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1 Introduction

1.1 Purpose of Report

Amey were commissioned by Bedfordshire County Council to carry out a feasibility study into ways of improving access to the Woodside industrial area of Dunstable. This would avoid the need for heavy goods vehicles (HGV’s) to travel along the A5 High Street / A505 Church Street, through the congested town centre, or along the A505 Luton Road from Junction 11 of the M1.

The brief required the assessment of both non-road solutions and the possible provision of a new road, known as the Woodside Connection. Proposed options were to be justified on traffic congestion and environmental grounds whilst considering the economic impacts and supporting the considerable growth that is planned in the Dunstable and Houghton Regis area in the coming years.

Broad environmental constraints were initially identified for Dunstable / Houghton Regis area in a desk based study focusing on ecology, cultural heritage, landscape, water, air quality, soil and geology and noise. Following the identification of potential route corridors this desk study was developed into a more detailed environmental assessment. The conclusions drawn from this assessment are presented within this report.

The traffic modelling and assessment work necessary for this study was undertaken by Halcrow. Halcrow were responsible for the development of the traffic model for the proposed Luton Northern Bypass (LNB). It was felt that this model was more suited to the Woodside study than the A5-M1 Link model developed by the Highways Agency as the industrial area of Dunstable was more accurately represented.

This report has been prepared generally in accordance with the requirements of a Stage 1 Scheme Assessment given in the Design Manual for Roads and Bridges (TD37/93) with the addition of initial traffic assessment of preliminary route options due to the availability of the LNB model.

1.2 Background

Existing Conditions and Planned Growth

The opening of the M1 in 1959 has helped establish Dunstable as a commuter area for London and the Hertfordshire towns. This development has led to a considerable amount of growth in road traffic and congestion. This congestion in the principal urban areas of Dunstable, Houghton Regis and Leighton Buzzard is now at such a serious level that it is impacting on the quality of life and the prosperity of the town centre as well as the environment.
Further growth of the Luton / Dunstable and Houghton Regis is planned within the Milton Keynes and South Midlands Sub Regional Strategy which calls for an additional 26,300 dwellings in the period 2001 to 2021. The strategy also states;

**Luton/Dunstable/Houghton Regis**, where the emphasis should be on building the principal growth town into a vibrant, culturally diversified conurbation with a major improvement in the local economy and skills base, and capacity to meet housing need. This should be achieved through economic regeneration across the urban area, making the most of its location close to London and other economic drivers in the South East and its good transport links.

The above planned growth combined with the existing traffic congestion support the principal aims of this study to help reduce congestion in the Dunstable / Houghton Regis area.

**The Woodside Industrial Area**

![Map of Woodside Industrial Area](image)

Figure 1.1 Woodside Industrial Area

The Woodside Industrial Area is located to the east of Dunstable town centre and approximately 3km northwest of junction 11 of the M1. The area includes the central Woodside Estate between Poynters Road and Boscombe Road which is bordered to the northeast by the Apex Business Centre and to the north by Nimbus Park and Houghton Hall Park. A further extension of the estate is located to the northwest adjacent to Foster Avenue. The Chiltern Business Park borders the estate to the south and the White Lion Retail Park and the newly constructed Pro Logis Park lie to the east, adjacent to Boscombe Road.
In total there are 120 units made up of retail, light industrial and storage / distribution. The units take up approximately 4.5 million square feet of floorspace.

**Proposed Schemes in the Area**

There are a number of schemes proposed in the vicinity of South Bedfordshire that will help improve the strategic transport network. A brief synopsis of each is given below.

**A5 – M1 link or Dunstable Northern Bypass – preferred route announced March 2007**

The proposed link road consists of a new all-purpose dual two-lane carriageway running east from the A5, just to the north of the existing A5/A505 roundabout, to join the M1 at a new Junction 11a. The overall project cost is currently estimated to be £85million.

As part of the preferred route announcement the secretary of State said that there would be no connection to local roads at Junction 11a. The Secretary of States decision took into account the views of all those who responded to the A5-M1 Public Consultation exercise.

