260.8352	130.5968	Total route assess PM_{10} (II): 538.0609
Net total route assessment for PM_{10} (II-I)	33	0	0		0.1554

PM_{10}, ROUTE 18. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	63	49	0	0	112
Properties (asome)	63	49	0	0	112
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.97	At 70m: 16.39	At 115m: 16.30	At 175m: 16.25	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.99	At 70m: 16.39	At 115m: 16.30	At 175m: 16.25	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	1069.242	802.9924	0	0	Total route assess PM_{10} (I): 1872.2347
Do-something PM_{10} assessment *(c = asome*bsome)*	1070.502	803.2129	0	0	Total route assess PM_{10} (II): 1873.7152
Net total route assessment for PM_{10} (II-I)	0	0	112		1.4805

PM_{10}, ROUTE 19. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.48	At 70m: 16.61	At 115m: 17.01	At 175m: 16.94	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.46	At 70m: 16.53	At 115m: 16.75	At 175m: 16.63	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 20. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	61	0	0	0	61
Properties (asome)	61	0	0	0	61
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.38	At 70m: 16.38	At 115m: 16.38	At 175m: 16.39	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.38	At 70m: 16.39	At 115m: 16.39	At 175m: 16.39	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	998.997	0	0	0	Total route assess PM_{10} (I): 998.997
Do-something PM_{10} assessment *(c = asome*bsome)*	999.2471	0	0	0	Total route assess PM_{10} (II): 999.2471
Net total route assessment for PM_{10} (II-I)	0	0	61		0.2501

PM_{10}, ROUTE 21. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	43	0	0	0	43
Properties (asome)	43	0	0	0	43
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.28	At 70m: 16.34	At 115m: 16.54	At 175m: 16.90	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.28	At 70m: 16.35	At 115m: 16.54	At 175m: 16.91	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	700.0873	0	0	0	Total route assess PM_{10} (I): 700.0873
Do-something PM_{10} assessment *(c = asome*bsome)*	700.1604	0	0	0	Total route assess PM_{10} (II): 700.1604
Net total route assessment for PM_{10} (II-I)	0	0	43		0.0731

PM_{10}, ROUTE 22. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.36	At 70m: 16.53	At 115m: 17.74	At 175m: 16.67	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.35	At 70m: 16.54	At 115m: 17.78	At 175m: 16.69	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 23. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	70	0	0	0	70
Properties (asome)	70	0	0	0	70
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.28	At 70m: 16.24	At 115m: 16.23	At 175m: 16.22	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.31	At 70m: 16.25	At 115m: 16.24	At 175m: 16.23	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	1139.621	0	0	0	Total route assess PM_{10} (I): 1139.621
Do-something PM_{10} assessment *(c = asome*bsome)*	1141.973	0	0	0	Total route assess PM_{10} (II): 1141.973
Net total route assessment for PM_{10} (II-I)	0	0	70		2.352

PM_{10}, ROUTE 24. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	17	48	67	132
Properties (asome)	0	17	48	67	132
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.85	At 70m: 16.34	At 115m: 16.27	At 175m: 16.24	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.88	At 70m: 16.35	At 115m: 16.28	At 175m: 16.24	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	277.8123	781.1232	1088.12	Total route assess PM_{10} (I): 2147.0557
Do-something PM_{10} assessment *(c = asome*bsome)*	0	277.9415	781.3344	1088.294	Total route assess PM_{10} (II): 2147.5703
Net total route assessment for PM_{10} (II-I)	0	0	132		0.5146

PM_{10}, ROUTE 25. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	128	92	0	0	220
Properties (asome)	128	92	0	0	220
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.27	At 70m: 16.30	At 115m: 16.72	At 175m: 16.26	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.27	At 70m: 16.30	At 115m: 16.72	At 175m: 16.26	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	2082.522	1499.802	0	0	Total route assess PM_{10} (I): 3582.324
Do-something PM_{10} assessment *(c = asome*bsome)*	2082.803	1499.894	0	0	Total route assess PM_{10} (II): 3582.6976
Net total route assessment for PM_{10} (II-I)	0	0	220		0.3736

PM_{10}, ROUTE 26. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.47	At 70m: 16.32	At 115m: 16.35	At 175m: 16.30	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.47	At 70m: 16.32	At 115m: 16.35	At 175m: 16.31	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 27. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.33	At 70m: 16.25	At 115m: 16.25	At 175m: 16.28	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.33	At 70m: 16.25	At 115m: 16.25	At 175m: 16.28	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 28. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	68	30	0	0	98
Properties (asome)	68	30	0	0	98
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.27	At 70m: 16.26	At 115m: 16.23	At 175m: 16.23	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.27	At 70m: 16.26	At 115m: 16.23	At 175m: 16.22	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	1106.299	487.878	0	0	Total route assess PM_{10} (I): 1594.1768
Do-something PM_{10} assessment *(c = asome*bsome)*	1106.333	487.914	0	0	Total route assess PM_{10} (II): 1594.2468
Net total route assessment for PM_{10} (II-I)	0	0	98		0.07

PM_{10}, ROUTE 29. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 0	At 70m: 0	At 115m: 0	At 175m: 0	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 0	At 70m: 0	At 115m: 0	At 175m: 0	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 30. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.89	At 70m: 16.34	At 115m: 16.25	At 175m: 16.20	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.89	At 70m: 16.34	At 115m: 16.25	At 175m: 16.20	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 31. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	58	79	62	72	271
Properties (asome)	58	79	62	72	271
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.29	At 70m: 16.19	At 115m: 16.17	At 175m: 16.16	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.29	At 70m: 16.19	At 115m: 16.17	At 175m: 16.16	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	944.646	1278.781	1002.528	1163.606	Total route assess PM_{10} (I): 4389.5609
Do-something PM_{10} assessment *(c = asome*bsome)*	944.6286	1278.734	1002.484	1163.549	Total route assess PM_{10} (II): 4389.3951
Net total route assessment for PM_{10} (II-I)	271	0	0		-0.1658

PM_{10}, ROUTE 32. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	49	150	151	154	504
Properties (asome)	49	150	151	154	504
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.38	At 70m: 16.20	At 115m: 16.17	At 175m: 16.16	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.37	At 70m: 16.20	At 115m: 16.17	At 175m: 16.16	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	802.4828	2430.735	2442.214	2488.286	Total route assess PM_{10} (I): 8163.7172
Do-something PM_{10} assessment *(c = asome*bsome)*	802.2476	2430.51	2442.078	2488.224	Total route assess PM_{10} (II): 8163.0595
Net total route assessment for PM_{10} (II-I)	504	0	0		-0.6577

PM_{10}, ROUTE 33. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	71	66	72	32	241
Properties (asome)	71	66	72	32	241
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.25	At 70m: 16.19	At 115m: 16.18	At 175m: 16.17	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.26	At 70m: 16.19	At 115m: 16.18	At 175m: 16.17	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	1153.913	1068.263	1164.629	517.5136	Total route assess PM_{10} (I): 3904.3185
Do-something PM_{10} assessment *(c = asome*bsome)*	1154.304	1068.316	1164.629	517.5008	Total route assess PM_{10} (II): 3904.749
Net total route assessment for PM_{10} (II-I)	0	0	241		0.4305

PM_{10}, ROUTE 34. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	110	50	1	0	161
Properties (asome)	110	50	1	0	161
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.46	At 70m: 16.25	At 115m: 16.22	At 175m: 16.20	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.48	At 70m: 16.25	At 115m: 16.22	At 175m: 16.20	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	1810.842	812.56	16.2163	0	Total route assess PM_{10} (I): 2639.6183
Do-something PM_{10} assessment *(c = asome*bsome)*	1812.635	812.745	16.2179	0	Total route assess PM_{10} (II): 2641.5979
Net total route assessment for PM_{10} (II-I)	0	0	161		1.9796

PM_{10}, ROUTE 35. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	24	20	13	12	69
Properties (asome)	24	20	13	12	69
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.40	At 70m: 16.23	At 115m: 16.21	At 175m: 16.20	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.39	At 70m: 16.23	At 115m: 16.20	At 175m: 16.20	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	393.5856	324.632	210.6663	194.3832	Total route assess PM_{10} **(I)**: 1123.2671
Do-something* PM_{10} assessment *(c = asome*bsome)	393.4704	324.602	210.6533	194.3712	Total route assess PM_{10} **(II)**: 1123.0969
Net total route assessment for PM_{10} (II-I)	69	0	0		-0.1702

PM_{10}, ROUTE 36. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	29	18	47
Properties (asome)	0	0	29	18	47
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.40	At 70m: 16.22	At 115m: 16.19	At 175m: 16.18	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.40	At 70m: 16.22	At 115m: 16.19	At 175m: 16.18	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	469.4694	291.2202	Total route assess PM_{10} **(I)**: 760.6896
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	469.4433	291.2076	Total route assess PM_{10} **(II)**: 760.6509
Net total route assessment for PM_{10} (II-I)	47	0	0		-0.0387

PM_{10}, ROUTE 37. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	58	184	41	18	301
Properties (asome)	58	184	41	18	301
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.42	At 70m: 16.24	At 115m: 16.22	At 175m: 16.22	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.41	At 70m: 16.23	At 115m: 16.22	At 175m: 16.23	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	952.2324	2987.258	665.0241	292.0302	Total route assess PM_{10} **(I)**: 4896.5451
Do-something* PM_{10} assessment *(c = asome*bsome)	951.8322	2987.038	665.0569	292.0662	Total route assess PM_{10} **(II)**: 4895.9929
Net total route assessment for PM_{10} (II-I)	301	0	0		-0.5522

PM_{10}, ROUTE 38. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	2	0	0	0	2
Properties (asome)	2	0	0	0	2
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.26	At 70m: 16.20	At 115m: 16.19	At 175m: 16.19	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.26	At 70m: 16.20	At 115m: 16.19	At 175m: 16.19	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	32.5244	0	0	0	Total route assess PM_{10} **(I)**: 32.5244
Do-something* PM_{10} assessment *(c = asome*bsome)	32.5172	0	0	0	Total route assess PM_{10} **(II)**: 32.5172
Net total route assessment for PM_{10} (II-I)	2	0	0		-0.0072

PM_{10}, ROUTE 39. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	38	21	39	50	148
Properties (asome)	38	21	39	50	148
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.19	At 70m: 16.16	At 115m: 16.16	At 175m: 16.16	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.18	At 70m: 16.16	At 115m: 16.16	At 175m: 16.16	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	615.0414	339.3894	630.1464	807.92	Total route assess PM_{10} **(I)**: 2392.4972
Do-something* PM_{10} assessment *(c = asome*bsome)	615.0148	339.3768	630.123	807.89	Total route assess PM_{10} **(II)**: 2392.4046
Net total route assessment for PM_{10} (II-I)	148	0	0		-0.0926

PM_{10}, ROUTE 40. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	10	1	0	1	12
Properties (asome)	10	1	0	1	12
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.26	At 70m: 16.25	At 115m: 16.38	At 175m: 16.43	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.26	At 70m: 16.25	At 115m: 16.37	At 175m: 16.42	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	162.593	16.2549	0	16.429	Total route assess PM_{10} **(I)**: 195.2769
Do-something* PM_{10} assessment *(c = asome*bsome)	162.551	16.2508	0	16.4174	Total route assess PM_{10} **(II)**: 195.2192
Net total route assessment for PM_{10} (II-I)	12	0	0		-0.0577

PM_{10}, ROUTE 41. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.22	At 70m: 16.22	At 115m: 16.23	At 175m: 16.32	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.22	At 70m: 16.22	At 115m: 16.23	At 175m: 16.32	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 42. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	21	80	14	0	115
Properties (asome)	21	80	14	0	115
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.49	At 70m: 16.26	At 115m: 16.22	At 175m: 16.25	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.47	At 70m: 16.25	At 115m: 16.22	At 175m: 16.24	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	346.2627	1300.416	227.0422	0	Total route assess PM_{10} **(I)**: 1873.7209
Do-something* PM_{10} assessment *(c = asome*bsome)	345.9645	1300.072	227.01	0	Total route assess PM_{10} **(II)**: 1873.0465
Net total route assessment for PM_{10} (II-I)	115	0	0		-0.6744

PM_{10}, ROUTE 43. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	2	0	0	0	2
Properties (asome)	2	0	0	0	2
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.35	At 70m: 16.24	At 115m: 16.23	At 175m: 16.23	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.35	At 70m: 16.24	At 115m: 16.23	At 175m: 16.23	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	32.7054	0	0	0	Total route assess PM_{10} **(I)**: 32.7054
Do-something* PM_{10} assessment *(c = asome*bsome)	32.6964	0	0	0	Total route assess PM_{10} **(II)**: 32.6964
Net total route assessment for PM_{10} (II-I)	2	0	0		-0.009

PM_{10}, ROUTE 44. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	21	52	0	0	73
Properties (asome)	21	52	0	0	73
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.23	At 70m: 16.20	At 115m: 16.21	At 175m: 16.25	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.23	At 70m: 16.19	At 115m: 16.21	At 175m: 16.25	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	340.8132	842.2024	0	0	Total route assess PM_{10} **(I)**: 1183.0156
Do-something* PM_{10} assessment *(c = asome*bsome)	340.8321	842.1192	0	0	Total route assess PM_{10} **(II)**: 1182.9513
Net total route assessment for PM_{10} (II-I)	0	0	73		-0.0643

PM_{10}, ROUTE 45. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	76	0	0	0	76
Properties (asome)	76	0	0	0	76
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.25	At 70m: 16.25	At 115m: 16.25	At 175m: 16.40	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.24	At 70m: 16.24	At 115m: 16.25	At 175m: 16.39	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	1234.863	0	0	0	Total route assess PM_{10} (I): 1234.8632
Do-something PM_{10} assessment *(c = asome*bsome)*	1234.574	0	0	0	Total route assess PM_{10} (II): 1234.5744
Net total route assessment for PM_{10} (II-I)	76	0	0		-0.2888

PM_{10}, ROUTE 46. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.38	At 70m: 16.25	At 115m: 16.23	At 175m: 16.27	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.37	At 70m: 16.25	At 115m: 16.23	At 175m: 16.27	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 47. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.28	At 70m: 16.22	At 115m: 16.22	At 175m: 16.25	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.27	At 70m: 16.22	At 115m: 16.22	At 175m: 16.25	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 48. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	1	1	12	1	15
Properties (asome)	1	1	12	1	15
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.26	At 70m: 16.21	At 115m: 16.21	At 175m: 16.31	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.23	At 70m: 16.20	At 115m: 16.21	At 175m: 16.31	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	16.2604	16.2077	194.5764	16.3097	Total route assess PM_{10} (I): 243.3542
Do-something PM_{10} assessment *(c = asome*bsome)*	16.2346	16.2027	194.5356	16.306	Total route assess PM_{10} (II): 243.2789
Net total route assessment for PM_{10} (II-I)	15	0	0		-0.0753

PM_{10}, ROUTE 49. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	4	5	0	0	9
Properties (asome)	4	5	0	0	9
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.44	At 70m: 16.26	At 115m: 16.23	At 175m: 16.23	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.43	At 70m: 16.26	At 115m: 16.23	At 175m: 16.23	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	65.7524	81.321	0	0	Total route assess PM_{10} (I): 147.0734
Do-something PM_{10} assessment *(c = asome*bsome)*	65.71	81.2985	0	0	Total route assess PM_{10} (II): 147.0085
Net total route assessment for PM_{10} (II-I)	9	0	0		-0.0649

PM_{10}, ROUTE 50. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.63	At 70m: 16.28	At 115m: 16.23	At 175m: 16.20	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.62	At 70m: 16.28	At 115m: 16.22	At 175m: 16.20	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 51. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	20	21	19	9	69
Properties (asome)	20	21	19	9	69
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.32	At 70m: 16.32	At 115m: 16.36	At 175m: 16.51	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.33	At 70m: 16.32	At 115m: 16.37	At 175m: 16.52	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	326.486	342.6948	310.8989	148.5567	Total route assess PM_{10} **(I)**: 1128.6364
Do-something* PM_{10} assessment *(c = asome*bsome)	326.606	342.8229	311.0585	148.6908	Total route assess PM_{10} **(II)**: 1129.1782
Net total route assessment for PM_{10} (II-I)	0	0	69		0.5418

PM_{10}, ROUTE 52. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	41	12	0	0	53
Properties (asome)	41	12	0	0	53
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.42	At 70m: 16.79	At 115m: 16.42	At 175m: 16.30	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.41	At 70m: 16.75	At 115m: 16.41	At 175m: 16.30	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	673.0314	201.42	0	0	Total route assess PM_{10} **(I)**: 874.4514
Do-something* PM_{10} assessment *(c = asome*bsome)	672.7075	201.048	0	0	Total route assess PM_{10} **(II)**: 873.7555
Net total route assessment for PM_{10} (II-I)	53	0	0		-0.6959

NO_2, SUMMARY OF ROUTES: THE AGGREGATED TABLE	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Total properties across all routes (min)	1970	1776	1013	785	5544
Total properties across all routes (some)	1970	1776	1013	785	5544
Do-minimum* NO_2 assessment *across all routes	53231.29	46179.35	25789.41	19900.2	Total assessment NO_2 **(I)**: 145100.2526
Do-something* NO_2 assessment *across all routes	53174.83	46138.78	25776.91	19872.32	Total assessment NO_2 **(II)**: 144962.8321
Net total assessment for NO_2, all routes (II-I)					-137.4205276
Number of properties with an improvement					***3328***
Number of properties with no change					***0***
Number of properties with a deterioration					***2216***

Reference Sources:

Quantitative Measures:

Assessment Scores:

Qualitative Comments:

NO_2, ROUTE 1. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 36.92	At 70m: 30.45	At 115m: 28.74	At 175m: 27.64	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 37.07	At 70m: 30.63	At 115m: 28.83	At 175m: 27.63	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 2. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 34.19	At 70m: 29.44	At 115m: 28.38	At 175m: 27.73	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 34.59	At 70m: 29.55	At 115m: 28.44	At 175m: 27.70	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 3. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	23	7	6	0	36
Properties (asome)	23	7	6	0	36
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.04	At 70m: 25.85	At 115m: 26.13	At 175m: 26.52	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.12	At 70m: 25.89	At 115m: 26.16	At 175m: 26.54	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	598.9221	180.9729	156.7506	0	Total route assess NO_2 **(I)**: 936.6455604
Do-something* NO_2 assessment *(c = asome*bsome)	600.7104	181.2509	156.9416	0	Total route assess NO_2 **(II)**: 938.9028843
Net total route assessment for NO_2 (II-I)	0	0	36		2.25732388

NO_2, ROUTE 4. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	169	232	246	73	720
Properties (asome)	169	232	246	73	720
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.76	At 70m: 24.95	At 115m: 24.81	At 175m: 24.78	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.95	At 70m: 25.04	At 115m: 24.87	At 175m: 24.82	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	4353.933	5788.3	6102.312	1808.786	Total route assess NO_2 **(I)**: 18053.33074
Do-something* NO_2 assessment *(c = asome*bsome)	4386.303	5808.849	6116.813	1811.501	Total route assess NO_2 **(II)**: 18123.46612
Net total route assessment for NO_2 (II-I)	0	0	720		70.13538077

NO_2, ROUTE 5. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 32.58	At 70m: 29.29	At 115m: 26.51	At 175m: 25.56	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 32.50	At 70m: 29.30	At 115m: 26.52	At 175m: 25.54	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 6. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 37.12	At 70m: 29.85	At 115m: 29.30	At 175m: 29.15	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 37.22	At 70m: 29.98	At 115m: 29.39	At 175m: 29.22	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 7. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 39.02	At 70m: 28.56	At 115m: 27.26	At 175m: 26.92	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 39.06	At 70m: 28.60	At 115m: 27.22	At 175m: 26.71	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 8. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	24	75	25	16	140
Properties (asome)	24	75	25	16	140
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 38.18	At 70m: 29.11	At 115m: 27.78	At 175m: 27.08	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 38.35	At 70m: 29.18	At 115m: 27.80	At 175m: 27.01	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	916.4129	2183.433	694.5643	433.2358	Total route assess NO_2 **(I)**: 4227.646125
Do-something* NO_2 assessment *(c = asome*bsome)	920.4476	2188.311	694.911	432.1128	Total route assess NO_2 **(II)**: 4235.782431
Net total route assessment for NO_2 (II-I)	0	0	140		8.13630559

NO_2, ROUTE 9. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	51	160	113	103	427
Properties (asome)	51	160	113	103	427
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 33.46	At 70m: 28.77	At 115m: 27.54	At 175m: 26.90	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 33.74	At 70m: 28.84	At 115m: 27.53	At 175m: 26.75	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1706.295	4603.102	3112.503	2771.185	Total route assess NO_2 **(I)**: 12193.08559
Do-something* NO_2 assessment *(c = asome*bsome)	1720.865	4614.366	3110.959	2755.028	Total route assess NO_2 **(II)**: 12201.218
Net total route assessment for NO_2 (II-I)	0	0	427		8.132418

NO_2, ROUTE 10. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.97	At 70m: 27.12	At 115m: 27.96	At 175m: 31.29	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.70	At 70m: 27.06	At 115m: 27.99	At 175m: 31.49	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 11. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	36	10	8	3	57
Properties (asome)	36	10	8	3	57
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.24	At 70m: 24.13	At 115m: 23.91	At 175m: 23.80	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.21	At 70m: 24.13	At 115m: 23.92	At 175m: 23.82	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	908.5221	241.3423	191.2784	71.41292	Total route assess NO_2 **(I)**: 1412.555646
Do-something* NO_2 assessment *(c = asome*bsome)	907.5954	241.2582	191.3364	71.44759	Total route assess NO_2 **(II)**: 1411.637544
Net total route assessment for NO_2 (II-I)	57	0	0		-0.91810166

NO_2, ROUTE 12. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	199	240	57	67	563
Properties (asome)	199	240	57	67	563
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.15	At 70m: 25.04	At 115m: 24.83	At 175m: 24.76	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.90	At 70m: 24.94	At 115m: 24.78	At 175m: 24.74	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	5203.744	6008.448	1415.358	1658.9	Total route assess NO_2 **(I)**: 14286.45063
Do-something* NO_2 assessment *(c = asome*bsome)	5154.336	5985.652	1412.627	1657.507	Total route assess NO_2 **(II)**: 14210.122
Net total route assessment for NO_2 (II-I)	563	0	0		-76.32862685

NO_2, ROUTE 13. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	164	82	3	37	286
Properties (asome)	164	82	3	37	286
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.24	At 70m: 25.58	At 115m: 25.55	At 175m: 25.62	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.88	At 70m: 25.46	At 115m: 25.50	At 175m: 25.60	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	4303.349	2097.232	76.65013	947.9019	Total route assess NO_2 **(I)**: 7425.132786
Do-something* NO_2 assessment *(c = asome*bsome)	4244.331	2087.358	76.48843	947.136	Total route assess NO_2 **(II)**: 7355.313771
Net total route assessment for NO_2 (II-I)	286	0	0		-69.819015

NO_2, ROUTE 14. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.09	At 70m: 27.07	At 115m: 27.52	At 175m: 28.20	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.02	At 70m: 27.00	At 115m: 27.41	At 175m: 28.06	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 15. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	218	0	0	0	218
Properties (asome)	218	0	0	0	218
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.29	At 70m: 26.22	At 115m: 27.35	At 175m: 27.35	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.33	At 70m: 26.22	At 115m: 26.76	At 175m: 27.38	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	5730.384	0	0	0	Total route assess NO_2 **(I)**: 5730.383811
Do-something* NO_2 assessment *(c = asome*bsome)	5740.92	0	0	0	Total route assess NO_2 **(II)**: 5740.92023
Net total route assessment for NO_2 (II-I)	0	0	218		10.5364196

NO_2, ROUTE 16. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	47	31	38	44	160
Properties (asome)	47	31	38	44	160
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 29.16	At 70m: 28.17	At 115m: 28.51	At 175m: 27.85	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 29.00	At 70m: 28.04	At 115m: 28.33	At 175m: 27.79	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1370.295	873.3699	1083.551	1225.299	Total route assess NO_2 **(I)**: 4552.514551
Do-something* NO_2 assessment *(c = asome*bsome)	1362.813	869.2267	1076.691	1222.711	Total route assess NO_2 **(II)**: 4531.441607
Net total route assessment for NO_2 (II-I)	160	0	0		-21.07294427

NO_2, ROUTE 17. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	9	16	8	33
Properties (asome)	0	9	16	8	33
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.12	At 70m: 27.70	At 115m: 27.84	At 175m: 28.12	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.75	At 70m: 27.63	At 115m: 27.81	At 175m: 28.13	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	249.3396	445.3684	224.947	Total route assess NO_2 **(I)**: 919.6550155
Do-something* NO_2 assessment *(c = asome*bsome)	0	248.7003	444.9112	225.0689	Total route assess NO_2 **(II)**: 918.6803861
Net total route assessment for NO_2 (II-I)	33	0	0		-0.97462932

NO_2, ROUTE 18. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	63	49	0	0	112
Properties (asome)	63	49	0	0	112
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 34.60	At 70m: 29.22	At 115m: 27.88	At 175m: 26.95	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 34.75	At 70m: 29.26	At 115m: 27.89	At 175m: 26.94	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	2180.1	1431.797	0	0	Total route assess NO_2 **(I)**: 3611.897383
Do-something* NO_2 assessment *(c = asome*bsome)	2189.454	1433.717	0	0	Total route assess NO_2 **(II)**: 3623.170974
Net total route assessment for NO_2 (II-I)	0	0	112		11.27359072

NO_2, ROUTE 19. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 30.02	At 70m: 31.20	At 115m: 33.67	At 175m: 33.26	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 29.78	At 70m: 30.53	At 115m: 32.01	At 175m: 31.28	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 20. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	61	0	0	0	61
Properties (asome)	61	0	0	0	61
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 29.07	At 70m: 29.14	At 115m: 29.16	At 175m: 29.19	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 29.09	At 70m: 29.18	At 115m: 29.21	At 175m: 29.22	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1773.513	0	0	0	Total route assess NO_2 **(I)**: 1773.513181
Do-something* NO_2 assessment *(c = asome*bsome)	1774.193	0	0	0	Total route assess NO_2 **(II)**: 1774.192564
Net total route assessment for NO_2 (II-I)	0	0	61		0.67938262

NO_2, ROUTE 21. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	43	0	0	0	43
Properties (asome)	43	0	0	0	43
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.61	At 70m: 28.64	At 115m: 30.94	At 175m: 33.70	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.56	At 70m: 28.65	At 115m: 30.99	At 175m: 33.78	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1187.051	0	0	0	Total route assess NO_2 **(I)**: 1187.051269
Do-something* NO_2 assessment *(c = asome*bsome)	1185.086	0	0	0	Total route assess NO_2 **(II)**: 1185.085935
Net total route assessment for NO_2 (II-I)	43	0	0		-1.96533435

NO_2, ROUTE 22. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.69	At 70m: 30.61	At 115m: 39.47	At 175m: 32.22	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.65	At 70m: 30.67	At 115m: 39.72	At 175m: 32.33	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 23. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	70	0	0	0	70
Properties (asome)	70	0	0	0	70
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.81	At 70m: 26.59	At 115m: 26.55	At 175m: 26.47	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.17	At 70m: 26.72	At 115m: 26.62	At 175m: 26.50	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1876.431	0	0	0	Total route assess NO_2 **(I)**: 1876.430899
Do-something* NO_2 assessment *(c = asome*bsome)	1902.247	0	0	0	Total route assess NO_2 **(II)**: 1902.246598
Net total route assessment for NO_2 (II-I)	0	0	70		25.815699

NO_2, ROUTE 24. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	17	48	67	132
Properties (asome)	0	17	48	67	132
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 33.81	At 70m: 28.76	At 115m: 27.64	At 175m: 26.93	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 33.78	At 70m: 28.73	At 115m: 27.62	At 175m: 26.90	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	488.9153	1326.851	1804.333	Total route assess NO_2 **(I)**: 3620.099329
Do-something* NO_2 assessment *(c = asome*bsome)	0	488.4759	1325.59	1802.376	Total route assess NO_2 **(II)**: 3616.442052
Net total route assessment for NO_2 (II-I)	132	0	0		-3.65727656

NO_2 ROUTE 25. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	128	92	0	0	220
Properties (asome)	128	92	0	0	220
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.03	At 70m: 27.16	At 115m: 29.22	At 175m: 26.94	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.01	At 70m: 27.12	At 115m: 29.14	At 175m: 26.91	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	3460.157	2498.346	0	0	Total route assess NO_2 **(I)**: 5958.502893
Do-something* NO_2 assessment *(c = asome*bsome)	3456.674	2494.692	0	0	Total route assess NO_2 **(II)**: 5951.365698
Net total route assessment for NO_2 (II-I)	220	0	0		-7.13719496

NO_2 ROUTE 26. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.83	At 70m: 28.00	At 115m: 28.38	At 175m: 28.14	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.80	At 70m: 27.99	At 115m: 28.37	At 175m: 28.12	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2 ROUTE 27. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.79	At 70m: 26.47	At 115m: 26.62	At 175m: 27.09	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.75	At 70m: 26.44	At 115m: 26.60	At 175m: 27.07	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2 ROUTE 28. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	68	30	0	0	98
Properties (asome)	68	30	0	0	98
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.44	At 70m: 26.58	At 115m: 26.31	At 175m: 26.37	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.40	At 70m: 26.53	At 115m: 26.27	At 175m: 26.33	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1797.983	797.2784	0	0	Total route assess NO_2 **(I)**: 2595.261822
Do-something* NO_2 assessment *(c = asome*bsome)	1794.947	796.0176	0	0	Total route assess NO_2 **(II)**: 2590.964459
Net total route assessment for NO_2 (II-I)	98	0	0		-4.297363

NO_2 ROUTE 29. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 0	At 70m: 0	At 115m: 0	At 175m: 0	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 0	At 70m: 0	At 115m: 0	At 175m: 0	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 30. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 32.70	At 70m: 27.70	At 115m: 26.31	At 175m: 25.36	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 32.72	At 70m: 27.69	At 115m: 26.31	At 175m: 25.36	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 31. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	58	79	62	72	271
Properties (asome)	58	79	62	72	271
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 24.71	At 70m: 24.22	At 115m: 24.13	At 175m: 24.10	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 24.76	At 70m: 24.23	At 115m: 24.13	At 175m: 24.09	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	1433.315	1913.56	1496.061	1735.251	Total route assess NO_2 **(I)**: 6578.186679
Do-something NO_2 assessment *(c = asome*bsome)*	1435.929	1914.448	1496.074	1734.608	Total route assess NO_2 **(II)**: 6581.059187
Net total route assessment for NO_2 (II-I)	0	0	271		2.87250873

NO_2, ROUTE 32. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	49	150	151	154	504
Properties (asome)	49	150	151	154	504
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.61	At 70m: 24.46	At 115m: 24.13	At 175m: 23.96	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.55	At 70m: 24.42	At 115m: 24.11	At 175m: 23.95	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	1254.882	3668.282	3643.554	3689.18	Total route assess NO_2 **(I)**: 12255.89748
Do-something NO_2 assessment *(c = asome*bsome)*	1252.045	3663.664	3639.905	3688.257	Total route assess NO_2 **(II)**: 12243.87149
Net total route assessment for NO_2 (II-I)	504	0	0		-12.02599699

NO_2, ROUTE 33. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	71	66	72	32	241
Properties (asome)	71	66	72	32	241
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.14	At 70m: 24.69	At 115m: 24.61	At 175m: 24.61	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.12	At 70m: 24.66	At 115m: 24.58	At 175m: 24.58	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	1785.079	1629.716	1772.229	787.627	Total route assess NO_2 **(I)**: 5974.650929
Do-something NO_2 assessment *(c = asome*bsome)*	1783.452	1627.796	1769.99	786.6049	Total route assess NO_2 **(II)**: 5967.842393
Net total route assessment for NO_2 (II-I)	241	0	0		-6.808536

NO_2, ROUTE 34. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	110	50	1	0	161
Properties (asome)	110	50	1	0	161
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.04	At 70m: 25.73	At 115m: 25.41	At 175m: 25.21	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.19	At 70m: 25.77	At 115m: 25.42	At 175m: 25.20	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	2974.416	1286.528	25.40589	0	Total route assess NO_2 **(I)**: 4286.349718
Do-something NO_2 assessment *(c = asome*bsome)*	2991.105	1288.613	25.41839	0	Total route assess NO_2 **(II)**: 4305.13718
Net total route assessment for NO_2 (II-I)	0	0	161		18.78746163

NO$_2$, ROUTE 35. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	24	20	13	12	69
Properties (asome)	24	20	13	12	69
NO$_2$ concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.63	At 70m: 25.30	At 115m: 24.98	At 175m: 24.82	N/A
NO$_2$ concentration at average point within band for *do-something* (bsome)	At 20m: 26.28	At 70m: 25.14	At 115m: 24.88	At 175m: 24.75	N/A
Do-minimum NO$_2$ assessment *(c = amin*bmin)*	639.0458	505.989	324.7842	297.878	Total route assess NO$_2$ (I): 1767.697041
Do-something NO$_2$ assessment *(c = asome*bsome)*	630.6032	502.8895	323.4019	296.9576	Total route assess NO$_2$ (II): 1753.852177
Net total route assessment for NO$_2$ (II-I)	69	0	0		-13.84486376

NO$_2$, ROUTE 36. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	29	18	47
Properties (asome)	0	0	29	18	47
NO$_2$ concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.51	At 70m: 25.09	At 115m: 24.73	At 175m: 24.49	N/A
NO$_2$ concentration at average point within band for *do-something* (bsome)	At 20m: 26.39	At 70m: 25.02	At 115m: 24.67	At 175m: 24.44	N/A
Do-minimum NO$_2$ assessment *(c = amin*bmin)*	0	0	717.2819	440.8482	Total route assess NO$_2$ (I): 1158.130179
Do-something NO$_2$ assessment *(c = asome*bsome)*	0	0	715.5482	439.9537	Total route assess NO$_2$ (II): 1155.501853
Net total route assessment for NO$_2$ (II-I)	47	0	0		-2.62832605

NO$_2$, ROUTE 37. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	58	184	41	18	301
Properties (asome)	58	184	41	18	301
NO$_2$ concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.83	At 70m: 25.57	At 115m: 25.41	At 175m: 25.45	N/A
NO$_2$ concentration at average point within band for *do-something* (bsome)	At 20m: 26.69	At 70m: 25.52	At 115m: 25.39	At 175m: 25.45	N/A
Do-minimum NO$_2$ assessment *(c = amin*bmin)*	1556.238	4704.127	1041.908	458.0228	Total route assess NO$_2$ (I): 7760.296477
Do-something NO$_2$ assessment *(c = asome*bsome)*	1548.108	4695.621	1041.103	458.1703	Total route assess NO$_2$ (II): 7743.00248
Net total route assessment for NO$_2$ (II-I)	301	0	0		-17.29399665

NO$_2$, ROUTE 38. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	2	0	0	0	2
Properties (asome)	2	0	0	0	2
NO$_2$ concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.68	At 70m: 25.29	At 115m: 25.22	At 175m: 25.25	N/A
NO$_2$ concentration at average point within band for *do-something* (bsome)	At 20m: 25.62	At 70m: 25.24	At 115m: 25.17	At 175m: 25.24	N/A
Do-minimum NO$_2$ assessment *(c = amin*bmin)*	51.35247	0	0	0	Total route assess NO$_2$ (I): 51.35246584
Do-something NO$_2$ assessment *(c = asome*bsome)*	51.2392	0	0	0	Total route assess NO$_2$ (II): 51.23920038
Net total route assessment for NO$_2$ (II-I)	2	0	0		-0.11326546

NO$_2$, ROUTE 39. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	38	21	39	50	148
Properties (asome)	38	21	39	50	148
NO$_2$ concentration at average point within band for *do-minimum* (bmin)	At 20m: 24.44	At 70m: 24.29	At 115m: 24.28	At 175m: 24.30	N/A
NO$_2$ concentration at average point within band for *do-something* (bsome)	At 20m: 24.39	At 70m: 24.26	At 115m: 24.25	At 175m: 24.26	N/A
Do-minimum NO$_2$ assessment *(c = amin*bmin)*	928.6034	510.166	947.0044	1214.949	Total route assess NO$_2$ (I): 3600.722549
Do-something NO$_2$ assessment *(c = asome*bsome)*	926.9624	509.3893	945.6112	1213.131	Total route assess NO$_2$ (II): 3595.093949
Net total route assessment for NO$_2$ (II-I)	148	0	0		-5.6285999

NO_2, ROUTE 40. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	10	1	0	1	12
Properties (asome)	10	1	0	1	12
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.69	At 70m: 25.84	At 115m: 26.83	At 175m: 27.19	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.61	At 70m: 25.74	At 115m: 26.66	At 175m: 27.00	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	256.9388	25.84456	0	27.18777	Total route assess NO_2 **(I)**: 309.9711718
Do-something NO_2 assessment *(c = asome*bsome)*	256.0909	25.74348	0	27.00243	Total route assess NO_2 **(II)**: 308.8368361
Net total route assessment for NO_2 (II-I)	12	0	0		-1.13433572

NO_2, ROUTE 41. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.59	At 70m: 25.69	At 115m: 25.91	At 175m: 26.70	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.53	At 70m: 25.64	At 115m: 25.86	At 175m: 26.65	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 42. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	21	80	14	0	115
Properties (asome)	21	80	14	0	115
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.50	At 70m: 25.84	At 115m: 25.48	At 175m: 25.57	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.29	At 70m: 25.73	At 115m: 25.41	At 175m: 25.50	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	577.4611	2067.27	356.7489	0	Total route assess NO_2 **(I)**: 3001.48018
Do-something NO_2 assessment *(c = asome*bsome)*	573.1585	2058.654	355.7898	0	Total route assess NO_2 **(II)**: 2987.602744
Net total route assessment for NO_2 (II-I)	115	0	0		-13.87743546

NO_2, ROUTE 43. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	2	0	0	0	2
Properties (asome)	2	0	0	0	2
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.78	At 70m: 26.02	At 115m: 25.88	At 175m: 25.89	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.66	At 70m: 25.93	At 115m: 25.79	At 175m: 25.79	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	53.55095	0	0	0	Total route assess NO_2 **(I)**: 53.55095052
Do-something NO_2 assessment *(c = asome*bsome)*	53.31538	0	0	0	Total route assess NO_2 **(II)**: 53.31538358
Net total route assessment for NO_2 (II-I)	2	0	0		-0.23556694

NO_2, ROUTE 44. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	21	52	0	0	73
Properties (asome)	21	52	0	0	73
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.34	At 70m: 25.10	At 115m: 25.27	At 175m: 25.74	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.32	At 70m: 25.04	At 115m: 25.19	At 175m: 25.64	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	532.1887	1305.245	0	0	Total route assess NO_2 **(I)**: 1837.433949
Do-something NO_2 assessment *(c = asome*bsome)*	531.7761	1302.005	0	0	Total route assess NO_2 **(II)**: 1833.7814
Net total route assessment for NO_2 (II-I)	73	0	0		-3.65254841

NO_2, ROUTE 45. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	76	0	0	0	76
Properties (asome)	76	0	0	0	76
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.04	At 70m: 26.05	At 115m: 26.11	At 175m: 27.67	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.93	At 70m: 25.95	At 115m: 26.00	At 175m: 27.38	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1978.791	0	0	0	Total route assess NO_2 **(I)**: 1978.791335
Do-something* NO_2 assessment *(c = asome*bsome)	1970.694	0	0	0	Total route assess NO_2 **(II)**: 1970.69422
Net total route assessment for NO_2 (II-I)	76	0	0		-8.09711448

NO_2, ROUTE 46. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.67	At 70m: 26.25	At 115m: 25.89	At 175m: 26.11	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.38	At 70m: 26.09	At 115m: 25.76	At 175m: 26.02	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 47. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.03	At 70m: 25.75	At 115m: 25.92	At 175m: 26.39	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.92	At 70m: 25.62	At 115m: 25.77	At 175m: 26.19	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 48. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	1	1	12	1	15
Properties (asome)	1	1	12	1	15
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.07	At 70m: 25.65	At 115m: 25.59	At 175m: 26.19	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.75	At 70m: 25.47	At 115m: 25.46	At 175m: 26.07	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	26.0672	25.65018	307.0506	26.18982	Total route assess NO_2 **(I)**: 384.9578351
Do-something* NO_2 assessment *(c = asome*bsome)	25.74516	25.47166	305.5011	26.07277	Total route assess NO_2 **(II)**: 382.7906613
Net total route assessment for NO_2 (II-I)	15	0	0		-2.16717382

NO_2, ROUTE 49. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	4	5	0	0	9
Properties (asome)	4	5	0	0	9
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.65	At 70m: 26.90	At 115m: 26.65	At 175m: 26.62	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.31	At 70m: 26.69	At 115m: 26.56	At 175m: 26.56	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	114.619	134.4773	0	0	Total route assess NO_2 **(I)**: 249.0963551
Do-something* NO_2 assessment *(c = asome*bsome)	113.2472	133.4639	0	0	Total route assess NO_2 **(II)**: 246.7111611
Net total route assessment for NO_2 (II-I)	9	0	0		-2.38519407

NO_2 ROUTE 50. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 31.04	At 70m: 27.24	At 115m: 26.33	At 175m: 25.73	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 30.87	At 70m: 27.13	At 115m: 26.23	At 175m: 25.64	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2 ROUTE 51. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	20	21	19	9	69
Properties (asome)	20	21	19	9	69
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.05	At 70m: 28.39	At 115m: 29.06	At 175m: 30.79	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.00	At 70m: 28.34	At 115m: 29.02	At 175m: 30.74	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	560.9701	596.1344	552.1961	277.0664	Total route assess NO_2 **(I)**: 1986.367044
Do-something* NO_2 assessment *(c = asome*bsome)	559.9068	595.04	551.2958	276.6749	Total route assess NO_2 **(II)**: 1982.917491
Net total route assessment for NO_2 (II-I)	69	0	0		-3.44955317

NO_2 ROUTE 52. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	41	12	0	0	53
Properties (asome)	41	12	0	0	53
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.82	At 70m: 30.37	At 115m: 28.01	At 175m: 26.88	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.57	At 70m: 29.84	At 115m: 27.69	At 175m: 26.67	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1140.684	364.4794	0	0	Total route assess NO_2 **(I)**: 1505.163026
Do-something* NO_2 assessment *(c = asome*bsome)	1130.526	358.1033	0	0	Total route assess NO_2 **(II)**: 1488.629
Net total route assessment for NO_2 (II-I)	53	0	0		-16.53402534

Environment: Local Air Quality - Plan Level Summary Table: 2020 Cut and Cover Tunnel

(Tag Unit 3.3.3 Worksheet 1b)

Long Term (annual) PM_{10}

PM_{10}, SUMMARY OF ROUTE: THE AGGREGATED TABLE	0-50 m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Total properties across all routes (min)	1970	1776	1013	785	5544
Total properties across all routes (some)	1970	1776	1013	785	5544
Do-minimum PM_{10} assessment across all routes	31944.21	28573.68	16256.63	12587.69	Total assessment PM_{10} (I) 89362.20
Do-something PM_{10} assessment across all routes	31903.58	28577.37	16264.3	12592.76	Total assessment PM_{10} (II) 89339.01
NET TOTAL ASSESSMENT FOR PM_{10}, all routes (II-I)					-24.19
Number of properties with an improvement					3002
Number of properties with no change					0
Number of properties with a deterioration					2542

Reference Sources	Concentrations: ADMS ROADS v2.3 (model: 2017BASEOG) Property counts: manual estimation from base plan (refer to Figure 1)
Quantitative Measures	To avoid double counting of properties, bandwidths were altered based on relative impact of links. Refer to Section 2.4 in text.
Assessment Scores	As reported.
Qualitative Comments	Demolition requirements: Castle Buildings (Grade II Listed); Earl de Grey PH (Grade II Listed); Properties 16 – 65 nr Dagger Road. This option does not result in an exceedence of either the annual AQS for PM_{10} (40 µg/m^3) at 20 m from the road centre. No exceedences of the AQS for PM_{10} are predicted at any of assessed locations (20 m, 70 m, 115 m, and 175 m from road centre).

Environment: Local Air Quality - Plan Level Summary Table: 2020 Cut and Cover Tunnel

(Tag Unit 3.3.3 Worksheet 1b)

Long Term (annual) NO_2

NO_2, SUMMARY OF ROUTE: THE AGGREGATED TABLE	0-50 m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Total properties across all routes (min)	1970	1776	1013	785	5544
Total properties across all routes (some)	1970	1776	1013	785	5544
Do-minimum NO_2 assessment across all routes	53125.32	46057.51	25696.02	19823.45	Total assessment NO_2 (I) 144702.30
Do-something NO_2 assessment across all routes	52544.8	46009.67	25766.44	19861.78	Total assessment NO_2 (II) 144182.69
NET TOTAL ASSESSMENT FOR NO_2, all routes (II-I)					-519.61
Number of properties with an improvement					3427
Number of properties with no change					0
Number of properties with a deterioration					2117

Reference Sources	Concentrations: ADMS ROADS v2.3 (model: 2017BASEOG) Property counts: manual estimation from base plan (refer to Figure 1)
Quantitative Measures	To avoid double counting of properties, bandwidths were altered based on relative impact of links. Refer to Section 2.4 in text.
Assessment Scores	As reported.
Qualitative Comments	Demolition requirements: Castle Buildings (Grade II Listed); Earl de Grey PH (Grade II Listed); Properties 16 – 65 nr Dagger Road. This option does not result in an exceedence of either the annual AQS for NO_2 (40 µg/m^3) at 20 m from the road centre. No exceedences of the AQS for NO_2 are predicted at any of assessed locations (20 m, 70 m, 115 m, and 175 m from road centre).

PM_{10}, SUMMARY OF ROUTES: THE AGGREGATED TABLE	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Total properties across all routes (min)	1970	1776	1013	785	5544
Total properties across all routes (some)	1970	1776	1013	785	5544
Do-minimum **PM_{10} assessment *across all routes***	31944.21	28573.68	16256.63	12587.69	Total assessment PM_{10} **(I)**: 89362.2046
Do-something **PM_{10} assessment *across all routes***	31903.58	28577.37	16264.3	12592.76	Total assessment PM_{10} **(II)**: 89338.0148
Net total assessment for PM_{10}, all routes (II-I)					-24.1898
Number of properties with an improvement					***3002***
Number of properties with no change					***0***
Number of properties with a deterioration					***2542***

Reference Sources:

Quantitative Measures:

Assessment Scores:

Qualitative Comments:

PM_{10}, ROUTE 1. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.19	At 70m: 16.54	At 115m: 16.21	At 175m: 16.13	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.23	At 70m: 16.60	At 115m: 16.23	At 175m: 16.14	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 2. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.80	At 70m: 16.26	At 115m: 16.18	At 175m: 16.14	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.91	At 70m: 16.28	At 115m: 16.19	At 175m: 16.15	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 3. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	23	7	6	0	36
Properties (asome)	23	7	6	0	36
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.12	At 70m: 16.07	At 115m: 16.09	At 175m: 16.11	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.14	At 70m: 16.08	At 115m: 16.09	At 175m: 16.11	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	370.8543	112.5124	96.5232	0	Total route assess PM_{10} **(I)**: 579.8899
Do-something* PM_{10} assessment *(c = asome*bsome)	371.174	112.553	96.5544	0	Total route assess PM_{10} **(II)**: 580.2814
Net total route assessment for PM_{10} (II-I)	0	0	36		0.3915

PM_{10}, ROUTE 4. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	169	232	246	73	720
Properties (asome)	169	232	246	73	720
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.20	At 70m: 16.05	At 115m: 16.02	At 175m: 16.01	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.21	At 70m: 16.05	At 115m: 16.03	At 175m: 16.02	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	2738.561	3723.6	3941.978	1168.92	Total route assess PM_{10} **(I)**: 11573.0581
Do-something* PM_{10} assessment *(c = asome*bsome)	2739.541	3724.342	3942.691	1169.132	Total route assess PM_{10} **(II)**: 11575.7058
Net total route assessment for PM_{10} (II-I)	0	0	720		2.6477

PM_{10}, ROUTE 5. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.59	At 70m: 16.35	At 115m: 16.11	At 175m: 16.03	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.60	At 70m: 16.36	At 115m: 16.11	At 175m: 16.04	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 6. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.21	At 70m: 16.30	At 115m: 16.24	At 175m: 16.23	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.24	At 70m: 16.32	At 115m: 16.26	At 175m: 16.25	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 7. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.55	At 70m: 16.21	At 115m: 16.10	At 175m: 16.10	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.66	At 70m: 16.23	At 115m: 16.11	At 175m: 16.10	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 8. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	24	75	25	16	140
Properties (asome)	24	75	25	16	140
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.33	At 70m: 16.22	At 115m: 16.13	At 175m: 16.10	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.42	At 70m: 16.24	At 115m: 16.14	At 175m: 16.10	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	415.8048	1216.823	403.2375	257.52	Total route assess PM_{10} **(I)**: 2293.3848
Do-something* PM_{10} assessment *(c = asome*bsome)	418.1616	1218.353	403.4975	257.576	Total route assess PM_{10} **(II)**: 2297.5876
Net total route assessment for PM_{10} (II-I)	0	0	140		4.2028

PM_{10}, ROUTE 9. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	51	160	113	103	427
Properties (asome)	51	160	113	103	427
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.71	At 70m: 16.20	At 115m: 16.11	At 175m: 16.09	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.78	At 70m: 16.22	At 115m: 16.13	At 175m: 16.10	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	852.0162	2591.296	1820.656	1657.146	Total route assess PM_{10} **(I)**: 6921.1146
Do-something* PM_{10} assessment *(c = asome*bsome)	855.6729	2595.952	1822.905	1658.104	Total route assess PM_{10} **(II)**: 6932.6339
Net total route assessment for PM_{10} (II-I)	0	0	427		11.5193

PM_{10}, ROUTE 10. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.12	At 70m: 16.09	At 115m: 16.14	At 175m: 16.44	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.11	At 70m: 16.10	At 115m: 16.16	At 175m: 16.49	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 11. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	36	10	8	3	57
Properties (asome)	36	10	8	3	57
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.17	At 70m: 16.01	At 115m: 15.99	At 175m: 15.98	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.16	At 70m: 16.01	At 115m: 15.99	At 175m: 15.98	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	582.1524	160.138	127.9128	47.9382	Total route assess PM_{10} **(I)**: 918.1414
Do-something* PM_{10} assessment *(c = asome*bsome)	581.7816	160.118	127.908	47.94	Total route assess PM_{10} **(II)**: 917.7476
Net total route assessment for PM_{10} (II-I)	57	0	0		-0.3938

PM_{10}, ROUTE 12. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	199	240	57	67	563
Properties (asome)	199	240	57	67	563
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.18	At 70m: 16.04	At 115m: 16.02	At 175m: 16.01	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.16	At 70m: 16.04	At 115m: 16.02	At 175m: 16.01	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	3220.357	3850.08	912.9462	1072.342	Total route assess PM_{10} **(I)**: 9055.7252
Do-something* PM_{10} assessment *(c = asome*bsome)	3216.517	3849.072	912.8607	1072.462	Total route assess PM_{10} **(II)**: 9050.9116
Net total route assessment for PM_{10} (II-I)	563	0	0		-4.8136

PM_{10}, ROUTE 13. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	164	82	3	37	286
Properties (asome)	164	82	3	37	286
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.15	At 70m: 16.05	At 115m: 16.04	At 175m: 16.03	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.12	At 70m: 16.05	At 115m: 16.05	At 175m: 16.05	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	2648.059	1315.723	48.1164	593.2543	Total route assess PM_{10} **(I)**: 4605.1523
Do-something* PM_{10} assessment *(c = asome*bsome)	2643.647	1315.78	48.1437	593.665	Total route assess PM_{10} **(II)**: 4601.2361
Net total route assessment for PM_{10} (II-I)	286	0	0		-3.9162

PM_{10}, ROUTE 14. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.17	At 70m: 16.13	At 115m: 16.16	At 175m: 16.18	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.17	At 70m: 16.15	At 115m: 16.21	At 175m: 16.29	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 15. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	218	0	0	0	218
Properties (asome)	218	0	0	0	218
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.10	At 70m: 16.07	At 115m: 16.32	At 175m: 16.11	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.13	At 70m: 16.08	At 115m: 16.25	At 175m: 16.15	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	3509.713	0	0	0	Total route assess PM_{10} **(I)**: 3509.7128
Do-something* PM_{10} assessment *(c = asome*bsome)	3517.234	0	0	0	Total route assess PM_{10} **(II)**: 3517.2338
Net total route assessment for PM_{10} (II-I)	0	0	218		7.521

PM_{10}, ROUTE 16. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	47	31	38	44	160
Properties (asome)	47	31	38	44	160
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.34	At 70m: 16.18	At 115m: 16.24	At 175m: 16.14	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.41	At 70m: 16.28	At 115m: 16.34	At 175m: 16.21	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	767.9283	501.5428	617.139	710.2392	Total route assess PM_{10} **(I)**: 2596.8493
Do-something* PM_{10} assessment *(c = asome*bsome)	771.1337	504.6335	621.0036	713.3324	Total route assess PM_{10} **(II)**: 2610.1032
Net total route assessment for PM_{10} (II-I)	0	0	160		13.2539

PM_{10}, ROUTE 17. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	9	16	8	33
Properties (asome)	0	9	16	8	33
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.18	At 70m: 16.12	At 115m: 16.13	At 175m: 16.15	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.25	At 70m: 16.18	At 115m: 16.17	At 175m: 16.18	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	145.0773	258.0304	129.1672	Total route assess PM_{10} **(I)**: 532.2749
Do-something* PM_{10} assessment *(c = asome*bsome)	0	145.6614	258.7872	129.4464	Total route assess PM_{10} **(II)**: 533.895
Net total route assessment for PM_{10} (II-I)	0	0	33		1.6201

PM_{10}, ROUTE 18. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	63	49	0	0	112
Properties (asome)	63	49	0	0	112
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.83	At 70m: 16.22	At 115m: 16.13	At 175m: 16.08	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.35	At 70m: 16.15	At 115m: 16.12	At 175m: 16.09	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	1060.353	794.976	0	0	Total route assess PM_{10} **(I)**: 1855.329
Do-something* PM_{10} assessment *(c = asome*bsome)	1029.823	791.4872	0	0	Total route assess PM_{10} **(II)**: 1821.3104
Net total route assessment for PM_{10} (II-I)	112	0	0		-34.0186

PM_{10}, ROUTE 19. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.31	At 70m: 16.41	At 115m: 16.77	At 175m: 16.70	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.55	At 70m: 17.02	At 115m: 17.93	At 175m: 17.09	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 20. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	61	0	0	0	61
Properties (asome)	61	0	0	0	61
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.21	At 70m: 16.22	At 115m: 16.22	At 175m: 16.22	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.15	At 70m: 16.16	At 115m: 16.19	At 175m: 16.26	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	989.0052	0	0	0	Total route assess PM_{10} **(I)**: 989.0052
Do-something* PM_{10} assessment *(c = asome*bsome)	984.8511	0	0	0	Total route assess PM_{10} **(II)**: 984.8511
Net total route assessment for PM_{10} (II-I)	61	0	0		-4.1541

PM_{10}, ROUTE 21. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	43	0	0	0	43
Properties (asome)	43	0	0	0	43
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.11	At 70m: 16.18	At 115m: 16.38	At 175m: 16.76	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.10	At 70m: 16.11	At 115m: 16.18	At 175m: 16.31	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	692.9235	0	0	0	Total route assess PM_{10} **(I)**: 692.9235
Do-something* PM_{10} assessment *(c = asome*bsome)	692.1194	0	0	0	Total route assess PM_{10} **(II)**: 692.1194
Net total route assessment for PM_{10} (II-I)	43	0	0		-0.8041

PM_{10}, ROUTE 22. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.20	At 70m: 16.38	At 115m: 17.63	At 175m: 16.52	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.13	At 70m: 16.18	At 115m: 16.71	At 175m: 16.61	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 23. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	70	0	0	0	70
Properties (asome)	70	0	0	0	70
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.11	At 70m: 16.07	At 115m: 16.06	At 175m: 16.05	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.04	At 70m: 16.05	At 115m: 16.05	At 175m: 16.05	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	1127.791	0	0	0	Total route assess PM_{10} **(I)**: 1127.791
Do-something* PM_{10} assessment *(c = asome*bsome)	1123.136	0	0	0	Total route assess PM_{10} **(II)**: 1123.136
Net total route assessment for PM_{10} (II-I)	70	0	0		-4.655

PM_{10}, ROUTE 24. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	17	48	67	132
Properties (asome)	0	17	48	67	132
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.66	At 70m: 16.17	At 115m: 16.10	At 175m: 16.07	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.67	At 70m: 16.17	At 115m: 16.10	At 175m: 16.07	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	274.8407	772.8624	1076.697	Total route assess PM_{10} **(I)**: 2124.3998
Do-something* PM_{10} assessment *(c = asome*bsome)	0	274.8883	772.9296	1076.744	Total route assess PM_{10} **(II)**: 2124.5615
Net total route assessment for PM_{10} (II-I)	0	0	132		0.1617

PM_{10}, ROUTE 25. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	128	92	0	0	220
Properties (asome)	128	92	0	0	220
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.10	At 70m: 16.14	At 115m: 16.59	At 175m: 16.09	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.10	At 70m: 16.13	At 115m: 16.56	At 175m: 16.09	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	2060.89	1484.797	0	0	Total route assess PM_{10} **(I)**: 3545.6868
Do-something* PM_{10} assessment *(c = asome*bsome)	2060.787	1484.337	0	0	Total route assess PM_{10} **(II)**: 3545.1244
Net total route assessment for PM_{10} (II-I)	220	0	0		-0.5624

PM_{10}, ROUTE 26. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.31	At 70m: 16.15	At 115m: 16.18	At 175m: 16.13	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.30	At 70m: 16.15	At 115m: 16.17	At 175m: 16.13	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 27. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.17	At 70m: 16.08	At 115m: 16.08	At 175m: 16.11	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.16	At 70m: 16.08	At 115m: 16.08	At 175m: 16.10	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 28. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	68	30	0	0	98
Properties (asome)	68	30	0	0	98
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.10	At 70m: 16.09	At 115m: 16.06	At 175m: 16.06	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.10	At 70m: 16.09	At 115m: 16.06	At 175m: 16.06	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	1094.916	482.811	0	0	Total route assess PM_{10} **(I)**: 1577.7266
Do-something* PM_{10} assessment *(c = asome*bsome)	1094.752	482.79	0	0	Total route assess PM_{10} **(II)**: 1577.5424
Net total route assessment for PM_{10} (II-I)	98	0	0		-0.1842

PM_{10}, ROUTE 29. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 0	At 70m: 0	At 115m: 0	At 175m: 0	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m:	At 70m:	At 115m:	At 175m:	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM10, ROUTE 30. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.69	At 70m: 16.17	At 115m: 16.07	At 175m: 16.02	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.71	At 70m: 16.17	At 115m: 16.08	At 175m: 16.03	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM10, ROUTE 31. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	58	79	62	72	271
Properties (asome)	58	79	62	72	271
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.12	At 70m: 16.02	At 115m: 16.00	At 175m: 15.99	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.12	At 70m: 16.02	At 115m: 16.00	At 175m: 15.99	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	935.2094	1265.541	992.0806	1151.438	Total route assess PM_{10} **(I)**: 4344.2689
Do-something* PM_{10} assessment *(c = asome*bsome)	935.163	1265.533	992.0868	1151.46	Total route assess PM_{10} **(II)**: 4344.2424
Net total route assessment for PM_{10} (II-I)	271	0	0		-0.0265

PM10, ROUTE 32. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	49	150	151	154	504
Properties (asome)	49	150	151	154	504
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.21	At 70m: 16.04	At 115m: 16.00	At 175m: 15.99	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.21	At 70m: 16.04	At 115m: 16.00	At 175m: 15.99	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	794.3586	2405.475	2416.71	2462.291	Total route assess PM_{10} **(I)**: 8078.8339
Do-something* PM_{10} assessment *(c = asome*bsome)	794.1234	2405.325	2416.649	2462.337	Total route assess PM_{10} **(II)**: 8078.4345
Net total route assessment for PM_{10} (II-I)	504	0	0		-0.3994

PM10, ROUTE 33. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	71	66	72	32	241
Properties (asome)	71	66	72	32	241
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.08	At 70m: 16.02	At 115m: 16.01	At 175m: 16.00	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.10	At 70m: 16.02	At 115m: 16.01	At 175m: 16.01	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	1141.978	1057.129	1152.49	512.1376	Total route assess PM_{10} **(I)**: 3863.734
Do-something* PM_{10} assessment *(c = asome*bsome)	1142.859	1057.406	1152.67	512.176	Total route assess PM_{10} **(II)**: 3865.11
Net total route assessment for PM_{10} (II-I)	0	0	241		1.376

PM10, ROUTE 34. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	110	50	1	0	161
Properties (asome)	110	50	1	0	161
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.37	At 70m: 16.10	At 115m: 16.06	At 175m: 16.04	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.29	At 70m: 16.08	At 115m: 16.05	At 175m: 16.03	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	1801.085	805.235	16.06	0	Total route assess PM_{10} **(I)**: 2622.38
Do-something* PM_{10} assessment *(c = asome*bsome)	1792.065	804.145	16.0483	0	Total route assess PM_{10} **(II)**: 2612.2583
Net total route assessment for PM_{10} (II-I)	161	0	0		-10.1217

PM_{10}, ROUTE 35. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	24	20	13	12	69
Properties (asome)	24	20	13	12	69
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.23	At 70m: 16.06	At 115m: 16.04	At 175m: 16.03	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.23	At 70m: 16.06	At 115m: 16.04	At 175m: 16.03	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	389.5656	321.266	208.4745	192.354	Total route assess PM_{10} (I): 1111.6601
Do-something PM_{10} assessment *(c = asome*bsome)*	389.4048	321.226	208.4576	192.3408	Total route assess PM_{10} (II): 1111.4292
Net total route assessment for PM_{10} (II-I)	69	0	0		-0.2309

PM_{10}, ROUTE 36. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	29	18	47
Properties (asome)	0	0	29	18	47
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.23	At 70m: 16.05	At 115m: 16.02	At 175m: 16.01	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.22	At 70m: 16.05	At 115m: 16.02	At 175m: 16.01	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	464.5626	288.1818	Total route assess PM_{10} (I): 752.7444
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	464.5278	288.1746	Total route assess PM_{10} (II): 752.7024
Net total route assessment for PM_{10} (II-I)	47	0	0		-0.042

PM_{10}, ROUTE 37. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	58	184	41	18	301
Properties (asome)	58	184	41	18	301
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.25	At 70m: 16.07	At 115m: 16.06	At 175m: 16.07	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.24	At 70m: 16.06	At 115m: 16.05	At 175m: 16.06	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	942.4826	2957.285	658.4846	289.2384	Total route assess PM_{10} (I): 4847.4904
Do-something PM_{10} assessment *(c = asome*bsome)*	941.7808	2955.666	658.0705	288.99	Total route assess PM_{10} (II): 4844.5069
Net total route assessment for PM_{10} (II-I)	301	0	0		-2.9835

PM_{10}, ROUTE 38. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	2	0	0	0	2
Properties (asome)	2	0	0	0	2
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.10	At 70m: 16.03	At 115m: 16.02	At 175m: 16.03	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.09	At 70m: 16.03	At 115m: 16.03	At 175m: 16.03	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	32.1906	0	0	0	Total route assess PM_{10} (I): 32.1906
Do-something PM_{10} assessment *(c = asome*bsome)*	32.1842	0	0	0	Total route assess PM_{10} (II): 32.1842
Net total route assessment for PM_{10} (II-I)	2	0	0		-0.0064

PM_{10}, ROUTE 39. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	38	21	39	50	148
Properties (asome)	38	21	39	50	148
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.02	At 70m: 15.99	At 115m: 15.99	At 175m: 15.99	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.02	At 70m: 15.99	At 115m: 15.99	At 175m: 15.99	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	608.6422	335.8509	623.5671	799.485	Total route assess PM_{10} (I): 2367.5452
Do-something PM_{10} assessment *(c = asome*bsome)*	608.6726	335.8551	623.571	799.455	Total route assess PM_{10} (II): 2367.5537
Net total route assessment for PM_{10} (II-I)	0	0	148		0.0085

PM_{10}, ROUTE 40. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	10	1	0	1	12
Properties (asome)	10	1	0	1	12
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.09	At 70m: 16.09	At 115m: 16.23	At 175m: 16.28	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.10	At 70m: 16.09	At 115m: 16.24	At 175m: 16.29	**N/A**
Do-minimum* PM_{10} assessment** ***(c = amin*bmin)	160.936	16.0908	0	16.2781	Total route assess PM_{10} **(I)**: 193.3049
Do-something* PM_{10} assessment** ***(c = asome*bsome)	160.968	16.0945	0	16.2884	Total route assess PM_{10} **(II)**: 193.3509
Net total route assessment for PM_{10} (II-I)	0	0	12		0.046

PM_{10}, ROUTE 41. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.05	At 70m: 16.05	At 115m: 16.06	At 175m: 16.17	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.06	At 70m: 16.06	At 115m: 16.06	At 175m: 16.16	**N/A**
Do-minimum* PM_{10} assessment** ***(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment** ***(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 42. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	21	80	14	0	115
Properties (asome)	21	80	14	0	115
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.34	At 70m: 16.09	At 115m: 16.05	At 175m: 16.08	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.36	At 70m: 16.10	At 115m: 16.05	At 175m: 16.08	**N/A**
Do-minimum* PM_{10} assessment** ***(c = amin*bmin)	343.1904	1287.456	224.7168	0	Total route assess PM_{10} **(I)**: 1855.3632
Do-something* PM_{10} assessment** ***(c = asome*bsome)	343.4634	1287.704	224.7364	0	Total route assess PM_{10} **(II)**: 1855.9038
Net total route assessment for PM_{10} (II-I)	0	0	115		0.5406

PM_{10}, ROUTE 43. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	2	0	0	0	2
Properties (asome)	2	0	0	0	2
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.18	At 70m: 16.08	At 115m: 16.06	At 175m: 16.07	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.18	At 70m: 16.08	At 115m: 16.06	At 175m: 16.07	**N/A**
Do-minimum* PM_{10} assessment** ***(c = amin*bmin)	32.3576	0	0	0	Total route assess PM_{10} **(I)**: 32.3576
Do-something* PM_{10} assessment** ***(c = asome*bsome)	32.3512	0	0	0	Total route assess PM_{10} **(II)**: 32.3512
Net total route assessment for PM_{10} (II-I)	2	0	0		-0.0064

PM_{10}, ROUTE 44. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	21	52	0	0	73
Properties (asome)	21	52	0	0	73
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.10	At 70m: 16.03	At 115m: 16.04	At 175m: 16.09	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.06	At 70m: 16.03	At 115m: 16.04	At 175m: 16.09	**N/A**
Do-minimum* PM_{10} assessment** ***(c = amin*bmin)	338.0853	833.742	0	0	Total route assess PM_{10} **(I)**: 1171.8273
Do-something* PM_{10} assessment** ***(c = asome*bsome)	337.3461	833.638	0	0	Total route assess PM_{10} **(II)**: 1170.9841
Net total route assessment for PM_{10} (II-I)	73	0	0		-0.8432

PM_{10}, ROUTE 45. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	76	0	0	0	76
Properties (asome)	76	0	0	0	76
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.09	At 70m: 16.08	At 115m: 16.09	At 175m: 16.22	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.09	At 70m: 16.09	At 115m: 16.09	At 175m: 16.23	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	1222.62	0	0	0	Total route assess PM_{10} (I): 1222.6196
Do-something PM_{10} assessment *(c = asome*bsome)*	1222.832	0	0	0	Total route assess PM_{10} (II): 1222.8324
Net total route assessment for PM_{10} (II-I)	0	0	76		0.2128

PM_{10}, ROUTE 46. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.20	At 70m: 16.08	At 115m: 16.06	At 175m: 16.11	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.21	At 70m: 16.08	At 115m: 16.06	At 175m: 16.12	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 47. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.11	At 70m: 16.05	At 115m: 16.05	At 175m: 16.08	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.11	At 70m: 16.05	At 115m: 16.05	At 175m: 16.08	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 48. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	1	1	12	1	15
Properties (asome)	1	1	12	1	15
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.09	At 70m: 16.04	At 115m: 16.05	At 175m: 16.14	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.09	At 70m: 16.04	At 115m: 16.05	At 175m: 16.15	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	16.0851	16.0374	192.5424	16.1425	Total route assess PM_{10} (I): 240.8074
Do-something PM_{10} assessment *(c = asome*bsome)*	16.0882	16.0393	192.5724	16.1488	Total route assess PM_{10} (II): 240.8487
Net total route assessment for PM_{10} (II-I)	0	0	15		0.0413

PM_{10}, ROUTE 49. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	4	5	0	0	9
Properties (asome)	4	5	0	0	9
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.25	At 70m: 16.09	At 115m: 16.06	At 175m: 16.06	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.24	At 70m: 16.09	At 115m: 16.06	At 175m: 16.06	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	65.0164	80.449	0	0	Total route assess PM_{10} (I): 145.4654
Do-something PM_{10} assessment *(c = asome*bsome)*	64.9624	80.437	0	0	Total route assess PM_{10} (II): 145.3994
Net total route assessment for PM_{10} (II-I)	9	0	0		-0.066

PM_{10}, ROUTE 50. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.43	At 70m: 16.10	At 115m: 16.05	At 175m: 16.03	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.44	At 70m: 16.10	At 115m: 16.05	At 175m: 16.03	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 51. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	20	21	19	9	69
Properties (asome)	20	21	19	9	69
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.15	At 70m: 16.14	At 115m: 16.19	At 175m: 16.32	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.15	At 70m: 16.15	At 115m: 16.19	At 175m: 16.33	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	322.994	339.0072	307.5359	146.9205	Total route assess PM_{10} **(I)**: 1116.4576
Do-something* PM_{10} assessment *(c = asome*bsome)	323.022	339.0807	307.6252	146.9925	Total route assess PM_{10} **(II)**: 1116.7204
Net total route assessment for PM_{10} (II-I)	0	0	69		0.2628

PM_{10}, ROUTE 52. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	41	12	0	0	53
Properties (asome)	41	12	0	0	53
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.25	At 70m: 16.57	At 115m: 16.24	At 175m: 16.13	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.24	At 70m: 16.60	At 115m: 16.25	At 175m: 16.13	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	666.0901	198.8988	0	0	Total route assess PM_{10} **(I)**: 864.9889
Do-something* PM_{10} assessment *(c = asome*bsome)	665.9671	199.254	0	0	Total route assess PM_{10} **(II)**: 865.2211
Net total route assessment for PM_{10} (II-I)	53	0	0		0.2322

NO_2, SUMMARY OF ROUTES: THE AGGREGATED TABLE	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Total properties across all routes (min)	1970	1776	1013	785	5544
Total properties across all routes (some)	1970	1776	1013	785	5544
Do-minimum* NO_2 assessment *across all routes	53125.32	46057.51	25696.02	19823.45	Total assessment NO_2 **(I)**: 144702.2981
Do-something* NO_2 assessment *across all routes	52544.8	46009.67	25766.44	19861.78	Total assessment NO_2 **(II)**: 144182.6906
Net total assessment for NO_2, all routes (II-I)					-519.6075042
Number of properties with an improvement					***3427***
Number of properties with no change					***0***
Number of properties with a deterioration					***2117***

Reference Sources:

Quantitative Measures:

Assessment Scores:

Qualitative Comments:

NO_2, ROUTE 1. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 36.47	At 70m: 30.32	At 115m: 28.57	At 175m: 27.42	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 36.82	At 70m: 30.60	At 115m: 28.76	At 175m: 27.56	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 2. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 33.74	At 70m: 29.22	At 115m: 28.19	At 175m: 27.52	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 34.49	At 70m: 29.47	At 115m: 28.37	At 175m: 27.62	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 3. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	23	7	6	0	36
Properties (asome)	23	7	6	0	36
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.90	At 70m: 25.73	At 115m: 25.99	At 175m: 26.36	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.09	At 70m: 25.82	At 115m: 26.07	At 175m: 26.44	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	595.7322	180.1087	155.9505	0	Total route assess NO_2 **(I)**: 931.7914315
Do-something* NO_2 assessment *(c = asome*bsome)	600.1231	180.7714	156.4366	0	Total route assess NO_2 **(II)**: 937.3311422
Net total route assessment for NO_2 (II-I)	0	0	36		5.53971068

NO_2, ROUTE 4. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	169	232	246	73	720
Properties (asome)	169	232	246	73	720
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.71	At 70m: 24.88	At 115m: 24.73	At 175m: 24.70	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.73	At 70m: 24.92	At 115m: 24.77	At 175m: 24.75	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	4344.77	5772.675	6084.142	1802.88	Total route assess NO_2 **(I)**: 18004.46647
Do-something* NO_2 assessment *(c = asome*bsome)	4348.357	5780.914	6094.481	1806.5	Total route assess NO_2 **(II)**: 18030.2517
Net total route assessment for NO_2 (II-I)	0	0	720		25.7852287

NO_2, ROUTE 5. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 32.12	At 70m: 29.02	At 115m: 26.35	At 175m: 25.41	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 32.28	At 70m: 29.13	At 115m: 26.43	At 175m: 25.46	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 6. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 36.60	At 70m: 29.61	At 115m: 29.04	At 175m: 28.87	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 36.92	At 70m: 29.90	At 115m: 29.31	At 175m: 29.14	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 7. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 38.27	At 70m: 28.30	At 115m: 27.01	At 175m: 26.59	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 38.99	At 70m: 28.55	At 115m: 27.15	At 175m: 26.60	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 8. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	24	75	25	16	140
Properties (asome)	24	75	25	16	140
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 37.45	At 70m: 28.83	At 115m: 27.54	At 175m: 26.83	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 38.16	At 70m: 29.10	At 115m: 27.72	At 175m: 26.92	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	898.8746	2161.967	688.5937	429.2633	Total route assess NO_2 **(I)**: 4178.69895
Do-something NO_2 assessment *(c = asome*bsome)*	915.9035	2182.519	693.067	430.7544	Total route assess NO_2 **(II)**: 4222.244056
Net total route assessment for NO_2 (II-I)	0	0	140		43.54510573

NO_2, ROUTE 9. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	51	160	113	103	427
Properties (asome)	51	160	113	103	427
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 33.12	At 70m: 28.52	At 115m: 27.30	At 175m: 26.61	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 33.76	At 70m: 28.91	At 115m: 27.60	At 175m: 26.79	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	1689.341	4563.999	3085.254	2740.439	Total route assess NO_2 **(I)**: 12079.03399
Do-something NO_2 assessment *(c = asome*bsome)*	1721.776	4625.327	3119.223	2759.086	Total route assess NO_2 **(II)**: 12225.41174
Net total route assessment for NO_2 (II-I)	0	0	427		146.3777452

NO_2, ROUTE 10. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.60	At 70m: 26.87	At 115m: 27.72	At 175m: 31.00	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.63	At 70m: 27.04	At 115m: 27.97	At 175m: 31.45	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

$NO_{2,}$ ROUTE 11. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	36	10	8	3	57
Properties (asome)	36	10	8	3	57
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.24	At 70m: 24.11	At 115m: 23.87	At 175m: 23.76	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.10	At 70m: 24.07	At 115m: 23.86	At 175m: 23.76	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	908.5145	241.1006	190.9682	71.28211	Total route assess NO_2 **(I)**: 1411.865441
Do-something NO_2 assessment *(c = asome*bsome)*	903.4762	240.674	190.8858	71.28778	Total route assess NO_2 **(II)**: 1406.323839
Net total route assessment for NO_2 (II-I)	57	0	0		-5.54160194

$NO_{2,}$ ROUTE 12. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	199	240	57	67	563
Properties (asome)	199	240	57	67	563
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.99	At 70m: 24.94	At 115m: 24.74	At 175m: 24.67	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.87	At 70m: 24.91	At 115m: 24.75	At 175m: 24.71	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	5172.444	5984.971	1410.285	1653.128	Total route assess NO_2 **(I)**: 14220.8279
Do-something NO_2 assessment *(c = asome*bsome)*	5147.562	5978.97	1411.016	1655.465	Total route assess NO_2 **(II)**: 14193.01251
Net total route assessment for NO_2 (II-I)	563	0	0		-27.81539124

$NO_{2,}$ ROUTE 13. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	164	82	3	37	286
Properties (asome)	164	82	3	37	286
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.12	At 70m: 25.47	At 115m: 25.45	At 175m: 25.51	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.93	At 70m: 25.52	At 115m: 25.57	At 175m: 25.68	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	4283.567	2088.909	76.36014	943.9132	Total route assess NO_2 **(I)**: 7392.749581
Do-something NO_2 assessment *(c = asome*bsome)*	4253.102	2092.441	76.70939	950.1023	Total route assess NO_2 **(II)**: 7372.355074
Net total route assessment for NO_2 (II-I)	286	0	0		-20.39450728

$NO_{2,}$ ROUTE 14. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.08	At 70m: 27.01	At 115m: 27.41	At 175m: 28.03	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.05	At 70m: 27.15	At 115m: 27.77	At 175m: 28.85	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

$NO_{2,}$ ROUTE 15. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	218	0	0	0	218
Properties (asome)	218	0	0	0	218
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.22	At 70m: 26.11	At 115m: 27.22	At 175m: 27.17	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.56	At 70m: 26.44	At 115m: 26.84	At 175m: 27.68	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	5716.274	0	0	0	Total route assess NO_2 **(I)**: 5716.274171
Do-something NO_2 assessment *(c = asome*bsome)*	5789.479	0	0	0	Total route assess NO_2 **(II)**: 5789.479382
Net total route assessment for NO_2 (II-I)	0	0	218		73.20521096

NO_2, ROUTE 16. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	47	31	38	44	160
Properties (asome)	47	31	38	44	160
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.96	At 70m: 28.00	At 115m: 28.34	At 175m: 27.70	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 29.45	At 70m: 28.80	At 115m: 29.16	At 175m: 28.18	N/A
Do-minimum* NO_2 assessment *(c = amin*bmin)	1361.322	867.9304	1076.847	1218.855	Total route assess NO_2 **(I)**: 4524.953955
Do-something* NO_2 assessment *(c = asome*bsome)	1384.201	892.8347	1107.966	1239.807	Total route assess NO_2 **(II)**: 4624.807965
Net total route assessment for NO_2 (II-I)	0	0	160		99.85400999

NO_2, ROUTE 17. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	9	16	8	33
Properties (asome)	0	9	16	8	33
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.67	At 70m: 27.43	At 115m: 27.58	At 175m: 27.87	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.48	At 70m: 28.15	At 115m: 28.16	At 175m: 28.33	N/A
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	246.8734	441.2749	222.9919	Total route assess NO_2 **(I)**: 911.1401427
Do-something* NO_2 assessment *(c = asome*bsome)	0	253.3169	450.5732	226.6365	Total route assess NO_2 **(II)**: 930.5266084
Net total route assessment for NO_2 (II-I)	0	0	33		19.3864657

NO_2, ROUTE 18. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	63	49	0	0	112
Properties (asome)	63	49	0	0	112
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 34.45	At 70m: 29.09	At 115m: 27.77	At 175m: 26.86	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 29.03	At 70m: 27.53	At 115m: 27.07	At 175m: 26.61	N/A
Do-minimum* NO_2 assessment *(c = amin*bmin)	2170.191	1425.557	0	0	Total route assess NO_2 **(I)**: 3595.748229
Do-something* NO_2 assessment *(c = asome*bsome)	1829.053	1349.113	0	0	Total route assess NO_2 **(II)**: 3178.166427
Net total route assessment for NO_2 (II-I)	112	0	0		-417.5818024

NO_2, ROUTE 19. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 29.75	At 70m: 30.77	At 115m: 32.58	At 175m: 32.41	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 31.36	At 70m: 34.12	At 115m: 38.51	At 175m: 35.03	N/A
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 20. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	61	0	0	0	61
Properties (asome)	61	0	0	0	61
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.95	At 70m: 29.01	At 115m: 29.02	At 175m: 29.03	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.35	At 70m: 27.61	At 115m: 28.05	At 175m: 28.88	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1766.123	0	0	0	Total route assess NO_2 **(I)**: 1766.123293
Do-something* NO_2 assessment *(c = asome*bsome)	1668.177	0	0	0	Total route assess NO_2 **(II)**: 1668.176829
Net total route assessment for NO_2 (II-I)	61	0	0		-97.94646414

NO_2, ROUTE 21. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	43	0	0	0	43
Properties (asome)	43	0	0	0	43
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.51	At 70m: 28.53	At 115m: 30.81	At 175m: 33.54	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.68	At 70m: 26.95	At 115m: 27.58	At 175m: 28.42	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1183.039	0	0	0	Total route assess NO_2 **(I)**: 1183.039276
Do-something* NO_2 assessment *(c = asome*bsome)	1147.261	0	0	0	Total route assess NO_2 **(II)**: 1147.261155
Net total route assessment for NO_2 (II-I)	43	0	0		-35.77812119

NO_2, ROUTE 22. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.56	At 70m: 30.47	At 115m: 39.32	At 175m: 32.08	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.96	At 70m: 27.48	At 115m: 30.81	At 175m: 31.50	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 23. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	70	0	0	0	70
Properties (asome)	70	0	0	0	70
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.68	At 70m: 26.46	At 115m: 26.41	At 175m: 26.33	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.87	At 70m: 26.02	At 115m: 26.08	At 175m: 26.09	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1867.502	0	0	0	Total route assess NO_2 **(I)**: 1867.50205
Do-something* NO_2 assessment *(c = asome*bsome)	1811.134	0	0	0	Total route assess NO_2 **(II)**: 1811.134097
Net total route assessment for NO_2 (II-I)	70	0	0		-56.3679536

NO_2, ROUTE 24. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	17	48	67	132
Properties (asome)	0	17	48	67	132
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 33.35	At 70m: 28.53	At 115m: 27.48	At 175m: 26.81	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 33.09	At 70m: 28.35	At 115m: 27.30	At 175m: 26.65	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	485.0946	1318.953	1796.547	Total route assess NO_2 **(I)**: 3600.59487
Do-something* NO_2 assessment *(c = asome*bsome)	0	481.8652	1310.51	1785.474	Total route assess NO_2 **(II)**: 3577.849421
Net total route assessment for NO_2 (II-I)	132	0	0		-22.74544853

NO_2, ROUTE 25. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	128	92	0	0	220
Properties (asome)	128	92	0	0	220
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.98	At 70m: 27.23	At 115m: 29.63	At 175m: 26.81	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.77	At 70m: 26.91	At 115m: 29.00	At 175m: 26.67	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	3453.19	2505.48	0	0	Total route assess NO_2 **(I)**: 5958.670164
Do-something* NO_2 assessment *(c = asome*bsome)	3426.427	2475.572	0	0	Total route assess NO_2 **(II)**: 5901.998768
Net total route assessment for NO_2 (II-I)	220	0	0		-56.67139576

NO_2, ROUTE 26. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.97	At 70m: 27.96	At 115m: 28.27	At 175m: 27.98	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.39	At 70m: 27.57	At 115m: 27.94	At 175m: 27.72	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 27. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.02	At 70m: 26.53	At 115m: 26.65	At 175m: 27.10	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.67	At 70m: 26.23	At 115m: 26.30	At 175m: 26.67	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 28. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	68	30	0	0	98
Properties (asome)	68	30	0	0	98
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.42	At 70m: 26.53	At 115m: 26.26	At 175m: 26.29	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.28	At 70m: 26.39	At 115m: 26.12	At 175m: 26.15	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1796.704	795.9735	0	0	Total route assess NO_2 **(I)**: 2592.67794
Do-something* NO_2 assessment *(c = asome*bsome)	1786.745	791.7339	0	0	Total route assess NO_2 **(II)**: 2578.47857
Net total route assessment for NO_2 (II-I)	98	0	0		-14.19936994

NO_2, ROUTE 29. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 0	At 70m: 0	At 115m: 0	At 175m: 0	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m:	At 70m:	At 115m:	At 175m:	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 30. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 32.31	At 70m: 27.48	At 115m: 26.14	At 175m: 25.23	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 32.45	At 70m: 27.56	At 115m: 26.21	At 175m: 25.28	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 31. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	58	79	62	72	271
Properties (asome)	58	79	62	72	271
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 24.80	At 70m: 24.24	At 115m: 24.12	At 175m: 24.08	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 24.76	At 70m: 24.22	At 115m: 24.11	At 175m: 24.07	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1438.19	1914.664	1495.599	1733.526	Total route assess NO_2 **(I)**: 6581.97855
Do-something* NO_2 assessment *(c = asome*bsome)	1436.258	1913.493	1495.078	1733.375	Total route assess NO_2 **(II)**: 6578.20391
Net total route assessment for NO_2 (II-I)	271	0	0		-3.77463975

NO_2, ROUTE 32. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	49	150	151	154	504
Properties (asome)	49	150	151	154	504
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.63	At 70m: 24.45	At 115m: 24.11	At 175m: 23.94	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.56	At 70m: 24.42	At 115m: 24.10	At 175m: 23.94	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1256.097	3667.352	3641.206	3687.416	Total route assess NO_2 **(I)**: 12252.07084
Do-something* NO_2 assessment *(c = asome*bsome)	1252.518	3662.876	3638.382	3687.011	Total route assess NO_2 **(II)**: 12240.7881
Net total route assessment for NO_2 (II-I)	504	0	0		-11.28273181

NO_2, ROUTE 33. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	71	66	72	32	241
Properties (asome)	71	66	72	32	241
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 24.99	At 70m: 24.60	At 115m: 24.54	At 175m: 24.56	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.19	At 70m: 24.69	At 115m: 24.60	At 175m: 24.59	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1774.18	1623.6	1766.933	785.8719	Total route assess NO_2 **(I)**: 5950.584961
Do-something* NO_2 assessment *(c = asome*bsome)	1788.48	1629.709	1771.177	786.7529	Total route assess NO_2 **(II)**: 5976.120018
Net total route assessment for NO_2 (II-I)	0	0	241		25.53505703

NO_2, ROUTE 34. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	110	50	1	0	161
Properties (asome)	110	50	1	0	161
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.58	At 70m: 25.94	At 115m: 25.53	At 175m: 25.27	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.85	At 70m: 25.61	At 115m: 25.30	At 175m: 25.11	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	3034.158	1296.966	25.52651	0	Total route assess NO_2 **(I)**: 4356.650794
Do-something* NO_2 assessment *(c = asome*bsome)	2953.416	1280.486	25.30019	0	Total route assess NO_2 **(II)**: 4259.202152
Net total route assessment for NO_2 (II-I)	161	0	0		-97.44864248

NO_2 ROUTE 35. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	24	20	13	12	69
Properties (asome)	24	20	13	12	69
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.31	At 70m: 25.15	At 115m: 24.88	At 175m: 24.74	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.28	At 70m: 25.13	At 115m: 24.85	At 175m: 24.71	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	631.4151	503.0366	323.4006	296.8794	Total route assess NO_2 (I): 1754.731718
Do-something NO_2 assessment *(c = asome*bsome)*	630.6788	502.5112	323.0345	296.4987	Total route assess NO_2 (II): 1752.7232
Net total route assessment for NO_2 (II-I)	69	0	0		-2.00851812

NO_2 ROUTE 36. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	29	18	47
Properties (asome)	0	0	29	18	47
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.38	At 70m: 25.01	At 115m: 24.67	At 175m: 24.43	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.29	At 70m: 24.96	At 115m: 24.62	At 175m: 24.41	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	715.3197	439.8251	Total route assess NO_2 (I): 1155.14472
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	714.0917	439.3163	Total route assess NO_2 (II): 1153.408018
Net total route assessment for NO_2 (II-I)	47	0	0		-1.73670203

NO_2 ROUTE 37. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	58	184	41	18	301
Properties (asome)	58	184	41	18	301
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.77	At 70m: 25.60	At 115m: 25.48	At 175m: 25.57	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.66	At 70m: 25.44	At 115m: 25.29	At 175m: 25.33	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	1552.85	4709.695	1044.734	460.2507	Total route assess NO_2 (I): 7767.529916
Do-something NO_2 assessment *(c = asome*bsome)*	1546.091	4680.503	1036.998	455.9216	Total route assess NO_2 (II): 7719.512926
Net total route assessment for NO_2 (II-I)	301	0	0		-48.01699

NO_2 ROUTE 38. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	2	0	0	0	2
Properties (asome)	2	0	0	0	2
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.66	At 70m: 25.26	At 115m: 25.20	At 175m: 25.29	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.57	At 70m: 25.21	At 115m: 25.15	At 175m: 25.17	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	51.31758	0	0	0	Total route assess NO_2 (I): 51.3175826
Do-something NO_2 assessment *(c = asome*bsome)*	51.14064	0	0	0	Total route assess NO_2 (II): 51.14064472
Net total route assessment for NO_2 (II-I)	2	0	0		-0.17693788

NO_2 ROUTE 39. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	38	21	39	50	148
Properties (asome)	38	21	39	50	148
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 24.40	At 70m: 24.27	At 115m: 24.25	At 175m: 24.26	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 24.39	At 70m: 24.25	At 115m: 24.22	At 175m: 24.23	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	927.2459	509.6342	945.6399	1213.121	Total route assess NO_2 (I): 3595.640523
Do-something NO_2 assessment *(c = asome*bsome)*	926.8147	509.173	944.6195	1211.634	Total route assess NO_2 (II): 3592.241089
Net total route assessment for NO_2 (II-I)	148	0	0		-3.39943478

NO_2, ROUTE 40. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	10	1	0	1	12
Properties (asome)	10	1	0	1	12
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.67	At 70m: 25.82	At 115m: 26.83	At 175m: 27.21	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.68	At 70m: 25.84	At 115m: 26.91	At 175m: 27.30	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	256.6783	25.82375	0	27.2091	Total route assess NO_2 **(I)**: 309.7111236
Do-something NO_2 assessment *(c = asome*bsome)*	256.7644	25.84466	0	27.3044	Total route assess NO_2 **(II)**: 309.9134884
Net total route assessment for NO_2 (II-I)	0	0	12		0.20236482

NO_2, ROUTE 41. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.56	At 70m: 25.68	At 115m: 25.95	At 175m: 26.93	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.50	At 70m: 25.58	At 115m: 25.79	At 175m: 26.62	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 42. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	21	80	14	0	115
Properties (asome)	21	80	14	0	115
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.52	At 70m: 25.86	At 115m: 25.45	At 175m: 25.54	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.65	At 70m: 25.86	At 115m: 25.43	At 175m: 25.53	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	578.0237	2069.027	356.3002	0	Total route assess NO_2 **(I)**: 3003.350951
Do-something NO_2 assessment *(c = asome*bsome)*	580.6583	2069.145	356.0649	0	Total route assess NO_2 **(II)**: 3005.867798
Net total route assessment for NO_2 (II-I)	0	0	115		2.51684678

NO_2, ROUTE 43. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	2	0	0	0	2
Properties (asome)	2	0	0	0	2
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.64	At 70m: 25.97	At 115m: 25.85	At 175m: 25.91	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.50	At 70m: 25.88	At 115m: 25.79	At 175m: 25.86	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	53.27672	0	0	0	Total route assess NO_2 **(I)**: 53.27671782
Do-something NO_2 assessment *(c = asome*bsome)*	53.00291	0	0	0	Total route assess NO_2 **(II)**: 53.0029054
Net total route assessment for NO_2 (II-I)	2	0	0		-0.27381242

NO_2, ROUTE 44. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	21	52	0	0	73
Properties (asome)	21	52	0	0	73
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.02	At 70m: 25.20	At 115m: 25.31	At 175m: 25.75	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.29	At 70m: 25.08	At 115m: 25.26	At 175m: 25.77	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	546.4624	1310.632	0	0	Total route assess NO_2 **(I)**: 1857.094752
Do-something NO_2 assessment *(c = asome*bsome)*	531.0083	1304.125	0	0	Total route assess NO_2 **(II)**: 1835.133441
Net total route assessment for NO_2 (II-I)	73	0	0		-21.96131112

NO_2, ROUTE 45. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	76	0	0	0	76
Properties (asome)	76	0	0	0	76
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.14	At 70m: 26.08	At 115m: 26.09	At 175m: 27.37	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.09	At 70m: 26.03	At 115m: 26.05	At 175m: 27.45	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	1986.601	0	0	0	Total route assess NO_2 **(I)**: 1986.600978
Do-something NO_2 assessment *(c = asome*bsome)*	1982.656	0	0	0	Total route assess NO_2 **(II)**: 1982.65623
Net total route assessment for NO_2 (II-I)	76	0	0		-3.94474808

NO_2, ROUTE 46. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.36	At 70m: 26.11	At 115m: 25.87	At 175m: 26.27	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.45	At 70m: 26.14	At 115m: 25.81	At 175m: 26.20	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 47. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.96	At 70m: 25.65	At 115m: 25.79	At 175m: 26.22	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.04	At 70m: 25.67	At 115m: 25.79	At 175m: 26.20	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 48. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	1	1	12	1	15
Properties (asome)	1	1	12	1	15
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.83	At 70m: 25.49	At 115m: 25.49	At 175m: 26.12	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.88	At 70m: 25.48	At 115m: 25.51	At 175m: 26.23	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	25.82722	25.48595	305.8314	26.12162	Total route assess NO_2 **(I)**: 383.2662081
Do-something NO_2 assessment *(c = asome*bsome)*	25.88333	25.47534	306.158	26.22522	Total route assess NO_2 **(II)**: 383.74186
Net total route assessment for NO_2 (II-I)	0	0	15		0.47565189

NO_2, ROUTE 49. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	4	5	0	0	9
Properties (asome)	4	5	0	0	9
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.28	At 70m: 26.67	At 115m: 26.51	At 175m: 26.49	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.97	At 70m: 26.53	At 115m: 26.39	At 175m: 26.38	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	113.119	133.3415	0	0	Total route assess NO_2 **(I)**: 246.4605691
Do-something NO_2 assessment *(c = asome*bsome)*	111.8822	132.6433	0	0	Total route assess NO_2 **(II)**: 244.5254949
Net total route assessment for NO_2 (II-I)	9	0	0		-1.93507419

NO_2, ROUTE 50. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 30.59	At 70m: 27.00	At 115m: 26.14	At 175m: 25.58	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 30.49	At 70m: 26.93	At 115m: 26.08	At 175m: 25.52	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 51. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	20	21	19	9	69
Properties (asome)	20	21	19	9	69
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.81	At 70m: 28.13	At 115m: 28.78	At 175m: 30.44	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.71	At 70m: 28.03	At 115m: 28.67	At 175m: 30.29	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	556.1453	590.808	546.8999	273.9279	Total route assess NO_2 **(I)**: 1967.781002
Do-something NO_2 assessment *(c = asome*bsome)*	554.1258	588.5552	544.67	272.6248	Total route assess NO_2 **(II)**: 1959.975772
Net total route assessment for NO_2 (II-I)	69	0	0		-7.80523002

NO_2, ROUTE 52. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	41	12	0	0	53
Properties (asome)	41	12	0	0	53
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.71	At 70m: 29.73	At 115m: 27.66	At 175m: 26.68	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.58	At 70m: 29.92	At 115m: 27.75	At 175m: 26.73	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	1136.147	356.8009	0	0	Total route assess NO_2 **(I)**: 1492.948323
Do-something NO_2 assessment *(c = asome*bsome)*	1130.646	359.0779	0	0	Total route assess NO_2 **(II)**: 1489.72425
Net total route assessment for NO_2 (II-I)	53	0	0		-3.22407295

Environment: Local Air Quality - Plan Level Summary Table: 2017 Base Overground

(Tag Unit 3.3.3 Worksheet 1b)

Long Term (annual) NO_2

NO_2, SUMMARY OF ROUTE: THE AGGREGATED TABLE	0-50 m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Total properties across all routes (min)	1970	1776	1013	785	5544
Total properties across all routes (some)	1970	1776	1013	785	5544
Do-minimum NO_2 assessment across all routes	53432.66	46308.76	25841.3	19935.17	Total assessment NO_2 (I) 145517.89
Do-something NO_2 assessment across all routes	53203.08	46256.89	25826.32	19921.32	Total assessment NO_2 (II) 145207.60
NET TOTAL ASSESSMENT FOR NO_2, all routes (II-I)					-310.29
Number of properties with an improvement					3286
Number of properties with no change					0
Number of properties with a deterioration					2258

Reference Sources	Concentrations: ADMS ROADS v2.3 (model: 2017BASEOG) Property counts: manual estimation from base plan (refer to Figure 1)
Quantitative Measures	To avoid double counting of properties, bandwidths were altered based on relative impact of links. Refer to Section 2.4 in text.
Assessment Scores	As reported.
Qualitative Comments	Demolition requirements: Castle Buildings (Grade II Listed); Earl de Grey PH (Grade II Listed). This option does not result in an exceedence of either the annual AQS for NO_2 (40 µg/m^3) at 20 m from the road centre. No exceedences of the AQS for NO_2 are predicted at any of assessed locations (20 m, 70 m, 115 m, and 175 m from road centre).

Environment: Local Air Quality - Plan Level Summary Table: 2017 Base Overground

(Tag Unit 3.3.3 Worksheet 1b)

Long Term (annual) PM_{10}

PM_{10}, SUMMARY OF ROUTE: THE AGGREGATED TABLE	0-50 m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Total properties across all routes (min)	1970	1776	1013	785	5544
Total properties across all routes (some)	1970	1776	1013	785	5544
Do-minimum PM_{10} assessment across all routes	32453.27	29034.84	16520.5	12792.07	Total assessment PM_{10} (I) 90800.68
Do-something PM_{10} assessment across all routes	32438.99	29034.2	16520.08	12791.28	Total assessment PM_{10} (II) 90784.54
NET TOTAL ASSESSMENT FOR PM_{10}, all routes (II-I)					-16.14
Number of properties with an improvement					3008
Number of properties with no change					0
Number of properties with a deterioration					2536

Reference Sources	Concentrations: ADMS ROADS v2.3 (model: 2017BASEOG) Property counts: manual estimation from base plan (refer to Figure 1)
Quantitative Measures	To avoid double counting of properties, bandwidths were altered based on relative impact of links. Refer to Section 2.4 in text.
Assessment Scores	As reported.
Qualitative Comments	Demolition requirements: Castle Buildings (Grade II Listed); Earl de Grey PH (Grade II Listed). This option does not result in an exceedence of either the annual AQS for PM_{10} (40 µg/m^3) at 20 m from the road centre. No exceedences of the AQS for PM_{10} are predicted at any of assessed locations (20 m, 70 m, 115 m, and 175 m from road centre).

PM_{10}, SUMMARY OF ROUTES: THE AGGREGATED TABLE	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Total properties across all routes (min)	1970	1776	1013	785	5544
Total properties across all routes (some)	1970	1776	1013	785	5544
Do-minimum **PM_{10} assessment *across all routes***	32453.27	29034.84	16520.5	12792.07	Total assessment PM_{10} **(I)**: 90800.6838
Do-something **PM_{10} assessment *across all routes***	32438.99	29034.2	16520.08	12791.28	Total assessment PM_{10} **(II)**: 90784.5434
Net total assessment for PM_{10}, all routes (II-I)					-16.1404
Number of properties with an improvement					***3008***
Number of properties with no change					***0***
Number of properties with a deterioration					***2536***

Reference Sources:

Quantitative Measures:

Assessment Scores:

Qualitative Comments:

PM_{10}, ROUTE 1. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.52	At 70m: 16.84	At 115m: 16.48	At 175m: 16.40	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.53	At 70m: 16.86	At 115m: 16.48	At 175m: 16.40	**N/A**
Do-minimum* PM_{10} assessment** ***(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment** ***(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 2. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.09	At 70m: 16.53	At 115m: 16.45	At 175m: 16.41	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.17	At 70m: 16.54	At 115m: 16.45	At 175m: 16.41	**N/A**
Do-minimum* PM_{10} assessment** ***(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment** ***(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 3. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	23	7	6	0	36
Properties (asome)	23	7	6	0	36
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.39	At 70m: 16.34	At 115m: 16.35	At 175m: 16.38	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.40	At 70m: 16.34	At 115m: 16.36	At 175m: 16.38	**N/A**
Do-minimum* PM_{10} assessment** ***(c = amin*bmin)	377.0712	114.3772	98.127	0	Total route assess PM_{10} **(I)**: 589.5754
Do-something* PM_{10} assessment** ***(c = asome*bsome)	377.2115	114.3898	98.1354	0	Total route assess PM_{10} **(II)**: 589.7367
Net total route assessment for PM_{10} (II-I)	0	0	36		0.1613

PM_{10}, ROUTE 4. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	169	232	246	73	720
Properties (asome)	169	232	246	73	720
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.46	At 70m: 16.31	At 115m: 16.28	At 175m: 16.27	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.46	At 70m: 16.31	At 115m: 16.29	At 175m: 16.27	**N/A**
Do-minimum* PM_{10} assessment** ***(c = amin*bmin)	2781.588	3783.642	4005.864	1187.914	Total route assess PM_{10} **(I)**: 11759.0079
Do-something* PM_{10} assessment** ***(c = asome*bsome)	2782.213	3784.013	4006.184	1188.002	Total route assess PM_{10} **(II)**: 11760.4118
Net total route assessment for PM_{10} (II-I)	0	0	720		1.4039

PM_{10}, ROUTE 5. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.88	At 70m: 16.63	At 115m: 16.38	At 175m: 16.30	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.89	At 70m: 16.64	At 115m: 16.38	At 175m: 16.30	**N/A**
Do-minimum* PM_{10} assessment** ***(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment** ***(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 6. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.54	At 70m: 16.57	At 115m: 16.51	At 175m: 16.50	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.55	At 70m: 16.58	At 115m: 16.53	At 175m: 16.51	N/A
Do-minimum **PM_{10} assessment** ***(c = amin*bmin)***	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something **PM_{10} assessment** ***(c = asome*bsome)***	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 7. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.85	At 70m: 16.47	At 115m: 16.36	At 175m: 16.37	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.98	At 70m: 16.49	At 115m: 16.37	At 175m: 16.36	N/A
Do-minimum **PM_{10} assessment** ***(c = amin*bmin)***	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something **PM_{10} assessment** ***(c = asome*bsome)***	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 8. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	24	75	25	16	140
Properties (asome)	24	75	25	16	140
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.65	At 70m: 16.49	At 115m: 16.40	At 175m: 16.36	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.74	At 70m: 16.51	At 115m: 16.40	At 175m: 16.36	N/A
Do-minimum **PM_{10} assessment** ***(c = amin*bmin)***	423.5352	1237.035	409.89	261.7568	Total route assess PM_{10} **(I)**: 2332.217
Do-something **PM_{10} assessment** ***(c = asome*bsome)***	425.6616	1238.273	410.0675	261.7792	Total route assess PM_{10} **(II)**: 2335.7808
Net total route assessment for PM_{10} (II-I)	0	0	140		3.5638

PM_{10}, ROUTE 9. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	51	160	113	103	427
Properties (asome)	51	160	113	103	427
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.96	At 70m: 16.45	At 115m: 16.37	At 175m: 16.35	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.13	At 70m: 16.48	At 115m: 16.38	At 175m: 16.35	N/A
Do-minimum **PM_{10} assessment** ***(c = amin*bmin)***	864.7968	2632.672	1850.025	1683.988	Total route assess PM_{10} **(I)**: 7031.4817
Do-something **PM_{10} assessment** ***(c = asome*bsome)***	873.5178	2636.688	1851.234	1684.122	Total route assess PM_{10} **(II)**: 7045.5617
Net total route assessment for PM_{10} (II-I)	0	0	427		14.08

PM_{10}, ROUTE 10. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.38	At 70m: 16.35	At 115m: 16.40	At 175m: 16.70	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.38	At 70m: 16.36	At 115m: 16.42	At 175m: 16.79	N/A
Do-minimum **PM_{10} assessment** ***(c = amin*bmin)***	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something **PM_{10} assessment** ***(c = asome*bsome)***	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 11. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	36	10	8	3	57
Properties (asome)	36	10	8	3	57
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.42	At 70m: 16.27	At 115m: 16.25	At 175m: 16.24	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.42	At 70m: 16.27	At 115m: 16.25	At 175m: 16.24	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	591.2892	162.723	129.9864	48.7173	Total route assess PM_{10} **(I)**: 932.7159
Do-something* PM_{10} assessment *(c = asome*bsome)	591.2316	162.717	129.9832	48.7173	Total route assess PM_{10} **(II)**: 932.6491
Net total route assessment for PM_{10} (II-I)	57	0	0		-0.0668

PM_{10}, ROUTE 12. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	199	240	57	67	563
Properties (asome)	199	240	57	67	563
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.45	At 70m: 16.30	At 115m: 16.28	At 175m: 16.27	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.42	At 70m: 16.30	At 115m: 16.27	At 175m: 16.27	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	3273.729	3912.984	927.8289	1089.809	Total route assess PM_{10} **(I)**: 9204.3506
Do-something* PM_{10} assessment *(c = asome*bsome)	3268.217	3911.064	927.5667	1089.755	Total route assess PM_{10} **(II)**: 9196.6025
Net total route assessment for PM_{10} (II-I)	563	0	0		-7.7481

PM_{10}, ROUTE 13. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	164	82	3	37	286
Properties (asome)	164	82	3	37	286
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.41	At 70m: 16.31	At 115m: 16.30	At 175m: 16.29	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.37	At 70m: 16.30	At 115m: 16.29	At 175m: 16.29	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	2690.863	1337.092	48.8964	602.8817	Total route assess PM_{10} **(I)**: 4679.7329
Do-something* PM_{10} assessment *(c = asome*bsome)	2684.778	1336.28	48.8829	602.8262	Total route assess PM_{10} **(II)**: 4672.7677
Net total route assessment for PM_{10} (II-I)	286	0	0		-6.9652

PM_{10}, ROUTE 14. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.42	At 70m: 16.39	At 115m: 16.42	At 175m: 16.45	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.42	At 70m: 16.38	At 115m: 16.41	At 175m: 16.42	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 15. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	218	0	0	0	218
Properties (asome)	218	0	0	0	218
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.36	At 70m: 16.33	At 115m: 16.58	At 175m: 16.37	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.35	At 70m: 16.32	At 115m: 16.50	At 175m: 16.37	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	3565.848	0	0	0	Total route assess PM_{10} **(I)**: 3565.8478
Do-something* PM_{10} assessment *(c = asome*bsome)	3564.147	0	0	0	Total route assess PM_{10} **(II)**: 3564.1474
Net total route assessment for PM_{10} (II-I)	218	0	0		-1.7004

PM_{10}, ROUTE 16. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	47	31	38	44	160
Properties (asome)	47	31	38	44	160
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.60	At 70m: 16.44	At 115m: 16.51	At 175m: 16.40	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.61	At 70m: 16.42	At 115m: 16.46	At 175m: 16.38	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	780.2658	509.6679	627.2318	721.7408	Total route assess PM_{10} (I): 2638.9063
Do-something PM_{10} assessment *(c = asome*bsome)*	780.4867	509.0851	625.556	720.7288	Total route assess PM_{10} (II): 2635.8566
Net total route assessment for PM_{10} (II-I)	0	0	160		-3.0497

PM_{10}, ROUTE 17. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	9	16	8	33
Properties (asome)	0	9	16	8	33
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.44	At 70m: 16.38	At 115m: 16.39	At 175m: 16.41	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.42	At 70m: 16.37	At 115m: 16.38	At 175m: 16.41	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	147.4218	262.1904	131.2432	Total route assess PM_{10} (I): 540.8554
Do-something PM_{10} assessment *(c = asome*bsome)*	0	147.3435	262.1232	131.2848	Total route assess PM_{10} (II): 540.7515
Net total route assessment for PM_{10} (II-I)	33	0	0		-0.1039

PM_{10}, ROUTE 18. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	63	49	0	0	112
Properties (asome)	63	49	0	0	112
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.08	At 70m: 16.48	At 115m: 16.39	At 175m: 16.34	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.94	At 70m: 16.46	At 115m: 16.38	At 175m: 16.34	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	1076.216	807.6327	0	0	Total route assess PM_{10} (I): 1883.8491
Do-something PM_{10} assessment *(c = asome*bsome)*	1067.409	806.5596	0	0	Total route assess PM_{10} (II): 1873.9686
Net total route assessment for PM_{10} (II-I)	112	0	0		-9.8805

PM_{10}, ROUTE 19. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.57	At 70m: 16.68	At 115m: 17.05	At 175m: 17.00	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.47	At 70m: 16.54	At 115m: 16.75	At 175m: 16.55	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 20. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	61	0	0	0	61
Properties (asome)	61	0	0	0	61
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.47	At 70m: 16.48	At 115m: 16.48	At 175m: 16.48	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.45	At 70m: 16.46	At 115m: 16.46	At 175m: 16.45	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	1004.67	0	0	0	Total route assess PM_{10} (I): 1004.67
Do-something PM_{10} assessment *(c = asome*bsome)*	1003.438	0	0	0	Total route assess PM_{10} (II): 1003.4378
Net total route assessment for PM_{10} (II-I)	61	0	0		-1.2322

PM_{10}, ROUTE 21. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	43	0	0	0	43
Properties (asome)	43	0	0	0	43
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.37	At 70m: 16.44	At 115m: 16.64	At 175m: 17.01	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.37	At 70m: 16.42	At 115m: 16.59	At 175m: 17.05	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	703.9358	0	0	0	Total route assess PM_{10} (I): 703.9358
Do-something PM_{10} assessment *(c = asome*bsome)*	703.7122	0	0	0	Total route assess PM_{10} (II): 703.7122
Net total route assessment for PM_{10} (II-I)	43	0	0		-0.2236

PM_{10}, ROUTE 22. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.46	At 70m: 16.63	At 115m: 17.87	At 175m: 16.78	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.46	At 70m: 16.62	At 115m: 17.40	At 175m: 16.76	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 23. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	70	0	0	0	70
Properties (asome)	70	0	0	0	70
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.39	At 70m: 16.33	At 115m: 16.32	At 175m: 16.32	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.39	At 70m: 16.34	At 115m: 16.33	At 175m: 16.32	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	1147.069	0	0	0	Total route assess PM_{10} (I): 1147.069
Do-something PM_{10} assessment *(c = asome*bsome)*	1147.104	0	0	0	Total route assess PM_{10} (II): 1147.104
Net total route assessment for PM_{10} (II-I)	0	0	70		0.035

PM_{10}, ROUTE 24. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	17	48	67	132
Properties (asome)	0	17	48	67	132
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.94	At 70m: 16.43	At 115m: 16.36	At 175m: 16.33	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.99	At 70m: 16.44	At 115m: 16.37	At 175m: 16.34	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	279.361	785.496	1094.231	Total route assess PM_{10} (I): 2159.0876
Do-something PM_{10} assessment *(c = asome*bsome)*	0	279.5599	785.8032	1094.458	Total route assess PM_{10} (II): 2159.8215
Net total route assessment for PM_{10} (II-I)	0	0	132		0.7339

PM_{10}, ROUTE 25. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	128	92	0	0	220
Properties (asome)	128	92	0	0	220
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.36	At 70m: 16.40	At 115m: 16.82	At 175m: 16.35	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.36	At 70m: 16.40	At 115m: 16.82	At 175m: 16.35	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	2094.426	1508.358	0	0	Total route assess PM_{10} **(I)**: 3602.784
Do-something* PM_{10} assessment *(c = asome*bsome)	2094.618	1508.358	0	0	Total route assess PM_{10} **(II)**: 3602.976
Net total route assessment for PM_{10} (II-I)	0	0	220		0.192

PM_{10}, ROUTE 26. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.57	At 70m: 16.41	At 115m: 16.44	At 175m: 16.40	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.56	At 70m: 16.41	At 115m: 16.45	At 175m: 16.40	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 27. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.42	At 70m: 16.34	At 115m: 16.34	At 175m: 16.37	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.42	At 70m: 16.34	At 115m: 16.34	At 175m: 16.37	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 28. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	68	30	0	0	98
Properties (asome)	68	30	0	0	98
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.36	At 70m: 16.36	At 115m: 16.32	At 175m: 16.32	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.36	At 70m: 16.36	At 115m: 16.32	At 175m: 16.32	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	1112.541	490.665	0	0	Total route assess PM_{10} **(I)**: 1603.2062
Do-something* PM_{10} assessment *(c = asome*bsome)	1112.507	490.686	0	0	Total route assess PM_{10} **(II)**: 1603.1932
Net total route assessment for PM_{10} (II-I)	98	0	0		-0.013

PM_{10}, ROUTE 29. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 0	At 70m: 0	At 115m: 0	At 175m: 0	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 0	At 70m: 0	At 115m: 0	At 175m: 0	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 30. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.00	At 70m: 16.44	At 115m: 16.34	At 175m: 16.29	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.00	At 70m: 16.44	At 115m: 16.34	At 175m: 16.29	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 31. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	58	79	62	72	271
Properties (asome)	58	79	62	72	271
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.38	At 70m: 16.28	At 115m: 16.26	At 175m: 16.25	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.38	At 70m: 16.28	At 115m: 16.26	At 175m: 16.25	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	949.9356	1285.93	1008.139	1170.122	Total route assess PM_{10} **(I)**: 4414.127
Do-something* PM_{10} assessment *(c = asome*bsome)	949.924	1285.883	1008.089	1170.058	Total route assess PM_{10} **(II)**: 4413.9536
Net total route assessment for PM_{10} (II-I)	271	0	0		-0.1734

PM_{10}, ROUTE 32. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	49	150	151	154	504
Properties (asome)	49	150	151	154	504
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.47	At 70m: 16.30	At 115m: 16.26	At 175m: 16.25	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.46	At 70m: 16.29	At 115m: 16.26	At 175m: 16.25	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	807.1084	2444.46	2455.955	2502.238	Total route assess PM_{10} **(I)**: 8209.7612
Do-something* PM_{10} assessment *(c = asome*bsome)	806.6331	2444.01	2455.683	2502.13	Total route assess PM_{10} **(II)**: 8208.4563
Net total route assessment for PM_{10} (II-I)	504	0	0		-1.3049

PM_{10}, ROUTE 33. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	71	66	72	32	241
Properties (asome)	71	66	72	32	241
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.34	At 70m: 16.28	At 115m: 16.27	At 175m: 16.26	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.35	At 70m: 16.28	At 115m: 16.27	At 175m: 16.26	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	1160.474	1074.302	1171.21	520.4512	Total route assess PM_{10} **(I)**: 3926.4363
Do-something* PM_{10} assessment *(c = asome*bsome)	1160.758	1074.302	1171.159	520.4128	Total route assess PM_{10} **(II)**: 3926.6315
Net total route assessment for PM_{10} (II-I)	0	0	241		0.1952

PM_{10}, ROUTE 34. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	110	50	1	0	161
Properties (asome)	110	50	1	0	161
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.60	At 70m: 16.36	At 115m: 16.32	At 175m: 16.29	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.59	At 70m: 16.35	At 115m: 16.31	At 175m: 16.29	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	1826.33	817.82	16.3154	0	Total route assess PM_{10} **(I)**: 2660.4654
Do-something* PM_{10} assessment *(c = asome*bsome)	1825.164	817.61	16.3123	0	Total route assess PM_{10} **(II)**: 2659.0863
Net total route assessment for PM_{10} (II-I)	161	0	0		-1.3791

PM_{10}, ROUTE 35. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	24	20	13	12	69
Properties (asome)	24	20	13	12	69
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.50	At 70m: 16.33	At 115m: 16.30	At 175m: 16.29	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.48	At 70m: 16.32	At 115m: 16.29	At 175m: 16.29	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	396.0072	326.514	211.8753	195.4932	Total route assess PM_{10} (I): 1129.8897
Do-something PM_{10} assessment *(c = asome*bsome)*	395.6112	326.41	211.8324	195.4644	Total route assess PM_{10} (II): 1129.318
Net total route assessment for PM_{10} (II-I)	69	0	0		-0.5717

PM_{10}, ROUTE 36. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	29	18	47
Properties (asome)	0	0	29	18	47
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.50	At 70m: 16.31	At 115m: 16.28	At 175m: 16.27	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.49	At 70m: 16.31	At 115m: 16.28	At 175m: 16.27	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	472.1432	292.8726	Total route assess PM_{10} (I): 765.0158
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	472.0881	292.8348	Total route assess PM_{10} (II): 764.9229
Net total route assessment for PM_{10} (II-I)	47	0	0		-0.0929

PM_{10}, ROUTE 37. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	58	184	41	18	301
Properties (asome)	58	184	41	18	301
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.52	At 70m: 16.33	At 115m: 16.32	At 175m: 16.32	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.50	At 70m: 16.33	At 115m: 16.31	At 175m: 16.32	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	957.9744	3004.922	669.0339	293.832	Total route assess PM_{10} (I): 4925.7627
Do-something PM_{10} assessment *(c = asome*bsome)*	957.1972	3004.131	668.8945	293.7708	Total route assess PM_{10} (II): 4923.9937
Net total route assessment for PM_{10} (II-I)	301	0	0		-1.769

PM_{10}, ROUTE 38. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	2	0	0	0	2
Properties (asome)	2	0	0	0	2
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.35	At 70m: 16.29	At 115m: 16.28	At 175m: 16.29	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.35	At 70m: 16.29	At 115m: 16.28	At 175m: 16.29	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	32.7036	0	0	0	Total route assess PM_{10} (I): 32.7036
Do-something PM_{10} assessment *(c = asome*bsome)*	32.6976	0	0	0	Total route assess PM_{10} (II): 32.6976
Net total route assessment for PM_{10} (II-I)	2	0	0		-0.006

PM_{10}, ROUTE 39. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	38	21	39	50	148
Properties (asome)	38	21	39	50	148
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.27	At 70m: 16.25	At 115m: 16.25	At 175m: 16.25	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.28	At 70m: 16.25	At 115m: 16.25	At 175m: 16.25	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	618.4462	341.292	633.6993	812.485	Total route assess PM_{10} (I): 2405.9225
Do-something PM_{10} assessment *(c = asome*bsome)*	618.4994	341.2857	633.6603	812.425	Total route assess PM_{10} (II): 2405.8704
Net total route assessment for PM_{10} (II-I)	0	0	148		-0.0521

PM_{10}, ROUTE 40. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	10	1	0	1	12
Properties (asome)	10	1	0	1	12
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.35	At 70m: 16.35	At 115m: 16.48	At 175m: 16.52	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.35	At 70m: 16.34	At 115m: 16.47	At 175m: 16.51	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	163.511	16.3467	0	16.5223	Total route assess PM_{10} (I): 196.38
Do-something PM_{10} assessment *(c = asome*bsome)*	163.46	16.3424	0	16.5116	Total route assess PM_{10} (II): 196.314
Net total route assessment for PM_{10} (II-I)	12	0	0		-0.066

PM_{10}, ROUTE 41. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.31	At 70m: 16.31	At 115m: 16.32	At 175m: 16.41	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.31	At 70m: 16.31	At 115m: 16.32	At 175m: 16.42	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 42. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	21	80	14	0	115
Properties (asome)	21	80	14	0	115
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.58	At 70m: 16.35	At 115m: 16.31	At 175m: 16.34	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.57	At 70m: 16.34	At 115m: 16.31	At 175m: 16.33	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	348.2346	1307.752	228.3204	0	Total route assess PM_{10} (I): 1884.307
Do-something PM_{10} assessment *(c = asome*bsome)*	347.9616	1307.424	228.2812	0	Total route assess PM_{10} (II): 1883.6668
Net total route assessment for PM_{10} (II-I)	115	0	0		-0.6402

PM_{10}, ROUTE 43. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	2	0	0	0	2
Properties (asome)	2	0	0	0	2
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.45	At 70m: 16.34	At 115m: 16.32	At 175m: 16.32	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.44	At 70m: 16.33	At 115m: 16.32	At 175m: 16.32	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	32.8904	0	0	0	Total route assess PM_{10} (I): 32.8904
Do-something PM_{10} assessment *(c = asome*bsome)*	32.8714	0	0	0	Total route assess PM_{10} (II): 32.8714
Net total route assessment for PM_{10} (II-I)	2	0	0		-0.019

PM_{10}, ROUTE 44. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	21	52	0	0	73
Properties (asome)	21	52	0	0	73
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.32	At 70m: 16.29	At 115m: 16.30	At 175m: 16.34	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.32	At 70m: 16.29	At 115m: 16.30	At 175m: 16.34	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	342.7095	846.9344	0	0	Total route assess PM_{10} (I): 1189.6439
Do-something PM_{10} assessment *(c = asome*bsome)*	342.7515	846.8564	0	0	Total route assess PM_{10} (II): 1189.6079
Net total route assessment for PM_{10} (II-I)	0	0	73		-0.036

PM_{10}, ROUTE 45. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	76	0	0	0	76
Properties (asome)	76	0	0	0	76
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.34	At 70m: 16.34	At 115m: 16.34	At 175m: 16.48	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.34	At 70m: 16.34	At 115m: 16.34	At 175m: 16.48	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	1241.794	0	0	0	Total route assess PM_{10} **(I)**: 1241.7944
Do-something* PM_{10} assessment *(c = asome*bsome)	1241.893	0	0	0	Total route assess PM_{10} **(II)**: 1241.8932
Net total route assessment for PM_{10} (II-I)	0	0	76		0.0988

PM_{10}, ROUTE 46. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.47	At 70m: 16.34	At 115m: 16.32	At 175m: 16.36	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.46	At 70m: 16.34	At 115m: 16.32	At 175m: 16.37	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 47. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.37	At 70m: 16.31	At 115m: 16.31	At 175m: 16.34	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.36	At 70m: 16.31	At 115m: 16.31	At 175m: 16.34	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 48. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	1	1	12	1	15
Properties (asome)	1	1	12	1	15
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.35	At 70m: 16.30	At 115m: 16.30	At 175m: 16.40	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.35	At 70m: 16.30	At 115m: 16.30	At 175m: 16.40	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	16.3463	16.2971	195.654	16.4005	Total route assess PM_{10} **(I)**: 244.6979
Do-something* PM_{10} assessment *(c = asome*bsome)	16.351	16.2971	195.642	16.3961	Total route assess PM_{10} **(II)**: 244.6862
Net total route assessment for PM_{10} (II-I)	0	0	15		-0.0117

PM_{10}, ROUTE 49. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	4	5	0	0	9
Properties (asome)	4	5	0	0	9
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.52	At 70m: 16.35	At 115m: 16.32	At 175m: 16.32	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.52	At 70m: 16.35	At 115m: 16.33	At 175m: 16.32	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	66.0712	81.757	0	0	Total route assess PM_{10} **(I)**: 147.8282
Do-something* PM_{10} assessment *(c = asome*bsome)	66.088	81.7695	0	0	Total route assess PM_{10} **(II)**: 147.8575
Net total route assessment for PM_{10} (II-I)	0	0	9		0.0293

PM_{10}, ROUTE 50. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.72	At 70m: 16.37	At 115m: 16.32	At 175m: 16.29	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.73	At 70m: 16.37	At 115m: 16.32	At 175m: 16.29	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 51. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	20	21	19	9	69
Properties (asome)	20	21	19	9	69
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.42	At 70m: 16.41	At 115m: 16.45	At 175m: 16.60	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.42	At 70m: 16.42	At 115m: 16.47	At 175m: 16.62	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	328.306	344.5932	312.6184	149.3739	Total route assess PM_{10} (I): 1134.8915
Do-something PM_{10} assessment *(c = asome*bsome)*	328.418	344.8242	312.8977	149.6025	Total route assess PM_{10} (II): 1135.7424
Net total route assessment for PM_{10} (II-I)	0	0	69		0.8509

PM_{10}, ROUTE 52. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	41	12	0	0	53
Properties (asome)	41	12	0	0	53
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.50	At 70m: 16.86	At 115m: 16.50	At 175m: 16.39	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.50	At 70m: 16.84	At 115m: 16.50	At 175m: 16.38	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	676.5861	202.2876	0	0	Total route assess PM_{10} (I): 878.8737
Do-something PM_{10} assessment *(c = asome*bsome)*	676.459	202.0356	0	0	Total route assess PM_{10} (II): 878.4946
Net total route assessment for PM_{10} (II-I)	53	0	0		-0.3791

NO_2, SUMMARY OF ROUTES: THE AGGREGATED TABLE	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Total properties across all routes (min)	1970	1776	1013	785	5544
Total properties across all routes (some)	1970	1776	1013	785	5544
Do-minimum **NO_2 assessment *across all routes***	53432.66	46308.76	25841.3	19935.17	Total assessment NO_2 **(I)**: 145517.89
Do-something **NO_2 assessment *across all routes***	53203.08	46256.89	25826.32	19921.32	Total assessment NO_2 **(II)**: 145207.6001
Net total assessment for NO_2, all routes (II-I)					-310.2899063
Number of properties with an improvement					***3286***
Number of properties with no change					***0***
Number of properties with a deterioration					***2258***

Reference Sources:

Quantitative Measures:

Assessment Scores:

Qualitative Comments:

NO_2, ROUTE 1. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 37.36	At 70m: 30.8	At 115m: 28.95	At 175m: 27.74	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 37.39	At 70m: 30.74	At 115m: 28.98	At 175m: 27.82	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 2. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 34.35	At 70m: 29.62	At 115m: 28.55	At 175m: 27.84	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 34.91	At 70m: 29.74	At 115m: 28.61	At 175m: 27.89	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 3. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	23	7	6	0	36
Properties (asome)	23	7	6	0	36
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.19	At 70m: 25.97	At 115m: 26.25	At 175m: 26.64	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.26	At 70m: 26.00	At 115m: 26.27	At 175m: 26.67	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	602.37	181.79	157.5	0	Total route assess NO_2 **(I)**: 941.66
Do-something* NO_2 assessment *(c = asome*bsome)	604.009	181.9945	157.5997	0	Total route assess NO_2 **(II)**: 943.6032958
Net total route assessment for NO_2 (II-I)	0	0	36		1.94329584

NO_2, ROUTE 4. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	169	232	246	73	720
Properties (asome)	169	232	246	73	720
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.72	At 70m: 24.96	At 115m: 24.83	At 175m: 24.81	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.76	At 70m: 24.99	At 115m: 24.86	At 175m: 24.85	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	4346.68	5790.72	6108.18	1811.13	Total route assess NO_2 **(I)**: 18056.71
Do-something* NO_2 assessment *(c = asome*bsome)	4353.986	5798.392	6116.373	1813.71	Total route assess NO_2 **(II)**: 18082.46087
Net total route assessment for NO_2 (II-I)	0	0	720		25.75087414

NO_2, ROUTE 5. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 32.75	At 70m: 29.46	At 115m: 26.63	At 175m: 25.63	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 32.90	At 70m: 29.51	At 115m: 26.65	At 175m: 25.68	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 6. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 37.51	At 70m: 30.04	At 115m: 29.42	At 175m: 29.23	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 37.59	At 70m: 30.17	At 115m: 29.61	At 175m: 29.47	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 7. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 38.98	At 70m: 28.61	At 115m: 27.28	At 175m: 26.85	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 39.86	At 70m: 28.85	At 115m: 27.45	At 175m: 27.01	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 8. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	24	75	25	16	140
Properties (asome)	24	75	25	16	140
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 38.28	At 70m: 29.19	At 115m: 27.85	At 175m: 27.11	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 38.99	At 70m: 29.43	At 115m: 28.01	At 175m: 27.23	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	918.72	2189.25	696.25	433.76	Total route assess NO_2 **(I)**: 4237.98
Do-something* NO_2 assessment *(c = asome*bsome)	935.8197	2207.216	700.196	435.6347	Total route assess NO_2 **(II)**: 4278.866279
Net total route assessment for NO_2 (II-I)	0	0	140		40.88627903

NO_2, ROUTE 9. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	51	160	113	103	427
Properties (asome)	51	160	113	103	427
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 33.5	At 70m: 28.79	At 115m: 27.54	At 175m: 26.83	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 34.62	At 70m: 29.03	At 115m: 27.69	At 175m: 26.95	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1708.5	4606.4	3112.02	2763.49	Total route assess NO_2 **(I)**: 12190.41
Do-something* NO_2 assessment *(c = asome*bsome)	1765.384	4645.517	3129.517	2775.904	Total route assess NO_2 **(II)**: 12316.32156
Net total route assessment for NO_2 (II-I)	0	0	427		125.9115595

NO_2, ROUTE 10. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.82	At 70m: 27.1	At 115m: 27.97	At 175m: 31.33	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.03	At 70m: 27.32	At 115m: 28.26	At 175m: 32.07	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 11. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	36	10	8	3	57
Properties (asome)	36	10	8	3	57
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.24	At 70m: 24.17	At 115m: 23.95	At 175m: 23.85	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.20	At 70m: 24.16	At 115m: 23.95	At 175m: 23.85	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	908.64	241.7	191.6	71.55	Total route assess NO_2 **(I)**: 1413.49
Do-something* NO_2 assessment *(c = asome*bsome)	907.0242	241.5608	191.5667	71.54278	Total route assess NO_2 **(II)**: 1411.694492
Net total route assessment for NO_2 (II-I)	57	0	0		-1.79550772

NO_2, ROUTE 12. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	199	240	57	67	563
Properties (asome)	199	240	57	67	563
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.23	At 70m: 25.1	At 115m: 24.89	At 175m: 24.81	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.97	At 70m: 25.00	At 115m: 24.84	At 175m: 24.80	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	5219.77	6024	1418.73	1662.27	Total route assess NO_2 **(I)**: 14324.77
Do-something* NO_2 assessment *(c = asome*bsome)	5168.157	5999.95	1415.981	1661.575	Total route assess NO_2 **(II)**: 14245.66351
Net total route assessment for NO_2 (II-I)	563	0	0		-79.10649483

NO_2, ROUTE 13. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	164	82	3	37	286
Properties (asome)	164	82	3	37	286
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.31	At 70m: 25.64	At 115m: 25.62	At 175m: 25.68	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.96	At 70m: 25.50	At 115m: 25.52	At 175m: 25.63	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	4314.84	2102.48	76.86	950.16	Total route assess NO_2 **(I)**: 7444.34
Do-something* NO_2 assessment *(c = asome*bsome)	4257.531	2091.192	76.56944	948.4306	Total route assess NO_2 **(II)**: 7373.722665
Net total route assessment for NO_2 (II-I)	286	0	0		-70.61733498

NO_2, ROUTE 14. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.26	At 70m: 27.21	At 115m: 27.64	At 175m: 28.29	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.10	At 70m: 27.00	At 115m: 27.32	At 175m: 27.75	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 15. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	218	0	0	0	218
Properties (asome)	218	0	0	0	218
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.36	At 70m: 26.28	At 115m: 27.42	At 175m: 27.4	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.23	At 70m: 26.17	At 115m: 26.85	At 175m: 27.19	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	5746.48	0	0	0	Total route assess NO_2 **(I)**: 5746.48
Do-something* NO_2 assessment *(c = asome*bsome)	5717.419	0	0	0	Total route assess NO_2 **(II)**: 5717.419434
Net total route assessment for NO_2 (II-I)	218	0	0		-29.0605663

NO_2, ROUTE 16. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	47	31	38	44	160
Properties (asome)	47	31	38	44	160
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 29.27	At 70m: 28.26	At 115m: 28.62	At 175m: 27.94	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.89	At 70m: 27.76	At 115m: 27.97	At 175m: 27.43	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1375.69	876.06	1087.56	1229.36	Total route assess NO_2 **(I)**: 4568.67
Do-something* NO_2 assessment *(c = asome*bsome)	1357.845	860.5171	1062.677	1206.932	Total route assess NO_2 **(II)**: 4487.971206
Net total route assessment for NO_2 (II-I)	160	0	0		-80.69879385

NO_2, ROUTE 17. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	0	9	16	8	33
Properties (asome)	0	9	16	8	33
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.91	At 70m: 27.67	At 115m: 27.82	At 175m: 28.12	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.69	At 70m: 27.42	At 115m: 27.63	At 175m: 28.08	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	249.03	445.12	224.96	Total route assess NO_2 **(I)**: 919.11
Do-something* NO_2 assessment *(c = asome*bsome)	0	246.7514	442.0314	224.6293	Total route assess NO_2 **(II)**: 913.4120713
Net total route assessment for NO_2 (II-I)	33	0	0		-5.69792874

NO_2, ROUTE 18. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	63	49	0	0	112
Properties (asome)	63	49	0	0	112
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 34.85	At 70m: 29.34	At 115m: 27.98	At 175m: 27.04	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 33.37	At 70m: 28.96	At 115m: 27.75	At 175m: 26.89	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	2195.55	1437.66	0	0	Total route assess NO_2 **(I)**: 3633.21
Do-something* NO_2 assessment *(c = asome*bsome)	2102.084	1418.957	0	0	Total route assess NO_2 **(II)**: 3521.040832
Net total route assessment for NO_2 (II-I)	112	0	0		-112.1691677

NO_2, ROUTE 19. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 30.09	At 70m: 31.17	At 115m: 33.11	At 175m: 32.98	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.57	At 70m: 29.17	At 115m: 30.62	At 175m: 29.13	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 20. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	61	0	0	0	61
Properties (asome)	61	0	0	0	61
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 29.16	At 70m: 29.26	At 115m: 29.29	At 175m: 29.31	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.82	At 70m: 28.88	At 115m: 28.84	At 175m: 28.63	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1778.76	0	0	0	Total route assess NO_2 **(I)**: 1778.76
Do-something* NO_2 assessment *(c = asome*bsome)	1757.746	0	0	0	Total route assess NO_2 **(II)**: 1757.746377
Net total route assessment for NO_2 (II-I)	61	0	0		-21.01362282

NO_2, ROUTE 21. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	43	0	0	0	43
Properties (asome)	43	0	0	0	43
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.63	At 70m: 28.73	At 115m: 31.09	At 175m: 33.934	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.50	At 70m: 28.49	At 115m: 30.49	At 175m: 34.10	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1188.09	0	0	0	Total route assess NO_2 **(I)**: 1188.09
Do-something* NO_2 assessment *(c = asome*bsome)	1182.673	0	0	0	Total route assess NO_2 **(II)**: 1182.673318
Net total route assessment for NO_2 (II-I)	43	0	0		-5.41668248

NO_2, ROUTE 22. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.83	At 70m: 30.78	At 115m: 39.86	At 175m: 32.42	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.80	At 70m: 30.61	At 115m: 36.73	At 175m: 32.24	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 23. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	70	0	0	0	70
Properties (asome)	70	0	0	0	70
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.14	At 70m: 26.75	At 115m: 26.65	At 175m: 26.54	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.17	At 70m: 26.78	At 115m: 26.69	At 175m: 26.59	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1899.8	0	0	0	Total route assess NO_2 **(I)**: 1899.8
Do-something* NO_2 assessment *(c = asome*bsome)	1901.621	0	0	0	Total route assess NO_2 **(II)**: 1901.621432
Net total route assessment for NO_2 (II-I)	0	0	70		1.8214315

NO_2, ROUTE 24. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	17	48	67	132
Properties (asome)	0	17	48	67	132
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 33.74	At 70m: 28.77	At 115m: 27.67	At 175m: 26.97	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 34.04	At 70m: 28.89	At 115m: 27.75	At 175m: 27.02	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	489.09	1328.16	1806.99	Total route assess NO_2 **(I)**: 3624.24
Do-something* NO_2 assessment *(c = asome*bsome)	0	491.1712	1332.06	1810.451	Total route assess NO_2 **(II)**: 3633.682568
Net total route assessment for NO_2 (II-I)	0	0	132		9.44256843

NO_2, ROUTE 25. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	128	92	0	0	220
Properties (asome)	128	92	0	0	220
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.11	At 70m: 27.25	At 115m: 29.39	At 175m: 26.97	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.13	At 70m: 27.23	At 115m: 29.30	At 175m: 27.03	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	3470.08	2507	0	0	Total route assess NO_2 **(I)**: 5977.08
Do-something* NO_2 assessment *(c = asome*bsome)	3472.086	2505.46	0	0	Total route assess NO_2 **(II)**: 5977.54662
Net total route assessment for NO_2 (II-I)	0	0	220		0.46661996

NO_2, ROUTE 26. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.96	At 70m: 28.09	At 115m: 28.46	At 175m: 28.18	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.91	At 70m: 28.09	At 115m: 28.50	At 175m: 28.25	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 27. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.86	At 70m: 26.55	At 115m: 26.7	At 175m: 27.18	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.92	At 70m: 26.55	At 115m: 26.69	At 175m: 27.16	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 28. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	68	30	0	0	98
Properties (asome)	68	30	0	0	98
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.52	At 70m: 26.65	At 115m: 26.37	At 175m: 26.42	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.51	At 70m: 26.66	At 115m: 26.38	At 175m: 26.44	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1803.36	799.5	0	0	Total route assess NO_2 **(I)**: 2602.86
Do-something* NO_2 assessment *(c = asome*bsome)	1802.606	799.6803	0	0	Total route assess NO_2 **(II)**: 2602.286382
Net total route assessment for NO_2 (II-I)	98	0	0		-0.57361834

NO_2, ROUTE 29. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 0	At 70m: 0	At 115m: 0	At 175m: 0	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 0	At 70m: 0	At 115m: 0	At 175m: 0	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 30. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 32.95	At 70m: 27.84	At 115m: 26.42	At 175m: 25.45	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 33.02	At 70m: 27.88	At 115m: 26.46	At 175m: 25.48	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 31. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	58	79	62	72	271
Properties (asome)	58	79	62	72	271
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 24.79	At 70m: 24.29	At 115m: 24.19	At 175m: 24.16	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 24.82	At 70m: 24.29	At 115m: 24.19	At 175m: 24.15	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1437.82	1918.91	1499.78	1739.52	Total route assess NO_2 **(I)**: 6596.03
Do-something* NO_2 assessment *(c = asome*bsome)	1439.841	1919.104	1499.553	1738.519	Total route assess NO_2 **(II)**: 6597.017954
Net total route assessment for NO_2 (II-I)	0	0	271		0.98795432

NO_2, ROUTE 32. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	49	150	151	154	504
Properties (asome)	49	150	151	154	504
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.72	At 70m: 24.54	At 115m: 24.2	At 175m: 24.02	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.58	At 70m: 24.47	At 115m: 24.15	At 175m: 24.00	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1260.28	3681	3654.2	3699.08	Total route assess NO_2 **(I)**: 12294.56
Do-something* NO_2 assessment *(c = asome*bsome)	1253.461	3670.394	3647.314	3696.752	Total route assess NO_2 **(II)**: 12267.92117
Net total route assessment for NO_2 (II-I)	504	0	0		-26.6388296

NO_2, ROUTE 33. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	71	66	72	32	241
Properties (asome)	71	66	72	32	241
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.25	At 70m: 24.78	At 115m: 24.7	At 175m: 24.71	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.14	At 70m: 24.71	At 115m: 24.64	At 175m: 24.64	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1792.75	1635.48	1778.4	790.72	Total route assess NO_2 **(I)**: 5997.35
Do-something* NO_2 assessment *(c = asome*bsome)	1785.041	1630.715	1773.765	788.5954	Total route assess NO_2 **(II)**: 5978.116243
Net total route assessment for NO_2 (II-I)	241	0	0		-19.233757

NO_2, ROUTE 34. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	110	50	1	0	161
Properties (asome)	110	50	1	0	161
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.6	At 70m: 26.02	At 115m: 25.63	At 175m: 25.38	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.49	At 70m: 25.94	At 115m: 25.56	At 175m: 25.31	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	3036	1301	25.63	0	Total route assess NO_2 **(I)**: 4362.63
Do-something* NO_2 assessment *(c = asome*bsome)	3023.663	1297.108	25.5553	0	Total route assess NO_2 **(II)**: 4346.327036
Net total route assessment for NO_2 (II-I)	161	0	0		-16.30296355

NO_2 ROUTE 35. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	24	20	13	12	69
Properties (asome)	24	20	13	12	69
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.56	At 70m: 25.33	At 115m: 25.04	At 175m: 24.9	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.30	At 70m: 25.20	At 115m: 24.94	At 175m: 24.81	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	637.44	506.6	325.52	298.8	Total route assess NO_2 **(I)**: 1768.36
Do-something NO_2 assessment *(c = asome*bsome)*	631.3193	503.9549	324.1914	297.7646	Total route assess NO_2 **(II)**: 1757.230178
Net total route assessment for NO_2 (II-I)	69	0	0		-11.12982204

NO_2 ROUTE 36. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	29	18	47
Properties (asome)	0	0	29	18	47
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.64	At 70m: 25.19	At 115m: 24.82	At 175m: 24.57	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.50	At 70m: 25.10	At 115m: 24.75	At 175m: 24.52	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	719.78	442.26	Total route assess NO_2 **(I)**: 1162.04
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	717.7573	441.2776	Total route assess NO_2 **(II)**: 1159.034831
Net total route assessment for NO_2 (II-I)	47	0	0		-3.00516863

NO_2 ROUTE 37. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	58	184	41	18	301
Properties (asome)	58	184	41	18	301
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.99	At 70m: 25.74	At 115m: 25.6	At 175m: 25.67	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.80	At 70m: 25.64	At 115m: 25.52	At 175m: 25.60	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	1565.42	4736.16	1049.6	462.06	Total route assess NO_2 **(I)**: 7813.24
Do-something NO_2 assessment *(c = asome*bsome)*	1554.355	4716.887	1046.212	460.7121	Total route assess NO_2 **(II)**: 7778.166047
Net total route assessment for NO_2 (II-I)	301	0	0		-35.07395316

NO_2 ROUTE 38. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	2	0	0	0	2
Properties (asome)	2	0	0	0	2
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.77	At 70m: 25.37	At 115m: 25.32	At 175m: 25.4	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.71	At 70m: 25.33	At 115m: 25.26	At 175m: 25.34	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	51.54	0	0	0	Total route assess NO_2 **(I)**: 51.54
Do-something NO_2 assessment *(c = asome*bsome)*	51.41067	0	0	0	Total route assess NO_2 **(II)**: 51.41067462
Net total route assessment for NO_2 (II-I)	2	0	0		-0.12932538

NO_2 ROUTE 39. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	38	21	39	50	148
Properties (asome)	38	21	39	50	148
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 24.49	At 70m: 24.36	At 115m: 24.36	At 175m: 24.38	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 24.49	At 70m: 24.34	At 115m: 24.32	At 175m: 24.34	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	930.62	511.56	950.04	1219	Total route assess NO_2 **(I)**: 3611.22
Do-something NO_2 assessment *(c = asome*bsome)*	930.4999	511.15	948.6189	1216.935	Total route assess NO_2 **(II)**: 3607.203477
Net total route assessment for NO_2 (II-I)	148	0	0		-4.01652317

NO_2, ROUTE 40. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	10	1	0	1	12
Properties (asome)	10	1	0	1	12
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.78	At 70m: 25.93	At 115m: 26.92	At 175m: 27.28	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.72	At 70m: 25.87	At 115m: 26.84	At 175m: 27.20	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	257.8	25.93	0	27.28	Total route assess NO_2 **(I)**: 311.01
Do-something NO_2 assessment *(c = asome*bsome)*	257.1511	25.86704	0	27.19954	Total route assess NO_2 **(II)**: 310.217666
Net total route assessment for NO_2 (II-I)	12	0	0		-0.79233398

NO_2, ROUTE 41. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.66	At 70m: 25.76	At 115m: 25.98	At 175m: 26.77	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.62	At 70m: 25.73	At 115m: 25.97	At 175m: 26.83	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 42. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	21	80	14	0	115
Properties (asome)	21	80	14	0	115
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.59	At 70m: 25.92	At 115m: 25.56	At 175m: 25.65	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.51	At 70m: 25.87	At 115m: 25.51	At 175m: 25.59	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	579.39	2073.6	357.84	0	Total route assess NO_2 **(I)**: 3010.83
Do-something NO_2 assessment *(c = asome*bsome)*	577.7104	2069.716	357.1108	0	Total route assess NO_2 **(II)**: 3004.537402
Net total route assessment for NO_2 (II-I)	115	0	0		-6.29259845

NO_2, ROUTE 43. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	2	0	0	0	2
Properties (asome)	2	0	0	0	2
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.86	At 70m: 26.1	At 115m: 25.95	At 175m: 25.95	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.68	At 70m: 26.01	At 115m: 25.90	At 175m: 25.95	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	53.72	0	0	0	Total route assess NO_2 **(I)**: 53.72
Do-something NO_2 assessment *(c = asome*bsome)*	53.35573	0	0	0	Total route assess NO_2 **(II)**: 53.35573046
Net total route assessment for NO_2 (II-I)	2	0	0		-0.36426954

NO_2, ROUTE 44. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	21	52	0	0	73
Properties (asome)	21	52	0	0	73
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.43	At 70m: 25.17	At 115m: 25.34	At 175m: 25.83	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.45	At 70m: 25.15	At 115m: 25.31	At 175m: 25.78	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	534.03	1308.84	0	0	Total route assess NO_2 **(I)**: 1842.87
Do-something NO_2 assessment *(c = asome*bsome)*	534.4129	1307.808	0	0	Total route assess NO_2 **(II)**: 1842.220518
Net total route assessment for NO_2 (II-I)	0	0	73		-0.64948222

NO_2, ROUTE 45. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	76	0	0	0	76
Properties (asome)	76	0	0	0	76
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.09	At 70m: 26.12	At 115m: 26.18	At 175m: 27.52	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.16	At 70m: 26.10	At 115m: 26.12	At 175m: 27.43	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1982.84	0	0	0	Total route assess NO_2 **(I)**: 1982.84
Do-something* NO_2 assessment *(c = asome*bsome)	1988.398	0	0	0	Total route assess NO_2 **(II)**: 1988.397675
Net total route assessment for NO_2 (II-I)	0	0	76		5.5576748

NO_2, ROUTE 46. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.52	At 70m: 26.21	At 115m: 25.89	At 175m: 26.17	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.42	At 70m: 26.17	At 115m: 25.91	At 175m: 26.33	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 47. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.05	At 70m: 25.74	At 115m: 25.88	At 175m: 26.31	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.02	At 70m: 25.72	At 115m: 25.87	At 175m: 26.31	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 48. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	1	1	12	1	15
Properties (asome)	1	1	12	1	15
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.94	At 70m: 25.59	At 115m: 25.58	At 175m: 26.21	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.01	At 70m: 25.63	At 115m: 25.58	At 175m: 26.18	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	25.94	25.59	306.96	26.21	Total route assess NO_2 **(I)**: 384.7
Do-something* NO_2 assessment *(c = asome*bsome)	26.0093	25.63347	307.0179	26.17805	Total route assess NO_2 **(II)**: 384.8386857
Net total route assessment for NO_2 (II-I)	0	0	15		0.13868573

NO_2, ROUTE 49. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	4	5	0	0	9
Properties (asome)	4	5	0	0	9
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.36	At 70m: 26.77	At 115m: 26.63	At 175m: 26.63	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.39	At 70m: 26.81	At 115m: 26.69	At 175m: 26.69	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	113.44	133.85	0	0	Total route assess NO_2 **(I)**: 247.29
Do-something* NO_2 assessment *(c = asome*bsome)	113.5477	134.0423	0	0	Total route assess NO_2 **(II)**: 247.5900716
Net total route assessment for NO_2 (II-I)	0	0	9		0.3000716

NO_2, ROUTE 50. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 31.03	At 70m: 27.23	At 115m: 26.32	At 175m: 25.72	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 31.19	At 70m: 27.31	At 115m: 26.38	At 175m: 25.76	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 51. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	20	21	19	9	69
Properties (asome)	20	21	19	9	69
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.03	At 70m: 28.36	At 115m: 29.03	At 175m: 30.73	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.14	At 70m: 28.50	At 115m: 29.19	At 175m: 30.95	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	560.6	595.56	551.57	276.57	Total route assess NO_2 **(I)**: 1984.3
Do-something* NO_2 assessment *(c = asome*bsome)	562.8571	598.449	554.6516	278.5747	Total route assess NO_2 **(II)**: 1994.532454
Net total route assessment for NO_2 (II-I)	0	0	69		10.23245408

NO_2, ROUTE 52. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	41	12	0	0	53
Properties (asome)	41	12	0	0	53
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.7	At 70m: 30	At 115m: 27.83	At 175m: 26.8	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.66	At 70m: 29.81	At 115m: 27.73	At 175m: 26.75	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1135.7	360	0	0	Total route assess NO_2 **(I)**: 1495.7
Do-something* NO_2 assessment *(c = asome*bsome)	1134.05	357.6998	0	0	Total route assess NO_2 **(II)**: 1491.749369
Net total route assessment for NO_2 (II-I)	53	0	0		-3.9506307

Environment: Local Air Quality - Plan Level Summary Table: 2017 LandBridge Overground

(Tag Unit 3.3.3 Worksheet 1b)

Long Term (annual) NO_2

NO_2, SUMMARY OF ROUTE: THE AGGREGATED TABLE	0-50 m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Total properties across all routes (min)	1970	1776	1013	785	5544
Total properties across all routes (some)	1970	1776	1013	785	5544
Do-minimum NO_2 assessment across all routes	53432.66	46308.76	25841.3	19935.17	Total assessment NO_2 (I) 145517.89
Do-something NO_2 assessment across all routes	53120.5	46242.47	25827.08	19892.72	Total assessment NO_2 (II) 145082.77
NET TOTAL ASSESSMENT FOR NO_2, all routes (II-I)					-435.12
Number of properties with an improvement					3274
Number of properties with no change					0
Number of properties with a deterioration					2270

Reference Sources	Concentrations: ADMS ROADS v2.3 (model: 2017BASEOG) Property counts: manual estimation from base plan (refer to Figure 1)
Quantitative Measures	To avoid double counting of properties, bandwidths were altered based on relative impact of links. Refer to Section 2.4 in text.
Assessment Scores	As reported.
Qualitative Comments	Demolition requirements: Castle Buildings (Grade II Listed); Earl de Grey PH (Grade II Listed); Marina Court Hotel. This option does not result in an exceedence of either the annual AQS for NO_2 (40 µg/m^3) at 20 m from the road centre. No exceedences of the AQS for NO_2 are predicted at any of assessed locations (20 m, 70 m, 115 m, and 175 m from road centre).

Environment: Local Air Quality - Plan Level Summary Table: 2017 LandBridge Overground

(Tag Unit 3.3.3 Worksheet 1b)

Long Term (annual) PM_{10}

PM_{10}, SUMMARY OF ROUTE: THE AGGREGATED TABLE	0-50 m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Total properties across all routes (min)	1970	1776	1013	785	5544
Total properties across all routes (some)	1970	1776	1013	785	5544
Do-minimum PM_{10} assessment across all routes	32453.27	29034.84	16520.5	12792.07	Total assessment PM_{10} (I) 90800.68
Do-something PM_{10} assessment across all routes	32429.44	29033.21	16519.91	12790.17	Total assessment PM_{10} (II) 90772.73
NET TOTAL ASSESSMENT FOR PM_{10}, all routes (II-I)					-27.95
Number of properties with an improvement					2770
Number of properties with no change					0
Number of properties with a deterioration					2774

Reference Sources	Concentrations: ADMS ROADS v2.3 (model: 2017BASEOG) Property counts: manual estimation from base plan (refer to Figure 1)
Quantitative Measures	To avoid double counting of properties, bandwidths were altered based on relative impact of links. Refer to Section 2.4 in text.
Assessment Scores	As reported.
Qualitative Comments	Demolition requirements: Castle Buildings (Grade II Listed); Earl de Grey PH (Grade II Listed); Marina Court Hotel. This option does not result in an exceedence of either the annual AQS for PM_{10} (40 µg/m^3) at 20 m from the road centre. No exceedences of the AQS for PM_{10} are predicted at any of assessed locations (20 m, 70 m, 115 m, and 175 m from road centre).

PM_{10}, SUMMARY OF ROUTES: THE AGGREGATED TABLE	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Total properties across all routes (min)	1970	1776	1013	785	5544
Total properties across all routes (some)	1970	1776	1013	785	5544
Do-minimum **PM_{10} assessment** ***across all routes***	32453.27	29034.84	16520.5	12792.07	Total assessment PM_{10} **(I)**: 90800.6838
Do-something **PM_{10} assessment** ***across all routes***	32429.44	29033.21	16519.91	12790.17	Total assessment PM_{10} **(II)**: 90772.73
Net total assessment for PM_{10}, all routes (II-I)					-27.9538
Number of properties with an improvement					***2770***
Number of properties with no change					***0***
Number of properties with a deterioration					***2774***

Reference Sources:

Quantitative Measures:

Assessment Scores:

Qualitative Comments:

PM_{10}, ROUTE 1. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.52	At 70m: 16.84	At 115m: 16.48	At 175m: 16.40	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.53	At 70m: 16.84	At 115m: 16.49	At 175m: 16.40	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 2. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.09	At 70m: 16.53	At 115m: 16.45	At 175m: 16.41	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.16	At 70m: 16.54	At 115m: 16.45	At 175m: 16.41	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 3. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	23	7	6	0	36
Properties (asome)	23	7	6	0	36
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.39	At 70m: 16.34	At 115m: 16.35	At 175m: 16.38	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.40	At 70m: 16.34	At 115m: 16.36	At 175m: 16.38	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	377.0712	114.3772	98.127	0	Total route assess PM_{10} (I): 589.5754
Do-something PM_{10} assessment *(c = asome*bsome)*	377.1057	114.3891	98.1372	0	Total route assess PM_{10} (II): 589.632
Net total route assessment for PM_{10} (II-I)	0	0	36		0.0566

PM_{10}, ROUTE 4. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	169	232	246	73	720
Properties (asome)	169	232	246	73	720
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.46	At 70m: 16.31	At 115m: 16.28	At 175m: 16.27	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.48	At 70m: 16.32	At 115m: 16.29	At 175m: 16.28	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	2781.588	3783.642	4005.864	1187.914	Total route assess PM_{10} (I): 11759.0079
Do-something PM_{10} assessment *(c = asome*bsome)*	2785.272	3785.289	4006.946	1188.126	Total route assess PM_{10} (II): 11765.6334
Net total route assessment for PM_{10} (II-I)	0	0	720		6.6255

PM_{10}, ROUTE 5. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.88	At 70m: 16.63	At 115m: 16.38	At 175m: 16.30	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.88	At 70m: 16.63	At 115m: 16.38	At 175m: 16.30	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 6. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.54	At 70m: 16.57	At 115m: 16.51	At 175m: 16.50	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.55	At 70m: 16.58	At 115m: 16.53	At 175m: 16.51	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 7. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.85	At 70m: 16.47	At 115m: 16.36	At 175m: 16.37	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.95	At 70m: 16.49	At 115m: 16.37	At 175m: 16.36	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 8. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	24	75	25	16	140
Properties (asome)	24	75	25	16	140
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.65	At 70m: 16.49	At 115m: 16.40	At 175m: 16.36	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.71	At 70m: 16.51	At 115m: 16.40	At 175m: 16.36	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	423.5352	1237.035	409.89	261.7568	Total route assess PM_{10} (I): 2332.217
Do-something PM_{10} assessment *(c = asome*bsome)*	425.0784	1237.973	410.0075	261.7248	Total route assess PM_{10} (II): 2334.7832
Net total route assessment for PM_{10} (II-I)	0	0	140		2.5662

PM_{10}, ROUTE 9. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	51	160	113	103	427
Properties (asome)	51	160	113	103	427
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.96	At 70m: 16.45	At 115m: 16.37	At 175m: 16.35	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.11	At 70m: 16.47	At 115m: 16.38	At 175m: 16.34	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	864.7968	2632.672	1850.025	1683.988	Total route assess PM_{10} (I): 7031.4817
Do-something PM_{10} assessment *(c = asome*bsome)*	872.6814	2635.792	1850.714	1683.401	Total route assess PM_{10} (II): 7042.5885
Net total route assessment for PM_{10} (II-I)	0	0	427		11.1068

PM_{10}, ROUTE 10. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.38	At 70m: 16.35	At 115m: 16.40	At 175m: 16.70	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.36	At 70m: 16.36	At 115m: 16.41	At 175m: 16.78	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM$_{10}$, ROUTE 11.	**0-50m**	**50-100m**	**100-150m**	**150-200m**	**0-200m**
Route name:	**(i)**	**(ii)**	**(iii)**	**(iv)**	**(v=i+ii+iii+iv)**
Properties (amin)	36	10	8	3	57
Properties (asome)	36	10	8	3	57
PM$_{10}$ concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.42	At 70m: 16.27	At 115m: 16.25	At 175m: 16.24	**N/A**
PM$_{10}$ concentration at average point within band for *do-something* (bsome)	At 20m: 16.43	At 70m: 16.27	At 115m: 16.25	At 175m: 16.24	**N/A**
Do-minimum* PM$_{10}$ assessment *(c = amin*bmin)	591.2892	162.723	129.9864	48.7173	Total route assess PM$_{10}$ **(I)**: 932.7159
Do-something* PM$_{10}$ assessment *(c = asome*bsome)	591.4296	162.732	129.9904	48.7206	Total route assess PM$_{10}$ **(II)**: 932.8726
Net total route assessment for PM$_{10}$ (II-I)	0	0	57		0.1567

PM$_{10}$, ROUTE 12.	**0-50m**	**50-100m**	**100-150m**	**150-200m**	**0-200m**
Route name:	**(i)**	**(ii)**	**(iii)**	**(iv)**	**(v=i+ii+iii+iv)**
Properties (amin)	199	240	57	67	563
Properties (asome)	199	240	57	67	563
PM$_{10}$ concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.45	At 70m: 16.30	At 115m: 16.28	At 175m: 16.27	**N/A**
PM$_{10}$ concentration at average point within band for *do-something* (bsome)	At 20m: 16.42	At 70m: 16.30	At 115m: 16.27	At 175m: 16.27	**N/A**
Do-minimum* PM$_{10}$ assessment *(c = amin*bmin)	3273.729	3912.984	927.8289	1089.809	Total route assess PM$_{10}$ **(I)**: 9204.3506
Do-something* PM$_{10}$ assessment *(c = asome*bsome)	3268.336	3911.16	927.5952	1089.782	Total route assess PM$_{10}$ **(II)**: 9196.8732
Net total route assessment for PM$_{10}$ (II-I)	563	0	0		-7.4774

PM$_{10}$, ROUTE 13.	**0-50m**	**50-100m**	**100-150m**	**150-200m**	**0-200m**
Route name:	**(i)**	**(ii)**	**(iii)**	**(iv)**	**(v=i+ii+iii+iv)**
Properties (amin)	164	82	3	37	286
Properties (asome)	164	82	3	37	286
PM$_{10}$ concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.41	At 70m: 16.31	At 115m: 16.30	At 175m: 16.29	**N/A**
PM$_{10}$ concentration at average point within band for *do-something* (bsome)	At 20m: 16.36	At 70m: 16.29	At 115m: 16.29	At 175m: 16.29	**N/A**
Do-minimum* PM$_{10}$ assessment *(c = amin*bmin)	2690.863	1337.092	48.8964	602.8817	Total route assess PM$_{10}$ **(I)**: 4679.7329
Do-something* PM$_{10}$ assessment *(c = asome*bsome)	2682.745	1336.124	48.8838	602.8262	Total route assess PM$_{10}$ **(II)**: 4670.5792
Net total route assessment for PM$_{10}$ (II-I)	286	0	0		-9.1537

PM$_{10}$, ROUTE 14.	**0-50m**	**50-100m**	**100-150m**	**150-200m**	**0-200m**
Route name:	**(i)**	**(ii)**	**(iii)**	**(iv)**	**(v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM$_{10}$ concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.42	At 70m: 16.39	At 115m: 16.42	At 175m: 16.45	**N/A**
PM$_{10}$ concentration at average point within band for *do-something* (bsome)	At 20m: 16.41	At 70m: 16.38	At 115m: 16.41	At 175m: 16.42	**N/A**
Do-minimum* PM$_{10}$ assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM$_{10}$ **(I)**: 0
Do-something* PM$_{10}$ assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM$_{10}$ **(II)**: 0
Net total route assessment for PM$_{10}$ (II-I)	0	0	0		0

PM$_{10}$, ROUTE 15.	**0-50m**	**50-100m**	**100-150m**	**150-200m**	**0-200m**
Route name:	**(i)**	**(ii)**	**(iii)**	**(iv)**	**(v=i+ii+iii+iv)**
Properties (amin)	218	0	0	0	218
Properties (asome)	218	0	0	0	218
PM$_{10}$ concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.36	At 70m: 16.33	At 115m: 16.58	At 175m: 16.37	**N/A**
PM$_{10}$ concentration at average point within band for *do-something* (bsome)	At 20m: 16.36	At 70m: 16.32	At 115m: 16.47	At 175m: 16.36	**N/A**
Do-minimum* PM$_{10}$ assessment *(c = amin*bmin)	3565.848	0	0	0	Total route assess PM$_{10}$ **(I)**: 3565.8478
Do-something* PM$_{10}$ assessment *(c = asome*bsome)	3565.87	0	0	0	Total route assess PM$_{10}$ **(II)**: 3565.8696
Net total route assessment for PM$_{10}$ (II-I)	0	0	218		0.0218

PM_{10}, ROUTE 16. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	47	31	38	44	160
Properties (asome)	47	31	38	44	160
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.60	At 70m: 16.44	At 115m: 16.51	At 175m: 16.40	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.59	At 70m: 16.42	At 115m: 16.46	At 175m: 16.37	**N/A**
Do-minimum* PM_{10} assessment** ***(c = amin*bmin)	780.2658	509.6679	627.2318	721.7408	Total route assess PM_{10} **(I)**: 2638.9063
Do-something* PM_{10} assessment** ***(c = asome*bsome)	779.9086	508.9239	625.5142	720.4824	Total route assess PM_{10} **(II)**: 2634.8291
Net total route assessment for PM_{10} (II-I)	160	0	0		-4.0772

PM_{10}, ROUTE 17. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	9	16	8	33
Properties (asome)	0	9	16	8	33
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.44	At 70m: 16.38	At 115m: 16.39	At 175m: 16.41	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.40	At 70m: 16.37	At 115m: 16.38	At 175m: 16.41	**N/A**
Do-minimum* PM_{10} assessment** ***(c = amin*bmin)	0	147.4218	262.1904	131.2432	Total route assess PM_{10} **(I)**: 540.8554
Do-something* PM_{10} assessment** ***(c = asome*bsome)	0	147.2958	262.0464	131.2464	Total route assess PM_{10} **(II)**: 540.5886
Net total route assessment for PM_{10} (II-I)	33	0	0		-0.2668

PM_{10}, ROUTE 18. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	63	49	0	0	112
Properties (asome)	63	49	0	0	112
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.08	At 70m: 16.48	At 115m: 16.39	At 175m: 16.34	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.77	At 70m: 16.45	At 115m: 16.38	At 175m: 16.33	**N/A**
Do-minimum* PM_{10} assessment** ***(c = amin*bmin)	1076.216	807.6327	0	0	Total route assess PM_{10} **(I)**: 1883.8491
Do-something* PM_{10} assessment** ***(c = asome*bsome)	1056.699	806.001	0	0	Total route assess PM_{10} **(II)**: 1862.7
Net total route assessment for PM_{10} (II-I)	112	0	0		-21.1491

PM_{10}, ROUTE 19. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.57	At 70m: 16.68	At 115m: 17.05	At 175m: 17.00	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.46	At 70m: 16.53	At 115m: 16.73	At 175m: 16.53	**N/A**
Do-minimum* PM_{10} assessment** ***(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment** ***(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 20. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	61	0	0	0	61
Properties (asome)	61	0	0	0	61
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.47	At 70m: 16.48	At 115m: 16.48	At 175m: 16.48	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.45	At 70m: 16.44	At 115m: 16.43	At 175m: 16.42	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	1004.67	0	0	0	Total route assess PM_{10} (I): 1004.67
Do-something PM_{10} assessment *(c = asome*bsome)*	1003.499	0	0	0	Total route assess PM_{10} (II): 1003.4988
Net total route assessment for PM_{10} (II-I)	61	0	0		-1.1712

PM_{10}, ROUTE 21. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	43	0	0	0	43
Properties (asome)	43	0	0	0	43
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.37	At 70m: 16.44	At 115m: 16.64	At 175m: 17.01	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.37	At 70m: 16.43	At 115m: 16.59	At 175m: 17.07	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	703.9358	0	0	0	Total route assess PM_{10} (I): 703.9358
Do-something PM_{10} assessment *(c = asome*bsome)*	703.8025	0	0	0	Total route assess PM_{10} (II): 703.8025
Net total route assessment for PM_{10} (II-I)	43	0	0		-0.1333

PM_{10}, ROUTE 22. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.46	At 70m: 16.63	At 115m: 17.87	At 175m: 16.78	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.45	At 70m: 16.63	At 115m: 17.44	At 175m: 16.78	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 23. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	70	0	0	0	70
Properties (asome)	70	0	0	0	70
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.39	At 70m: 16.33	At 115m: 16.32	At 175m: 16.32	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.40	At 70m: 16.34	At 115m: 16.33	At 175m: 16.32	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	1147.069	0	0	0	Total route assess PM_{10} (I): 1147.069
Do-something PM_{10} assessment *(c = asome*bsome)*	1148.175	0	0	0	Total route assess PM_{10} (II): 1148.175
Net total route assessment for PM_{10} (II-I)	0	0	70		1.106

PM_{10}, ROUTE 24. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	17	48	67	132
Properties (asome)	0	17	48	67	132
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.94	At 70m: 16.43	At 115m: 16.36	At 175m: 16.33	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.96	At 70m: 16.44	At 115m: 16.37	At 175m: 16.33	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	279.361	785.496	1094.231	Total route assess PM_{10} (I): 2159.0876
Do-something PM_{10} assessment *(c = asome*bsome)*	0	279.4392	785.6304	1094.345	Total route assess PM_{10} (II): 2159.4141
Net total route assessment for PM_{10} (II-I)	0	0	132		0.3265

PM_{10}, ROUTE 25. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	128	92	0	0	220
Properties (asome)	128	92	0	0	220
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.36	At 70m: 16.40	At 115m: 16.82	At 175m: 16.35	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.36	At 70m: 16.40	At 115m: 16.83	At 175m: 16.35	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	2094.426	1508.358	0	0	Total route assess PM_{10} **(I)**: 3602.784
Do-something* PM_{10} assessment *(c = asome*bsome)	2094.554	1508.46	0	0	Total route assess PM_{10} **(II)**: 3603.0132
Net total route assessment for PM_{10} (II-I)	0	0	220		0.2292

PM_{10}, ROUTE 26. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.57	At 70m: 16.41	At 115m: 16.44	At 175m: 16.40	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.57	At 70m: 16.41	At 115m: 16.45	At 175m: 16.40	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 27. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.42	At 70m: 16.34	At 115m: 16.34	At 175m: 16.37	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.42	At 70m: 16.34	At 115m: 16.34	At 175m: 16.37	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 28. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	68	30	0	0	98
Properties (asome)	68	30	0	0	98
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.36	At 70m: 16.36	At 115m: 16.32	At 175m: 16.32	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.36	At 70m: 16.36	At 115m: 16.32	At 175m: 16.32	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	1112.541	490.665	0	0	Total route assess PM_{10} **(I)**: 1603.2062
Do-something* PM_{10} assessment *(c = asome*bsome)	1112.507	490.674	0	0	Total route assess PM_{10} **(II)**: 1603.1812
Net total route assessment for PM_{10} (II-I)	98	0	0		-0.025

PM_{10}, ROUTE 29. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 0	At 70m: 0	At 115m: 0	At 175m: 0	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 0	At 70m: 0	At 115m: 0	At 175m: 0	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 30. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.00	At 70m: 16.44	At 115m: 16.34	At 175m: 16.29	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.00	At 70m: 16.44	At 115m: 16.34	At 175m: 16.29	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 31. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	58	79	62	72	271
Properties (asome)	58	79	62	72	271
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.38	At 70m: 16.28	At 115m: 16.26	At 175m: 16.25	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.38	At 70m: 16.28	At 115m: 16.26	At 175m: 16.25	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	949.9356	1285.93	1008.139	1170.122	Total route assess PM_{10} (I): 4414.127
Do-something PM_{10} assessment *(c = asome*bsome)*	950.0458	1285.954	1008.132	1170.094	Total route assess PM_{10} (II): 4414.2259
Net total route assessment for PM_{10} (II-I)	0	0	271		0.0989

PM_{10}, ROUTE 32. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	49	150	151	154	504
Properties (asome)	49	150	151	154	504
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.47	At 70m: 16.30	At 115m: 16.26	At 175m: 16.25	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.46	At 70m: 16.29	At 115m: 16.26	At 175m: 16.25	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	807.1084	2444.46	2455.955	2502.238	Total route assess PM_{10} (I): 8209.7612
Do-something PM_{10} assessment *(c = asome*bsome)*	806.7017	2444.085	2455.728	2502.177	Total route assess PM_{10} (II): 8208.6914
Net total route assessment for PM_{10} (II-I)	504	0	0		-1.0698

PM_{10}, ROUTE 33. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	71	66	72	32	241
Properties (asome)	71	66	72	32	241
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.34	At 70m: 16.28	At 115m: 16.27	At 175m: 16.26	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.35	At 70m: 16.28	At 115m: 16.27	At 175m: 16.26	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	1160.474	1074.302	1171.21	520.4512	Total route assess PM_{10} (I): 3926.4363
Do-something PM_{10} assessment *(c = asome*bsome)*	1161.148	1074.401	1171.21	520.4192	Total route assess PM_{10} (II): 3927.1778
Net total route assessment for PM_{10} (II-I)	0	0	241		0.7415

PM_{10}, ROUTE 34. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	110	50	1	0	161
Properties (asome)	110	50	1	0	161
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.60	At 70m: 16.36	At 115m: 16.32	At 175m: 16.29	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.58	At 70m: 16.35	At 115m: 16.31	At 175m: 16.29	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	1826.33	817.82	16.3154	0	Total route assess PM_{10} (I): 2660.4654
Do-something PM_{10} assessment *(c = asome*bsome)*	1823.272	817.355	16.3093	0	Total route assess PM_{10} (II): 2656.9363
Net total route assessment for PM_{10} (II-I)	161	0	0		-3.5291

PM_{10}, ROUTE 35. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	24	20	13	12	69
Properties (asome)	24	20	13	12	69
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.50	At 70m: 16.33	At 115m: 16.30	At 175m: 16.29	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.49	At 70m: 16.32	At 115m: 16.30	At 175m: 16.29	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	396.0072	326.514	211.8753	195.4932	Total route assess PM_{10} **(I)**: 1129.8897
Do-something* PM_{10} assessment *(c = asome*bsome)	395.688	326.43	211.8389	195.4656	Total route assess PM_{10} **(II)**: 1129.4225
Net total route assessment for PM_{10} (II-I)	69	0	0		-0.4672

PM_{10}, ROUTE 36. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	29	18	47
Properties (asome)	0	0	29	18	47
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.50	At 70m: 16.31	At 115m: 16.28	At 175m: 16.27	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.49	At 70m: 16.31	At 115m: 16.28	At 175m: 16.27	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	472.1432	292.8726	Total route assess PM_{10} **(I)**: 765.0158
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	472.0852	292.842	Total route assess PM_{10} **(II)**: 764.9272
Net total route assessment for PM_{10} (II-I)	47	0	0		-0.0886

PM_{10}, ROUTE 37. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	58	184	41	18	301
Properties (asome)	58	184	41	18	301
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.52	At 70m: 16.33	At 115m: 16.32	At 175m: 16.32	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.51	At 70m: 16.33	At 115m: 16.31	At 175m: 16.32	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	957.9744	3004.922	669.0339	293.832	Total route assess PM_{10} **(I)**: 4925.7627
Do-something* PM_{10} assessment *(c = asome*bsome)	957.4872	3004.021	668.8248	293.7204	Total route assess PM_{10} **(II)**: 4924.0532
Net total route assessment for PM_{10} (II-I)	301	0	0		-1.7095

PM_{10}, ROUTE 38. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	2	0	0	0	2
Properties (asome)	2	0	0	0	2
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.35	At 70m: 16.29	At 115m: 16.28	At 175m: 16.29	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.35	At 70m: 16.29	At 115m: 16.28	At 175m: 16.29	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	32.7036	0	0	0	Total route assess PM_{10} **(I)**: 32.7036
Do-something* PM_{10} assessment *(c = asome*bsome)	32.6962	0	0	0	Total route assess PM_{10} **(II)**: 32.6962
Net total route assessment for PM_{10} (II-I)	2	0	0		-0.0074

PM_{10}, ROUTE 39. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	38	21	39	50	148
Properties (asome)	38	21	39	50	148
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.27	At 70m: 16.25	At 115m: 16.25	At 175m: 16.25	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.27	At 70m: 16.25	At 115m: 16.25	At 175m: 16.25	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	618.4462	341.292	633.6993	812.485	Total route assess PM_{10} **(I)**: 2405.9225
Do-something* PM_{10} assessment *(c = asome*bsome)	618.4082	341.2752	633.6603	812.43	Total route assess PM_{10} **(II)**: 2405.7737
Net total route assessment for PM_{10} (II-I)	148	0	0		-0.1488

PM_{10}, ROUTE 40. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	10	1	0	1	12
Properties (asome)	10	1	0	1	12
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.35	At 70m: 16.35	At 115m: 16.48	At 175m: 16.52	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.35	At 70m: 16.34	At 115m: 16.47	At 175m: 16.52	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	163.511	16.3467	0	16.5223	Total route assess PM_{10} **(I)**: 196.38
Do-something* PM_{10} assessment *(c = asome*bsome)	163.471	16.3438	0	16.5165	Total route assess PM_{10} **(II)**: 196.3313
Net total route assessment for PM_{10} (II-I)	12	0	0		-0.0487

PM_{10}, ROUTE 41. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.31	At 70m: 16.31	At 115m: 16.32	At 175m: 16.41	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.31	At 70m: 16.31	At 115m: 16.32	At 175m: 16.42	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 42. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	21	80	14	0	115
Properties (asome)	21	80	14	0	115
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.58	At 70m: 16.35	At 115m: 16.31	At 175m: 16.34	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.58	At 70m: 16.34	At 115m: 16.31	At 175m: 16.33	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	348.2346	1307.752	228.3204	0	Total route assess PM_{10} **(I)**: 1884.307
Do-something* PM_{10} assessment *(c = asome*bsome)	348.0897	1307.552	228.2882	0	Total route assess PM_{10} **(II)**: 1883.9299
Net total route assessment for PM_{10} (II-I)	115	0	0		-0.3771

PM_{10}, ROUTE 43. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	2	0	0	0	2
Properties (asome)	2	0	0	0	2
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.45	At 70m: 16.34	At 115m: 16.32	At 175m: 16.32	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.44	At 70m: 16.33	At 115m: 16.32	At 175m: 16.32	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	32.8904	0	0	0	Total route assess PM_{10} **(I)**: 32.8904
Do-something* PM_{10} assessment *(c = asome*bsome)	32.8764	0	0	0	Total route assess PM_{10} **(II)**: 32.8764
Net total route assessment for PM_{10} (II-I)	2	0	0		-0.014