The route aims to reduce journey times and improve journey time reliability for long distance traffic currently travelling through Dunstable. This traffic will be able to use the M1 motorway as an alternative route. The proposals will also reduce traffic travelling to Junctions 11 and 12 from the local road network in Dunstable, Houghton Regis and surrounding villages.

**A5 Dunstable Queue Relocation Scheme**

The Dunstable A5 queue relocation scheme was designed to provide a co-ordinated traffic management control system using existing and new traffic signals along the A5. The scheme’s aims were to improve safety and accessibility for pedestrians; improve the accident safety record at Caddington Turn junction and lessen noise and pollution. Construction began in 1999 and was completed in 2004.

**M1 Widening - Junction 6A to 10 (on site)**

Works to widen the M1 between junctions 6A and 10, reducing congestion and improving both safety and journey time reliability, commenced mid March 2006 and are expected to be completed by autumn 2008.

The section of the M1 between Junctions 6A and 10 is approximately 10 miles long, stretching from the M25 through to Luton, and carries an average of 160,000 vehicles per day with long delays experienced at peak times.
Work will be carried out on both carriageways of the M1 between J6A and J10 to bring it up to a full standard four lane motorway with continuous hard shoulders.

M1 Widening - Junction 10 to 13 (planned)

This section of motorway currently carries between 100,000 and 130,000 vehicles per day and is significantly congested during peak times, at roadworks and incidents, causing delays and increasing the risk of accidents.

The proposed scheme seeks to widen approximately 15 miles (25km) of the M1 corridor from dual 3-lane motorway to dual 4 lanes plus associated junction improvements at junctions 11, 12 and 13. The estimated cost is £382 million.

The Luton – Dunstable Translink Guided Busway scheme (Orders Confirmed)

Translink is a proposed system of special buses capable of running both on their own track and on the public roads. The system will link Houghton Regis, Dunstable and Luton as shown in Figure 1.2.

Translink will serve a large number of destinations in the area, connecting the main housing areas of the conurbation with the main industrial areas, the three town centres, the main line rail stations in Luton, and London Luton airport.
The network is due to open by 2010 and a Transport & Works Act order for the Luton – Dunstable Translink was granted by the Secretary of State on 3rd November 2006.

Luton Northern Bypass (feasibility study complete)

Plans for a northern bypass of Luton have been in existence since the 1970s. More recently the scheme has been identified in the MKSM Growth Area Strategy as part of the transport infrastructure needed to allow expansion of the Luton/Dunstable area.

The bypass could potentially perform the following three functions:

- To be a key part of a route around the urban area.
- To form a new link between the M1 and the A505
- To be the main access to major new housing and employment sites located to the north of the M1 to A6 section of the new route.

HOV study

High occupancy vehicle (HOV) lanes are a form of dedicated lane, intended for vehicles carrying more than one person.

A preliminary study into suitable locations for HOV lanes in the UK identified a number of potential sites including the southbound section of the M1 between Juncions 10 and 7. It has subsequently been decided that an HOV lane should be implemented on both carriageways of the M1 between Juncions 7 and 10. The HOV lane will be implemented as part of the planned widening of this section of motorway.

1.3 Objectives

The objectives of this study were to review ways of improving access to the Woodside Industrial area to reduce the amount of HGV movements through the town centre, along the A5 High Street / A505 Church Street or along the A505 Luton Road from Junction 11 of the M1.

The study identifies a number of potential routes that will help achieve this objective and assesses them primarily on traffic and environmental grounds. Potential non-road solutions that could help reduce HGV movements within Dunstable and Houghton Regis are also identified. Conclusions are drawn and recommendations for further work are given.

To assist in the evaluation of the potential routes a questionnaire was sent out the individual businesses within the estate. The questionnaire sought to gain information on the number of HGV movements generated by each business and the preferred routes taken by drivers.