PM_{10}, ROUTE 44. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	21	52	0	0	73
Properties (asome)	21	52	0	0	73
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.32	At 70m: 16.29	At 115m: 16.30	At 175m: 16.34	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.32	At 70m: 16.29	At 115m: 16.30	At 175m: 16.34	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	342.7095	846.9344	0	0	Total route assess PM_{10} **(I)**: 1189.6439
Do-something* PM_{10} assessment *(c = asome*bsome)	342.7473	846.8824	0	0	Total route assess PM_{10} **(II)**: 1189.6297
Net total route assessment for PM_{10} (II-I)	0	0	73		-0.0142

PM_{10}, ROUTE 45. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	76	0	0	0	76
Properties (asome)	76	0	0	0	76
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.34	At 70m: 16.34	At 115m: 16.34	At 175m: 16.48	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.34	At 70m: 16.34	At 115m: 16.34	At 175m: 16.47	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	1241.794	0	0	0	Total route assess PM_{10} (I): 1241.7944
Do-something PM_{10} assessment *(c = asome*bsome)*	1241.924	0	0	0	Total route assess PM_{10} (II): 1241.9236
Net total route assessment for PM_{10} (II-I)	0	0	76		0.1292

PM_{10}, ROUTE 46. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.47	At 70m: 16.34	At 115m: 16.32	At 175m: 16.36	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.46	At 70m: 16.34	At 115m: 16.32	At 175m: 16.37	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 47. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.37	At 70m: 16.31	At 115m: 16.31	At 175m: 16.34	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.37	At 70m: 16.31	At 115m: 16.31	At 175m: 16.34	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 48. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	1	1	12	1	15
Properties (asome)	1	1	12	1	15
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.35	At 70m: 16.30	At 115m: 16.30	At 175m: 16.40	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.35	At 70m: 16.30	At 115m: 16.30	At 175m: 16.40	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	16.3463	16.2971	195.654	16.4005	Total route assess PM_{10} (I): 244.6979
Do-something PM_{10} assessment *(c = asome*bsome)*	16.3531	16.2976	195.6516	16.3999	Total route assess PM_{10} (II): 244.7022
Net total route assessment for PM_{10} (II-I)	0	0	15		0.0043

PM_{10}, ROUTE 49. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	4	5	0	0	9
Properties (asome)	4	5	0	0	9
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.52	At 70m: 16.35	At 115m: 16.32	At 175m: 16.32	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.52	At 70m: 16.35	At 115m: 16.32	At 175m: 16.32	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	66.0712	81.757	0	0	Total route assess PM_{10} (I): 147.8282
Do-something PM_{10} assessment *(c = asome*bsome)*	66.0748	81.763	0	0	Total route assess PM_{10} (II): 147.8378
Net total route assessment for PM_{10} (II-I)	0	0	9		0.0096

PM_{10}, ROUTE 50. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.72	At 70m: 16.37	At 115m: 16.32	At 175m: 16.29	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.73	At 70m: 16.37	At 115m: 16.32	At 175m: 16.29	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 51. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	20	21	19	9	69
Properties (asome)	20	21	19	9	69
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.42	At 70m: 16.41	At 115m: 16.45	At 175m: 16.60	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.42	At 70m: 16.41	At 115m: 16.46	At 175m: 16.61	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	328.306	344.5932	312.6184	149.3739	Total route assess PM_{10} **(I)**: 1134.8915
Do-something* PM_{10} assessment *(c = asome*bsome)	328.334	344.673	312.7153	149.4513	Total route assess PM_{10} **(II)**: 1135.1736
Net total route assessment for PM_{10} (II-I)	0	0	69		0.2821

PM_{10}, ROUTE 52. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	41	12	0	0	53
Properties (asome)	41	12	0	0	53
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.50	At 70m: 16.86	At 115m: 16.50	At 175m: 16.39	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.50	At 70m: 16.83	At 115m: 16.49	At 175m: 16.38	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	676.5861	202.2876	0	0	Total route assess PM_{10} **(I)**: 878.8737
Do-something* PM_{10} assessment *(c = asome*bsome)	676.4631	201.924	0	0	Total route assess PM_{10} **(II)**: 878.3871
Net total route assessment for PM_{10} (II-I)	53	0	0		-0.4866

NO_2, SUMMARY OF ROUTES: THE AGGREGATED TABLE	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Total properties across all routes (min)	1970	1776	1013	785	5544
Total properties across all routes (some)	1970	1776	1013	785	5544
Do-minimum* NO_2 assessment *across all routes	53432.66	46308.76	25841.3	19935.17	Total assessment NO_2 **(I)**: 145517.89
Do-something* NO_2 assessment *across all routes	53120.5	46242.47	25827.08	19892.72	Total assessment NO_2 **(II)**: 145082.7684
Net total assessment for NO_2, all routes (II-I)					-435.121577
Number of properties with an improvement					***3274***
Number of properties with no change					***0***
Number of properties with a deterioration					***2270***

Reference Sources:

Quantitative Measures:

Assessment Scores:

Qualitative Comments:

NO_2, ROUTE 1. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 37.36	At 70m: 30.8	At 115m: 28.95	At 175m: 27.74	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 37.43	At 70m: 30.85	At 115m: 29.00	At 175m: 27.77	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 2. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 34.35	At 70m: 29.62	At 115m: 28.55	At 175m: 27.84	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 34.75	At 70m: 29.73	At 115m: 28.60	At 175m: 27.83	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 3. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	23	7	6	0	36
Properties (asome)	23	7	6	0	36
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.19	At 70m: 25.97	At 115m: 26.25	At 175m: 26.64	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.16	At 70m: 25.99	At 115m: 26.27	At 175m: 26.66	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	602.37	181.79	157.5	0	Total route assess NO_2 **(I)**: 941.66
Do-something NO_2 assessment *(c = asome*bsome)*	601.7447	181.918	157.6029	0	Total route assess NO_2 **(II)**: 941.2655934
Net total route assessment for NO_2 (II-I)	36	0	0		-0.39440659

NO_2, ROUTE 4. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	169	232	246	73	720
Properties (asome)	169	232	246	73	720
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.72	At 70m: 24.96	At 115m: 24.83	At 175m: 24.81	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.11	At 70m: 25.15	At 115m: 24.97	At 175m: 24.91	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	4346.68	5790.72	6108.18	1811.13	Total route assess NO_2 **(I)**: 18056.71
Do-something NO_2 assessment *(c = asome*bsome)*	4412.335	5835.249	6142.246	1818.573	Total route assess NO_2 **(II)**: 18208.40261
Net total route assessment for NO_2 (II-I)	0	0	720		151.6926094

NO_2, ROUTE 5. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 32.75	At 70m: 29.46	At 115m: 26.63	At 175m: 25.63	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 32.77	At 70m: 29.49	At 115m: 26.65	At 175m: 25.63	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 6. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 37.51	At 70m: 30.04	At 115m: 29.42	At 175m: 29.23	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 37.59	At 70m: 30.16	At 115m: 29.55	At 175m: 29.37	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 7. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 38.98	At 70m: 28.61	At 115m: 27.28	At 175m: 26.85	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 39.52	At 70m: 28.77	At 115m: 27.33	At 175m: 26.78	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 8. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	24	75	25	16	140
Properties (asome)	24	75	25	16	140
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 38.28	At 70m: 29.19	At 115m: 27.85	At 175m: 27.11	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 38.67	At 70m: 29.33	At 115m: 27.93	At 175m: 27.11	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	918.72	2189.25	696.25	433.76	Total route assess NO_2 **(I)**: 4237.98
Do-something NO_2 assessment *(c = asome*bsome)*	928.1438	2199.737	698.1787	433.804	Total route assess NO_2 **(II)**: 4259.863844
Net total route assessment for NO_2 (II-I)	0	0	140		21.88384418

NO_2, ROUTE 9. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	51	160	113	103	427
Properties (asome)	51	160	113	103	427
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 33.5	At 70m: 28.79	At 115m: 27.54	At 175m: 26.83	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 34.33	At 70m: 28.86	At 115m: 27.53	At 175m: 26.72	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	1708.5	4606.4	3112.02	2763.49	Total route assess NO_2 **(I)**: 12190.41
Do-something NO_2 assessment *(c = asome*bsome)*	1751.029	4617.795	3110.378	2751.716	Total route assess NO_2 **(II)**: 12230.91751
Net total route assessment for NO_2 (II-I)	0	0	427		40.5075114

NO_2, ROUTE 10. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.82	At 70m: 27.1	At 115m: 27.97	At 175m: 31.33	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.72	At 70m: 27.14	At 115m: 28.10	At 175m: 31.85	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 11. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	36	10	8	3	57
Properties (asome)	36	10	8	3	57
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.24	At 70m: 24.17	At 115m: 23.95	At 175m: 23.85	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.39	At 70m: 24.23	At 115m: 24.01	At 175m: 23.90	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	908.64	241.7	191.6	71.55	Total route assess NO_2 **(I)**: 1413.49
Do-something NO_2 assessment *(c = asome*bsome)*	914.1089	242.3299	192.0517	71.69345	Total route assess NO_2 **(II)**: 1420.183938
Net total route assessment for NO_2 (II-I)	0	0	57		6.69393814

NO_2, ROUTE 12. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	199	240	57	67	563
Properties (asome)	199	240	57	67	563
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.23	At 70m: 25.1	At 115m: 24.89	At 175m: 24.81	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.03	At 70m: 25.03	At 115m: 24.87	At 175m: 24.82	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	5219.77	6024	1418.73	1662.27	Total route assess NO_2 **(I)**: 14324.77
Do-something NO_2 assessment *(c = asome*bsome)*	5179.992	6008.221	1417.64	1663.23	Total route assess NO_2 **(II)**: 14269.08235
Net total route assessment for NO_2 (II-I)	563	0	0		-55.68765267

NO_2, ROUTE 13. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	164	82	3	37	286
Properties (asome)	164	82	3	37	286
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.31	At 70m: 25.64	At 115m: 25.62	At 175m: 25.68	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.84	At 70m: 25.47	At 115m: 25.51	At 175m: 25.61	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	4314.84	2102.48	76.86	950.16	Total route assess NO_2 **(I)**: 7444.34
Do-something NO_2 assessment *(c = asome*bsome)*	4238.197	2088.185	76.52941	947.6336	Total route assess NO_2 **(II)**: 7350.545064
Net total route assessment for NO_2 (II-I)	286	0	0		-93.79493642

NO_2, ROUTE 14. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.26	At 70m: 27.21	At 115m: 27.64	At 175m: 28.29	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.01	At 70m: 26.92	At 115m: 27.24	At 175m: 27.62	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 15. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	218	0	0	0	218
Properties (asome)	218	0	0	0	218
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.36	At 70m: 26.28	At 115m: 27.42	At 175m: 27.4	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.29	At 70m: 26.14	At 115m: 26.62	At 175m: 27.09	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	5746.48	0	0	0	Total route assess NO_2 **(I)**: 5746.48
Do-something NO_2 assessment *(c = asome*bsome)*	5730.796	0	0	0	Total route assess NO_2 **(II)**: 5730.796106
Net total route assessment for NO_2 (II-I)	218	0	0		-15.68389446

NO_2, ROUTE 16. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	47	31	38	44	160
Properties (asome)	47	31	38	44	160
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 29.27	At 70m: 28.26	At 115m: 28.62	At 175m: 27.94	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.77	At 70m: 27.63	At 115m: 27.84	At 175m: 27.24	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1375.69	876.06	1087.56	1229.36	Total route assess NO_2 **(I)**: 4568.67
Do-something* NO_2 assessment *(c = asome*bsome)	1352.107	856.4228	1058.073	1198.583	Total route assess NO_2 **(II)**: 4465.185831
Net total route assessment for NO_2 (II-I)	160	0	0		-103.484169

NO_2, ROUTE 17. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	9	16	8	33
Properties (asome)	0	9	16	8	33
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.91	At 70m: 27.67	At 115m: 27.82	At 175m: 28.12	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.31	At 70m: 27.22	At 115m: 27.45	At 175m: 27.91	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	249.03	445.12	224.96	Total route assess NO_2 **(I)**: 919.11
Do-something* NO_2 assessment *(c = asome*bsome)	0	244.9585	439.1416	223.2625	Total route assess NO_2 **(II)**: 907.3625609
Net total route assessment for NO_2 (II-I)	33	0	0		-11.74743906

NO_2, ROUTE 18. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	63	49	0	0	112
Properties (asome)	63	49	0	0	112
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 34.85	At 70m: 29.34	At 115m: 27.98	At 175m: 27.04	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 31.58	At 70m: 28.53	At 115m: 27.50	At 175m: 26.75	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	2195.55	1437.66	0	0	Total route assess NO_2 **(I)**: 3633.21
Do-something* NO_2 assessment *(c = asome*bsome)	1989.369	1398.101	0	0	Total route assess NO_2 **(II)**: 3387.469229
Net total route assessment for NO_2 (II-I)	112	0	0		-245.7407712

NO_2, ROUTE 19. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 30.09	At 70m: 31.17	At 115m: 33.11	At 175m: 32.98	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.31	At 70m: 28.92	At 115m: 30.29	At 175m: 28.75	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 20. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	61	0	0	0	61
Properties (asome)	61	0	0	0	61
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 29.16	At 70m: 29.26	At 115m: 29.29	At 175m: 29.31	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.61	At 70m: 28.52	At 115m: 28.47	At 175m: 28.40	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1778.76	0	0	0	Total route assess NO_2 **(I)**: 1778.76
Do-something* NO_2 assessment *(c = asome*bsome)	1745.293	0	0	0	Total route assess NO_2 **(II)**: 1745.293166
Net total route assessment for NO_2 (II-I)	61	0	0		-33.46683443

NO_2, ROUTE 21. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	43	0	0	0	43
Properties (asome)	43	0	0	0	43
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.63	At 70m: 28.73	At 115m: 31.09	At 175m: 33.934	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.44	At 70m: 28.40	At 115m: 30.39	At 175m: 34.00	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1188.09	0	0	0	Total route assess NO_2 **(I)**: 1188.09
Do-something* NO_2 assessment *(c = asome*bsome)	1179.872	0	0	0	Total route assess NO_2 **(II)**: 1179.872151
Net total route assessment for NO_2 (II-I)	43	0	0		-8.21784868

NO_2, ROUTE 22. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.83	At 70m: 30.78	At 115m: 39.86	At 175m: 32.42	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.62	At 70m: 30.57	At 115m: 36.85	At 175m: 32.32	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 23. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	70	0	0	0	70
Properties (asome)	70	0	0	0	70
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.14	At 70m: 26.75	At 115m: 26.65	At 175m: 26.54	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.25	At 70m: 26.80	At 115m: 26.69	At 175m: 26.58	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1899.8	0	0	0	Total route assess NO_2 **(I)**: 1899.8
Do-something* NO_2 assessment *(c = asome*bsome)	1907.623	0	0	0	Total route assess NO_2 **(II)**: 1907.62303
Net total route assessment for NO_2 (II-I)	0	0	70		7.8230299

NO_2, ROUTE 24. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	17	48	67	132
Properties (asome)	0	17	48	67	132
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 33.74	At 70m: 28.77	At 115m: 27.67	At 175m: 26.97	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 33.89	At 70m: 28.83	At 115m: 27.72	At 175m: 27.00	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	489.09	1328.16	1806.99	Total route assess NO_2 **(I)**: 3624.24
Do-something* NO_2 assessment *(c = asome*bsome)	0	490.1781	1330.366	1809.127	Total route assess NO_2 **(II)**: 3629.671416
Net total route assessment for NO_2 (II-I)	0	0	132		5.43141611

NO_2, ROUTE 25. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	128	92	0	0	220
Properties (asome)	128	92	0	0	220
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.11	At 70m: 27.25	At 115m: 29.39	At 175m: 26.97	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.12	At 70m: 27.25	At 115m: 29.37	At 175m: 27.01	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	3470.08	2507	0	0	Total route assess NO_2 **(I)**: 5977.08
Do-something NO_2 assessment *(c = asome*bsome)*	3471.602	2506.814	0	0	Total route assess NO_2 **(II)**: 5978.415759
Net total route assessment for NO_2 (II-I)	0	0	220		1.335759

NO_2, ROUTE 26. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.96	At 70m: 28.09	At 115m: 28.46	At 175m: 28.18	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.95	At 70m: 28.10	At 115m: 28.49	At 175m: 28.23	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 27. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.86	At 70m: 26.55	At 115m: 26.7	At 175m: 27.18	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.92	At 70m: 26.55	At 115m: 26.68	At 175m: 27.16	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 28. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	68	30	0	0	98
Properties (asome)	68	30	0	0	98
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.52	At 70m: 26.65	At 115m: 26.37	At 175m: 26.42	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.51	At 70m: 26.65	At 115m: 26.37	At 175m: 26.43	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	1803.36	799.5	0	0	Total route assess NO_2 **(I)**: 2602.86
Do-something NO_2 assessment *(c = asome*bsome)*	1802.885	799.6456	0	0	Total route assess NO_2 **(II)**: 2602.530354
Net total route assessment for NO_2 (II-I)	98	0	0		-0.3296458

NO_2, ROUTE 29. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 0	At 70m: 0	At 115m: 0	At 175m: 0	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 0	At 70m: 0	At 115m: 0	At 175m: 0	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 30. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 32.95	At 70m: 27.84	At 115m: 26.42	At 175m: 25.45	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 32.98	At 70m: 27.85	At 115m: 26.43	At 175m: 25.46	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 31. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	58	79	62	72	271
Properties (asome)	58	79	62	72	271
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 24.79	At 70m: 24.29	At 115m: 24.19	At 175m: 24.16	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 24.86	At 70m: 24.32	At 115m: 24.21	At 175m: 24.17	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1437.82	1918.91	1499.78	1739.52	Total route assess NO_2 **(I)**: 6596.03
Do-something* NO_2 assessment *(c = asome*bsome)	1441.639	1921.121	1501.032	1740.123	Total route assess NO_2 **(II)**: 6603.915274
Net total route assessment for NO_2 (II-I)	0	0	271		7.88527447

NO_2, ROUTE 32. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	49	150	151	154	504
Properties (asome)	49	150	151	154	504
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.72	At 70m: 24.54	At 115m: 24.2	At 175m: 24.02	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.61	At 70m: 24.48	At 115m: 24.17	At 175m: 24.01	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1260.28	3681	3654.2	3699.08	Total route assess NO_2 **(I)**: 12294.56
Do-something* NO_2 assessment *(c = asome*bsome)	1254.897	3672.711	3649.028	3698.289	Total route assess NO_2 **(II)**: 12274.92503
Net total route assessment for NO_2 (II-I)	504	0	0		-19.63496847

NO_2, ROUTE 33. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	71	66	72	32	241
Properties (asome)	71	66	72	32	241
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.25	At 70m: 24.78	At 115m: 24.7	At 175m: 24.71	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.20	At 70m: 24.74	At 115m: 24.65	At 175m: 24.65	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1792.75	1635.48	1778.4	790.72	Total route assess NO_2 **(I)**: 5997.35
Do-something* NO_2 assessment *(c = asome*bsome)	1789.219	1632.546	1775.028	788.861	Total route assess NO_2 **(II)**: 5985.653545
Net total route assessment for NO_2 (II-I)	241	0	0		-11.69645548

NO_2, ROUTE 34. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	110	50	1	0	161
Properties (asome)	110	50	1	0	161
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.6	At 70m: 26.02	At 115m: 25.63	At 175m: 25.38	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.35	At 70m: 25.88	At 115m: 25.51	At 175m: 25.29	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	3036	1301	25.63	0	Total route assess NO_2 **(I)**: 4362.63
Do-something* NO_2 assessment *(c = asome*bsome)	3008.662	1293.94	25.51285	0	Total route assess NO_2 **(II)**: 4328.114833
Net total route assessment for NO_2 (II-I)	161	0	0		-34.51516693

NO_2, ROUTE 35. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	24	20	13	12	69
Properties (asome)	24	20	13	12	69
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.56	At 70m: 25.33	At 115m: 25.04	At 175m: 24.9	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.36	At 70m: 25.23	At 115m: 24.96	At 175m: 24.83	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	637.44	506.6	325.52	298.8	Total route assess NO_2 **(I)**: 1768.36
Do-something NO_2 assessment *(c = asome*bsome)*	632.6886	504.5054	324.44	297.9196	Total route assess NO_2 **(II)**: 1759.553696
Net total route assessment for NO_2 (II-I)	69	0	0		-8.80630406

NO_2, ROUTE 36. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	29	18	47
Properties (asome)	0	0	29	18	47
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.64	At 70m: 25.19	At 115m: 24.82	At 175m: 24.57	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.50	At 70m: 25.11	At 115m: 24.76	At 175m: 24.52	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	719.78	442.26	Total route assess NO_2 **(I)**: 1162.04
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	718.0132	441.4364	Total route assess NO_2 **(II)**: 1159.449648
Net total route assessment for NO_2 (II-I)	47	0	0		-2.59035227

NO_2, ROUTE 37. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	58	184	41	18	301
Properties (asome)	58	184	41	18	301
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.99	At 70m: 25.74	At 115m: 25.6	At 175m: 25.67	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.89	At 70m: 25.64	At 115m: 25.50	At 175m: 25.56	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	1565.42	4736.16	1049.6	462.06	Total route assess NO_2 **(I)**: 7813.24
Do-something NO_2 assessment *(c = asome*bsome)*	1559.815	4718.588	1045.704	460.105	Total route assess NO_2 **(II)**: 7784.212195
Net total route assessment for NO_2 (II-I)	301	0	0		-29.02780508

NO_2, ROUTE 38. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	2	0	0	0	2
Properties (asome)	2	0	0	0	2
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.77	At 70m: 25.37	At 115m: 25.32	At 175m: 25.4	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.69	At 70m: 25.32	At 115m: 25.25	At 175m: 25.31	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	51.54	0	0	0	Total route assess NO_2 **(I)**: 51.54
Do-something NO_2 assessment *(c = asome*bsome)*	51.37789	0	0	0	Total route assess NO_2 **(II)**: 51.37789278
Net total route assessment for NO_2 (II-I)	2	0	0		-0.16210722

NO_2, ROUTE 39. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	38	21	39	50	148
Properties (asome)	38	21	39	50	148
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 24.49	At 70m: 24.36	At 115m: 24.36	At 175m: 24.38	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 24.47	At 70m: 24.34	At 115m: 24.33	At 175m: 24.35	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	930.62	511.56	950.04	1219	Total route assess NO_2 **(I)**: 3611.22
Do-something NO_2 assessment *(c = asome*bsome)*	929.8811	511.1015	948.8894	1217.36	Total route assess NO_2 **(II)**: 3607.232056
Net total route assessment for NO_2 (II-I)	148	0	0		-3.98794413

NO_2, ROUTE 40. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	10	1	0	1	12
Properties (asome)	10	1	0	1	12
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.78	At 70m: 25.93	At 115m: 26.92	At 175m: 27.28	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.73	At 70m: 25.89	At 115m: 26.88	At 175m: 27.24	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	257.8	25.93	0	27.28	Total route assess NO_2 **(I)**: 311.01
Do-something* NO_2 assessment *(c = asome*bsome)	257.3255	25.88784	0	27.24178	Total route assess NO_2 **(II)**: 310.4551242
Net total route assessment for NO_2 (II-I)	12	0	0		-0.55487578

NO_2, ROUTE 41. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.66	At 70m: 25.76	At 115m: 25.98	At 175m: 26.77	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.62	At 70m: 25.73	At 115m: 25.97	At 175m: 26.83	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 42. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	21	80	14	0	115
Properties (asome)	21	80	14	0	115
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.59	At 70m: 25.92	At 115m: 25.56	At 175m: 25.65	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.56	At 70m: 25.89	At 115m: 25.52	At 175m: 25.60	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	579.39	2073.6	357.84	0	Total route assess NO_2 **(I)**: 3010.83
Do-something* NO_2 assessment *(c = asome*bsome)	578.6901	2071.389	357.2255	0	Total route assess NO_2 **(II)**: 3007.304525
Net total route assessment for NO_2 (II-I)	115	0	0		-3.52547493

NO_2, ROUTE 43. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	2	0	0	0	2
Properties (asome)	2	0	0	0	2
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.86	At 70m: 26.1	At 115m: 25.95	At 175m: 25.95	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.74	At 70m: 26.04	At 115m: 25.92	At 175m: 25.96	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	53.72	0	0	0	Total route assess NO_2 **(I)**: 53.72
Do-something* NO_2 assessment *(c = asome*bsome)	53.47026	0	0	0	Total route assess NO_2 **(II)**: 53.47025676
Net total route assessment for NO_2 (II-I)	2	0	0		-0.24974324

NO_2, ROUTE 44. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	21	52	0	0	73
Properties (asome)	21	52	0	0	73
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.43	At 70m: 25.17	At 115m: 25.34	At 175m: 25.83	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.45	At 70m: 25.16	At 115m: 25.32	At 175m: 25.80	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	534.03	1308.84	0	0	Total route assess NO_2 **(I)**: 1842.87
Do-something* NO_2 assessment *(c = asome*bsome)	534.4614	1308.272	0	0	Total route assess NO_2 **(II)**: 1842.73347
Net total route assessment for NO_2 (II-I)	0	0	73		-0.13653048

NO_2, ROUTE 45. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	76	0	0	0	76
Properties (asome)	76	0	0	0	76
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.09	At 70m: 26.12	At 115m: 26.18	At 175m: 27.52	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.17	At 70m: 26.12	At 115m: 26.14	At 175m: 27.38	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1982.84	0	0	0	Total route assess NO_2 **(I)**: 1982.84
Do-something* NO_2 assessment *(c = asome*bsome)	1988.973	0	0	0	Total route assess NO_2 **(II)**: 1988.972618
Net total route assessment for NO_2 (II-I)	0	0	76		6.13261784

NO_2, ROUTE 46. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.52	At 70m: 26.21	At 115m: 25.89	At 175m: 26.17	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.37	At 70m: 26.16	At 115m: 25.91	At 175m: 26.33	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 47. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.05	At 70m: 25.74	At 115m: 25.88	At 175m: 26.31	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.03	At 70m: 25.72	At 115m: 25.86	At 175m: 26.29	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 48. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	1	1	12	1	15
Properties (asome)	1	1	12	1	15
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.94	At 70m: 25.59	At 115m: 25.58	At 175m: 26.21	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.02	At 70m: 25.63	At 115m: 25.58	At 175m: 26.19	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	25.94	25.59	306.96	26.21	Total route assess NO_2 **(I)**: 384.7
Do-something* NO_2 assessment *(c = asome*bsome)	26.01666	25.62885	306.912	26.19486	Total route assess NO_2 **(II)**: 384.7523182
Net total route assessment for NO_2 (II-I)	0	0	15		0.05231819

NO_2, ROUTE 49. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	4	5	0	0	9
Properties (asome)	4	5	0	0	9
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.36	At 70m: 26.77	At 115m: 26.63	At 175m: 26.63	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.33	At 70m: 26.78	At 115m: 26.66	At 175m: 26.66	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	113.44	133.85	0	0	Total route assess NO_2 **(I)**: 247.29
Do-something* NO_2 assessment *(c = asome*bsome)	113.3296	133.9052	0	0	Total route assess NO_2 **(II)**: 247.2348299
Net total route assessment for NO_2 (II-I)	9	0	0		-0.05517007

NO_2, ROUTE 50. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 31.03	At 70m: 27.23	At 115m: 26.32	At 175m: 25.72	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 31.17	At 70m: 27.28	At 115m: 26.36	At 175m: 25.75	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 51. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	20	21	19	9	69
Properties (asome)	20	21	19	9	69
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.03	At 70m: 28.36	At 115m: 29.03	At 175m: 30.73	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.09	At 70m: 28.43	At 115m: 29.11	At 175m: 30.84	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	560.6	595.56	551.57	276.57	Total route assess NO_2 **(I)**: 1984.3
Do-something NO_2 assessment *(c = asome*bsome)*	561.7014	597.006	553.0885	277.5619	Total route assess NO_2 **(II)**: 1989.357757
Net total route assessment for NO_2 (II-I)	0	0	69		5.05775658

NO_2, ROUTE 52. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	41	12	0	0	53
Properties (asome)	41	12	0	0	53
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.7	At 70m: 30	At 115m: 27.83	At 175m: 26.8	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.64	At 70m: 29.69	At 115m: 27.67	At 175m: 26.72	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	1135.7	360	0	0	Total route assess NO_2 **(I)**: 1495.7
Do-something NO_2 assessment *(c = asome*bsome)*	1133.261	356.3117	0	0	Total route assess NO_2 **(II)**: 1489.572844
Net total route assessment for NO_2 (II-I)	53	0	0		-6.12715575

Environment: Local Air Quality - Plan Level Summary Table: 2018 Extended Viaduct

(Tag Unit 3.3.3 Worksheet 1b)

Long Term (annual) NO_2

NO_2, SUMMARY OF ROUTE: THE AGGREGATED TABLE	0-50 m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Total properties across all routes (min)	1970	1776	1013	785	5544
Total properties across all routes (some)	1970	1776	1013	785	5544
Do-minimum NO_2 assessment across all routes	53231.29	46179.35	25789.41	19900.2	Total assessment NO_2 (I) 145100.25
Do-something NO_2 assessment across all routes	52830.69	46183.82	25811.31	19872.75	Total assessment NO_2 (II) 144698.56
NET TOTAL ASSESSMENT FOR NO_2, all routes (II-I)					-401.70
Number of properties with an improvement					2717
Number of properties with no change					0
Number of properties with a deterioration					2827

Reference Sources	Concentrations: ADMS ROADS v2.3 (model: 2017BASEOG) Property counts: manual estimation from base plan (refer to Figure 1)
Quantitative Measures	To avoid double counting of properties, bandwidths were altered based on relative impact of links. Refer to Section 2.4 in text.
Assessment Scores	As reported.
Qualitative Comments	Demolition requirements: Castle Buildings (Grade II Listed); Earl de Grey PH (Grade II Listed); Marina Court Office Blocks (x3) and Temporary Buildings; Properties 16 – 65 nr Dagger Road; Castle St/Queen St Carpark. This option does not result in an exceedence of either the annual AQS for NO_2 (40 µg/m^3) at 20 m from the road centre. No exceedences of the AQS for NO_2 are predicted at any of assessed locations (20 m, 70 m, 115 m, and 175 m from road centre).

Environment: Local Air Quality - Plan Level Summary Table: 2018 Extended Viaduct

(Tag Unit 3.3.3 Worksheet 1b)

Long Term (annual) PM_{10}

PM_{10}, SUMMARY OF ROUTE: THE AGGREGATED TABLE	0-50 m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Total properties across all routes (min)	1970	1776	1013	785	5544
Total properties across all routes (some)	1970	1776	1013	785	5544
Do-minimum PM_{10} assessment across all routes	32265.24	28871.61	16428.41	12721	Total assessment PM_{10} (I) 90286.26
Do-something PM_{10} assessment across all routes	32247.74	28881.3	16432.82	12721.26	Total assessment PM_{10} (II) 90283.12
NET TOTAL ASSESSMENT FOR PM_{10}, all routes (II-I)					-3.14
Number of properties with an improvement					2334
Number of properties with no change					0
Number of properties with a deterioration					3210

Reference Sources	Concentrations: ADMS ROADS v2.3 (model: 2017BASEOG) Property counts: manual estimation from base plan (refer to Figure 1)
Quantitative Measures	To avoid double counting of properties, bandwidths were altered based on relative impact of links. Refer to Section 2.4 in text.
Assessment Scores	As reported.
Qualitative Comments	Demolition requirements: Castle Buildings (Grade II Listed); Earl de Grey PH (Grade II Listed); Marina Court Office Blocks (x3) and Temporary Buildings; Properties 16 – 65 nr Dagger Road; Castle St/Queen St Carpark. This option does not result in an exceedence of either the annual AQS for PM_{10} (40 µg/m^3) at 20 m from the road centre. No exceedences of the AQS for PM_{10} are predicted at any of assessed locations (20 m, 70 m, 115 m, and 175 m from road centre).

PM_{10}, SUMMARY OF ROUTES: THE AGGREGATED TABLE	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Total properties across all routes (min)	1970	1776	1013	785	5544
Total properties across all routes (some)	1970	1776	1013	785	5544
Do-minimum **PM_{10} assessment** ***across all routes***	32265.24	28871.61	16428.41	12721	Total assessment PM_{10} **(I)**: 90286.2644
Do-something **PM_{10} assessment** ***across all routes***	32247.74	28881.3	16432.82	12721.26	Total assessment PM_{10} **(II)**: 90283.1206
Net total assessment for PM_{10}, all routes (II-I)					-3.1438
Number of properties with an improvement					***2334***
Number of properties with no change					***0***
Number of properties with a deterioration					***3210***

Reference Sources:

Quantitative Measures:

Assessment Scores:

Qualitative Comments:

PM_{10}, ROUTE 1. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.40	At 70m: 16.72	At 115m: 16.39	At 175m: 16.30	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.45	At 70m: 16.76	At 115m: 16.40	At 175m: 16.31	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 2. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.99	At 70m: 16.44	At 115m: 16.36	At 175m: 16.32	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.10	At 70m: 16.46	At 115m: 16.37	At 175m: 16.32	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 3. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	23	7	6	0	36
Properties (asome)	23	7	6	0	36
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.30	At 70m: 16.25	At 115m: 16.26	At 175m: 16.28	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.31	At 70m: 16.25	At 115m: 16.27	At 175m: 16.29	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	374.8724	113.7255	97.5666	0	Total route assess PM_{10} **(I)**: 586.1645
Do-something* PM_{10} assessment *(c = asome*bsome)	375.1254	113.7682	97.602	0	Total route assess PM_{10} **(II)**: 586.4956
Net total route assessment for PM_{10} (II-I)	0	0	36		0.3311

PM_{10}, ROUTE 4. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	169	232	246	73	720
Properties (asome)	169	232	246	73	720
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.37	At 70m: 16.22	At 115m: 16.19	At 175m: 16.18	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.39	At 70m: 16.23	At 115m: 16.20	At 175m: 16.19	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	2767.155	3763.04	3983.847	1181.352	Total route assess PM_{10} **(I)**: 11695.394
Do-something* PM_{10} assessment *(c = asome*bsome)	2769.335	3764.246	3984.806	1181.585	Total route assess PM_{10} **(II)**: 11699.9735
Net total route assessment for PM_{10} (II-I)	0	0	720		4.5795

PM_{10}, ROUTE 5. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.78	At 70m: 16.53	At 115m: 16.28	At 175m: 16.21	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.79	At 70m: 16.54	At 115m: 16.29	At 175m: 16.21	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 6. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.42	At 70m: 16.48	At 115m: 16.42	At 175m: 16.41	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.46	At 70m: 16.50	At 115m: 16.44	At 175m: 16.43	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 7. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.77	At 70m: 16.38	At 115m: 16.27	At 175m: 16.28	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.93	At 70m: 16.41	At 115m: 16.28	At 175m: 16.27	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 8. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	24	75	25	16	140
Properties (asome)	24	75	25	16	140
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 17.54	At 70m: 16.40	At 115m: 16.30	At 175m: 16.27	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.64	At 70m: 16.42	At 115m: 16.32	At 175m: 16.27	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	421.0128	1230.113	407.6	260.312	Total route assess PM_{10} **(I)**: 2319.0373
Do-something* PM_{10} assessment *(c = asome*bsome)	423.4368	1231.778	407.8775	260.3552	Total route assess PM_{10} **(II)**: 2323.447
Net total route assessment for PM_{10} (II-I)	0	0	140		4.4097

PM_{10}, ROUTE 9. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	51	160	113	103	427
Properties (asome)	51	160	113	103	427
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.86	At 70m: 16.36	At 115m: 16.28	At 175m: 16.26	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 17.03	At 70m: 16.39	At 115m: 16.29	At 175m: 16.26	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	859.7427	2617.984	1839.832	1674.996	Total route assess PM_{10} **(I)**: 6992.5551
Do-something* PM_{10} assessment *(c = asome*bsome)	868.3821	2622.32	1841.143	1674.739	Total route assess PM_{10} **(II)**: 7006.5838
Net total route assessment for PM_{10} (II-I)	0	0	427		14.0287

PM_{10}, ROUTE 10. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.29	At 70m: 16.26	At 115m: 16.31	At 175m: 16.60	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.28	At 70m: 16.27	At 115m: 16.33	At 175m: 16.69	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 11. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	36	10	8	3	57
Properties (asome)	36	10	8	3	57
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.34	At 70m: 16.18	At 115m: 16.16	At 175m: 16.15	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.34	At 70m: 16.18	At 115m: 16.16	At 175m: 16.15	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	588.1032	161.825	129.2664	48.4476	Total route assess PM_{10} (I): 927.6422
Do-something PM_{10} assessment *(c = asome*bsome)*	588.1464	161.833	129.2728	48.4509	Total route assess PM_{10} (II): 927.7031
Net total route assessment for PM_{10} (II-I)	0	0	57		0.0609

PM_{10}, ROUTE 12. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	199	240	57	67	563
Properties (asome)	199	240	57	67	563
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.36	At 70m: 16.21	At 115m: 16.19	At 175m: 16.18	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.33	At 70m: 16.21	At 115m: 16.18	At 175m: 16.18	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	3255.361	3891.168	922.659	1083.752	Total route assess PM_{10} (I): 9152.9402
Do-something PM_{10} assessment *(c = asome*bsome)*	3249.59	3889.416	922.4595	1083.799	Total route assess PM_{10} (II): 9145.2646
Net total route assessment for PM_{10} (II-I)	563	0	0		-7.6756

PM_{10}, ROUTE 13. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	164	82	3	37	286
Properties (asome)	164	82	3	37	286
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.32	At 70m: 16.22	At 115m: 16.21	At 175m: 16.20	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.29	At 70m: 16.21	At 115m: 16.21	At 175m: 16.21	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	2676.185	1329.646	48.6246	599.5295	Total route assess PM_{10} (I): 4653.9853
Do-something PM_{10} assessment *(c = asome*bsome)*	2671.494	1329.327	48.6372	599.7071	Total route assess PM_{10} (II): 4649.1653
Net total route assessment for PM_{10} (II-I)	286	0	0		-4.82

PM_{10}, ROUTE 14. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.33	At 70m: 16.29	At 115m: 16.33	At 175m: 16.36	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.33	At 70m: 16.29	At 115m: 16.33	At 175m: 16.34	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 15. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	218	0	0	0	218
Properties (asome)	218	0	0	0	218
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.27	At 70m: 16.24	At 115m: 16.49	At 175m: 16.28	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.29	At 70m: 16.24	At 115m: 16.43	At 175m: 16.28	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	3546.097	0	0	0	Total route assess PM_{10} (I): 3546.097
Do-something PM_{10} assessment *(c = asome*bsome)*	3551.961	0	0	0	Total route assess PM_{10} (II): 3551.9612
Net total route assessment for PM_{10} (II-I)	0	0	218		5.8642

PM_{10}, ROUTE 16. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	47	31	38	44	160
Properties (asome)	47	31	38	44	160
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.51	At 70m: 16.35	At 115m: 16.41	At 175m: 16.31	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.49	At 70m: 16.34	At 115m: 16.40	At 175m: 16.29	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	775.9089	506.8624	623.7206	717.7192	Total route assess PM_{10} **(I)**: 2624.2111
Do-something* PM_{10} assessment *(c = asome*bsome)	775.2086	506.4377	623.0366	716.9184	Total route assess PM_{10} **(II)**: 2621.6013
Net total route assessment for PM_{10} (II-I)	160	0	0		-2.6098

PM_{10}, ROUTE 17. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	9	16	8	33
Properties (asome)	0	9	16	8	33
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.36	At 70m: 16.29	At 115m: 16.30	At 175m: 16.31	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.33	At 70m: 16.29	At 115m: 16.30	At 175m: 16.32	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	146.6271	260.76	130.5184	Total route assess PM_{10} **(I)**: 537.9055
Do-something* PM_{10} assessment *(c = asome*bsome)	0	146.6028	260.7712	130.5888	Total route assess PM_{10} **(II)**: 537.9628
Net total route assessment for PM_{10} (II-I)	33	0	0		0.0573

PM_{10}, ROUTE 18. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	63	49	0	0	112
Properties (asome)	63	49	0	0	112
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.97	At 70m: 16.39	At 115m: 16.30	At 175m: 16.25	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.52	At 70m: 16.33	At 115m: 16.28	At 175m: 16.24	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	1069.242	802.9924	0	0	Total route assess PM_{10} **(I)**: 1872.2347
Do-something* PM_{10} assessment *(c = asome*bsome)	1040.993	800.17	0	0	Total route assess PM_{10} **(II)**: 1841.1631
Net total route assessment for PM_{10} (II-I)	112	0	0		-31.0716

PM_{10}, ROUTE 19. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.48	At 70m: 16.61	At 115m: 17.01	At 175m: 16.94	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.40	At 70m: 16.50	At 115m: 16.78	At 175m: 16.60	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 20. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	61	0	0	0	61
Properties (asome)	61	0	0	0	61
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.38	At 70m: 16.38	At 115m: 16.38	At 175m: 16.39	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.34	At 70m: 16.33	At 115m: 16.33	At 175m: 16.33	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	998.997	0	0	0	Total route assess PM_{10} (I): 998.997
Do-something PM_{10} assessment *(c = asome*bsome)*	996.5936	0	0	0	Total route assess PM_{10} (II): 996.5936
Net total route assessment for PM_{10} (II-I)	61	0	0		-2.4034

PM_{10}, ROUTE 21. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	43	0	0	0	43
Properties (asome)	43	0	0	0	43
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.28	At 70m: 16.34	At 115m: 16.54	At 175m: 16.90	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.28	At 70m: 16.31	At 115m: 16.39	At 175m: 16.49	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	700.0873	0	0	0	Total route assess PM_{10} (I): 700.0873
Do-something PM_{10} assessment *(c = asome*bsome)*	699.8981	0	0	0	Total route assess PM_{10} (II): 699.8981
Net total route assessment for PM_{10} (II-I)	43	0	0		-0.1892

PM_{10}, ROUTE 22. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.36	At 70m: 16.53	At 115m: 17.74	At 175m: 16.67	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.32	At 70m: 16.37	At 115m: 16.78	At 175m: 16.46	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	0	0	0	Total route assess PM_{10} (I): 0
Do-something PM_{10} assessment *(c = asome*bsome)*	0	0	0	0	Total route assess PM_{10} (II): 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 23. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	70	0	0	0	70
Properties (asome)	70	0	0	0	70
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.28	At 70m: 16.24	At 115m: 16.23	At 175m: 16.22	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.27	At 70m: 16.24	At 115m: 16.24	At 175m: 16.23	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	1139.621	0	0	0	Total route assess PM_{10} (I): 1139.621
Do-something PM_{10} assessment *(c = asome*bsome)*	1138.851	0	0	0	Total route assess PM_{10} (II): 1138.851
Net total route assessment for PM_{10} (II-I)	70	0	0		-0.77

PM_{10}, ROUTE 24. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	17	48	67	132
Properties (asome)	0	17	48	67	132
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.85	At 70m: 16.34	At 115m: 16.27	At 175m: 16.24	N/A
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.75	At 70m: 16.62	At 115m: 16.33	At 175m: 16.26	N/A
Do-minimum PM_{10} assessment *(c = amin*bmin)*	0	277.8123	781.1232	1088.12	Total route assess PM_{10} (I): 2147.0557
Do-something PM_{10} assessment *(c = asome*bsome)*	0	282.5519	783.8352	1089.574	Total route assess PM_{10} (II): 2155.9612
Net total route assessment for PM_{10} (II-I)	132	0	0		8.9055

PM_{10}, ROUTE 25. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	128	92	0	0	220
Properties (asome)	128	92	0	0	220
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.27	At 70m: 16.30	At 115m: 16.72	At 175m: 16.26	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.28	At 70m: 16.31	At 115m: 16.75	At 175m: 16.27	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	2082.522	1499.802	0	0	Total route assess PM_{10} **(I)**: 3582.324
Do-something* PM_{10} assessment *(c = asome*bsome)	2084.198	1500.842	0	0	Total route assess PM_{10} **(II)**: 3585.0404
Net total route assessment for PM_{10} (II-I)	0	0	220		2.7164

PM_{10}, ROUTE 26. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.47	At 70m: 16.32	At 115m: 16.35	At 175m: 16.30	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.49	At 70m: 16.33	At 115m: 16.37	At 175m: 16.32	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 27. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.33	At 70m: 16.25	At 115m: 16.25	At 175m: 16.28	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.33	At 70m: 16.25	At 115m: 16.25	At 175m: 16.28	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 28. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	68	30	0	0	98
Properties (asome)	68	30	0	0	98
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.27	At 70m: 16.26	At 115m: 16.23	At 175m: 16.23	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.27	At 70m: 16.27	At 115m: 16.24	At 175m: 16.23	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	1106.299	487.878	0	0	Total route assess PM_{10} **(I)**: 1594.1768
Do-something* PM_{10} assessment *(c = asome*bsome)	1106.686	488.163	0	0	Total route assess PM_{10} **(II)**: 1594.8494
Net total route assessment for PM_{10} (II-I)	0	0	98		0.6726

PM_{10}, ROUTE 29. **Route name:**	**0-50m** **(i)**	**50-100m** **(ii)**	**100-150m** **(iii)**	**150-200m** **(iv)**	**0-200m** **(v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 0	At 70m: 0	At 115m: 0	At 175m: 0	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 0	At 70m: 0	At 115m: 0	At 175m: 0	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 30. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.89	At 70m: 16.34	At 115m: 16.25	At 175m: 16.20	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.91	At 70m: 16.35	At 115m: 16.25	At 175m: 16.20	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 31. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	58	79	62	72	271
Properties (asome)	58	79	62	72	271
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.29	At 70m: 16.19	At 115m: 16.17	At 175m: 16.16	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.30	At 70m: 16.19	At 115m: 16.17	At 175m: 16.16	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	944.646	1278.781	1002.528	1163.606	Total route assess PM_{10} **(I)**: 4389.5609
Do-something* PM_{10} assessment *(c = asome*bsome)	945.1854	1279.01	1002.633	1163.678	Total route assess PM_{10} **(II)**: 4390.5068
Net total route assessment for PM_{10} (II-I)	0	0	271		0.9459

PM_{10}, ROUTE 32. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	49	150	151	154	504
Properties (asome)	49	150	151	154	504
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.38	At 70m: 16.20	At 115m: 16.17	At 175m: 16.16	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.38	At 70m: 16.20	At 115m: 16.17	At 175m: 16.16	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	802.4828	2430.735	2442.214	2488.286	Total route assess PM_{10} **(I)**: 8163.7172
Do-something* PM_{10} assessment *(c = asome*bsome)	802.3799	2430.72	2442.229	2488.455	Total route assess PM_{10} **(II)**: 8163.7838
Net total route assessment for PM_{10} (II-I)	504	0	0		0.0666

PM_{10}, ROUTE 33. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	71	66	72	32	241
Properties (asome)	71	66	72	32	241
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.25	At 70m: 16.19	At 115m: 16.18	At 175m: 16.17	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.26	At 70m: 16.19	At 115m: 16.18	At 175m: 16.17	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	1153.913	1068.263	1164.629	517.5136	Total route assess PM_{10} **(I)**: 3904.3185
Do-something* PM_{10} assessment *(c = asome*bsome)	1154.503	1068.428	1164.73	517.5456	Total route assess PM_{10} **(II)**: 3905.2056
Net total route assessment for PM_{10} (II-I)	0	0	241		0.8871

PM_{10}, ROUTE 34. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	110	50	1	0	161
Properties (asome)	110	50	1	0	161
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.46	At 70m: 16.25	At 115m: 16.22	At 175m: 16.20	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.47	At 70m: 16.25	At 115m: 16.22	At 175m: 16.20	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	1810.842	812.56	16.2163	0	Total route assess PM_{10} **(I)**: 2639.6183
Do-something* PM_{10} assessment *(c = asome*bsome)	1812.14	812.735	16.2184	0	Total route assess PM_{10} **(II)**: 2641.0934
Net total route assessment for PM_{10} (II-I)	0	0	161		1.4751

PM_{10}, ROUTE 35. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	24	20	13	12	69
Properties (asome)	24	20	13	12	69
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.40	At 70m: 16.23	At 115m: 16.21	At 175m: 16.20	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.39	At 70m: 16.23	At 115m: 16.20	At 175m: 16.20	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	393.5856	324.632	210.6663	194.3832	Total route assess PM_{10} **(I)**: 1123.2671
Do-something* PM_{10} assessment *(c = asome*bsome)	393.4344	324.61	210.6637	194.3856	Total route assess PM_{10} **(II)**: 1123.0937
Net total route assessment for PM_{10} (II-I)	69	0	0		-0.1734

PM_{10}, ROUTE 36. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	29	18	47
Properties (asome)	0	0	29	18	47
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.40	At 70m: 16.22	At 115m: 16.19	At 175m: 16.18	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.40	At 70m: 16.22	At 115m: 16.19	At 175m: 16.18	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	469.4694	291.2202	Total route assess PM_{10} **(I)**: 760.6896
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	469.4781	291.222	Total route assess PM_{10} **(II)**: 760.7001
Net total route assessment for PM_{10} (II-I)	0	0	47		0.0105

PM_{10}, ROUTE 37. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	58	184	41	18	301
Properties (asome)	58	184	41	18	301
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.42	At 70m: 16.24	At 115m: 16.22	At 175m: 16.22	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.40	At 70m: 16.23	At 115m: 16.22	At 175m: 16.23	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	952.2324	2987.258	665.0241	292.0302	Total route assess PM_{10} **(I)**: 4896.5451
Do-something* PM_{10} assessment *(c = asome*bsome)	951.4204	2986.89	665.0487	292.0662	Total route assess PM_{10} **(II)**: 4895.4257
Net total route assessment for PM_{10} (II-I)	301	0	0		-1.1194

PM_{10}, ROUTE 38. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	2	0	0	0	2
Properties (asome)	2	0	0	0	2
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.26	At 70m: 16.20	At 115m: 16.19	At 175m: 16.19	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.26	At 70m: 16.20	At 115m: 16.19	At 175m: 16.20	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	32.5244	0	0	0	Total route assess PM_{10} **(I)**: 32.5244
Do-something* PM_{10} assessment *(c = asome*bsome)	32.526	0	0	0	Total route assess PM_{10} **(II)**: 32.526
Net total route assessment for PM_{10} (II-I)	0	0	2		0.0016

PM_{10}, ROUTE 39. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	38	21	39	50	148
Properties (asome)	38	21	39	50	148
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.19	At 70m: 16.16	At 115m: 16.16	At 175m: 16.16	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.19	At 70m: 16.16	At 115m: 16.16	At 175m: 16.16	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	615.0414	339.3894	630.1464	807.92	Total route assess PM_{10} **(I)**: 2392.4972
Do-something* PM_{10} assessment *(c = asome*bsome)	615.201	339.4251	630.1893	807.935	Total route assess PM_{10} **(II)**: 2392.7504
Net total route assessment for PM_{10} (II-I)	0	0	148		0.2532

PM_{10}, ROUTE 40. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	10	1	0	1	12
Properties (asome)	10	1	0	1	12
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.26	At 70m: 16.25	At 115m: 16.38	At 175m: 16.43	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.27	At 70m: 16.26	At 115m: 16.41	At 175m: 16.46	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	162.593	16.2549	0	16.429	Total route assess PM_{10} **(I)**: 195.2769
Do-something* PM_{10} assessment *(c = asome*bsome)	162.67	16.2639	0	16.459	Total route assess PM_{10} **(II)**: 195.3929
Net total route assessment for PM_{10} (II-I)	0	0	12		0.116

PM_{10}, ROUTE 41. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.22	At 70m: 16.22	At 115m: 16.23	At 175m: 16.32	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.23	At 70m: 16.22	At 115m: 16.23	At 175m: 16.33	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 42. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	21	80	14	0	115
Properties (asome)	21	80	14	0	115
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.49	At 70m: 16.26	At 115m: 16.22	At 175m: 16.25	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.53	At 70m: 16.27	At 115m: 16.22	At 175m: 16.25	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	346.2627	1300.416	227.0422	0	Total route assess PM_{10} **(I)**: 1873.7209
Do-something* PM_{10} assessment *(c = asome*bsome)	347.0397	1301.296	227.1122	0	Total route assess PM_{10} **(II)**: 1875.4479
Net total route assessment for PM_{10} (II-I)	0	0	115		1.727

PM_{10}, ROUTE 43. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	2	0	0	0	2
Properties (asome)	2	0	0	0	2
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.35	At 70m: 16.24	At 115m: 16.23	At 175m: 16.23	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.36	At 70m: 16.25	At 115m: 16.24	At 175m: 16.24	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	32.7054	0	0	0	Total route assess PM_{10} **(I)**: 32.7054
Do-something* PM_{10} assessment *(c = asome*bsome)	32.7188	0	0	0	Total route assess PM_{10} **(II)**: 32.7188
Net total route assessment for PM_{10} (II-I)	0	0	2		0.0134

PM_{10}, ROUTE 44. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	21	52	0	0	73
Properties (asome)	21	52	0	0	73
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.23	At 70m: 16.20	At 115m: 16.21	At 175m: 16.25	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.24	At 70m: 16.20	At 115m: 16.21	At 175m: 16.26	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	340.8132	842.2024	0	0	Total route assess PM_{10} **(I)**: 1183.0156
Do-something* PM_{10} assessment *(c = asome*bsome)	340.9665	842.4676	0	0	Total route assess PM_{10} **(II)**: 1183.4341
Net total route assessment for PM_{10} (II-I)	0	0	73		0.4185

PM_{10}, ROUTE 45. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	76	0	0	0	76
Properties (asome)	76	0	0	0	76
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.25	At 70m: 16.25	At 115m: 16.25	At 175m: 16.40	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.26	At 70m: 16.26	At 115m: 16.26	At 175m: 16.42	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	1234.863	0	0	0	Total route assess PM_{10} **(I)**: 1234.8632
Do-something* PM_{10} assessment *(c = asome*bsome)	1235.448	0	0	0	Total route assess PM_{10} **(II)**: 1235.4484
Net total route assessment for PM_{10} (II-I)	0	0	76		0.5852

PM_{10}, ROUTE 46. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.38	At 70m: 16.25	At 115m: 16.23	At 175m: 16.27	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.40	At 70m: 16.26	At 115m: 16.24	At 175m: 16.28	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 47. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.28	At 70m: 16.22	At 115m: 16.22	At 175m: 16.25	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.29	At 70m: 16.23	At 115m: 16.23	At 175m: 16.26	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 48. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	1	1	12	1	15
Properties (asome)	1	1	12	1	15
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.26	At 70m: 16.21	At 115m: 16.21	At 175m: 16.31	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.26	At 70m: 16.21	At 115m: 16.22	At 175m: 16.32	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	16.2604	16.2077	194.5764	16.3097	Total route assess PM_{10} **(I)**: 243.3542
Do-something* PM_{10} assessment *(c = asome*bsome)	16.2643	16.2124	194.6448	16.3219	Total route assess PM_{10} **(II)**: 243.4434
Net total route assessment for PM_{10} (II-I)	0	0	15		0.0892

PM_{10}, ROUTE 49. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	4	5	0	0	9
Properties (asome)	4	5	0	0	9
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.44	At 70m: 16.26	At 115m: 16.23	At 175m: 16.23	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.44	At 70m: 16.27	At 115m: 16.24	At 175m: 16.24	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	65.7524	81.321	0	0	Total route assess PM_{10} **(I)**: 147.0734
Do-something* PM_{10} assessment *(c = asome*bsome)	65.7536	81.3345	0	0	Total route assess PM_{10} **(II)**: 147.0881
Net total route assessment for PM_{10} (II-I)	0	0	9		0.0147

PM_{10}, ROUTE 50. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.63	At 70m: 16.28	At 115m: 16.23	At 175m: 16.20	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.61	At 70m: 16.28	At 115m: 16.23	At 175m: 16.20	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	0	0	0	0	Total route assess PM_{10} **(I)**: 0
Do-something* PM_{10} assessment *(c = asome*bsome)	0	0	0	0	Total route assess PM_{10} **(II)**: 0
Net total route assessment for PM_{10} (II-I)	0	0	0		0

PM_{10}, ROUTE 51. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	20	21	19	9	69
Properties (asome)	20	21	19	9	69
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.32	At 70m: 16.32	At 115m: 16.36	At 175m: 16.51	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.33	At 70m: 16.31	At 115m: 16.34	At 175m: 16.39	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	326.486	342.6948	310.8989	148.5567	Total route assess PM_{10} **(I)**: 1128.6364
Do-something* PM_{10} assessment *(c = asome*bsome)	326.5	342.552	310.4296	147.4758	Total route assess PM_{10} **(II)**: 1126.9574
Net total route assessment for PM_{10} (II-I)	0	0	69		-1.679

PM_{10}, ROUTE 52. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	41	12	0	0	53
Properties (asome)	41	12	0	0	53
PM_{10} concentration at average point within band for *do-minimum* (bmin)	At 20m: 16.42	At 70m: 16.79	At 115m: 16.42	At 175m: 16.30	**N/A**
PM_{10} concentration at average point within band for *do-something* (bsome)	At 20m: 16.43	At 70m: 16.82	At 115m: 16.44	At 175m: 16.31	**N/A**
Do-minimum* PM_{10} assessment *(c = amin*bmin)	673.0314	201.42	0	0	Total route assess PM_{10} **(I)**: 874.4514
Do-something* PM_{10} assessment *(c = asome*bsome)	673.6915	201.8976	0	0	Total route assess PM_{10} **(II)**: 875.5891
Net total route assessment for PM_{10} (II-I)	0	0	53		1.1377

NO_2, SUMMARY OF ROUTES: THE AGGREGATED TABLE	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Total properties across all routes (min)	1970	1776	1013	785	5544
Total properties across all routes (some)	1970	1776	1013	785	5544
Do-minimum **NO_2 assessment** ***across all routes***	53231.29	46179.35	25789.41	19900.2	Total assessment NO_2 **(I)**: 145100.2526
Do-something **NO_2 assessment** ***across all routes***	52830.69	46183.82	25811.31	19872.75	Total assessment NO_2 **(II)**: 144698.5576
Net total assessment for NO_2, all routes (II-I)					-401.6950083
Number of properties with an improvement					***2717***
Number of properties with no change					***0***
Number of properties with a deterioration					***2827***

Reference Sources:

Quantitative Measures:

Assessment Scores:

Qualitative Comments:

NO_2, ROUTE 1. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 36.92	At 70m: 30.45	At 115m: 28.74	At 175m: 27.64	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 37.33	At 70m: 30.86	At 115m: 28.98	At 175m: 27.75	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 2. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 34.19	At 70m: 29.44	At 115m: 28.38	At 175m: 27.73	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 34.78	At 70m: 29.71	At 115m: 28.58	At 175m: 27.82	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 3. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	23	7	6	0	36
Properties (asome)	23	7	6	0	36
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.04	At 70m: 25.85	At 115m: 26.13	At 175m: 26.52	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.17	At 70m: 25.94	At 115m: 26.21	At 175m: 26.59	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	598.9221	180.9729	156.7506	0	Total route assess NO_2 **(I)**: 936.6455604
Do-something* NO_2 assessment *(c = asome*bsome)	601.9477	181.5856	157.2461	0	Total route assess NO_2 **(II)**: 940.7793295
Net total route assessment for NO_2 (II-I)	0	0	36		4.13376901

NO_2, ROUTE 4. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	169	232	246	73	720
Properties (asome)	169	232	246	73	720
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.76	At 70m: 24.95	At 115m: 24.81	At 175m: 24.78	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.91	At 70m: 25.04	At 115m: 24.88	At 175m: 24.84	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	4353.933	5788.3	6102.312	1808.786	Total route assess NO_2 **(I)**: 18053.33074
Do-something* NO_2 assessment *(c = asome*bsome)	4378.934	5808.264	6119.294	1812.973	Total route assess NO_2 **(II)**: 18119.466
Net total route assessment for NO_2 (II-I)	0	0	720		66.1352608

NO_2, ROUTE 5. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 32.58	At 70m: 29.29	At 115m: 26.51	At 175m: 25.56	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 32.67	At 70m: 29.39	At 115m: 26.58	At 175m: 25.59	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 6. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 37.12	At 70m: 29.85	At 115m: 29.30	At 175m: 29.15	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 37.45	At 70m: 30.14	At 115m: 29.53	At 175m: 29.36	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 7. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 39.02	At 70m: 28.56	At 115m: 27.26	At 175m: 26.92	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 39.68	At 70m: 28.75	At 115m: 27.31	At 175m: 26.77	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 8. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	24	75	25	16	140
Properties (asome)	24	75	25	16	140
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 38.18	At 70m: 29.11	At 115m: 27.78	At 175m: 27.08	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 38.67	At 70m: 29.32	At 115m: 27.91	At 175m: 27.09	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	916.4129	2183.433	694.5643	433.2358	Total route assess NO_2 **(I)**: 4227.646125
Do-something* NO_2 assessment *(c = asome*bsome)	928.0958	2198.8	697.6428	433.456	Total route assess NO_2 **(II)**: 4257.994334
Net total route assessment for NO_2 (II-I)	0	0	140		30.34820866

NO_2, ROUTE 9. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	51	160	113	103	427
Properties (asome)	51	160	113	103	427
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 33.46	At 70m: 28.77	At 115m: 27.54	At 175m: 26.90	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 34.32	At 70m: 28.88	At 115m: 27.54	At 175m: 26.74	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1706.295	4603.102	3112.503	2771.185	Total route assess NO_2 **(I)**: 12193.08559
Do-something* NO_2 assessment *(c = asome*bsome)	1750.332	4620.35	3112.36	2753.816	Total route assess NO_2 **(II)**: 12236.85848
Net total route assessment for NO_2 (II-I)	0	0	427		43.77289749

NO_2, ROUTE 10. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.97	At 70m: 27.12	At 115m: 27.96	At 175m: 31.29	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.73	At 70m: 27.13	At 115m: 28.10	At 175m: 31.85	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 11. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	36	10	8	3	57
Properties (asome)	36	10	8	3	57
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.24	At 70m: 24.13	At 115m: 23.91	At 175m: 23.80	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.24	At 70m: 24.15	At 115m: 23.93	At 175m: 23.83	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	908.5221	241.3423	191.2784	71.41292	Total route assess NO_2 **(I)**: 1412.555646
Do-something NO_2 assessment *(c = asome*bsome)*	908.7982	241.4873	191.449	71.48384	Total route assess NO_2 **(II)**: 1413.218322
Net total route assessment for NO_2 (II-I)	0	0	57		0.66267649

NO_2, ROUTE 12. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	199	240	57	67	563
Properties (asome)	199	240	57	67	563
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.15	At 70m: 25.04	At 115m: 24.83	At 175m: 24.76	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.88	At 70m: 24.95	At 115m: 24.80	At 175m: 24.76	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	5203.744	6008.448	1415.358	1658.9	Total route assess NO_2 **(I)**: 14286.45063
Do-something NO_2 assessment *(c = asome*bsome)*	5150.97	5988.174	1413.615	1659.048	Total route assess NO_2 **(II)**: 14211.80722
Net total route assessment for NO_2 (II-I)	563	0	0		-74.64340912

NO_2, ROUTE 13. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	164	82	3	37	286
Properties (asome)	164	82	3	37	286
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.24	At 70m: 25.58	At 115m: 25.55	At 175m: 25.62	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.99	At 70m: 25.51	At 115m: 25.56	At 175m: 25.64	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	4303.349	2097.232	76.65013	947.9019	Total route assess NO_2 **(I)**: 7425.132786
Do-something NO_2 assessment *(c = asome*bsome)*	4263.027	2092.14	76.66841	948.6483	Total route assess NO_2 **(II)**: 7380.48392
Net total route assessment for NO_2 (II-I)	286	0	0		-44.64886608

NO_2, ROUTE 14. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.09	At 70m: 27.07	At 115m: 27.52	At 175m: 28.20	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.99	At 70m: 26.91	At 115m: 27.27	At 175m: 27.67	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 15. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	218	0	0	0	218
Properties (asome)	218	0	0	0	218
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.29	At 70m: 26.22	At 115m: 27.35	At 175m: 27.35	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.51	At 70m: 26.23	At 115m: 26.96	At 175m: 27.17	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	5730.384	0	0	0	Total route assess NO_2 **(I)**: 5730.383811
Do-something NO_2 assessment *(c = asome*bsome)*	5778.325	0	0	0	Total route assess NO_2 **(II)**: 5778.32452
Net total route assessment for NO_2 (II-I)	0	0	218		47.94070918

NO_2, ROUTE 16. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	47	31	38	44	160
Properties (asome)	47	31	38	44	160
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 29.16	At 70m: 28.17	At 115m: 28.51	At 175m: 27.85	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.70	At 70m: 27.66	At 115m: 27.94	At 175m: 27.21	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1370.295	873.3699	1083.551	1225.299	Total route assess NO_2 **(I)**: 4552.514551
Do-something* NO_2 assessment *(c = asome*bsome)	1348.793	857.6052	1061.615	1197.395	Total route assess NO_2 **(II)**: 4465.407949
Net total route assessment for NO_2 (II-I)	160	0	0		-87.10660238

NO_2, ROUTE 17. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	9	16	8	33
Properties (asome)	0	9	16	8	33
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.12	At 70m: 27.70	At 115m: 27.84	At 175m: 28.12	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.43	At 70m: 27.35	At 115m: 27.53	At 175m: 27.96	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	249.3396	445.3684	224.947	Total route assess NO_2 **(I)**: 919.6550155
Do-something* NO_2 assessment *(c = asome*bsome)	0	246.1197	440.5402	223.6845	Total route assess NO_2 **(II)**: 910.3444475
Net total route assessment for NO_2 (II-I)	33	0	0		-9.31056791

NO_2, ROUTE 18. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	63	49	0	0	112
Properties (asome)	63	49	0	0	112
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 34.60	At 70m: 29.22	At 115m: 27.88	At 175m: 26.95	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 29.16	At 70m: 27.74	At 115m: 27.10	At 175m: 26.55	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	2180.1	1431.797	0	0	Total route assess NO_2 **(I)**: 3611.897383
Do-something* NO_2 assessment *(c = asome*bsome)	1837.063	1359.148	0	0	Total route assess NO_2 **(II)**: 3196.210203
Net total route assessment for NO_2 (II-I)	112	0	0		-415.6871802

NO_2, ROUTE 19. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 30.02	At 70m: 31.20	At 115m: 33.67	At 175m: 33.26	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.45	At 70m: 29.27	At 115m: 31.04	At 175m: 29.92	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 20. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	61	0	0	0	61
Properties (asome)	61	0	0	0	61
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 29.07	At 70m: 29.14	At 115m: 29.16	At 175m: 29.19	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.73	At 70m: 27.71	At 115m: 27.74	At 175m: 27.80	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1773.513	0	0	0	Total route assess NO_2 **(I)**: 1773.513181
Do-something* NO_2 assessment *(c = asome*bsome)	1691.301	0	0	0	Total route assess NO_2 **(II)**: 1691.301475
Net total route assessment for NO_2 (II-I)	61	0	0		-82.21170629

NO_2, ROUTE 21. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	43	0	0	0	43
Properties (asome)	43	0	0	0	43
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.61	At 70m: 28.64	At 115m: 30.94	At 175m: 33.70	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.01	At 70m: 27.54	At 115m: 28.33	At 175m: 28.84	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1187.051	0	0	0	Total route assess NO_2 **(I)**: 1187.051269
Do-something* NO_2 assessment *(c = asome*bsome)	1161.547	0	0	0	Total route assess NO_2 **(II)**: 1161.547103
Net total route assessment for NO_2 (II-I)	43	0	0		-25.50416645

NO_2, ROUTE 22. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.69	At 70m: 30.61	At 115m: 39.47	At 175m: 32.22	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.49	At 70m: 27.98	At 115m: 30.45	At 175m: 29.00	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 23. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	70	0	0	0	70
Properties (asome)	70	0	0	0	70
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.81	At 70m: 26.59	At 115m: 26.55	At 175m: 26.47	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.57	At 70m: 26.49	At 115m: 26.49	At 175m: 26.44	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1876.431	0	0	0	Total route assess NO_2 **(I)**: 1876.430899
Do-something* NO_2 assessment *(c = asome*bsome)	1860.162	0	0	0	Total route assess NO_2 **(II)**: 1860.16186
Net total route assessment for NO_2 (II-I)	70	0	0		-16.2690388

NO_2, ROUTE 24. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	17	48	67	132
Properties (asome)	0	17	48	67	132
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 33.81	At 70m: 28.76	At 115m: 27.64	At 175m: 26.93	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 32.86	At 70m: 31.64	At 115m: 28.45	At 175m: 27.29	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	488.9153	1326.851	1804.333	Total route assess NO_2 **(I)**: 3620.099329
Do-something* NO_2 assessment *(c = asome*bsome)	0	537.8122	1365.77	1828.346	Total route assess NO_2 **(II)**: 3731.928272
Net total route assessment for NO_2 (II-I)	132	0	0		111.828943

NO_2, ROUTE 25. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	128	92	0	0	220
Properties (asome)	128	92	0	0	220
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.03	At 70m: 27.16	At 115m: 29.22	At 175m: 26.94	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.19	At 70m: 27.22	At 115m: 29.30	At 175m: 27.48	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	3460.157	2498.346	0	0	Total route assess NO_2 **(I)**: 5958.502893
Do-something* NO_2 assessment *(c = asome*bsome)	3480.263	2504.291	0	0	Total route assess NO_2 **(II)**: 5984.553948
Net total route assessment for NO_2 (II-I)	0	0	220		26.0510558

NO_2, ROUTE 26. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.83	At 70m: 28.00	At 115m: 28.38	At 175m: 28.14	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.77	At 70m: 28.01	At 115m: 28.49	At 175m: 28.34	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 27. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.79	At 70m: 26.47	At 115m: 26.62	At 175m: 27.09	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.77	At 70m: 26.44	At 115m: 26.56	At 175m: 26.99	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 28. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	68	30	0	0	98
Properties (asome)	68	30	0	0	98
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.44	At 70m: 26.58	At 115m: 26.31	At 175m: 26.37	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.51	At 70m: 26.69	At 115m: 26.44	At 175m: 26.56	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1797.983	797.2784	0	0	Total route assess NO_2 **(I)**: 2595.261822
Do-something* NO_2 assessment *(c = asome*bsome)	1802.613	800.8214	0	0	Total route assess NO_2 **(II)**: 2603.434587
Net total route assessment for NO_2 (II-I)	0	0	98		8.17276488

NO_2, ROUTE 29. Route name:	**0-50m (i)**	**50-100m (ii)**	**100-150m (iii)**	**150-200m (iv)**	**0-200m (v=i+ii+iii+iv)**
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 0	At 70m: 0	At 115m: 0	At 175m: 0	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 0	At 70m: 0	At 115m: 0	At 175m: 0	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 30. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 32.70	At 70m: 27.70	At 115m: 26.31	At 175m: 25.36	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 32.85	At 70m: 27.77	At 115m: 26.37	At 175m: 25.41	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 31. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	58	79	62	72	271
Properties (asome)	58	79	62	72	271
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 24.71	At 70m: 24.22	At 115m: 24.13	At 175m: 24.10	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 24.84	At 70m: 24.28	At 115m: 24.17	At 175m: 24.12	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	1433.315	1913.56	1496.061	1735.251	Total route assess NO_2 **(I)**: 6578.186679
Do-something NO_2 assessment *(c = asome*bsome)*	1440.829	1918.133	1498.25	1736.56	Total route assess NO_2 **(II)**: 6593.771817
Net total route assessment for NO_2 (II-I)	0	0	271		15.58513817

NO_2, ROUTE 32. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	49	150	151	154	504
Properties (asome)	49	150	151	154	504
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.61	At 70m: 24.46	At 115m: 24.13	At 175m: 23.96	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.59	At 70m: 24.45	At 115m: 24.13	At 175m: 23.98	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	1254.882	3668.282	3643.554	3689.18	Total route assess NO_2 **(I)**: 12255.89748
Do-something NO_2 assessment *(c = asome*bsome)*	1253.883	3667.573	3643.284	3692.497	Total route assess NO_2 **(II)**: 12257.23681
Net total route assessment for NO_2 (II-I)	504	0	0		1.33932729

NO_2, ROUTE 33. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	71	66	72	32	241
Properties (asome)	71	66	72	32	241
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.14	At 70m: 24.69	At 115m: 24.61	At 175m: 24.61	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.10	At 70m: 24.67	At 115m: 24.59	At 175m: 24.59	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	1785.079	1629.716	1772.229	787.627	Total route assess NO_2 **(I)**: 5974.650929
Do-something NO_2 assessment *(c = asome*bsome)*	1782.184	1627.962	1770.595	787.0218	Total route assess NO_2 **(II)**: 5967.76275
Net total route assessment for NO_2 (II-I)	241	0	0		-6.88817906

NO_2, ROUTE 34. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	110	50	1	0	161
Properties (asome)	110	50	1	0	161
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.04	At 70m: 25.73	At 115m: 25.41	At 175m: 25.21	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.19	At 70m: 25.78	At 115m: 25.43	At 175m: 25.22	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	2974.416	1286.528	25.40589	0	Total route assess NO_2 **(I)**: 4286.349718
Do-something NO_2 assessment *(c = asome*bsome)*	2991.233	1289.228	25.43489	0	Total route assess NO_2 **(II)**: 4305.89547
Net total route assessment for NO_2 (II-I)	0	0	161		19.54575182

NO$_2$, ROUTE 35. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	24	20	13	12	69
Properties (asome)	24	20	13	12	69
NO$_2$ concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.63	At 70m: 25.30	At 115m: 24.98	At 175m: 24.82	N/A
NO$_2$ concentration at average point within band for *do-something* (bsome)	At 20m: 26.27	At 70m: 25.15	At 115m: 24.89	At 175m: 24.77	N/A
Do-minimum NO$_2$ assessment *(c = amin*bmin)*	639.0458	505.989	324.7842	297.878	Total route assess NO$_2$ **(I)**: 1767.697041
Do-something NO$_2$ assessment *(c = asome*bsome)*	630.3686	503.087	323.6273	297.2564	Total route assess NO$_2$ **(II)**: 1754.339387
Net total route assessment for NO$_2$ (II-I)	69	0	0		-13.35765417

NO$_2$, ROUTE 36. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	29	18	47
Properties (asome)	0	0	29	18	47
NO$_2$ concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.51	At 70m: 25.09	At 115m: 24.73	At 175m: 24.49	N/A
NO$_2$ concentration at average point within band for *do-something* (bsome)	At 20m: 26.46	At 70m: 25.06	At 115m: 24.71	At 175m: 24.47	N/A
Do-minimum NO$_2$ assessment *(c = amin*bmin)*	0	0	717.2819	440.8482	Total route assess NO$_2$ **(I)**: 1158.130179
Do-something NO$_2$ assessment *(c = asome*bsome)*	0	0	716.4623	440.4435	Total route assess NO$_2$ **(II)**: 1156.905798
Net total route assessment for NO$_2$ (II-I)	47	0	0		-1.22438071

NO$_2$, ROUTE 37. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	58	184	41	18	301
Properties (asome)	58	184	41	18	301
NO$_2$ concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.83	At 70m: 25.57	At 115m: 25.41	At 175m: 25.45	N/A
NO$_2$ concentration at average point within band for *do-something* (bsome)	At 20m: 26.72	At 70m: 25.54	At 115m: 25.41	At 175m: 25.47	N/A
Do-minimum NO$_2$ assessment *(c = amin*bmin)*	1556.238	4704.127	1041.908	458.0228	Total route assess NO$_2$ **(I)**: 7760.296477
Do-something NO$_2$ assessment *(c = asome*bsome)*	1549.979	4699.7	1041.9	458.4672	Total route assess NO$_2$ **(II)**: 7750.046478
Net total route assessment for NO$_2$ (II-I)	301	0	0		-10.24999878

NO$_2$, ROUTE 38. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	2	0	0	0	2
Properties (asome)	2	0	0	0	2
NO$_2$ concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.68	At 70m: 25.29	At 115m: 25.22	At 175m: 25.25	N/A
NO$_2$ concentration at average point within band for *do-something* (bsome)	At 20m: 25.66	At 70m: 25.28	At 115m: 25.22	At 175m: 25.26	N/A
Do-minimum NO$_2$ assessment *(c = amin*bmin)*	51.35247	0	0	0	Total route assess NO$_2$ **(I)**: 51.35246584
Do-something NO$_2$ assessment *(c = asome*bsome)*	51.32557	0	0	0	Total route assess NO$_2$ **(II)**: 51.32556792
Net total route assessment for NO$_2$ (II-I)	2	0	0		-0.02689792

NO$_2$, ROUTE 39. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	38	21	39	50	148
Properties (asome)	38	21	39	50	148
NO$_2$ concentration at average point within band for *do-minimum* (bmin)	At 20m: 24.44	At 70m: 24.29	At 115m: 24.28	At 175m: 24.30	N/A
NO$_2$ concentration at average point within band for *do-something* (bsome)	At 20m: 24.47	At 70m: 24.31	At 115m: 24.28	At 175m: 24.30	N/A
Do-minimum NO$_2$ assessment *(c = amin*bmin)*	928.6034	510.166	947.0044	1214.949	Total route assess NO$_2$ **(I)**: 3600.722549
Do-something NO$_2$ assessment *(c = asome*bsome)*	929.7054	510.5653	947.0618	1214.817	Total route assess NO$_2$ **(II)**: 3602.149925
Net total route assessment for NO$_2$ (II-I)	0	0	148		1.42737595

NO_2, ROUTE 40. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	10	1	0	1	12
Properties (asome)	10	1	0	1	12
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.69	At 70m: 25.84	At 115m: 26.83	At 175m: 27.19	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.76	At 70m: 25.92	At 115m: 26.98	At 175m: 27.38	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	256.9388	25.84456	0	27.18777	Total route assess NO_2 (I): 309.9711718
Do-something NO_2 assessment *(c = asome*bsome)*	257.5871	25.92357	0	27.38362	Total route assess NO_2 (II): 310.8943168
Net total route assessment for NO_2 (II-I)	0	0	12		0.92314502

NO_2, ROUTE 41. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.59	At 70m: 25.69	At 115m: 25.91	At 175m: 26.70	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.62	At 70m: 25.70	At 115m: 25.92	At 175m: 26.71	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	0	0	0	0	Total route assess NO_2 (I): 0
Do-something NO_2 assessment *(c = asome*bsome)*	0	0	0	0	Total route assess NO_2 (II): 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 42. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	21	80	14	0	115
Properties (asome)	21	80	14	0	115
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.50	At 70m: 25.84	At 115m: 25.48	At 175m: 25.57	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.72	At 70m: 25.94	At 115m: 25.53	At 175m: 25.62	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	577.4611	2067.27	356.7489	0	Total route assess NO_2 (I): 3001.48018
Do-something NO_2 assessment *(c = asome*bsome)*	582.0748	2075.558	357.427	0	Total route assess NO_2 (II): 3015.059952
Net total route assessment for NO_2 (II-I)	0	0	115		13.57977215

NO_2, ROUTE 43. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	2	0	0	0	2
Properties (asome)	2	0	0	0	2
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.78	At 70m: 26.02	At 115m: 25.88	At 175m: 25.89	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.82	At 70m: 26.08	At 115m: 25.94	At 175m: 25.96	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	53.55095	0	0	0	Total route assess NO_2 (I): 53.55095052
Do-something NO_2 assessment *(c = asome*bsome)*	53.64614	0	0	0	Total route assess NO_2 (II): 53.64614394
Net total route assessment for NO_2 (II-I)	0	0	2		0.09519342

NO_2, ROUTE 44. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	21	52	0	0	73
Properties (asome)	21	52	0	0	73
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 25.34	At 70m: 25.10	At 115m: 25.27	At 175m: 25.74	N/A
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 25.42	At 70m: 25.16	At 115m: 25.34	At 175m: 25.84	N/A
Do-minimum NO_2 assessment *(c = amin*bmin)*	532.1887	1305.245	0	0	Total route assess NO_2 (I): 1837.433949
Do-something NO_2 assessment *(c = asome*bsome)*	533.8877	1308.529	0	0	Total route assess NO_2 (II): 1842.416578
Net total route assessment for NO_2 (II-I)	0	0	73		4.98262954

NO_2, ROUTE 45. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	76	0	0	0	76
Properties (asome)	76	0	0	0	76
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.04	At 70m: 26.05	At 115m: 26.11	At 175m: 27.67	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.12	At 70m: 26.14	At 115m: 26.19	At 175m: 27.92	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1978.791	0	0	0	Total route assess NO_2 **(I)**: 1978.791335
Do-something* NO_2 assessment *(c = asome*bsome)	1984.884	0	0	0	Total route assess NO_2 **(II)**: 1984.884134
Net total route assessment for NO_2 (II-I)	0	0	76		6.09279916

NO_2, ROUTE 46. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.67	At 70m: 26.25	At 115m: 25.89	At 175m: 26.11	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.93	At 70m: 26.41	At 115m: 26.02	At 175m: 26.16	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 47. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.03	At 70m: 25.75	At 115m: 25.92	At 175m: 26.39	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.20	At 70m: 25.87	At 115m: 26.03	At 175m: 26.50	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 48. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	1	1	12	1	15
Properties (asome)	1	1	12	1	15
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 26.07	At 70m: 25.65	At 115m: 25.59	At 175m: 26.19	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 26.06	At 70m: 25.67	At 115m: 25.69	At 175m: 26.38	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	26.0672	25.65018	307.0506	26.18982	Total route assess NO_2 **(I)**: 384.9578351
Do-something* NO_2 assessment *(c = asome*bsome)	26.06279	25.67003	308.2321	26.37558	Total route assess NO_2 **(II)**: 386.3404512
Net total route assessment for NO_2 (II-I)	15	0	0		1.38261613

NO_2, ROUTE 49. Route name:	0-50m (i)	50-100m (ii)	100-150m (iii)	150-200m (iv)	0-200m (v=i+ii+iii+iv)
Properties (amin)	4	5	0	0	9
Properties (asome)	4	5	0	0	9
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.65	At 70m: 26.90	At 115m: 26.65	At 175m: 26.62	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.64	At 70m: 26.91	At 115m: 26.81	At 175m: 26.89	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	114.619	134.4773	0	0	Total route assess NO_2 **(I)**: 249.0963551
Do-something* NO_2 assessment *(c = asome*bsome)	114.5493	134.5514	0	0	Total route assess NO_2 **(II)**: 249.100663
Net total route assessment for NO_2 (II-I)	9	0	0		0.00430787

NO_2, ROUTE 50. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	0	0	0	0	0
Properties (asome)	0	0	0	0	0
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 31.04	At 70m: 27.24	At 115m: 26.33	At 175m: 25.73	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 30.69	At 70m: 27.12	At 115m: 26.27	At 175m: 25.71	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	0	0	0	0	Total route assess NO_2 **(I)**: 0
Do-something* NO_2 assessment *(c = asome*bsome)	0	0	0	0	Total route assess NO_2 **(II)**: 0
Net total route assessment for NO_2 (II-I)	0	0	0		0

NO_2, ROUTE 51. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	20	21	19	9	69
Properties (asome)	20	21	19	9	69
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 28.05	At 70m: 28.39	At 115m: 29.06	At 175m: 30.79	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 27.89	At 70m: 28.14	At 115m: 28.57	At 175m: 29.23	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	560.9701	596.1344	552.1961	277.0664	Total route assess NO_2 **(I)**: 1986.367044
Do-something* NO_2 assessment *(c = asome*bsome)	557.8285	590.9007	542.8353	263.073	Total route assess NO_2 **(II)**: 1954.63748
Net total route assessment for NO_2 (II-I)	69	0	0		-31.72956395

NO_2, ROUTE 52. Route name:	**0-50m** (i)	**50-100m** (ii)	**100-150m** (iii)	**150-200m** (iv)	**0-200m** (v=i+ii+iii+iv)
Properties (amin)	41	12	0	0	53
Properties (asome)	41	12	0	0	53
NO_2 concentration at average point within band for *do-minimum* (bmin)	At 20m: 27.82	At 70m: 30.37	At 115m: 28.01	At 175m: 26.88	**N/A**
NO_2 concentration at average point within band for *do-something* (bsome)	At 20m: 28.01	At 70m: 30.82	At 115m: 28.29	At 175m: 27.09	**N/A**
Do-minimum* NO_2 assessment *(c = amin*bmin)	1140.684	364.4794	0	0	Total route assess NO_2 **(I)**: 1505.163026
Do-something* NO_2 assessment *(c = asome*bsome)	1148.485	369.8367	0	0	Total route assess NO_2 **(II)**: 1518.321888
Net total route assessment for NO_2 (II-I)	0	0	53		13.15886173

GREENHOUSE GASES

APPRAISAL- Greenhouse Gases

Proposal Name: A63 Castle Street 2018 BASE UG

Current Year of Appraisal: 2004

Proposal Opening year: 2018

Project (Road/Rail or Road and Rail): Road

Overall Assessment Score:

Net Present Value of Carbon Emissions of Proposal (£): 421,869

(60 Year Period)

*positive value reflects a **net benefit** (i.e. carbon emissions reduction)

Quantitative Assessment:

Change in Carbon Emissions over 60 year appraisal period (tonnes): -14,555
(between with scheme and without scheme scenarios)

Change in Carbon Emissions in Opening year (tonnes): -237
(between with scheme and without scheme scenarios)

Qualitative Comments:

Sensitivity Analysis:

Description:

Upper bound Net Present Value of Carbon Emissions of Proposal (£): 692,967

Lower bound Net Present Value of Carbon Emissions of Proposal (£): 286,320

Data Sources:

Tonnes of carbon emitted:

Road:

	Tonnes of carbon emitted in without scheme scenario	Tonnes of carbon emitted in with scheme scenario
Year		
2018	13,498	13,261
2019	13,409	13,172
2020	13,321	13,084
2021	13,328	13,091
2022	13,338	13,100
2023	13,347	13,109
2024	13,356	13,117
2025	13,364	13,125
2026	13,373	13,134
2027	13,381	13,142
2028	13,390	13,151
2029	13,398	13,159
2030	13,407	13,168
2031	13,416	13,176
2032	13,424	13,185
2033	13,433	13,193
2034	13,442	13,202
2035	13,450	13,210
2036	13,459	13,218
2037	13,468	13,227
2038	13,476	13,235
2039	13,485	13,244
2040	13,494	13,252
2041	13,502	13,261
2042	13,511	13,269
2043	13,520	13,278
2044	13,528	13,286
2045	13,537	13,295
2046	13,545	13,303
2047	13,554	13,312
2048	13,563	13,320
2049	13,571	13,329
2050	13,580	13,337
2051	13,589	13,345
2052	13,597	13,354
2053	13,606	13,362
2054	13,615	13,371
2055	13,623	13,379
2056	13,632	13,388
2057	13,641	13,396
2058	13,649	13,405
2059	13,658	13,413
2060	13,666	13,422
2061	13,675	13,430
2062	13,684	13,439
2063	13,692	13,447
2064	13,701	13,455
2065	13,710	13,464
2066	13,718	13,472
2067	13,727	13,481
2068	13,736	13,489
2069	13,744	13,498
2070	13,753	13,506
2071	13,762	13,515
2072	13,770	13,523
2073	13,779	13,532
2074	13,788	13,540
2075	13,796	13,549
2076	13,805	13,557
2077	13,813	13,565

Rail:

	Tonnes of carbon emitted in without scheme scenario	Tonnes of carbon emitted in with scheme scenario
Year		
2018	0	0
2019	0	0
2020	0	0
2021	0	0
2022	0	0
2023	0	0
2024	0	0
2025	0	0
2026	0	0
2027	0	0
2028	0	0
2029	0	0
2030	0	0
2031	0	0
2032	0	0
2033	0	0
2034	0	0
2035	0	0
2036	0	0
2037	0	0
2038	0	0
2039	0	0
2040	0	0
2041	0	0
2042	0	0
2043	0	0
2044	0	0
2045	0	0
2046	0	0
2047	0	0
2048	0	0
2049	0	0
2050	0	0
2051	0	0
2052	0	0
2053	0	0
2054	0	0
2055	0	0
2056	0	0
2057	0	0
2058	0	0
2059	0	0
2060	0	0
2061	0	0
2062	0	0
2063	0	0
2064	0	0
2065	0	0
2066	0	0
2067	0	0
2068	0	0
2069	0	0
2070	0	0
2071	0	0
2072	0	0
2073	0	0
2074	0	0
2075	0	0
2076	0	0
2077	0	0

Monetary cacul

Change in tonnes of carbon emitted
-236.5424536
-237.1250175
-237.6893439
-237.8787663
-238.0692577
-238.2531169
-238.4307855
-238.6026221
-238.658
-238.841
-239.024
-239.207
-239.39
-239.573
-239.756
-239.939
-240.122
-240.305
-240.488
-240.671
-240.854
-241.037
-241.22
-241.403
-241.586
-241.769
-241.952
-242.135
-242.318
-242.501
-242.684
-242.867
-243.05
-243.233
-243.416
-243.599
-243.782
-243.965
-244.148
-244.331
-244.514
-244.697
-244.88
-245.063
-245.246
-245.429
-245.612
-245.795
-245.978
-246.161
-246.344
-246.527
-246.71
-246.893
-247.076
-247.259
-247.442
-247.625
-247.808
-247.991

Net Present Value of (

ılation of total change resulting from scheme:

Social cost of carbon per tonne	Social cost of carbon for year change	NPV
91.08	-21544.29	12424.72
92.11	-21842.77	12170.87
93.15	-22140.76	11919.73
94.18	-22404.61	11653.89
95.22	-22668.95	11392.64
96.25	-22933.05	11135.62
97.29	-23196.93	10882.85
98.32	-23460.60	10634.35
99.36	-23713.06	10385.30
100.40	-23978.44	10146.41
101.43	-24244.20	9911.94
102.47	-24510.35	9681.89
103.50	-24776.86	9456.20
104.54	-25043.76	9234.84
105.57	-25311.04	9017.78
106.61	-25578.70	8804.96
107.64	-25846.73	8596.36
108.68	-26115.15	8432.65
109.71	-26383.94	8271.30
110.75	-26653.11	8112.32
111.78	-26922.66	7955.69
112.82	-27192.59	7801.41
113.85	-27462.90	7649.48
114.89	-27733.58	7499.88
115.92	-28004.65	7352.60
116.96	-28276.09	7207.64
117.99	-28547.92	7064.98
119.03	-28820.12	6924.61
120.06	-29092.70	6786.50
121.10	-29365.66	6650.66
122.13	-29639.00	6517.05
123.17	-29912.71	6385.67
124.20	-30186.81	6256.49
125.24	-30461.28	6129.49
126.27	-30736.14	6004.66
127.31	-31011.37	5881.97
128.34	-31286.98	5761.40
129.38	-31562.97	5642.93
130.41	-31839.34	5526.55
131.45	-32116.09	5412.22
132.48	-32393.21	5299.92
133.52	-32670.72	5189.64
134.55	-32948.60	5081.34
135.59	-33226.87	4975.00
136.62	-33505.51	4870.60
137.66	-33784.53	4768.12
138.69	-34063.93	4667.53
139.73	-34343.71	4568.80
140.76	-34623.86	4471.91
141.80	-34904.40	4376.84
142.83	-35185.31	4283.56
143.87	-35466.61	4192.04
144.90	-35748.28	4102.27
145.94	-36030.33	4014.21
146.97	-36312.76	3927.84
148.01	-36595.57	3843.13
149.04	-36878.76	3760.07
150.08	-37162.32	3678.62
151.11	-37446.27	3598.77
152.15	-37730.59	3520.48
Carbon Emissions of Proposal:		421869.18

APPRAISAL- Greenhouse Gases

Proposal Name: **A63 Castle Street 2018 LandB UG**

Current Year of Appraisal: 2004

Proposal Opening year: 2018

Project (Road/Rail or Road and Rail): Road

Overall Assessment Score:

Net Present Value of Carbon Emissions of Proposal (£): 367,268

(60 Year Period)

*positive value reflects a **net benefit** (i.e. carbon emissions reduction)

Quantitative Assessment:

Change in Carbon Emissions over 60 year appraisal period (tonnes): -12,664
(between with scheme and without scheme scenarios)

Change in Carbon Emissions in Opening year (tonnes): -207
(between with scheme and without scheme scenarios)

Qualitative Comments:

Sensitivity Analysis:

Description:

Upper bound Net Present Value of Carbon Emissions of Proposal (£): 603,330

Lower bound Net Present Value of Carbon Emissions of Proposal (£): 249,236

Data Sources:

Tonnes of carbon emitted:

Road:

Year	Tonnes of carbon emitted in without scheme scenario	Tonnes of carbon emitted in with scheme scenario
2018	13,498	13,291
2019	13,409	13,202
2020	13,321	13,114
2021	13,328	13,121
2022	13,338	13,130
2023	13,347	13,139
2024	13,356	13,148
2025	13,364	13,156
2026	13,373	13,165
2027	13,381	13,173
2028	13,390	13,182
2029	13,398	13,190
2030	13,407	13,199
2031	13,416	13,207
2032	13,424	13,216
2033	13,433	13,224
2034	13,442	13,233
2035	13,450	13,241
2036	13,459	13,250
2037	13,468	13,258
2038	13,476	13,267
2039	13,485	13,275
2040	13,494	13,284
2041	13,502	13,292
2042	13,511	13,301
2043	13,520	13,309
2044	13,528	13,318
2045	13,537	13,326
2046	13,545	13,335
2047	13,554	13,343
2048	13,563	13,352
2049	13,571	13,360
2050	13,580	13,369
2051	13,589	13,377
2052	13,597	13,386
2053	13,606	13,394
2054	13,615	13,403
2055	13,623	13,411
2056	13,632	13,420
2057	13,641	13,428
2058	13,649	13,437
2059	13,658	13,445
2060	13,666	13,454
2061	13,675	13,462
2062	13,684	13,471
2063	13,692	13,479
2064	13,701	13,488
2065	13,710	13,496
2066	13,718	13,505
2067	13,727	13,513
2068	13,736	13,522
2069	13,744	13,530
2070	13,753	13,539
2071	13,762	13,547
2072	13,770	13,556
2073	13,779	13,564
2074	13,788	13,573
2075	13,796	13,581
2076	13,805	13,590
2077	13,813	13,598

Rail:

Year	Tonnes of carbon emitted in without scheme scenario	Tonnes of carbon emitted in with scheme scenario
2018	0	0
2019	0	0
2020	0	0
2021	0	0
2022	0	0
2023	0	0
2024	0	0
2025	0	0
2026	0	0
2027	0	0
2028	0	0
2029	0	0
2030	0	0
2031	0	0
2032	0	0
2033	0	0
2034	0	0
2035	0	0
2036	0	0
2037	0	0
2038	0	0
2039	0	0
2040	0	0
2041	0	0
2042	0	0
2043	0	0
2044	0	0
2045	0	0
2046	0	0
2047	0	0
2048	0	0
2049	0	0
2050	0	0
2051	0	0
2052	0	0
2053	0	0
2054	0	0
2055	0	0
2056	0	0
2057	0	0
2058	0	0
2059	0	0
2060	0	0
2061	0	0
2062	0	0
2063	0	0
2064	0	0
2065	0	0
2066	0	0
2067	0	0
2068	0	0
2069	0	0
2070	0	0
2071	0	0
2072	0	0
2073	0	0
2074	0	0
2075	0	0
2076	0	0
2077	0	0

Monetary cacul

Change in tonnes of carbon emitted
-207.3111561
-207.2219511
-207.1296596
-207.2788199
-207.4284843
-207.5715935
-207.7085793
-207.8397915
-208.0024
-208.1448
-208.2872
-208.4296
-208.572
-208.7144
-208.8568
-208.9992
-209.1416
-209.284
-209.4264
-209.5688
-209.7112
-209.8536
-209.996
-210.1384
-210.2808
-210.4232
-210.5656
-210.708
-210.8504
-210.9928
-211.1352
-211.2776
-211.42
-211.5624
-211.7048
-211.8472
-211.9896
-212.132
-212.2744
-212.4168
-212.5592
-212.7016
-212.844
-212.9864
-213.1288
-213.2712
-213.4136
-213.556
-213.6984
-213.8408
-213.9832
-214.1256
-214.268
-214.4104
-214.5528
-214.6952
-214.8376
-214.98
-215.1224
-215.2648

Net Present Value of

ılation of total change resulting from scheme:

Social cost of carbon per tonne	Social cost of carbon for year change	NPV
91.08	-18881.90	10889.30
92.11	-19088.25	10636.05
93.15	-19294.13	10387.21
94.18	-19522.56	10154.77
95.22	-19751.34	9926.35
96.25	-19979.80	9701.61
97.29	-20207.97	9480.58
98.32	-20435.85	9263.28
99.36	-20667.12	9051.31
100.40	-20896.70	8842.37
101.43	-21126.57	8637.34
102.47	-21356.74	8436.17
103.50	-21587.20	8238.85
104.54	-21817.96	8045.33
105.57	-22049.01	7855.59
106.61	-22280.36	7669.58
107.64	-22512.00	7487.26
108.68	-22743.94	7344.08
109.71	-22976.17	7202.98
110.75	-23208.70	7063.95
111.78	-23441.52	6927.01
112.82	-23674.63	6792.13
113.85	-23908.04	6659.31
114.89	-24141.75	6528.55
115.92	-24375.75	6399.84
116.96	-24610.05	6273.16
117.99	-24844.64	6148.50
119.03	-25079.52	6025.85
120.06	-25314.70	5905.20
121.10	-25550.17	5786.54
122.13	-25785.94	5669.84
123.17	-26022.01	5555.09
124.20	-26258.36	5442.28
125.24	-26495.02	5331.39
126.27	-26731.97	5222.39
127.31	-26969.21	5115.28
128.34	-27206.75	5010.04
129.38	-27444.58	4906.63
130.41	-27682.70	4805.06
131.45	-27921.13	4705.28
132.48	-28159.84	4607.29
133.52	-28398.85	4511.06
134.55	-28638.16	4416.58
135.59	-28877.76	4323.82
136.62	-29117.66	4232.75
137.66	-29357.85	4143.37
138.69	-29598.33	4055.64
139.73	-29839.11	3969.55
140.76	-30080.19	3885.06
141.80	-30321.56	3802.17
142.83	-30563.22	3720.85
143.87	-30805.18	3641.08
144.90	-31047.43	3562.82
145.94	-31289.98	3486.08
146.97	-31532.83	3410.81
148.01	-31775.96	3337.00
149.04	-32019.40	3264.62
150.08	-32263.12	3193.66
151.11	-32507.15	3124.09
152.15	-32751.46	3055.90
Carbon Emissions of Proposal:		367267.53

APPRAISAL- Greenhouse Gases

Proposal Name: A63 Castle Street 2020 CandC Tunnel

Current Year of Appraisal: 2004

Proposal Opening year: 2020

Project (Road/Rail or Road and Rail): Road

Overall Assessment Score:

Net Present Value of Carbon Emissions of Proposal (£): 302,424

(60 Year Period)

*positive value reflects a **net benefit** (i.e. carbon emissions reduction)

Quantitative Assessment:

Change in Carbon Emissions over 60 year appraisal period (tonnes): -10,939
(between with scheme and without scheme scenarios)

Change in Carbon Emissions in Opening year (tonnes): -176
(between with scheme and without scheme scenarios)

Qualitative Comments:

Sensitivity Analysis:

Description:

Upper bound Net Present Value of Carbon Emissions of Proposal (£): 492,972

Lower bound Net Present Value of Carbon Emissions of Proposal (£): 207,150

Data Sources:

Tonnes of carbon emitted:

Road:

	Tonnes of carbon emitted in without scheme scenario	Tonnes of carbon emitted in with scheme scenario
Year		
2020	13,368	13,192
2021	13,375	13,199
2022	13,384	13,208
2023	13,393	13,217
2024	13,402	13,225
2025	13,410	13,233
2026	13,419	13,242
2027	13,428	13,250
2028	13,436	13,259
2029	13,445	13,267
2030	13,454	13,275
2031	13,462	13,284
2032	13,471	13,292
2033	13,479	13,301
2034	13,488	13,309
2035	13,497	13,317
2036	13,505	13,326
2037	13,514	13,334
2038	13,522	13,343
2039	13,531	13,351
2040	13,540	13,359
2041	13,548	13,368
2042	13,557	13,376
2043	13,565	13,384
2044	13,574	13,393
2045	13,583	13,401
2046	13,591	13,410
2047	13,600	13,418
2048	13,609	13,426
2049	13,617	13,435
2050	13,626	13,443
2051	13,634	13,452
2052	13,643	13,460
2053	13,652	13,468
2054	13,660	13,477
2055	13,669	13,485
2056	13,677	13,494
2057	13,686	13,502
2058	13,695	13,510
2059	13,703	13,519
2060	13,712	13,527
2061	13,720	13,536
2062	13,729	13,544
2063	13,738	13,552
2064	13,746	13,561
2065	13,755	13,569
2066	13,763	13,578
2067	13,772	13,586
2068	13,781	13,594
2069	13,789	13,603
2070	13,798	13,611
2071	13,806	13,620
2072	13,815	13,628
2073	13,824	13,636
2074	13,832	13,645
2075	13,841	13,653
2076	13,849	13,662
2077	13,858	13,670
2078	13,867	13,678
2079	13,875	13,687

Rail:

	Tonnes of carbon emitted in without scheme scenario	Tonnes of carbon emitted in with scheme scenario
Year		
2020	0	0
2021	0	0
2022	0	0
2023	0	0
2024	0	0
2025	0	0
2026	0	0
2027	0	0
2028	0	0
2029	0	0
2030	0	0
2031	0	0
2032	0	0
2033	0	0
2034	0	0
2035	0	0
2036	0	0
2037	0	0
2038	0	0
2039	0	0
2040	0	0
2041	0	0
2042	0	0
2043	0	0
2044	0	0
2045	0	0
2046	0	0
2047	0	0
2048	0	0
2049	0	0
2050	0	0
2051	0	0
2052	0	0
2053	0	0
2054	0	0
2055	0	0
2056	0	0
2057	0	0
2058	0	0
2059	0	0
2060	0	0
2061	0	0
2062	0	0
2063	0	0
2064	0	0
2065	0	0
2066	0	0
2067	0	0
2068	0	0
2069	0	0
2070	0	0
2071	0	0
2072	0	0
2073	0	0
2074	0	0
2075	0	0
2076	0	0
2077	0	0
2078	0	0
2079	0	0

Monetary cacul

Change in tonnes of carbon emitted
-175.9927539
-176.1994651
-176.4183407
-176.6297056
-176.8340135
-177.0316462
-177.4314
-177.6403
-177.8492
-178.0581
-178.267
-178.4759
-178.6848
-178.8937
-179.1026
-179.3115
-179.5204
-179.7293
-179.9382
-180.1471
-180.356
-180.5649
-180.7738
-180.9827
-181.1916
-181.4005
-181.6094
-181.8183
-182.0272
-182.2361
-182.445
-182.6539
-182.8628
-183.0717
-183.2806
-183.4895
-183.6984
-183.9073
-184.1162
-184.3251
-184.534
-184.7429
-184.9518
-185.1607
-185.3696
-185.5785
-185.7874
-185.9963
-186.2052
-186.4141
-186.623
-186.8319
-187.0408
-187.2497
-187.4586
-187.6675
-187.8764
-188.0853
-188.2942
-188.5031

Net Present Value of (

ılation of total change resulting from scheme:

Social cost of carbon per tonne	Social cost of carbon for year change	NPV
93.15	-16393.73	8825.74
94.18	-16595.35	8632.16
95.22	-16798.55	8442.38
96.25	-17001.49	8255.43
97.29	-17204.18	8071.35
98.32	-17406.64	7890.18
99.36	-17629.58	7721.00
100.40	-17834.20	7546.49
101.43	-18039.24	7375.12
102.47	-18244.72	7206.89
103.50	-18450.63	7041.76
104.54	-18656.98	6879.73
105.57	-18863.75	6720.75
106.61	-19070.96	6564.80
107.64	-19278.60	6411.87
108.68	-19486.68	6292.30
109.71	-19695.18	6174.39
110.75	-19904.12	6058.15
111.78	-20113.49	5943.57
112.82	-20323.30	5830.65
113.85	-20533.53	5719.38
114.89	-20744.20	5609.77
115.92	-20955.30	5501.80
116.96	-21166.83	5395.47
117.99	-21378.80	5290.78
119.03	-21591.19	5187.71
120.06	-21804.02	5086.26
121.10	-22017.29	4986.42
122.13	-22230.98	4888.17
123.17	-22445.11	4791.51
124.20	-22659.67	4696.42
125.24	-22874.66	4602.89
126.27	-23090.09	4510.91
127.31	-23305.94	4420.47
128.34	-23522.23	4331.55
129.38	-23738.95	4244.13
130.41	-23956.11	4158.21
131.45	-24173.70	4073.76
132.48	-24391.71	3990.78
133.52	-24610.17	3909.24
134.55	-24829.05	3829.14
135.59	-25048.37	3750.45
136.62	-25268.11	3673.16
137.66	-25488.30	3597.25
138.69	-25708.91	3522.70
139.73	-25929.96	3449.50
140.76	-26151.43	3377.64
141.80	-26373.35	3307.09
142.83	-26595.69	3237.83
143.87	-26818.46	3169.86
144.90	-27041.67	3103.15
145.94	-27265.31	3037.68
146.97	-27489.39	2973.44
148.01	-27713.89	2910.41
149.04	-27938.83	2848.58
150.08	-28164.20	2787.92
151.11	-28390.00	2728.42
152.15	-28616.24	2670.06
153.18	-28842.91	2612.82
154.22	-29070.01	2556.69
Carbon Emissions of Proposal:		302424.13

APPRAISAL- Greenhouse Gases

Proposal Name: A63 Castle Street 2017 BASE OG

Current Year of Appraisal: 2004

Proposal Opening year: 2017

Project (Road/Rail or Road and Rail): Road

Overall Assessment Score:

Net Present Value of Carbon Emissions of Proposal (£): 126,250

(60 Year Period)

*positive value reflects a **net benefit** (i.e. carbon emissions reduction)

Quantitative Assessment:

Change in Carbon Emissions over 60 year appraisal period (tonnes): 4,275
(between with scheme and without scheme scenarios)

Change in Carbon Emissions in Opening year (tonnes): 67
(between with scheme and without scheme scenarios)

Qualitative Comments:

Sensitivity Analysis:

Description:

Upper bound Net Present Value of Carbon Emissions of Proposal (£): -208,040

Lower bound Net Present Value of Carbon Emissions of Proposal (£): -85,354

Data Sources:

Tonnes of carbon emitted:

Road:

	Tonnes of carbon emitted in without scheme scenario	Tonnes of carbon emitted in with scheme scenario
Year		
2017	13,283	13,351
2018	13,193	13,261
2019	13,104	13,172
2020	13,017	13,086
2021	13,023	13,093
2022	13,033	13,102
2023	13,041	13,111
2024	13,050	13,119
2025	13,058	13,127
2026	13,067	13,136
2027	13,075	13,145
2028	13,083	13,153
2029	13,092	13,162
2030	13,100	13,170
2031	13,109	13,179
2032	13,117	13,187
2033	13,125	13,196
2034	13,134	13,204
2035	13,142	13,212
2036	13,151	13,221
2037	13,159	13,229
2038	13,167	13,238
2039	13,176	13,246
2040	13,184	13,255
2041	13,193	13,263
2042	13,201	13,272
2043	13,209	13,280
2044	13,218	13,289
2045	13,226	13,297
2046	13,235	13,306
2047	13,243	13,314
2048	13,252	13,323
2049	13,260	13,331
2050	13,268	13,340
2051	13,277	13,348
2052	13,285	13,357
2053	13,294	13,365
2054	13,302	13,374
2055	13,310	13,382
2056	13,319	13,391
2057	13,327	13,399
2058	13,336	13,408
2059	13,344	13,416
2060	13,352	13,425
2061	13,361	13,433
2062	13,369	13,442
2063	13,378	13,450
2064	13,386	13,459
2065	13,395	13,467
2066	13,403	13,476
2067	13,411	13,484
2068	13,420	13,493
2069	13,428	13,501
2070	13,437	13,510
2071	13,445	13,518
2072	13,453	13,527
2073	13,462	13,535
2074	13,470	13,544
2075	13,479	13,552
2076	13,487	13,561

Rail:

	Tonnes of carbon emitted in without scheme scenario	Tonnes of carbon emitted in with scheme scenario
Year		
2017	0	0
2018	0	0
2019	0	0
2020	0	0
2021	0	0
2022	0	0
2023	0	0
2024	0	0
2025	0	0
2026	0	0
2027	0	0
2028	0	0
2029	0	0
2030	0	0
2031	0	0
2032	0	0
2033	0	0
2034	0	0
2035	0	0
2036	0	0
2037	0	0
2038	0	0
2039	0	0
2040	0	0
2041	0	0
2042	0	0
2043	0	0
2044	0	0
2045	0	0
2046	0	0
2047	0	0
2048	0	0
2049	0	0
2050	0	0
2051	0	0
2052	0	0
2053	0	0
2054	0	0
2055	0	0
2056	0	0
2057	0	0
2058	0	0
2059	0	0
2060	0	0
2061	0	0
2062	0	0
2063	0	0
2064	0	0
2065	0	0
2066	0	0
2067	0	0
2068	0	0
2069	0	0
2070	0	0
2071	0	0
2072	0	0
2073	0	0
2074	0	0
2075	0	0
2076	0	0

Monetary cacul

Change in tonnes of carbon emitted
67.22905863
67.84197516
68.43760703
69.01835804
69.12155974
69.21203203
69.29844908
69.38110747
69.46024823
69.4828
69.5706
69.6584
69.7462
69.834
69.9218
70.0096
70.0974
70.1852
70.273
70.3608
70.4486
70.5364
70.6242
70.712
70.7998
70.8876
70.9754
71.0632
71.151
71.2388
71.3266
71.4144
71.5022
71.59
71.6778
71.7656
71.8534
71.9412
72.029
72.1168
72.2046
72.2924
72.3802
72.468
72.5558
72.6436
72.7314
72.8192
72.907
72.9948
73.0826
73.1704
73.2582
73.346
73.4338
73.5216
73.6094
73.6972
73.785
73.8728

Net Present Value of

ılation of total change resulting from scheme:

Social cost of carbon per tonne	Social cost of carbon for year change	NPV
90.04	6053.64	-3613.36
91.08	6179.05	-3563.49
92.11	6304.13	-3512.69
93.15	6429.06	-3461.16
94.18	6510.21	-3386.32
95.22	6590.37	-3312.09
96.25	6670.32	-3238.91
97.29	6750.09	-3166.81
98.32	6829.68	-3095.80
99.36	6903.81	-3023.57
100.40	6984.54	-2955.49
101.43	7065.45	-2888.62
102.47	7146.54	-2822.97
103.50	7227.82	-2758.53
104.54	7309.28	-2695.28
105.57	7390.91	-2633.22
106.61	7472.73	-2572.34
107.64	7554.73	-2512.63
108.68	7636.92	-2465.98
109.71	7719.28	-2419.98
110.75	7801.83	-2374.62
111.78	7884.56	-2329.90
112.82	7967.47	-2285.83
113.85	8050.56	-2242.39
114.89	8133.84	-2199.60
115.92	8217.29	-2157.44
116.96	8300.93	-2115.93
117.99	8384.75	-2075.04
119.03	8468.75	-2034.79
120.06	8552.93	-1995.16
121.10	8637.29	-1956.15
122.13	8721.84	-1917.77
123.17	8806.57	-1880.00
124.20	8891.48	-1842.84
125.24	8976.57	-1806.29
126.27	9061.84	-1770.33
127.31	9147.30	-1734.98
128.34	9232.93	-1700.22
129.38	9318.75	-1666.04
130.41	9404.75	-1632.44
131.45	9490.93	-1599.42
132.48	9577.30	-1566.96
133.52	9663.84	-1535.07
134.55	9750.57	-1503.73
135.59	9837.48	-1472.95
136.62	9924.57	-1442.71
137.66	10011.84	-1413.00
138.69	10099.29	-1383.83
139.73	10186.93	-1355.18
140.76	10274.75	-1327.05
141.80	10362.75	-1299.44
142.83	10450.93	-1272.32
143.87	10539.29	-1245.71
144.90	10627.84	-1219.59
145.94	10716.56	-1193.95
146.97	10805.47	-1168.79
148.01	10894.56	-1144.11
149.04	10983.83	-1119.89
150.08	11073.28	-1096.12
151.11	11162.92	-1072.81
Carbon Emissions of Proposal:		-126249.63

APPRAISAL- Greenhouse Gases

Proposal Name: A63 Castle Street 2017 LandB OG

Current Year of Appraisal: 2004

Proposal Opening year: 2017

Project (Road/Rail or Road and Rail): Road

Overall Assessment Score:

Net Present Value of Carbon Emissions of Proposal (£): 23,921

(60 Year Period)

*positive value reflects a **net benefit** (i.e. carbon emissions reduction)

Quantitative Assessment:

Change in Carbon Emissions over 60 year appraisal period (tonnes): -789
(between with scheme and without scheme scenarios)

Change in Carbon Emissions in Opening year (tonnes): -16
(between with scheme and without scheme scenarios)

Qualitative Comments:

Sensitivity Analysis:

Description:

Upper bound Net Present Value of Carbon Emissions of Proposal (£): 39,581

Lower bound Net Present Value of Carbon Emissions of Proposal (£): 16,091

Data Sources:

Tonnes of carbon emitted:

Road:

Year	Tonnes of carbon emitted in without scheme scenario	Tonnes of carbon emitted in with scheme scenario
2017	13,283	13,267
2018	13,193	13,177
2019	13,104	13,089
2020	13,017	13,003
2021	13,023	13,010
2022	13,033	13,019
2023	13,041	13,028
2024	13,050	13,036
2025	13,058	13,044
2026	13,067	13,053
2027	13,075	13,061
2028	13,083	13,070
2029	13,092	13,078
2030	13,100	13,087
2031	13,109	13,095
2032	13,117	13,104
2033	13,125	13,112
2034	13,134	13,120
2035	13,142	13,129
2036	13,151	13,137
2037	13,159	13,146
2038	13,167	13,154
2039	13,176	13,163
2040	13,184	13,171
2041	13,193	13,179
2042	13,201	13,188
2043	13,209	13,196
2044	13,218	13,205
2045	13,226	13,213
2046	13,235	13,222
2047	13,243	13,230
2048	13,252	13,239
2049	13,260	13,247
2050	13,268	13,255
2051	13,277	13,264
2052	13,285	13,272
2053	13,294	13,281
2054	13,302	13,289
2055	13,310	13,298
2056	13,319	13,306
2057	13,327	13,314
2058	13,336	13,323
2059	13,344	13,331
2060	13,352	13,340
2061	13,361	13,348
2062	13,369	13,357
2063	13,378	13,365
2064	13,386	13,374
2065	13,395	13,382
2066	13,403	13,390
2067	13,411	13,399
2068	13,420	13,407
2069	13,428	13,416
2070	13,437	13,424
2071	13,445	13,433
2072	13,453	13,441
2073	13,462	13,449
2074	13,470	13,458
2075	13,479	13,466
2076	13,487	13,475

Rail:

Year	Tonnes of carbon emitted in without scheme scenario	Tonnes of carbon emitted in with scheme scenario
2017	0	0
2018	0	0
2019	0	0
2020	0	0
2021	0	0
2022	0	0
2023	0	0
2024	0	0
2025	0	0
2026	0	0
2027	0	0
2028	0	0
2029	0	0
2030	0	0
2031	0	0
2032	0	0
2033	0	0
2034	0	0
2035	0	0
2036	0	0
2037	0	0
2038	0	0
2039	0	0
2040	0	0
2041	0	0
2042	0	0
2043	0	0
2044	0	0
2045	0	0
2046	0	0
2047	0	0
2048	0	0
2049	0	0
2050	0	0
2051	0	0
2052	0	0
2053	0	0
2054	0	0
2055	0	0
2056	0	0
2057	0	0
2058	0	0
2059	0	0
2060	0	0
2061	0	0
2062	0	0
2063	0	0
2064	0	0
2065	0	0
2066	0	0
2067	0	0
2068	0	0
2069	0	0
2070	0	0
2071	0	0
2072	0	0
2073	0	0
2074	0	0
2075	0	0
2076	0	0

Monetary cacul

Change in tonnes of carbon emitted
-16.29909757
-15.42583744
-14.5723226
-13.73703432
-13.70104127
-13.67376642
-13.64668795
-13.61977019
-13.59298347
-13.6642
-13.6359
-13.6076
-13.5793
-13.551
-13.5227
-13.4944
-13.4661
-13.4378
-13.4095
-13.3812
-13.3529
-13.3246
-13.2963
-13.268
-13.2397
-13.2114
-13.1831
-13.1548
-13.1265
-13.0982
-13.0699
-13.0416
-13.0133
-12.985
-12.9567
-12.9284
-12.9001
-12.8718
-12.8435
-12.8152
-12.7869
-12.7586
-12.7303
-12.702
-12.6737
-12.6454
-12.6171
-12.5888
-12.5605
-12.5322
-12.5039
-12.4756
-12.4473
-12.419
-12.3907
-12.3624
-12.3341
-12.3058
-12.2775
-12.2492

Net Present Value of (

ılation of total change resulting from scheme:

Social cost of carbon per tonne	Social cost of carbon for year change	NPV
90.04	-1467.65	876.03
91.08	-1404.99	810.26
92.11	-1342.33	747.95
93.15	-1279.60	688.89
94.18	-1290.43	671.23
95.22	-1302.02	654.35
96.25	-1313.56	637.83
97.29	-1325.07	621.66
98.32	-1336.53	605.83
99.36	-1357.67	594.60
100.40	-1368.98	579.28
101.43	-1380.22	564.29
102.47	-1391.40	549.62
103.50	-1402.53	535.28
104.54	-1413.60	521.26
105.57	-1424.60	507.56
106.61	-1435.55	494.16
107.64	-1446.44	481.07
108.68	-1457.28	470.56
109.71	-1468.05	460.23
110.75	-1478.77	450.09
111.78	-1489.42	440.13
112.82	-1500.02	430.35
113.85	-1510.56	420.75
114.89	-1521.04	411.33
115.92	-1531.47	402.09
116.96	-1541.83	393.02
117.99	-1552.13	384.12
119.03	-1562.38	375.39
120.06	-1572.57	366.84
121.10	-1582.70	358.45
122.13	-1592.77	350.22
123.17	-1602.78	342.16
124.20	-1612.74	334.25
125.24	-1622.63	326.51
126.27	-1632.47	318.92
127.31	-1642.25	311.49
128.34	-1651.97	304.20
129.38	-1661.63	297.07
130.41	-1671.23	290.09
131.45	-1680.77	283.24
132.48	-1690.26	276.55
133.52	-1699.69	269.99
134.55	-1709.05	263.57
135.59	-1718.36	257.29
136.62	-1727.61	251.14
137.66	-1736.81	245.12
138.69	-1745.94	239.23
139.73	-1755.02	233.47
140.76	-1764.03	227.84
141.80	-1772.99	222.32
142.83	-1781.89	216.93
143.87	-1790.73	211.66
144.90	-1799.51	206.50
145.94	-1808.24	201.46
146.97	-1816.90	196.53
148.01	-1825.51	191.71
149.04	-1834.06	187.00
150.08	-1842.55	182.39
151.11	-1850.98	177.89
Carbon Emissions of Proposal:		23921.21

APPRAISAL- Greenhouse Gases

Proposal Name: A63 Castle Street 2018 EXT VIA

Current Year of Appraisal: 2004

Proposal Opening year: 2018

Project (Road/Rail or Road and Rail): Road

Overall Assessment Score:

Net Present Value of Carbon Emissions of Proposal (£): 155,907

(60 Year Period)

*positive value reflects a **net benefit** (i.e. carbon emissions reduction)

Quantitative Assessment:

Change in Carbon Emissions over 60 year appraisal period (tonnes): -5,447
(between with scheme and without scheme scenarios)

Change in Carbon Emissions in Opening year (tonnes): -80
(between with scheme and without scheme scenarios)

Qualitative Comments:

Sensitivity Analysis:

Description:

Upper bound Net Present Value of Carbon Emissions of Proposal (£): 255,608

Lower bound Net Present Value of Carbon Emissions of Proposal (£): 106,057

Data Sources:

Tonnes of carbon emitted:

Road:

Year	Tonnes of carbon emitted in without scheme scenario	Tonnes of carbon emitted in with scheme scenario
2018	13,498	13,418
2019	13,409	13,326
2020	13,321	13,237
2021	13,328	13,244
2022	13,338	13,253
2023	13,347	13,262
2024	13,356	13,270
2025	13,364	13,278
2026	13,373	13,287
2027	13,381	13,295
2028	13,390	13,303
2029	13,398	13,312
2030	13,407	13,320
2031	13,416	13,329
2032	13,424	13,337
2033	13,433	13,346
2034	13,442	13,354
2035	13,450	13,362
2036	13,459	13,371
2037	13,468	13,379
2038	13,476	13,388
2039	13,485	13,396
2040	13,494	13,404
2041	13,502	13,413
2042	13,511	13,421
2043	13,520	13,430
2044	13,528	13,438
2045	13,537	13,446
2046	13,545	13,455
2047	13,554	13,463
2048	13,563	13,472
2049	13,571	13,480
2050	13,580	13,489
2051	13,589	13,497
2052	13,597	13,505
2053	13,606	13,514
2054	13,615	13,522
2055	13,623	13,531
2056	13,632	13,539
2057	13,641	13,547
2058	13,649	13,556
2059	13,658	13,564
2060	13,666	13,573
2061	13,675	13,581
2062	13,684	13,590
2063	13,692	13,598
2064	13,701	13,606
2065	13,710	13,615
2066	13,718	13,623
2067	13,727	13,632
2068	13,736	13,640
2069	13,744	13,648
2070	13,753	13,657
2071	13,762	13,665
2072	13,770	13,674
2073	13,779	13,682
2074	13,788	13,690
2075	13,796	13,699
2076	13,805	13,707
2077	13,813	13,716

Rail:

Year	Tonnes of carbon emitted in without scheme scenario	Tonnes of carbon emitted in with scheme scenario
2018	0	0
2019	0	0
2020	0	0
2021	0	0
2022	0	0
2023	0	0
2024	0	0
2025	0	0
2026	0	0
2027	0	0
2028	0	0
2029	0	0
2030	0	0
2031	0	0
2032	0	0
2033	0	0
2034	0	0
2035	0	0
2036	0	0
2037	0	0
2038	0	0
2039	0	0
2040	0	0
2041	0	0
2042	0	0
2043	0	0
2044	0	0
2045	0	0
2046	0	0
2047	0	0
2048	0	0
2049	0	0
2050	0	0
2051	0	0
2052	0	0
2053	0	0
2054	0	0
2055	0	0
2056	0	0
2057	0	0
2058	0	0
2059	0	0
2060	0	0
2061	0	0
2062	0	0
2063	0	0
2064	0	0
2065	0	0
2066	0	0
2067	0	0
2068	0	0
2069	0	0
2070	0	0
2071	0	0
2072	0	0
2073	0	0
2074	0	0
2075	0	0
2076	0	0
2077	0	0

Monetary cacul

Change in tonnes of carbon emitted
-80.34562591
-82.39539515
-84.39758892
-84.65810253
-84.89636687
-85.12718081
-85.35107643
-85.56849073
-85.8658
-86.0991
-86.3324
-86.5657
-86.799
-87.0323
-87.2656
-87.4989
-87.7322
-87.9655
-88.1988
-88.4321
-88.6654
-88.8987
-89.132
-89.3653
-89.5986
-89.8319
-90.0652
-90.2985
-90.5318
-90.7651
-90.9984
-91.2317
-91.465
-91.6983
-91.9316
-92.1649
-92.3982
-92.6315
-92.8648
-93.0981
-93.3314
-93.5647
-93.798
-94.0313
-94.2646
-94.4979
-94.7312
-94.9645
-95.1978
-95.4311
-95.6644
-95.8977
-96.131
-96.3643
-96.5976
-96.8309
-97.0642
-97.2975
-97.5308
-97.7641

Net Present Value of (

ılation of total change resulting from scheme:

Social cost of carbon per tonne	Social cost of carbon for year change	NPV
91.08	-7317.88	4220.26
92.11	-7589.85	4229.09
93.15	-7861.64	4232.40
94.18	-7973.52	4147.47
95.22	-8083.83	4062.66
96.25	-8193.92	3978.73
97.29	-8303.81	3895.74
98.32	-8413.52	3813.73
99.36	-8531.63	3736.49
100.40	-8643.92	3657.65
101.43	-8756.70	3580.07
102.47	-8869.95	3503.74
103.50	-8983.70	3428.67
104.54	-9097.92	3354.84
105.57	-9212.63	3282.26
106.61	-9327.82	3210.92
107.64	-9443.49	3140.81
108.68	-9559.65	3086.84
109.71	-9676.29	3033.49
110.75	-9793.41	2980.79
111.78	-9911.02	2928.72
112.82	-10029.11	2877.30
113.85	-10147.68	2826.52
114.89	-10266.73	2776.39
115.92	-10386.27	2726.91
116.96	-10506.29	2678.08
117.99	-10626.79	2629.90
119.03	-10747.78	2582.37
120.06	-10869.25	2535.49
121.10	-10991.20	2489.26
122.13	-11113.63	2443.68
123.17	-11236.55	2398.74
124.20	-11359.95	2354.45
125.24	-11483.84	2310.80
126.27	-11608.20	2267.79
127.31	-11733.05	2225.42
128.34	-11858.38	2183.68
129.38	-11984.20	2142.58
130.41	-12110.50	2102.09
131.45	-12237.28	2062.23
132.48	-12364.54	2022.99
133.52	-12492.29	1984.36
134.55	-12620.52	1946.34
135.59	-12749.23	1908.92
136.62	-12878.43	1872.10
137.66	-13008.11	1835.88
138.69	-13138.27	1800.24
139.73	-13268.91	1765.19
140.76	-13400.04	1730.71
141.80	-13531.65	1696.80
142.83	-13663.75	1663.46
143.87	-13796.32	1630.68
144.90	-13929.38	1598.46
145.94	-14062.92	1566.78
146.97	-14196.95	1535.64
148.01	-14331.46	1505.04
149.04	-14466.45	1474.97
150.08	-14601.92	1445.42
151.11	-14737.88	1416.38
152.15	-14874.32	1387.86

Carbon Emissions of Proposal: 155907.24

LANDSCAPE

Worksheet: Scheme Option 1, Underground Base Scheme. Environment: Landscape

Features	Description	Scale it matters	Rarity	Importance	Substitutability	Impact	Additional Mitigation
Pattern	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable
Tranquillity	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable
Cultural	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable
Landcover	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable
Summary of character	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable

Reference Source(s): Design Manual for Roads and Bridges (DMRB) Volume 11: Environmental Assessment, Section 3, Part 5 Landscape Effects and Interim advice note (IAN) 81/06, Guidelines for Landscape and Visual Impact Assessment, second edition, 2002" (GLVIA 2002), Countryside Agency and Scottish Natural Heritage, "Landscape Character Assessment Guidance for England and Scotland, 2002", Variations for Urban Schemes' of DMRB Volume 11 Section 3, Part 5.

Summary assessment score: Neutral

Qualitative comments: Not assessed due to entire urban nature of scheme corridor. No features affected.

Worksheet: Scheme Option 2, Underground Land Bridge Option. Environment: Landscape

Features	Description	Scale it matters	Rarity	Importance	Substitutability	Impact	Additional Mitigation
Pattern	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable
Tranquillity	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable
Cultural	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable
Landcover	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable
Summary of character	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable

Reference Source(s): Design Manual for Roads and Bridges (DMRB) Volume 11: Environmental Assessment, Section 3, Part 5 Landscape Effects and Interim advice note (IAN) 81/06, Guidelines for Landscape and Visual Impact Assessment, second edition, 2002" (GLVIA 2002), Countryside Agency and Scottish Natural Heritage, "Landscape Character Assessment Guidance for England and Scotland, 2002", Variations for Urban Schemes' of DMRB Volume 11 Section 3, Part 5.

Summary assessment score: Neutral

Qualitative comments: Not assessed due to entire urban nature of scheme corridor. No features affected.

Worksheet: Scheme Option 3, Underground Cut and Cover Option. Environment: Landscape

Features	Description	Scale it matters	Rarity	Importance	Substitutability	Impact	Additional Mitigation
Pattern	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable
Tranquillity	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable
Cultural	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable
Landcover	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable
Summary of character	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable

Reference Source(s): Design Manual for Roads and Bridges (DMRB) Volume 11: Environmental Assessment, Section 3, Part 5 Landscape Effects and Interim advice note (IAN) 81/06, Guidelines for Landscape and Visual Impact Assessment, second edition, 2002" (GLVIA 2002), Countryside Agency and Scottish Natural Heritage, "Landscape Character Assessment Guidance for England and Scotland, 2002", Variations for Urban Schemes' of DMRB Volume 11 Section 3, Part 5.

Summary assessment score: Neutral

Qualitative comments: Not assessed due to entire urban nature of scheme corridor. No features affected.

Worksheet: Scheme Option 4, Over Ground Base Option. Environment: Landscape

Features	Description	Scale it matters	Rarity	Importance	Substitutability	Impact	Additional Mitigation
Pattern	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable
Tranquillity	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable
Cultural	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable
Landcover	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable
Summary of character	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable

Reference Source(s): Design Manual for Roads and Bridges (DMRB) Volume 11: Environmental Assessment, Section 3, Part 5 Landscape Effects and Interim advice note (IAN) 81/06, Guidelines for Landscape and Visual Impact Assessment, second edition, 2002" (GLVIA 2002), Countryside Agency and Scottish Natural Heritage, "Landscape Character Assessment Guidance for England and Scotland, 2002", Variations for Urban Schemes' of DMRB Volume 11 Section 3, Part 5.

Summary assessment score: Neutral

Qualitative comments: Not assessed due to entire urban nature of scheme corridor. No features affected.

Worksheet: Scheme Option 5, Over Ground Land Bridge Option. Environment: Landscape

Features	Description	Scale it matters	Rarity	Importance	Substitutability	Impact	Additional Mitigation
Pattern	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable
Tranquillity	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable
Cultural	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable
Landcover	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable
Summary of character	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable

Reference Source(s): Design Manual for Roads and Bridges (DMRB) Volume 11: Environmental Assessment, Section 3, Part 5 Landscape Effects and Interim advice note (IAN) 81/06, Guidelines for Landscape and Visual Impact Assessment, second edition, 2002" (GLVIA 2002), Countryside Agency and Scottish Natural Heritage, "Landscape Character Assessment Guidance for England and Scotland, 2002", Variations for Urban Schemes' of DMRB Volume 11 Section 3, Part 5.

Summary assessment score: Neutral

Qualitative comments: Not assessed due to entire urban nature of scheme corridor. No features affected.

Worksheet: Scheme Option 6, Over Ground Extended Viaduct Option. Environment: Landscape

Features	Description	Scale it matters	Rarity	Importance	Substitutability	Impact	Additional Mitigation
Pattern	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable
Tranquillity	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable
Cultural	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable
Landcover	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable
Summary of character	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Neutral	Not applicable

Reference Source(s): Design Manual for Roads and Bridges (DMRB) Volume 11: Environmental Assessment, Section 3, Part 5 Landscape Effects and Interim advice note (IAN) 81/06, Guidelines for Landscape and Visual Impact Assessment, second edition, 2002" (GLVIA 2002), Countryside Agency and Scottish Natural Heritage, "Landscape Character Assessment Guidance for England and Scotland, 2002", Variations for Urban Schemes' of DMRB Volume 11 Section 3, Part 5.

Summary assessment score: Neutral

Qualitative comments: Not assessed due to entire urban nature of scheme corridor. No features affected.

TOWNSCAPE

Worksheet: Scheme Option 1, Underground Base Scheme. Environment: Townscape

Features	Description	Scale it matters	Rarity	Importance	Substitutability	Changes in do minimum	Impact	Additional Mitigation
Layout	Typical urban city centre with linear scheme corridor. Mix of forms from historic core to open docks and post war social housing	Regionally (City Wide)	Rare – 'A 'Road, city centre, waterfront location	High Importance at a regional level	General layout substitutable however proposals largely within current scheme corridor	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Demolition of listed north wall to Humber Dock. Moderate Adverse.	New hard-scape urban design to areas around Prince's and Humber Dock to link affected areas either side of the A63 together.
Density and mix	Range from high density residential, to open docks and low to high density retail, and medium density industry.	Regionally (City Wide)	Rare – 'A 'Road, city centre, waterfront location	High Importance at a regional level	Mix of building styles / types / sizes substitutable in appearance	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Demolition of Castle and Earl de Grey Buildings and development of Trinity Burial Ground widens scheme corridor affecting density. Moderate Adverse	Not Required
Scale	Large scale road junction within mix of building scales reflecting the different land uses, flat topography generally gives enclosed scale due to the surrounding buildings, channelling views down the road corridor and surrounding roads. Large open scale as the road passes between Prince's and Humber Dock.	Regionally (City Wide)	Typical of city centre and urban roads in general	Low importance locally	Scheme design substitutable however impacts not.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Large scale development to Mytongate junction, opening out area creating large cutting. Three new pedestrian footbridges out of scale. Large Adverse.	Not Required
Appearance	Listed buildings, Trinity Burial Ground and the docks give local distinctiveness and create identity along the route corridor. Current road built around these features.	Regionally (City Wide) to Nationally	Rare, interesting combination of historic buildings and structures	High Importance at a regional to national level	Only possible to substitute demolition of listed buildings by taking down and rebuilding elsewhere. Unable to substitute Trinity Burial Ground in short to medium term.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Demolition of listed Castle and Earl de Grey Buildings. Porter Street, Prince's Quay and Market Place footbridges negatively impact appearance of the area. Large Adverse.	Relocation of Castle and Earl de Grey Buildings. Iconic individually designed pedestrian foot bridges to create key designed features along the route corridor.
Human interaction	Vehicular dominated road corridor, pedestrian crossing points are restricted by the road. Lots of activity in areas connecting with the road corridor e.g. the boats of the docks, people shopping in Prince's Quay and walking through the historic streets around Trinity Church.	Regionally (City Wide)	Rare – Area unique to Hull	High Importance at a regional level	Substitutable as current interaction with road is poor creating room for improvement.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Proposals should enhance human interaction and improve pedestrian movement along and across the route corridor. Slight Beneficial.	Improvements above the minimum features required e.g. look to enhance the wider areas around the docks to encourage pedestrian interaction in the area.

Features	Description	Scale it matters	Rarity	Importance	Substitutability	Changes in do minimum	Impact	Additional Mitigation
Cultural	Listed buildings / structures and those features of townscape quality combine to create a sense of place and provide the few enhancing features of the scheme corridor. Corridor dissects 'Old Town' Conservation Area.	Regionally (City Wide) to Nationally	Rare, interesting combination of historic buildings and structures	High Importance at a regional to national level	Only possible to substitute demolition of listed buildings by taking down and rebuilding elsewhere. Unable to substitute Trinity Burial Ground in short to medium term.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Demolition of listed Castle and Earl de Grey Buildings and north wall to Humber Dock and impact on the footprint of Trinity Burial Ground. Large Adverse.	Investigate avoidance of demolition to listed buildings and structures. Relocation of listed buildings.
Land use	Typical of an urban city centre of a variety of ages from historic to modern, spanning out from the A63 corridor including residential / light industrial / office and leisure uses.	Regionally (City Wide)	Rare – 'A 'Road, city centre, waterfront location	High Importance at a regional level	Trinity Burial Ground and Humber Dock area not substitutable.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Development generally within scheme corridor however reduction in area of Trinity Burial Ground by approx one third and impact on the northern area of Humber Dock. Moderate Adverse.	Provide new public areas around Prince's and Humber Dock to link affected areas either side of the A63 together.
Summary of character	Area dominated by the busy A63 corridor segregating surrounding areas however it is but enhanced by the attractive historic features of the docks, Trinity Church area and the few remaining listed buildings.	Regionally (City Wide)	Rare combination of different urban features within city centre location	Highly important at a regional level to local residents with ownership of city centre.	Historic features not easily substitutable. Development largely within existing road corridor.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Based on the above impact assessments for the individual categories and the Townscape and Visual Impact Assessment the overall Impact is Moderate adverse.	Impact can be reduced by removal of the three large pedestrian footbridges or if not removed to replace with iconic unique bridge structures. Creation of central plaza area between Humber and Prince's Dock.

Reference Source(s):__ Design Manual for Roads and Bridges (DMRB) Volume 11: Environmental Assessment, Section 3, Part 5 Landscape Effects and Interim advice note (IAN) 81/06, Guidelines for Landscape and Visual Impact Assessment, second edition, 2002" (GLVIA 2002), Countryside Agency and Scottish Natural Heritage, "Landscape Character Assessment Guidance for England and Scotland, 2002", Variations for Urban Schemes' of DMRB Volume 11 Section 3, Part 5.

Summary assessment score: Moderate Adverse

Qualitative comments: This scheme option is largely within the existing highway boundary however there is significant damage to Trinity Burial Ground, and demolition of the listed Castle Buildings, Earl de Grey public house and north wall to Humber Dock with three new pedestrian footbridges highly intrusive visual features within the local townscape.

Worksheet: Scheme Option 2, Underground Land Bridge Option. Environment: Townscape

Features	Description	Scale it matters	Rarity	Importance	Substitutability	Changes in do minimum	Impact	Additional Mitigation
Layout	Typical urban city centre with linear scheme corridor. Mix of forms from historic core to open docks and post war social housing	Regionally (City Wide)	Rare – 'A 'Road, city centre, waterfront location	High Importance at a regional level	General layout substitutable however proposals largely within current scheme corridor	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Demolition of listed north wall to Humber Dock. Moderate Adverse.	Create new public areas around Prince's and Humber Dock fronting the land bridge to provide a key new civic space within the city centre
Density and mix	Range from high density residential, to open docks and low to high density retail, and medium density industry.	Regionally (City Wide)	Rare – 'A 'Road, city centre, waterfront location	High Importance at a regional level	Mix of building styles / types / sizes which would be substitutable in appearance but not in location	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Demolition of Castle and Earl de Grey Buildings and development of Trinity Burial Ground widens scheme corridor affecting density. Demolition of northern wings Holiday Inn and Marina Court. Large Adverse	Not Required
Scale	Large scale road junction within mix of building scales reflecting the different land uses, flat topography generally gives enclosed scale due to the surrounding buildings, channelling views down the road corridor and surrounding roads. Large open scale as the road passes between Prince's and Humber Dock.	Regionally (City Wide)	Typical of city centre and urban roads in general	Low importance locally	Scheme design substitutable however impacts not.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Large scale development to Mytongate junction, opening out area creating large elongated cutting. Prince's Quay and Market Place footbridges out of scale with surrounding townscape. Large Adverse.	Not Required
Appearanc e	Listed buildings, Trinity Burial Ground and the docks give local distinctiveness and create identity along the route corridor. Current road built around these features.	Regionally (City Wide) to Nationally	Rare, interesting combinati on of historic buildings and structures	High Importance at a regional to national level	Only possible to substitute demolition of listed buildings by taking down and rebuilding elsewhere. Unable to substitute Trinity Burial Ground in short to medium term.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Demolition of listed Castle and Earl de Grey Buildings. Porter Street and Market Place footbridges negatively impact appearance of the area. Part demolition of Holiday Inn and Marina Court. A63 in cutting removes road from view from some receptors. Large Adverse.	Relocation of Castle and Earl de Grey Buildings. Iconic individually designed pedestrian foot bridges to create key designed features along the route corridor. Creation of new plaza area around the land bridge to link the areas between the two docks.
Human interaction	Vehicular dominated road corridor, pedestrian crossing points are restricted by the road. Lots of activity in areas connecting with the road corridor e.g. the boats of the docks, people shopping in Prince's Quay and walking through the historic streets around Trinity Church.	Regionally (City Wide)	Rare – Area unique to Hull	High Importance at a regional level	Substitutable as current interaction with road is poor creating room for improvement. land bridge should improve pedestrian connectivity between the areas either side of the A63	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Proposals should enhance human interaction and improve pedestrian movement along and across the route corridor, particularly between Humber and Prince's Dock over the land bridge. Moderate Beneficial	Improvements above the minimum features required e.g. look to enhance the wider areas around the docks to encourage pedestrian interaction in the area particularly around the land bridge.

Features	Description	Scale it matters	Rarity	Importance	Substitutability	Changes in do minimum	Impact	Additional Mitigation
Cultural	Listed buildings / structures and those features of townscape quality combine to create a sense of place and provide the few enhancing features of the scheme corridor. Corridor dissects 'Old Town' Conservation Area.	Regionally (City Wide) to Nationally	Rare, interesting combination of historic buildings and structures	High Importance at a regional to national level	Only possible to substitute demolition of listed buildings by taking down and rebuilding elsewhere. Unable to substitute Trinity Burial Ground in short to medium term.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Demolition of listed Castle and Earl de Grey Buildings and north wall to Humber Dock and impact on the footprint of Trinity Burial Ground. Large Adverse.	Investigate avoidance of demolition to listed buildings and structures. Relocation of listed buildings.
Land use	Typical of an urban city centre of a variety of ages from historic to modern, spanning out from the A63 corridor including residential / light industrial / office and leisure uses.	Regionally (City Wide)	Rare – 'A 'Road, city centre, waterfront location	High Importance at a regional level	Trinity Burial Ground and Humber Dock area not substitutable. Impacts on Holiday Inn and Marina Court substitutable in a different location.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Reduction in area of Trinity Burial Ground by approx one third and impact on the northern area of Humber Dock. Large Adverse	
Summary of character	Area dominated by the busy A63 corridor segregating surrounding areas however it is but enhanced by the attractive historic features of the docks, Trinity Church area and the few remaining listed buildings.	Regionally (City Wide)	Rare combination of different urban features within city centre location	Highly important at a regional level to local residents with ownership of city centre.	Historic features not easily substitutable. Development largely within existing road corridor. Modern buildings substitutable in new location.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Based on the above impact assessments for the individual categories and the Townscape and Visual Impact Assessment the Overall Impact is Large Adverse	Impact can be reduced by removal of large pedestrian bridges at Porter Street and Market Place, or if not removed to replace with iconic unique bridge structures. Creation of central plaza area around land bridge to tie in with other dock side areas.

Reference Source(s):__ Design Manual for Roads and Bridges (DMRB) Volume 11: Environmental Assessment, Section 3, Part 5 Landscape Effects and Interim advice note (IAN) 81/06, Guidelines for Landscape and Visual Impact Assessment, second edition, 2002" (GLVIA 2002), Countryside Agency and Scottish Natural Heritage, "Landscape Character Assessment Guidance for England and Scotland, 2002", Variations for Urban Schemes' of DMRB Volume 11 Section 3, Part 5.

Summary assessment score: Large Adverse

Qualitative comments: This scheme option is largely within the existing highway boundary but with an increased area of road in cutting and significant damage to Trinity Burial Ground and provision of a new built structure in the open areas between Humber and Prince's Dock. Demolition of the important listed Castle Buildings, Earl de Grey public house and north wall to Humber Dock. Demolition of the northern wings to the Holiday Inn and Marina Court widens the scheme corridor and two new pedestrian footbridges are highly intrusive visual features within the local townscape.

Worksheet: Scheme Option 3, Underground Cut and Cover Option. Environment: Townscape

Features	Description	Scale it matters	Rarity	Importance	Substitutability	Changes in do minimum	Impact	Additional Mitigation
Layout	Typical urban city centre with linear scheme corridor. Mix of forms from historic core to open docks and post war social housing	Regionally (City Wide)	Rare – 'A 'Road, city centre, waterfront location	High Importance at a regional level	General layout substitutable however proposals largely within current scheme corridor. Impacts on housing layout not substitutable in current location.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Demolition of listed north wall to Humber Dock. Demolition of properties within Trinity Court and Grammar School Yard affecting the layout of these housing areas. Large Adverse.	Provide new public areas above the tunnelled section to link in areas to the north and south of the road. Provision of new buffer zone, private open space to properties of Trinity Burial Ground and Grammar School Yard.
Density and mix	Range from high density residential, to open docks and low to high density retail, and medium density industry.	Regionally (City Wide)	Rare – 'A 'Road, city centre, waterfront location	High Importance at a regional level	Mix of building styles / types / sizes which would be substitutable in appearance but not in location	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Demolition of Castle and Earl de Grey Buildings and development of Trinity Burial Ground widens scheme corridor affecting density. Demolition of frontage sections of Trinity Court and Grammar School Yard. Very Large Adverse.	Recommend new structures on the site of the demolished properties of Trinity Court and Grammar School Yard to limit impact on the remaining properties.
Scale	Large scale road junction within mix of building scales reflecting the different land uses, flat topography generally gives enclosed scale due to the surrounding buildings, channelling views down the road corridor and surrounding roads. Large open scale as the road passes between Prince's and Humber Dock.	Regionally (City Wide)	Typical of city centre and urban roads in general	Low importance locally	Possible to substitute demolished buildings alongside the road with new buildings once the option is constructed.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Large scale development to Mytongate junction, creating large elongated cutting. Open area of LAR above tunnel retains existing scale. Demolition of frontage sections of Trinity Court and Grammar School Yard. Large Adverse.	Not Required
Appearance	Listed buildings, Trinity Burial Ground and the docks give local distinctiveness and create identity along the route corridor. Current road built around these features.	Regionally (City Wide) to Nationally	Rare, interesting combination of historic buildings and structures	High Importance at a regional to national level	Only possible to substitute demolition of listed buildings by taking down and rebuilding elsewhere. Unable to substitute Trinity Burial Ground in short to medium term. Trinity and Grammar School Yard properties substitutable in new locations only.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Demolition of listed Castle, Earl de Grey Buildings and north wall to Humber Dock. Porter Street footbridge negatively impacts appearance of the area. Demolition of frontage sections of Trinity Court and Grammar School Yard. A63 in tunnel removes main road from view from many receptors improving the appearance of the sensitive central area of the corridor. Slight Adverse.	Creation of new public spaces on top of the tunnel section to connect areas either side of the road. Materials in the area should be of a similar design style throughout with pedestrian priority.

Features	Description	Scale it matters	Rarity	Importance	Substitutability	Changes in do minimum	Impact	Additional Mitigation
Human interaction	Vehicular dominated road corridor, pedestrian crossing points are restricted by the road. Lots of activity in areas connecting with the road corridor e.g. the boats of the docks, people shopping in Prince's Quay and walking through the historic streets around Trinity Church.	Regionally (City Wide)	Rare – Area unique to Hull	High Importance at a regional level	Substitutable as current interaction with road is poor creating room for improvement. A63 in tunnel would improve pedestrian connectivity between the areas either side of the A63	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Potential to be Major Beneficial, subject to detailed design of the LAR and surrounding areas. Proposals should enhance human interaction and improve pedestrian movement along the route corridor, particularly between Humber and Prince's Dock over the LAR.	It is recommended that public areas within the LAR area will extend into the surrounding areas around the docks creating a uniform public space.
Cultural	Listed buildings / structures and those features of townscape quality combine to create a sense of place and provide the few enhancing features of the scheme corridor. Corridor dissects 'Old Town' Conservation Area.	Regionally (City Wide) to Nationally	Rare, interesting combination of historic buildings and structures	High Importance at a regional to national level	Only possible to substitute demolition of listed buildings by taking down and rebuilding elsewhere. Unable to substitute Trinity Burial Ground in short to medium term.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Demolition of listed Castle and Earl de Grey Buildings and north wall to Humber Dock and impact on the footprint of Trinity Burial Ground. Large Adverse.	Investigate avoidance of demolition to listed buildings and structures. Relocation of listed buildings.
Land use	Typical of an urban city centre of a variety of ages from historic to modern, spanning out from the A63 corridor including residential / light industrial / office and leisure uses.	Regionally (City Wide)	Rare – 'A 'Road, city centre, waterfront location	High Importance at a regional level	Trinity Burial Ground and Humber Dock area not substitutable. Trinity and Grammar School Yard properties substitutable in new locations only.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Reduction in area of Trinity Burial Ground by approx one half and impact on the northern area of Humber Dock. Major impact on layout on the residential areas of Trinity Court and Grammar School Yard. Large Adverse.	Redevelopment of the demolished areas of Trinity Court and Grammar School Yard to respect the remaining properties and provide new land use.
Summary of character	Area dominated by the busy A63 corridor segregating surrounding areas however it is but enhanced by the attractive historic features of the docks, Trinity Church area and the few remaining listed buildings.	Regionally (City Wide)	Rare combination of different urban features within city centre location	Highly important at a regional level to local residents with ownership of city centre.	Historic features and Trinity Burial Ground not easily substitutable. Development largely within existing road corridor. Modern buildings substitutable in new location.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Removal of the A63 into a tunnelled section presents exciting opportunities for redevelopment of the areas above combined with the LAR. Demolition of listed buildings and structures still necessary. Based on the above impact assessments for the individual categories and the Townscape and Visual Impact Assessment the Overall Impact is Moderate Adverse	Impact can be reduced by removal of large pedestrian bridge at Porter Street, or if not removed to replace with iconic unique bridge structures. Creation of central public space above the tunnel to link areas either side of the road with pedestrian priority over the LAR.

Reference Source(s):__ Design Manual for Roads and Bridges (DMRB) Volume 11: Environmental Assessment, Section 3, Part 5 Landscape Effects and Interim advice note (IAN) 81/06, Guidelines for Landscape and Visual Impact Assessment, second edition, 2002" (GLVIA 2002), Countryside Agency and Scottish Natural Heritage, "Landscape Character Assessment Guidance for England and Scotland, 2002", Variations for Urban Schemes' of DMRB Volume 11 Section 3, Part 5.

Summary assessment score: Moderate Adverse

Qualitative comments: This scheme option causes major damage to Trinity Burial Ground, and demolition of the listed Castle Buildings, Earl de Grey public house, north wall to Humber Dock and the residential areas of Trinity Square and Grammar School Yard. The tunnelled section of the A63 improves the townscape within the central area, removing traffic from view however the improved setting would be highly dependant on the detailed design of the LAR and surrounding public areas.

Worksheet: Scheme Option 4, Over Ground Base Scheme. Environment: Townscape

Features	Description	Scale it matters	Rarity	Importance	Substitutability	Changes in do minimum	Impact	Additional Mitigation
Layout	Typical urban city centre with linear scheme corridor. Mix of forms from historic core to open docks and post war social housing	Regionally (City Wide)	Rare – 'A 'Road, city centre, waterfront location	High Importance at a regional level	General layout substitutable however proposals largely within current scheme corridor	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Demolition of listed north wall to Humber Dock. Moderate Adverse.	New urban design to public areas around Prince's and Humber Dock to link affected areas either side of the A63 together.
Density and mix	Range from high density residential, to open docks and low to high density retail, and medium density industry.	Regionally (City Wide)	Rare – 'A 'Road, city centre, waterfront location	High Importance at a regional level	Mix of building styles / types / sizes substitutable in appearance	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Demolition of Castle and Earl de Grey Buildings and development of Trinity Burial Ground widens scheme corridor affecting density. Moderate Adverse	Consider the redesign of areas under the viaduct section by Trinity Burial Ground to mitigate against loss of trees in the area and to create new public areas.
Scale	Large scale road junction within mix of building scales reflecting the different land uses, flat topography generally gives enclosed scale due to the surrounding buildings, channelling views down the road corridor and surrounding roads. Large open scale as the road passes between Prince's and Humber Dock.	Regionally (City Wide)	Typical of city centre and urban roads in general	Low importance locally	Scheme design substitutable however impacts not.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Large scale development to Mytongate junction, opening out area creating large cutting. Three new pedestrian footbridges out of scale. Large Adverse.	Not Required
Appearance	Listed buildings, Trinity Burial Ground and the docks give local distinctiveness and create identity along the route corridor. Current road built around these features.	Regionally (City Wide) to Nationally	Rare, interesting combination of historic buildings and structures	High Importance at a regional to national level	Only possible to substitute demolition of listed buildings by taking down and rebuilding elsewhere. Unable to substitute Trinity Burial Ground in short to medium term.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Demolition of listed Castle and Earl de Grey Buildings. Porter Street, Prince's Quay and Market Place footbridges negatively impact appearance of the area. Viaduct section highly visible within local area. Large Adverse.	Relocation of Castle and Earl de Grey Buildings. Iconic individually designed pedestrian foot bridges to create key designed features along the route corridor.
Human interaction	Vehicular dominated road corridor, pedestrian crossing points are restricted by the road. Lots of activity in areas connecting with the road corridor e.g. the boats of the docks, people shopping in Prince's Quay and walking through the historic streets around Trinity Church.	Regionally (City Wide)	Rare – Area unique to Hull	High Importance at a regional level	Substitutable as current interaction with road is poor creating room for improvement.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Proposals should enhance human interaction and improve pedestrian movement along and across the route corridor. Slight Beneficial.	Improvements above the minimum features required e.g. look to enhance the wider areas around the docks to encourage pedestrian interaction in the wider area.
Cultural	Listed buildings / structures and those features of townscape quality combine to create a sense of place and provide the few enhancing features of the scheme corridor. Corridor dissects 'Old Town' Conservation Area.	Regionally (City Wide) to Nationally	Rare, interesting combination of historic buildings and structures	High Importance at a regional to national level	Only possible to substitute demolition of listed buildings by taking down and rebuilding elsewhere. Unable to substitute Trinity Burial Ground in short to medium term.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Demolition of listed Castle and Earl de Grey Buildings and north wall to Humber Dock and impact on the footprint of Trinity Burial Ground. Large Adverse.	Investigate avoidance of demolition to listed buildings and structures. Relocation of listed buildings.

Features	Description	Scale it matters	Rarity	Importance	Substitutability	Changes in do minimum	Impact	Additional Mitigation
Land use	Typical of an urban city centre of a variety of ages from historic to modern, spanning out from the A63 corridor including residential / light industrial / office and leisure uses.	Regionally (City Wide)	Rare – 'A 'Road, city centre, waterfront location	High Importance at a regional level	Trinity Burial Ground and Humber Dock area not substitutable.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Development generally within scheme corridor however reduction in area of Trinity Burial Ground by approx one third and impact on the northern area of Humber Dock. Moderate Adverse.	Provide new public areas around Prince's and Humber Dock to link affected areas either side of the A63 together.
Summary of character	Area dominated by the busy A63 corridor segregating surrounding areas however it is but enhanced by the attractive historic features of the docks, Trinity Church area and the few remaining listed buildings.	Regionally (City Wide)	Rare combination of different urban features within city centre location	Highly important at a regional level to local residents with ownership of city centre.	Historic features not easily substitutable. Development largely within existing road corridor.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Based on the above impact assessments for the individual categories and the Townscape and Visual Impact Assessment the Overall Impact is Moderate adverse	Impact can be reduced by removal of the three large pedestrian footbridges or if not removed to replace with iconic unique bridge structures. Creation of central plaza area between Humber and Prince's Dock.

Reference Source(s):__ Design Manual for Roads and Bridges (DMRB) Volume 11: Environmental Assessment, Section 3, Part 5 Landscape Effects and Interim advice note (IAN) 81/06, Guidelines for Landscape and Visual Impact Assessment, second edition, 2002" (GLVIA 2002), Countryside Agency and Scottish Natural Heritage, "Landscape Character Assessment Guidance for England and Scotland, 2002", Variations for Urban Schemes' of DMRB Volume 11 Section 3, Part 5.

Summary assessment score: Moderate Adverse

Qualitative comments: This scheme option is largely within the existing highway boundary however there is significant damage to Trinity Burial Ground, and demolition of the listed Castle Buildings, Earl de Grey public house and north wall to Humber Dock with three new pedestrian footbridges which are highly intrusive visual features within the local townscape. The proposal presents the opportunity to create new public spaces underneath the viaduct section adjacent to Trinity Burial Ground.

Worksheet: Scheme Option 5, Over Ground Land Bridge Option. Environment: Townscape

Features	Description	Scale it matters	Rarity	Importance	Substitutability	Changes in do minimum	Impact	Additional Mitigation
Layout	Typical urban city centre with linear scheme corridor. Mix of forms from historic core to open docks and post war social housing	Regionally (City Wide)	Rare – 'A 'Road, city centre, waterfront location	High Importance at a regional level	General layout substitutable however proposals largely within current scheme corridor	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Demolition of listed north wall to Humber Dock. Moderate Adverse.	Provide public areas around Prince's and Humber Dock fronting the land bridge to provide a key new civic space within the city centre.
Density and mix	Range from high density residential, to open docks and low to high density retail, and medium density industry.	Regionally (City Wide)	Rare – 'A 'Road, city centre, waterfront location	High Importance at a regional level	Mix of building styles / types / sizes which would be substitutable in appearance but not in location	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Demolition of Castle and Earl de Grey Buildings and development of Trinity Burial Ground widens scheme corridor affecting density. Demolition of northern wing of Holiday Inn. Large Adverse.	Consider the redesign of areas under the viaduct section by Trinity Burial Ground to mitigate against loss of trees in the area and to create new public areas.
Scale	Large scale road junction within mix of building scales reflecting the different land uses, flat topography generally gives enclosed scale due to the surrounding buildings, channelling views down the road corridor and surrounding roads. Large open scale as the road passes between Prince's and Humber Dock.	Regionally (City Wide)	Typical of city centre and urban roads in general	Low importance locally	Scheme design substitutable however impacts not.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Large scale development to Mytongate junction, opening out area creating large elongated cutting. Viaduct section out of scale within the historic docks. Prince's Quay and Market Place footbridges out of scale with surrounding townscape. Very Large Adverse.	Not Required
Appearance	Listed buildings, Trinity Burial Ground and the docks give local distinctiveness and create identity along the route corridor. Current road built around these features.	Regionally (City Wide) to Nationally	Rare, interesting combination of historic buildings and structures	High Importance at a regional to national level	Only possible to substitute demolition of listed buildings by taking down and rebuilding elsewhere. Unable to substitute Trinity Burial Ground in short to medium term.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Demolition of listed Castle and Earl de Grey Buildings. Porter Street and Market Place footbridges negatively impact appearance of the area. Part demolition of leisure club wing to Holiday Inn. A63 viaduct section unattractive and highly visible from many receptors. Very Large Adverse.	Relocation of Castle and Earl de Grey Buildings. Iconic individually designed pedestrian foot bridges to create key designed features along the route corridor. Creation of new plaza area around the land bridge to link the areas between the two docks.
Human interaction	Vehicular dominated road corridor, pedestrian crossing points are restricted by the road. Lots of activity in areas connecting with the road corridor e.g. the boats of the docks, people shopping in Prince's Quay and walking through the historic streets around Trinity Church.	Regionally (City Wide)	Rare – Area unique to Hull	High Importance at a regional level	Substitutable as current interaction with road is poor creating room for improvement. land bridge should improve pedestrian connectivity between the areas either side of the A63.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Proposals should enhance human interaction and improve pedestrian movement along and across the route corridor, particularly between Humber and Prince's Dock over the land bridge. Moderate Beneficial.	Improvements above the minimum features required e.g. look to enhance the wider areas around the docks to encourage pedestrian interaction in the area particularly around the land bridge.

Features	Description	Scale it matters	Rarity	Importance	Substitutability	Changes in do minimum	Impact	Additional Mitigation
Cultural	Listed buildings / structures and those features of townscape quality combine to create a sense of place and provide the few enhancing features of the scheme corridor. Corridor dissects 'Old Town' Conservation Area.	Regionally (City Wide) to Nationally	Rare, interesting combination of historic buildings and structures	High Importance at a regional to national level	Only possible to substitute demolition of listed buildings by taking down and rebuilding elsewhere. Unable to substitute Trinity Burial Ground in short to medium term.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Demolition of listed Castle and Earl de Grey Buildings and north wall to Humber Dock and impact on the footprint of Trinity Burial Ground. Large Adverse.	Investigate avoidance of demolition to listed buildings and structures. Relocation of listed buildings.
Land use	Typical of an urban city centre of a variety of ages from historic to modern, spanning out from the A63 corridor including residential / light industrial / office and leisure uses.	Regionally (City Wide)	Rare – 'A 'Road, city centre, waterfront location	High Importance at a regional level	Trinity Burial Ground and Humber Dock area not substitutable. Impacts on Holiday Inn and Marina Court substitutable in a different location.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Reduction in area of Trinity Burial Ground by approx one third and impact on the northern area of Humber Dock. Large Adverse	Not Required.
Summary of character	Area dominated by the busy A63 corridor segregating surrounding areas however it is but enhanced by the attractive historic features of the docks, Trinity Church area and the few remaining listed buildings.	Regionally (City Wide)	Rare combination of different urban features within city centre location	Highly important at a regional level to local residents with ownership of city centre.	Historic features not easily substitutable. Development largely within existing road corridor. Holiday Inn leisure club substitutable in new location.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Viaduct section would be highly visible to receptors within the study area and out of scale, negatively impacting townscape quality. A land bridge structure would not be required underneath the A63 as levels could remain as currently found. Overall Impact Very Large Adverse.	Impact can be reduced by removal of large pedestrian bridges at Porter Street and Market Place, or if not removed to replace with iconic unique bridge structures. Creation of central plaza area around land bridge and underneath the viaduct to tie in with other dock side areas and Trinity Burial Ground.

Reference Source(s):__ Design Manual for Roads and Bridges (DMRB) Volume 11: Environmental Assessment, Section 3, Part 5 Landscape Effects and Interim advice note (IAN) 81/06, Guidelines for Landscape and Visual Impact Assessment, second edition, 2002" (GLVIA 2002), Countryside Agency and Scottish Natural Heritage, "Landscape Character Assessment Guidance for England and Scotland, 2002", Variations for Urban Schemes' of DMRB Volume 11 Section 3, Part 5.

Summary assessment score: Very Large Adverse

Qualitative comments: This scheme option is largely within the existing highway boundary with an increased length of elevated viaduct section visible. There would be significant damage to Trinity Burial Ground and a highly visible viaduct and land bridge structure in the open areas between Humber and Prince's Dock. Demolition of the important listed Castle Buildings, Earl de Grey public house and north wall to Humber Dock and leisure club wing to the Holiday Inn. Two new pedestrian footbridges are highly intrusive visual features within the local townscape. The option presents the opportunity to create a new public space underneath the viaduct section linking into Trinity Burial Ground.

Worksheet: Scheme Option 6, Over Ground Full Viaduct Option. Environment: Townscape

Features	Description	Scale it matters	Rarity	Importance	Substitutability	Changes in do minimum	Impact	Additional Mitigation
Layout	Typical urban city centre with linear scheme corridor. Mix of forms from historic core to open docks and post war social housing	Regionally (City Wide)	Rare – 'A 'Road, city centre, waterfront location	High Importance at a regional level	General layout substitutable however proposals largely within current scheme corridor. Impacts on housing layout not substitutable in current location.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Demolition of listed north wall to Humber Dock. Demolition of properties within Trinity Court and Grammar School Yard affecting the layout of these housing areas. Demolition of northern wings of Holiday Inn and Marina Court. Very Large Adverse.	New urban design to areas beneath the viaduct section to link in areas to the north and south of the road around the new LAR. Provision of new buffer zone, private open space to properties of Trinity Burial Ground and Grammar School Yard.
Density and mix	Range from high density residential, to open docks and low to high density retail, and medium density industry.	Regionally (City Wide)	Rare – 'A 'Road, city centre, waterfront location	High Importance at a regional level	Mix of building styles / types / sizes which would be substitutable in appearance but not in location	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Demolition of Castle and Earl de Grey Buildings and development of Trinity Burial Ground widens scheme corridor affecting density. Demolition of frontage sections of Trinity Court and Grammar School Yard. Viaduct section increases the density of the area. Very Large Adverse.	Recommend new structures on the site of the demolished properties of Trinity Court and Grammar School Yard to limit impact on the remaining properties and to screen views to the viaduct.
Scale	Large scale road junction within mix of building scales reflecting the different land uses, flat topography generally gives enclosed scale due to the surrounding buildings, channelling views down the road corridor and surrounding roads. Large open scale as the road passes between Prince's and Humber Dock	Regionally (City Wide)	Typical of city centre and urban roads in general	Low importance locally	Possible to substitute demolished buildings alongside the road with new buildings once the option is constructed.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Large scale development to Mytongate junction, creation of large extended viaduct. Open area of LAR below viaduct. Demolition of frontage sections of Trinity Court and Grammar School Yard. Very Large Adverse.	Not Required
Appearance	Listed buildings, Trinity Burial Ground and the docks give local distinctiveness and create identity along the route corridor. Current road built around these features.	Regionally (City Wide) to Nationally	Rare, interesting combination of historic buildings and structures	High Importance at a regional to national level	Only possible to substitute demolition of listed buildings by taking down and rebuilding elsewhere. Unable to substitute Trinity Burial Ground in short to medium term. Trinity and Grammar School Yard properties substitutable in new locations only.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Demolition of listed Castle, Earl de Grey Buildings and north wall to Humber Dock. Porter Street footbridge negatively impacts appearance of the area. Demolition of frontage sections of Trinity Court and Grammar School Yard. A63 on viaduct increases visibility from many receptors. Very Large Adverse	Possible to create new large public space beneath the viaduct by Trinity Burial Ground to connect areas north and south of the road corridor. New public areas can also be created alongside the LAR. Materials in the area should be seamless throughout with pedestrian priority.
Human interaction	Vehicular dominated road corridor, pedestrian crossing points are restricted by the road. Lots of activity in areas connecting with the road corridor e.g. the boats of the docks, people shopping in Prince's Quay and walking through the historic streets around Trinity Church.	Regionally (City Wide)	Rare – Area unique to Hull	High Importance at a regional level	Substitutable as current interaction with road is poor creating room for improvement. A63 in tunnel would improve pedestrian connectivity between the areas either side of the A63	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Potential to be Major Beneficial, as interaction with A63 would be removed. Proposals should enhance human interaction and improve pedestrian movement along and across the route corridor, particularly between Humber and Prince's Dock over the LAR. Subject to detailed design of the LAR.	It is recommended that public areas within the LAR area will extend into the surrounding areas around the docks creating a uniform appearance and design style.

Features	Description	Scale it matters	Rarity	Importance	Substitutability	Changes in do minimum	Impact	Additional Mitigation
Cultural	Listed buildings / structures and those features of townscape quality combine to create a sense of place and provide the few enhancing features of the scheme corridor. Corridor dissects 'Old Town' Conservation Area.	Regionally (City Wide) to Nationally	Rare, interesting combination of historic buildings and structures	High Importance at a regional to national level	Only possible to substitute demolition of listed buildings by taking down and rebuilding elsewhere. Unable to substitute Trinity Burial Ground in short to medium term.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Demolition of listed Castle and Earl de Grey Buildings and north wall to Humber Dock and impact on the footprint of Trinity Burial Ground. Large Adverse.	Investigate avoidance of demolition to listed buildings and structures. Relocation of listed buildings.
Land use	Typical of an urban city centre of a variety of ages from historic to modern, spanning out from the A63 corridor including residential / light industrial / office and leisure uses.	Regionally (City Wide)	Rare – 'A 'Road, city centre, waterfront location	High Importance at a regional level	Trinity Burial Ground and Humber Dock area not substitutable. Trinity and Grammar School Yard properties substitutable in new locations only.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Reduction in area of Trinity Burial Ground by approx one half and impact on the northern area of Humber Dock. Major impact on layout on the residential areas of Trinity Court and Grammar School Yard. Loss of northern wings to Holiday Inn and Marina Court. Very Large Adverse.	Redevelopment of the demolished areas of Trinity Court and Grammar School Yard to respect the remaining properties and provide new appropriate land use.
Summary of character	Area dominated by the busy A63 corridor segregating surrounding areas however it is but enhanced by the attractive historic features of the docks, Trinity Church area and the few remaining listed buildings.	Regionally (City Wide)	Rare combination of different urban features within city centre location	Highly important at a regional level to local residents with ownership of city centre.	Historic features and Trinity Burial Ground not easily substitutable. Development largely within existing road corridor. Modern buildings substitutable in new location.	Minor improvements to Mytongate junction within existing highway boundary, no further impacts on townscape although traffic flow may be improved.	Removal of the A63 onto an elevated viaduct section presents exciting opportunities for redevelopment of the areas below combined with LAR. Demolition of listed buildings still required. Viaduct highly visible uncharacteristic feature. Overall Impact Very Large Adverse	Impact can be reduced by removal of large pedestrian bridge at Porter Street, or if not removed to replace with iconic unique bridge structures. Creation of central public spaces below the viaduct to link areas either side of the road with pedestrian priority over the LAR.

Reference Source(s):__ Design Manual for Roads and Bridges (DMRB) Volume 11: Environmental Assessment, Section 3, Part 5 Landscape Effects and Interim advice note (IAN) 81/06, Guidelines for Landscape and Visual Impact Assessment, second edition, 2002" (GLVIA 2002), Countryside Agency and Scottish Natural Heritage, "Landscape Character Assessment Guidance for England and Scotland, 2002", Variations for Urban Schemes' of DMRB Volume 11 Section 3, Part 5.

Summary assessment score: Very Large Adverse

Qualitative comments: This scheme option causes major damage to Trinity Burial Ground, and demolition of the listed Castle Buildings, Earl de Grey public house and north wall to Humber Dock and demolition of the residential areas of Trinity Square and Grammar School Yard. The long viaduct section of the A63 would be highly visible negatively impacting the townscape quality of the area. Areas beneath the viaduct including the LAR present the opportunity for further detailed design to improve the appearance of the area.

HERITAGE OF HISTORIC RESOURCES

A63 Castle Street Improvements, Hull
Worksheet 1 Environment: Heritage of Historic Resources - Plan Level Option 1: Underground Base scheme

Part 1		Part 2			Part 3
Features	**Description**	**Scale it matters**	**Significance**	**Rarity**	**Impact**
Form	Upstanding resource includes several locally listed buildings and 21 Listed Buildings. Those adjacent to the scheme footprint include Humber Docks, Castle Buildings, Earl de Grey public house, Warehouse No. 6 and Market Place toilets (all Grade II), and Grade I statue of King William III in Market Place. Other buildings are shops, offices and dwellings. Also some modern and unlisted buildings of note. Old Town Conservation Area covers central and east part of route corridor. Some elements of medieval and later street pattern survive but most destroyed by subsequent development. Total of 231 archaeological sites in study area, most represented by well preserved buried remains with upstanding elements having been demolished. Most assets of post-medieval date, including public houses, prisons, burial ground, industrial complexes, chapels and churches, and dock infrastructure. Medieval assets include Old Town defences (gate and walls), guildhalls, market halls, Augustinian Friary, and extensive occupation along medieval Mytongate (present-day Castle Street), parts of which have already been excavated. Also potential for pre-medieval and palaeo-environmental deposits buried at depth, associated with former water courses to the west of the Old Town.	Resource of High, Medium, Low and Negligible	Conservation Area and listed built environment of High and Medium value. Non-listed built elements of Medium and Low value. High and medium value of Old Town defences and friary proved by previous excavation. Assets to west of the Old Town not yet assessed, neither are palaeo-environmental impacts.	All elements of the Old Town defences are rare, as are Grade I and II* Listed Buildings. Docks relatively rare regionally, but associated infrastructure now largely demolished. Undisturbed medieval deposits in the Old Town adds to rarity. Short-lived use of burial ground (1789-1867) is rare. Post-medieval urban assets not especially rare.	Based on current knowledge, Large Adverse impact. Some 44 assets directly affected by option. Large adverse effects due to demolition of two Grade II Listed Buildings and impacts on 18th century goal and medieval Myton Gate, although the latter could be designed out. Moderate adverse impacts on burial ground, chapels, industrial sites, dock infrastructure and town defences. Depth of construction means that there is some opportunity for archaeological preservation in situ at east end of option, but mitigation will still involve some advance archaeological excavation and the clearance of part of the burial ground. The majority of the Old Town sites are avoided by this option.
Survival	Survival generally good for built heritage with Castle Buildings undergoing renovation. Most buildings in use, or converted to other uses, e.g. docks to marinas, warehouses to restaurants. Survival of dock walls not known but assumed to be good. Large numbers of post-medieval buildings demolished and cleared, especially on south side of Castle Street. Survival of below ground medieval remains is considered to be very good in the Old Town, as evidenced by previous excavations, due to high water table and lack of subsequent disturbance at depth. Survival of other assets to west of Old Town presently unknown, as well as state of preservation and density of human remains in burial ground. Medieval street pattern in Old Town only partly survives and modern developments pay it little regard.	High, Medium, Low and Negligible.	Survival of individual archaeological assets not yet fully assessed, but likely to be significant in the Old Town based on results from previous excavations. Little knowledge about assets outside the Old Town (e.g. goal and burial ground).	The range and quality of survival of well preserved medieval deposits beneath later developments is rare. Survival of most assets outside the Old Town likely not to be especially rare. Any well preserved pre-medieval assets will be especially rare.	Large Adverse impact due to demolition of two Listed Buildings and potential effects on Myton Gate and town defences. Any changes in water table could have significant effects on below-ground survival of archaeological sites. Impacts can be mitigated through pre-construction excavation and recording. Survival of human remains in burial ground will influence mitigation proposals. Indirect visual effects on built heritage considered elsewhere.
Condition	The buildings, particularly the Listed Buildings, within the Old Town Conservation Area are generally in good condition. Docks in good condition, still in use as marinas. Burial ground monuments in poor condition, with many elements damaged. Previous Old Town excavations show that condition of below-ground remains is extremely good, e.g. town walls buried beneath later material. Post-medieval assets in poor condition, with many structures demolished.	High, Medium, Low and Negligible.	Condition of buried assets within Old Town of high significance, other assets to west not yet assessed in detail.	Well preserved below-ground stratified medieval deposits, including town defences, are rare. Condition of burials in burial ground not known, but may add to rarity.	Built heritage likely to be maintained by owners. Large adverse effects on to-be-demolished Listed Buildings and other extant structures can be mitigated by advance recording. Other large and moderate impacts can be mitigated through pre-construction excavation and detailed design.
Complexity	Archaeological sites in Old Town very complex (e.g. Augustinian friary), both in terms of diversity of elements and relationship with urban landscape, with areas showing change in use from open ground and industrial to intensive occupation. Old Town sites are multi-phased with deep stratigraphy, sites further to west not yet assessed. Docks are significant to Hull's use as a port. Built heritage is of low complexity, with single phase single use structures usually represented.	High, Medium, Low and Negligible.	Complexity of buried features within Old Town adds to significance. Complexity of assets outside the Old Town not yet assessed.	Relationship between assets and the history of Hull adds to rarity. Complexity of built heritage not especially rare.	Moderate adverse. Proposals will affect complexity of buried remains, depending on depth of construction, although majority of Old Town assets avoided. Significant impacts at burial ground. Some elements of built heritage will be destroyed.