Given the current size of the industrial estate and the likelihood of future growth it was considered at an early stage that the non - HGV traffic generated by the estate is also likely to have a significant impact on congestion during peak periods. The study therefore also considers non-road solutions that would help reduce congestion caused by cars.
## 1.4 Approach and Scope

The report begins with considering the existing conditions. This details the current routes used to access the estate, traffic flows and accident data for key links together with results of the consultation with the businesses on the Industrial area.

Potential route options are then presented together with outline cost estimates. The section of the report also identifies potential non-road solutions that may lead to a reduction in congestion caused by both HGV and non-HGV traffic.

The potential route alignments are then reviewed against key engineering factors. Conclusions drawn within this section are relatively broad as only outline scheme designs have been prepared at this stage.

The findings of the environmental assessment are then summarised in Section 5. This assessment considers the impacts of each of the proposed route options against the following factors:

- Air Quality
- Cultural Heritage
- Disruption Due to Construction
- Ecology and Nature Conservation
- Landscape Effects
- Land Use
- Traffic Noise and Vibration
- Pedestrians, Cyclists, Equestrians and Community Effects
- Road Drainage and the Water Environment
- Geology and Soils
- Impact on Policies and Plans

Each of these topics have been assessed in accordance with the DMRB and initial Appraisal Summary Tables (Appendix I) were developed in line with Transport Analysis Guidance (TAG) Unit 3.2 (DfT, 2004).

Section 6 summarises the findings of the Halcrow work on the traffic appraisal. This appraisal assesses the implications of the do-minimum scenario (i.e. the existing situation including improvement schemes under construction and committed) and the various options (do-something) in the estimated year of opening (2011) and the fifteenth year after opening. It reports on the implications of these options on the network and in particular; congestion, accidents, accessibility and noise.

Conclusions are then drawn on each of the above assessments and recommendations for further studies and consultations are provided.
2 Existing Conditions

2.1 Description of current routes and traffic flows

HGV’s are directed to the industrial estate via the Boscombe Road Junction with the A505. This involves vehicles leaving the M1 at Junction 11, travelling along the A505 and turning right at the signalised junction with Boscombe Road. HGV’s travelling along the A5 move in an easterly direction at the junction with the A505 and then turn left at the Boscombe Road Junction. For HGV’s travelling southbound on the A5 this involves driving through Dunstable town centre.

Although HGV’s are directed toward Boscombe Road it was evident from observations made during a site visit on the 12th December 2006 that there are alternative routes used by HGV’s. These are outlined below and shown in Appendix A together with a street map of the local area.

Poynters Road

HGV’s leaving the M1 at junction 11 are directed to the industrial estate via the A505 and the Boscombe Road Junction. However, it was observed that a considerable number of HGV’s were instead choosing to turn right at the A505 roundabout with Poynters Road. HGV’s would then travel along Poynters Road and turn left at the roundabout with Porz Avenue to gain access to the estate.

Poynters Road is a relatively wide 30mph residential road with no weight restriction. There are no structures along the route and the carriageway, which appears to be made up of a concrete construction recently overlaid with a bituminous surface course, is in good repair.

Although not signed previously along Poynters Road, the industrial estate is signed at the roundabout with Porz Avenue. It was apparent that this roundabout poses a problem for HGV’s as there is evidence of HGV’s overrunning the adjacent footpaths and colliding with pedestrian guard railing. The circulatory carriageway is also in a state of disrepair.

The two-way traffic flow along Poynters Road in the weekday am peak is approximately 1,000 vehicles per hour.

M1, A505 and Boscombe Road

HGV’s drivers who follow the directions from the M1 travel along the A505 and turn right at the signalised junction with Boscombe Road.

This involves driving through a number of signalised junctions and passing a large number of residential properties. At the junction with Boscombe Road there is a signalised right turn. Vehicles were observed to be queuing at this junction during periods of relatively low traffic flows. The period available for turning right at this junction was observed to be approximately 5 seconds and a number of vehicles were seen to be undertaking the manoeuvre after the lights had turned red. It is
considered that, during periods of peak flow, this minimal green phase would cause significant delays and congestion along the A505.