Context	All assets have an urban context. Docks illustrate historic setting and provide a sense of place, although context largely destroyed. Some structures e.g. warehouses and dock-side elements remain, but mostly lost or demolished. Holy Trinity burial ground provides a historical link with the Holy Trinity church. Context of medieval assets now lost due to subsequent development, and historic street pattern has been fragmented. Alignment of town walls picked out in differential paving at street level but with little explanation or understanding.	High, Medium, Low and Negligible.	Compact townscape context (both modern and buried) and history of Hull adds to significance.	Wider heritage links to other assets within Hull adds to rarity. Assets relating to particular events in Hull's history (e.g. town walls, goals and Civil War earthworks) are a rare resource. Other assets e.g. docks have international connections. Some localised areas retain their context, but mostly lost or significantly altered.	Slight to Moderate Adverse. Context of extant assets not likely to be significantly altered given existing Castle Street and modern developments. Physical loss and severance of burial ground significantly reduces context with large numbers of burials having to be exhumed. Loss of the Myton Gate and adjacent town walls (if necessary) would be significant to the Old Town defences as a whole.
Period	Potential for pre-Roman, Roman and pre-Old Town occupation throughout scheme corridor. Medieval Old Town defences documented 1321-24, replacing earlier bank. Civil War defences are 17th century. All defences demolished by 1800 for dock developments. Old Town occupation from 13th century onwards, extending from planned core around High Street and Market Place. Multi-period occupancy, e.g. 12th to 16th century Augustinian Friary replaced by later market structures and public houses. Major of demolished sites date from 18th and 19th century. Holy Trinity burial ground was the sole place of burial for the parishioners of Holy Trinity between 1783-1867, and town goal dates to 17th century. Built heritage generally 19th century; Humber Dock opened 1809, Prince's Dock 1829, Railway Dock 1846, Castle Buildings c.1890. Some other assets are 18th century in date, e.g. Earl de Grey public house and King William III statue.	High, Medium, Low and Negligible.	Varying, though majority is medieval and post-medieval with moderate significance. Evidence for pre-medieval occupation would be significant.	Prehistoric, Roman and palaeo-environmental deposits, if proved, would be rare. Continuity of occupation in Old Town within medieval street pattern rare. Restricted time span of burial ground use (1789-1867) adds to rarity. Post-medieval assets not especially rare, but many with earlier origins.	Large Adverse. Direct impact on 44 identified assets including demolition of two Listed Buildings and partial demolition of another. The option is unlikely to disturb the Old Town defences and the Myton Gate with preservation in situ possible. Mitigation for option would involve some archaeological excavation, including clearance of affected parts of burial ground.

Reference sources: Acer & York Archaeological Trust (1995) A63 Castle Street Improvement Environmental Statement: Archaeology and Heritage; Humber Archaeology Partnership (2002 revised 2004) Assessment of Archaeological Potential; Pell Frischmann Consultants Ltd (2004) TPI Entry Report – Heritage of Historic Resources; Golder Associates (2008) Cultural Heritage Detailed Assessment Report.

Qualitative comments: Based on current knowledge, the option would have an adverse impact on 44 Cultural Heritage assets. Impacts categorised as four Large adverse, 11 Moderate adverse, 24 Slight adverse and 5 Neutral adverse. No real beneficial effects as option is on line and volume of traffic is not reduced. Two Grade II Listed Buildings to be demolished and partial demolition of another, but impacts on High and Medium value archaeological assets within Old Town largely avoided. Moderate impact on Holy Trinity burial ground, requiring advance archaeological clearance of affected area and exhumation of burials. Some potential for preservation in situ, depending on detailed design, but works will need to be preceded by some archaeological excavations. Archaeological potential for as yet undiscovered assets considered to be Medium.

Overall Assessment Score: **LARGE ADVERSE**

A63 Castle Street Improvements, Hull
Worksheet 1 Environment: Heritage of Historic Resources - Plan Level **Option 2: Underground Landbridge**

Part 1		Part 2			Part 3
Features	**Description**	**Scale it matters**	**Significance**	**Rarity**	**Impact**
Form	Upstanding resource includes several locally listed buildings and 21 Listed Buildings. Those adjacent to the scheme footprint include Humber Docks, Castle Buildings, Earl de Grey public house, Warehouse No. 6 and Market Place toilets (all Grade II), and Grade I statue of King William III in Market Place. Other buildings are shops, offices and dwellings. Also some modern and unlisted buildings of note. Old Town Conservation Area covers central and east part of route corridor. Some elements of medieval and later street pattern survive but most destroyed by subsequent development. Total of 231 archaeological sites in study area, most represented by well preserved buried remains with upstanding elements having been demolished. Most assets of post-medieval date, including public houses, prisons, burial ground, industrial complexes, chapels and churches, and dock infrastructure. Medieval assets include Old Town defences (gate and walls), guildhalls, market halls, Augustinian Friary, and extensive occupation along medieval Mytongate (present-day Castle Street), parts of which have already been excavated. Also potential for pre-medieval and palaeo-environmental deposits buried at depth, associated with former water courses to the west of the Old Town.	Resource of High, Medium, Low and Negligible	Conservation Area and listed built environment of High and Medium value. Non-listed built elements of Medium and Low value. High and medium value of Old Town defences and friary proved by previous excavation. Assets to west of the Old Town not yet assessed, neither are palaeo-environmental impacts.	All elements of the Old Town defences are rare, as are Grade I and II* Listed Buildings. Docks relatively rare regionally, but associated infrastructure now largely demolished. Undisturbed medieval deposits in the Old Town adds to rarity. Short-lived use of burial ground is rare. Post-medieval urban assets not especially rare.	Based on current knowledge, Large Adverse impact. Some 55 assets directly affected by option, some by material storage areas and compounds. Large adverse effects due to demolition of two Grade II Listed Buildings and impacts on 18th century goal and medieval Myton Gate, although the latter could be reduced through careful design. Moderate adverse impacts on burial ground, chapels, industrial sites, dock infrastructure and town defences. Depth of construction means that there is some opportunity for archaeological preservation in situ at east end of option, but mitigation will still involve some advance archaeological excavation and the clearance of part of the burial ground. The majority of the Old Town sites are avoided by this option.
Survival	Survival generally good for built heritage with Castle Buildings undergoing renovation. Most buildings in use, or converted to other uses, e.g. docks to marinas, warehouses to restaurants. Survival of dock walls not known but assumed to be good. Large numbers of post-medieval buildings demolished and cleared, especially on south side of Castle Street. Survival of below ground medieval remains is considered to be very good in the Old Town, as evidenced by previous excavations, due to high water table and lack of subsequent disturbance at depth. Survival of other assets to west of Old Town presently unknown, as well as state of preservation and density of human remains in burial ground. Medieval street pattern in Old Town only partly survives and modern developments pay it little regard.	High, Medium, Low and Negligible.	Survival of individual archaeological assets not yet fully assessed, but likely to be significant in the Old Town based on results from previous excavations. Little knowledge about assets outside the Old Town (e.g. goal and burial ground).	The range and quality of survival of well preserved medieval deposits beneath later developments is rare. Survival of most assets outside Old Town likely not to be especially rare. Any well preserved pre-medieval assets will be especially rare.	Large Adverse impact due to demolition of two Listed Buildings and potential effects on Myton Gate and town defences. Any changes in water table could have significant effects on below-ground survival of archaeological assets. Impacts can be mitigated through pre-construction excavation and recording. Survival of human remains in burial ground will influence mitigation proposals. Indirect visual effects on built heritage considered elsewhere.
Condition	The buildings, particularly the Listed Buildings, within the Old Town Conservation Area are generally in good condition. Docks in good condition, still in use as marinas. Burial ground monuments in poor condition, with many elements damaged. Previous Old Town excavations show that condition of below-ground remains is extremely good, e.g. town walls buried beneath later material. Post-medieval assets in poor condition, with many structures demolished.	High, Medium, Low and Negligible.	Condition of buried assets within Old Town of high significance, other assets to west not yet assessed in detail.	Well preserved below-ground stratified medieval deposits, including town defences, are rare. Condition of burials in burial ground not known, but may add to rarity.	Built heritage likely to be maintained by owners. Large adverse effects on to-be-demolished Listed Buildings and other extant structures can be mitigated by advance recording. Other large and moderate impacts can be mitigated through pre-construction excavation and detailed design.
Complexity	Archaeological sites in Old Town very complex (e.g. Augustinian friary), both in terms of diversity of elements and relationship with urban landscape, with areas showing change in use from open ground and industrial to intensive occupation. Old Town sites are multi-phased with deep stratigraphy, sites further to west not yet assessed. Docks are significant to Hull's use as a port. Built heritage is of low complexity, with single phase single use structures usually represented.	High, Medium, Low and Negligible.	Complexity of buried features within Old Town adds to significance. Complexity of assets outside Old Town not yet assessed.	Relationship between assets within the history of Hull adds to rarity. Complexity of built heritage not especially rare.	Moderate adverse. Proposals will affect complexity of buried remains, depending on depth of construction, although majority of Old Town assets avoided. Significant impacts at burial ground. Some elements of built heritage will be destroyed.

Context	All assets have an urban context. Docks illustrate historic setting and provide a sense of place, although context largely destroyed. Some structures e.g. warehouses and dock-side elements remain, but mostly lost or demolished. Holy Trinity burial ground provides a historical link with the Holy Trinity church. Context of medieval assets now lost due to subsequent development, and historic street pattern has been fragmented. Alignment of town walls picked out in differential paving at street level but with little explanation or understanding.	High, Medium, Low and Negligible.	Compact townscape context (both modern and buried) and history of Hull adds to significance.	Wider heritage links to other assets within Hull adds to rarity. Assets relating to particular events in Hull's history (e.g. town walls, goals and Civil War earthworks) are a rare resource. Other assets e.g. docks have international connections. Some localised areas retain their context, but mostly lost or significantly altered.	Slight to Moderate Adverse. Context of extant assets not likely to be significantly altered given existing Castle Street and modern developments. Physical loss and severance of burial ground significantly reduces context with large numbers of burials having to be exhumed. Loss of the Myton Gate and adjacent town walls (if necessary) would be significant to the Old Town defences as a whole.
Period	Potential for pre-Roman, Roman and pre-Old Town occupation throughout scheme corridor. Medieval Old Town defences documented 1321-24, replacing earlier bank. Civil War defences are 17th century. All defences demolished by 1800 for dock developments. Old Town occupation from 13th century onwards, extending from planned core around High Street and Market Place. Multi-period occupancy, e.g. 12th to 16th century Augustinian Friary replaced by later market structures and public houses. Major of demolished assets date from 18th and 19th century. Holy Trinity burial ground was the sole place of burial for the parishioners of Holy Trinity between 1783-1867, and town goal dates to 17th century. Built heritage generally 19th century; Humber Dock opened 1809, Prince's Dock 1829, Railway Dock 1846, Castle Buildings c.1890. Some other assets are 18th century in date, e.g. Earl de Grey public house and King William III statue.	High, Medium, Low and Negligible.	Varying, though majority is medieval and post-medieval with moderate significance. Evidence for pre-medieval occupation would be significant.	Prehistoric, Roman and palaeo-environmental deposits, if proved, would be rare. Continuity of occupation in Old Town within medieval street pattern rare. Restricted time span of burial ground use (1789-1867) adds to rarity. Post-medieval assets not especially rare, but many with earlier origins.	Large Adverse. Direct impact on 55 identified assets including demolition of two Listed Buildings and partial demolition of another. The option may disturb the Old Town defences and the Myton Gate but preservation in situ could be possible with careful design. Mitigation for option would involve some archaeological excavation, including clearance of affected parts of burial ground.

Reference sources: Acer & York Archaeological Trust (1995) A63 Castle Street Improvement Environmental Statement: Archaeology and Heritage; Humber Archaeology Partnership (2002 revised 2004) Assessment of Archaeological Potential; Pell Frischmann Consultants Ltd (2004) TPI Entry Report – Heritage of Historic Resources; Golder Associates (2008) Cultural Heritage Detailed Assessment Report.

Qualitative comments: Based on current knowledge, the option would have an adverse impact on 55 Cultural Heritage assets. Impacts categorised as four Large adverse, 14 Moderate adverse, 31 Slight adverse and 6 Neutral adverse. No real beneficial effects as option is on line and volume of traffic is not reduced. Two Grade II Listed Buildings to be demolished and partial demolition of another, but impacts on High and Medium value archaeological assets within Old Town largely avoided. Moderate impact on Holy Trinity burial ground, requiring advance archaeological clearance of affected area and exhumation of burials. Some potential for preservation in situ, depending on detailed design, but works will need to be preceded by some archaeological excavations. Archaeological potential for as yet undiscovered assets considered to be Medium.

Overall Assessment Score: **LARGE ADVERSE**

A63 Castle Street Improvements, Hull
Worksheet 1 Environment: Heritage of Historic Resources - Plan Level **Option 3: Underground Cut and Cover tunnel**

Part 1		Part 2			Part 3
Features	**Description**	**Scale it matters**	**Significance**	**Rarity**	**Impact**
Form	Upstanding resource includes several locally listed buildings and 21 Listed Buildings. Those adjacent to the scheme footprint include Humber Docks, Castle Buildings, Earl de Grey public house, Warehouse No. 6 and Market Place toilets (all Grade II), and Grade I statue of King William III in Market Place. Other buildings are shops, offices and dwellings. Also some modern and unlisted buildings of note. Old Town Conservation Area covers central and east part of route corridor. Some elements of medieval and later street pattern survive but most destroyed by subsequent development. Total of 231 archaeological sites in study area, most represented by well preserved buried remains with upstanding elements having been demolished. Most assets of post-medieval date, including public houses, prisons, burial ground, industrial complexes, chapels and churches, and dock infrastructure. Medieval assets include Old Town defences (gate and walls), guildhalls, market halls, Augustinian Friary, and extensive occupation along medieval Mytongate (present-day Castle Street), parts of which have already been excavated. Also potential for pre-medieval and palaeo-environmental deposits buried at depth, associated with former water courses to the west of the Old Town.	Resource of High, Medium, Low and Negligible	Conservation Area and listed built environment of High and Medium value. Non-listed built elements of Medium and Low value. High and medium value of Old Town defences and friary proved by previous excavation. Assets to west of the Old Town not yet assessed, neither are palaeo-environmental impacts.	All elements of the Old Town defences are rare, as are Grade I and II* Listed Buildings. Docks relatively rare regionally, but associated infrastructure now largely demolished. Undisturbed medieval deposits in the Old Town adds to rarity. Short-lived use of burial ground (1789-1867) increases rarity. Post-medieval urban assets not especially rare.	Based on current knowledge, Very Large Adverse impact. Some 91 assets directly affected by option, some by material storage areas and compounds. Very Large adverse effects from impacts on medieval Myton Gate and unexcavated parts of Augustinian Friary, Large adverse effects due to demolition of two Grade II Listed Buildings and impacts on 18th century goal and numerous medieval assets in the Old Town. Moderate adverse impacts on burial ground, chapels, industrial sites, dock infrastructure, town defences and demolished structures. Depth of construction means that there is no opportunity for archaeological preservation, and mitigation will involve large areas of pre-construction archaeological excavation and the clearance of part of the burial ground.
Survival	Survival generally good for built heritage with Castle Buildings undergoing renovation. Most buildings in use, or converted to other uses, e.g. docks to marinas, warehouses to restaurants. Survival of dock walls not known but assumed to be good. Large numbers of post-medieval buildings demolished and cleared, especially on south side of Castle Street. Survival of below ground medieval remains is considered to be very good in the Old Town, as evidenced by previous excavations, due to high water table and lack of subsequent disturbance at depth. Survival of other assets to west of Old Town presently unknown, as well as state of preservation and density of human remains in burial ground. Medieval street pattern in Old Town only partly survives and modern developments pay it little regard.	High, Medium, Low and Negligible.	Survival of individual archaeological assets not yet fully assessed, but likely to be significant in the Old Town based on results from previous excavations. Little knowledge about assets outside the Old Town (e.g. goal and burial ground).	The range and quality of survival of well preserved medieval deposits beneath later developments is rare. Survival of most assets outside Old Town likely not to be especially rare. Any well preserved pre-medieval assets will be especially rare.	Very Large Adverse impact due to demolition of two Listed Buildings and effects on medieval Myton Gate, town defences and Old Town tenements and infrastructure. Any changes in water table could have significant effects on below-ground survival of archaeological assets. Impacts can be mitigated through pre-construction excavation and recording. Survival of human remains in burial ground will influence mitigation proposals. Indirect visual effects on built heritage considered elsewhere.
Condition	The buildings, particularly the Listed Buildings, within the Old Town Conservation Area are generally in good condition. Docks in good condition, still in use as marinas. Burial ground monuments in poor condition, with many elements damaged. Previous Old Town excavations show that condition of below-ground remains is extremely good, e.g. town walls buried beneath later material. Post-medieval assets in poor condition, with many structures demolished.	High, Medium, Low and Negligible.	Condition of buried assets within Old Town of high significance, other assets to west not yet assessed in detail.	Well preserved below-ground stratified medieval deposits, including town defences, are rare. Condition of burials in burial ground not known, but may add to rarity.	Built heritage likely to be maintained by owners. Large adverse effects on to-be-demolished Listed Buildings and other extant structures can be mitigated by advance recording. Other large and moderate impacts can be mitigated through extensive pre-construction excavation.

Complexity	Archaeological sites in Old Town very complex (e.g. Augustinian friary), both in terms of diversity of elements and relationship with urban landscape, with areas showing change in use from open ground and industrial to intensive occupation. Old Town sites are multi-phased with deep stratigraphy, sites further to west not yet assessed. Docks are significant to Hull's use as a port. Built heritage is of low complexity, with single phase single use structures usually represented.	High, Medium, Low and Negligible.	Complexity of buried features within Old Town adds to significance. Complexity of assets outside Old Town not yet assessed.	Relationship between assets within the history of Hull adds to rarity. Complexity of built heritage not especially rare.	Very Large adverse. Proposals will affect complexity of buried remains, especially in the Old Town. Significant impacts at burial ground. Some elements of built heritage will be destroyed.
Context	All assets have an urban context. Docks illustrate historic setting and provide a sense of place, although context largely destroyed. Some structures e.g. warehouses and dock-side elements remain, but mostly lost or demolished. Holy Trinity burial ground provides a historical link with the Holy Trinity church. Context of medieval assets now lost due to subsequent development, and historic street pattern has been fragmented. Alignment of town walls picked out in differential paving at street level but with little explanation or understanding.	High, Medium, Low and Negligible.	Compact townscape context (both modern and buried) and history of Hull adds to significance.	Wider heritage links to other assets within Hull adds to rarity. Assets relating to particular events in Hull's history (e.g. town walls, goals and Civil War earthworks) are a rare resource. Other assets e.g. docks have international connections. Some localised areas retain their context, but mostly lost or significantly altered.	Slight to Moderate Adverse. Context of most assets not likely to be significantly altered given LAR will follow existing Castle Street, although potentially slight improvements to surviving Listed Buildings and Conservation Area due to reduction of visible traffic. Loss of the Myton Gate and adjacent town walls, and the medieval tenements along Castle Street, would be significant to the Old Town. Physical loss and severance of burial ground significantly reduces context with large numbers of burials having to be exhumed.
Period	Potential for pre-Roman, Roman and pre-Old Town occupation throughout scheme corridor. Medieval Old Town defences documented 1321-24, replacing earlier bank. Civil War defences are 17th century. All defences demolished by 1800 for dock developments. Old Town occupation from 13th century onwards, extending from planned core around High Street and Market Place. Multi-period occupancy, e.g. 12th to 16th century Augustinian Friary replaced by later market structures and public houses. Major of demolished assets date from 18th and 19th century. Holy Trinity burial ground was the sole place of burial for the parishioners of Holy Trinity between 1783-1867, and town goal dates to 17th century. Built heritage generally 19th century; Humber Dock opened 1809, Prince's Dock 1829, Railway Dock 1846, Castle Buildings c.1890. Some other assets of 18th century date, e.g. Earl de Grey public house and King William III statue.	High, Medium, Low and Negligible.	Varying, though majority is medieval and post-medieval with moderate significance. Evidence for pre-medieval occupation would be significant.	Prehistoric, Roman and palaeo-environmental deposits, if proved, would be rare. Continuity of occupation in Old Town within medieval street pattern rare. Restricted time span of burial ground use (1789-1867) adds to rarity. Post-medieval assets not especially rare, but many with earlier origins.	Very Large Adverse. Direct impact on 91 identified assets including demolition of two Listed Buildings and partial demolition of another. The option will also destroy the Myton Gate and parts of town defences, as well as significant areas of medieval tenements and Old Town infrastructure. Mitigation for option would involve extensive areas of pre-construction archaeological excavation, including clearance of affected parts of burial ground.

Reference sources: Acer & York Archaeological Trust (1995) A63 Castle Street Improvement Environmental Statement: Archaeology and Heritage; Humber Archaeology Partnership (2002 revised 2004) Assessment of Archaeological Potential; Pell Frischmann Consultants Ltd (2004) TPI Entry Report – Heritage of Historic Resources; Golder Associates (2008) Cultural Heritage Detailed Assessment Report.

Qualitative comments: Based on current knowledge, the option would have an adverse impact on 91 Cultural Heritage assets. Impacts categorised as two Very Large adverse, six Large adverse, 20 Moderate adverse, 46 Slight adverse and 15 Neutral adverse. Two Slight beneficial effects due to reduction of visible traffic. Two Grade II Listed Buildings to be demolished and partial demolition of another, and major impacts on archaeological assets of all values within the Old Town. Moderate impact on Holy Trinity burial ground, requiring advance archaeological clearance of affected area and exhumation of burials. No potential for preservation in situ and works will need to be preceded by extensive archaeological excavations. Archaeological potential for as yet undiscovered assets considered to be High.

Overall Assessment Score: **VERY LARGE ADVERSE**

A63 Castle Street Improvements, Hull
Worksheet 1 Environment: Heritage of Historic Resources - Plan Level **Option 4: Overground Base scheme**

Part 1		Part 2			Part 3
Features	**Description**	**Scale it matters**	**Significance**	**Rarity**	**Impact**
Form	Upstanding resource includes several locally listed buildings and 21 Listed Buildings. Those adjacent to the scheme footprint include Humber Docks, Castle Buildings, Earl de Grey public house, Warehouse No. 6 and Market Place toilets (all Grade II), and Grade I statue of King William III in Market Place. Other buildings are shops, offices and dwellings. Also some modern and unlisted buildings of note. Old Town Conservation Area covers central and east part of route corridor. Some elements of medieval and later street pattern survive but most destroyed by subsequent development. Total of 231 archaeological sites in study area, most represented by well preserved buried remains with upstanding elements having been demolished. Most assets of post-medieval date, including public houses, prisons, burial ground, industrial complexes, chapels and churches, and dock infrastructure. Medieval assets include Old Town defences (gate and walls), guildhalls, market halls, Augustinian Friary, and extensive occupation along medieval Mytongate (present-day Castle Street), parts of which have already been excavated. Also potential for pre-medieval and palaeo-environmental deposits buried at depth, associated with former water courses to the west of the Old Town.	Resource of High, Medium, Low and Negligible	Conservation Area and listed built environment of High and Medium value. Non-listed built elements of Medium and Low value. High and medium value of Old Town defences and friary proved by previous excavation. Assets to west of the Old Town not yet assessed, neither are palaeo-environmental impacts.	All elements of the Old Town defences are rare, as are Grade I and II* Listed Buildings. Docks relatively rare regionally, but associated infrastructure now largely demolished. Undisturbed medieval deposits in the Old Town adds to rarity. Short-lived use of burial ground (1789-1867) is rare. Post-medieval urban assets not especially rare.	Based on current knowledge, Large Adverse impact. Some 44 assets directly affected by option. Large adverse effects due to demolition of two Grade II Listed Buildings and impacts on 18th century goal and medieval Myton Gate, although the latter could be spanned by viaduct. Moderate adverse impacts on burial ground, chapels, industrial sites, dock infrastructure and town defences. Nature of construction means that there is some opportunity for archaeological preservation in situ, but mitigation will involve some advance archaeological excavation and the clearance of part of the burial ground. The majority of the Old Town sites are avoided by this option.
Survival	Survival generally good for built heritage with Castle Buildings undergoing renovation. Most buildings in use, or converted to other uses, e.g. docks to marinas, warehouses to restaurants. Survival of dock walls not known but assumed to be good. Large numbers of post-medieval buildings demolished and cleared, especially on south side of Castle Street. Survival of below ground medieval remains is considered to be very good in the Old Town, as evidenced by previous excavations, due to high water table and lack of subsequent disturbance at depth. Survival of other assets to west of Old Town presently unknown, as well as state of preservation and density of human remains in burial ground. Medieval street pattern in Old Town only partly survives and modern developments pay it little regard.	High, Medium, Low and Negligible.	Survival of individual archaeological assets not yet fully assessed, but likely to be significant in the Old Town based on results from previous excavations. Little knowledge about assets outside the Old Town (e.g. goal and burial ground).	The range and quality of survival of well preserved medieval deposits beneath later developments is rare. Survival of most assets outside Old Town likely not to be especially rare. Any well preserved pre-medieval assets will be especially rare.	Large Adverse impact due to demolition of two Listed Buildings and potential effects on Myton Gate and town defences. Any changes in water table could have significant effects on below-ground survival of archaeological assets. Impacts can be mitigated through pre-construction excavation and recording. Survival of human remains in burial ground will influence mitigation proposals. Indirect visual effects on built heritage considered elsewhere.
Condition	The buildings, particularly the Listed Buildings, within the Old Town Conservation Area are generally in good condition. Docks in good condition, still in use as marinas. Burial ground monuments in poor condition, with many elements damaged. Previous Old Town excavations show that condition of below-ground remains is extremely good, e.g. town walls buried beneath later material. Post-medieval assets in poor condition, with many structures demolished.	High, Medium, Low and Negligible.	Condition of buried assets within Old Town of high significance, other assets to west not yet assessed in detail.	Well preserved below-ground stratified medieval deposits, including town defences, are rare. Condition of burials in burial ground not known, but may add to rarity.	Built heritage likely to be maintained by owners. Large adverse effects on to-be-demolished Listed Buildings and other extant structures can be mitigated by advance recording. Other large and moderate impacts can be mitigated through pre-construction excavation, and detailed design could allow some buried remains to be spanned by viaduct.
Complexity	Archaeological sites in Old Town very complex (e.g. Augustinian friary), both in terms of diversity of elements and relationship with urban landscape, with areas showing change in use from open ground and industrial to intensive occupation. Old Town sites are multi-phased with deep stratigraphy, sites further to west not yet assessed. Docks are significant to Hull's use as a port. Built heritage is of low complexity, with single phase single use structures usually represented.	High, Medium, Low and Negligible.	Complexity of buried features within Old Town adds to significance. Complexity of assets outside Old Town not yet assessed.	Relationship between assets within the history of Hull adds to rarity. Complexity of built heritage not especially rare.	Moderate adverse. Proposals will affect complexity of buried remains, depending on depth of construction, although majority of Old Town assets avoided. Significant impacts at burial ground. Some elements of built heritage will be destroyed.

Context	All assets have an urban context. Docks illustrate historic setting and provide a sense of place, although context largely destroyed. Some structures e.g. warehouses and dock-side elements remain, but mostly lost or demolished. Holy Trinity burial ground provides a historical link with the Holy Trinity church. Context of medieval assets now lost due to subsequent development, and historic street pattern has been fragmented. Alignment of town walls picked out in differential paving at street level but with little explanation or understanding.	High, Medium, Low and Negligible.	Compact townscape context (both modern and buried) and history of Hull adds to significance.	Wider heritage links to other assets within Hull adds to rarity. Assets relating to particular events in Hull's history (e.g. town walls, goals and Civil War earthworks) are a rare resource. Other assets e.g. docks have international connections. Some localised areas retain their context, but mostly lost or significantly altered.	Slight to Moderate Adverse. Context of extant assets not likely to be significantly altered given existing Castle Street and modern developments. Severance of burial ground significantly reduces context with large numbers of burials having to be exhumed. Loss of the Myton Gate and adjacent town walls (if necessary) would be significant to the Old Town defences as a whole.
Period	Potential for pre-Roman, Roman and pre-Old Town occupation throughout scheme corridor. Medieval Old Town defences documented 1321-24, replacing earlier bank. Civil War defences are 17th century. All defences demolished by 1800 for dock developments. Old Town occupation from 13th century onwards, extending from planned core around High Street and Market Place. Multi-period occupancy, e.g. 12th to 16th century Augustinian Friary replaced by later market structures and public houses. Major of demolished assets date from 18th and 19th century. Holy Trinity burial ground was the sole place of burial for the parishioners of Holy Trinity between 1783-1867, and town goal dates to 17th century. Built heritage generally 19th century; Humber Dock opened 1809, Prince's Dock 1829, Railway Dock 1846, Castle Buildings c.1890. Some other assets of 18th century date, e.g. Earl de Grey public house and King William III statue.	High, Medium, Low and Negligible.	Varying, though majority is medieval and post-medieval with moderate significance. Evidence for pre-medieval occupation would be significant.	Prehistoric, Roman and palaeo-environmental deposits, if proved, would be rare. Continuity of occupation in Old Town within medieval street pattern rare. Restricted time span of burial ground use (1789-1867) adds to rarity. Post-medieval assets not especially rare, but many with earlier origins.	Large Adverse. Direct impact on 44 identified assets including demolition of two Listed Buildings and partial demolition of another. The option is unlikely to disturb the Old Town defences and the Myton Gate with preservation in situ possible. Mitigation for option would involve some archaeological excavation for viaduct supports, as well as clearance of affected parts of burial ground.

Reference sources: Acer & York Archaeological Trust (1995) A63 Castle Street Improvement Environmental Statement: Archaeology and Heritage; Humber Archaeology Partnership (2002 revised 2004) Assessment of Archaeological Potential; Pell Frischmann Consultants Ltd (2004) TPI Entry Report – Heritage of Historic Resources; Golder Associates (2008) Cultural Heritage Detailed Assessment Report.

Qualitative comments: Based on current knowledge, the option would have an adverse impact on 44 Cultural Heritage assets. Impacts categorised as four Large adverse, 11 Moderate adverse, 24 Slight adverse and 5 Neutral adverse. No real beneficial effects as option is on line and elevated, and volume of traffic is not reduced. Two Grade II Listed Buildings to be demolished and partial demolition of another, but impacts on High and Medium value archaeological assets within Old Town largely avoided. Moderate impact on Holy Trinity burial ground, requiring advance archaeological clearance of affected area and exhumation of burials. Some potential for preservation in situ and the oversailing of archaeological assets, but depends on detailed design, and foundation works will need to be preceded by archaeological excavation. Archaeological potential for as yet undiscovered assets considered to be Medium.

Overall Assessment Score: **LARGE ADVERSE**

A63 Castle Street Improvements, Hull
Worksheet 1 Environment: Heritage of Historic Resources - Plan Level

Option 5: Overground Medium Viaduct

Part 1		Part 2			Part 3
Features	**Description**	**Scale it matters**	**Significance**	**Rarity**	**Impact**
Form	Upstanding resource includes several locally listed buildings and 21 Listed Buildings. Those adjacent to the scheme footprint include Humber Docks, Castle Buildings, Earl de Grey public house, Warehouse No. 6 and Market Place toilets (all Grade II), and Grade I statue of King William III in Market Place. Other buildings are shops, offices and dwellings. Also some modern and unlisted buildings of note. Old Town Conservation Area covers central and east part of route corridor. Some elements of medieval and later street pattern survive but most destroyed by subsequent development. Total of 231 archaeological sites in study area, most represented by well preserved buried remains with upstanding elements having been demolished. Most assets of post-medieval date, including public houses, prisons, burial ground, industrial complexes, chapels and churches, and dock infrastructure. Medieval assets include Old Town defences (gate and walls), guildhalls, market halls, Augustinian Friary, and extensive occupation along medieval Mytongate (present-day Castle Street), parts of which have already been excavated. Also potential for pre-medieval and palaeo-environmental deposits buried at depth, associated with former water courses to the west of the Old Town.	Resource of High, Medium, Low and Negligible	Conservation Area and listed built environment of High and Medium value. Non-listed built elements of Medium and Low value. High and medium value of Old Town defences and friary proved by previous excavation. Assets to west of the Old Town not yet assessed, neither are palaeo-environmental impacts.	All elements of the Old Town defences are rare, as are Grade I and II* Listed Buildings. Docks relatively rare regionally, but associated infrastructure now largely demolished. Undisturbed medieval deposits in the Old Town adds to rarity. Short-lived use of burial ground is rare. Post-medieval urban assets not especially rare.	Based on current knowledge, Large Adverse impact. Some 54 assets directly affected by option, some by material storage areas and compounds. Large adverse effects due to demolition of two Grade II Listed Buildings and impacts on 18th century goal and medieval Myton Gate, although the latter could be reduced through careful design. Moderate adverse impacts on burial ground, chapels, industrial sites, dock infrastructure and town defences. Nature of construction means that there is some opportunity for archaeological preservation in situ, but mitigation will involve some advance archaeological excavation and clearance of part of the burial ground. The majority of the Old Town sites are avoided by this option.
Survival	Survival generally good for built heritage with Castle Buildings undergoing renovation. Most buildings in use, or converted to other uses, e.g. docks to marinas, warehouses to restaurants. Survival of dock walls not known but assumed to be good. Large numbers of post-medieval buildings demolished and cleared, especially on south side of Castle Street. Survival of below ground medieval remains is considered to be very good in the Old Town, as evidenced by previous excavations, due to high water table and lack of subsequent disturbance at depth. Survival of other assets to west of Old Town presently unknown, as well as state of preservation and density of human remains in burial ground. Medieval street pattern in Old Town only partly survives and modern developments pay it little regard.	High, Medium, Low and Negligible.	Survival of individual archaeological assets not yet fully assessed, but likely to be significant in the Old Town based on results from previous excavations. Little knowledge about assets outside the Old Town (e.g. goal and burial ground).	The range and quality of survival of well preserved medieval deposits beneath later developments is rare. Survival of most assets outside Old Town likely not to be especially rare. Any well preserved pre-medieval assets will be especially rare.	Large Adverse impact due to demolition of two Listed Buildings and potential effects on Myton Gate and town defences. Any changes in water table could have significant effects on below-ground survival of archaeological assets. Impacts can be mitigated through pre-construction excavation and recording. Survival of human remains in burial ground will influence mitigation proposals. Indirect visual effects on built heritage considered elsewhere.
Condition	The buildings, particularly the Listed Buildings, within the Old Town Conservation Area are generally in good condition. Docks in good condition, still in use as marinas. Burial ground monuments in poor condition, with many elements damaged. Previous Old Town excavations show that condition of below-ground remains is extremely good, e.g. town walls buried beneath later material. Post-medieval assets in poor condition, with many structures demolished.	High, Medium, Low and Negligible.	Condition of buried assets within Old Town of high significance, other assets to west not yet assessed in detail.	Well preserved below-ground stratified medieval deposits, including town defences, are rare. Condition of burials in burial ground not known, but may add to rarity.	Built heritage likely to be maintained by owners. Large adverse effects on to-be-demolished Listed Buildings and other extant structures can be mitigated by advance recording. Other large and moderate impacts can be mitigated through pre-construction excavation, and detailed design could allow some buried remains to be spanned by viaduct.
Complexity	Archaeological sites in Old Town very complex (e.g. Augustinian friary), both in terms of diversity of elements and relationship with urban landscape, with areas showing change in use from open ground and industrial to intensive occupation. Old Town sites are multi-phased with deep stratigraphy, sites further to west not yet assessed. Docks are significant to Hull's use as a port. Built heritage is of low complexity, with single phase single use structures usually represented.	High, Medium, Low and Negligible.	Complexity of buried features within Old Town adds to significance. Complexity of assets outside Old Town not yet assessed.	Relationship between assets within the history of Hull adds to rarity. Complexity of built heritage not especially rare.	Moderate adverse. Proposals will affect complexity of buried remains, depending on depth of construction, although majority of Old Town assets avoided. Significant impacts at burial ground. Some elements of built heritage will be destroyed.

Context	All assets have an urban context. Docks illustrate historic setting and provide a sense of place, although context largely destroyed. Some structures e.g. warehouses and dock-side elements remain, but mostly lost or demolished. Holy Trinity burial ground provides a historical link with the Holy Trinity church. Context of medieval assets now lost due to subsequent development, and historic street pattern has been fragmented. Alignment of town walls picked out in differential paving at street level but with little explanation or understanding.	High, Medium, Low and Negligible.	Compact townscape context (both modern and buried) and history of Hull adds to significance.	Wider heritage links to other assets within Hull adds to rarity. Assets relating to particular events in Hull's history (e.g. town walls, goals and Civil War earthworks) are a rare resource. Other assets e.g. docks have international connections. Some localised areas retain their context, but mostly lost or significantly altered.	Slight to Moderate Adverse. Context of extant assets not likely to be significantly altered given existing Castle Street and modern developments. Severance of burial ground significantly reduces context with large numbers of burials having to be exhumed. Loss of the Myton Gate and adjacent town walls (if necessary) would be significant to the Old Town defences as a whole. Increased visual intrusion due to height of viaduct.
Period	Potential for pre-Roman, Roman and pre-Old Town occupation throughout scheme corridor. Medieval Old Town defences documented 1321-24, replacing earlier bank. Civil War defences are 17th century. All defences demolished by 1800 for dock developments. Old Town occupation from 13th century onwards, extending from planned core around High Street and Market Place. Multi-period occupancy, e.g. 12th to 16th century Augustinian Friary replaced by later market structures and public houses. Major of demolished assets date from 18th and 19th century. Holy Trinity burial ground was the sole place of burial for the parishioners of Holy Trinity between 1783-1867, and town goal dates to 17th century. Built heritage generally 19th century; Humber Dock opened 1809, Prince's Dock 1829, Railway Dock 1846, Castle Buildings c.1890. Some other assets of 18th century date, e.g. Earl de Grey public house and King William III statue.	High, Medium, Low and Negligible.	Varying, though majority is medieval and post-medieval with moderate significance. Evidence for pre-medieval occupation would be significant.	Prehistoric, Roman and palaeo-environmental deposits, if proved, would be rare. Continuity of occupation in Old Town within medieval street pattern rare. Restricted time span of burial ground use (1789-1867) adds to rarity. Post-medieval assets not especially rare, but many with earlier origins.	Large Adverse. Direct impact on 54 identified assets including demolition of two Listed Buildings and partial demolition of another. The option may disturb the Old Town defences and the Myton Gate but preservation in situ could be possible with careful design. Mitigation for option would involve pre-construction archaeological excavation for viaduct supports, as well as clearance of affected parts of burial ground.

Reference sources: Acer & York Archaeological Trust (1995) A63 Castle Street Improvement Environmental Statement: Archaeology and Heritage; Humber Archaeology Partnership (2002 revised 2004) Assessment of Archaeological Potential; Pell Frischmann Consultants Ltd (2004) TPI Entry Report – Heritage of Historic Resources; Golder Associates (2008) Cultural Heritage Detailed Assessment Report.

Qualitative comments: Based on current knowledge, the option would have an adverse impact on 54 Cultural Heritage assets. Impacts categorised as four Large adverse, 14 Moderate adverse, 30 Slight adverse and 6 Neutral adverse. No real beneficial effects as option is on line and elevated, and volume of traffic is not reduced. Increased visual intrusion due to height of viaduct. Two Grade II Listed Buildings to be demolished and partial demolition of another, but impacts on High and Medium value archaeological assets within Old Town largely avoided. Moderate impact on Holy Trinity burial ground, requiring advance archaeological clearance of affected area and exhumation of burials. Some potential for preservation in situ and the oversailing of archaeological assets, but depends on detailed design, and foundation works will need to be preceded by archaeological excavation. Archaeological potential for as yet undiscovered assets considered to be Medium.

Overall Assessment Score: **LARGE ADVERSE**

A63 Castle Street Improvements, Hull
Worksheet 1 Environment: Heritage of Historic Resources - Plan Level — Option 6: Overground Extended Viaduct

Part 1		Part 2			Part 3
Features	**Description**	**Scale it matters**	**Significance**	**Rarity**	**Impact**
Form	Upstanding resource includes several locally listed buildings and 21 Listed Buildings. Those adjacent to the scheme footprint include Humber Docks, Castle Buildings, Earl de Grey public house, Warehouse No. 6 and Market Place toilets (all Grade II), and Grade I statue of King William III in Market Place. Other buildings are shops, offices and dwellings. Also some modern and unlisted buildings of note. Old Town Conservation Area covers central and east part of route corridor. Some elements of medieval and later street pattern survive but most destroyed by subsequent development. Total of 231 archaeological sites in study area, most represented by well preserved buried remains with upstanding elements having been demolished. Most assets of post-medieval date, including public houses, prisons, burial ground, industrial complexes, chapels and churches, and dock infrastructure. Medieval assets include Old Town defences (gate and walls), guildhalls, market halls, Augustinian Friary, and extensive occupation along medieval Mytongate (present-day Castle Street), parts of which have already been excavated. Also potential for pre-medieval and palaeo-environmental deposits buried at depth, associated with former water courses to the west of the Old Town.	Resource of High, Medium, Low and Negligible	Conservation Area and listed built environment of High and Medium value. Non-listed built elements of Medium and Low value. High and medium value of Old Town defences and friary proved by previous excavation. Assets to west of the Old Town not yet assessed, neither are palaeo-environmental impacts.	All elements of the Old Town defences are rare, as are Grade I and II* Listed Buildings. Docks relatively rare regionally, but associated infrastructure now largely demolished. Undisturbed medieval deposits in the Old Town adds to rarity. Short-lived use of burial ground (1789-1867) increases rarity. Post-medieval urban assets not especially rare.	Based on current knowledge, Very Large Adverse impact. Some 92 assets directly affected by option, some by material storage areas and compounds. Large adverse effects due to demolition of two Grade II Listed Buildings and impacts on medieval Myton Gate, unexcavated parts of Augustinian Friary, 18th century goal and numerous medieval assets in the Old Town. Moderate adverse impacts on burial ground, chapels, industrial sites, dock infrastructure, town defences and demolished structures. Nature of construction means that there is some opportunity for archaeological preservation in situ, but mitigation will involve some advance archaeological excavation and the clearance of part of the burial ground.
Survival	Survival generally good for built heritage with Castle Buildings undergoing renovation. Most buildings in use, or converted to other uses, e.g. docks to marinas, warehouses to restaurants. Survival of dock walls not known but assumed to be good. Large numbers of post-medieval buildings demolished and cleared, especially on south side of Castle Street. Survival of below ground medieval remains is considered to be very good in the Old Town, as evidenced by previous excavations, due to high water table and lack of subsequent disturbance at depth. Survival of other assets to west of Old Town presently unknown, as well as state of preservation and density of human remains in burial ground. Medieval street pattern in Old Town only partly survives and modern developments pay it little regard.	High, Medium, Low and Negligible.	Survival of individual archaeological assets not yet fully assessed, but likely to be significant in the Old Town based on results from previous excavations. Little knowledge about assets outside the Old Town (e.g. goal and burial ground).	The range and quality of survival of well preserved medieval deposits beneath later developments is rare. Survival of most assets outside Old Town likely not to be especially rare. Any well preserved pre-medieval assets will be especially rare.	Large Adverse impact due to demolition of two Listed Buildings and potential effects on medieval Myton Gate, town defences and Old Town tenements and infrastructure. Any changes in water table could have significant effects on below-ground survival of archaeological assets. Impacts can be mitigated through pre-construction excavation and recording. Survival of human remains in burial ground will influence mitigation proposals. Indirect visual effects on built heritage considered elsewhere.
Condition	The buildings, particularly the Listed Buildings, within the Old Town Conservation Area are generally in good condition. Docks in good condition, still in use as marinas. Burial ground monuments in poor condition, with many elements damaged. Previous Old Town excavations show that condition of below-ground remains is extremely good, e.g. town walls buried beneath later material. Post-medieval assets in poor condition, with many structures demolished.	High, Medium, Low and Negligible.	Condition of buried assets within Old Town of high significance, other assets to west not yet assessed in detail.	Well preserved below-ground stratified medieval deposits, including town defences, are rare. Condition of burials in burial ground not known, but may add to rarity.	Built heritage likely to be maintained by owners. Large adverse effects on to-be-demolished Listed Buildings and other extant structures can be mitigated by advance recording. Other large and moderate impacts can be mitigated through extensive pre-construction excavation, and detailed design could allow some buried remains to be spanned by viaduct.

Complexity	Archaeological sites in Old Town very complex (e.g. Augustinian friary), both in terms of diversity of elements and relationship with urban landscape, with areas showing change in use from open ground and industrial to intensive occupation. Old Town sites are multi-phased with deep stratigraphy, sites further to west not yet assessed. Docks are significant to Hull's use as a port. Built heritage is of low complexity, with single phase single use structures usually represented.	High, Medium, Low and Negligible.	Complexity of buried features within Old Town adds to significance. Complexity of assets outside Old Town not yet assessed.	Relationship between assets within the history of Hull adds to rarity. Complexity of built heritage not especially rare.	Moderate adverse. Proposals will affect complexity of buried remains, especially in the Old Town. Significant impacts at burial ground. Some elements of built heritage will be destroyed.
Context	All assets have an urban context. Docks illustrate historic setting and provide a sense of place, although context largely destroyed. Some structures e.g. warehouses and dock-side elements remain, but mostly lost or demolished. Holy Trinity burial ground provides a historical link with the Holy Trinity church. Context of medieval assets now lost due to subsequent development, and historic street pattern has been fragmented. Alignment of town walls picked out in differential paving at street level but with little explanation or understanding.	High, Medium, Low and Negligible.	Compact townscape context (both modern and buried) and history of Hull adds to significance.	Wider heritage links to other assets within Hull adds to rarity. Assets relating to particular events in Hull's history (e.g. town walls, goals and Civil War earthworks) are a rare resource. Other assets e.g. docks have international connections. Some localised areas retain their context, but mostly lost or significantly altered.	Slight to Moderate Adverse. Context of most assets not likely to be significantly altered given LAR will follow existing Castle Street. Increased visual instruction due to height and length of viaduct. Loss of the Myton Gate and adjacent town walls (if necessary), and the medieval tenements along Castle Street, would be significant to the Old Town. Severance of burial ground significantly reduces context with large numbers of burials having to be exhumed. Significant visual intrusion due to height and length of viaduct.
Period	Potential for pre-Roman, Roman and pre-Old Town occupation throughout scheme corridor. Medieval Old Town defences documented 1321-24, replacing earlier bank. Civil War defences are 17th century. All defences demolished by 1800 for dock developments. Old Town occupation from 13th century onwards, extending from planned core around High Street and Market Place. Multi-period occupancy, e.g. 12th to 16th century Augustinian Friary replaced by later market structures and public houses. Major of demolished assets date from 18th and 19th century. Holy Trinity burial ground was the sole place of burial for the parishioners of Holy Trinity between 1783-1867, and town goal dates to 17th century. Built heritage generally 19th century; Humber Dock opened 1809, Prince's Dock 1829, Railway Dock 1846, Castle Buildings c.1890. Some other assets of 18th century date, e.g. Earl de Grey public house and King William III statue.	High, Medium, Low and Negligible.	Varying, though majority is medieval and post-medieval with moderate significance. Evidence for pre-medieval occupation would be significant.	Prehistoric, Roman and palaeo-environmental deposits, if proved, would be rare. Continuity of occupation in Old Town within medieval street pattern rare. Restricted time span of burial ground use (1789-1867) adds to rarity. Post-medieval assets not especially rare, but many with earlier origins.	Very Large Adverse. Direct impact on 92 identified assets including demolition of two Listed Buildings and partial demolition of another. The option may disturb the Old Town defences and the Myton Gate, as well as significant areas of medieval tenements and Old Town infrastructure, but preservation in situ could be possible with careful design. Mitigation for option would involve pre-construction archaeological excavation for viaduct supports, as well as the clearance of affected parts of burial ground.

Reference sources: Acer & York Archaeological Trust (1995) A63 Castle Street Improvement Environmental Statement: Archaeology and Heritage; Humber Archaeology Partnership (2002 revised 2004) Assessment of Archaeological Potential; Pell Frischmann Consultants Ltd (2004) TPI Entry Report – Heritage of Historic Resources; Golder Associates (2008) Cultural Heritage Detailed Assessment Report.

Qualitative comments: Based on current knowledge, the option would have an adverse impact on 92 Cultural Heritage assets. Impacts categorised as eight Large adverse, 22 Moderate adverse, 47 Slight adverse and 15 Neutral adverse. No real beneficial effects as option is on line and elevated, and volume of traffic is not reduced. Significant increased visual intrusion due to height and length of viaduct. Two Grade II Listed Buildings to be demolished and partial demolition of another, and major impacts on archaeological assets of all values within the Old Town. Moderate impact on Holy Trinity burial ground, requiring advance archaeological clearance of affected area and exhumation of burials. Some potential for preservation in situ and the oversailing of archaeological assets, but depends on detailed design, and foundation works will need to be preceded by archaeological excavation. Archaeological potential for as yet undiscovered assets considered to be High.

Overall Assessment Score: **VERY LARGE ADVERSE**

BIODIVERSITY

Worksheet 1 Environment: Biodiversity - Plan Level

Scheme / option: A63 Castle Street Option 1 – Underground Base Option

Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact	Assessment score (in absence of mitigation)
Trinity Burial Ground SNCI	Cemetery with a number of mature trees	County	Designated as non-statutory site (SNCI)	Equilibrium	Medium	Intermediate negative	Moderate adverse
Mature trees	Species include ash, lime, elm, poplar and sycamore. Potential habitat for birds, bats and invertebrates	District	No recognised status	Unknown	Medium/ lower	Intermediate negative	Moderate adverse
Bats	Foraging bats recorded and several potential roost sites.	District	Schedule 5 of WCA and Annex 2 of European Habitats Directive Pipistrelle is UK BAP Priority Species	Most species have declined due to loss of roosts and loss / degradation of foraging habitat	Medium/ lower	Intermediate negative	Moderate adverse

Reference Source(s):

Highways Agency (1995) Design Manual for Roads and Bridges volume 11, section 3, part 4, Ecology and Nature Conservation. HMSO, London.
Hull Biodiversity Partnership (2002) Hull Biodiversity Action Plan. Hull City Council, Hull
JNCC (1993) Handbook for Phase 1 habitat survey: a technique for environmental audit. Peterborough, Joint Nature Conservation Committee.
JNCC (2004) UK BAP Website. http://www.ukbap.org.uk/
Mitchell-Jones (2004) Bat Mitigation Guidelines. English Nature, Peterborough.
National Biodiversity Network Gatway. http://www.searchnbn.net/
Environmental survey undertaken by Golder Associates in 2007
Environmental survey undertaken by Smeeden Foreman Partnership in 2003
IEEM (2002) Guidelines on Ecological Impact Assessment, Amended Pilot.
Transport Analysis Guidance (2004) The Biodiversity Sub-Objective: TAG Unit 3.3.10. Derived from: DETR (2000) Guidance on the Methodology for Multi-Modal Studies, Volume 2.

Summary assessment score: Slight adverse

Qualitative comments: There would be moderate impacts on the Trinity Burial Ground SNCI, foraging and roosting bats and mature trees. Negative impacts will be minimised by retaining existing vegetation wherever possible and creating species-rich grassland and planting new trees. The mitigation measures will reduce the overall impact of the scheme to slight adverse.

Worksheet 1 Environment: Biodiversity - Plan Level

Scheme / option: A63 Castle Street Option 2 – Underground Landbridge Option

Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact	Assessment score (in absence of mitigation)
Trinity Burial Ground SNCI	Cemetery with a number of mature trees	County	Designated as non-statutory site (SNCI)	Equilibrium	Medium	Intermediate negative	Moderate adverse
Mature trees	Species include ash, lime, elm, poplar and sycamore. Potential habitat for birds, bats and invertebrates	District	No recognised status	Unknown	Medium/ lower	Intermediate negative	Moderate adverse
Bats	Foraging bats recorded and several potential roost sites.	District	Schedule 5 of WCA and Annex 2 of European Habitats Directive Pipistrelle is UK BAP Priority Species	Most species have declined due to loss of roosts and loss / degradation of foraging habitat	Medium/ lower	Intermediate negative	Moderate adverse

Reference Source(s):

Highways Agency (1995) Design Manual for Roads and Bridges volume 11, section 3, part 4, Ecology and Nature Conservation. HMSO, London.
Hull Biodiversity Partnership (2002) Hull Biodiversity Action Plan. Hull City Council, Hull
JNCC (1993) Handbook for Phase 1 habitat survey: a technique for environmental audit. Peterborough, Joint Nature Conservation Committee.
JNCC (2004) UK BAP Website. http://www.ukbap.org.uk/
Mitchell-Jones (2004) Bat Mitigation Guidelines. English Nature, Peterborough.
National Biodiversity Network Gatway. http://www.searchnbn.net/
Environmental survey undertaken by Golder Associates in 2007
Environmental survey undertaken by Smeeden Foreman Partnership in 2003
IEEM (2002) Guidelines on Ecological Impact Assessment, Amended Pilot.
Transport Analysis Guidance (2004) The Biodiversity Sub-Objective: TAG Unit 3.3.10. Derived from: DETR (2000) Guidance on the Methodology for Multi-Modal Studies, Volume 2.

Summary assessment score: Slight adverse

Qualitative comments: There would be moderate impacts on the Trinity Burial Ground SNCI, foraging and roosting bats and mature trees. Negative impacts will be minimised by retaining existing vegetation wherever possible and creating species-rich grassland and planting new trees. The mitigation measures will reduce the overall impact of the scheme to slight adverse.

Worksheet 1 Environment: Biodiversity - Plan Level

Scheme / option: A63 Castle Street Option 3 – Underground Cut and Cover Option

Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact	Assessment score (in absence of mitigation)
Trinity Burial Ground SNCI	Cemetery with a number of mature trees	County	Designated as non-statutory site (SNCI)	Equilibrium	Medium	intermediate negative	Moderate adverse
Mature trees	Species include ash, lime, elm, poplar and sycamore. Potential habitat for birds, bats and invertebrates	District	No recognised status	Unknown	Medium/ lower	intermediate negative	Moderate adverse
Bats	Foraging bats recorded and several potential roost sites.	District	Schedule 5 of WCA and Annex 2 of European Habitats Directive Pipistrelle is UK BAP Priority Species	Most species have declined due to loss of roosts and loss / degradation of foraging habitat	Medium/ lower	intermediate negative	Moderate adverse

Reference Source(s):

Highways Agency (1995) Design Manual for Roads and Bridges volume 11, section 3, part 4, Ecology and Nature Conservation. HMSO, London.
Hull Biodiversity Partnership (2002) Hull Biodiversity Action Plan. Hull City Council, Hull
JNCC (1993) Handbook for Phase 1 habitat survey: a technique for environmental audit. Peterborough, Joint Nature Conservation Committee.
JNCC (2004) UK BAP Website. http://www.ukbap.org.uk/
Mitchell-Jones (2004) Bat Mitigation Guidelines. English Nature, Peterborough.
National Biodiversity Network Gatway. http://www.searchnbn.net/
Environmental survey undertaken by Golder Associates in 2007
Environmental survey undertaken by Smeeden Foreman Partnership in 2003
IEEM (2002) Guidelines on Ecological Impact Assessment, Amended Pilot.
Transport Analysis Guidance (2004) The Biodiversity Sub-Objective: TAG Unit 3.3.10. Derived from: DETR (2000) Guidance on the Methodology for Multi-Modal Studies, Volume 2.

Summary assessment score: Slight adverse

Qualitative comments: There would be moderate impacts on the Trinity Burial Ground SNCI, foraging and roosting bats and mature trees. Fewer mature trees will be affected than with the other options. Negative impacts will be minimised by retaining existing vegetation wherever possible and creating species-rich grassland and planting new trees. The mitigation measures will reduce the overall impact of the scheme to slight adverse.

Worksheet 1 Environment: Biodiversity - Plan Level

Scheme / option: A63 Castle Street Option 4 – Overground Base Scheme Option

Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact	Assessment score (in absence of mitigation)
Trinity Burial Ground SNCI	Cemetery with a number of mature trees	County	Designated as non-statutory site (SNCI)	Equilibrium	Medium	intermediate negative	Moderate adverse
Mature trees	Species include ash, lime, elm, poplar and sycamore. Potential habitat for birds, bats and invertebrates	District	No recognised status	Unknown	Medium/ lower	intermediate negative	Moderate adverse
Bats	Foraging bats recorded and several potential roost sites.	District	Schedule 5 of WCA and Annex 2 of European Habitats Directive Pipistrelle is UK BAP Priority Species	Most species have declined due to loss of roosts and loss / degradation of foraging habitat	Medium/ lower	intermediate negative	Moderate adverse

Reference Source(s):

Highways Agency (1995) Design Manual for Roads and Bridges volume 11, section 3, part 4, Ecology and Nature Conservation. HMSO, London.
Hull Biodiversity Partnership (2002) Hull Biodiversity Action Plan. Hull City Council, Hull
JNCC (1993) Handbook for Phase 1 habitat survey: a technique for environmental audit. Peterborough, Joint Nature Conservation Committee.
JNCC (2004) UK BAP Website. http://www.ukbap.org.uk/
Mitchell-Jones (2004) Bat Mitigation Guidelines. English Nature, Peterborough.
National Biodiversity Network Gatway. http://www.searchnbn.net/
Environmental survey undertaken by Golder Associates in 2007
Environmental survey undertaken by Smeeden Foreman Partnership in 2003
IEEM (2002) Guidelines on Ecological Impact Assessment, Amended Pilot.
Transport Analysis Guidance (2004) The Biodiversity Sub-Objective: TAG Unit 3.3.10. Derived from: DETR (2000) Guidance on the Methodology for Multi-Modal Studies, Volume 2.

Summary assessment score: Slight adverse

Qualitative comments: There would be moderate impacts on the Trinity Burial Ground SNCI, foraging and roosting bats and mature trees. Negative impacts will be minimised by retaining existing vegetation wherever possible and creating species-rich grassland and planting new trees. The mitigation measures will reduce the overall impact of the scheme to slight adverse.

Worksheet 1 Environment: Biodiversity - Plan Level

Scheme / option: A63 Castle Street Option 5 – Overground Landbridge Equivalent Option

Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact	Assessment score (in absence of mitigation)
Trinity Burial Ground SNCI	Cemetery with a number of mature trees	County	Designated as non-statutory site (SNCI)	Equilibrium	Medium	intermediate negative	Moderate adverse
Mature trees	Species include ash, lime, elm, poplar and sycamore. Potential habitat for birds, bats and invertebrates	District	No recognised status	Unknown	Medium/ lower	intermediate negative	Moderate adverse
Bats	Foraging bats recorded and several potential roost sites.	District	Schedule 5 of WCA and Annex 2 of European Habitats Directive Pipistrelle is UK BAP Priority Species	Most species have declined due to loss of roosts and loss / degradation of foraging habitat	Medium/ lower	intermediate negative	Moderate adverse

Reference Source(s):

Highways Agency (1995) Design Manual for Roads and Bridges volume 11, section 3, part 4, Ecology and Nature Conservation. HMSO, London.
Hull Biodiversity Partnership (2002) Hull Biodiversity Action Plan. Hull City Council, Hull
JNCC (1993) Handbook for Phase 1 habitat survey: a technique for environmental audit. Peterborough, Joint Nature Conservation Committee.
JNCC (2004) UK BAP Website. http://www.ukbap.org.uk/
Mitchell-Jones (2004) Bat Mitigation Guidelines. English Nature, Peterborough.
National Biodiversity Network Gatway. http://www.searchnbn.net/
Environmental survey undertaken by Golder Associates in 2007
Environmental survey undertaken by Smeeden Foreman Partnership in 2003
IEEM (2002) Guidelines on Ecological Impact Assessment, Amended Pilot.
Transport Analysis Guidance (2004) The Biodiversity Sub-Objective: TAG Unit 3.3.10. Derived from: DETR (2000) Guidance on the Methodology for Multi-Modal Studies, Volume 2.

Summary assessment score: Slight adverse

Qualitative comments: There would be moderate impacts on the Trinity Burial Ground SNCI, foraging and roosting bats and mature trees. Negative impacts will be minimised by retaining existing vegetation wherever possible and creating species-rich grassland and planting new trees. The mitigation measures will reduce the overall impact of the scheme to slight adverse.

Worksheet 1 Environment: Biodiversity - Plan Level

Scheme / option: A63 Castle Street Option 6 – Extended Viaduct Scheme Option

Area	Description of feature / attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact	Assessment score (in absence of mitigation)
Trinity Burial Ground SNCI	Cemetery with a number of mature trees	County	Designated as non-statutory site (SNCI)	Equilibrium	Medium	Intermediate negative	Moderate adverse
Mature trees	Species include ash, lime, elm, poplar and sycamore. Potential habitat for birds, bats and invertebrates	District	No recognised status	Unknown	Medium/ lower	Intermediate negative	Moderate adverse
Bats	Foraging bats recorded and several potential roost sites.	District	Schedule 5 of WCA and Annex 2 of European Habitats Directive Pipistrelle is UK BAP Priority Species	Most species have declined due to loss of roosts and loss / degradation of foraging habitat	Medium/ lower	Intermediate negative	Moderate adverse

Reference Source(s):

Highways Agency (1995) Design Manual for Roads and Bridges volume 11, section 3, part 4, Ecology and Nature Conservation. HMSO, London.
Hull Biodiversity Partnership (2002) Hull Biodiversity Action Plan. Hull City Council, Hull
JNCC (1993) Handbook for Phase 1 habitat survey: a technique for environmental audit. Peterborough, Joint Nature Conservation Committee.
JNCC (2004) UK BAP Website. http://www.ukbap.org.uk/
Mitchell-Jones (2004) Bat Mitigation Guidelines. English Nature, Peterborough.
National Biodiversity Network Gatway. http://www.searchnbn.net/
Environmental survey undertaken by Golder Associates in 2007
Environmental survey undertaken by Smeeden Foreman Partnership in 2003
IEEM (2002) Guidelines on Ecological Impact Assessment, Amended Pilot.
Transport Analysis Guidance (2004) The Biodiversity Sub-Objective: TAG Unit 3.3.10. Derived from: DETR (2000) Guidance on the Methodology for Multi-Modal Studies, Volume 2.

Summary assessment score: Slight adverse

Qualitative comments: There would be moderate impacts on the Trinity Burial Ground SNCI, foraging and roosting bats and mature trees. This option will affect the most mature trees. Negative impacts will be minimised by retaining existing vegetation wherever possible and creating species-rich grassland and planting new trees. The mitigation measures will reduce the overall impact of the scheme to slight adverse.

WATER ENVIRONMENT

A63 CASTLE STREET IMPROVEMENTS, HULL
Worksheet for Environment: Water Environment **Underground Base Option**

Description of study area	Feature	Services	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
A63 Castle Street **Potential Impacts:**	**Humber Estuary**	Water supply	Saline water linked to the River Humber No surface water abstractions within 1km of the proposed scheme. - Estuary has a CEWP grade of A. - Unlikely that the scheme would result in a change to this grade given the volume of water within the estuary.	Local	Medium	Low	Medium	Negligible	Insignificant
		Transport and dilution of waste products	Contribution of surface water discharges to the total river flow is minimal. No known trade discharges	Local	Low	Low	Medium	Negligible	Insignificant
		Biodiversity	- Estuary has a CEWP grade of A. - It is unlikely that the scheme would result in a change to this grade given the volume of water within the estuary. No Fisheries are present within the vicinity of the proposed scheme. This stretch of the Humber has been designated as: - Ramsar Site - Site of Special Scientific Interest (SSSI) - Site of Special Scientific Interest Units - Special Area of Conservation (SAC), - Special Protection Area (SPA)	National	Very High	Low	High	Negligible	Insignificant
		Aesthetics	Predominant landscape feature. No landscape assessment data currently available.	Local	Medium	Low	Medium	Negligible	Insignificant
		Cultural Heritage	Scheduled Ancient Monument and listed buildings are situated with 1km of the proposed scheme. These are not associated with the estuary and are unlikely to be impacted by the proposed scheme.	n/a	n/a	n/a	n/a	n/a	n/a
		Recreation	The proposed scheme is unlikely to impact upon access to the riverside/estuary.	Local	Low	Medium	Medium	Negligible	Insignificant
		Value to the economy	Humber docks are present along the estuary, adjacent to the proposed scheme. These are unlikely to be impacted by the proposed scheme.	Local	Low	Low	High	Negligible	Insignificant
A63 Castle Street **Potential Impacts:**	**Minor watercourse:** **Docks**	Water supply	Saline water linked to Humber estuary. No surface water abstractions within 1km of the proposed scheme.	Local	Low	High	Medium	Minor	Insignificant

Description of study area	Feature	Services	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
	(Marina)	Transport of waste products	Proposed surface water outfalls are to discharge into the docks. Contribution of surface water discharges to the total river flow is minimal.	Local	Low	Medium	Medium	Minor	Insignificant
		Biodiversity	- Estuary has a CEWP grade of A. - It is unlikely that the scheme would result in a change to this grade given the volume of water within the estuary. No Fisheries are present within the vicinity of the proposed scheme. These Docks are within the following designated areas: - Ramsar Site - Site of Special Scientific Interest (SSSI) - Site of Special Scientific Interest Units - Special Area of Conservation (SAC), - Special Protection Area (SPA)	National	Very High	Low	High	Negligible	Insignificant
		Aesthetics	Marina part of a tourist action area. No Landscape assessment data is currently available.	Local	Medium	Low	Medium	Minor	Insignificant
		Cultural Heritage	A number of listed buildings are associated with the dock / marina area, however these are unlikely to be impacted by the proposed scheme.	n/a	n/a	n/a	n/a	n/a	n/a
		Recreation	Currently used as a marina for mooring small pleasure craft.	Local / Regional	Medium	Low	Medium	Minor	Insignificant
		Value to economy	Dock has light industrial uses.	Local	Medium	Low	Medium	Minor	Insignificant
A63 Castle Street Potential Impacts:	**River Hull**	Water supply	Unclassified tidal river which discharges into Humber Estuary. River has a GQA Chemistry Grade of F.	Local	Medium	Low	Medium	Negligible	Insignificant
		Transport of waste products	2 no. known trade discharges.	Local	Medium	Low	Medium	Negligible	Insignificant

Description of study area	Feature	Services	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
		Biodiversity	- GQA ungraded. - It is unlikely that the scheme would result in a change to this grade given the volume of water within the estuary. No Fisheries are present within the vicinity of the proposed scheme. The lower reached of the River Hull have been designated as: - Ramsar Site - Site of Special Scientific Interest (SSSI) - Special Area of Conservation (SAC), - Special Protection Area (SPA)	National	Low	High	Low	Negligible	Insignificant
		Aesthetics	Contribution to landscape and quality is unknown - Landscape assessment data not available	Local	Medium	Low	Low	Negligible	Insignificant
		Cultural Heritage	The River Hull delineates the Boundary of medieval Hull. Originally used for wharfage.	National / Regional	High	Low	High	Negligible	Insignificant
		Recreation	General water sports e.g. rowing	Local	Low	Medium	Medium	Negligible	Insignificant
		Value to economy	Large vessels navigate to and from the River Hull industrial area at high tide.	Local	Medium	Low	Medium	Negligible	Insignificant
		Conveyance of flow	No history of Flooding in the area	Local	Low	Low	Medium	Negligible	Insignificant

Reference Source(s):	Environmental Statement undertaken by Acer in 1995, Scoping study undertaken by Smeedon Foreman in 2003; Environment Agency Data; PSSR undertaken by PFC; Multi Agency Geographic Information System
Summary Assessment Score:	**NEUTRAL**
Qualitative Comments:	The Humber Estuary and River Hull are outside the proposed improvement corridor so will have minimal impacts. The site is not situated within a Groundwater Source Protection Zone, Nitrate Vulnerable Zone or Nitrate Sensitive Area.

A63 CASTLE STREET IMPROVEMENTS, HULL
Worksheet for Environment: Water Environment **Underground Landbridge Option**

Description of study area	Feature	Attributes/ Services	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
A63 Castle Street **Potential Impacts:**	**Humber Estuary**	Water supply	Saline water linked to the River Humber No surface water abstractions within 1km of the proposed scheme. - Estuary has a CEWP grade of A. - Unlikely that the scheme would result in a change to this grade given the volume of water within the estuary.	Local	Medium	Low	Medium	Negligible	Insignificant
		Transport and dilution of waste products	Contribution of surface water discharges to the total river flow is minimal. No known trade discharges	Local	Low	Low	Medium	Negligible	Insignificant
		Biodiversity	- Estuary has a CEWP grade of A. - It is unlikely that the scheme would result in a change to this grade given the volume of water within the estuary. No Fisheries are present within the vicinity of the proposed scheme. This stretch of the Humber has been designated as: - Ramsar Site - Site of Special Scientific Interest (SSSI) - Site of Special Scientific Interest Units - Special Area of Conservation (SAC), - Special Protection Area (SPA)	National	Very High	Low	High	Negligible	Insignificant
		Aesthetics	Predominant landscape feature. No landscape assessment data currently available.	Local	Medium	Low	Medium	Negligible	Insignificant
		Cultural Heritage	Scheduled Ancient Monument and listed buildings are situated with 1km of the proposed scheme. These are not associated with the estuary and are unlikely to be impacted by the proposed scheme.	n/a	n/a	n/a	n/a	n/a	n/a
		Recreation	The proposed scheme is unlikely to impact upon access to the riverside/estuary.	Local	Low	Medium	Medium	Negligible	Insignificant
		Value to the economy	Humber docks are present along the estuary, adjacent to the proposed scheme. These are unlikely to be impacted by the proposed scheme.	Local	Low	Low	High	Negligible	Insignificant
A63 Castle Street	**Minor**	Water supply	Saline water linked to Humber estuary.	Local	Low	High	Medium	Minor	Insignificant

Description of study area	Feature	Attributes/ Services	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
Potential Impacts:	**watercourse: Docks (Marina)**		No surface water abstractions within 1km of the proposed scheme.						
		Transport of waste products	Proposed surface water outfalls are to discharge into the docks. Contribution of surface water discharges to the total river flow is minimal.	Local	Low	Medium	Medium	Minor	Insignificant
		Biodiversity	- Estuary has a CEWP grade of A. - It is unlikely that the scheme would result in a change to this grade given the volume of water within the estuary. No Fisheries are present within the vicinity of the proposed scheme. These Docks are within the following designated areas: - Ramsar Site - Site of Special Scientific Interest (SSSI) - Site of Special Scientific Interest Units - Special Area of Conservation (SAC), - Special Protection Area (SPA)	National	Very High	Low	High	Negligible	Insignificant
		Aesthetics	Marina part of a tourist action area. No Landscape assessment data is currently available.	Local	Medium	Low	Medium	Minor	Insignificant
		Cultural Heritage	A number of listed buildings are associated with the dock / marina area, however these are unlikely to be impacted by the proposed scheme.	n/a	n/a	n/a	n/a	n/a	n/a
		Recreation	Currently used as a marina for mooring small pleasure craft.	Local / Regional	Medium	Low	Medium	Minor	Insignificant
		Value to economy	Dock has light industrial uses.	Local	Medium	Low	Medium	Minor	Insignificant
A63 Castle Street Potential Impacts:	**River Hull**	Water supply	Unclassified tidal river which discharges into Humber Estuary. River has a GQA Chemistry Grade of F.	Local	Medium	Low	Medium	Negligible	Insignificant

Description of study area	Feature	Attributes/ Services	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
		Transport of waste products	2 no. known trade discharges.	Local	Medium	Low	Medium	Negligible	Insignificant
		Biodiversity	- GQA ungraded. - It is unlikely that the scheme would result in a change to this grade given the volume of water within the estuary. No Fisheries are present within the vicinity of the proposed scheme. The lower reached of the River Hull have been designated as: - Ramsar Site - Site of Special Scientific Interest (SSSI) - Special Area of Conservation (SAC), - Special Protection Area (SPA)	National	Low	High	Low	Negligible	Insignificant
		Aesthetics	Contribution to landscape and quality is unknown - Landscape assessment data not available	Local	Medium	Low	Low	Negligible	Insignificant
		Cultural Heritage	The River Hull delineates the Boundary of medieval Hull. Originally used for wharfage.	National / Regional	High	Low	High	Negligible	Insignificant
		Recreation	General water sports e.g. rowing	Local	Low	Medium	Medium	Negligible	Insignificant
		Value to economy	Large vessels navigate to and from the River Hull industrial area at high tide.	Local	Medium	Low	Medium	Negligible	Insignificant
		Conveyance of flow	No history of Flooding in the area	Local	Low	Low	Medium	Negligible	Insignificant

Reference Source(s):	Environmental Statement undertaken by Acer in 1995, Scoping study undertaken by Smeedon Foreman in 2003; Environment Agency Data; PSSR undertaken by PFC; Multi Agency Geographic Information System
Summary Assessment Score:	**NEUTRAL**
Qualitative Comments:	The Humber Estuary and River Hull are outside the proposed improvement corridor so will have minimal impacts. The site is not situated within a Groundwater Source Protection Zone, Nitrate Vulnerable Zone or Nitrate Sensitive Area.

Description of study area	Feature	Attributes/ Services	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
A63 Castle Street **Potential Impacts:**	**Humber Estuary**	Water supply	Saline water linked to the River Humber No surface water abstractions within 1km of the proposed scheme. - Estuary has a CEWP grade of A. - Unlikely that the scheme would result in a change to this grade given the volume of water within the estuary.	Local	Medium	Low	Medium	Negligible	Insignificant
		Transport and dilution of waste products	Contribution of surface water discharges to the total river flow is minimal. No known trade discharges	Local	Low	Low	Medium	Negligible	Insignificant
		Biodiversity	- Estuary has a CEWP grade of A. - It is unlikely that the scheme would result in a change to this grade given the volume of water within the estuary. No Fisheries are present within the vicinity of the proposed scheme. This stretch of the Humber has been designated as: - Ramsar Site - Site of Special Scientific Interest (SSSI) - Site of Special Scientific Interest Units - Special Area of Conservation (SAC), - Special Protection Area (SPA)	National	Very High	Low	High	Negligible	Insignificant
		Aesthetics	Predominant landscape feature. No landscape assessment data currently available.	Local	Medium	Low	Medium	Negligible	Insignificant
		Cultural Heritage	Scheduled Ancient Monument and listed buildings are situated with 1km of the proposed scheme. These are not associated with the estuary and are unlikely to be impacted by the proposed scheme.	n/a	n/a	n/a	n/a	n/a	n/a
		Recreation	The proposed scheme is unlikely to impact upon access to the riverside/estuary.	Local	Low	Medium	Medium	Negligible	Insignificant
		Value to the economy	Humber docks are present along the estuary, adjacent to the proposed scheme. These are unlikely to be impacted by the proposed scheme.	Local	Low	Low	High	Negligible	Insignificant
A63 Castle Street **Potential Impacts:**	**Minor watercourse:** **Docks**	Water supply	Saline water linked to Humber estuary. No surface water abstractions within 1km of the proposed scheme.	Local	Low	High	Medium	Minor	Insignificant

Description of study area	Feature	Attributes/ Services	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
	(Marina)	Transport of waste products	Proposed surface water outfalls are to discharge into the docks. Contribution of surface water discharges to the total river flow is minimal.	Local	Low	Medium	Medium	Minor	Insignificant
		Biodiversity	- Estuary has a CEWP grade of A. - It is unlikely that the scheme would result in a change to this grade given the volume of water within the estuary. No Fisheries are present within the vicinity of the proposed scheme. These Docks are within the following designated areas: - Ramsar Site - Site of Special Scientific Interest (SSSI) - Site of Special Scientific Interest Units - Special Area of Conservation (SAC), - Special Protection Area (SPA)	National	Very High	Low	High	Negligible	Insignificant
		Aesthetics	Marina part of a tourist action area. No Landscape assessment data is currently available.	Local	Medium	Low	Medium	Minor	Insignificant
		Cultural Heritage	A number of listed buildings are associated with the dock / marina area, however these are unlikely to be impacted by the proposed scheme.	n/a	n/a	n/a	n/a	n/a	n/a
		Recreation	Currently used as a marina for mooring small pleasure craft.	Local / Regional	Medium	Low	Medium	Minor	Insignificant
		Value to economy	Dock has light industrial uses.	Local	Medium	Low	Medium	Minor	Insignificant
A63 Castle Street Potential Impacts:	**River Hull**	Water supply	Unclassified tidal river which discharges into Humber Estuary. River has a GQA Chemistry Grade of F.	Local	Medium	Low	Medium	Negligible	Insignificant
		Transport of waste products	2 no. known trade discharges.	Local	Medium	Low	Medium	Negligible	Insignificant

Description of study area	Feature	Attributes/ Services	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
		Biodiversity	- GQA ungraded. - It is unlikely that the scheme would result in a change to this grade given the volume of water within the estuary. No Fisheries are present within the vicinity of the proposed scheme. The lower reached of the River Hull have been designated as: - Ramsar Site - Site of Special Scientific Interest (SSSI) - Special Area of Conservation (SAC), - Special Protection Area (SPA)	National	Low	High	Low	Negligible	Insignificant
		Aesthetics	Contribution to landscape and quality is unknown - Landscape assessment data not available	Local	Medium	Low	Low	Negligible	Insignificant
		Cultural Heritage	The River Hull delineates the Boundary of medieval Hull. Originally used for wharfage.	National / Regional	High	Low	High	Negligible	Insignificant
		Recreation	General water sports e.g. rowing	Local	Low	Medium	Medium	Negligible	Insignificant
		Value to economy	Large vessels navigate to and from the River Hull industrial area at high tide.	Local	Medium	Low	Medium	Negligible	Insignificant
		Conveyance of flow	No history of Flooding in the area	Local	Low	Low	Medium	Negligible	Insignificant

Reference Source(s):	Environmental Statement undertaken by Acer in 1995, Scoping study undertaken by Smeedon Foreman in 2003; Environment Agency Data; PSSR undertaken by PFC; Multi Agency Geographic Information System
Summary Assessment Score:	**NEUTRAL**
Qualitative Comments:	The Humber Estuary and River Hull are outside the proposed improvement corridor so will have minimal impacts. The site is not situated within a Groundwater Source Protection Zone, Nitrate Vulnerable Zone or Nitrate Sensitive Area. Surface water run off to be collected, stored and have a controlled discharge into existing drainage system. Ends of tunnel ramps raised to prevent flooding.

Description of study area	Feature	Services	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
A63 Castle Street **Potential Impacts:**	**Humber Estuary**	Water supply	Saline water linked to the River Humber No surface water abstractions within 1km of the proposed scheme. - Estuary has a CEWP grade of A. - Unlikely that the scheme would result in a change to this grade given the volume of water within the estuary.	Local	Medium	Low	Medium	Negligible	Insignificant
		Transport and dilution of waste products	Contribution of surface water discharges to the total river flow is minimal. No known trade discharges	Local	Low	Low	Medium	Negligible	Insignificant
		Biodiversity	- Estuary has a CEWP grade of A. - It is unlikely that the scheme would result in a change to this grade given the volume of water within the estuary. No Fisheries are present within the vicinity of the proposed scheme. This stretch of the Humber has been designated as: - Ramsar Site - Site of Special Scientific Interest (SSSI) - Site of Special Scientific Interest Units - Special Area of Conservation (SAC), - Special Protection Area (SPA)	National	Very High	Low	High	Negligible	Insignificant
		Aesthetics	Predominant landscape feature. No landscape assessment data currently available.	Local	Medium	Low	Medium	Negligible	Insignificant
		Cultural Heritage	Scheduled Ancient Monument and listed buildings are situated with 1km of the proposed scheme. These are not associated with the estuary and are unlikely to be impacted by the proposed scheme.	n/a	n/a	n/a	n/a	n/a	n/a
		Recreation	The proposed scheme is unlikely to impact upon access to the riverside/estuary.	Local	Low	Medium	Medium	Negligible	Insignificant
		Value to the economy	Humber docks are present along the estuary, adjacent to the proposed scheme. These are unlikely to be impacted by the proposed scheme.	Local	Low	Low	High	Negligible	Insignificant
		Conveyance of flow	No history of flooding in the area. The dock is part of the Humber Estuary Flood defence.	Local	Low	Low	High	Negligible	Insignificant
A63 Castle Street **Potential Impacts:**	**Minor watercourse:** **Docks**	Water supply	Saline water linked to Humber estuary. No surface water abstractions within 1km of the proposed scheme.	Local	Low	High	Medium	Minor	Insignificant

Description of study area	Feature	Services	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
	(Marina)	Transport of waste products	Proposed surface water outfalls are to discharge into the docks. Contribution of surface water discharges to the total river flow is minimal.	Local	Low	Medium	Medium	Minor	Insignificant
		Biodiversity	- Estuary has a CEWP grade of A. - It is unlikely that the scheme would result in a change to this grade given the volume of water within the estuary. No Fisheries are present within the vicinity of the proposed scheme. These Docks are within the following designated areas: - Ramsar Site - Site of Special Scientific Interest (SSSI) - Site of Special Scientific Interest Units - Special Area of Conservation (SAC), - Special Protection Area (SPA)	National	Very High	Low	High	Negligible	Insignificant
		Aesthetics	Marina part of a tourist action area. No Landscape assessment data is currently available.	Local	Medium	Low	Medium	Minor	Insignificant
		Cultural Heritage	A number of listed buildings are associated with the dock / marina area. The Dock is also a listed structure	Medium	Medium	Low	High	Moderate	Significant
		Recreation	Currently used as a marina for mooring small pleasure craft.	Local / Regional	Medium	Low	Medium	Minor	Insignificant
		Value to economy	Dock has light industrial uses.	Local	Medium	Low	Medium	Minor	Insignificant
		Conveyance of flow	No history of Flooding in the area. Flood defences are present along the Humber Estuary.	Local	Low	Low	Medium	Negligible	Insignificant
A63 Castle Street **Potential Impacts:**	**River Hull**	Water supply	Unclassified tidal river which discharges into Humber Estuary. River has a GQA Chemistry Grade of F.	Local	Medium	Low	Medium	Negligible	Insignificant
		Transport of waste products	2 no. known trade discharges.	Local	Medium	Low	Medium	Negligible	Insignificant

Description of study area	Feature	Services	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
		Biodiversity	- GQA ungraded. - It is unlikely that the scheme would result in a change to this grade given the volume of water within the estuary. No Fisheries are present within the vicinity of the proposed scheme. The lower reached of the River Hull have been designated as: - Ramsar Site - Site of Special Scientific Interest (SSSI) - Special Area of Conservation (SAC), - Special Protection Area (SPA)	National	Low	High	Low	Negligible	Insignificant
		Aesthetics	Contribution to landscape and quality is unknown - Landscape assessment data not available	Local	Medium	Low	Low	Negligible	Insignificant
		Cultural Heritage	The River Hull delineates the Boundary of medieval Hull. Originally used for wharfage.	National / Regional	High	Low	High	Negligible	Insignificant
		Recreation	General water sports e.g. rowing	Local	Low	Medium	Medium	Negligible	Insignificant
		Value to economy	Large vessels navigate to and from the River Hull industrial area at high tide.	Local	Medium	Low	Medium	Negligible	Insignificant
		Conveyance of flow	No history of Flooding in the area	Local	Low	Low	Medium	Negligible	Insignificant

Reference Source(s):	Environmental Statement undertaken by Acer in 1995, Scoping study undertaken by Smeedon Foreman in 2003; Environment Agency Data; PSSR undertaken by PFC; Multi Agency Geographic Information System
Summary Assessment Score:	**NEUTRAL**
Qualitative Comments:	The Humber Estuary and River Hull are outside the proposed improvement corridor so will have minimal impacts. The site is not situated within a Groundwater Source Protection Zone, Nitrate Vulnerable Zone or Nitrate Sensitive Area.

Description of study area	Feature	Attributes/ Services	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
A63 Castle Street **Potential Impacts:**	**Humber Estuary**	Water supply	Saline water linked to the River Humber No surface water abstractions within 1km of the proposed scheme. - Estuary has a CEWP grade of A. - Unlikely that the scheme would result in a change to this grade given the volume of water within the estuary.	Local	Medium	Low	Medium	Negligible	Insignificant
		Transport and dilution of waste products	Contribution of surface water discharges to the total river flow is minimal. No known trade discharges	Local	Low	Low	Medium	Negligible	Insignificant
		Biodiversity	- Estuary has a CEWP grade of A. - It is unlikely that the scheme would result in a change to this grade given the volume of water within the estuary. No Fisheries are present within the vicinity of the proposed scheme. This stretch of the Humber has been designated as: - Ramsar Site - Site of Special Scientific Interest (SSSI) - Site of Special Scientific Interest Units - Special Area of Conservation (SAC), - Special Protection Area (SPA)	National	Very High	Low	High	Negligible	Insignificant
		Aesthetics	Predominant landscape feature. No landscape assessment data currently available.	Local	Medium	Low	Medium	Negligible	Insignificant
		Cultural Heritage	Scheduled Ancient Monument and listed buildings are situated with 1km of the proposed scheme. These are not associated with the estuary and are unlikely to be impacted by the proposed scheme.	n/a	n/a	n/a	n/a	n/a	n/a
		Recreation	The proposed scheme is unlikely to impact upon access to the riverside/estuary.	Local	Low	Medium	Medium	Negligible	Insignificant
		Value to the economy	Humber docks are present along the estuary, adjacent to the proposed scheme. These are unlikely to be impacted by the proposed scheme.	Local	Low	Low	High	Negligible	Insignificant
A63 Castle Street **Potential Impacts:**	**Minor watercourse:** **Docks**	Water supply	Saline water linked to Humber estuary. No surface water abstractions within 1km of the proposed scheme.	Local	Low	High	Medium	Minor	Insignificant

Description of study area	Feature	Attributes/ Services	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
	(Marina)	Transport of waste products	Proposed surface water outfalls are to discharge into the docks. Contribution of surface water discharges to the total river flow is minimal.	Local	Low	Medium	Medium	Minor	Insignificant
		Biodiversity	- Estuary has a CEWP grade of A. - It is unlikely that the scheme would result in a change to this grade given the volume of water within the estuary. No Fisheries are present within the vicinity of the proposed scheme. These Docks are within the following designated areas: - Ramsar Site - Site of Special Scientific Interest (SSSI) - Site of Special Scientific Interest Units - Special Area of Conservation (SAC), - Special Protection Area (SPA)	National	Very High	Low	High	Negligible	Insignificant
		Aesthetics	Marina part of a tourist action area. No Landscape assessment data is currently available.	Local	Medium	Low	Medium	Minor	Insignificant
		Cultural Heritage	A number of listed buildings are associated with the dock / marina area, however these are unlikely to be impacted by the proposed scheme.	n/a	n/a	n/a	n/a	n/a	n/a
		Recreation	Currently used as a marina for mooring small pleasure craft.	Local / Regional	Medium	Low	Medium	Minor	Insignificant
		Value to economy	Dock has light industrial uses.	Local	Medium	Low	Medium	Minor	Insignificant
A63 Castle Street Potential Impacts:	**River Hull**	Water supply	Unclassified tidal river which discharges into Humber Estuary. River has a GQA Chemistry Grade of F.	Local	Medium	Low	Medium	Negligible	Insignificant
		Transport of waste products	2 no. known trade discharges.	Local	Medium	Low	Medium	Negligible	Insignificant
		Biodiversity	- GQA ungraded. - It is unlikely that the scheme would result in a change to this grade given the volume of water within the estuary.	National	Low	High	Low	Negligible	Insignificant

A63 CASTLE STREET IMPROVEMENT, HULL
Worksheet for Environment: Water Environment **Overground Landbridge Option**

Description of study area	Feature	Attributes/ Services	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
			No Fisheries are present within the vicinity of the proposed scheme.						
			The lower reached of the River Hull have been designated as: - Ramsar Site - Site of Special Scientific Interest (SSSI) - Special Area of Conservation (SAC), - Special Protection Area (SPA)						
		Aesthetics	Contribution to landscape and quality is unknown - Landscape assessment data not available	Local	Medium	Low	Low	Negligible	Insignificant
		Cultural Heritage	The River Hull delineates the Boundary of medieval Hull. Originally used for wharfage.	National / Regional	High	Low	High	Negligible	Insignificant
		Recreation	General water sports e.g. rowing	Local	Low	Medium	Medium	Negligible	Insignificant
		Value to economy	Large vessels navigate to and from the River Hull industrial area at high tide.	Local	Medium	Low	Medium	Negligible	Insignificant
		Conveyance of flow	No history of Flooding in the area	Local	Low	Low	Medium	Negligible	Insignificant

Reference Source(s):	Environmental Statement undertaken by Acer in 1995, Scoping study undertaken by Smeedon Foreman in 2003; Environment Agency Data; PSSR undertaken by PFC; Multi Agency Geographic Information System
Summary Assessment Score:	**NEUTRAL**
Qualitative Comments:	The Humber Estuary and River Hull are outside the proposed improvement corridor so will have minimal impacts. The site is not situated within a Groundwater Source Protection Zone, Nitrate Vulnerable Zone or Nitrate Sensitive Area.

A63 CASTLE STREET IMPROVMENTS, HULL
Worksheet for Environment: Water Environment

Overground Full Viaduct Option

Description of study area	Feature	Attributes/ Services	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
A63 Castle Street **Potential Impacts:**	**Humber Estuary**	Water supply	Saline water linked to the River Humber No surface water abstractions within 1km of the proposed scheme. - Estuary has a CEWP grade of A. - Unlikely that the scheme would result in a change to this grade given the volume of water within the estuary.	Local	Medium	Low	Medium	Negligible	Insignificant
		Transport and dilution of waste products	Contribution of surface water discharges to the total river flow is minimal. No known trade discharges	Local	Low	Low	Medium	Negligible	Insignificant
		Biodiversity	- Estuary has a CEWP grade of A. - It is unlikely that the scheme would result in a change to this grade given the volume of water within the estuary. No Fisheries are present within the vicinity of the proposed scheme. This stretch of the Humber has been designated as: - Ramsar Site - Site of Special Scientific Interest (SSSI) - Site of Special Scientific Interest Units - Special Area of Conservation (SAC), - Special Protection Area (SPA)	National	Very High	Low	High	Negligible	Insignificant
		Aesthetics	Predominant landscape feature. No landscape assessment data currently available.	Local	Medium	Low	Medium	Negligible	Insignificant
		Cultural Heritage	Scheduled Ancient Monument and listed buildings are situated with 1km of the proposed scheme. These are not associated with the estuary and are unlikely to be impacted by the proposed scheme.	n/a	n/a	n/a	n/a	n/a	n/a
		Recreation	The proposed scheme is unlikely to impact upon access to the riverside/estuary.	Local	Low	Medium	Medium	Negligible	Insignificant
		Value to the economy	Humber docks are present along the estuary, adjacent to the proposed scheme. These are unlikely to be impacted by the proposed scheme.	Local	Low	Low	High	Negligible	Insignificant
A63 Castle Street **Potential Impacts:**	**Minor watercourse:** **Docks**	Water supply	Saline water linked to Humber estuary. No surface water abstractions within 1km of the proposed scheme.	Local	Low	High	Medium	Minor	Insignificant

Description of study area	Feature	Attributes/ Services	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
	(Marina)	Transport of waste products	Proposed surface water outfalls are to discharge into the docks. Contribution of surface water discharges to the total river flow is minimal.	Local	Low	Medium	Medium	Minor	Insignificant
		Biodiversity	- Estuary has a CEWP grade of A. - It is unlikely that the scheme would result in a change to this grade given the volume of water within the estuary. No Fisheries are present within the vicinity of the proposed scheme. These Docks are within the following designated areas: - Ramsar Site - Site of Special Scientific Interest (SSSI) - Site of Special Scientific Interest Units - Special Area of Conservation (SAC), - Special Protection Area (SPA)	National	Very High	Low	High	Negligible	Insignificant
		Aesthetics	Marina part of a tourist action area. No Landscape assessment data is currently available.	Local	Medium	Low	Medium	Minor	Insignificant
		Cultural Heritage	A number of listed buildings are associated with the dock / marina area, however these are unlikely to be impacted by the proposed scheme.	n/a	n/a	n/a	n/a	n/a	n/a
		Recreation	Currently used as a marina for mooring small pleasure craft.	Local / Regional	Medium	Low	Medium	Minor	Insignificant
		Value to economy	Dock has light industrial uses.	Local	Medium	Low	Medium	Minor	Insignificant
		Conveyance of flow	No history of Flooding in the area. Flood defences are present along the Humber Estuary.	Local	Low	Low	Medium	Negligible	Insignificant
A63 Castle Street Potential Impacts:	**River Hull**	Water supply	Unclassified tidal river which discharges into Humber Estuary. River has a GQA Chemistry Grade of F.	Local	Medium	Low	Medium	Negligible	Insignificant

Description of study area	Feature	Attributes/ Services	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
		Transport of waste products	2 no. known trade discharges.	Local	Medium	Low	Medium	Negligible	Insignificant
		Biodiversity	- GQA ungraded. - It is unlikely that the scheme would result in a change to this grade given the volume of water within the estuary. No Fisheries are present within the vicinity of the proposed scheme. The lower reached of the River Hull have been designated as: - Ramsar Site - Site of Special Scientific Interest (SSSI) - Special Area of Conservation (SAC), - Special Protection Area (SPA)	National	Low	High	Low	Negligible	Insignificant
		Aesthetics	Contribution to landscape and quality is unknown - Landscape assessment data not available	Local	Medium	Low	Low	Negligible	Insignificant
		Cultural Heritage	The River Hull delineates the Boundary of medieval Hull. Originally used for wharfage.	National / Regional	High	Low	High	Negligible	Insignificant
		Recreation	General water sports e.g. rowing	Local	Low	Medium	Medium	Negligible	Insignificant
		Value to economy	Large vessels navigate to and from the River Hull industrial area at high tide.	Local	Medium	Low	Medium	Negligible	Insignificant
		Conveyance of flow	No history of Flooding in the area	Local	Low	Low	Medium	Negligible	Insignificant

Reference Source(s):	Environmental Statement undertaken by Acer in 1995, Scoping study undertaken by Smeedon Foreman in 2003; Environment Agency Data; PSSR undertaken by PFC; Multi Agency Geographic Information System
Summary Assessment Score:	**NEUTRAL**
Qualitative Comments:	The Humber Estuary and River Hull are outside the proposed improvement corridor so will have minimal impacts. The site is not situated within a Groundwater Source Protection Zone, Nitrate Vulnerable Zone or Nitrate Sensitive Area.

PHYSICAL FITNESS

Worksheet 1 Environment: Physical Fitness

Activity Duration per day	**Change in Number of People**	
	Pedestrians	Cyclists
Less than 30 minutes	N/A	N/A
Greater than 30 minutes	N/A	N/A

Reference Source(s): WebTAG 3.3.12

A63 Castle Street Economic Impact Report W11189/VDT/T03

Summary assessment score: Slight Beneficial

Qualitative comments: With the removal of crossings 7 & 5 and the consolidation of crossing points 2 & 3 the majority of pedestrians and cyclists using these facilities would experience an increase in their levels of physical activity. Cyclists currently using the A63 to access Queen Street would have a longer journey due to the proposed stop start nature of crossing the Ferensway junction and the need to use the Market Place Footbridge though this would overall increase their physical activity. The proposed footbridge at the Princes Quay Shopping Centre would create greater exertion for its users due to the constrained nature of the crossing forcing users to use a series of steps or extended ramps. The Market Place footbridge would channel users to the west of the junction and thereby increase journey times and physical exertion.

Worksheet 1 **Environment: Physical Fitness**

Activity Duration per day	**Change in Number of People**	
	Pedestrians	Cyclists
Less than 30 minutes	N/A	N/A
Greater than 30 minutes	N/A	N/A

Reference Source(s): WebTAG 3.3.12

A63 Castle Street Economic Impact Report W11189/VDT/T03

Summary assessment score: Beneficial

Qualitative comments: With the removal of crossings 7 & 5 and the consolidation of crossing points 2 & 3, the majority of pedestrians and cyclists currently using these facilities would experience an increase in their level of physical activity.

Cyclists already benefit from having an off-road cycle path between Porter St & Ferensway. This would continue unhindered regardless of which scheme is implemented. Cyclists wanting to access Queen St in particular would experience a greatly sustained exertion in order to reach their destination; so much so that it may be a disincentive to cycling numbers. Cyclists accessing the Market Place would have an alternative route via Ferensway hence would experience a small increase in journey time. The improved crossing facility, landbridge, at Princes Quay Shopping centre would accommodate a small percentage increase of the pedestrians, from the defunct crossing 5. Without origin / destination data it is difficult to apportion directional change in footfall.

As highlighted in recent media reports, climbing stairs is very beneficial nature to health. As all options proposed involve climbing and descending stairs this could be seen as a positive action.

Worksheet 1 **Environment: Physical Fitness**

Activity Duration per day	Change in Number of People	
	Pedestrians	Cyclists
Less than 30 minutes	N/A	N/A
Greater than 30 minutes	N/A	N/A

Reference Source(s): WebTAG 3.3.12
A63 Castle Street Economic Impact Report W11189/VDT/T03

Summary assessment score: Slight Beneficial

Qualitative comments: With the removal of crossings 7 & 5 and consolidation of crossings 2 & 3 there would be an increase in physical activity for pedestrians and cyclists; particularly at the western end of the scheme for those accessing Commercial Rd. The reallocation of road space around the Princes Quay Shopping Centre to widened pavements would, at best, keep a status quo on the level of physical activity due to unrestrained movement along the old A63. This may be boosted through provision of a more convivial NMU environment in which to travel and, over time, could offer beneficial effects. The Market Place junction would lead to a sharp increase in physical activity due to all NMU's being diverted around the western side of the junction.

Worksheet 1 **Environment: Physical Fitness**

Activity Duration per day	**Change in Number of People**	
	Pedestrians	Cyclists
Less than 30 minutes	N/A	N/A
Greater than 30 minutes	N/A	N/A

Reference Source(s): WebTAG 3.3.12

A63 Castle Street Economic Impact Report W11189/VDT/T03

Summary assessment score: Beneficial

Qualitative comments: The footbridge at the Porter Street junction would increase physical exertion as the direct routes previously available become consolidated. The removal of informal crossing would necessitate users travelling a substantially further distance to reach their destinations. The junction alterations at Ferensway would decrease physical activity due to the more direct nature of the desire line with journey times marginally affected. The Princes Quay shopping centre and Market Place crossings would increase physical exertion, both are consolidations of previous crossing points, but neither follow the original desire lines. Use of the proposed facilities would increase the exertion of all users however this may be offset by less people choosing to use them due to these increased levels of exertion.

Worksheet 1 **Environment: Physical Fitness**

Activity Duration per day	**Change in Number of People**	
	Pedestrians	Cyclists
Less than 30 minutes	N/A	N/A
Greater than 30 minutes	N/A	N/A

Reference Source(s): WebTAG 3.3.12

A63 Castle Street Economic Impact Report W11189/VDT/T03

Summary assessment score: Slight Beneficial

Qualitative comments: The Porter Street footbridge will increase physical fitness as it is a physically longer route than the crossing points it replaces and involves negotiating series of stairs or extended ramps. Accessing Commercial Road will require greater exertion for users coming from the west of the junction but this exertion shall be of a stop start nature as they contend with the multiple crossings to go underneath the A63 Castle Street. For those traversing the junction from the north the exertion shall be reduced due to the more direct nature of the NMU facilities though journey times will largely remain the same. The Landbridge (Subway) at the shopping centre shall provide a focused means to circumvent the A63 and will lead to increased physical exertion due to it replacing 2 crossing points. It shall also be an attractive route for those who take advantage of the redevelopment of the waterfront. The footbridge at Market Place will increase levels of physical fitness due to its location off the desire line and its height over the reconfigured A63.

Many of the trips are of a stop-start nature and are consequently of a lesser value due to the actual time value of the journey spent stationary being a significant proportion of the total journey time. The Landbridge replaces 2 crossing points but is located at a trip generator so total distance of travel, exertion and journey time will be relatively close to current levels. Overall exertion levels will increase slightly but will have a minimal impact on the attractiveness of making extended journeys by larger volumes of people.

Worksheet 1 **Environment: Physical Fitness**

Activity Duration per day	**Change in Number of People**	
	Pedestrians	Cyclists
Less than 30 minutes	N/A	N/A
Greater than 30 minutes	N/A	N/A

Reference Source(s): WebTAG 3.3.12

A63 Castle Street Economic Impact Report W11189/VDT/T03

Summary assessment score: Slight Disbenefit

Qualitative comments: The footbridge at Porter Street would increase physical fitness, in comparison to the two previous at grade crossings, due to the need to climb stairs or use access ramps. However, removal of the A63 at street level would decrease the levels of physical exertion given that a myriad of uncontrolled crossing options along the local access road beneath the A63 would be possible. The consolidation of two crossing points at Ferensway would provide a more direct access to the dockside with a similar crossing time span to the current facilities. Between Ferensway and the Market Place, with the reduced traffic flows, NMU's would have the option of crossing the local access road at almost any point. At Market Place junction itself the north-south route would be more direct but with increased exertion as there would be no need to wait for crossing signals over multiple roads.

JOURNEY AMBIENCE

Worksheet 1 Environment: Journey Ambience

Factor	Sub-factor	Better	Neutral	Worse
Traveller Care	Cleanliness		✓	
	Facilities		✓	
	Information	✓		
	Environment			✓
Travellers' Views	-			✓
Traveller Stress	Frustration	✓		
	Fear of potential accidents	✓		
	Route uncertainty	✓		

Reference Source(s): Environmental Assessment report (Option Identification Stage), Economic Assessment Report, WEBTAG unit 3.3.13 The Journey Ambience Sub-Objective

Summary assessment score: Large Beneficial

Qualitative comments: New signage will be provided at Mytongate junction. There are no services / facilities within road to be affected by the scheme. Existing trees and habitats would be lost within the footprint of the scheme including vegetation from Mytongate roundabout and Trinity Burial ground.

Travellers on A63 would experience worse views as the road descends into cutting to the west of Mytongate junction restricting views out from this gateway to the city centre. The road ascends out of cutting, east of Mytongate junction, between Humber and Prince's Docks returning views to those currently found. Three pedestrian footbridges at Porter Street, Prince's Quay and Market Place would be highly prominent restricting immediate views in these areas.

Improvements scheme will lead to reduced congestion and delay and improved journey times thus reducing driver stress. The removal of at grade pedestrian crossings will reduce conflict between vehicles and pedestrians. Grade separated junction will reduce congestion and enable traffic to flow more freely. The provision of the grade separated junction and new pedestrian footbridges will reduce fear of accidents. The grade separated junction at Mytongate and improved road markings and signage will reduce uncertainty.

Worksheet 1 Environment: Journey Ambience

Factor	Sub-factor	Better	Neutral	Worse
Traveller Care	Cleanliness		✓	
	Facilities		✓	
	Information	✓		
	Environment			✓
Travellers' Views	-			✓
Traveller Stress	Frustration	✓		
	Fear of potential accidents	✓		
	Route uncertainty	✓		

Reference Source(s): Environmental Assessment report (Option Identification Stage), Economic Assessment Report, WEBTAG unit 3.3.13 The Journey Ambience Sub-Objective

Summary assessment score: Large Beneficial

Qualitative comments: New signs to be provided at Mytongate Junction. There are no services / facilities within road to be affected by the scheme. Existing trees and habitats would be lost within the footprint of the scheme including vegetation from Mytongate roundabout and Trinity Burial Ground.

Travellers on A63 would experience worse views as the road descends into cutting to the west of Mytongate junction before ascending to current ground levels at Prince's Dock Street. As the road would be in cutting in the central area views would not be possible over Humber and Prince's Dock and the surrounding areas. Two pedestrian footbridges at Porter Street and Market Place would be highly prominent restricting immediate views in these areas.

Improvements scheme will lead to reduced congestion and delay and improved journey times thus reducing driver stress. The removal of at grade pedestrian crossings will reduce conflict between vehicles and pedestrians. The grade separated junction will reduce congestion and enable traffic to flow more freely. The provision of the grade separated junction and new pedestrian footbridges will reduce fear of accidents. The grade separated junction at Mytongate and improved road markings and signage will reduce uncertainty.

Worksheet 1 Environment: Journey Ambience

Factor	Sub-factor	Better	Neutral	Worse
Traveller Care	Cleanliness		✓	
	Facilities		✓	
	Information	✓		
	Environment			✓
Travellers' Views	-			✓
Traveller Stress	Frustration	✓		
	Fear of potential accidents	✓		
	Route uncertainty	✓		

Reference Source(s): Environmental Assessment report (Option Identification Stage), Economic Assessment Report, WEBTAG unit 3.3.13 The Journey Ambience Sub-Objective

Summary assessment score: Large Beneficial

Qualitative comments: New signs to be provided at Mytongate Junction. There are no services / facilities within the road to be affected by the scheme. Existing trees and habitats would be lost within the footprint of the scheme including vegetation from Mytongate roundabout and Trinity Burial ground.

Road users travelling on the LAR above would experience views similar to the current situation. Travellers on the A63 would experience a significantly worse view than currently experienced. Users would descend into cutting to the west of Mytongate junction before entering a tunnel section east of the junction then emerging out of tunnel and cutting at Market Place to travel up Myton Bridge. Attractive views of the docks and 'Old Town' area would be lost to A63 travellers. Pedestrian footbridge at Porter Street would be prominent at the western end of the scheme.

Grade separated junction and separation of A63/LAR traffic will reduce congestion and enable traffic to flow more freely, improving journey times and reducing driver stress, the reduction will be offset slightly by increased driver stress due to restricted view in underground sections. The provision of the grade separated junction, dedicated mainline A63 in tunnel, new pedestrian footbridges and improved road markings and signage will reduce fear of accidents and uncertainty. The scheme will reduce conflict between vehicles and pedestrians.

Worksheet 1 Environment: Journey Ambience

Factor	**Sub-factor**	**Better**	**Neutral**	**Worse**
Traveller Care	Cleanliness		✓	
	Facilities		✓	
	Information	✓		
	Environment			✓
Travellers' Views	-	✓		
Traveller Stress	Frustration	✓		
	Fear of potential accidents	✓		
	Route uncertainty	✓		

Reference Source(s): Environmental Assessment report (Option Identification Stage), Economic Assessment Report, WEBTAG unit 3.3.13 The Journey Ambience Sub-Objective

Summary assessment score: Large Beneficial

Qualitative comments: New signs to be provided at Mytongate Junction. There are no services / facilities within the road to be affected by the scheme. Existing trees and habitats would be lost within the footprint of the scheme including vegetation from Mytongate roundabout and Trinity Burial ground.

Travellers on the A63 would experience improved views over the city centre as the road rises up over Mytongate junction. This elevated section would provide extensive views towards the city centre to the north east and the dock areas to the east. Three pedestrian footbridges at Porter Street, Prince's Quay and Market Place would be highly prominent and restrict immediate views in these areas.

Grade separated junction will reduce congestion and enable traffic to flow more freely resulting in improved journey times thus reducing driver stress. The provision of the grade separated junction and new pedestrian footbridges will reduce fear of accidents. The grade separated junction at Mytongate and improved road markings and signage will reduce uncertainty.

Worksheet 1 Environment: Journey Ambience

Factor	Sub-factor	Better	Neutral	Worse
Traveller Care	Cleanliness		✓	
	Facilities		✓	
	Information	✓		
	Environment			✓
Travellers' Views	-	✓		
Traveller Stress	Frustration	✓		
	Fear of potential accidents	✓		
	Route uncertainty	✓		

Reference Source(s): Environmental Assessment report (Option Identification Stage), Economic Assessment Report, WEBTAG unit 3.3.13 The Journey Ambience Sub-Objective

Summary assessment score: Large Beneficial

Qualitative comments: New signs to be provided at Mytongate Junction. There are no services / facilities within the road to be affected by the scheme. Existing trees and habitats would be lost within the footprint of the scheme including vegetation from Mytongate roundabout and Trinity Burial ground

Travellers on the A63 would experience improved and extensive views over the city centre from the section of A63 on extended viaduct, rising from the west of Mytongate junction before descending between Humber and Prince's Docks. The road would provide clear views over the central dock areas; particularly when travelling in an easterly direction. Road users would also have views north over the future 'Quay West' development site. Two pedestrian footbridges at Porter Street and Market Place would be highly prominent restricting immediate views in these areas.

Grade separated junction and viaduct will reduce congestion delay and improved journey times thus reducing driver stress. This and the removal of at grade pedestrian crossings will enable traffic to flow more freely. The provision of the grade separated junction and new pedestrian footbridges will reduce conflict between vehicles and pedestrians and thus fear of accidents. The grade separated junction at Mytongate and improved road markings and signage will reduce uncertainty.

Worksheet 1 Environment: Journey Ambience

Factor	Sub-factor	Better	Neutral	Worse
Traveller Care	Cleanliness		✓	
	Facilities		✓	
	Information	✓		
	Environment			✓
Travellers' Views	-	✓		
Traveller Stress	Frustration	✓		
	Fear of potential accidents	✓		
	Route uncertainty	✓		

Reference Source(s): Environmental Assessment report (Option Identification Stage Economic Assessment Report, WEBTAG unit 3.3.13 The Journey Ambience Sub-Objective

Summary assessment score: Large Beneficial

Qualitative comments: New signs to be provided at Mytongate Junction. There are no services / facilities within the road to be affected by the scheme. Existing trees and habitats would be lost within the footprint of the scheme including vegetation from Mytongate roundabout and Trinity Burial ground.

Travellers on the A63 would experience extensive views over the city centre as the road rises to the west of Mytongate junction, continuing along an elevated viaduct to Market Place and Myton Bridge. Long range views would be possible south over Humber Dock and beyond to the Humber Estuary. There would also be extensive views north into the 'Old Town' area and over the Fruit Market development area to the south. Road users travelling on the LAR above would experience worse views due to the presence of the overhead viaduct.

Grade separated junction and long viaduct will reduce congestion and enable traffic to flow more freely. The provision of the grade separated junction, separation of A63/LAR traffic and new pedestrian footbridges will reduce fear of accidents. The grade separated junction at Mytongate, dedicated mainline and improved road markings and signage will reduce uncertainty.

ACCIDENTS

A63 Castle Street

UNDERGROUND BASE SCHEME

Worksheet 7.1b for Safety: Accidents (based on GNATA Worksheet 7.1)

Year of Assessment (Opening Year 2018)

	Casualties			**Number of Personal Injury Accidents**	**Benefits (£M) in 2002 prices, discounted using a 3.5% discount rate.**
	Fatal	**Serious**	**Slight**		
Accident Impact of Proposal over 60 year assessment period (a)	0.8	10.0	115.4	91.9	4.376
Accident impact during construction (b)	0.01	-0.05	-0.13	-0.04	-0.09
Accident impact during maintenance (c)	0.01	0.32	5.04	3.48	0.22
Total accident impact (d=a+b+c)	**0.82**	**10.27**	**120.31**	**95.34**	**£4.506m**
For Quantitative column:					
For Summary Assessment Column					

A63 Castle Street

Landbridge Underground Option

Worksheet 7.1b for Safety: Accidents (based on GNATA Worksheet 7.1)

Year of Assessment (Opening Year 2018)

	Casualties			Number of Personal Injury Accidents	Benefits (£M) in 2002 prices, discounted using a 3.5% discount rate.
	Fatal	Serious	Slight		
Accident Impact of Proposal over 60 year assessment period (a)	1.0	13.9	163.6	129.1	6.107
Accident impact during construction (b)	-0.02	-0.39	-6.04	-4.57	-0.32
Accident impact during maintenance (c)	0.02	0.30	5.30	3.84	0.23
Total accident impact (d=a+b+c)	**1.0**	**13.81**	**162.86**	**128.37**	**£6.017m**
For Quantitative column:					
For Summary Assessment Column					

A63 Castle Street

Cut and Cover, Underground

Worksheet 7.1b for Safety: Accidents (based on GNATA Worksheet 7.1)

Year of Assessment (Opening Year 2020)

	Casualties			Number of Personal Injury Accidents	Benefits (£M) in 2002 prices, discounted using a 3.5% discount rate.
	Fatal	**Serious**	**Slight**		
Accident Impact of Proposal over 60 year assessment period (a)	1.0	13.0	150.2	117.8	5.469
Accident impact during construction (b)	-0.12	-1.39	-22.15	-20.65	-0.88
Accident impact during maintenance (c)	0.02	0.01	0.05	4.29	0.12
Total accident impact (d=a+b+c)	**0.9**	**11.62**	**128.1**	**101.44**	**£4.709m**
For Quantitative column:					
For Summary Assessment Column					

A63 Castle Street

OVERGROUND BASE SCHEME

Worksheet 7.1b for Safety: Accidents (based on GNATA Worksheet 7.1)

Year of Assessment (Opening Year 2017)

	Casualties			Number of Personal Injury Accidents	Benefits (£M) in 2002 prices, discounted using a 3.5% discount rate.
	Fatal	**Serious**	**Slight**		
Accident Impact of Proposal over 60 year assessment period (a)	0.8	10.1	118.6	94.2	4.554
Accident impact during construction (b)	0.0	-0.03	-0.28	-0.29	-0.10
Accident impact during maintenance (c)	0.01	0.32	5.04	3.65	0.22
Total accident impact (d=a+b+c)	**0.81**	**10.39**	**123.36**	**97.56**	**£4.674m**
For Quantitative column:					
For Summary Assessment Column					

A63 Castle Street

Landbridge Overground Option

Worksheet 7.1b for Safety: Accidents (based on GNATA Worksheet 7.1)

Year of Assessment (Opening Year 2017)

	Casualties			Number of Personal Injury Accidents	Benefits (£M) in 2002 prices, discounted using a 3.5% discount rate.
	Fatal	Serious	Slight		
Accident Impact of Proposal over 60 year assessment period (a)	1.1	14.0	166.1	130.9	6.295
Accident impact during construction (b)	-0.02	-0.22	-3.19	-2.41	-0.21
Accident impact during maintenance (c)	0.02	0.32	5.32	3.84	0.23
Total accident impact (d=a+b+c)	**1.1**	**14.1**	**168.2**	**132.3**	**£ 6.315m**
For Quantitative column:					
For Summary Assessment Column					

A63 Castle Street

Full Viaduct Scheme

Worksheet 7.1b for Safety: Accidents (based on GNATA Worksheet 7.1)

Year of Assessment (Opening Year 2018)

	Casualties			Number of Personal Injury Accidents	Benefits (£M) in 2002 prices, discounted using a 3.5% discount rate.
	Fatal	Serious	Slight		
Accident Impact of Proposal over 60 year assessment period (a)	0.8	10.3	110.8	88.4	4.354
Accident impact during construction (b)	0.01	-0.43	-6.32	-4.79	-0.34
Accident impact during maintenance (c)	0.01	-0.01	-0.25	-0.2	0.14
Total accident impact (d=a+b+c)	**0.82**	**9.86**	**104.23**	**83.41**	**£4.194m**
For Quantitative column:					
For Summary Assessment Column					

SECURITY

Worksheet 1: Assessment of Security Sub-objective

Security Indicator	Relative importance (High/Medium/Low)	Without strategy (Poor/Moderate/High)	With strategy (Poor/Moderate/High)
Formal surveillance	Low	Poor	Poor
Informal surveillance	Low	Moderate	Moderate
Landscaping	Medium	High	High
Lighting and visibility	Medium	Moderate	High
Emergency call	Low	Poor	Moderate
Pedestrians and cyclist Facilities	Medium	Poor	Moderate

Approximate numbers of users affected: Not assessed

Overall assessment of impact on Security sub-objective (slight/moderate/large positive/negative or neutral): Slight Positive

Reference Source(s): WEBTAG Unit 3.4.2

Qualitative comments: Improvements to A63 Castle Street will reduce the likelihood of vehicle travellers slowing down or stopping due to signals and/or congestion. Footbridges to be well designed and adequately lit.

Worksheet 1: Assessment of Security Sub-objective

Security Indicator	**Relative importance (High/Medium/Low)**	**Without strategy (Poor/Moderate/High)**	**With strategy (Poor/Moderate/High)**
Formal surveillance	Low	Poor	Poor
Informal surveillance	Low	Moderate	Moderate
Landscaping	Medium	High	High
Lighting and visibility	Medium	Moderate	High
Emergency call	Low	Poor	Moderate
Pedestrians and cyclist Facilities	Medium	Poor	Moderate

Approximate numbers of users affected: Not assessed

Overall assessment of impact on Security sub-objective (slight/moderate/large positive/negative or neutral): Slight Positive

Reference Source(s): WEBTAG Unit 3.4.2

Qualitative comments: Improvements to A63 Castle Street will reduce the likelihood of vehicle travellers slowing down or stopping due to signals and/or congestion. The proposed land bridge would be a well lit crossing with an reasonably open aspect.

Worksheet 1: Assessment of Security Sub-objective

Security Indicator	Relative importance (High/Medium/Low)	Without strategy (Poor/Moderate/High)	With strategy (Poor/Moderate/High)
Formal surveillance	Low	Poor	Moderate
Informal surveillance	Low	Moderate	Moderate
Landscaping	Medium	High	High
Lighting and visibility	Medium	Moderate	High
Emergency call	Low	Poor	Moderate
Pedestrians and cyclist Facilities	Medium	Poor	Moderate

Approximate numbers of users affected: Not assessed

Overall assessment of impact on Security sub-objective (slight/moderate/large positive/negative or neutral): Slight Positive

Reference Source(s): WEBTAG Unit 3.4.2

Qualitative comments: Improvements to A63 Castle Street will reduce the likelihood of vehicle travellers slowing down or stopping due to signals and/or congestion. The tunnel will incorporate lighting and CCTV. Footbridges at each end of the scheme would be well designed and adequately lit. Pedestrian crossing on the LAR would need to be placed in suitable locations to enable clear visibility.

Worksheet 1: Assessment of Security Sub-objective

Security Indicator	Relative importance (High/Medium/Low)	Without strategy (Poor/Moderate/High)	With strategy (Poor/Moderate/High)
Formal surveillance	Low	Poor	Poor
Informal surveillance	Low	Moderate	Moderate
Landscaping	Medium	High	High
Lighting and visibility	Medium	Moderate	High
Emergency call	Low	Poor	Moderate
Pedestrians and cyclist Facilities	Medium	Poor	Moderate

Approximate numbers of users affected: Not assessed

Overall assessment of impact on Security sub-objective (slight/moderate/large positive/negative or neutral): Slight Positive

Reference Source(s): WEBTAG Unit 3.4.2

Qualitative comments: Improvements to A63 Castle Street will reduce the likelihood of vehicle travellers slowing down or stopping due to signals and/or congestion. Footbridges to be well designed and adequately lit.

Worksheet 1: Assessment of Security Sub-objective

Security Indicator	Relative importance (High/Medium/Low)	Without strategy (Poor/Moderate/High)	With strategy (Poor/Moderate/High)
Formal surveillance	Low	Poor	Poor
Informal surveillance	Low	Moderate	Moderate
Landscaping	Medium	High	High
Lighting and visibility	Medium	Moderate	High
Emergency call	Low	Poor	Moderate
Pedestrians and cyclist Facilities	Medium	Poor	Poor

Approximate numbers of users affected: Not assessed

Overall assessment of impact on Security sub-objective (slight/moderate/large positive/negative or neutral): Neutral

Reference Source(s): WEBTAG Unit 3.4.2

Qualitative comments: Improvements to A63 Castle Street will reduce the likelihood of vehicle travellers slowing down or stopping due to signals and/or congestion. The landbridge will be shaded by the viaduct above and is set approximately 1m below ground level. The lack of direct views outwards may result in the crossing being perceived as a wide underpass with low headroom. Amenity of the underpass will be dependant on what the space is used for and how well it is maintained.

Worksheet 1: Assessment of Security Sub-objective

Security Indicator	Relative importance (High/Medium/Low)	Without strategy (Poor/Moderate/High)	With strategy (Poor/Moderate/High)
Formal surveillance	Low	Poor	Poor
Informal surveillance	Low	Moderate	Moderate
Landscaping	Medium	High	High
Lighting and visibility	Medium	Moderate	High
Emergency call	Low	Poor	Moderate
Pedestrians and cyclist Facilities	Medium	Poor	Moderate

Approximate numbers of users affected: Not assessed

Overall assessment of impact on Security sub-objective (slight/moderate/large positive/negative or neutral): Slight Positive

Reference Source(s): WEBTAG Unit 3.4.2

Qualitative comments: Improvements to A63 Castle Street will reduce the likelihood of vehicle travellers slowing down or stopping due to signals and/or congestion. Footbridges at each end of the scheme would be well designed and adequately lit. Pedestrian crossing on the LAR would need to be placed in suitable locations to enable clear visibility. Pedestrian routes will be overshadowed by the viaduct above.

PUBLIC ACCOUNTS

Table 3 Public Accounts for the Appraisal of Major Highway Schemes

	ROAD INFRASTRUCTURE TOTAL
Local Government Funding	
Operating Costs	-
Investment Costs	-
Developer and Other Contributions	-
NET IMPACT	-
Central Government Funding	
Operating costs	-
Investment Costs	65,984
Developer and Other Contributions	-
Indirect Tax Revenues	1,963
NET IMPACT	67,947
Present Value of Costs (PVC)	67,947

Costs in £1000's

Underground Base P50

Table 3 Public Accounts for the Appraisal of Major Highway Schemes

	ROAD INFRASTRUCTURE TOTAL
Local Government Funding	
Operating Costs	-
Investment Costs	-
Developer and Other Contributions	-
NET IMPACT	-
Central Government Funding	
Operating costs	-
Investment Costs	76,706
Developer and Other Contributions	-
Indirect Tax Revenues	2,002
NET IMPACT	78,708
Present Value of Costs (PVC)	78,708

Costs in £1000's

Table 3 Public Accounts for the Appraisal of Major Highway Schemes

Local Government Funding	**ROAD INFRASTRUCTURE TOTAL**
Operating Costs	-
Investment Costs	-
Developer and Other Contributions	-
NET IMPACT	-
Central Government Funding	
Operating costs	-
Investment Costs	87,196
Developer and Other Contributions	-
Indirect Tax Revenues	2,002
NET IMPACT	89,198
Present Value of Costs (PVC)	89,198

Costs in £1000's

Table 3 Public Accounts for the Appraisal of Major Highway Schemes

Local Government Funding	**ROAD INFRASTRUCTURE TOTAL**
Operating Costs	-
Investment Costs	-
Developer and Other Contributions	-
NET IMPACT	-
Central Government Funding	
Operating costs	-
Investment Costs	135,630
Developer and Other Contributions	-
Indirect Tax Revenues	820
NET IMPACT	136,450
Present Value of Costs (PVC)	136,450

Costs in £1000's

Table 3 Public Accounts for the Appraisal of Major Highway Schemes

	ROAD INFRASTRUCTURE TOTAL
Local Government Funding	
Operating Costs	-
Investment Costs	-
Developer and Other Contributions	-
NET IMPACT	-
Central Government Funding	
Operating costs	-
Investment Costs	153,269
Developer and Other Contributions	-
Indirect Tax Revenues	820
NET IMPACT	154,089
Present Value of Costs (PVC)	154,089

Costs in £1000's

Table 3 Public Accounts for the Appraisal of Major Highway Schemes

	ROAD INFRASTRUCTURE TOTAL
Local Government Funding	
Operating Costs	-
Investment Costs	-
Developer and Other Contributions	-
NET IMPACT	-
Central Government Funding	
Operating costs	-
Investment Costs	170,914
Developer and Other Contributions	-
Indirect Tax Revenues	820
NET IMPACT	171,734
Present Value of Costs (PVC)	171,734

Costs in £1000's

Table 3 Public Accounts for the Appraisal of Major Highway Schemes

Local Government Funding	**ROAD INFRASTRUCTURE TOTAL**
Operating Costs	-
Investment Costs	-
Developer and Other Contributions	-
NET IMPACT	-
Central Government Funding	
Operating costs	-
Investment Costs	155,639
Developer and Other Contributions	-
Indirect Tax Revenues	1,254
NET IMPACT	156,893
Present Value of Costs (PVC)	156,893

Costs in £1000's

Table 3 Public Accounts for the Appraisal of Major Highway Schemes

	ROAD INFRASTRUCTURE TOTAL
Local Government Funding	
Operating Costs	-
Investment Costs	-
Developer and Other Contributions	-
NET IMPACT	-
Central Government Funding	
Operating costs	-
Investment Costs	181,813
Developer and Other Contributions	-
Indirect Tax Revenues	1,254
NET IMPACT	183,067
Present Value of Costs (PVC)	183,067

Costs in £1000's

Table 3 Public Accounts for the Appraisal of Major Highway Schemes

	ROAD INFRASTRUCTURE TOTAL
Local Government Funding	
Operating Costs	-
Investment Costs	-
Developer and Other Contributions	-
NET IMPACT	-
Central Government Funding	
Operating costs	-
Investment Costs	208,066
Developer and Other Contributions	-
Indirect Tax Revenues	1,254
NET IMPACT	209,320
Present Value of Costs (PVC)	209,320

Costs in £1000's

Over Ground Base P10

Table 3 Public Accounts for the Appraisal of Major Highway Schemes

	ROAD INFRASTRUCTURE TOTAL
Local Government Funding	
Operating Costs	-
Investment Costs	-
Developer and Other Contributions	-
NET IMPACT	-
Central Government Funding	
Operating costs	-
Investment Costs	63,921
Developer and Other Contributions	-
Indirect Tax Revenues	1,587
NET IMPACT	65,508
Present Value of Costs (PVC)	65,508

Costs in £1000's

Over Ground Base P50

Table 3 Public Accounts for the Appraisal of Major Highway Schemes

Local Government Funding	**ROAD INFRASTRUCTURE TOTAL**
Operating Costs	-
Investment Costs	-
Developer and Other Contributions	-
NET IMPACT	-
Central Government Funding	
Operating costs	-
Investment Costs	71,143
Developer and Other Contributions	-
Indirect Tax Revenues	1,587
NET IMPACT	72,730
Present Value of Costs (PVC)	72,730

Costs in £1000's

Over Ground Base P90

Table 3 Public Accounts for the Appraisal of Major Highway Schemes

Local Government Funding	**ROAD INFRASTRUCTURE TOTAL**
Operating Costs	-
Investment Costs	-
Developer and Other Contributions	-
NET IMPACT	-
Central Government Funding	
Operating costs	-
Investment Costs	78,153
Developer and Other Contributions	-
Indirect Tax Revenues	1,587
NET IMPACT	79,740
Present Value of Costs (PVC)	79,740

Costs in £1000's

Table 3 Public Accounts for the Appraisal of Major Highway Schemes

Local Government Funding	**ROAD INFRASTRUCTURE TOTAL**
Operating Costs	-
Investment Costs	-
Developer and Other Contributions	-
NET IMPACT	-
Central Government Funding	
Operating costs	-
Investment Costs	118,039
Developer and Other Contributions	-
Indirect Tax Revenues	694
NET IMPACT	118,733
Present Value of Costs (PVC)	118,733

Costs in £1000's

Table 3 Public Accounts for the Appraisal of Major Highway Schemes

Local Government Funding	**ROAD INFRASTRUCTURE TOTAL**
Operating Costs	-
Investment Costs	-
Developer and Other Contributions	-
NET IMPACT	-
Central Government Funding	
Operating costs	-
Investment Costs	133,705
Developer and Other Contributions	-
Indirect Tax Revenues	694
NET IMPACT	134,399
Present Value of Costs (PVC)	134,399

Costs in £1000's

Over Ground Landbridge P90

Table 3 Public Accounts for the Appraisal of Major Highway Schemes

	ROAD INFRASTRUCTURE TOTAL
Local Government Funding	
Operating Costs	-
Investment Costs	-
Developer and Other Contributions	-
NET IMPACT	-
Central Government Funding	
Operating costs	-
Investment Costs	149,361
Developer and Other Contributions	-
Indirect Tax Revenues	713
NET IMPACT	150,074
Present Value of Costs (PVC)	150,074

Costs in £1000's

Full Viaduct P10

Table 3 Public Accounts for the Appraisal of Major Highway Schemes

	ROAD INFRASTRUCTURE TOTAL
Local Government Funding	
Operating Costs	-
Investment Costs	-
Developer and Other Contributions	-
NET IMPACT	-
Central Government Funding	
Operating costs	-
Investment Costs	168,303
Developer and Other Contributions	-
Indirect Tax Revenues	1557
NET IMPACT	169,860
Present Value of Costs (PVC)	169,860

Costs in £1000's

Full Viaduct P50

Table 3 Public Accounts for the Appraisal of Major Highway Schemes

Local Government Funding	**ROAD INFRASTRUCTURE TOTAL**
Operating Costs	-
Investment Costs	-
Developer and Other Contributions	-
NET IMPACT	-
Central Government Funding	
Operating costs	-
Investment Costs	192,154
Developer and Other Contributions	-
Indirect Tax Revenues	1,557
NET IMPACT	193,711
Present Value of Costs (PVC)	193,711

Costs in £1000's

Table 3 Public Accounts for the Appraisal of Major Highway Schemes

Local Government Funding	ROAD INFRASTRUCTURE TOTAL
Operating Costs	-
Investment Costs	-
Developer and Other Contributions	-
NET IMPACT	-
Central Government Funding	
Operating costs	-
Investment Costs	216,017
Developer and Other Contributions	-
Indirect Tax Revenues	1,557
NET IMPACT	217,574
Present Value of Costs (PVC)	217,574

Costs in £1000's

TRANSPORT ECONOMIC EFFICIENCY

Underground Base P10

Table 2 Economic Efficiency of the Transport System (TEE) for the Appraisal of Major Highway Schemes

Consumer User Benefits				
User benefits	**TOTAL**	**CARS AND PRIVATE LGVS**	**GOOS VEHICLES AND BUSINESS LGVS**	**BUS AND COACH**
Travel time	82,701	82,701		
Vehicle operating costs	3,156	3,156		
Travel time and vehicle operating costs:				
During construction	-12,970	-12,745		-225
During maintenance				
NET CONSUMER BENEFITS	72,887	73,112		-225
Business				
User benefits				
Travel time	108,112	72,507	35,605	
Vehicle operating costs	3,944	2,017	1,927	
Travel time and vehicle operating costs:				
During construction	-5,788	-2,147	-3,567	-74
During maintenance				
Subtotal	106,268	72,377	3,3,965	-74
Private sector provider impacts				
Operating costs	-21			-21
Other business impacts				
Developer and other contributions				
NET BUSINESS IMPACT	106,247			
TOTAL				
Present Value of Transport Economic Efficiency Benefits	179,134			

Prices in £1000's

Underground Base P50

Table 2 Economic Efficiency of the Transport System (TEE) for the Appraisal of Major Highway Schemes

Consumer User Benefits				
User benefits	**TOTAL**	**CARS AND PRIVATE LGVS**	**GOOS VEHICLES AND BUSINESS LGVS**	**BUS AND COACH**
Travel time	82,701	82,701		
Vehicle operating costs	3,156	3,618		
Travel time and vehicle operating costs:				
During construction	-12,970	-12,745		-225
During maintenance				
NET CONSUMER BENEFITS	73,349	73,574		-225
Business				
User benefits				
Travel time	139,055	94,859	44,196	
Vehicle operating costs	3,865	2,093	1,772	
Travel time and vehicle operating costs:				
During construction	-5,788	-2,147	-3,567	-74
During maintenance				
Subtotal	106,189	72,453	33,810	-74
Private sector provider impacts				
Operating costs	-21			-21
Other business impacts				
Developer and other contributions				
NET BUSINESS IMPACT	106,168			
TOTAL				
Present Value of Transport Economic Efficiency Benefits	179,517			

Prices in £1000's

Underground Base P90

Table 2 Economic Efficiency of the Transport System (TEE) for the Appraisal of Major Highway Schemes

Consumer User Benefits				
User benefits	**TOTAL**	**CARS AND PRIVATE LGVS**	**GOOS VEHICLES AND BUSINESS LGVS**	**BUS AND COACH**
Travel time	82,701	82,701		
Vehicle operating costs	3,156	3,618		
Travel time and vehicle operating costs:				
During construction	-12,970	-12,745		-225
During maintenance				
NET CONSUMER BENEFITS	73,349	73,574		-225
Business				
User benefits				
Travel time	139,055	94,859	44,196	
Vehicle operating costs	3,865	2,093	1,772	
Travel time and vehicle operating costs:				
During construction	-5,788	-2,147	-3,567	-74
During maintenance				
Subtotal	106,189	72,453	33,810	-74
Private sector provider impacts				
Operating costs	-21			-21
Other business impacts				
Developer and other contributions				
NET BUSINESS IMPACT	106,168			
TOTAL				
Present Value of Transport Economic Efficiency Benefits	179,517			

Prices in £1000's

Table 2 Economic Efficiency of the Transport System (TEE) for the Appraisal of Major Highway Schemes

Consumer User Benefits				
User benefits	**TOTAL**	**CARS AND PRIVATE LGVS**	**GOOS VEHICLES AND BUSINESS LGVS**	**BUS AND COACH**
Travel time	59,618	59,168		
Vehicle operating costs	1,944	1,944		
Travel time and vehicle operating costs:				
During construction	-13,870	-13,761		-236
During maintenance				
NET CONSUMER BENEFITS	47,692	47,928		-236
Business				
User benefits				
Travel time	82,774	55,044	27,730	
Vehicle operating costs	2,387	1,455	932	
Travel time and vehicle operating costs:				
During construction	-6,420	-2,473	-3,870	-77
During maintenance				
Subtotal	78,741	54,026	24,792	-77
Private sector provider impacts				
Operating costs	-22			-22
Other business impacts				
Developer and other contributions				
NET BUSINESS IMPACT	78,719			
TOTAL				
Present Value of Transport Economic Efficiency Benefits	126,411			

Prices in £1000's

Table 2 Economic Efficiency of the Transport System (TEE) for the Appraisal of Major Highway Schemes

Consumer User Benefits				
User benefits	**TOTAL**	**CARS AND PRIVATE LGVS**	**GOOS VEHICLES AND BUSINESS LGVS**	**BUS AND COACH**
Travel time	59,618	59,168		
Vehicle operating costs	1,944	1,944		
Travel time and vehicle operating costs:				
During construction	-13,870	-13,761		-236
During maintenance				
NET CONSUMER BENEFITS	47,692	47,928		-236
Business				
User benefits				
Travel time	82,774	55,044	27,730	
Vehicle operating costs	2,387	1,455	932	
Travel time and vehicle operating costs:				
During construction	-6,420	-2,473	-3,870	-77
During maintenance				
Subtotal	78,741	54,026	24,792	-77
Private sector provider impacts				
Operating costs	-22			-22
Other business impacts				
Developer and other contributions				
NET BUSINESS IMPACT	78,719			
TOTAL				
Present Value of Transport Economic Efficiency Benefits	126,411			

Prices in £1000's

Table 2 Economic Efficiency of the Transport System (TEE) for the Appraisal of Major Highway Schemes

Consumer User Benefits				
User benefits	**TOTAL**	**CARS AND PRIVATE LGVS**	**GOOS VEHICLES AND BUSINESS LGVS**	**BUS AND COACH**
Travel time	59,618	59,168		
Vehicle operating costs	1,944	1,944		
Travel time and vehicle operating costs:				
During construction	-13,870	-13,761		-236
During maintenance				
NET CONSUMER BENEFITS	47,692	47,928		-236
Business				
User benefits				
Travel time	82,774	55,044	27,730	
Vehicle operating costs	2,387	1,455	932	
Travel time and vehicle operating costs:				
During construction	-6,420	-2,473	-3,870	-77
During maintenance				
Subtotal	78,741	54,026	24,792	-77
Private sector provider impacts				
Operating costs	-22			-22
Other business impacts				
Developer and other contributions				
NET BUSINESS IMPACT	78,719			
TOTAL				
Present Value of Transport Economic Efficiency Benefits	126,411			

Prices in £1000's

Cut and Cover P10

Table 2 Economic Efficiency of the Transport System (TEE) for the Appraisal of Major Highway Schemes

Consumer User Benefits				
User benefits	**TOTAL**	**CARS AND PRIVATE LGVS**	**GOOS VEHICLES AND BUSINESS LGVS**	**BUS AND COACH**
Travel time	90,726	90,726		
Vehicle operating costs	3,037	3,037		
Travel time and vehicle operating costs:				
During construction	-29,147	-28,441		-706
During maintenance				
NET CONSUMER BENEFITS	64,616	65,322		-706
Business				
User benefits				
Travel time	131,179	83,988	47,191	
Vehicle operating costs	4,620	2,291	2,329	
Travel time and vehicle operating costs:				
During construction	-33,942	-17,112	-16,564	-266
During maintenance				
Subtotal	131,045	89,148	42,163	-266
Private sector provider impacts				
Operating costs	-56			-56
Other business impacts				
Developer and other contributions				
NET BUSINESS IMPACT	101,857			
TOTAL				
Present Value of Transport Economic Efficiency Benefits	166,417			

Prices in £1000's

Cut and Cover P50

Table 2 Economic Efficiency of the Transport System (TEE) for the Appraisal of Major Highway Schemes

Consumer User Benefits				
User benefits	**TOTAL**	**CARS AND PRIVATE LGVS**	**GOOS VEHICLES AND BUSINESS LGVS**	**BUS AND COACH**
Travel time	90,726	90,726		
Vehicle operating costs	3,037	3,037		
Travel time and vehicle operating costs:				
During construction	-29,147	-28,441		-706
During maintenance				
NET CONSUMER BENEFITS	64,616	65,322		-706
Business				
User benefits				
Travel time	131,179	83,988	47,191	
Vehicle operating costs	4,620	2,291	2,329	
Travel time and vehicle operating costs:				
During construction	-33,942	-17,112	-16,564	-266
During maintenance				
Subtotal	131,045	89,148	42,163	-266
Private sector provider impacts				
Operating costs	-56			-56
Other business impacts				
Developer and other contributions				
NET BUSINESS IMPACT	101,857			
TOTAL				
Present Value of Transport Economic Efficiency Benefits	166,417			

Prices in £1000's

Cut and Cover P90

Table 2 Economic Efficiency of the Transport System (TEE) for the Appraisal of Major Highway Schemes

Consumer User Benefits				
User benefits	TOTAL	CARS AND PRIVATE LGVS	GOOS VEHICLES AND BUSINESS LGVS	BUS AND COACH
Travel time	90,726	90,726		
Vehicle operating costs	3,037	3,037		
Travel time and vehicle operating costs:				
During construction	-29,147	-28,441		-706
During maintenance				
NET CONSUMER BENEFITS	64,616	65,322		-706
Business				
User benefits				
Travel time	131,179	83,988	47,191	
Vehicle operating costs	4,620	2,291	2,329	
Travel time and vehicle operating costs:				
During construction	-33,942	-17,112	-16,564	-266
During maintenance				
Subtotal	131,045	89,148	42,163	-266
Private sector provider impacts				
Operating costs	-56			-56
Other business impacts				
Developer and other contributions				
NET BUSINESS IMPACT	101,857			
TOTAL				
Present Value of Transport Economic Efficiency Benefits	166,417			

Prices in £1000’s

Overground Base P10

Table 2 Economic Efficiency of the Transport System (TEE) for the Appraisal of Major Highway Schemes

Consumer User Benefits				
User benefits	**TOTAL**	**CARS AND PRIVATE LGVS**	**GOOS VEHICLES AND BUSINESS LGVS**	**BUS AND COACH**
Travel time	86,611	86,661		
Vehicle operating costs	2,898	,2898		
Travel time and vehicle operating costs:				
During construction	-13,039	-12,814		-225
During maintenance				
NET CONSUMER BENEFITS	76,470	76,695		-225
Business				
User benefits				
Travel time	112,696	79,652	35,044	
Vehicle operating costs	3,.506	2,107	1,399	
Travel time and vehicle operating costs:				
During construction	-5,846	-2,173	-3,599	-74
During maintenance				
Subtotal	110,356	77,586	432,844	-74
Private sector provider impacts				
Operating costs	-20			-20
Other business impacts				
Developer and other contributions				
NET BUSINESS IMPACT	110,356			
TOTAL				
Present Value of Transport Economic Efficiency Benefits	186,806			

Prices in £1000's

Overground Base P50

Table 2 Economic Efficiency of the Transport System (TEE) for the Appraisal of Major Highway Schemes

Consumer User Benefits				
User benefits	**TOTAL**	**CARS AND PRIVATE LGVS**	**GOOS VEHICLES AND BUSINESS LGVS**	**BUS AND COACH**
Travel time	86,611	86,661		
Vehicle operating costs	2,898	,2898		
Travel time and vehicle operating costs:				
During construction	-13,039	-12,814		-225
During maintenance				
NET CONSUMER BENEFITS	76,470	76,695		-225
Business				
User benefits				
Travel time	112,696	79,652	35,044	
Vehicle operating costs	3,.506	2,107	1,399	
Travel time and vehicle operating costs:				
During construction	-5,846	-2,173	-3,599	-74
During maintenance				
Subtotal	110,356	77,586	432,844	-74
Private sector provider impacts				
Operating costs	-20			-20
Other business impacts				
Developer and other contributions				
NET BUSINESS IMPACT	110,356			
TOTAL				
Present Value of Transport Economic Efficiency Benefits	186,806			

Prices in £1000's

Overground Base P90

Table 2 Economic Efficiency of the Transport System (TEE) for the Appraisal of Major Highway Schemes

Consumer User Benefits

User benefits	TOTAL	CARS AND PRIVATE LGVS	GOOS VEHICLES AND BUSINESS LGVS	BUS AND COACH
Travel time	86,611	86,661		
Vehicle operating costs	2,898	,2898		
Travel time and vehicle operating costs:				
During construction	-13,039	-12,814		-225
During maintenance				
NET CONSUMER BENEFITS	76,470	76,695		-225

Business

User benefits	TOTAL	CARS AND PRIVATE LGVS	GOOS VEHICLES AND BUSINESS LGVS	BUS AND COACH
Travel time	112,696	79,652	35,044	
Vehicle operating costs	3,.506	2,107	1,399	
Travel time and vehicle operating costs:				
During construction	-5,846	-2,173	-3,599	-74
During maintenance				
Subtotal	110,356	77,586	432,844	-74
Private sector provider impacts				
Operating costs	-20			-20
Other business impacts				
Developer and other contributions				
NET BUSINESS IMPACT	110,356			
TOTAL				
Present Value of Transport Economic Efficiency Benefits	186,806			

Prices in £1000's

Table 2 Economic Efficiency of the Transport System (TEE) for the Appraisal of Major Highway Schemes

Consumer User Benefits				
User benefits	TOTAL	CARS AND PRIVATE LGVS	GOOS VEHICLES AND BUSINESS LGVS	BUS AND COACH
Travel time	64,416	64,416		
Vehicle operating costs	1,899	1,899		
Travel time and vehicle operating costs:				
During construction	-14,006	-13,761		-245
During maintenance				
NET CONSUMER BENEFITS	52,309	52,554		-245
Business				
User benefits				
Travel time	87,415	60,632	27,783	
Vehicle operating costs	2,206	1,584	622	
Travel time and vehicle operating costs:				
During construction	-6,712	-2,602	-4,030	-80
During maintenance				
Subtotal	82,909	59,614	23,375	-80
Private sector provider impacts				
Operating costs	-23			-23
Other business impacts				
Developer and other contributions				
NET BUSINESS IMPACT	82,886			
TOTAL				
Present Value of Transport Economic Efficiency Benefits	135,195			

Prices in £1000's

Table 2 Economic Efficiency of the Transport System (TEE) for the Appraisal of Major Highway Schemes

Consumer User Benefits

User benefits	TOTAL	CARS AND PRIVATE LGVS	GOOS VEHICLES AND BUSINESS LGVS	BUS AND COACH
Travel time	64,416	64,416		
Vehicle operating costs	1,899	1,899		
Travel time and vehicle operating costs:				
During construction	-14,006	-13,761		-245
During maintenance				
NET CONSUMER BENEFITS	52,309	52,554		-245

Business

User benefits	TOTAL	CARS AND PRIVATE LGVS	GOOS VEHICLES AND BUSINESS LGVS	BUS AND COACH
Travel time	87,415	60,632	27,783	
Vehicle operating costs	2,206	1,584	622	
Travel time and vehicle operating costs:				
During construction	-6,712	-2,602	-4,030	-80
During maintenance				
Subtotal	82,909	59,614	23,375	-80
Private sector provider impacts				
Operating costs	-23			-23
Other business impacts				
Developer and other contributions				
NET BUSINESS IMPACT	82,886			
TOTAL				
Present Value of Transport Economic Efficiency Benefits	135,195			

Prices in £1000's

Table 2 Economic Efficiency of the Transport System (TEE) for the Appraisal of Major Highway Schemes

Consumer User Benefits				
User benefits	**TOTAL**	**CARS AND PRIVATE LGVS**	**GOOS VEHICLES AND BUSINESS LGVS**	**BUS AND COACH**
Travel time	64,416	64,416		
Vehicle operating costs	1,620	1,620		
Travel time and vehicle operating costs:				
During construction	-14,006	-13,761		-245
During maintenance				
NET CONSUMER BENEFITS	52,030	52,275		-245
Business				
User benefits				
Travel time	87,415	60,632	27,783	
Vehicle operating costs	2,377	1,533	842	
Travel time and vehicle operating costs:				
During construction	-6,712	-2,602	-4,030	-80
During maintenance				
Subtotal	83,080	59,565	23,595	-80
Private sector provider impacts				
Operating costs	-23			-23
Other business impacts				
Developer and other contributions				
NET BUSINESS IMPACT	83,057			
TOTAL				
Present Value of Transport Economic Efficiency Benefits	135,087			

Prices in £1000's

Full Viaduct P10

Table 2 Economic Efficiency of the Transport System (TEE) for the Appraisal of Major Highway Schemes

Consumer User Benefits				
User benefits	**TOTAL**	**CARS AND PRIVATE LGVS**	**GOOS VEHICLES AND BUSINESS LGVS**	**BUS AND COACH**
Travel time	86,286	86, 286		
Vehicle operating costs	3,532	3,532		
Travel time and vehicle operating costs:				
During construction	-27,732	-27,048		-684
During maintenance				
NET CONSUMER BENEFITS	60,086	62,770		-684
Business				
User benefits				
Travel time	116,553	73,325	43,228	
Vehicle operating costs	4,445	2,016	2,429	
Travel time and vehicle operating costs:				
During construction	-32,271	-16,156	-15,857	-258
During maintenance				
Subtotal	88,727	59,185	37,557	-258
Private sector provider impacts				
Operating costs	-54			-54
Other business impacts				
Developer and other contributions				
NET BUSINESS IMPACT	88673			
TOTAL				
Present Value of Transport Economic Efficiency Benefits	150,759			

Prices in £1000's

Full Viaduct P50

Table 2 Economic Efficiency of the Transport System (TEE) for the Appraisal of Major Highway Schemes

Consumer User Benefits				
User benefits	**TOTAL**	**CARS AND PRIVATE LGVS**	**GOOS VEHICLES AND BUSINESS LGVS**	**BUS AND COACH**
Travel time	86,286	86,286		
Vehicle operating costs	3,532	3,532		
Travel time and vehicle operating costs:				
During construction	-27,732	-27,048		-684
During maintenance				
NET CONSUMER BENEFITS	62,086	62,770		-684
Business				
User benefits				
Travel time	116,553	73,325	43,228	
Vehicle operating costs	4,445	2,016	2,429	
Travel time and vehicle operating costs:				
During construction	-32,271	-16,156	-15,857	-258
During maintenance				
Subtotal	88,727	59,185	29,800	-258
Private sector provider impacts				
Operating costs	-54			-54
Other business impacts				
Developer and other contributions				
NET BUSINESS IMPACT	88,673			
TOTAL				
Present Value of Transport Economic Efficiency Benefits	150,759			

Prices in £1000's

Full Viaduct P90

Table 2 Economic Efficiency of the Transport System (TEE) for the Appraisal of Major Highway Schemes

Consumer User Benefits				
User benefits	**TOTAL**	**CARS AND PRIVATE LGVS**	**GOOS VEHICLES AND BUSINESS LGVS**	**BUS AND COACH**
Travel time	86,286	86,286		
Vehicle operating costs	3,532	3,532		
Travel time and vehicle operating costs:				
During construction	-27,732	-27,048		-684
During maintenance				
NET CONSUMER BENEFITS	62,086	62,770		-684
Business				
User benefits				
Travel time	116,553	73,325	43,228	
Vehicle operating costs	4,445	2,016	2,429	
Travel time and vehicle operating costs:				
During construction	-32,271	-16,156	-15,857	-258
During maintenance				
Subtotal	88,727	59,185	29,800	-258
Private sector provider impacts				
Operating costs	-54			-54
Other business impacts				
Developer and other contributions				
NET BUSINESS IMPACT	88,673			
TOTAL				
Present Value of Transport Economic Efficiency Benefits	150,759			

Prices in £1000's

ANALYSIS OF MONITISED COST AND BENEFITS

Underground Base P10

Table 3

Analysis of Monetised Costs and Benefits

Noise	N/A	
Local Air Quality	N/A	
Greenhouse Gases	N/A	
Journey Ambience	N/A	
Accidents	4,506	
Consumer Users	72,887	
Business Users and Providers	106,247	
Reliability	N/A	
Option Values	N/A	
Present Value of Benefits (see notes) (PVB)	183,867	
Public Accounts		
Present Value of Costs (see notes) (PVC)	67,948	
OVERALL IMPACTS		
Net Present Value (NPV)	115,919	*NPV=PVB-PVC*
Benefit to Cost Ratio (BCR)	2.706	*BCR=PVB/PVC*

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Prices in £1000's

Note: Carbon Benefits have been included in the Present Value of Benefits.

Underground Base P50

Table 3

Analysis of Monetised Costs and Benefits

Noise	N/A	
Local Air Quality	N/A	
Greenhouse Gases	N/A	
Journey Ambience	N/A	
Accidents	4,506	
Consumer Users	73,349	
Business Users and Providers	106,189	
Reliability	N/A	
Option Values	N/A	
Present Value of Benefits (see notes) (PVB)	184,396	
Public Accounts		
Present Value of Costs (see notes) (PVC)	78,708	
OVERALL IMPACTS		
Net Present Value (NPV)	105,688	*NPV=PVB-PVC*
Benefit to Cost Ratio (BCR)	2.343	*BCR=PVB/PVC*

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Prices in £1000's

Note: Carbon Benefits have been included in the Present Value of Benefits.

Underground Base P90

Table 3

Analysis of Monetised Costs and Benefits

Noise	N/A	
Local Air Quality	N/A	
Greenhouse Gases	N/A	
Journey Ambience	N/A	
Accidents	4,506	
Consumer Users	73,349	
Business Users and Providers	106,189	
Reliability	N/A	
Option Values	N/A	
Present Value of Benefits (see notes) (PVB)	184,396	
Public Accounts		
Present Value of Costs (see notes) (PVC)	89,197	
OVERALL IMPACTS		
Net Present Value (NPV)	95,199	*NPV=PVB-PVC*
Benefit to Cost Ratio (BCR)	2.067	*BCR=PVB/PVC*

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Prices in £1000's

Note: Carbon Benefits have been included in the Present Value of Benefits.

Underground Landbridge P10

Table 3

Analysis of Monetised Costs and Benefits

Noise	N/A	
Local Air Quality	N/A	
Greenhouse Gases	N/A	
Journey Ambience	N/A	
Accidents	6,017	
Consumer Users	47,692	
Business Users and Providers	78,719	
Reliability	N/A	
Option Values	N/A	
Present Value of Benefits (see notes) (PVB)	132,539	
Public Accounts		
Present Value of Costs (see notes) (PVC)	136,449	
OVERALL IMPACTS		
Net Present Value (NPV)	-3,910	*NPV=PVB-PVC*
Benefit to Cost Ratio (BCR)	0.971	*BCR=PVB/PVC*

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Prices in £1000’s

Note: Carbon Benefits have been included in the Present Value of Benefits.

Underground Landbridge P50

Table 3

Analysis of Monetised Costs and Benefits

Noise	N/A	
Local Air Quality	N/A	
Greenhouse Gases	N/A	
Journey Ambience	N/A	
Accidents	6,017	
Consumer Users	47,692	
Business Users and Providers	78,719	
Reliability	N/A	
Option Values	N/A	
Present Value of Benefits (see notes) (PVB)	132,539	
Public Accounts		
Present Value of Costs (see notes) (PVC)	154,088	
OVERALL IMPACTS		
Net Present Value (NPV)	-21,549	*NPV=PVB-PVC*
Benefit to Cost Ratio (BCR)	0.860	*BCR=PVB/PVC*

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Prices in £1000's

Note: Carbon Benefits have been included in the Present Value of Benefits.

Underground Landbridge P90

Table 3

Analysis of Monetised Costs and Benefits

Noise	N/A	
Local Air Quality	N/A	
Greenhouse Gases	N/A	
Journey Ambience	N/A	
Accidents	6,017	
Consumer Users	47,702	
Business Users and Providers	78,719	
Reliability	N/A	
Option Values	N/A	
Present Value of Benefits (see notes) (PVB)	132,549	
Public Accounts		
Present Value of Costs (see notes) (PVC)	171,733	
OVERALL IMPACTS		
Net Present Value (NPV)	-39,184	*NPV=PVB-PVC*
Benefit to Cost Ratio (BCR)	0.772	*BCR=PVB/PVC*

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Prices in £1000's

Note: Carbon Benefits have been included in the Present Value of Benefits.

Cut and Cover Tunnel P10

Table 3

Analysis of Monetised Costs and Benefits

Noise	N/A	
Local Air Quality	N/A	
Greenhouse Gases	N/A	
Journey Ambience	N/A	
Accidents	4,709	
Consumer Users	64,616	
Business Users and Providers	101,801	
Reliability	N/A	
Option Values	N/A	
Present Value of Benefits (see notes) (PVB)	171,213	
Public Accounts		
Present Value of Costs (see notes) (PVC)	156,893	
OVERALL IMPACTS		
Net Present Value (NPV)	14,320	*NPV=PVB-PVC*
Benefit to Cost Ratio (BCR)	1.091	*BCR=PVB/PVC*

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Prices in £1000's

Note: Carbon Benefits have been included in the Present Value of Benefits.

Cut and Cover Tunnel P50

Table 3

Analysis of Monetised Costs and Benefits

Noise	N/A	
Local Air Quality	N/A	
Greenhouse Gases	N/A	
Journey Ambience	N/A	
Accidents	4,709	
Consumer Users	64,616	
Business Users and Providers	101,801	
Reliability	N/A	
Option Values	N/A	
Present Value of Benefits (see notes) (PVB)	171,213	
Public Accounts		
Present Value of Costs (see notes) (PVC)	183,067	
OVERALL IMPACTS		
Net Present Value (NPV)	-11,854	*NPV=PVB-PVC*
Benefit to Cost Ratio (BCR)	0.935	*BCR=PVB/PVC*

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Prices in £1000's

Note: Carbon Benefits have been included in the Present Value of Benefits.

Cut and Cover Tunnel P90

Table 3

Analysis of Monetised Costs and Benefits

Noise	N/A	
Local Air Quality	N/A	
Greenhouse Gases	N/A	
Journey Ambience	N/A	
Accidents	4,709	
Consumer Users	64,616	
Business Users and Providers	101,801	
Reliability	N/A	
Option Values	N/A	
Present Value of Benefits (see notes) (PVB)	171,213	
Public Accounts		
Present Value of Costs (see notes) (PVC)	209,320	
OVERALL IMPACTS		
Net Present Value (NPV)	-38,107	*NPV=PVB-PVC*
Benefit to Cost Ratio (BCR)	0.818	*BCR=PVB/PVC*

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Prices in £1000's

Note: Carbon Benefits have been included in the Present Value of Benefits.

Over Ground Base P10

Table 3

Analysis of Monetised Costs and Benefits

Noise	N/A	
Local Air Quality	N/A	
Greenhouse Gases	N/A	
Journey Ambience	N/A	
Accidents	4,674	
Consumer Users	76,470	
Business Users and Providers	110,336	
Reliability	N/A	
Option Values	N/A	
Present Value of Benefits (see notes) (PVB)	191,747	
Public Accounts		
Present Value of Costs (see notes) (PVC)	65,508	
OVERALL IMPACTS		
Net Present Value (NPV)	126,239	*NPV=PVB-PVC*
Benefit to Cost Ratio (BCR)	2.927	*BCR=PVB/PVC*

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Prices in £1000's

Note: Carbon Benefits have been included in the Present Value of Benefits.

Over Ground Base P50

Table 3

Analysis of Monetised Costs and Benefits

Noise	N/A	
Local Air Quality	N/A	
Greenhouse Gases	N/A	
Journey Ambience	N/A	
Accidents	4,674	
Consumer Users	76,470	
Business Users and Providers	110,356	
Reliability	N/A	
Option Values	N/A	
Present Value of Benefits (see notes) (PVB)	191,767	
Public Accounts		
Present Value of Costs (see notes) (PVC)	72,729	
OVERALL IMPACTS		
Net Present Value (NPV)	119,038	*NPV=PVB-PVC*
Benefit to Cost Ratio (BCR)	2.637	*BCR=PVB/PVC*

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Prices in £1000's

Note: Carbon Benefits have been included in the Present Value of Benefits.

Over Ground Base P90

Table 3

Analysis of Monetised Costs and Benefits

Noise	N/A	
Local Air Quality	N/A	
Greenhouse Gases	N/A	
Journey Ambience	N/A	
Accidents	4,674	
Consumer Users	76,470	
Business Users and Providers	110,356	
Reliability	N/A	
Option Values	N/A	
Present Value of Benefits (see notes) (PVB)	191,767	
Public Accounts		
Present Value of Costs (see notes) (PVC)	79,739	
OVERALL IMPACTS		
Net Present Value (NPV)	112,028	*NPV=PVB-PVC*
Benefit to Cost Ratio (BCR)	2.405	*BCR=PVB/PVC*

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Prices in £1000's

Note: Carbon Benefits have been included in the Present Value of Benefits.

Over Ground Landbridge P10

Table 3

Analysis of Monetised Costs and Benefits

Noise	N/A	
Local Air Quality	N/A	
Greenhouse Gases	N/A	
Journey Ambience	N/A	
Accidents	6,315	
Consumer Users	52,309	
Business Users and Providers	82,886	
Reliability	N/A	
Option Values	N/A	
Present Value of Benefits (see notes) (PVB)	141,596	
Public Accounts		
Present Value of Costs (see notes) (PVC)	118,733	
OVERALL IMPACTS		
Net Present Value (NPV)	22,863	*NPV=PVB-PVC*
Benefit to Cost Ratio (BCR)	1.193	*BCR=PVB/PVC*

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Prices in £1000's

Note: Carbon Benefits have been included in the Present Value of Benefits.

Over Ground Landbridge P50

Table 3

Analysis of Monetised Costs and Benefits

Noise	N/A	
Local Air Quality	N/A	
Greenhouse Gases	N/A	
Journey Ambience	N/A	
Accidents	6,315	
Consumer Users	52,309	
Business Users and Providers	82,886	
Reliability	N/A	
Option Values	N/A	
Present Value of Benefits (see notes) (PVB)	141,596	
Public Accounts		
Present Value of Costs (see notes) (PVC)	134,399	
OVERALL IMPACTS		
Net Present Value (NPV)	7,197	*NPV=PVB-PVC*
Benefit to Cost Ratio (BCR)	1.054	*BCR=PVB/PVC*

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Prices in £1000's

Note: Carbon Benefits have been included in the Present Value of Benefits.

Over Ground Landbridge P90

Table 3

Analysis of Monetised Costs and Benefits

Noise	N/A	
Local Air Quality	N/A	
Greenhouse Gases	N/A	
Journey Ambience	N/A	
Accidents	6,315	
Consumer Users	52,030	
Business Users and Providers	83,057	
Reliability	N/A	
Option Values	N/A	
Present Value of Benefits (see notes) (PVB)	141,440	
Public Accounts		
Present Value of Costs (see notes) (PVC)	150,075	
OVERALL IMPACTS		
Net Present Value (NPV)	-8,635	*NPV=PVB-PVC*
Benefit to Cost Ratio (BCR)	0.942	*BCR=PVB/PVC*

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Prices in £1000's

Note: Carbon Benefits have been included in the Present Value of Benefits.

Full Viaduct P10

Analysis of Monetised Costs and Benefits

Noise	N/A	
Local Air Quality	N/A	
Greenhouse Gases	N/A	
Journey Ambience	N/A	
Accidents	4,194	
Consumer Users	62,086	
Business Users and Providers	88,673	
Reliability	N/A	
Option Values	N/A	
Present Value of Benefits (see notes) (PVB)	154,862	
Public Accounts		
Present Value of Costs (see notes) (PVC)	169,861	
OVERALL IMPACTS		
Net Present Value (NPV)	-14,999	*NPV=PVB-PVC*
Benefit to Cost Ratio (BCR)	0.912	*BCR=PVB/PVC*

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Note: Carbon Benefits have been included in the Present Value of Benefits.

Full Viaduct P50

Analysis of Monetised Costs and Benefits

Noise	N/A
Local Air Quality	N/A
Greenhouse Gases	N/A
Journey Ambience	N/A
Accidents	4,194
Consumer Users	62,086
Business Users and Providers	88,673
Reliability	N/A
Option Values	N/A
Present Value of Benefits (see notes) (PVB)	154,861
Public Accounts	
Present Value of Costs (see notes) (PVC)	193,711
OVERALL IMPACTS	
Net Present Value (NPV)	-38,850	*NPV=PVB-PVC*
Benefit to Cost Ratio (BCR)	0.799	*BCR=PVB/PVC*

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Prices in £1000's

Note: Carbon Benefits have been included in the Present Value of Benefits.

Full Viaduct P90

Analysis of Monetised Costs and Benefits

Noise	N/A	
Local Air Quality	N/A	
Greenhouse Gases	N/A	
Journey Ambience	N/A	
Accidents	4,194	
Consumer Users	62,086	
Business Users and Providers	88,673	
Reliability	N/A	
Option Values	N/A	
Present Value of Benefits (see notes) (PVB)	154,862	
Public Accounts		
Present Value of Costs (see notes) (PVC)	217,575	
OVERALL IMPACTS		
Net Present Value (NPV)	-62,713	*NPV=PVB-PVC*
Benefit to Cost Ratio (BCR)	0.712	*BCR=PVB/PVC*

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Prices in £1000's

Note: Carbon Benefits have been included in the Present Value of Benefits.

RELIABILITY

Worksheet 1: Economy: Reliability

	Old Route (i)	**New Route (ii)**
Do minimum stress (a)	115%	not applicable
Do something stress (b)	107%	N/A
Difference in stress (c=a-b, restricting a and b to the range 75% - 125%)	8	0
Do something AADT flow (d)	87,387	0
Overall impacts (e=c*d)	699,096	0
	Overall assessment (e(i) +e(ii)):	699,096

Note: Where a new road route is provided, the Quantitative column should contain values a(i) and b(ii). Where no new road route is provided, use values a(i) and b(i).

Reference sources:____

Assessment scores: Slight Beneficial

Qualitative comments:____

____

Worksheet 1: Economy: Reliability

	Old Route (i)	**New Route (ii)**
Do minimum stress (a)	115%	not applicable
Do something stress (b)	106%	
Difference in stress (c=a-b, restricting a and b to the range 75% - 125%)	9	0
Do something AADT flow (d)	85,933	0
Overall impacts (e=c*d)	773,397	0
	Overall assessment (e(i) +e(ii)):	773,397

Note: Where a new road route is provided, the Quantitative column should contain values a(i) and b(ii). Where no new road route is provided, use values a(i) and b(i).

Reference sources:____

Assessment scores: Slight Beneficial

Qualitative comments:____

____

Worksheet 1: Economy: Reliability

	Old Route (i)	**New Route (ii)**
Do minimum stress (a)	117%	not applicable
Do something stress (b)	88%	80%
Difference in stress (c=a-b, restricting a and b to the range 75% - 125%)	29	0
Do something AADT flow (d)	24,895	0
Overall impacts (e=c*d)	721,955	0
	Overall assessment (e(i) +e(ii)):	721,955

Note: Where a new road route is provided, the Quantitative column should contain values a(i) and b(ii). Where no new road route is provided, use values a(i) and b(i).
Reference sources:____
Assessment scores: Slight Beneficial
Qualitative comments:____
____

Worksheet 1: Economy: Reliability

	Old Route (i)	New Route (ii)
Do minimum stress (a)	114%	not applicable
Do something stress (b)	106%	N/A
Difference in stress (c=a-b, restricting a and b to the range 75% - 125%)	6	0
Do something AADT flow (d)	86,690	0
Overall impacts (e=c*d)	520,140	0
	Overall assessment (e(i) +e(ii)):	520,140

Note: Where a new road route is provided, the Quantitative column should contain values a(i) and b(ii). Where no new road route is provided, use values a(i) and b(i).
Reference sources:____
Assessment scores: Slight Beneficial
Qualitative comments:____
____

Worksheet 1: Economy: Reliability

	Old Route (i)	**New Route (ii)**
Do minimum stress (a)	114%	not applicable
Do something stress (b)	105%	0
Difference in stress (c=a-b, restricting a and b to the range 75% - 125%)	9	0
Do something AADT flow (d)	85,933	0
Overall impacts (e=c*d)	773,397	0
	Overall assessment (e(i) +e(ii)):	773,397

Note: Where a new road route is provided, the Quantitative column should contain values a(i) and b(ii). Where no new road route is provided, use values a(i) and b(i).

Reference sources:____

Assessment scores: Slight Beneficial

Qualitative comments:____

____

Worksheet 1: Economy: Reliability

	Old Route (i)	**New Route (ii)**
Do minimum stress (a)	115%	not applicable
Do something stress (b)	82%	82%
Difference in stress (c=a-b, restricting a and b to the range 75% - 125%)	33	0
Do something AADT flow (d)	23,091	0
Overall impacts (e=c*d)	762,003	0
	Overall assessment (e(i) +e(ii)):	762,003

Note: Where a new road route is provided, the Quantitative column should contain values a(i) and b(ii). Where no new road route is provided, use values a(i) and b(i).

Reference sources:____

Assessment scores: Slight Beneficial

Qualitative comments:____

____

SEVERANCE

Worksheet 1: **Accessibility - Severance**

Change in Severance	Population Affected					
	Location a	**Location b**	**Location c**	**Location d**	**Location e**	**Total Affected**
Large negative						
Moderate negative						
Slight negative			Prince's Dock (West 798)[1] (East 892)[1]			Provision of one footbridge in place of 2no signalised crossing in place will result in the increased journey lengths/times and will create a need to climb. This is likely to create new severance.
Neutral	Porter Street Crossing (190)[1]			Market Place (442)[1]	High Street (915)[1]	Porter Street & Market Place – provision of footbridge in place of signalised crossing will increase journey times/length and will create a need to climb. The future level of severance is likely to be no worse than current; therefore no change in severance at this location. High Street – this crossing is not affected by the proposed schemes, but will provide a suitable alternative for pedestrians affected by changes at Market Place.
Slight positive		Mytongate Junction (West 1229)[1] (East 531)[1]				Removes conflict between pedestrians and vehicles on A63, as pedestrians will cross the A63 using footpaths on the new overbridge. Current uncontrolled crossing will be replaced with signalised crossings. Increases in journey times may occur for pedestrians whose trips crossing the A63 both originate and end either to the west or east sides of the junction.
Moderate positive						
Large positive						

Note 1: number of pedestrians recorded in 2004 survey between 0700 and 1900

Reference Source(s): Environmental Assessment Report (PF, 2008)

Assessment Score: Neutral

Qualitative comments: The key desire lines crossing the A63 occur at Prince's Dock and Mytongate junction. At Mytongate the provision of a dedicated pedestrian footpath on the bridge in place of controlled at grade crossings will result in a decrease in severance. This is slightly offset by an increase in journey lengths/time for pedestrians whose trips crossing the A63 both originate and ends either to the west or east sides of the junction. At Princes Dock the provision of a single footbridge will result in increase journey lengths and a need to climb, resulting in an increase in severance in this area. Overall on balance there will be no increase in severance for the option.

Worksheet 1: **Accessibility - Severance**

Change in Severance	Population Affected					
	Location a	**Location b**	**Location c**	**Location d**	**Location e**	**Total Affected**
Large negative						
Moderate negative						
Slight negative			Prince's Dock (West 798)[1] (East 892)[1]			Provision of landbridge in place of 2no signalised crossing will increase journey times/length and create a need to climb. This is likely to create new severance.
Neutral	Porter Street Crossing (190)[1]			Market Place (442)[1]	High Street (915)[1]	Porter Street/Market Place – provision of footbridge in place of signalised crossing will increase journey times/length and will create a need to climb. The future level of severance is likely to be no worse than current; therefore no change in severance at this location. High Street – this crossing is not affected by the proposed schemes, but will provide a suitable alternative for pedestrians affected by changes at Market Place.
Slight positive		Mytongate Junction (West 1229)[1] (East 531)[1]				Removes conflict between pedestrians and vehicles on A63, as pedestrians will cross the A63 using footpaths on the new overbridge. Current uncontrolled crossings will be replaced with signalised crossings. Increases in journey times may occur for pedestrians whose trips crossing the A63 both originate and end either to the west or east sides of the junction.
Moderate positive						
Large positive						

Note 1: number of pedestrians recorded in 2004 survey between 0700 and 1900

Reference Source(s): Environmental Assessment Report (PF, 2008)

Assessment Score: Neutral

Qualitative comments: The key desire lines crossing the A63 occur at Princes Dock and Mytongate Junction. At Mytongate the provision of dedicated pedestrian footbridge on the overbridge in place of the current controlled at grade crossings on the A63 will result in a decrease in severance. This will be offset slightly by an increase in journey lengths/times for pedestrians whose trips crossing the A63 both originate and end either to the west or east sides of the junction. At Princes Dock the provision of the landbridge in place of two at grade crossings will increase the journey lengths and create a need to climb, resulting in an increase in severance at this location. Overall on balance there will be no increase in severance for the option.

Worksheet 1: **Accessibility - Severance**

Change in Severance	Population Affected					
	Location a	Location b	Location c	Location d	Location e	Total Affected
Large negative						
Moderate negative						
Slight negative						
Neutral	Porter Street Crossing (190)[1]			Market Place (442)[1]	High Street (915)[1]	Porter Street/Market Place – provision of footbridge in place of signalised crossing will increase journey times/length and will create a need to climb. The future level of severance is likely to be no worse than current; therefore no change in severance at this location. High Street – this crossing is not affected by the proposed schemes, but will provide a suitable alternative for pedestrians affected by changes at Market Place.
Slight positive		Mytongate Junction (West 1229)[1] (East 531)[1]				Removes conflict between pedestrians and vehicles on A63, as pedestrians will cross the A63 using footpaths on the new overbridge. Current uncontrolled crossing will be replaced with signalised crossings. Increases in journey times may occur for pedestrians whose trips crossing the A63 both originate and end either to the west or east sides of the junction.
Moderate positive						
Large positive			Prince's Dock (West 798)[1] (East 892)[1]			Traffic on the A63 will be moved into a cut and cover tunnel with an at grade access road. Traffic flow on the access road will be reduced by 71% compared to the existing situation.

Note 1: number of pedestrians recorded in 2004 survey between 0700 and 1900

Reference Source(s): Environmental Assessment Report (PF, 2008)

Assessment Score: Large Beneficial

Qualitative comments: The key desire lines crossing the A63 occur at Princes Dock and Mytongate Junction. At Mytongate the provision of dedicated pedestrian footbridge on the overbridge in place of the current controlled at grade crossings on the A63 will result in a decrease in severance. This will be offset slightly by an increase in journey lengths/times for pedestrians whose trips crossing the A63 both originate and end either to the west or east sides of the junction. The reduction in traffic and removal of the A63 traffic into the tunnel together with wider footways will increase the amenity value of the Prince's dock areas and will reduce community severance in this location. Overall there will be a reduction in severance for the scheme.

Worksheet 1: **Accessibility - Severance**

Change in Severance	Population Affected					
	Location a	Location b	Location c	Location d	Location e	Total Affected
Large negative						
Moderate negative						
Slight negative			Prince's Dock (West 798)[1] (East 892)[1]			Provision of footbridge in place of 2no signalised crossing will increase journey times/length and will create a need to climb. This is likely to create new severance.
Neutral	Porter Street Crossing (190)[1]			Market Place (442)[1]	High Street (915)[1]	Porter St/Market Pl –provision of footbridge in place of signalised crossing will increase journey times/length and will create a need to climb. The future level of severance is likely to be no worse than current; therefore no change in severance at this location. High St – this crossing is not affected by the proposed schemes, but will provide a suitable alternative for pedestrians affected by changes at Market Place.
Slight positive						
Moderate positive		Mytongate Junction (West 1229)[1] (East 531)[1]				Removes conflict between pedestrians and vehicles on A63, as a footpath is present below the A63 overbridge. Current uncontrolled crossing will be replaced with signalised crossings. Headroom beneath viaduct provides opportunities for formal or informal footways beneath the viaduct. Journey times should be reduced.
Large positive						

Note 1: number of pedestrians recorded in 2004 survey between 0700 and 1900

Reference Source(s): Environmental Assessment Report (PF, 2008)

Assessment Score: Large Beneficial

Qualitative comments: The key desire lines crossing the A63 occur at Prince's Dock and Mytongate junction. At Mytongate the provision of a dedicated pedestrian footpath under the bridge in place of controlled at grade crossings will result in decreases journey times and a decrease in severance. At Princes Dock the provision of a single footbridge will result in increase journey lengths and a need to climb, resulting in an increase in severance in this area. Overall on balance there will be a slight reduction in severance for the option.

Worksheet 1: **Accessibility - Severance**

Change in Severance	Population Affected					
	Location a	**Location b**	**Location c**	**Location d**	**Location e**	**Total Affected**
Large negative						
Moderate negative						
Slight negative			Prince's Dock (West 798)[1] (East 892)[1]			Provision of 25m wide pedestrian crossing 1m bgl beneath the viaduct in place of 2no signalised crossings will increase journey times/length and will create a need to climb. This is likely to create new severance.
Neutral	Porter Street Crossing (190)[1]			Market Place (442)[1]	High Street (915)[1]	Porter St/Market Pl –provision of footbridge in place of signalised crossing will increase journey times/length and will create a need to climb. The future level of severance is likely to be no worse than current; therefore no change in severance at this location. High St – this crossing is not affected by the proposed schemes, but will provide a suitable alternative for pedestrians affected by changes at Market Place.
Slight positive						
Moderate positive		Mytongate Junction (West 1229)[1] (East 531)[1]				Removes conflict between pedestrians and vehicles on A63, as a footpath is present below the A63 overbridge. Current uncontrolled crossing will be replaced with signalised crossings. Headroom beneath viaduct provides opportunities for formal or informal footways beneath the viaduct. Journey times should be reduced.
Large positive						

Note 1: number of pedestrians recorded in 2004 survey between 0700 and 1900

Reference Source(s): Environmental Assessment Report (PF, 2008)

Assessment Score: Large Beneficial

Qualitative comments: The key desire lines crossing the A63 occur at Prince's Dock and Mytongate junction. At Mytongate the provision of a dedicated pedestrian footpath under the overbridge in place of controlled at grade crossings will result in decreases journey times and a decrease in severance. At Princes Dock the provision of a landbridge 1m bgl in place of two at grade crossings will result in increased journey lengths and a need to climb, resulting in a slight increase in severance in this area. Overall on balance there will be a slight reduction in severance for the option.

Worksheet 1: **Accessibility - Severance**

Change in Severance	Population Affected					
	Location a	Location b	Location c	Location d	Location e	Total Affected
Large negative						
Moderate negative						
Slight negative						
Neutral	Porter Street Crossing (190)[1]			Market Place (442)[1]	High Street (915)[1]	Porter Street - provision of footbridge in place of signalised crossing will increase journey times/length and will create a need to climb. The future level of severance is likely to be no worse than current; therefore no change in severance at this location. Market Place - footpath under the viaduct will reduce conflict with vehicles. No change in severance between existing and base scheme High St – this crossing is not affected by the proposed schemes, but will provide a suitable alternative for pedestrians affected by changes at Market Place.
Slight positive						
Moderate positive		Mytongate Junction (West 1229)[1] (East 531)[1]	Prince's Dock (West 798)[1] (East 892)[1]			MG -Removes conflict between pedestrians and vehicles on A63, as a footpath is present below the A63 overbridge. Current uncontrolled crossing will be replaced with signalised crossings. Headroom beneath viaduct provides opportunities for formal or informal footways beneath the viaduct. Journey times should be reduced. PD- Traffic on the A63 will be moved onto a viaduct with an at grade access road. Traffic flow on the access road will be reduced by 71% compared to the existing situation. Delays at new crossing points will be reduced
Large positive						

Note 1: number of pedestrians recorded in 2004 survey between 0700 and 1900

Reference Source(s): Environmental Assessment Report (PF, 2008)

Assessment Score: Large Beneficial

Qualitative comments: The key desire lines crossing the A63 occur at Prince's Dock and Mytongate junction. At Mytongate the provision of a dedicated pedestrian footpath beneath the viaduct in place of controlled at grade crossings will result in decreases journey times and a decrease in severance. The reduction in traffic and removal of the A63 traffic onto the viaduct will reduce community severance in this location.

LAND USE POLICY

Worksheet – Integration – Land Use Policy – Underground Base

Land Use Proposals **Assessment Score**
National ***Beneficial***
Regional ***Beneficial***
Local ***Beneficial***

National Transport Policies:

National Government	White Paper 'A New Deal for Transport: Better for Everyone'	Provision of an integrated transport system sustaining the economy and promoting accessibility.	Furthered
National Government	White Paper 'The Future of Transport'	Prepares for long term transport needs and provides opportunity for economic growth. Need to plan ahead to get best out of transport system.	Furthered
National Government	Eddington Transport Report	Action should be prioritised on those parts of the system where networks are critical in supporting economic growth.	Furthered
National Government	Towards a Sustainable Transport System Supporting Economic Growth in a Low Carbon World	Top priority is given to maintaining and managing the existing road network and getting it to work better. Priority is also to be given to congested cities and international gateways.	Furthered
National Government	Manual For Streets	Streets should give a high priority to pedestrians. Not applicable to trunk roads	Neutral
National Government	PPG 13 Transport	Recognises quality of life depends on transport and access we need a safe, efficient and integrated transport system to promote sustainability and accessibility. Land use is a key to delivering an integrated transport strategy.	Furthered

Transport Regional

Inter-Regional	The Northern Way Growth Strategy Sept 2004	A key objective in relation to Hull is addressing specific road bottlenecks to the port – such as the A63 Castle Street.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy HE1	Aims to increase road accessibility to Hull in line with priorities in the Regional Transport strategy	Furthered

Regional	Regional Transport Strategy which is embodied within the Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy T7	This policy specifically supports improvements to the A63 Castle Street to aid access to the Port of Hull	Furthered
Regional	Regional Transport Strategy which is embodied within the Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy T9	This policy sets out transport investment priorities. "Improved quality of road access to Hull and the Port of Hull" is listed as a Category A – highest priority, scheme.	Furthered
Regional	Joint Structure Plan Adopted June 2005 Policy EC 2	The policy sets out that the east-west multi-modal freight transport corridor should provide a focus for the movement of freight and new employment development	Furthered
Regional	Joint Structure Plan Adopted June 2005 Policy T 3	The highway network should be improved to facilitate the movement of people and freight.	Furthered
Regional	Hull and Humber Ports City Region (Part of Northern Way Initiative)	A 63 Castle Street improvement is a main priority action. With a Cut and Cover tunnel being favoured at this time.	Furthered
Regional	Regional Transport Board	The Board consider that the scheme will facilitate economic growth and regeneration. It is within the Board's Priority Transport Scheme list.	Furthered

Transport Local

Local	Hull City Council Local Transport Plan 2006-2011	The Plan sets out that improvements from the Port of Hull to the national transport system are vital and lists as a major objective both long and short term improvements to the A63 Castle Street. While the published Plan favours the Cut and Cover option the City Council has reserved it position and will give its formal view as part of the Highways Agencies public consultation on options. There is therefore an in principle support for all options	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M1	Promotes a balanced transport system – including walking and cycling.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M9	Encourages improved facilities for cyclists and pedestrians	Hindered

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M11	The design of cycle and pedestrian routes and pedestrian areas are expected to take into account cycle and pedestrian access and personal safety and the needs of the mobility impaired.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M12 (a)	Cycle and footpath/footbridge schemes are indicated for Castle Street, Porter Street/St James Street Princes Dock Street/Humber Dock Street is programmed to have a cycle and pedestrian underpass and the land required will be protected from other development).	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy BE7	Cycle and pedestrian routes will take account of safety and needs of all users	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M16	Road schemes will be encouraged if they are part of the primary road network.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M18	Land needed for Castle Street improvement is identified.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M37	Developing regional, national and international transport links serving Hull will be encouraged.	Furthered
Local	City Centre Masterplan (endorsed by City Council)	This is an investment framework. It has the aims of reducing congestion and severance in relation to A63 Castle Street.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 - Saved Policy M18 (a)	Land needed for Castle Street improvement is identified and protected.	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 39	Contributing to public realm in the city centre by accommodating or contributing to strategic walks and footbridges	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 40	Proposes short term transport measures for Castle Street. Longer term proposals will need to take these measures into account.	Neutral

Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 41	City centre developments are to contribute to transport improvements to the A63	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 43	Development will not be allowed within the indicative protected line of long term improvements to the A63 – or any other line determined at a later date.	Furthered
Local	Hull East-West Corridor Multi-Modal Study July 2002	This included a specific requirement to address the problems of congestion and severance. The principle of an on- line scheme to improve Castle Street was endorsed.	Furthered

Regeneration and Economy Policies:

Regeneration and Economy National

National Government	PPS 1 Delivering Sustainable Development	Aim of maintenance of high and stable levels of economic growth and employment	Furthered
National Government	PPG 4 Industry	Links transport and economic development. Transport systems can offer locational advantage to industry. Good access is a commercial priority.	Furthered
National Government	PPS 6 Planning for Town Centres	Town centres are to grow and improved accessibility to them is a specific objective.	Furthered

Regeneration and Economy Regional

Inter- Regional	The Northern Way Growth Strategy Sept 2004	Key objectives are to develop the Humber Trade zone – including the Port of Hull and promoting the renaissance of Hull city centre.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy YH1	This policy cites Hull as a Regeneration Priority Area where economic conditions are to be transformed. Opportunities provide by the Humber Ports as an international gateway are to be optimised.	Furthered

Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy YH4	Hull is one of four regional cities which are expected to be the prime focus for housing, employment, shopping, leisure, education, health and cultural activities and facilities in the region. It is expected to be transformed into an attractive, cohesive and safe place where people want to live, work, invest, and spend time in.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy HE1	This policy aims to transform the role of Hull as a regional city making the most of the multimodal transport links, ports and city centres.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy E1	The role of ports as significant economic drivers is recognised and this role promoted	Furthered
Regional	Regional Economic Strategy 2006-15	Has the objectives of connecting people to good jobs and having good transport connections to existing infrastructure.	Furthered
Regional	Joint Structure Plan Adopted June 2005 Policy EC2	Promotes a regional east-west multi-modal freight transport corridor.	Furthered

Regeneration and Economy Local

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000	Aims of the Plan include: • to promote urban regeneration; • to support and develop the local economy; • to protect, support and develop the role of the city centre; and • to promote the growth of the Port.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy E6	Port related development will be encouraged	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy UR1	Development assisting urban regeneration will be encouraged	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy UR2	This sets out regeneration priority areas which abut the A63 Castle Street.	Furthered

Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 6	Development that contributes to the regeneration of the city centre will be encouraged.	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 20	This sets out the objectives for regenerating the city centre, which as the proposals map and other policies indicate the promoting of the roadscheme must, on balance, support this scheme in principle.	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 31	This policy relates to Quay West - a large area to the north of the road on which the council has resolved to support the grant planning permission subject to a Section 106 Agreement. This agreement is now signed and any roadscheme proposed will need to take into account the access arrangements for this development.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 33	This policy relates to Fruit Market - a large area to the south of the road. No development that poses a risk to the redevelopment of the area will be permitted.	Neutral
Local	City Centre Masterplan (endorsed by City Council)	This is an investment framework with the objective of regenerating the city centre. The document is clear that solutions will be needed to the existing problems at A63 Castle Street. It foresees a solution which separates local and through traffic and therefore specifically supports the "cut and cover" option.	Neutral
Local	Hull Community Strategy 2006-2011	This has an objective of enhancing the competitiveness of Hull's businesses.	Furthered

Environment Policies:

Environment National

National Government	PPS 9 Biodiversity and Geological Conservation	A key objective is to ensure biological and geological diversity are conserved and enhanced as part of economic development.	Hindered

National Government	PPS 25 Planning and Pollution Control	Decisions must be taken subject to full account of environmental impacts being satisfied.	Neutral
National Government	PPG 24 Planning and Noise	Noise can be a material consideration in the planning process. However much development in relation to essential infrastructure will generate noise. Unjustifiable obstacles should not be placed in the way of such development.	Furthered
National Government	PPS 25 Planning and Flood Risk	Development should not be located or designed in a way that exacerbates flood risk. Development proposals in at-risk areas should be accompanied by a risk assessment – including mitigation measures.	Neutral
National Government	PPG 15 Planning and the Historic Environment	There should be effective protection of all aspects of the historic environment – including Conservation Areas and Listed Buildings.	Hindered
National Government	PPG.16 'Archaeology and Planning'	Recognises that archaeological remains are irreplaceable. Is a finite and now renewable resource. Preservation of identified deposits must be weighed against the need for the proposed development.	Hindered

Environment Regional

Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy HE1	This seeks to protect and enhance the biodiversity and landscape character of the Humber estuary and increase tree planting. Air quality should be improved and the Cities economic assets protected from flooding.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV1	This sets out provisions in relation to flood risk and requires a sequential approach to be taken to flood risk and assessments where necessary. Development of land in the City will be facilitated.	Neutral
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV3	High levels of water quality should be maintained and pollution of surface and underground water resources should be prevented.	Furthered

Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV6	Conserve, enhance and increase planting especially in urban areas	Hindered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV8	Safeguard and enhance biodiversity and geological heritage	Neutral
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV11	This relates to Health and recreation. It encourages economic development in Hull covers maximising opportunities for walking and cycling in the city.	Neutral
Regional	Joint Structure Plan Adopted June 2005 Policy ENV3	Development will need to prove an overriding need if it has an adverse impact on specific species previously identified.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV 9	This aims to safeguard and enhance the historic environment, and ensure that historical context informs decisions about development and regeneration.	Hindered
Regional	Joint Structure Plan Adopted June 2005 Policy ENV 6	The setting, character or appearance of strategically important buildings, features or areas of historic or architectural interest should be protected and where appropriate enhanced.	Hindered
Regional	Joint Structure Plan Adopted June 2005 Policy ENV 7	Nationally important archaeological remains and their settings will be preserved and development that is likely to have an adverse impact should not be allowed. Archaeological remains will be protected unless an overriding need for the development is demonstrated.	Furthered

Environment Local

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 CC1 (a)	Development within the city centre will be allowed subject to a range of issues including, impact on amenity, impact on the built and natural environment and the risk of pollution.	Neutral

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE6 (a)	A good standard of landscape will be required	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE22	A tree or group of trees of significant amenity value will be retained unless the works are necessary in the public interest	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE1	Development of urban greenspace will be allowed if there is overriding justification.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE3	Development of designated urban greenspace will not be allowed if adversely affected.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE 17	Development having a significant adverse effect on nationally or locally significant sites for nature conservation will not be allowed.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE 18	Development resulting in loss of trees of significant amenity value will not be allowed	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE 20	Development adversely affecting a species protected by legislation will not be allowed. Managing and improving Urban Greenspace for the benefit of both the community and wildlife will be supported.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME2	Development will not be allowed if it has an unacceptable pollution impact	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME3	Development near to a known or potential source of pollution will not be allowed unless the risk is acceptable.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME4	Development on contaminated land will be supported.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME14	Protecting and managing trees will be encouraged.	Hindered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 2	Development will be permitted if detailed planning considerations are acceptable. These include: natural and built environment, pollution, air quality and flood risk	Neutral

Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 20	Development will be permitted if detailed planning considerations are acceptable. These include: natural and built environment, pollution, air quality and flood risk	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 CC1 (a)	Development will be allowed if detailed planning considerations are acceptable – this includes impact on the built and natural environment.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE1(a)	A high standard of design will be sought for all developments.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 18	There will be special regard paid to preserving or enhancing the character or appearance of a designated Conservation Area.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 19	Development should preserve or enhance the character or appearance of a designated Conservation Area.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 20	Demolishing a building in a Conservation Area if redevelopment produces substantial community benefits.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 21	Development adversely affecting the views or setting of a Conservation Area will not be allowed.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 25	Special regard will be had to retaining Listed Buildings	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 28	Development within the setting of a Listed Building will not be allow if it adversely affects or is not in keeping with the Listed Building.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 30 (a)	Demolishing a Listed Building will not be allowed unless redevelopment will produce substantial community benefits.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 31 (a)	Important archaeological remains will be preserved.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 32	Archaeological assessment will be required for potentially archaeologically valuable sites	Neutral

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 34	If development is accepted as outweighing the loss of important archaeological remains adequate provision must be made for recording the remains.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 2	Development will be permitted if detailed planning considerations are acceptable. These include the built environment.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 3	High standards of design will be required for development in the city centre.	Neutral

Reference Source (s): As detailed in tables above
Assessment Score: ***Beneficial***
Qualitative Comments: This option scores very well in relation to transport and regeneration policies and comparatively poorly in terms of the environment, particularly in relation to the built environment. It is considered that policies with regard to the promotion of walking and cycling have not been met and issues of severance remain to be addressed. On balance the score is beneficial overall given the support afforded to the traffic elements of the scheme at a national regional and local level and the site specific allocation in the adopted Local Plan.

Worksheet – Integration – Land Use Policy – Underground Landbridge

Land Use Proposals	**Assessment Score**
National	***Beneficial***
Regional	***Beneficial***
Local	***Beneficial***

National Transport Policies:

National Government	White Paper ‘A New Deal for Transport: Better for Everyone’	Provision of an integrated transport system sustaining the economy and promoting accessibility.	Furthered
National Government	White Paper ‘The Future of Transport’	Prepares for long term transport needs and provides opportunity for economic growth. Need to plan ahead to get best out of transport system.	Furthered
National Government	Eddington Transport Report	Action should be prioritised on those parts of the system where networks are critical in supporting economic growth.	Furthered
National Government	Towards a Sustainable Transport System Supporting Economic Growth in a Low Carbon World	Top priority is given to maintaining and managing the existing road network and getting it to work better. Priority is also to be given to congested cities and international gateways.	Furthered
National Government	Manual For Streets	Streets should give a high priority to pedestrians. Not applicable to trunk roads	Neutral
National Government	PPG 13 Transport	Recognises quality of life depends on transport and access we need a safe, efficient and integrated transport system to promote sustainability and accessibility. Land use is a key to delivering an integrated transport strategy.	Furthered

Transport Regional

Inter-Regional	The Northern Way Growth Strategy Sept 2004	A key objective in relation to Hull is addressing specific road bottlenecks to the port – such as the A63 Castle Street.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy HE1	Aims to increase road accessibility to Hull in line with priorities in the Regional Transport strategy	Furthered

Regional	Regional Transport Strategy which is embodied within the Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy T7	This policy specifically supports improvements to the A63 Castle Street to aid access to the Port of Hull	Furthered
Regional	Regional Transport Strategy which is embodied within the Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy T9	This policy sets out transport investment priorities. "Improved quality of road access to Hull and the Port of Hull" is listed as a Category A – highest priority, scheme.	Furthered
Regional	Joint Structure Plan Adopted June 2005 Policy EC 2	The policy sets out that the east-west multi-modal freight transport corridor should provide a focus for the movement of freight and new employment development	Furthered
Regional	Joint Structure Plan Adopted June 2005 Policy T 3	The highway network should be improved to facilitate the movement of people and freight.	Furthered
Regional	Hull and Humber Ports City Region (Part of Northern Way Initiative)	A 63 Castle Street improvement is a main priority action. With a Cut and Cover tunnel being favoured at this time.	Furthered
Regional	Regional Transport Board	The Board consider that the scheme will facilitate economic growth and regeneration. It is within the Board's Priority Transport Scheme list.	Furthered

Transport Local

Local	Hull City Council Local Transport Plan 2006-2011	The Plan sets out that improvements from the Port of Hull to the national transport system are vital and lists as a major objective both long and short term improvements to the A63 Castle Street. While the published Plan favours the Cut and Cover option the City Council has reserved it position and will give its formal view as part of the Highways Agencies public consultation on options. There is therefore an in principle support for all options	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M1	Promotes a balanced transport system – including walking and cycling.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M9	Encourages improved facilities for cyclists and pedestrians	Hindered

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M11	The design of cycle and pedestrian routes and pedestrian areas are expected to take into account cycle and pedestrian access and personal safety and the needs of the mobility impaired.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M12 (a)	Cycle and footpath/footbridge schemes are indicated for Castle Street, Porter Street/St James Street Princes Dock Street/Humber Dock Street is programmed to have a cycle and pedestrian underpass and the land required will be protected from other development).	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy BE7	Cycle and pedestrian routes will take account of safety and needs of all users	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M16	Road schemes will be encouraged if they are part of the primary road network.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M18	Land needed for Castle Street improvement is identified.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M37	Developing regional, national and international transport links serving Hull will be encouraged.	Furthered
Local	City Centre Masterplan (endorsed by City Council)	This is an investment framework. It has the aims of reducing congestion and severance in relation to A63 Castle Street.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 - Saved Policy M18 (a)	Land needed for Castle Street improvement is identified and protected.	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 39	Contributing to public realm in the city centre by accommodating or contributing to strategic walks and footbridges	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 40	Proposes short term transport measures for Castle Street. Longer term proposals will need to take these measures into account.	Neutral

Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 41	City centre developments are to contribute to transport improvements to the A63	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 43	Development will not be allowed within the indicative protected line of long term improvements to the A63 – or any other line determined at a later date.	Furthered
Local	Hull East-West Corridor Multi-Modal Study July 2002	This included a specific requirement to address the problems of congestion and severance. The principle of an on- line scheme to improve Castle Street was endorsed.	Furthered

Regeneration and Economy Policies:

Regeneration and Economy National

National Government	PPS 1 Delivering Sustainable Development	Aim of maintenance of high and stable levels of economic growth and employment	Furthered
National Government	PPG 4 Industry	Links transport and economic development. Transport systems can offer locational advantage to industry. Good access is a commercial priority.	Furthered
National Government	PPS 6 Planning for Town Centres	Town centres are to grow and improved accessibility to them is a specific objective.	Furthered

Regeneration and Economy Regional

Inter- Regional	The Northern Way Growth Strategy Sept 2004	Key objectives are to develop the Humber Trade zone – including the Port of Hull and promoting the renaissance of Hull city centre.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy YH1	This policy cites Hull as a Regeneration Priority Area where economic conditions are to be transformed. Opportunities provide by the Humber Ports as an international gateway are to be optimised.	Furthered

Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy YH4	Hull is one of four regional cities which are expected to be the prime focus for housing, employment, shopping, leisure, education, health and cultural activities and facilities in the region. It is expected to be transformed into an attractive, cohesive and safe place where people want to live, work, invest, and spend time in.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy HE1	This policy aims to transform the role of Hull as a regional city making the most of the multimodal transport links, ports and city centres.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy E1	The role of ports as significant economic drivers is recognised and this role promoted	Furthered
Regional	Regional Economic Strategy 2006-15	Has the objectives of connecting people to good jobs and having good transport connections to existing infrastructure.	Furthered
Regional	Joint Structure Plan Adopted June 2005 Policy EC2	Promotes a regional east-west multi-modal freight transport corridor.	Furthered

Regeneration and Economy Local

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000	Aims of the Plan include: • to promote urban regeneration; • to support and develop the local economy; • to protect, support and develop the role of the city centre; and • to promote the growth of the Port.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy E6	Port related development will be encouraged	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy UR1	Development assisting urban regeneration will be encouraged	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy UR2	This sets out regeneration priority areas which abut the A63 Castle Street.	Furthered

Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 6	Development that contributes to the regeneration of the city centre will be encouraged.	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 20	This sets out the objectives for regenerating the city centre, which as the proposals map and other policies indicate the promoting of the roadscheme must, on balance, support this scheme in principle.	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 31	This policy relates to Quay West - a large area to the north of the road on which the council has resolved to support the grant planning permission subject to a Section 106 Agreement. This agreement is now signed and any roadscheme proposed will need to take into account the access arrangements for this development.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 33	This policy relates to Fruit Market - a large area to the south of the road. No development that poses a risk to the redevelopment of the area will be permitted.	Neutral
Local	City Centre Masterplan (endorsed by City Council)	This is an investment framework with the objective of regenerating the city centre. The document is clear that solutions will be needed to the existing problems at A63 Castle Street. It foresees a solution which separates local and through traffic and therefore specifically supports the “cut and cover” option.	Neutral
Local	Hull Community Strategy 2006-2011	This has an objective of enhancing the competitiveness of Hull’s businesses.	Furthered

Environment Policies:

Environment National

National Government	PPS 9 Biodiversity and Geological Conservation	A key objective is to ensure biological and geological diversity are conserved and enhanced as part of economic development.	Hindered

National Government	PPS 25 Planning and Pollution Control	Decisions must be taken subject to full account of environmental impacts being satisfied.	Neutral
National Government	PPG 24 Planning and Noise	Noise can be a material consideration in the planning process. However much development in relation to essential infrastructure will generate noise. Unjustifiable obstacles should not be placed in the way of such development.	Furthered
National Government	PPS 25 Planning and Flood Risk	Development should not be located or designed in a way that exacerbates flood risk. Development proposals in at-risk areas should be accompanied by a risk assessment – including mitigation measures.	Neutral
National Government	PPG 15 Planning and the Historic Environment	There should be effective protection of all aspects of the historic environment – including Conservation Areas and Listed Buildings.	Hindered
National Government	PPG.16 'Archaeology and Planning'	Recognises that archaeological remains are irreplaceable. Is a finite and now renewable resource. Preservation of identified deposits must be weighed against the need for the proposed development.	Hindered

Environment Regional

Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy HE1	This seeks to protect and enhance the biodiversity and landscape character of the Humber estuary and increase tree planting. Air quality should be improved and the Cities economic assets protected from flooding.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV1	This sets out provisions in relation to flood risk and requires a sequential approach to be taken to flood risk and assessments where necessary. Development of land in the City will be facilitated.	Neutral
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV3	High levels of water quality should be maintained and pollution of surface and underground water resources should be prevented.	Furthered

Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV6	Conserve, enhance and increase planting especially in urban areas	Hindered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV8	Safeguard and enhance biodiversity and geological heritage	Neutral
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV11	This relates to Health and recreation. It encourages economic development in Hull covers maximising opportunities for walking and cycling in the city.	Neutral
Regional	Joint Structure Plan Adopted June 2005 Policy ENV3	Development will need to prove an overriding need if it has an adverse impact on specific species previously identified.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV 9	This aims to safeguard and enhance the historic environment, and ensure that historical context informs decisions about development and regeneration.	Hindered
Regional	Joint Structure Plan Adopted June 2005 Policy ENV 6	The setting, character or appearance of strategically important buildings, features or areas of historic or architectural interest should be protected and where appropriate enhanced.	Hindered
Regional	Joint Structure Plan Adopted June 2005 Policy ENV 7	Nationally important archaeological remains and their settings will be preserved and development that is likely to have an adverse impact should not be allowed. Archaeological remains will be protected unless an overriding need for the development is demonstrated.	Furthered

Environment Local

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 CC1 (a)	Development within the city centre will be allowed subject to a range of issues including, impact on amenity, impact on the built and natural environment and the risk of pollution.	Neutral

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE6 (a)	A good standard of landscape will be required	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE22	A tree or group of trees of significant amenity value will be retained unless the works are necessary in the public interest	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE1	Development of urban greenspace will be allowed if there is overriding justification.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE3	Development of designated urban greenspace will not be allowed if adversely affected.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE 17	Development having a significant adverse effect on nationally or locally significant sites for nature conservation will not be allowed.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE 18	Development resulting in loss of trees of significant amenity value will not be allowed	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE 20	Development adversely affecting a species protected by legislation will not be allowed. Managing and improving Urban Greenspace for the benefit of both the community and wildlife will be supported.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME2	Development will not be allowed if it has an unacceptable pollution impact	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME3	Development near to a known or potential source of pollution will not be allowed unless the risk is acceptable.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME4	Development on contaminated land will be supported.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME14	Protecting and managing trees will be encouraged.	Hindered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 2	Development will be permitted if detailed planning considerations are acceptable. These include: natural and built environment, pollution, air quality and flood risk	Neutral

Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 20	Development will be permitted if detailed planning considerations are acceptable. These include: natural and built environment, pollution, air quality and flood risk	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 CC1 (a)	Development will be allowed if detailed planning considerations are acceptable – this includes impact on the built and natural environment.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE1(a)	A high standard of design will be sought for all developments.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 18	There will be special regard paid to preserving or enhancing the character or appearance of a designated Conservation Area.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 19	Development should preserve or enhance the character or appearance of a designated Conservation Area.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 20	Demolishing a building in a Conservation Area if redevelopment produces substantial community benefits.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 21	Development adversely affecting the views or setting of a Conservation Area will not be allowed.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 25	Special regard will be had to retaining Listed Buildings	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 28	Development within the setting of a Listed Building will not be allow if it adversely affects or is not in keeping with the Listed Building.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 30 (a)	Demolishing a Listed Building will not be allowed unless redevelopment will produce substantial community benefits.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 31 (a)	Important archaeological remains will be preserved.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 32	Archaeological assessment will be required for potentially archaeologically valuable sites	Neutral

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 34	If development is accepted as outweighing the loss of important archaeological remains adequate provision must be made for recording the remains.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 2	Development will be permitted if detailed planning considerations are acceptable. These include the built environment.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 3	High standards of design will be required for development in the city centre.	Neutral

Reference Source (s): As detailed in tables above
Assessment Score: ***Beneficial***
Qualitative Comments: This option scores very well in relation to transport and regeneration policies and comparatively poorly in terms of the environment, particularly in relation to the built environment. It is considered that policies with regard to the promotion of walking and cycling have not been met and issues of severance remain to be addressed. On balance the score is beneficial overall given the support afforded to the traffic elements of the scheme at a national regional and local level and the site specific allocation in the adopted Local Plan.

Worksheet – Integration – Land Use Policy – Underground Cut and Cover

Land Use Proposals	**Assessment Score**
National	***Beneficial***
Regional	***Beneficial***
Local	***Beneficial***

National Transport Policies:

National Government	White Paper 'A New Deal for Transport: Better for Everyone'	Provision of an integrated transport system sustaining the economy and promoting accessibility.	Furthered
National Government	White Paper 'The Future of Transport'	Prepares for long term transport needs and provides opportunity for economic growth. Need to plan ahead to get best out of transport system.	Furthered
National Government	Eddington Transport Report	Action should be prioritised on those parts of the system where networks are critical in supporting economic growth.	Furthered
National Government	Towards a Sustainable Transport System Supporting Economic Growth in a Low Carbon World	Top priority is given to maintaining and managing the existing road network and getting it to work better. Priority is also to be given to congested cities and international gateways.	Furthered
National Government	Manual For Streets	Streets should give a high priority to pedestrians. Not applicable to trunk roads	Neutral
National Government	PPG 13 Transport	Recognises quality of life depends on transport and access we need a safe, efficient and integrated transport system to promote sustainability and accessibility. Land use is a key to delivering an integrated transport strategy.	Furthered

Transport Regional

Inter-Regional	The Northern Way Growth Strategy Sept 2004	A key objective in relation to Hull is addressing specific road bottlenecks to the port – such as the A63 Castle Street.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy HE1	Aims to increase road accessibility to Hull in line with priorities in the Regional Transport strategy	Furthered

Regional	Regional Transport Strategy which is embodied within the Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy T7	This policy specifically supports improvements to the A63 Castle Street to aid access to the Port of Hull	Furthered
Regional	Regional Transport Strategy which is embodied within the Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy T9	This policy sets out transport investment priorities. "Improved quality of road access to Hull and the Port of Hull" is listed as a Category A – highest priority, scheme.	Furthered
Regional	Joint Structure Plan Adopted June 2005 Policy EC 2	The policy sets out that the east-west multi-modal freight transport corridor should provide a focus for the movement of freight and new employment development	Furthered
Regional	Joint Structure Plan Adopted June 2005 Policy T 3	The highway network should be improved to facilitate the movement of people and freight.	Furthered
Regional	Hull and Humber Ports City Region (Part of Northern Way Initiative)	A 63 Castle Street improvement is a main priority action. With a Cut and Cover tunnel being favoured at this time.	Furthered
Regional	Regional Transport Board	The Board consider that the scheme will facilitate economic growth and regeneration. It is within the Board's Priority Transport Scheme list.	Furthered

Transport Local

Local	Hull City Council Local Transport Plan 2006-2011	The Plan sets out that improvements from the Port of Hull to the national transport system are vital and lists as a major objective both long and short term improvements to the A63 Castle Street. While the published Plan favours the Cut and Cover option the City Council has reserved it position and will give its formal view as part of the Highways Agencies public consultation on options. There is therefore an in principle support for all options	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M1	Promotes a balanced transport system – including walking and cycling.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M9	Encourages improved facilities for cyclists and pedestrians	Neutral

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M11	The design of cycle and pedestrian routes and pedestrian areas are expected to take into account cycle and pedestrian access and personal safety and the needs of the mobility impaired.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M12 (a)	Cycle and footpath/footbridge schemes are indicated for Castle Street, Porter Street/St James Street Princes Dock Street/Humber Dock Street is programmed to have a cycle and pedestrian underpass and the land required will be protected from other development).	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy BE7	Cycle and pedestrian routes will take account of safety and needs of all users	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M16	Road schemes will be encouraged if they are part of the primary road network.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M18	Land needed for Castle Street improvement is identified.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M37	Developing regional, national and international transport links serving Hull will be encouraged.	Furthered
Local	City Centre Masterplan (endorsed by City Council)	This is an investment framework. It has the aims of reducing congestion and severance in relation to A63 Castle Street.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 - Saved Policy M18 (a)	Land needed for Castle Street improvement is identified and protected.	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 39	Contributing to public realm in the city centre by accommodating or contributing to strategic walks and footbridges	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 40	Proposes short term transport measures for Castle Street. Longer term proposals will need to take these measures into account.	Neutral

Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 41	City centre developments are to contribute to transport improvements to the A63	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 43	Development will not be allowed within the indicative protected line of long term improvements to the A63 – or any other line determined at a later date.	Furthered
Local	Hull East-West Corridor Multi-Modal Study July 2002	This included a specific requirement to address the problems of congestion and severance. The principle of an on- line scheme to improve Castle Street was endorsed.	Furthered

Regeneration and Economy Policies:

Regeneration and Economy National

National Government	PPS 1 Delivering Sustainable Development	Aim of maintenance of high and stable levels of economic growth and employment	Furthered
National Government	PPG 4 Industry	Links transport and economic development. Transport systems can offer locational advantage to industry. Good access is a commercial priority.	Furthered
National Government	PPS 6 Planning for Town Centres	Town centres are to grow and improved accessibility to them is a specific objective.	Furthered

Regeneration and Economy Regional

Inter- Regional	The Northern Way Growth Strategy Sept 2004	Key objectives are to develop the Humber Trade zone – including the Port of Hull and promoting the renaissance of Hull city centre.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy YH1	This policy cites Hull as a Regeneration Priority Area where economic conditions are to be transformed. Opportunities provide by the Humber Ports as an international gateway are to be optimised.	Furthered

Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy YH4	Hull is one of four regional cities which are expected to be the prime focus for housing, employment, shopping, leisure, education, health and cultural activities and facilities in the region. It is expected to be transformed into an attractive, cohesive and safe place where people want to live, work, invest, and spend time in.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy HE1	This policy aims to transform the role of Hull as a regional city making the most of the multimodal transport links, ports and city centres.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy E1	The role of ports as significant economic drivers is recognised and this role promoted	Furthered
Regional	Regional Economic Strategy 2006-15	Has the objectives of connecting people to good jobs and having good transport connections to existing infrastructure.	Furthered
Regional	Joint Structure Plan Adopted June 2005 Policy EC2	Promotes a regional east-west multi-modal freight transport corridor.	Furthered

Regeneration and Economy Local

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000	Aims of the Plan include: • to promote urban regeneration; • to support and develop the local economy; • to protect, support and develop the role of the city centre; and • to promote the growth of the Port.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy E6	Port related development will be encouraged	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy UR1	Development assisting urban regeneration will be encouraged	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy UR2	This sets out regeneration priority areas which abut the A63 Castle Street.	Furthered

Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 6	Development that contributes to the regeneration of the city centre will be encouraged.	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 20	This sets out the objectives for regenerating the city centre, which as the proposals map and other policies indicate the promoting of the roadscheme must, on balance, support this scheme in principle.	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 31	This policy relates to Quay West - a large area to the north of the road on which the council has resolved to support the grant planning permission subject to a Section 106 Agreement. This agreement is now signed and any roadscheme proposed will need to take into account the access arrangements for this development.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 33	This policy relates to Fruit Market - a large area to the south of the road. No development that poses a risk to the redevelopment of the area will be permitted.	Neutral
Local	City Centre Masterplan (endorsed by City Council)	This is an investment framework with the objective of regenerating the city centre. The document is clear that solutions will be needed to the existing problems at A63 Castle Street. It foresees a solution which separates local and through traffic and therefore specifically supports the "cut and cover" option.	Furthered
Local	Hull Community Strategy 2006-2011	This has an objective of enhancing the competitiveness of Hull's businesses.	Furthered

Environment Policies:

Environment National

National Government	PPS 9 Biodiversity and Geological Conservation	A key objective is to ensure biological and geological diversity are conserved and enhanced as part of economic development.	Hindered

National Government	PPS 25 Planning and Pollution Control	Decisions must be taken subject to full account of environmental impacts being satisfied.	Neutral
National Government	PPG 24 Planning and Noise	Noise can be a material consideration in the planning process. However much development in relation to essential infrastructure will generate noise. Unjustifiable obstacles should not be placed in the way of such development.	Furthered
National Government	PPS 25 Planning and Flood Risk	Development should not be located or designed in a way that exacerbates flood risk. Development proposals in at-risk areas should be accompanied by a risk assessment – including mitigation measures.	Neutral
National Government	PPG 15 Planning and the Historic Environment	There should be effective protection of all aspects of the historic environment – including Conservation Areas and Listed Buildings.	Hindered
National Government	PPG.16 'Archaeology and Planning'	Recognises that archaeological remains are irreplaceable. Is a finite and now renewable resource. Preservation of identified deposits must be weighed against the need for the proposed development.	Hindered

Environment Regional

Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy HE1	This seeks to protect and enhance the biodiversity and landscape character of the Humber estuary and increase tree planting. Air quality should be improved and the Cities economic assets protected from flooding.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV1	This sets out provisions in relation to flood risk and requires a sequential approach to be taken to flood risk and assessments where necessary. Development of land in the City will be facilitated.	Neutral
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV3	High levels of water quality should be maintained and pollution of surface and underground water resources should be prevented.	Furthered

Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV6	Conserve, enhance and increase planting especially in urban areas	Hindered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV8	Safeguard and enhance biodiversity and geological heritage	Neutral
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV11	This relates to Health and recreation. It encourages economic development in Hull covers maximising opportunities for walking and cycling in the city.	Neutral
Regional	Joint Structure Plan Adopted June 2005 Policy ENV3	Development will need to prove an overriding need if it has an adverse impact on specific species previously identified.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV 9	This aims to safeguard and enhance the historic environment, and ensure that historical context informs decisions about development and regeneration.	Hindered
Regional	Joint Structure Plan Adopted June 2005 Policy ENV 6	The setting, character or appearance of strategically important buildings, features or areas of historic or architectural interest should be protected and where appropriate enhanced.	Hindered
Regional	Joint Structure Plan Adopted June 2005 Policy ENV 7	Nationally important archaeological remains and their settings will be preserved and development that is likely to have an adverse impact should not be allowed. Archaeological remains will be protected unless an overriding need for the development is demonstrated.	Furthered

Environment Local

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 CC1 (a)	Development within the city centre will be allowed subject to a range of issues including, impact on amenity, impact on the built and natural environment and the risk of pollution.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE6 (a)	A good standard of landscape will be required	Furthered

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE22	A tree or group of trees of significant amenity value will be retained unless the works are necessary in the public interest	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE1	Development of urban greenspace will be allowed if there is overriding justification.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE3	Development of designated urban greenspace will not be allowed if adversely affected.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE 17	Development having a significant adverse effect on nationally or locally significant sites for nature conservation will not be allowed.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE 18	Development resulting in loss of trees of significant amenity value will not be allowed	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE 20	Development adversely affecting a species protected by legislation will not be allowed. Managing and improving Urban Greenspace for the benefit of both the community and wildlife will be supported.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME2	Development will not be allowed if it has an unacceptable pollution impact	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME3	Development near to a known or potential source of pollution will not be allowed unless the risk is acceptable.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME4	Development on contaminated land will be supported.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME14	Protecting and managing trees will be encouraged.	Hindered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 2	Development will be permitted if detailed planning considerations are acceptable. These include: natural and built environment, pollution, air quality and flood risk	Neutral

Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 20	Development will be permitted if detailed planning considerations are acceptable. These include: natural and built environment, pollution, air quality and flood risk	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 CC1 (a)	Development will be allowed if detailed planning considerations are acceptable – this includes impact on the built and natural environment.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE1(a)	A high standard of design will be sought for all developments.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 18	There will be special regard paid to preserving or enhancing the character or appearance of a designated Conservation Area.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 19	Development should preserve or enhance the character or appearance of a designated Conservation Area.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 20	Demolishing a building in a Conservation Area if redevelopment produces substantial community benefits.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 21	Development adversely affecting the views or setting of a Conservation Area will not be allowed.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 25	Special regard will be had to retaining Listed Buildings	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 28	Development within the setting of a Listed Building will not be allow if it adversely affects or is not in keeping with the Listed Building.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 30 (a)	Demolishing a Listed Building will not be allowed unless redevelopment will produce substantial community benefits.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 31 (a)	Important archaeological remains will be preserved.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 32	Archaeological assessment will be required for potentially archaeologically valuable sites	Neutral

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 34	If development is accepted as outweighing the loss of important archaeological remains adequate provision must be made for recording the remains.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 2	Development will be permitted if detailed planning considerations are acceptable. These include the built environment.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 3	High standards of design will be required for development in the city centre.	Neutral

Reference Source (s): As detailed in tables above
Assessment Score: ***Beneficial***
Qualitative Comments: This option scores very well in relation to transport and regeneration policies and comparatively poorly in terms of the environment, particularly in relation to the built environment. It is considered that policies with regard to the promotion of walking and cycling have not been fully met and issues of severance remain to be addressed. On balance the score is beneficial overall given the support afforded to the traffic elements of the scheme at a national regional and local level and the site specific allocation in the adopted Local Plan.

Worksheet – Integration – Land Use Policy – Overground Base

Land Use Proposals	**Assessment Score**
National	***Beneficial***
Regional	***Beneficial***
Local	***Beneficial***

National Transport Policies:

National Government	White Paper ‘A New Deal for Transport: Better for Everyone’	Provision of an integrated transport system sustaining the economy and promoting accessibility.	Furthered
National Government	White Paper ‘The Future of Transport’	Prepares for long term transport needs and provides opportunity for economic growth. Need to plan ahead to get best out of transport system.	Furthered
National Government	Eddington Transport Report	Action should be prioritised on those parts of the system where networks are critical in supporting economic growth.	Furthered
National Government	Towards a Sustainable Transport System Supporting Economic Growth in a Low Carbon World	Top priority is given to maintaining and managing the existing road network and getting it to work better. Priority is also to be given to congested cities and international gateways.	Furthered
National Government	Manual For Streets	Streets should give a high priority to pedestrians. Not applicable to trunk roads	Neutral
National Government	PPG 13 Transport	Recognises quality of life depends on transport and access we need a safe, efficient and integrated transport system to promote sustainability and accessibility. Land use is a key to delivering an integrated transport strategy.	Furthered

Transport Regional

Inter-Regional	The Northern Way Growth Strategy Sept 2004	A key objective in relation to Hull is addressing specific road bottlenecks to the port – such as the A63 Castle Street.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy HE1	Aims to increase road accessibility to Hull in line with priorities in the Regional Transport strategy	Furthered

Regional	Regional Transport Strategy which is embodied within the Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy T7	This policy specifically supports improvements to the A63 Castle Street to aid access to the Port of Hull	Furthered
Regional	Regional Transport Strategy which is embodied within the Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy T9	This policy sets out transport investment priorities. "Improved quality of road access to Hull and the Port of Hull" is listed as a Category A – highest priority, scheme.	Furthered
Regional	Joint Structure Plan Adopted June 2005 Policy EC 2	The policy sets out that the east-west multi-modal freight transport corridor should provide a focus for the movement of freight and new employment development	Furthered
Regional	Joint Structure Plan Adopted June 2005 Policy T 3	The highway network should be improved to facilitate the movement of people and freight.	Furthered
Regional	Hull and Humber Ports City Region (Part of Northern Way Initiative)	A 63 Castle Street improvement is a main priority action. With a Cut and Cover tunnel being favoured at this time.	Furthered
Regional	Regional Transport Board	The Board consider that the scheme will facilitate economic growth and regeneration. It is within the Board's Priority Transport Scheme list.	Furthered

Transport Local

Local	Hull City Council Local Transport Plan 2006-2011	The Plan sets out that improvements from the Port of Hull to the national transport system are vital and lists as a major objective both long and short term improvements to the A63 Castle Street. While the published Plan favours the Cut and Cover option the City Council has reserved it position and will give its formal view as part of the Highways Agencies public consultation on options. There is therefore an in principle support for all options	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M1	Promotes a balanced transport system – including walking and cycling.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M9	Encourages improved facilities for cyclists and pedestrians	Hindered

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M11	The design of cycle and pedestrian routes and pedestrian areas are expected to take into account cycle and pedestrian access and personal safety and the needs of the mobility impaired.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M12 (a)	Cycle and footpath/footbridge schemes are indicated for Castle Street, Porter Street/St James Street Princes Dock Street/Humber Dock Street is programmed to have a cycle and pedestrian underpass and the land required will be protected from other development).	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy BE7	Cycle and pedestrian routes will take account of safety and needs of all users	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M16	Road schemes will be encouraged if they are part of the primary road network.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M18	Land needed for Castle Street improvement is identified.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M37	Developing regional, national and international transport links serving Hull will be encouraged.	Furthered
Local	City Centre Masterplan (endorsed by City Council)	This is an investment framework. It has the aims of reducing congestion and severance in relation to A63 Castle Street.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 - Saved Policy M18 (a)	Land needed for Castle Street improvement is identified and protected.	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 39	Contributing to public realm in the city centre by accommodating or contributing to strategic walks and footbridges	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 40	Proposes short term transport measures for Castle Street. Longer term proposals will need to take these measures into account.	Neutral

Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 41	City centre developments are to contribute to transport improvements to the A63	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 43	Development will not be allowed within the indicative protected line of long term improvements to the A63 – or any other line determined at a later date.	Furthered
Local	Hull East-West Corridor Multi-Modal Study July 2002	This included a specific requirement to address the problems of congestion and severance. The principle of an on- line scheme to improve Castle Street was endorsed.	Furthered

Regeneration and Economy Policies:

Regeneration and Economy National

National Government	PPS 1 Delivering Sustainable Development	Aim of maintenance of high and stable levels of economic growth and employment	Furthered
National Government	PPG 4 Industry	Links transport and economic development. Transport systems can offer locational advantage to industry. Good access is a commercial priority.	Furthered
National Government	PPS 6 Planning for Town Centres	Town centres are to grow and improved accessibility to them is a specific objective.	Furthered

Regeneration and Economy Regional

Inter- Regional	The Northern Way Growth Strategy Sept 2004	Key objectives are to develop the Humber Trade zone – including the Port of Hull and promoting the renaissance of Hull city centre.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy YH1	This policy cites Hull as a Regeneration Priority Area where economic conditions are to be transformed. Opportunities provide by the Humber Ports as an international gateway are to be optimised.	Furthered

Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy YH4	Hull is one of four regional cities which are expected to be the prime focus for housing, employment, shopping, leisure, education, health and cultural activities and facilities in the region. It is expected to be transformed into an attractive, cohesive and safe place where people want to live, work, invest, and spend time in.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy HE1	This policy aims to transform the role of Hull as a regional city making the most of the multimodal transport links, ports and city centres.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy E1	The role of ports as significant economic drivers is recognised and this role promoted	Furthered
Regional	Regional Economic Strategy 2006-15	Has the objectives of connecting people to good jobs and having good transport connections to existing infrastructure.	Furthered
Regional	Joint Structure Plan Adopted June 2005 Policy EC2	Promotes a regional east-west multi-modal freight transport corridor.	Furthered

Regeneration and Economy Local

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000	Aims of the Plan include: • to promote urban regeneration; • to support and develop the local economy; • to protect, support and develop the role of the city centre; and • to promote the growth of the Port.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy E6	Port related development will be encouraged	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy UR1	Development assisting urban regeneration will be encouraged	Furthered

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy UR2	This sets out regeneration priority areas which abut the A63 Castle Street.	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 6	Development that contributes to the regeneration of the city centre will be encouraged.	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 20	This sets out the objectives for regenerating the city centre, which as the proposals map and other policies indicate the promoting of the roadscheme must, on balance, support this scheme in principle.	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 31	This policy relates to Quay West - a large area to the north of the road on which the council has resolved to support the grant planning permission subject to a Section 106 Agreement. This agreement is now signed and any roadscheme proposed will need to take into account the access arrangements for this development.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 33	This policy relates to Fruit Market - a large area to the south of the road. No development that poses a risk to the redevelopment of the area will be permitted.	Neutral
Local	City Centre Masterplan (endorsed by City Council)	This is an investment framework with the objective of regenerating the city centre. The document is clear that solutions will be needed to the existing problems at A63 Castle Street. It foresees a solution which separates local and through traffic and therefore specifically supports the "cut and cover" option.	Neutral
Local	Hull Community Strategy 2006-2011	This has an objective of enhancing the competitiveness of Hull's businesses.	Furthered

Environment Policies:

Environment National

National Government	PPS 9 Biodiversity and Geological Conservation	A key objective is to ensure biological and geological diversity are conserved and enhanced as part of economic development.	Hindered
National Government	PPS 25 Planning and Pollution Control	Decisions must be taken subject to full account of environmental impacts being satisfied.	Neutral
National Government	PPG 24 Planning and Noise	Noise can be a material consideration in the planning process. However much development in relation to essential infrastructure will generate noise. Unjustifiable obstacles should not be placed in the way of such development.	Furthered
National Government	PPS 25 Planning and Flood Risk	Development should not be located or designed in a way that exacerbates flood risk. Development proposals in at-risk areas should be accompanied by a risk assessment – including mitigation measures.	Neutral
National Government	PPG 15 Planning and the Historic Environment	There should be effective protection of all aspects of the historic environment – including Conservation Areas and Listed Buildings.	Hindered
National Government	PPG.16 'Archaeology and Planning'	Recognises that archaeological remains are irreplaceable. Is a finite and now renewable resource. Preservation of identified deposits must be weighed against the need for the proposed development.	Hindered

Environment Regional

Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy HE1	This seeks to protect and enhance the biodiversity and landscape character of the Humber estuary and increase tree planting. Air quality should be improved and the Cities economic assets protected from flooding.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV1	This sets out provisions in relation to flood risk and requires a sequential approach to be taken to flood risk and assessments where necessary. Development of land in the City will be facilitated.	Neutral

Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV3	High levels of water quality should be maintained and pollution of surface and underground water resources should be prevented.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV6	Conserve, enhance and increase planting especially in urban areas	Hindered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV8	Safeguard and enhance biodiversity and geological heritage	Neutral
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV11	This relates to Health and recreation. It encourages economic development in Hull covers maximising opportunities for walking and cycling in the city.	Neutral
Regional	Joint Structure Plan Adopted June 2005 Policy ENV3	Development will need to prove an overriding need if it has an adverse impact on specific species previously identified.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV 9	This aims to safeguard and enhance the historic environment, and ensure that historical context informs decisions about development and regeneration.	Hindered
Regional	Joint Structure Plan Adopted June 2005 Policy ENV 6	The setting, character or appearance of strategically important buildings, features or areas of historic or architectural interest should be protected and where appropriate enhanced.	Hindered
Regional	Joint Structure Plan Adopted June 2005 Policy ENV 7	Nationally important archaeological remains and their settings will be preserved and development that is likely to have an adverse impact should not be allowed. Archaeological remains will be protected unless an overriding need for the development is demonstrated.	Furthered

Environment Local

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 CC1 (a)	Development within the city centre will be allowed subject to a range of issues including, impact on amenity, impact on the built and natural environment and the risk of pollution.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE6 (a)	A good standard of landscape will be required	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE22	A tree or group of trees of significant amenity value will be retained unless the works are necessary in the public interest	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE1	Development of urban greenspace will be allowed if there is overriding justification.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE3	Development of designated urban greenspace will not be allowed if adversely affected.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE 17	Development having a significant adverse effect on nationally or locally significant sites for nature conservation will not be allowed.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE 18	Development resulting in loss of trees of significant amenity value will not be allowed	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE 20	Development adversely affecting a species protected by legislation will not be allowed. Managing and improving Urban Greenspace for the benefit of both the community and wildlife will be supported.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME2	Development will not be allowed if it has an unacceptable pollution impact	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME3	Development near to a known or potential source of pollution will not be allowed unless the risk is acceptable.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME4	Development on contaminated land will be supported.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME14	Protecting and managing trees will be encouraged.	Hindered

Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 2	Development will be permitted if detailed planning considerations are acceptable. These include: natural and built environment, pollution, air quality and flood risk	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 20	Development will be permitted if detailed planning considerations are acceptable. These include: natural and built environment, pollution, air quality and flood risk	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 CC1 (a)	Development will be allowed if detailed planning considerations are acceptable – this includes impact on the built and natural environment.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE1(a)	A high standard of design will be sought for all developments.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 18	There will be special regard paid to preserving or enhancing the character or appearance of a designated Conservation Area.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 19	Development should preserve or enhance the character or appearance of a designated Conservation Area.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 20	Demolishing a building in a Conservation Area if redevelopment produces substantial community benefits.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 21	Development adversely affecting the views or setting of a Conservation Area will not be allowed.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 25	Special regard will be had to retaining Listed Buildings	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 28	Development within the setting of a Listed Building will not be allow if it adversely affects or is not in keeping with the Listed Building.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 30 (a)	Demolishing a Listed Building will not be allowed unless redevelopment will produce substantial community benefits.	Furthered

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 31 (a)	Important archaeological remains will be preserved.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 32	Archaeological assessment will be required for potentially archaeologically valuable sites	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 34	If development is accepted as outweighing the loss of important archaeological remains adequate provision must be made for recording the remains.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 2	Development will be permitted if detailed planning considerations are acceptable. These include the built environment.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 3	High standards of design will be required for development in the city centre.	Neutral

Reference Source (s): As detailed in tables above
Assessment Score: ***Beneficial***
Qualitative Comments: This option scores very well in relation to transport and regeneration policies and comparatively poorly in terms of the environment, particularly in relation to the built environment. It is considered that policies with regard to the promotion of walking and cycling have not been met and issues of severance remain to be addressed. On balance the score is beneficial overall given the support afforded to the traffic elements of the scheme at a national regional and local level and the site specific allocation in the adopted Local Plan.

Worksheet – Integration – Land Use Policy – Overground Landbridge

Land Use Proposals	Assessment Score
National	***Beneficial***
Regional	***Beneficial***
Local	***Beneficial***

National Transport Policies:

National Government	White Paper 'A New Deal for Transport: Better for Everyone'	Provision of an integrated transport system sustaining the economy and promoting accessibility.	Furthered
National Government	White Paper 'The Future of Transport'	Prepares for long term transport needs and provides opportunity for economic growth. Need to plan ahead to get best out of transport system.	Furthered
National Government	Eddington Transport Report	Action should be prioritised on those parts of the system where networks are critical in supporting economic growth.	Furthered
National Government	Towards a Sustainable Transport System Supporting Economic Growth in a Low Carbon World	Top priority is given to maintaining and managing the existing road network and getting it to work better. Priority is also to be given to congested cities and international gateways.	Furthered
National Government	Manual For Streets	Streets should give a high priority to pedestrians. Not applicable to trunk roads	Neutral
National Government	PPG 13 Transport	Recognises quality of life depends on transport and access we need a safe, efficient and integrated transport system to promote sustainability and accessibility. Land use is a key to delivering an integrated transport strategy.	Furthered

Transport Regional

Inter-Regional	The Northern Way Growth Strategy Sept 2004	A key objective in relation to Hull is addressing specific road bottlenecks to the port – such as the A63 Castle Street.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy HE1	Aims to increase road accessibility to Hull in line with priorities in the Regional Transport strategy	Furthered

Regional	Regional Transport Strategy which is embodied within the Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy T7	This policy specifically supports improvements to the A63 Castle Street to aid access to the Port of Hull	Furthered
Regional	Regional Transport Strategy which is embodied within the Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy T9	This policy sets out transport investment priorities. "Improved quality of road access to Hull and the Port of Hull" is listed as a Category A – highest priority, scheme.	Furthered
Regional	Joint Structure Plan Adopted June 2005 Policy EC 2	The policy sets out that the east-west multi-modal freight transport corridor should provide a focus for the movement of freight and new employment development	Furthered
Regional	Joint Structure Plan Adopted June 2005 Policy T 3	The highway network should be improved to facilitate the movement of people and freight.	Furthered
Regional	Hull and Humber Ports City Region (Part of Northern Way Initiative)	A 63 Castle Street improvement is a main priority action. With a Cut and Cover tunnel being favoured at this time.	Furthered
Regional	Regional Transport Board	The Board consider that the scheme will facilitate economic growth and regeneration. It is within the Board's Priority Transport Scheme list.	Furthered

Transport Local

Local	Hull City Council Local Transport Plan 2006-2011	The Plan sets out that improvements from the Port of Hull to the national transport system are vital and lists as a major objective both long and short term improvements to the A63 Castle Street. While the published Plan favours the Cut and Cover option the City Council has reserved it position and will give its formal view as part of the Highways Agencies public consultation on options. There is therefore an in principle support for all options	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M1	Promotes a balanced transport system – including walking and cycling.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M9	Encourages improved facilities for cyclists and pedestrians	Hindered

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M11	The design of cycle and pedestrian routes and pedestrian areas are expected to take into account cycle and pedestrian access and personal safety and the needs of the mobility impaired.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M12 (a)	Cycle and footpath/footbridge schemes are indicated for Castle Street, Porter Street/St James Street Princes Dock Street/Humber Dock Street is programmed to have a cycle and pedestrian underpass and the land required will be protected from other development).	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy BE7	Cycle and pedestrian routes will take account of safety and needs of all users	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M16	Road schemes will be encouraged if they are part of the primary road network.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M18	Land needed for Castle Street improvement is identified.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M37	Developing regional, national and international transport links serving Hull will be encouraged.	Furthered
Local	City Centre Masterplan (endorsed by City Council)	This is an investment framework. It has the aims of reducing congestion and severance in relation to A63 Castle Street.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 - Saved Policy M18 (a)	Land needed for Castle Street improvement is identified and protected.	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 39	Contributing to public realm in the city centre by accommodating or contributing to strategic walks and footbridges	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 40	Proposes short term transport measures for Castle Street. Longer term proposals will need to take these measures into account.	Neutral

Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 41	City centre developments are to contribute to transport improvements to the A63	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 43	Development will not be allowed within the indicative protected line of long term improvements to the A63 – or any other line determined at a later date.	Furthered
Local	Hull East-West Corridor Multi-Modal Study July 2002	This included a specific requirement to address the problems of congestion and severance. The principle of an on- line scheme to improve Castle Street was endorsed.	Furthered

Regeneration and Economy Policies:

Regeneration and Economy National

National Government	PPS 1 Delivering Sustainable Development	Aim of maintenance of high and stable levels of economic growth and employment	Furthered
National Government	PPG 4 Industry	Links transport and economic development. Transport systems can offer locational advantage to industry. Good access is a commercial priority.	Furthered
National Government	PPS 6 Planning for Town Centres	Town centres are to grow and improved accessibility to them is a specific objective.	Furthered

Regeneration and Economy Regional

Inter- Regional	The Northern Way Growth Strategy Sept 2004	Key objectives are to develop the Humber Trade zone – including the Port of Hull and promoting the renaissance of Hull city centre.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy YH1	This policy cites Hull as a Regeneration Priority Area where economic conditions are to be transformed. Opportunities provide by the Humber Ports as an international gateway are to be optimised.	Furthered

Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy YH4	Hull is one of four regional cities which are expected to be the prime focus for housing, employment, shopping, leisure, education, health and cultural activities and facilities in the region. It is expected to be transformed into an attractive, cohesive and safe place where people want to live, work, invest, and spend time in.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy HE1	This policy aims to transform the role of Hull as a regional city making the most of the multimodal transport links, ports and city centres.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy E1	The role of ports as significant economic drivers is recognised and this role promoted	Furthered
Regional	Regional Economic Strategy 2006-15	Has the objectives of connecting people to good jobs and having good transport connections to existing infrastructure.	Furthered
Regional	Joint Structure Plan Adopted June 2005 Policy EC2	Promotes a regional east-west multi-modal freight transport corridor.	Furthered

Regeneration and Economy Local

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000	Aims of the Plan include: • to promote urban regeneration; • to support and develop the local economy; • to protect, support and develop the role of the city centre; and • to promote the growth of the Port.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy E6	Port related development will be encouraged	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy UR1	Development assisting urban regeneration will be encouraged	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy UR2	This sets out regeneration priority areas which abut the A63 Castle Street.	Furthered

Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 6	Development that contributes to the regeneration of the city centre will be encouraged.	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 20	This sets out the objectives for regenerating the city centre, which as the proposals map and other policies indicate the promoting of the roadscheme must, on balance, support this scheme in principle.	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 31	This policy relates to Quay West - a large area to the north of the road on which the council has resolved to support the grant planning permission subject to a Section 106 Agreement. This agreement is now signed and any roadscheme proposed will need to take into account the access arrangements for this development.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 33	This policy relates to Fruit Market - a large area to the south of the road. No development that poses a risk to the redevelopment of the area will be permitted.	Neutral
Local	City Centre Masterplan (endorsed by City Council)	This is an investment framework with the objective of regenerating the city centre. The document is clear that solutions will be needed to the existing problems at A63 Castle Street. It foresees a solution which separates local and through traffic and therefore specifically supports the "cut and cover" option.	Neutral
Local	Hull Community Strategy 2006-2011	This has an objective of enhancing the competitiveness of Hull's businesses.	Furthered

Environment Policies:

Environment National

National Government	PPS 9 Biodiversity and Geological Conservation	A key objective is to ensure biological and geological diversity are conserved and enhanced as part of economic development.	Hindered

National Government	PPS 25 Planning and Pollution Control	Decisions must be taken subject to full account of environmental impacts being satisfied.	Neutral
National Government	PPG 24 Planning and Noise	Noise can be a material consideration in the planning process. However much development in relation to essential infrastructure will generate noise. Unjustifiable obstacles should not be placed in the way of such development.	Furthered
National Government	PPS 25 Planning and Flood Risk	Development should not be located or designed in a way that exacerbates flood risk. Development proposals in at-risk areas should be accompanied by a risk assessment – including mitigation measures.	Neutral
National Government	PPG 15 Planning and the Historic Environment	There should be effective protection of all aspects of the historic environment – including Conservation Areas and Listed Buildings.	Hindered
National Government	PPG.16 'Archaeology and Planning'	Recognises that archaeological remains are irreplaceable. Is a finite and now renewable resource. Preservation of identified deposits must be weighed against the need for the proposed development.	Hindered

Environment Regional

Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy HE1	This seeks to protect and enhance the biodiversity and landscape character of the Humber estuary and increase tree planting. Air quality should be improved and the Cities economic assets protected from flooding.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV1	This sets out provisions in relation to flood risk and requires a sequential approach to be taken to flood risk and assessments where necessary. Development of land in the City will be facilitated.	Neutral
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV3	High levels of water quality should be maintained and pollution of surface and underground water resources should be prevented.	Furthered

Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV6	Conserve, enhance and increase planting especially in urban areas	Hindered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV8	Safeguard and enhance biodiversity and geological heritage	Neutral
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV11	This relates to Health and recreation. It encourages economic development in Hull covers maximising opportunities for walking and cycling in the city.	Neutral
Regional	Joint Structure Plan Adopted June 2005 Policy ENV3	Development will need to prove an overriding need if it has an adverse impact on specific species previously identified.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV 9	This aims to safeguard and enhance the historic environment, and ensure that historical context informs decisions about development and regeneration.	Hindered
Regional	Joint Structure Plan Adopted June 2005 Policy ENV 6	The setting, character or appearance of strategically important buildings, features or areas of historic or architectural interest should be protected and where appropriate enhanced.	Hindered
Regional	Joint Structure Plan Adopted June 2005 Policy ENV 7	Nationally important archaeological remains and their settings will be preserved and development that is likely to have an adverse impact should not be allowed. Archaeological remains will be protected unless an overriding need for the development is demonstrated.	Furthered

Environment Local

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 CC1 (a)	Development within the city centre will be allowed subject to a range of issues including, impact on amenity, impact on the built and natural environment and the risk of pollution.	Neutral

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE6 (a)	A good standard of landscape will be required	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE22	A tree or group of trees of significant amenity value will be retained unless the works are necessary in the public interest	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE1	Development of urban greenspace will be allowed if there is overriding justification.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE3	Development of designated urban greenspace will not be allowed if adversely affected.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE 17	Development having a significant adverse effect on nationally or locally significant sites for nature conservation will not be allowed.	Neutral
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Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE 20	Development adversely affecting a species protected by legislation will not be allowed. Managing and improving Urban Greenspace for the benefit of both the community and wildlife will be supported.	Hindered
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Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME3	Development near to a known or potential source of pollution will not be allowed unless the risk is acceptable.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME4	Development on contaminated land will be supported.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME14	Protecting and managing trees will be encouraged.	Hindered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 2	Development will be permitted if detailed planning considerations are acceptable. These include: natural and built environment, pollution, air quality and flood risk	Neutral

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Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 18	There will be special regard paid to preserving or enhancing the character or appearance of a designated Conservation Area.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 19	Development should preserve or enhance the character or appearance of a designated Conservation Area.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 20	Demolishing a building in a Conservation Area if redevelopment produces substantial community benefits.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 21	Development adversely affecting the views or setting of a Conservation Area will not be allowed.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 25	Special regard will be had to retaining Listed Buildings	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 28	Development within the setting of a Listed Building will not be allow if it adversely affects or is not in keeping with the Listed Building.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 30 (a)	Demolishing a Listed Building will not be allowed unless redevelopment will produce substantial community benefits.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 31 (a)	Important archaeological remains will be preserved.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 32	Archaeological assessment will be required for potentially archaeologically valuable sites	Neutral

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 34	If development is accepted as outweighing the loss of important archaeological remains adequate provision must be made for recording the remains.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 2	Development will be permitted if detailed planning considerations are acceptable. These include the built environment.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 3	High standards of design will be required for development in the city centre.	Neutral

Reference Source (s): As detailed in tables above
Assessment Score: ***Beneficial***
Qualitative Comments: This option scores very well in relation to transport and regeneration policies and comparatively poorly in terms of the environment, particularly in relation to the built environment. It is considered that policies with regard to the promotion of walking and cycling have not been met and issues of severance remain to be addressed. On balance the score is beneficial overall given the support afforded to the traffic elements of the scheme at a national regional and local level and the site specific allocation in the adopted Local Plan.

Worksheet – Integration – Land Use Policy – Overground Full Viaduct

Land Use Proposals **Assessment Score**
National ***Beneficial***
Regional ***Beneficial***
Local ***Beneficial***

National Transport Policies:

National Government	White Paper 'A New Deal for Transport: Better for Everyone'	Provision of an integrated transport system sustaining the economy and promoting accessibility.	Furthered
National Government	White Paper 'The Future of Transport'	Prepares for long term transport needs and provides opportunity for economic growth. Need to plan ahead to get best out of transport system.	Furthered
National Government	Eddington Transport Report	Action should be prioritised on those parts of the system where networks are critical in supporting economic growth.	Furthered
National Government	Towards a Sustainable Transport System Supporting Economic Growth in a Low Carbon World	Top priority is given to maintaining and managing the existing road network and getting it to work better. Priority is also to be given to congested cities and international gateways.	Furthered
National Government	Manual For Streets	Streets should give a high priority to pedestrians. Not applicable to trunk roads	Neutral
National Government	PPG 13 Transport	Recognises quality of life depends on transport and access we need a safe, efficient and integrated transport system to promote sustainability and accessibility. Land use is a key to delivering an integrated transport strategy.	Furthered

Transport Regional

Inter-Regional	The Northern Way Growth Strategy Sept 2004	A key objective in relation to Hull is addressing specific road bottlenecks to the port – such as the A63 Castle Street.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy HE1	Aims to increase road accessibility to Hull in line with priorities in the Regional Transport strategy	Furthered

Regional	Regional Transport Strategy which is embodied within the Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy T7	This policy specifically supports improvements to the A63 Castle Street to aid access to the Port of Hull	Furthered
Regional	Regional Transport Strategy which is embodied within the Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy T9	This policy sets out transport investment priorities. "Improved quality of road access to Hull and the Port of Hull" is listed as a Category A – highest priority, scheme.	Furthered
Regional	Joint Structure Plan Adopted June 2005 Policy EC 2	The policy sets out that the east-west multi-modal freight transport corridor should provide a focus for the movement of freight and new employment development	Furthered
Regional	Joint Structure Plan Adopted June 2005 Policy T 3	The highway network should be improved to facilitate the movement of people and freight.	Furthered
Regional	Hull and Humber Ports City Region (Part of Northern Way Initiative)	A 63 Castle Street improvement is a main priority action. With a Cut and Cover tunnel being favoured at this time.	Furthered
Regional	Regional Transport Board	The Board consider that the scheme will facilitate economic growth and regeneration. It is within the Board's Priority Transport Scheme list.	Furthered

Transport Local

Local	Hull City Council Local Transport Plan 2006-2011	The Plan sets out that improvements from the Port of Hull to the national transport system are vital and lists as a major objective both long and short term improvements to the A63 Castle Street. While the published Plan favours the Cut and Cover option the City Council has reserved it position and will give its formal view as part of the Highways Agencies public consultation on options. There is therefore an in principle support for all options	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M1	Promotes a balanced transport system – including walking and cycling.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M9	Encourages improved facilities for cyclists and pedestrians	Neutral

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M11	The design of cycle and pedestrian routes and pedestrian areas are expected to take into account cycle and pedestrian access and personal safety and the needs of the mobility impaired.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M12 (a)	Cycle and footpath/footbridge schemes are indicated for Castle Street, Porter Street/St James Street Princes Dock Street/Humber Dock Street is programmed to have a cycle and pedestrian underpass and the land required will be protected from other development).	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy BE7	Cycle and pedestrian routes will take account of safety and needs of all users	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M16	Road schemes will be encouraged if they are part of the primary road network.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M18	Land needed for Castle Street improvement is identified.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy M37	Developing regional, national and international transport links serving Hull will be encouraged.	Furthered
Local	City Centre Masterplan (endorsed by City Council)	This is an investment framework. It has the aims of reducing congestion and severance in relation to A63 Castle Street.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 - Saved Policy M18 (a)	Land needed for Castle Street improvement is identified and protected.	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 39	Contributing to public realm in the city centre by accommodating or contributing to strategic walks and footbridges	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 40	Proposes short term transport measures for Castle Street. Longer term proposals will need to take these measures into account.	Neutral

Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 41	City centre developments are to contribute to transport improvements to the A63	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 43	Development will not be allowed within the indicative protected line of long term improvements to the A63 – or any other line determined at a later date.	Furthered
Local	Hull East-West Corridor Multi-Modal Study July 2002	This included a specific requirement to address the problems of congestion and severance. The principle of an on- line scheme to improve Castle Street was endorsed.	Furthered

Regeneration and Economy Policies:

Regeneration and Economy National

National Government	PPS 1 Delivering Sustainable Development	Aim of maintenance of high and stable levels of economic growth and employment	Furthered
National Government	PPG 4 Industry	Links transport and economic development. Transport systems can offer locational advantage to industry. Good access is a commercial priority.	Furthered
National Government	PPS 6 Planning for Town Centres	Town centres are to grow and improved accessibility to them is a specific objective.	Furthered

Regeneration and Economy Regional

Inter- Regional	The Northern Way Growth Strategy Sept 2004	Key objectives are to develop the Humber Trade zone – including the Port of Hull and promoting the renaissance of Hull city centre.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy YH1	This policy cites Hull as a Regeneration Priority Area where economic conditions are to be transformed. Opportunities provide by the Humber Ports as an international gateway are to be optimised.	Furthered

Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy YH4	Hull is one of four regional cities which are expected to be the prime focus for housing, employment, shopping, leisure, education, health and cultural activities and facilities in the region. It is expected to be transformed into an attractive, cohesive and safe place where people want to live, work, invest, and spend time in.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy HE1	This policy aims to transform the role of Hull as a regional city making the most of the multimodal transport links, ports and city centres.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy E1	The role of ports as significant economic drivers is recognised and this role promoted	Furthered
Regional	Regional Economic Strategy 2006-15	Has the objectives of connecting people to good jobs and having good transport connections to existing infrastructure.	Furthered
Regional	Joint Structure Plan Adopted June 2005 Policy EC2	Promotes a regional east-west multi-modal freight transport corridor.	Furthered

Regeneration and Economy Local

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000	Aims of the Plan include: • to promote urban regeneration; • to support and develop the local economy; • to protect, support and develop the role of the city centre; and • to promote the growth of the Port.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy E6	Port related development will be encouraged	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy UR1	Development assisting urban regeneration will be encouraged	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 Policy UR2	This sets out regeneration priority areas which abut the A63 Castle Street.	Furthered

Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 6	Development that contributes to the regeneration of the city centre will be encouraged.	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 20	This sets out the objectives for regenerating the city centre, which as the proposals map and other policies indicate the promoting of the roadscheme must, on balance, support this scheme in principle.	Furthered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 31	This policy relates to Quay West - a large area to the north of the road on which the council has resolved to support the grant planning permission subject to a Section 106 Agreement. This agreement is now signed and any roadscheme proposed will need to take into account the access arrangements for this development.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 33	This policy relates to Fruit Market - a large area to the south of the road. No development that poses a risk to the redevelopment of the area will be permitted.	Neutral
Local	City Centre Masterplan (endorsed by City Council)	This is an investment framework with the objective of regenerating the city centre. The document is clear that solutions will be needed to the existing problems at A63 Castle Street. It foresees a solution which separates local and through traffic and therefore specifically supports the "cut and cover" option.	Furthered
Local	Hull Community Strategy 2006-2011	This has an objective of enhancing the competitiveness of Hull's businesses.	Furthered

Environment Policies:

Environment National

National Government	PPS 9 Biodiversity and Geological Conservation	A key objective is to ensure biological and geological diversity are conserved and enhanced as part of economic development.	Hindered

National Government	PPS 25 Planning and Pollution Control	Decisions must be taken subject to full account of environmental impacts being satisfied.	Neutral
National Government	PPG 24 Planning and Noise	Noise can be a material consideration in the planning process. However much development in relation to essential infrastructure will generate noise. Unjustifiable obstacles should not be placed in the way of such development.	Furthered
National Government	PPS 25 Planning and Flood Risk	Development should not be located or designed in a way that exacerbates flood risk. Development proposals in at-risk areas should be accompanied by a risk assessment – including mitigation measures.	Neutral
National Government	PPG 15 Planning and the Historic Environment	There should be effective protection of all aspects of the historic environment – including Conservation Areas and Listed Buildings.	Hindered
National Government	PPG.16 'Archaeology and Planning'	Recognises that archaeological remains are irreplaceable. Is a finite and now renewable resource. Preservation of identified deposits must be weighed against the need for the proposed development.	Hindered

Environment Regional

Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy HE1	This seeks to protect and enhance the biodiversity and landscape character of the Humber estuary and increase tree planting. Air quality should be improved and the Cities economic assets protected from flooding.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV1	This sets out provisions in relation to flood risk and requires a sequential approach to be taken to flood risk and assessments where necessary. Development of land in the City will be facilitated.	Neutral
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV3	High levels of water quality should be maintained and pollution of surface and underground water resources should be prevented.	Furthered

Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV6	Conserve, enhance and increase planting especially in urban areas	Hindered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV8	Safeguard and enhance biodiversity and geological heritage	Neutral
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV11	This relates to Health and recreation. It encourages economic development in Hull covers maximising opportunities for walking and cycling in the city.	Neutral
Regional	Joint Structure Plan Adopted June 2005 Policy ENV3	Development will need to prove an overriding need if it has an adverse impact on specific species previously identified.	Furthered
Regional	Regional Spatial Strategy Yorkshire and the Humber May 2008 Policy ENV 9	This aims to safeguard and enhance the historic environment, and ensure that historical context informs decisions about development and regeneration.	Hindered
Regional	Joint Structure Plan Adopted June 2005 Policy ENV 6	The setting, character or appearance of strategically important buildings, features or areas of historic or architectural interest should be protected and where appropriate enhanced.	Hindered
Regional	Joint Structure Plan Adopted June 2005 Policy ENV 7	Nationally important archaeological remains and their settings will be preserved and development that is likely to have an adverse impact should not be allowed. Archaeological remains will be protected unless an overriding need for the development is demonstrated.	Furthered

Environment Local

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 CC1 (a)	Development within the city centre will be allowed subject to a range of issues including, impact on amenity, impact on the built and natural environment and the risk of pollution.	Neutral

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE6 (a)	A good standard of landscape will be required	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE22	A tree or group of trees of significant amenity value will be retained unless the works are necessary in the public interest	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE1	Development of urban greenspace will be allowed if there is overriding justification.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE3	Development of designated urban greenspace will not be allowed if adversely affected.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE 17	Development having a significant adverse effect on nationally or locally significant sites for nature conservation will not be allowed.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE 18	Development resulting in loss of trees of significant amenity value will not be allowed	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 NE 20	Development adversely affecting a species protected by legislation will not be allowed. Managing and improving Urban Greenspace for the benefit of both the community and wildlife will be supported.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME2	Development will not be allowed if it has an unacceptable pollution impact	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME3	Development near to a known or potential source of pollution will not be allowed unless the risk is acceptable.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME4	Development on contaminated land will be supported.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 ME14	Protecting and managing trees will be encouraged.	Hindered
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 2	Development will be permitted if detailed planning considerations are acceptable. These include: natural and built environment, pollution, air quality and flood risk	Neutral

Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 20	Development will be permitted if detailed planning considerations are acceptable. These include: natural and built environment, pollution, air quality and flood risk	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 CC1 (a)	Development will be allowed if detailed planning considerations are acceptable – this includes impact on the built and natural environment.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE1(a)	A high standard of design will be sought for all developments.	Neutral
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 18	There will be special regard paid to preserving or enhancing the character or appearance of a designated Conservation Area.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 19	Development should preserve or enhance the character or appearance of a designated Conservation Area.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 20	Demolishing a building in a Conservation Area if redevelopment produces substantial community benefits.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 21	Development adversely affecting the views or setting of a Conservation Area will not be allowed.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 25	Special regard will be had to retaining Listed Buildings	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 28	Development within the setting of a Listed Building will not be allow if it adversely affects or is not in keeping with the Listed Building.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 30 (a)	Demolishing a Listed Building will not be allowed unless redevelopment will produce substantial community benefits.	Furthered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 31 (a)	Important archaeological remains will be preserved.	Hindered
Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 32	Archaeological assessment will be required for potentially archaeologically valuable sites	Neutral

Local	Hull City Council CityPlan (Local Plan) Adopted May 2000 BE 34	If development is accepted as outweighing the loss of important archaeological remains adequate provision must be made for recording the remains.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 2	Development will be permitted if detailed planning considerations are acceptable. These include the built environment.	Neutral
Local	Hull City Council City Centre Area Action Plan Incorporating Citywide Policies Issued for Consultation December 2007 Policy CCAAP 3	High standards of design will be required for development in the city centre.	Neutral

Reference Source (s): As detailed in tables above
Assessment Score: ***Beneficial***
Qualitative Comments: This option scores very well in relation to transport and regeneration policies and comparatively poorly in terms of the environment, particularly in relation to the built environment. It is considered that policies with regard to the promotion of walking and cycling have not been fully met and issues of severance remain to be addressed. On balance the score is beneficial overall given the support afforded to the traffic elements of the scheme at a national regional and local level and the site specific allocation in the adopted Local Plan.

OTHER GOVERNMENT POLICIES

Worksheet – Integration – Other Government Policy – Underground Base Scheme

Government Department	Policies	Policies Helped	Neutral	Policies Hindered
Department for Communities and Local Government (formally Office of the Deputy Prime Minister)	***Making it Happen: The Northern Way (2004)*** The Northern Way is a former ODPM (now DCLG) initiative. Its key ambition relates to establishing the North of England as an area of exceptional opportunity, with a world class economy and superb quality of life. An aim is to create stronger linkages between regions by reducing congestion and improving reliability on inter-urban strategic roads. Overall the Northern Way's objective is to kick-start an economic rebirth in the North of England. This scheme will assist in improving transport links to an international 'gateway' port which is in a regeneration priority area.	✔		
	The Hull and Humber Ports City Region Development Programme May 2005 is the action plan for the Northern Way in relation to the Humber Ports area. A main programme priority is then implementation of 'cut and cover scheme' for the A63 Castle Street Hull. It is anticipated that this will help: • enable the Port of Hull to grow; • regenerate the city; • improve access to the sea ports helping to capture a larger share of global trade; and • address worklessness and sustainable communities through the transformation of the city centre.		✔	
	DCLG – Social Exclusion Unit One of the Government's top priorities to tackle and prevent social exclusion. This focuses on preventing those at special risk from becoming socially excluded, reintegrating those who have become excluded and delivering basic minimum standards to everyone. This involves facilitating the poorest and most excluded people in society to get – amongst other things - higher incomes and, more jobs.	✔		
	Economic regeneration and providing improved access to jobs to deprived communities are considered key to reducing social exclusion. This project will contribute to these aims.	✔		

Department for Transport	***Sustainable Communities Plan*** Has an aim of liveability. The Plan sets out the Government intention to intensify efforts to improve the local environment of all communities. To be sustainable a community must offer a clean, safe environment. The road scheme is intended to improve the environment and safety for those using the City Centre. One of two challenges for transport is to decrease congestion on key transport links as this is seen as a threat to the region's competitiveness. This document refers to the Government working with the region on the Regional Spatial Strategy which contains a Regional Transport Strategy to address the region's transport problems. This scheme is promoted in the Regional Transport Strategy. ***Urban White Paper – Our Towns and Cities, the Future : Delivering on Urban Renaissance (2000)*** Policy 1): enabling all towns and cities to create and share prosperity by providing an efficient transport system; and Policy 2): reliable and safe transport system to contribute to business efficiency and improve peoples access to jobs and services. ***The Communities Plan- Sustainable Communities: Building for the Future (2003)*** Policy 1): to ensure all communities have a clean, safe and attractive environment in which people can take pride. Policy 2): reliable and safe transport system to contribute to business efficiency and improve peoples access to jobs and services. ***The Communities Plan- Sustainable Communities: Building for the Future (2003)*** The Department's priority is: 'Improving access to jobs and services, particularly for those most in need, in ways that are sustainable: improved public transport - reduced problems of congestion and reduced problems of congestion, pollution and safety.' ***White Paper "A New Deal for Transport: Better for everyone"(1998)*** This reflects the importance of upgrading the existing network in the context of an integrated transport policy and maximising the benefits of transport while minimising the negative impact on people and the environment. The policy is to have investment focused on improving reliability of journeys with less congestion on roads, less pollution and improved road safety. ***Transport White Paper - The Future of Transport: A Network for 2030 (2004)*** Policy 1): sustained investment in transport networks, improvements to traffic management and planning ahead for transport; Policy 2): road networks enhanced by new capacity where it is needed, assuming that any environmental and social costs are justified; Policy 3): local travel enhanced through freer flowing local roads delivered though measures such as congestion charging;	✔ ✔ ✔ ✔ ✔ ✔ ✔ ✔ ✔ ✔ ✔		

	Policy 4): respecting the environment by keeping the environmental impacts of new and existing transport infrastructure to a minimum and ensuring that mitigation measures are implemented to a high standard; Policy 5): ensuring that the noise impacts of transport are reduced and mitigated; and Policy 6): delivering carbon savings in line with domestic and international commitments and reduce the impact of other emissions which pollute the environment. *Towards A Sustainable Transport System Supporting Economic Growth in a Low Carbon World (2007)* This details the close link between transport and the economy and recognises that transport infrastructure can have both positive and negative impacts and a balance must be struck. It stresses: • Focusing new infrastructure on the most congested places selected for growth • Providing greater equality of opportunity by improving access for all ***Transport 2010: The 10 Year Plan (2000)*** Policy 1): delivering a quicker, safer, more punctual and environmentally friendly transport system; Policy 2): tackling congestion through better road infrastructure; and Policy 3): a better quality of life through a faster, safer, more reliable, modern transport system; a contribution to a cleaner environment; a fairer society, through better access to jobs and services; and an improvement in the quality of life for us all;. ***Tomorrow's Roads: Safer For Everyone (2000)*** Policy: safer infrastructure by ensuring that safety is a main objective in designing, building, operating and maintaining trunk and local roads.	✓ (Policy 4) ✓ (Policy 5) ✓ (Focusing new infrastructure) ✓ (Providing greater equality) ✓ (Policy 1) ✓ (Policy 2) ✓ (Policy 3) ✓ (Policy: safer infrastructure)		✓ (Policy 6)
Department for Culture Media & Sport	***Government's Statement on the Historic Environment - A Force for Our Future (2001)*** Policy: protecting and sustaining the historic environment for the benefit of our own and future generations The scheme has a neutral impact on cultural heritage.			✓

Securing the Future: The UK Government Sustainable Development Strategy (March 2005)	Priorities are: • sustainable consumption and production; • climate change; • natural resource protection; and • sustainable communities.		✔	
DEFRA	Effective protection of the environment is one of the four objectives of sustainable development and a principle concern of DEFRA. This remit includes safeguarding individuals from the effects of poor air quality or toxic chemicals and noise pollution. It also covers protecting the water environment and landscape and biodiversity. The score is therefore a balance of all these aspsects.		✔	
Department of Health	A key objective of the Department is to address accidental injury. The scheme is designed to improve road safely and decrease the current level of accidents.	✔		
Department of Trade and Industry	The Department's statement of purpose is "Creating the conditions for business success; and helping the UK respond to the challenge of globalization." The Department supports economic regeneration and national and regional competitiveness. The road fulfils a key priority of regional and more local policies to promote the economic regeneration of a key city in the north which is an international gateway for trade. ***Energy White Paper - Our Energy Future - Creating a Low Carbon Economy*** Policy: Reducing carbon dioxide emissions by 60% by 2050	✔		✔
HM Treasury	***Productivity in the UK: the Evidence and the Government's Approach (2000)*** Policy: to improvement in transport infrastructure to enhance regional and local economic performance.	✔		

Reference Source (s): Relevant Government Departments**:** Departmental policies, aims and objectives from websites detailed above.

Assessment Score: ***Beneficial***

Qualitative Comments: The proposal contributes to a range of Government policy notably those in relation to economic development. There are also environmental policies such as those relating to archaeology where policies are hindered. However given the number of policies that are helped by this proposal and the importance given by government to economic development in such a deprived area the overall assessment is beneficial.

Worksheet – Integration – Other Government Policy – Underground Landbridge

Government Department	Policies	Policies Helped	Neutral	Policies Hindered
Department for Communities and Local Government (formally Office of the Deputy Prime Minister)	***Making it Happen: The Northern Way (2004)***			
	The Northern Way is a former ODPM (now DCLG) initiative. Its key ambition relates to establishing the North of England as an area of exceptional opportunity, with a world class economy and superb quality of life. An aim is to create stronger linkages between regions by reducing congestion and improving reliability on inter-urban strategic roads. Overall the Northern Way's objective is to kick-start an economic rebirth in the North of England. This scheme will assist in improving transport links to an international 'gateway' port which is in a regeneration priority area.	✔		
	The Hull and Humber Ports City Region Development Programme May 2005 is the action plan for the Northern Way in relation to the Humber Ports area. A main programme priority is then implementation of 'cut and cover scheme' for the A63 Castle Street Hull. It is anticipated that this will help: • enable the Port of Hull to grow; • regenerate the city; • improve access to the sea ports helping to capture a larger share of global trade; and • address worklessness and sustainable communities through the transformation of the city centre.		✔	
	DCLG – Social Exclusion Unit			
	One of the Government's top priorities to tackle and prevent social exclusion. This focuses on preventing those at special risk from becoming socially excluded, reintegrating those who have become excluded and delivering basic minimum standards to everyone. This involves facilitating the poorest and most excluded people in society to get – amongst other things - higher incomes and, more jobs.	✔		
	Economic regeneration and providing improved access to jobs to deprived communities are considered key to reducing social exclusion. This project will contribute to these aims.	✔		

Department for Transport	***Sustainable Communities Plan*** Has an aim of liveability. The Plan sets out the Government intention to intensify efforts to improve the local environment of all communities. To be sustainable a community must offer a clean, safe environment. The road scheme is intended to improve the environment and safety for those using the City Centre.	✔		
	One of two challenges for transport is to decrease congestion on key transport links as this is seen as a threat to the region's competitiveness.	✔		
	This document refers to the Government working with the region on the Regional Spatial Strategy which contains a Regional Transport Strategy to address the region's transport problems. This scheme is promoted in the Regional Transport Strategy.			
	Urban White Paper – Our Towns and Cities, the Future : Delivering on Urban Renaissance (2000)			
	Policy 1): enabling all towns and cities to create and share prosperity by providing an efficient transport system; and	✔		
	Policy 2): reliable and safe transport system to contribute to business efficiency and improve peoples access to jobs and services.	✔		
	The Communities Plan- Sustainable Communities: Building for the Future (2003)			
	Policy 1): to ensure all communities have a clean, safe and attractive environment in which people can take pride.	✔		
	Policy 2): reliable and safe transport system to contribute to business efficiency and improve peoples access to jobs and services.	✔		
	The Communities Plan- Sustainable Communities: Building for the Future (2003)			
	The Department's priority is: 'Improving access to jobs and services, particularly for those most in need, in ways that are sustainable: improved public transport - reduced problems of congestion and reduced problems of congestion, pollution and safety.'	✔		
	White Paper "A New Deal for Transport: Better for everyone"(1998)			
	This reflects the importance of upgrading the existing network in the context of an integrated transport policy and maximising the benefits of transport while minimising the negative impact on people and the environment. The policy is to have investment focused on improving reliability of journeys with less congestion on roads, less pollution and improved road safety.	✔		
	Transport White Paper - The Future of Transport: A Network for 2030 (2004)			
	Policy 1): sustained investment in transport networks, improvements to traffic management and planning ahead for transport;	✔		
	Policy 2): road networks enhanced by new capacity where it is needed, assuming that any environmental and social costs are justified;	✔		
	Policy 3): local travel enhanced through freer flowing local roads delivered though measures such as congestion charging;	✔		

	Policy 4): respecting the environment by keeping the environmental impacts of new and existing transport infrastructure to a minimum and ensuring that mitigation measures are implemented to a high standard; Policy 5): ensuring that the noise impacts of transport are reduced and mitigated; and Policy 6): delivering carbon savings in line with domestic and international commitments and reduce the impact of other emissions which pollute the environment. *Towards A Sustainable Transport System Supporting Economic Growth in a Low Carbon World (2007)* This details the close link between transport and the economy and recognises that transport infrastructure can have both positive and negative impacts and a balance must be struck. It stresses: • Focusing new infrastructure on the most congested places selected for growth • Providing greater equality of opportunity by improving access for all ***Transport 2010: The 10 Year Plan (2000)*** Policy 1): delivering a quicker, safer, more punctual and environmentally friendly transport system; Policy 2): tackling congestion through better road infrastructure; and Policy 3): a better quality of life through a faster, safer, more reliable, modern transport system; a contribution to a cleaner environment; a fairer society, through better access to jobs and services; and an improvement in the quality of life for us all;. ***Tomorrow's Roads: Safer For Everyone (2000)*** Policy: safer infrastructure by ensuring that safety is a main objective in designing, building, operating and maintaining trunk and local roads.	✔ ✔ ✔ ✔ ✔ ✔ ✔ ✔		✔
Department for Culture Media & Sport	***Government's Statement on the Historic Environment - A Force for Our Future (2001)*** Policy: protecting and sustaining the historic environment for the benefit of our own and future generations The scheme has a neutral impact on cultural heritage.			✔

Securing the Future: The UK Government Sustainable Development Strategy (March 2005)	Priorities are: • sustainable consumption and production; • climate change; • natural resource protection; and • sustainable communities.		✔	
DEFRA	Effective protection of the environment is one of the four objectives of sustainable development and a principle concern of DEFRA. This remit includes safeguarding individuals from the effects of poor air quality or toxic chemicals and noise pollution. It also covers protecting the water environment and landscape and biodiversity. The score is therefore a balance of all these aspsects.		✔	
Department of Health	A key objective of the Department is to address accidental injury. The scheme is designed to improve road safely and decrease the current level of accidents.	✔		
Department of Trade and Industry	The Department's statement of purpose is "Creating the conditions for business success; and helping the UK respond to the challenge of globalization." The Department supports economic regeneration and national and regional competitiveness. The road fulfils a key priority of regional and more local policies to promote the economic regeneration of a key city in the north which is an international gateway for trade.	✔		
	Energy White Paper - Our Energy Future - Creating a Low Carbon Economy Policy: Reducing carbon dioxide emissions by 60% by 2050			✔
HM Treasury	***Productivity in the UK: the Evidence and the Government's Approach (2000)*** Policy: to improvement in transport infrastructure to enhance regional and local economic performance.	✔		

Reference Source (s): Relevant Government Departments**:** Departmental policies, aims and objectives from websites detailed above.

Assessment Score: ***Beneficial***

Qualitative Comments: The proposal contributes to a range of Government policy notably those in relation to economic development. There are also environmental policies such as those relating to archaeology where policies are hindered. However given the number of policies that are helped by this proposal and the importance given by government to economic development in such a deprived area the overall assessment is beneficial.

Worksheet – Integration – Other Government Policy – Cut and Cover Tunnel

Government Department	Policies	Policies Helped	Neutral	Policies Hindered
Department for Communities and Local Government (formally Office of the Deputy Prime Minister)	***Making it Happen: The Northern Way (2004)*** The Northern Way is a former ODPM (now DCLG) initiative. Its key ambition relates to establishing the North of England as an area of exceptional opportunity, with a world class economy and superb quality of life. An aim is to create stronger linkages between regions by reducing congestion and improving reliability on inter-urban strategic roads. Overall the Northern Way's objective is to kick-start an economic rebirth in the North of England. This scheme will assist in improving transport links to an international 'gateway' port which is in a regeneration priority area.	✓		
	The Hull and Humber Ports City Region Development Programme May 2005 is the action plan for the Northern Way in relation to the Humber Ports area. A main programme priority is then implementation of 'cut and cover scheme' for the A63 Castle Street Hull. It is anticipated that this will help: • enable the Port of Hull to grow; • regenerate the city; • improve access to the sea ports helping to capture a larger share of global trade; and • address worklessness and sustainable communities through the transformation of the city centre.		✓	
	DCLG – Social Exclusion Unit One of the Government's top priorities to tackle and prevent social exclusion. This focuses on preventing those at special risk from becoming socially excluded, reintegrating those who have become excluded and delivering basic minimum standards to everyone. This involves facilitating the poorest and most excluded people in society to get – amongst other things - higher incomes and, more jobs.	✓		
	Economic regeneration and providing improved access to jobs to deprived communities are considered key to reducing social exclusion. This project will contribute to these aims.	✓		

Department for Transport	***Sustainable Communities Plan*** Has an aim of liveability. The Plan sets out the Government intention to intensify efforts to improve the local environment of all communities. To be sustainable a community must offer a clean, safe environment. The road scheme is intended to improve the environment and safety for those using the City Centre.	✔		
	One of two challenges for transport is to decrease congestion on key transport links as this is seen as a threat to the region's competitiveness.	✔		
	This document refers to the Government working with the region on the Regional Spatial Strategy which contains a Regional Transport Strategy to address the region's transport problems. This scheme is promoted in the Regional Transport Strategy.			
	Urban White Paper – Our Towns and Cities, the Future : Delivering on Urban Renaissance (2000)			
	Policy 1): enabling all towns and cities to create and share prosperity by providing an efficient transport system; and	✔		
	Policy 2): reliable and safe transport system to contribute to business efficiency and improve peoples access to jobs and services.	✔		
	The Communities Plan- Sustainable Communities: Building for the Future (2003)			
	Policy 1): to ensure all communities have a clean, safe and attractive environment in which people can take pride.	✔		
	Policy 2): reliable and safe transport system to contribute to business efficiency and improve peoples access to jobs and services.	✔		
	The Communities Plan- Sustainable Communities: Building for the Future (2003)			
	The Department's priority is: 'Improving access to jobs and services, particularly for those most in need, in ways that are sustainable: improved public transport - reduced problems of congestion and reduced problems of congestion, pollution and safety.'	✔		
	White Paper "A New Deal for Transport: Better for everyone"(1998)			
	This reflects the importance of upgrading the existing network in the context of an integrated transport policy and maximising the benefits of transport while minimising the negative impact on people and the environment. The policy is to have investment focused on improving reliability of journeys with less congestion on roads, less pollution and improved road safety.	✔		
	Transport White Paper - The Future of Transport: A Network for 2030 (2004)			
	Policy 1): sustained investment in transport networks, improvements to traffic management and planning ahead for transport;	✔		
	Policy 2): road networks enhanced by new capacity where it is needed, assuming that any environmental and social costs are justified;	✔		
	Policy 3): local travel enhanced through freer flowing local roads delivered though measures such as congestion charging;	✔		

	Policy 4): respecting the environment by keeping the environmental impacts of new and existing transport infrastructure to a minimum and ensuring that mitigation measures are implemented to a high standard;	✓		
	Policy 5): ensuring that the noise impacts of transport are reduced and mitigated; and	✓		
	Policy 6): delivering carbon savings in line with domestic and international commitments and reduce the impact of other emissions which pollute the environment.			✓
	Towards A Sustainable Transport System Supporting Economic Growth in a Low Carbon World (2007)			
	This details the close link between transport and the economy and recognises that transport infrastructure can have both positive and negative impacts and a balance must be struck.			
	It stresses:			
	• Focusing new infrastructure on the most congested places selected for growth	✓		
	• Providing greater equality of opportunity by improving access for all	✓		
	Transport 2010: The 10 Year Plan (2000)			
	Policy 1): delivering a quicker, safer, more punctual and environmentally friendly transport system;	✓		
	Policy 2): tackling congestion through better road infrastructure; and	✓		
	Policy 3): a better quality of life through a faster, safer, more reliable, modern transport system; a contribution to a cleaner environment; a fairer society, through better access to jobs and services; and an improvement in the quality of life for us all;.	✓		
	Tomorrow's Roads: Safer For Everyone (2000)			
	Policy: safer infrastructure by ensuring that safety is a main objective in designing, building, operating and maintaining trunk and local roads.	✓		
Department for Culture Media & Sport	***Government's Statement on the Historic Environment - A Force for Our Future (2001)*** Policy: protecting and sustaining the historic environment for the benefit of our own and future generations The scheme has a neutral impact on cultural heritage.			✓

Securing the Future: The UK Government Sustainable Development Strategy (March 2005)	Priorities are: • sustainable consumption and production; • climate change; • natural resource protection; and • sustainable communities.		✔	
DEFRA	Effective protection of the environment is one of the four objectives of sustainable development and a principle concern of DEFRA. This remit includes safeguarding individuals from the effects of poor air quality or toxic chemicals and noise pollution. It also covers protecting the water environment and landscape and biodiversity. The score is therefore a balance of all these aspsects.		✔	
Department of Health	A key objective of the Department is to address accidental injury. The scheme is designed to improve road safely and decrease the current level of accidents.	✔		
Department of Trade and Industry	The Department's statement of purpose is "Creating the conditions for business success; and helping the UK respond to the challenge of globalization." The Department supports economic regeneration and national and regional competitiveness. The road fulfils a key priority of regional and more local policies to promote the economic regeneration of a key city in the north which is an international gateway for trade. ***Energy White Paper - Our Energy Future - Creating a Low Carbon Economy*** Policy: Reducing carbon dioxide emissions by 60% by 2050	✔		✔
HM Treasury	***Productivity in the UK: the Evidence and the Government's Approach (2000)*** Policy: to improvement in transport infrastructure to enhance regional and local economic performance.	✔		

Reference Source (s): Relevant Government Departments**:** Departmental policies, aims and objectives from websites detailed above.

Assessment Score: ***Beneficial***

Qualitative Comments: The proposal contributes to a range of Government policy notably those in relation to economic development. There are also environmental policies such as those relating to archaeology where policies are hindered. However given the number of policies that are helped by this proposal and the importance given by government to economic development in such a deprived area the overall assessment is beneficial.

Worksheet – Integration – Other Government Policy – Overground Base Scheme

Government Department	Policies	Policies Helped	Neutral	Policies Hindered
Department for Communities and Local Government (formally Office of the Deputy Prime Minister)	***Making it Happen: The Northern Way (2004)*** The Northern Way is a former ODPM (now DCLG) initiative. Its key ambition relates to establishing the North of England as an area of exceptional opportunity, with a world class economy and superb quality of life. An aim is to create stronger linkages between regions by reducing congestion and improving reliability on inter-urban strategic roads. Overall the Northern Way's objective is to kick-start an economic rebirth in the North of England. This scheme will assist in improving transport links to an international 'gateway' port which is in a regeneration priority area.	✓		
	The Hull and Humber Ports City Region Development Programme May 2005 is the action plan for the Northern Way in relation to the Humber Ports area. A main programme priority is then implementation of 'cut and cover scheme' for the A63 Castle Street Hull. It is anticipated that this will help: • enable the Port of Hull to grow; • regenerate the city; • improve access to the sea ports helping to capture a larger share of global trade; and • address worklessness and sustainable communities through the transformation of the city centre.		✓	
	DCLG – Social Exclusion Unit One of the Government's top priorities to tackle and prevent social exclusion. This focuses on preventing those at special risk from becoming socially excluded, reintegrating those who have become excluded and delivering basic minimum standards to everyone. This involves facilitating the poorest and most excluded people in society to get – amongst other things - higher incomes and, more jobs.	✓		
	Economic regeneration and providing improved access to jobs to deprived communities are considered key to reducing social exclusion. This project will contribute to these aims.	✓		

Department for Transport	***Sustainable Communities Plan*** Has an aim of liveability. The Plan sets out the Government intention to intensify efforts to improve the local environment of all communities. To be sustainable a community must offer a clean, safe environment. The road scheme is intended to improve the environment and safety for those using the City Centre.	✔		
	One of two challenges for transport is to decrease congestion on key transport links as this is seen as a threat to the region's competitiveness.	✔		
	This document refers to the Government working with the region on the Regional Spatial Strategy which contains a Regional Transport Strategy to address the region's transport problems. This scheme is promoted in the Regional Transport Strategy.			
	Urban White Paper – Our Towns and Cities, the Future : Delivering on Urban Renaissance (2000)			
	Policy 1): enabling all towns and cities to create and share prosperity by providing an efficient transport system; and	✔		
	Policy 2): reliable and safe transport system to contribute to business efficiency and improve peoples access to jobs and services.	✔		
	The Communities Plan- Sustainable Communities: Building for the Future (2003)			
	Policy 1): to ensure all communities have a clean, safe and attractive environment in which people can take pride.	✔		
	Policy 2): reliable and safe transport system to contribute to business efficiency and improve peoples access to jobs and services.	✔		
	The Communities Plan- Sustainable Communities: Building for the Future (2003)			
	The Department's priority is:			
	'Improving access to jobs and services, particularly for those most in need, in ways that are sustainable: improved public transport - reduced problems of congestion and reduced problems of congestion, pollution and safety.'	✔		
	White Paper "A New Deal for Transport: Better for everyone"(1998)			
	This reflects the importance of upgrading the existing network in the context of an integrated transport policy and maximising the benefits of transport while minimising the negative impact on people and the environment. The policy is to have investment focused on improving reliability of journeys with less congestion on roads, less pollution and improved road safety.	✔		
	Transport White Paper - The Future of Transport: A Network for 2030 (2004)			
	Policy 1): sustained investment in transport networks, improvements to traffic management and planning ahead for transport;	✔		
	Policy 2): road networks enhanced by new capacity where it is needed, assuming that any environmental and social costs are justified;	✔		
	Policy 3): local travel enhanced through freer flowing local roads delivered though measures such as congestion charging;	✔		

	Policy 4): respecting the environment by keeping the environmental impacts of new and existing transport infrastructure to a minimum and ensuring that mitigation measures are implemented to a high standard; Policy 5): ensuring that the noise impacts of transport are reduced and mitigated; and Policy 6): delivering carbon savings in line with domestic and international commitments and reduce the impact of other emissions which pollute the environment. *Towards A Sustainable Transport System Supporting Economic Growth in a Low Carbon World (2007)* This details the close link between transport and the economy and recognises that transport infrastructure can have both positive and negative impacts and a balance must be struck. It stresses: • Focusing new infrastructure on the most congested places selected for growth • Providing greater equality of opportunity by improving access for all ***Transport 2010: The 10 Year Plan (2000)*** Policy 1): delivering a quicker, safer, more punctual and environmentally friendly transport system; Policy 2): tackling congestion through better road infrastructure; and Policy 3): a better quality of life through a faster, safer, more reliable, modern transport system; a contribution to a cleaner environment; a fairer society, through better access to jobs and services; and an improvement in the quality of life for us all;. ***Tomorrow's Roads: Safer For Everyone (2000)*** Policy: safer infrastructure by ensuring that safety is a main objective in designing, building, operating and maintaining trunk and local roads.	✔ (Policy 4) ✔ (Policy 5) ✔ (Focusing new infrastructure) ✔ (Providing greater equality) ✔ (Policy 1) ✔ (Policy 2) ✔ (Policy 3) ✔ (Tomorrow's Roads Policy)		✔ (Policy 6)
Department for Culture Media & Sport	***Government's Statement on the Historic Environment - A Force for Our Future (2001)*** Policy: protecting and sustaining the historic environment for the benefit of our own and future generations The scheme has a neutral impact on cultural heritage.			✔

Securing the Future: The UK Government Sustainable Development Strategy (March 2005)	Priorities are: • sustainable consumption and production; • climate change; • natural resource protection; and • sustainable communities.		✔	
DEFRA	Effective protection of the environment is one of the four objectives of sustainable development and a principle concern of DEFRA. This remit includes safeguarding individuals from the effects of poor air quality or toxic chemicals and noise pollution. It also covers protecting the water environment and landscape and biodiversity. The score is therefore a balance of all these aspsects.		✔	
Department of Health	A key objective of the Department is to address accidental injury. The scheme is designed to improve road safely and decrease the current level of accidents.	✔		
Department of Trade and Industry	The Department's statement of purpose is "Creating the conditions for business success; and helping the UK respond to the challenge of globalization." The Department supports economic regeneration and national and regional competitiveness. The road fulfils a key priority of regional and more local policies to promote the economic regeneration of a key city in the north which is an international gateway for trade. ***Energy White Paper - Our Energy Future - Creating a Low Carbon Economy*** Policy: Reducing carbon dioxide emissions by 60% by 2050	✔		✔
HM Treasury	***Productivity in the UK: the Evidence and the Government's Approach (2000)*** Policy: to improvement in transport infrastructure to enhance regional and local economic performance.	✔		

Reference Source (s): Relevant Government Departments**:** Departmental policies, aims and objectives from websites detailed above.

Assessment Score: ***Beneficial***

Qualitative Comments: The proposal contributes to a range of Government policy notably those in relation to economic development. There are also environmental policies such as those relating to archaeology where policies are hindered. However given the number of policies that are helped by this proposal and the importance given by government to economic development in such a deprived area the overall assessment is beneficial.

Worksheet – Integration – Other Government Policy – Overground Landbridge

Government Department	Policies	Policies Helped	Neutral	Policies Hindered
Department for Communities and Local Government (formally Office of the Deputy Prime Minister)	***Making it Happen: The Northern Way (2004)*** The Northern Way is a former ODPM (now DCLG) initiative. Its key ambition relates to establishing the North of England as an area of exceptional opportunity, with a world class economy and superb quality of life. An aim is to create stronger linkages between regions by reducing congestion and improving reliability on inter-urban strategic roads. Overall the Northern Way's objective is to kick-start an economic rebirth in the North of England. This scheme will assist in improving transport links to an international 'gateway' port which is in a regeneration priority area.	✔		
	The Hull and Humber Ports City Region Development Programme May 2005 is the action plan for the Northern Way in relation to the Humber Ports area. A main programme priority is then implementation of 'cut and cover scheme' for the A63 Castle Street Hull. It is anticipated that this will help: • enable the Port of Hull to grow; • regenerate the city; • improve access to the sea ports helping to capture a larger share of global trade; and • address worklessness and sustainable communities through the transformation of the city centre.		✔	
	DCLG – Social Exclusion Unit One of the Government's top priorities to tackle and prevent social exclusion. This focuses on preventing those at special risk from becoming socially excluded, reintegrating those who have become excluded and delivering basic minimum standards to everyone. This involves facilitating the poorest and most excluded people in society to get – amongst other things - higher incomes and, more jobs.	✔		
	Economic regeneration and providing improved access to jobs to deprived communities are considered key to reducing social exclusion. This project will contribute to these aims.	✔		

Department for Transport	***Sustainable Communities Plan*** Has an aim of liveability. The Plan sets out the Government intention to intensify efforts to improve the local environment of all communities. To be sustainable a community must offer a clean, safe environment. The road scheme is intended to improve the environment and safety for those using the City Centre.	✔		
	One of two challenges for transport is to decrease congestion on key transport links as this is seen as a threat to the region's competitiveness.	✔		
	This document refers to the Government working with the region on the Regional Spatial Strategy which contains a Regional Transport Strategy to address the region's transport problems. This scheme is promoted in the Regional Transport Strategy.			
	Urban White Paper – Our Towns and Cities, the Future : Delivering on Urban Renaissance (2000)			
	Policy 1): enabling all towns and cities to create and share prosperity by providing an efficient transport system; and	✔		
	Policy 2): reliable and safe transport system to contribute to business efficiency and improve peoples access to jobs and services.	✔		
	The Communities Plan- Sustainable Communities: Building for the Future (2003)			
	Policy 1): to ensure all communities have a clean, safe and attractive environment in which people can take pride.	✔		
	Policy 2): reliable and safe transport system to contribute to business efficiency and improve peoples access to jobs and services.	✔		
	The Communities Plan- Sustainable Communities: Building for the Future (2003)			
	The Department's priority is: 'Improving access to jobs and services, particularly for those most in need, in ways that are sustainable: improved public transport - reduced problems of congestion and reduced problems of congestion, pollution and safety.'	✔		
	White Paper "A New Deal for Transport: Better for everyone"(1998)			
	This reflects the importance of upgrading the existing network in the context of an integrated transport policy and maximising the benefits of transport while minimising the negative impact on people and the environment. The policy is to have investment focused on improving reliability of journeys with less congestion on roads, less pollution and improved road safety.	✔		
	Transport White Paper - The Future of Transport: A Network for 2030 (2004)			
	Policy 1): sustained investment in transport networks, improvements to traffic management and planning ahead for transport;	✔		
	Policy 2): road networks enhanced by new capacity where it is needed, assuming that any environmental and social costs are justified;	✔		
	Policy 3): local travel enhanced through freer flowing local roads delivered though measures such as congestion charging;	✔		

	Policy 4): respecting the environment by keeping the environmental impacts of new and existing transport infrastructure to a minimum and ensuring that mitigation measures are implemented to a high standard;	✔		
	Policy 5): ensuring that the noise impacts of transport are reduced and mitigated; and	✔		
	Policy 6): delivering carbon savings in line with domestic and international commitments and reduce the impact of other emissions which pollute the environment.			✔
	Towards A Sustainable Transport System Supporting Economic Growth in a Low Carbon World (2007)			
	This details the close link between transport and the economy and recognises that transport infrastructure can have both positive and negative impacts and a balance must be struck.			
	It stresses:			
	• Focusing new infrastructure on the most congested places selected for growth	✔		
	• Providing greater equality of opportunity by improving access for all	✔		
	Transport 2010: The 10 Year Plan (2000)			
	Policy 1): delivering a quicker, safer, more punctual and environmentally friendly transport system;	✔		
	Policy 2): tackling congestion through better road infrastructure; and	✔		
	Policy 3): a better quality of life through a faster, safer, more reliable, modern transport system; a contribution to a cleaner environment; a fairer society, through better access to jobs and services; and an improvement in the quality of life for us all;.	✔		
	Tomorrow's Roads: Safer For Everyone (2000)			
	Policy: safer infrastructure by ensuring that safety is a main objective in designing, building, operating and maintaining trunk and local roads.	✔		
Department for Culture Media & Sport	***Government's Statement on the Historic Environment - A Force for Our Future (2001)*** Policy: protecting and sustaining the historic environment for the benefit of our own and future generations The scheme has a neutral impact on cultural heritage.			✔

Securing the Future: The UK Government Sustainable Development Strategy (March 2005)	Priorities are: • sustainable consumption and production; • climate change; • natural resource protection; and • sustainable communities.		✔	
DEFRA	Effective protection of the environment is one of the four objectives of sustainable development and a principle concern of DEFRA. This remit includes safeguarding individuals from the effects of poor air quality or toxic chemicals and noise pollution. It also covers protecting the water environment and landscape and biodiversity. The score is therefore a balance of all these aspsects.		✔	
Department of Health	A key objective of the Department is to address accidental injury. The scheme is designed to improve road safely and decrease the current level of accidents.	✔		
Department of Trade and Industry	The Department's statement of purpose is "Creating the conditions for business success; and helping the UK respond to the challenge of globalization." The Department supports economic regeneration and national and regional competitiveness. The road fulfils a key priority of regional and more local policies to promote the economic regeneration of a key city in the north which is an international gateway for trade. ***Energy White Paper - Our Energy Future - Creating a Low Carbon Economy*** Policy: Reducing carbon dioxide emissions by 60% by 2050	✔		✔
HM Treasury	***Productivity in the UK: the Evidence and the Government's Approach (2000)*** Policy: to improvement in transport infrastructure to enhance regional and local economic performance.	✔		

Reference Source (s): Relevant Government Departments**:** Departmental policies, aims and objectives from websites detailed above.

Assessment Score: ***Beneficial***

Qualitative Comments: The proposal contributes to a range of Government policy notably those in relation to economic development. There are also environmental policies such as those relating to archaeology where policies are hindered. However given the number of policies that are helped by this proposal and the importance given by government to economic development in such a deprived area the overall assessment is beneficial.

Worksheet – Integration – Other Government Policy – Extended Viaduct

Government Department	Policies	Policies Helped	Neutral	Policies Hindered
Department for Communities and Local Government (formally Office of the Deputy Prime Minister)	***Making it Happen: The Northern Way (2004)*** The Northern Way is a former ODPM (now DCLG) initiative. Its key ambition relates to establishing the North of England as an area of exceptional opportunity, with a world class economy and superb quality of life. An aim is to create stronger linkages between regions by reducing congestion and improving reliability on inter-urban strategic roads. Overall the Northern Way's objective is to kick-start an economic rebirth in the North of England. This scheme will assist in improving transport links to an international 'gateway' port which is in a regeneration priority area.	✓		
	The Hull and Humber Ports City Region Development Programme May 2005 is the action plan for the Northern Way in relation to the Humber Ports area. A main programme priority is then implementation of 'cut and cover scheme' for the A63 Castle Street Hull. It is anticipated that this will help: • enable the Port of Hull to grow; • regenerate the city; • improve access to the sea ports helping to capture a larger share of global trade; and • address worklessness and sustainable communities through the transformation of the city centre.		✓	
	DCLG – Social Exclusion Unit One of the Government's top priorities to tackle and prevent social exclusion. This focuses on preventing those at special risk from becoming socially excluded, reintegrating those who have become excluded and delivering basic minimum standards to everyone. This involves facilitating the poorest and most excluded people in society to get – amongst other things - higher incomes and, more jobs.	✓		
	Economic regeneration and providing improved access to jobs to deprived communities are considered key to reducing social exclusion. This project will contribute to these aims.	✓		

Department for Transport	***Sustainable Communities Plan*** Has an aim of liveability. The Plan sets out the Government intention to intensify efforts to improve the local environment of all communities. To be sustainable a community must offer a clean, safe environment. The road scheme is intended to improve the environment and safety for those using the City Centre. One of two challenges for transport is to decrease congestion on key transport links as this is seen as a threat to the region's competitiveness. This document refers to the Government working with the region on the Regional Spatial Strategy which contains a Regional Transport Strategy to address the region's transport problems. This scheme is promoted in the Regional Transport Strategy. ***Urban White Paper – Our Towns and Cities, the Future : Delivering on Urban Renaissance (2000)*** Policy 1): enabling all towns and cities to create and share prosperity by providing an efficient transport system; and Policy 2): reliable and safe transport system to contribute to business efficiency and improve peoples access to jobs and services. ***The Communities Plan- Sustainable Communities: Building for the Future (2003)*** Policy 1): to ensure all communities have a clean, safe and attractive environment in which people can take pride. Policy 2): reliable and safe transport system to contribute to business efficiency and improve peoples access to jobs and services. ***The Communities Plan- Sustainable Communities: Building for the Future (2003)*** The Department's priority is: 'Improving access to jobs and services, particularly for those most in need, in ways that are sustainable: improved public transport - reduced problems of congestion and reduced problems of congestion, pollution and safety.' ***White Paper "A New Deal for Transport: Better for everyone"(1998)*** This reflects the importance of upgrading the existing network in the context of an integrated transport policy and maximising the benefits of transport while minimising the negative impact on people and the environment. The policy is to have investment focused on improving reliability of journeys with less congestion on roads, less pollution and improved road safety. ***Transport White Paper - The Future of Transport: A Network for 2030 (2004)*** Policy 1): sustained investment in transport networks, improvements to traffic management and planning ahead for transport; Policy 2): road networks enhanced by new capacity where it is needed, assuming that any environmental and social costs are justified; Policy 3): local travel enhanced through freer flowing local roads delivered though measures such as congestion charging;	✔ ✔ ✔ ✔ ✔ ✔ ✔ ✔ ✔ ✔ ✔		

	Policy 4): respecting the environment by keeping the environmental impacts of new and existing transport infrastructure to a minimum and ensuring that mitigation measures are implemented to a high standard;	✓		
	Policy 5): ensuring that the noise impacts of transport are reduced and mitigated; and	✓		
	Policy 6): delivering carbon savings in line with domestic and international commitments and reduce the impact of other emissions which pollute the environment.			✓
	Towards A Sustainable Transport System Supporting Economic Growth in a Low Carbon World (2007) This details the close link between transport and the economy and recognises that transport infrastructure can have both positive and negative impacts and a balance must be struck. It stresses:			
	• Focusing new infrastructure on the most congested places selected for growth	✓		
	• Providing greater equality of opportunity by improving access for all	✓		
	Transport 2010: The 10 Year Plan (2000)			
	Policy 1): delivering a quicker, safer, more punctual and environmentally friendly transport system;	✓		
	Policy 2): tackling congestion through better road infrastructure; and	✓		
	Policy 3): a better quality of life through a faster, safer, more reliable, modern transport system; a contribution to a cleaner environment; a fairer society, through better access to jobs and services; and an improvement in the quality of life for us all;.	✓		
	Tomorrow's Roads: Safer For Everyone (2000)			
	Policy: safer infrastructure by ensuring that safety is a main objective in designing, building, operating and maintaining trunk and local roads.	✓		
Department for Culture Media & Sport	***Government's Statement on the Historic Environment - A Force for Our Future (2001)*** Policy: protecting and sustaining the historic environment for the benefit of our own and future generations The scheme has a neutral impact on cultural heritage.			✓

Securing the Future: The UK Government Sustainable Development Strategy (March 2005)	Priorities are: • sustainable consumption and production; • climate change; • natural resource protection; and • sustainable communities.		✔	
DEFRA	Effective protection of the environment is one of the four objectives of sustainable development and a principle concern of DEFRA. This remit includes safeguarding individuals from the effects of poor air quality or toxic chemicals and noise pollution. It also covers protecting the water environment and landscape and biodiversity. The score is therefore a balance of all these aspsects.		✔	
Department of Health	A key objective of the Department is to address accidental injury. The scheme is designed to improve road safely and decrease the current level of accidents.	✔		
Department of Trade and Industry	The Department's statement of purpose is "Creating the conditions for business success; and helping the UK respond to the challenge of globalization." The Department supports economic regeneration and national and regional competitiveness. The road fulfils a key priority of regional and more local policies to promote the economic regeneration of a key city in the north which is an international gateway for trade. ***Energy White Paper - Our Energy Future - Creating a Low Carbon Economy*** Policy: Reducing carbon dioxide emissions by 60% by 2050	✔		✔
HM Treasury	***Productivity in the UK: the Evidence and the Government's Approach (2000)*** Policy: to improvement in transport infrastructure to enhance regional and local economic performance.	✔		

Reference Source (s): Relevant Government Departments**:** Departmental policies, aims and objectives from websites detailed above.

Assessment Score: ***Beneficial***

Qualitative Comments: The proposal contributes to a range of Government policy notably those in relation to economic development. There are also environmental policies such as those relating to archaeology where policies are hindered. However given the number of policies that are helped by this proposal and the importance given by government to economic development in such a deprived area the overall assessment is beneficial.

Appendix E – Appraisal Summary Tables (AST)

A63 Castle Street Improvements, Hull
Appraisal Summary Table

Option: Underground Base (Option 1)		Description: Provision of grade separate junction at Mytongate (A63 lowered), footbridges at Porter Street, Princes Dock and Market Place.	Problems: Major traffic congestion and RTAs at Mytongate, severance of Humber Dock Area	Present Value of Costs to Public Accounts £148.3m
OBJECTIVE	**SUB-OBJECTIVE**	**QUALITATIVE IMPACTS**	**QUANTITATIVE ASSESSMENT**	**ASSESSMENT**
ENVIRONMENT	**Noise**	946 people will experience a noise increase, 5711 will experience no change in noise level and 463 people will experience a noise decrease with regard to changes defined by the worksheet noise bands. There is predicted to be a net increase in noise levels resulting in an increase in people annoyed by traffic noise giving a negative impact. There is predicted to be 390 properties exposed to noise levels of 68 dB(A) and greater in the 15th year after opening.	Estimated Population Annoyed (EPA) in the study area. Without scheme, 1851. With scheme, 1867.	Net population lose 15. NPV -£290,829
	Local Air Quality	The study area is located in Hull AQMA for annual mean NO_2. Ongoing monitoring has identified that current long term NO_2 concentrations exceed the statutory objective for human health. For this option it is predicted that all properties located within 200 m of the roads assessed would not exceed the annual statutory objective. Model results predict an overall improvement in air quality for the study area, although it should be noted that for a number of specific selected receptors modelled the predicted NO_2 concentration from this option are up to 0.19 $\mu g/m^3$ higher than the do minimum scenario. The key driver for the overall reduction in NO_2 is considered to be the improvement in UK vehicle fleet emissions due to advancements in vehicle emission technology. Existing annual mean PM_{10} concentrations are well below the statutory objective. It is predicted that future concentrations will decrease further below the statutory objective due to this option. Demolition requirements: Castle Buildings (Grade II Listed); Earl de Grey PH (Grade II Listed).	NO_2 Number of properties with an improvement: 4327 Number of properties with a deterioration: 1217 PM_{10} Number of properties with an improvement: 3497 Number of properties with a deterioration: 2047	Net total Assessment for NO_2: - 388.41 Net total Assessment for PM_{10}: - 7.79
	Greenhouse Gases	A slight decrease in annual average daily traffic flow within the study area is considered to be the main driver for the reduced emissions of CO_2 from this scheme option.	Whole appraisal period: -14,555 tonnes of C Scheme opening year (2017): -237 tonnes of C	NPV: £421,869
	Landscape	Not assessed due to entire urban nature of scheme corridor.	No Features Affected	Neutral
	Townscape	Overall baseline quality of townscape within study area assessed as ordinary to good; qualities of the different townscape areas range from poor to high quality. Option largely within existing highway follows present road layout but with increased presence. Would be significant damage to locally distinctive Trinity Burial Ground, and demolition of culturally important listed buildings (Castle Buildings, Earl de Grey public house and north wall to Humber Dock). New pedestrian footbridges would be highly intrusive visual features, out of scale and character with local townscape. Should proposed mitigation be implemented and three footbridges removed or be iconic structures then overall score could be reduced as slight to moderate adverse.	Not applicable	Moderate Adverse
	Heritage of Historic Resources	Option would have a large and direct adverse effect on High and Medium grade heritage assets that they would be lost or significantly damaged; including demolition of two Listed Buildings and the partial demolition of another. Moderate impact on Holy Trinity burial ground; would require exhumation of burials. Some potential for archaeological preservation in situ, depending on detailed design, but construction will need to be preceded by some excavation. Potential for as yet undiscovered archaeological assets during excavation of A63 mainline is assessed to be Medium.	The proposals will have an adverse effect on 44 known cultural heritage assets, including 4 Large adverse, 11 Moderate adverse, 24 Slight adverse and 5 Neutral adverse impacts.	Large adverse (negative) effect
	Biodiversity	There would be moderate impacts on the Trinity Burial Ground SNCI, foraging/roosting bats and mature trees. Negative impacts will be minimised by retaining existing vegetation wherever possible and creating species-rich grassland/planting new trees. The mitigation measures will reduce the overall impact of the scheme to slight adverse.	24 Mature trees likely to be lost (incl. 7 with moderate or high bat roost potential) / approx. 0.4 ha (33%) of SNCI lost.	Slight Adverse
	Water Environment	The Humber Estuary and River Hull are outside the proposed improvement corridor so will have minimal impacts. The site is not situated within a Groundwater Source Protection Zone, Nitrate Vulnerable Zone or Nitrate Sensitive Area.	Spillage risk is 0.23% (urban area, emergency services response time of 20 mins) <1%, no further spillage risk measures will be required.	Neutral
	Physical Fitness	Consolidation/removal of crossing points and replacement with footbridges will result in increased journey time and physical exertion.	Not applicable	Slight Beneficial
	Journey Ambience	Impact on traveller care neutral. The restricted views as the A63 moves into cutting at Mytongate GSJ, and the new footbridges will result in travellers experiencing worse views. The scheme will lead to a reduction in congestion and delays, pedestrian footbridges will remove conflict between vehicles and pedestrians thus reducing driver stress, traveller stress will therefore be better.	Not applicable	Large Beneficial
SAFETY	**Accidents**	Accident savings arising from scheme improvements (Do Minimum accidents – Do Something accidents).	Accidents Fatal Serious Slight 95 1 10 120	PVB £4.506m
	Security	Improvements to Castle Street will reduce the likelihood of vehicle travellers slowing or stopping. New footbridges would be well designed and adequately lit.	Not applicable	Slight Positive
ECONOMY	**Public Accounts**	Costs to central government arising from scheme improvements. Cost range P10, P50 and P90	Central Govt PVC	PVC P10 £67.948m, P50 £78.708m P90 £89.197m
	Transport Economic Efficiency: Business Users & Transport Providers	Journey time savings and reduced congestion along the A63.	Users PVB, Transport Providers PVB, Other PVB	PVB £106.168m
	Transport Economic Efficiency: Consumers	Benefits to consumers arising from scheme improvements	Users PVB	PVB £73.349m
	Reliability	Improvements to existing route		Slight Beneficial
	Wider Economic Impacts	In terms of job creation it is estimated that the Base Scheme Option will generate between 1,923 and 2,858 additional new jobs. This equates to economic benefits of between £51 million and £77 million.		Neutral
ACCESSIBILITY	**Option values**	These were not a consideration for the proposed improvements.		PVB £m
	Severance	The key desire lines crossing the A63 occur at Princes Dock and Mytongate junction. At Mytongate the provision of a dedicated footpath on the overbridge will result in a decrease in severance. This is offset by an increase at Princes Dock due to the replacement of two crossings with a footbridge resulting in increased journey lengths and the need to climb.	Not Applicable	Neutral
	Access to the Transport System	The proposals do not directly affect the existing public transport within the A63 corridor, and access to the transport system is not considered at this stage.		
INTEGRATION	**Transport Interchange**	The proposals do not affect transport interchange issue	Not applicable	Neutral
	Land-Use Policy	This option scores well in relation to transport and regeneration policies and relatively poorly in terms of the environment particularly in relation to the built environment. On balance it is beneficial overall.	Not applicable	Beneficial
	Other Government Policies	This option helps policies that relate to transport and the economy with significant benefits in terms of economic regeneration. There is however some environmental disbenefits. On balance it is beneficial overall.	Not applicable	Beneficial

A63 Castle Street Improvements, Hull
Appraisal Summary Table

Option: Underground Landbridge (Option 2)		**Description:** Provision of grade separate junction at Mytongate (A63 lowered), A63 in cutting to Princes Dock Street, pedestrian landbridge at 3.5m above GL in front of Princes Quay, footbridges at Porter Street and Market Place.	**Problems:** Major traffic congestion and RTAs at Mytongate, severance of Humber Dock Area	**Present Value of Costs to Public Accounts £268.7m**
OBJECTIVE	**SUB-OBJECTIVE**	**QUALITATIVE IMPACTS**	**QUANTITATIVE ASSESSMENT**	**ASSESSMENT**
ENVIRONMENT	**Noise**	347 people will experience a noise increase, 5105 will experience no change in noise level and 1669 people will experience a noise decrease with regard to changes defined by the worksheet noise bands. There is predicted to be a net decrease in noise levels resulting in a decrease in people annoyed by traffic noise giving a beneficial impact. There is predicted to be 314 properties exposed to noise levels of 68 dB(A) and greater in the 15th year after opening.	Estimated Population Annoyed (EPA) in the study area. Without scheme, 1851. With scheme, 1763.	Net population win 89. NPV £2,956,480
	Local Air Quality	The study area is located in Hull AQMA for annual mean NO_2. Ongoing monitoring has identified that current long term NO_2 concentrations exceed the statutory objective for human health. For this option it is predicted that all properties located within 200 m of the roads assessed would not exceed the annual statutory objective. Model results predict an overall improvement in air quality for the study area, although it should be noted that for a number of specific selected receptors modelled the predicted NO_2 concentration from this option are up to 0.18 $\mu g/m^3$ higher than the do minimum scenario. The key driver for the overall reduction in NO_2 is considered to be the improvement in UK vehicle fleet emissions due to advancements in vehicle emission technology. Existing annual mean PM_{10} concentrations are well below the statutory objective. It is predicted that future concentrations will decrease further below the statutory objective due to this option. Demolition requirements: Castle Buildings (Grade II Listed); Earl de Grey PH (Grade II Listed); Marina Court Hotel and Office Blocks (x3).	NO_2 Number of properties with an improvement: 3328 Number of properties with a deterioration: 2216 PM_{10} Number of properties with an improvement: 2723 Number of properties with a deterioration: 2821	Net total Assessment for NO_2: - 137.42 Net total Assessment for PM_{10}: - 1.02
	Greenhouse Gases	A slight decrease in annual average daily traffic flow within the study area is considered to be the main driver for the reduced emissions of CO_2 from this scheme option.	Whole appraisal period: -12,664 tonnes of C Scheme opening year (2017): -207 tonnes of C	NPV: £367,268
	Landscape	Not assessed due to entire urban nature of scheme corridor.	No Features Affected	Neutral
	Townscape	Overall baseline quality of townscape in study area assessed as ordinary to good; qualities of different townscape areas range from poor to high quality. Option follows existing highway alignment/layout but with a longer section in cutting (compared to option 1) increasing presence and footprint of road. Would be significant damage to locally distinctive and attractive Trinity Burial Ground and provision of a new built structure in the open areas between Humber and Prince's Dock, negatively impacting on the scale of the area. Demolition of culturally important and visually distinctive Castle Buildings, Earl de Grey public house and north wall to Humber Dock (all listed). Demolition of northern wings to Holiday Inn and Marina Court affects land use within scheme corridor and study area. Two new pedestrian footbridges are highly intrusive visual features, out of scale with the surrounding local townscape. Should proposed mitigation be implemented, two footbridges removed or be iconic structures, with land bridge and surrounding areas sympathetically designed then overall assessment score could be reduced to moderate adverse.	Not applicable	Large Adverse
	Heritage of Historic Resources	Option would have a large and direct adverse effect on High and Medium grade heritage assets, they would either be lost or significantly damaged; including demolition of two Listed Buildings and partial demolition of another. Moderate impact on Holy Trinity burial ground; would require exhumation of burials. Some potential for archaeological preservation in situ, depending on detailed design, but construction will need to be preceded by some excavation. Potential for as yet undiscovered archaeological assets along the excavated underground section is assessed to be Medium.	The proposals will have an adverse effect on 55 known cultural heritage assets, including 4 Large adverse, 14 Moderate adverse, 31 Slight adverse and 6 Neutral adverse impacts.	Large adverse (negative) effect
	Biodiversity	There would be moderate impacts on the Trinity Burial Ground SNCI, including foraging/roosting bats and mature trees. Negative impacts will be minimised by retaining existing vegetation wherever possible and creating species-rich grassland and planting new trees. The mitigation measures will reduce the overall impact of the scheme to slight adverse.	24 Mature trees likely to be lost (incl. 7 with moderate or high bat roost potential) / approx. 0.4 ha (33%) of SNCI lost.	Slight Adverse
	Water Environment	The Humber Estuary and River Hull are outside the proposed road improvement corridor so will have minimal impacts. The site is not situated within a Groundwater Source Protection Zone, Nitrate Vulnerable Zone or Nitrate Sensitive Area.	Spillage risk is 0.23%, (urban area, emergency services response time of 20 mins) <1%, no further spillage risk measures will be required.	Neutral
	Physical Fitness	Consolidation/removal of crossing points and replacement with footbridges at each end of the scheme will result in increased journey time and physical exertion.	Not applicable	Slight Beneficial
	Journey Ambience	Impact on traveller care neutral. The restricted views as the A63 moves into cutting at Mytongate GSJ, and the new footbridges will result in travellers experiencing worse views. The scheme will lead to a reduction in congestion and delays, pedestrian footbridges will remove conflict between vehicles and pedestrians thus reducing driver stress, the reduction will be offset slightly by increased driver stress due to restricted view in underground sections - overall stress will be reduced.	Not applicable	Large Beneficial
SAFETY	**Accidents**	Accident savings arising from scheme improvements (Do Minimum accidents – Do Something accidents).	Accidents Fatal Serious Slight 128 1 14 163	PVB £6.017m
	Security	Improvements to Castle Street will reduce the likelihood of vehicle travellers slowing or stopping. Proposed landbridge would be a well lit crossing with a reasonably open aspect.	Not applicable	Slight Positive
ECONOMY	**Public Accounts**	Costs to central government arising from scheme improvements. Cost range P10, P50 and P90	Central Govt PVC	PVC P10 £136.449m, P50 £ 154.088m P90 £171.733m
	Transport Economic Efficiency: Business Users & Transport Providers	Journey time savings and reduced congestion along the A63.	Users PVB, Transport Providers PVB, Other PVB	PVB £78.719m
	Transport Economic Efficiency: Consumers	Benefits to consumers arising from scheme improvements	Users PVB	PVB £47.692m
	Reliability	Improvements to existing route		Slight Beneficial
	Wider Economic Impacts	In terms of job creation it is estimated that the Landbridge Option will generate between 1,923 and 3,412 additional new jobs. This equates to economic benefits of between £51 million and £92 million.		Neutral
ACCESSIBILITY	**Option values**	These were not a consideration for the proposed improvements.		PVB £m
	Severance	The key desire lines crossing the A63 occur at Princes Dock and Mytongate junction. At Mytongate the provision of a dedicated footpath on the overbridge will result in a decrease in severance. This is offset by an increase at Princes Dock due to the replacement of two crossings with the landbridge resulting in increased journey lengths and the need to climb.	Not applicable	Neutral
	Access to the Transport System	The proposals do not directly affect the existing public transport within the A63 corridor, and access to the transport system is not considered at this stage.		Neutral
INTEGRATION	**Transport Interchange**	The proposals do not affect transport interchange issue	Not applicable	Neutral
	Land-Use Policy	This option scores well in relation to transport and regeneration policies and relatively poorly in terms f the environment particularly in relation to the built environment. On balance it is beneficial overall	Not applicable	Beneficial
	Other Government Policies	This option helps policies that relate to transport and the economy with significant benefits in terms of economic regeneration. There are however some environmental disbenefits. On balance it is considered to be beneficial overall	Not Applicable	Beneficial

A63 Castle Street Improvements, Hull - Appraisal Summary Table

HIGHWAYS AGENCY

Option: Cut and Cover Tunnel (Option 3)		Description: Provision of grade separate junction at Mytongate (A63 lowered), A63 in cut and cover tunnel to Market Place, LAR between Mytongate and Market Place, footbridge at Porter Street.	Problems: Major traffic congestion and RTAs at Mytongate, severance of Humber Dock Area	Present Value of Costs to Public Accounts £371.3m
OBJECTIVE	**SUB-OBJECTIVE**	**QUALITATIVE IMPACTS**	**QUANTITATIVE ASSESSMENT**	**ASSESSMENT**
ENVIRONMENT	**Noise**	750 people will experience a noise increase, 4767 will experience no change in noise level and 1520 people will experience a noise decrease with regard to changes defined by the worksheet noise bands. There is predicted to be a net decrease in noise levels resulting in a decrease in people annoyed by traffic noise giving a beneficial impact. There is predicted to be 314 properties exposed to noise levels of 68 dB(A) and greater in the 15th year after opening.	Estimated Population Annoyed (EPA) in the study area. Without scheme, 1791. With scheme, 1735.	Net population win 56. NPV £1,464,776
	Local Air Quality	The study area is located in Hull AQMA for annual mean NO_2. Ongoing monitoring has identified that current long term NO_2 concentrations exceed the statutory objective for human health. For this option it is predicted that all properties located within 200 m of the roads assessed would not exceed the annual statutory objective. Model results predict an overall improvement in air quality for the study area, although it should be noted that for a number of specific selected receptors modelled the predicted NO_2 concentration from this option are up to 0.59 $\mu g/m^3$ higher than the do minimum scenario. Furthermore, it should be noted that this option is predicted to result in the largest area of exceedence of the statutory objective; though the extent of this exceedence is predicted to occur along the A63 carriageway only, i.e. not at sensitive receptors. The key driver for the overall reduction in NO_2 is considered to be the improvement in UK vehicle fleet emissions due to advancements in vehicle emission technology. The predicted area of exceedence is considered likely to be caused by flow restrictions due to signalling at the west side of the cut and cover tunnel. Existing annual mean PM_{10} concentrations are well below the statutory objective. It is predicted that future concentrations will decrease further below the statutory objective due to this option. Demolition requirements: Castle Buildings (Grade II Listed); Earl de Grey PH (Grade II Listed); Properties 16 – 65 nr Dagger Road.	NO_2 Number of properties with an improvement: 3427 Number of properties with a deterioration: 2117 PM_{10} Number of properties with an improvement: 3002 Number of properties with a deterioration: 2542	Net total Assessment for NO_2: - 519.61 Net total Assessment for PM_{10}: - 24.19
	Greenhouse Gases	A slight decrease in annual average daily traffic flow within the study area is considered to be the main driver for the reduced emissions of CO_2 from this scheme option.	Whole appraisal period: -10,939 tonnes of C Scheme opening year (2017): -176 tonnes of C	NPV: £302,424
	Landscape	Not assessed due to entire urban nature of scheme corridor.	No features affected	Neutral
	Townscape	Overall baseline quality of townscape in study area assessed as ordinary to good; qualities of different townscape areas range from poor to high quality. Option approximately follows existing alignment of A63 however it would cause significant damage to the locally distinctive and attractive Trinity Burial Ground. Option results in demolition of culturally important and distinctive Castle Buildings, Earl de Grey public house, north wall to Humber Dock (all listed) together with residential areas of Trinity Square and Grammar School Yard, affecting land use and density of this central area. Tunnelled section of A63 would improve townscape within central area, removing traffic from view. Improved setting would be highly dependant on the detailed design of LAR and surrounding public areas. Should proposed mitigation measures be implemented then long term townscape impact has the potential to be neutral to slight beneficial.	Not applicable	Large Adverse
	Heritage of Historic Resources	Option would have a very large and direct adverse effect on High and Medium grade heritage assets such they would be lost or significantly damaged. Includes demolition of two Listed Buildings, partial demolition of another, and major impacts on archaeological sites within the medieval Old Town. Moderate impact on Holy Trinity Burial ground; would require exhumation of burials. No potential for archaeological preservation in situ, and construction will need to be preceded by extensive archaeological excavation. Potential for as yet undiscovered archaeological assets is assessed to be High.	The proposals will have an adverse effect on 91 known cultural heritage assets, including 2 Very Large adverse, 6 Large adverse, 20 Moderate adverse, 46 Slight adverse and 15 Neutral adverse impacts. Also two Slight beneficial impacts.	Very Large adverse (negative) effect
	Biodiversity	There would be moderate impacts on the Trinity Burial Ground SNCI including foraging/roosting bats and mature trees. Fewer mature trees would be affected than with the other options. Negative impacts would be minimised by retaining existing vegetation wherever possible and creating species-rich grassland and planting new trees. The mitigation measures would reduce the overall impact of the scheme to slight adverse.	20 Mature trees likely to be lost (incl. 8 with moderate or high bat roost potential) / approx. 0.6 ha (50%) of SNCI lost.	Slight Adverse
	Water Environment	The Humber Estuary and River Hull are outside the proposed road improvement corridor so will have minimal impacts. The site is not situated within a Groundwater Source Protection Zone, Nitrate Vulnerable Zone or Nitrate Sensitive Area. The northern section of Humber Dock will be affected by the proposals as they involve land take within the old dock. Surface water runoff to be collected, stored and have a controlled discharge into existing drainage system. The ends of tunnel ramps raised to prevent flooding.	Spillage risk is 0.17%, (urban area, emergency services response time of 20 mins) <1%, no further spillage risk measures will be required.	Neutral
	Physical Fitness	Consolidation of crossing points and replacement with footbridges at each end of the scheme will result in increased journey time and physical exertion. The more convivial NMU environment at Princes Quay may boost pedestrian activity.	Not applicable	Slight Beneficial
	Journey Ambience	Impact on traveller care neutral. Travellers on A63 will experience significantly worse views as vehicles descend into the cutting and the new footbridge will result in travellers experiencing worse views. The scheme will lead to a reduction in congestion and delays and will reduce conflict between vehicles and pedestrians thus reducing driver stress, the reduction will be offset slightly by increased driver stress due to restricted view in underground sections - overall stress will be reduced.	Not applicable	Large Beneficial
SAFETY	**Accidents**	Accident savings arising from scheme improvements (Do Minimum accidents – Do Something accidents).	Accidents Fatal Serious Slight 101 1 12 128	PVB £4.709m
	Security	Improvements to Castle Street will reduce the likelihood of vehicle travellers slowing or stopping. The tunnel will incorporate lighting and CCTV. New footbridges/signalised crossings would be well designed and adequately lit.	Not applicable	Slight Positive
ECONOMY	**Public Accounts**	Costs to central government arising from scheme improvements. Cost range P10, P50 and P90	Central Govt PVC	PVC P10 £166.893m, P50 £183.067m P90 £ 209.32m
	Transport Economic Efficiency: Business Users & Transport Providers	Journey time savings and reduced congestion along the A63.	Users PVB, Transport Providers PVB, Other PVB	PVB £101.801m
	Transport Economic Efficiency: Consumers	Benefits to consumers arising from scheme improvements	Users PVB	PVB £64.615m
	Reliability	Improvements to existing route		Slight Beneficial
	Wider Economic Impacts	In terms of job creation it is estimated that the Cut and Cover Tunnel Option will generate between 2,179 and 5,667 additional new jobs. This equates to economic benefits of between £58 million and £153 million.		Neutral
ACCESSIBILITY	**Option values**	These were not a consideration for the proposed improvements.		PVB £m
	Severance	The key desire lines crossing the A63 occur at Princes Dock and Mytongate Junction. At Mytongate the provision of a dedicated pedestrian footbridge on the overbridge will result in a decrease in severance. The reduction in traffic due to the removal of the A63 traffic into the tunnel together with wider footways will increase the amenity value of the Prince's dock areas and will reduce community severance in this location.	Not applicable	Large Beneficial
	Access to the Transport System	No direct impact to existing public transport. Possibility of improved local bus services.		Neutral
INTEGRATION	**Transport Interchange**	The proposals do not affect transport interchange	Not applicable	Neutral
	Land-Use Policy	This option scores well in relation to transport and regeneration policies and relatively poorly in terms of the environment particularly in relation to cultural heritage. This option scores comparatively well in terms of access for pedestrians and cyclists. On balance it is considered to be beneficial overall.	Not applicable	Beneficial
	Other Government Policies	This option would assist policies that relate to transport and the economy with significant benefits in terms of economic regeneration. There are however some environmental disbenefits. On balance it is beneficial overall	Not applicable	Beneficial

A63 Castle Street Improvements, Hull
Appraisal Summary Table

Option: Overground Base (Option 4)		Description: Provision of grade separate junction at Mytongate (A63 raised), footbridges at Porter Street, Princes Dock and Market Place.	Problems: Major traffic congestion and RTAs at Mytongate, severance of Humber Dock Area	Present Value of Costs to Public Accounts £146.7m
OBJECTIVE	**SUB-OBJECTIVE**	**QUALITATIVE IMPACTS**	**QUANTITATIVE ASSESSMENT**	**ASSESSMENT**
ENVIRONMENT	**Noise**	916 people will experience a noise increase, 5293 will experience no change in noise level and 911 people will experience a noise decrease with regard to changes defined by the worksheet noise bands. There is predicted to be a net decrease in noise levels resulting in a decrease in people annoyance by traffic noise giving a beneficial impact. There is predicted to be 383 properties exposed to noise levels of 68 dB(A) and greater in the 15th year after opening.	Estimated Population Annoyed (EPA) in the study area. Without scheme, 1847. With scheme, 1837.	Net population win 10. NPV £44,819
	Local Air Quality	The study area is located in Hull AQMA for annual mean NO_2. Ongoing monitoring has identified that current long term NO_2 concentrations exceed the statutory objective for human health. For this option it is predicted that all properties located within 200 m of the roads assessed would not exceed the annual statutory objective. Model results predict an overall improvement in air quality for the study area, although it should be noted that for a number of specific selected receptors modelled the predicted NO_2 concentration from this option are up to 0.2 $\mu g/m^3$ higher than the do minimum scenario. The key driver for the overall reduction in NO_2 is considered to be the improvement in UK vehicle fleet emissions due to advancements in vehicle emission technology. Existing annual mean PM_{10} concentrations are well below the statutory objective. It is predicted that future concentrations will decrease further below the statutory objective due to this option. Demolition requirements: Castle Buildings (Grade II Listed); Earl de Grey PH (Grade II Listed).	NO_2 Number of properties with an improvement: 3286 Number of properties with a deterioration: 2258 PM_{10} Number of properties with an improvement: 3008 Number of properties with a deterioration: 2536	Net total Assessment for NO_2: - 310.29 Net total Assessment for PM_{10}: - 16.14
	Greenhouse Gases	Although traffic flow along the A63 Castle Street will be smoother, an increase in traffic flow and speed on this link is predicted. This is considered likely to be the main driver in the overall increase in emissions of CO_2 from this scheme option.	Whole appraisal period: 4,275 tonnes of C Scheme opening year (2017): 67 tonnes of C	NPV: -£126,250
	Landscape	Not assessed due to entire urban nature of scheme corridor.	No Features Affected	Neutral
	Townscape	Overall baseline quality of townscape in study area is assessed as ordinary to good; qualities of different townscape areas range from poor to high quality. Option largely follows existing highway layout but with an increased presence; wider footprint. There would be significant damage to locally distinctive and attractive Trinity Burial Ground. Option would result in demolition of culturally important and distinctive Castle Buildings, Earl de Grey public house and north wall to Humber Dock (all listed). Raised section of A63 over Mytongate junction and three new pedestrian footbridges would be visually intrusive features within local predominantly flat townscape. Option presents an opportunity to create new public spaces and increase human interaction beneath viaduct section adjacent to Trinity Burial Ground. Should proposed mitigation be implemented and three footbridges removed or be iconic structures then overall score could be reduced to slight to moderate adverse.	Not applicable	Moderate Adverse
	Heritage of Historic Resources	Option would have a large and direct adverse effect on High and Medium grade heritage assets, either lost or significantly damaged, including demolition of two Listed Buildings and the partial demolition of another. Moderate impact on Holy Trinity burial ground; would require exhumation of burials. Some potential for archaeological preservation in situ, depending on detailed design, but construction will need to be preceded by some excavation. Potential for as yet undiscovered archaeological assets during excavations at Mytongate is assessed to be Medium.	The proposals will have an adverse effect on 44 known cultural heritage assets, including 4 Large adverse, 11 Moderate adverse, 24 Slight adverse and 5 Neutral adverse impacts.	Large adverse (negative) effect
	Biodiversity	There would be moderate impacts on the Trinity Burial Ground SNCI, foraging/roosting bats and mature trees. Negative impacts will be minimised through retention of existing vegetation and creation of species-rich grassland together with planting new trees. The mitigation measures will reduce the overall impact of the scheme to slight adverse.	23 Mature trees likely to be lost (incl. 7 with moderate or high bat roost potential) / approx. 0.4ha (33%) of SNCI lost.	Slight Adverse
	Water Environment	The Humber Estuary and River Hull are outside the proposed road improvement corridor so will have minimal impacts. The site is not situated within a Groundwater Source Protection Zone, Nitrate Vulnerable Zone or Nitrate Sensitive Area.	Spillage risk is 0.25%, (urban area, emergency services response time of 20 mins) <1%, no further spillage risk measures will be required.	Neutral
	Physical Fitness	Consolidation/removal of crossing points and replacement with footbridges will result in increased journey time and physical exertion. Alterations to Ferensway will decrease physical activity whilst increasing journey time.	Not applicable	Slight Beneficial
	Journey Ambience	Impact on traveller care neutral. Travellers on the A63 would experience improved views in the elevated sections; however the new footbridges will restrict views in these locations. Travellers views will be better overall. The scheme will reduce congestion, enable traffic to flow more freely and reduce conflict between vehicles and pedestrians. Traveller stress will be better.	Not applicable	Large Beneficial
SAFETY	**Accidents**	Accident savings arising from scheme improvements (Do Minimum accidents – Do Something accidents).	Accidents Fatal Serious Slight 98 1 10 123	PVB £4.674m
	Security	Improvements to Castle Street will reduce the likelihood of vehicle travellers slowing or stopping. New footbridges would be well designed and adequately lit.	Not applicable	Slight Positive
ECONOMY	**Public Accounts**	Costs to central government arising from scheme improvements. Cost range P10, P50 and P90	Central Govt PVC	PVC P10 £65.508m, P50 £72.729m P90 £79.739m
	Transport Economic Efficiency: Business Users & Transport Providers	Journey time savings and reduced congestion along the A63.	Users PVB, Transport Providers PVB, Other PVB	PVB £110.336m
	Transport Economic Efficiency: Consumers	Benefits to consumers arising from scheme improvements	Users PVB	PVB £76.47m
	Reliability	Improvements to existing route		Slight Beneficial
	Wider Economic Impacts	In terms of job creation it is estimated that the Base Scheme Option will generate between 1,923 and 2,858 additional new jobs. This equates to economic benefits of between £51 million and £77 million.		Neutral
ACCESSIBILITY	**Option values**	These were not a consideration for the proposed improvements.		PVB £m
	Severance	The key desire lines crossing the A63 occur at Prince's Dock and Mytongate. At Mytongate the provision of a dedicated pedestrian footpath under the bridge will result in decreases journey times and a decrease in severance. At Princes Dock the provision of a single footbridge will result in increase journey lengths and a need to climb, resulting in an increase in severance in this area. Overall on balance there will be a slight reduction in severance for the option.	Not applicable	Large Beneficial
	Access to the Transport System	The proposals do not directly affect the existing public transport within the A63 corridor, and access to the transport system is not considered at this stage.		
INTEGRATION	**Transport Interchange**	The proposals do not affect transport interchange issues	Not applicable	Neutral
	Land-Use Policy	This option scores well in relation to transport and regeneration policies but relatively poorly in terms of the environment particularly in relation to the built environment. On balance it is considered to be beneficial overall.	Not applicable	Beneficial
	Other Government Policies	This option assists policies that relate to transport and the economy with significant benefits in terms of economic regeneration. There are however some environmental disbenefits. On balance it is considered to be beneficial overall	Not applicable	Beneficial

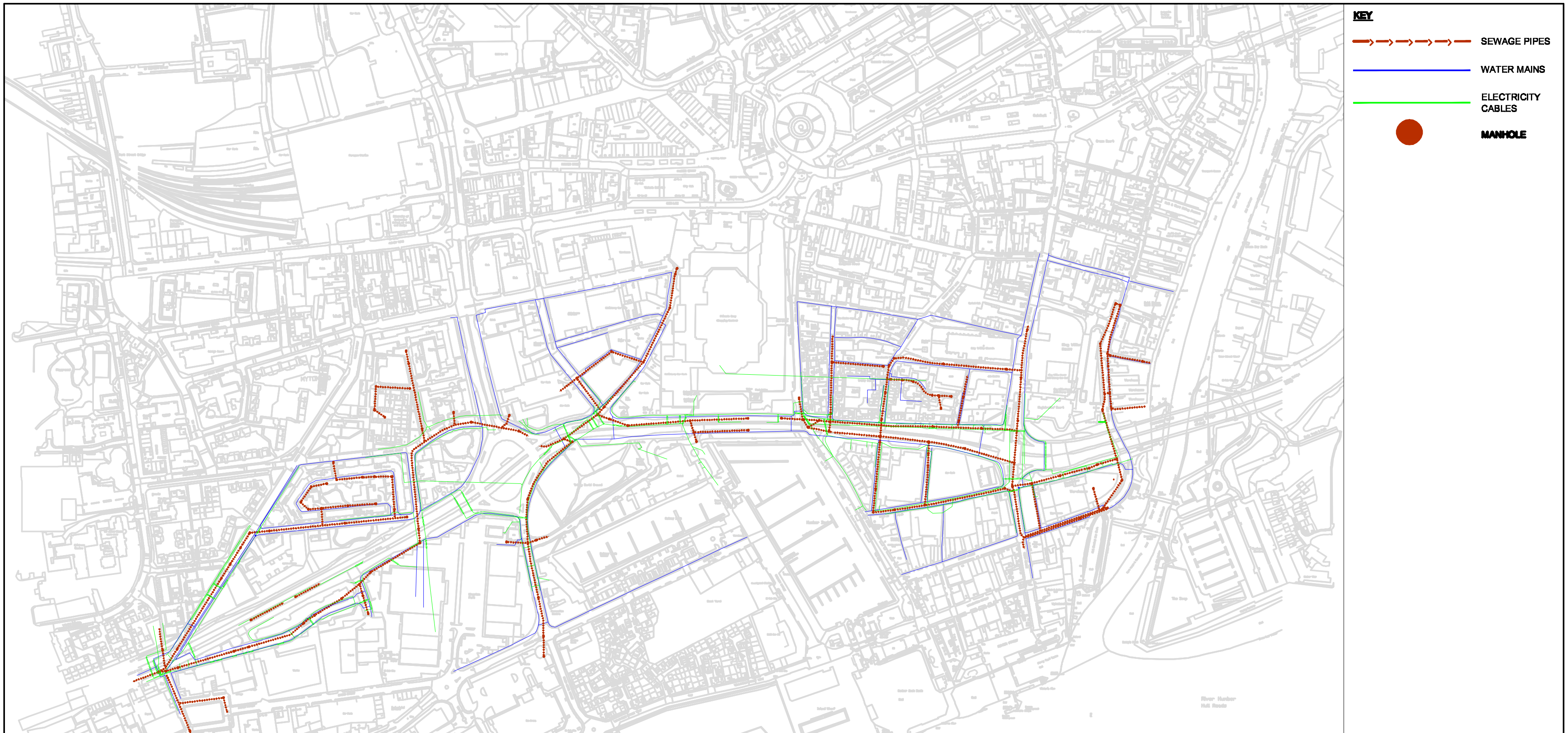
A63 Castle Street Improvements, Hull
Appraisal Summary Table

Option: Overground Landbridge (Option 5)		Description: Provision of grade separate junction at Mytongate (A63 raised), A63 on raised viaduct to Princes Dock Street, pedestrian landbridge 1m bgl at in front of Princes Quay, footbridges at Porter Street and Market Place.	Problems: Major traffic congestion and RTAs at Mytongate, severance of Humber Dock Area	Present Value of Costs to Public Accounts £243.5m
OBJECTIVE	**SUB-OBJECTIVE**	**QUALITATIVE IMPACTS**	**QUANTITATIVE ASSESSMENT**	**ASSESSMENT**
ENVIRONMENT	**Noise**	1152 people will experience a noise increase, 4951 will experience no change in noise level and 1017 people will experience a noise decrease with regard to changes defined by the worksheet noise bands. There are predicted to be both noise increases and decreases resulting in no change in the number of people annoyance by traffic noise giving a neutral impact. There is predicted to be 376 properties exposed to noise levels of 68 dB(A) and greater in the 15th year after opening.	Estimated Population Annoyed (EPA) in the study area. Without scheme, 1847. With scheme, 1847.	Net population win/lose 0. NPV £273,010
	Local Air Quality	The study area is located in Hull AQMA for annual mean NO_2. Ongoing monitoring has identified that current long term NO_2 concentrations exceed the statutory objective for human health. For this option it is predicted that all properties located within 200 m of the roads assessed would not exceed the annual statutory objective. Model results predict an overall improvement in air quality for the study area, although it should be noted that for a number of specific selected receptors modelled the predicted NO_2 concentration from this option are up to 0.1 $\mu g/m^3$ higher than the do minimum scenario. The key driver for the overall reduction in NO_2 is considered to be the improvement in UK vehicle fleet emissions due to advancements in vehicle emission technology. Existing annual mean PM_{10} concentrations are well below the statutory objective. It is predicted that future concentrations will decrease further below the statutory objective due to this option. Demolition requirements: Castle Buildings (Grade II Listed); Earl de Grey PH (Grade II Listed); Marina Court Hotel.	NO_2 Number of properties with an improvement: 3274 Number of properties with a deterioration: 2270 PM_{10} Number of properties with an improvement: 2770 Number of properties with a deterioration: 2774	Net total Assessment for NO_2: - 435.12 Net total Assessment for PM_{10}: - 27.95
	Greenhouse Gases	A slight decrease in annual average daily traffic flow within the study area is considered to be the main driver for the reduced emissions of CO_2 from this scheme option.	Whole appraisal period: -789 tonnes of C Scheme opening year (2017): -16 tonnes of C	NPV: £23,921
	Landscape	Not assessed due to entire urban nature of scheme corridor.	No Features Affected	Neutral
	Townscape	Overall baseline quality of townscape in study area assessed as ordinary to good; qualities of different townscape areas range from poor to high quality. Option follows existing highway alignment and layout but with longer elevated viaduct section (compared to option 1) increasing presence/footprint of road. There would be significant damage to locally distinctive Trinity Burial Ground. Between Humber and Prince's Docks viaduct and land bridge structure beneath would be highly visible in this open area, negatively affecting scale/appearance of docks. Option results in demolition of culturally important and distinctive Castle Buildings, Earl de Grey public house and north wall to Humber Dock (all listed). Leisure club wing to Holiday Inn also demolished affecting land use of area. New pedestrian footbridges would be highly intrusive visual features, out of scale with local townscape. Option presents an opportunity to create new public space beneath viaduct section linked to Trinity Burial Ground increasing human interaction in the area. Should proposed mitigation be implemented, two footbridges removed or become iconic structures with land bridge and surrounding areas sympathetically designed, then overall assessment score could be reduced to moderate adverse.	Not applicable	Large Adverse
	Heritage of Historic Resources	Option would have a large and direct adverse effect on High and Medium grade heritage assets such that they would be lost or significantly damaged, including the demolition of two Listed Buildings and the partial demolition of another. Moderate impact on Holy Trinity Burial ground; would require exhumation of burials. Some potential for archaeological preservation in situ, depending on detailed design, but construction will need to be preceded by some excavation. Potential for as yet undiscovered archaeological assets at Mytongate is assessed to be Medium.	The proposals will have an adverse effect on 54 known cultural heritage assets, including 4 Large adverse, 14 Moderate adverse, 30 Slight adverse and 6 Neutral adverse impacts.	Large adverse (negative) effect
	Biodiversity	There would be moderate impacts on the Trinity Burial Ground SNCI, foraging/roosting bats and mature trees. Negative impacts will be minimised by retaining existing vegetation wherever possible, together with creation of species-rich grassland and new tree planting. The mitigation measures will reduce the overall impact of the scheme to slight adverse.	25 Mature trees likely to be lost (incl. 6 with moderate or high bat roost potential) / approx. 0.4 ha (33%) of SNCI lost.	Slight Adverse
	Water Environment	The Humber Estuary and River Hull are outside the proposed improvement corridor so will have minimal impacts. The site is not situated within a Groundwater Source Protection Zone, Nitrate Vulnerable Zone or Nitrate Sensitive Area.	Spillage risk is 0.18%, (urban area, emergency services response time of 20 mins) <1%, no further spillage risk measures will be required.	Neutral
	Physical Fitness	Removal of crossing points and replacement with footbridges at each end of the scheme will result in increased journey time and physical exertion. The provision of the landbridge (subway) will lead to slightly increased physical exertion.	Not applicable	Slight Beneficial
	Journey Ambience	Impact on traveller care neutral. Travellers on the A63 would experience improved extensive views in the elevated sections; however the new footbridges will restrict views in these locations - better overall. The scheme will reduce congestion, enable traffic to flow more freely and reduce conflict between vehicles and pedestrians. Traveller stress will be better.	Not applicable	Large Beneficial
SAFETY	**Accidents**	Accident savings arising from scheme improvements (Do Minimum accidents – Do Something accidents).	Accidents Fatal Serious Slight 132 1 14 168	PVB £6.315m
	Security	Improvements to Castle Street will reduce the likelihood of vehicle travellers slowing or stopping. Landbridge shaded by viaduct and 1m bgl, perception as a wide underpass. Amenity dependant on maintenance regime.	Not applicable	Neutral
ECONOMY	**Public Accounts**	Costs to central government arising from scheme improvements. Cost range P10, P50 and P90	Central Govt PVC	PVC P10 £118.733m, P50 £ 134.399m P90 £150.075m
	Transport Economic Efficiency: Business Users & Transport Providers	Journey time savings and reduced congestion along the A63.	Users PVB, Transport Providers PVB, Other PVB	PVB £82.886m
	Transport Economic Efficiency: Consumers	Benefits to consumers arising from scheme improvements	Users PVB	PVB £53.309m
	Reliability	Improvements to existing route		Slight Beneficial
	Wider Economic Impacts	In terms of job creation it is estimated that the Landbridge Option will generate between 1,923 and 3,412 additional new jobs. This equates to economic benefits of between £51 million and £92 million.		Neutral
ACCESSIBILITY	**Option values**	These were not a consideration for the proposed improvements.		PVB £m
	Severance	The key desire lines crossing the A63 occur at Prince's Dock and Mytongate. At Mytongate the provision of a dedicated pedestrian footpath under the overbridge will result in decreased journey times and severance. At Princes Dock the provision of a landbridge 1m bgl will result in increase journey lengths and a need to climb, resulting in a slight increase in severance in this area. On balance there will be a slight reduction in severance.	Not Applicable	Large Beneficial
	Access to the Transport System	The proposals do not directly affect the existing public transport within the A63 corridor, and access to the transport system is not considered at this stage.		Neutral
INTEGRATION	**Transport Interchange**	The scheme does not affect transport interchange issues	Not Applicable	Neutral
	Land-Use Policy	This scheme scores well in relation to transport and regeneration policies but relatively poorly in terms of the environment; particularly in elation to the built environment. On balance it is beneficial overall.	Not Applicable	Beneficial
	Other Government Policies	This option assists policies that relate to transport and the economy with significant benefits in terms of economic regeneration. There are however some environmental disbenefits. On balance it is beneficial overall	Not Applicable	Beneficial

A63 Castle Street Improvements, Hull
Appraisal Summary Table

Option: Extended Viaduct (Option 6)		Description: Provision of grade separate junction at Mytongate (A63 raised), A63 on raised viaduct to Myton Swing bridge , LAR running beneath viaduct from Mytongate to market Place, footbridge at Porter Street.	Problems: Major traffic congestion and RTAs at Mytongate, severance of Humber Dock Area	Present Value of Costs to Public Accounts £340.6m
OBJECTIVE	**SUB-OBJECTIVE**	**QUALITATIVE IMPACTS**	**QUANTITATIVE ASSESSMENT**	**ASSESSMENT**
ENVIRONMENT	**Noise**	1182 people will experience a noise increase, 4715 will experience no change in noise level and 1140 people will experience a noise decrease with regard to changes defined by the worksheet noise bands. There is predicted to be a net increase in noise levels resulting in an increase in people annoyance by traffic noise giving a negative impact. There is predicted to be 349 properties exposed to noise levels of 68 dB(A) and greater in the 15th year after opening.	Estimated Population Annoyed (EPA) in the study area. Without scheme, 1791. With scheme, 1813.	Net population lose 22. NPV -£734,136
	Local Air Quality	The study area is located in Hull AQMA for annual mean NO_2. Ongoing monitoring has identified that current long term NO_2 concentrations exceed the statutory objective for human health. For this option it is predicted that all properties located within 200 m of the roads assessed would not exceed the annual statutory objective. Model results predict an overall improvement in air quality for the study area, although it should be noted that for a number of specific selected receptors modelled the predicted NO_2 concentration from this option are up to 0.22 $\mu g/m^3$ higher than the do minimum scenario. The key driver for the overall reduction in NO_2 concentrations at ground level receptors is considered to be the increased dispersion of exhaust emissions along the elevated section of the A63 Castle Street. Existing annual mean PM_{10} concentrations are well below the statutory objective. It is predicted that future concentrations will decrease further below the statutory objective due to this option. Demolition requirements: Castle Buildings (Grade II Listed); Earl de Grey PH (Grade II Listed); Marina Court Office Blocks (x3) and Temporary Buildings; Properties 16 – 65 nr Dagger Road; Castle St/Queen St Carpark	NO_2 Number of properties with an improvement: 2717 Number of properties with a deterioration: 2827 PM_{10} Number of properties with an improvement: 2334 Number of properties with a deterioration: 3210	Net total Assessment for NO_2: - 401.70 Net total Assessment for PM_{10}: - 3.14
	Greenhouse Gases	A slight decrease in annual average daily traffic flow within the study area is considered to be the main driver for the reduced emissions of CO_2 from this scheme option.	Whole appraisal period: -5,447 tonnes of C Scheme opening year (2017): -80 tonnes of C	NPV: £155,907
	Landscape	Not assessed due to entire urban nature of scheme corridor.	No Features Affected	Neutral
	Townscape	Overall baseline quality of townscape in study area is assessed to be ordinary to good; qualities of different townscape areas range from poor to high quality. Option approximately follows existing alignment of the A63 but would cause significant damage to the locally distinctive and attractive Trinity Burial Ground. Option results in demolition of culturally important and distinctive Castle Buildings, Earl de Grey public house and north wall to Humber Dock (all listed). Land use and density of central area affected by demolition of residential areas at Trinity Square and Grammar School Yard. The long viaduct would be highly visible from surrounding areas along it's entire length, negatively impacting townscape quality and general appearance of the area. Viaduct would affect scale of currently open areas at Humber/Prince's Dock restricting views. Beneath viaduct LAR presents an opportunity for further detailed design to improve appearance of the area and human interaction with connectivity on a north/south axis. Should mitigation measures proposed be implemented then long term townscape impact has the potential to be moderate adverse.	Not applicable	Large Adverse
	Heritage of Historic Resources	Option would have a very large and direct adverse effect on High and Medium grade heritage assets such that they would be lost or significantly damaged. Includes the demolition of two Listed Buildings and partial demolition of another. Potentially major impacts on archaeological sites within the medieval Old Town. Moderate impact on Holy Trinity Burial ground; would require exhumation of burials. Some potential for archaeological preservation in situ, depending on detailed design, but construction will need to be preceded by archaeological excavation. Potential for as yet undiscovered archaeological assets during viaduct foundation is High. Significant visual intrusion due to height and length of viaduct.	The proposals will have an adverse effect on 92 known cultural heritage assets, including 8 Large adverse, 22 Moderate adverse, 47 Slight adverse and 15 Neutral adverse impacts.	Very Large adverse (negative) effect
	Biodiversity	There would be moderate impacts on the Trinity Burial Ground SNCI, foraging/roosting bats and mature trees. This option would affect the most mature trees. Negative impacts would be minimised by retaining existing vegetation and creating species-rich grassland with planting of new trees. Mitigation measures would reduce the overall impact to slight adverse.	29 Mature trees likely to be lost (incl. 8 with moderate or high bat roost potential) / approx. 0.6 ha (50%) of SNCI lost.	Slight Adverse
	Water Environment	The Humber Estuary and River Hull are outside the proposed road improvement corridor so will have minimal impacts. The site is not situated within a Groundwater Source Protection Zone, Nitrate Vulnerable Zone or Nitrate Sensitive Area.	Spillage risk is 0.23%, (urban area, emergency services response time of 20 mins) <1%, no further spillage risk measures will be required.	Neutral
	Physical Fitness	The footbridge at Porter Street would increase physical fitness in comparison to the two previous street level crossings. However the removal of the A63 at street level shall decrease the levels of physical exertion as there are likely to be a number of potential at grade crossing opportunities.	Not applicable	Slight Disbenefit
	Journey Ambience	Impact on traveller care neutral. Travellers on the A63 would experience extensive views in the elevated sections; thi sis offset slightly by the LAR which would experience restricted views. Overall travellers views would better. The scheme will reduce congestion, enable traffic to flow more freely and reduce conflict between vehicles and pedestrians. Traveller stress will be better.	Not applicable	Large Beneficial
SAFETY	**Accidents**	Accident savings arising from scheme improvements (Do Minimum accidents – Do Something accidents).	Accidents Fatal Serious Slight 83 1 10 104	PVB £4.194m
	Security	Improvements to Castle Street will reduce the likelihood of vehicle travellers slowing or stopping. New footbridges/crossings well designed and lit. Viaduct will overshadow pedestrians routes	Not Applicable	Slight Positive
ECONOMY	**Public Accounts**	Costs to central government arising from scheme improvements. Cost range P10, P50 and P90	Central Govt PVC	PVC P10 £169.861m, P50 £193.711m P90 £ 217.575m
	Transport Economic Efficiency: Business Users & Transport Providers	Journey time savings and reduced congestion along the A63.	Users PVB, Transport Providers PVB, Other PVB	PVB £88.673m
	Transport Economic Efficiency: Consumers	Benefits to consumers arising from scheme improvements	Users PVB	PVB £62.086m
	Reliability	Improvements to existing route		Slight Beneficial
	Wider Economic Impacts	In terms of job creation it is estimated that the Full Viaduct Option will generate between 2,179 and 4,516 additional new jobs. This equates to economic benefits of between £58 million and £121 million.		Score
ACCESSIBILITY	**Option values**	These were not a consideration for the proposed improvements.		PVB £m
	Severance	The key desire lines crossing the A63 occur at Prince's Dock and Mytongate. At Mytongate the provision of a dedicated pedestrian footpath beneath the viaduct will result in decreased journey times and a decrease in severance. The reduction in traffic and removal of the A63 traffic onto the viaduct will reduce community severance.	Not applicable	Large Beneficial
	Access to the Transport System	No direct impact to existing public transport. Possibility of improved local bus services.		Neutral
INTEGRATION	**Transport Interchange**	No direct impact to transport interchange	Not Applicable	Neutral
	Land-Use Policy	This option scores well in relation to transport and regeneration policies and relatively poorly in terms of the environment particularly in relation to the built environment and cultural heritage. This option scores comparatively well in terms of access for pedestrians and cyclists. On balance it is considered to be beneficial overall.	Not applicable	Beneficial
	Other Government Policies	The option assists policies that relate to transport and the economy with significant benefits in terms of economic regeneration. There are however some environmental disbenefits. On balance it is beneficial overall.	Not applicable	Beneficial

Appendix F – Statutory Bodies Information



Pell Frischmann

Architect/Client/Contractor

HIGHWAYS AGENCY

Project

A63 CASTLE STREET IMPROVEMENTS, HULL

Drawing Title

STATUTORY BODIES INFORMATION
FIGURE 15A

	Name	Date
Drawn	ND	04/07
Designed	ND	04/07
Checked	SH	04/07
Approved	AW	04/07

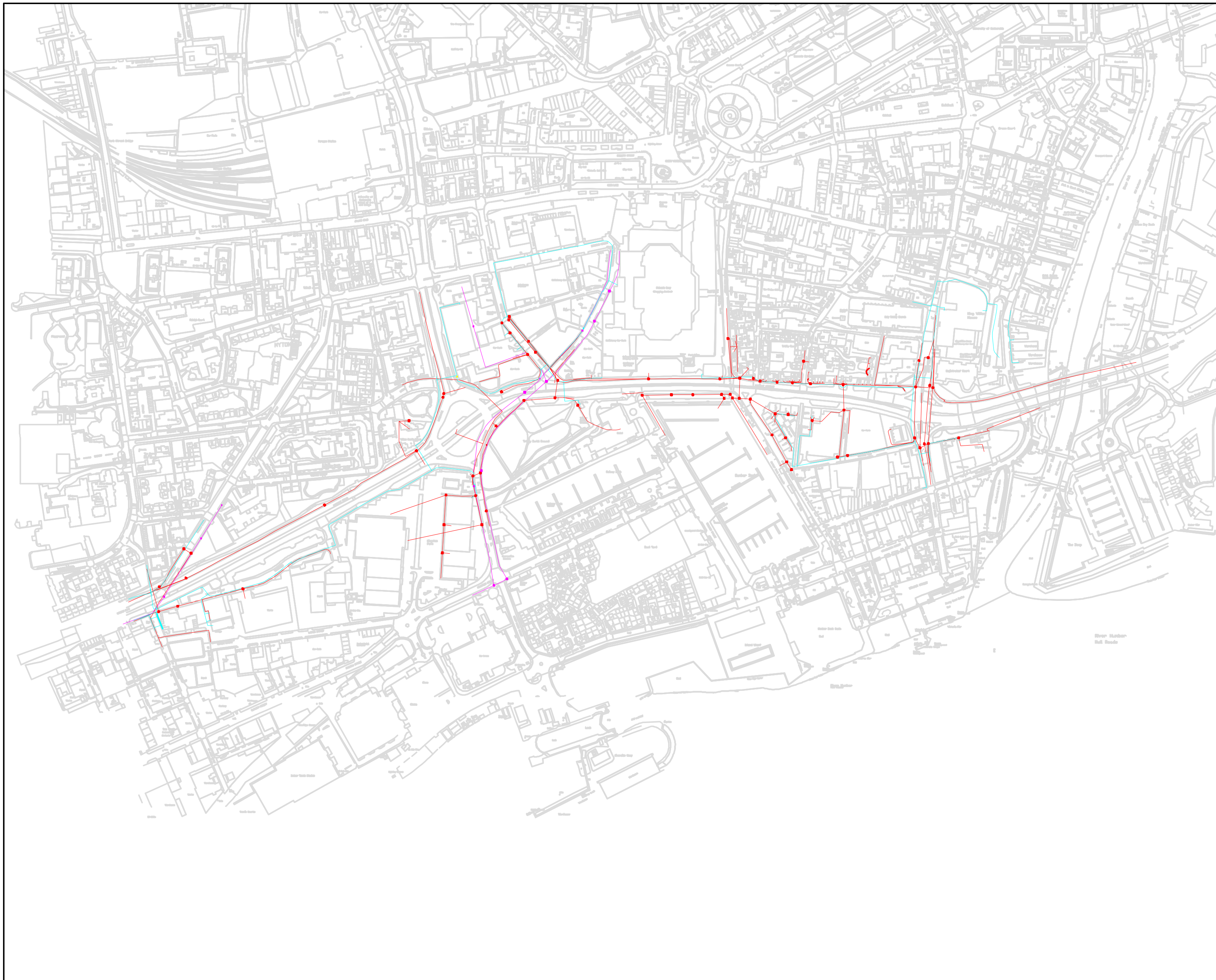
Scale 1:2500

File No. W11189_05_01.dwg

Drawing Status STATUS

Drawing No. **W1189/05/02**

Revision -



KEY

- ST CABLES
- ST CABLE JOINT BOX
- ST CABLE MANHOLE
- GAS WORKS
- KINGSTON COMMUNICATIONS
- KINGSTON COMMUNICATION JOINTING CHAMBER
- KINGSTON COMMUNICATION MANHOLE
- JC DECAUX STREET FURNITURE

REV	DESCRIPTION	DRN	CHK	APP	DATE

Pell Frischmann

Architect/Client/Contractor

HIGHWAYS AGENCY

Project

A63 CASTLE STREET IMPROVEMENTS, HULL

Drawing Title

STATUTORY BODIES INFORMATION
FIGURE 15B

	Name	Date
Drawn	ND	04/07
Designed	ND	04/07
Checked	SH	04/07
Approved	AW	04/07

Scale 1:2500

File No. W11189_05_02.dwg

Drawing Status STATUS

Drawing No. **W1189/05/02**

Revision -