There are no structures along this length of the A505 and the carriageway appears to be in good repair.

The two-way traffic flow along the A505 in the weekday am peak is approximately 2,500 vehicles per hour.

**A5 Southbound and Boscombe Road**

A large proportion of HGV’s en route to the estate travel south along the A5 and through the town centre to the junction with the A505. They then travel along the A505 and turn left at the junction with Boscombe Road to gain access to the estate.

At the town centre the A5 (or High Street North) is a single carriageway with the provision of a southbound bus lane between the Ashton Middle School and the junction with the A505. As stated previously, the area adjacent to the A5 in the town centre is designated as an Air Quality Management Area. There are no structures along this length of the A5 and the carriageway is in good repair.

The section of the A505 between the A5 and Boscombe Road is in good repair. There is an overbridge located to the west of the Boscombe Road junction that carries the disused railway line.

The two-way traffic flow along the A5 (High Street North) in the weekday am peak is approximately 1,750 vehicles per hour.

**White Lion Link**

The White Lion Link Road (Bedford Way) provides a link for vehicles to the industrial area from the A5 High Street North. The Link Road runs between Kingsway and the industrial estate (Boscombe Road). Vehicles travelling along the A5 through the town centre can access the link road via Queensway and Court Road.

The road has been designed as route for buses and has a rising bollard system at either end to prevent the passage of cars. The bollard system however, has been disabled and a number of cars were observed to be using the link road.

The link road is believed to be used by approximately 1000 vehicles per hour and has had a positive impact on congestion in the town centre. There is therefore a considerable amount of local support in keeping the route open to traffic.

Should the route remain open to traffic it will be for non-HGV traffic only and will therefore not reduce the numbers of HGV’s travelling through the town centre AQMA.
2.2 Accident data

There have been a total of 342 accidents in the period 01/10/2001 to 30/09/2006 along or in the above areas A – F of which 27 involved HGV's. Table 2.1 provides summary statistics for all accidents in these areas.

<table>
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<th>SECTION</th>
<th>All VEHICLES</th>
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<tr>
<td></td>
<td>Serious</td>
<td>4</td>
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<td></td>
<td>Slight</td>
<td>30</td>
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<tr>
<td>B</td>
<td>Fatal</td>
<td>2</td>
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<td>Serious</td>
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<td>Slight</td>
<td>47</td>
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<tr>
<td>C</td>
<td>Fatal</td>
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</tr>
<tr>
<td></td>
<td>Serious</td>
<td>1</td>
</tr>
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<td></td>
<td>Slight</td>
<td>38</td>
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<tr>
<td>D</td>
<td>Fatal</td>
<td>1</td>
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<tr>
<td></td>
<td>Serious</td>
<td>5</td>
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<td></td>
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<tr>
<td>E</td>
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<td>Slight</td>
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The fatal accident along involving a HGV along the A505 occurred in September 2005. An eastbound cyclist was stationary at a red light at the traffic signals located 40m west of the junction with Woodford Road. A 32 tonne HGV, also travelling eastbound, was also stationary at the traffic lights. When the lights changed the cyclist moved away. The HGV also moved away but failed to see the cyclist in front and collided with the rear wheel pulling the rider under the HGV’s front off side wheel.

2.3 Public Utilities

Consultations with Statutory Undertakers have not been carried out at this stage. An estimate of likely diversion costs has been made on the basis of typical costs for similar schemes.

2.4 Consultation

2.4.1 Overview

To gain a better picture of vehicular activity generated by the industrial area a short questionnaire was issued to the 87 businesses within the Woodside Industrial area (see Appendix B for questionnaire and consultees). The questionnaire focused on inward / outward deliveries and defined the 4 main routes into the industrial area. Consultees were asked to give the approximate number of inward and outward deliveries per week and the percentage of deliveries travelling each route.

The routes identified were;

1. M1 Junction 11 followed by Poynters Road
2. M1 Junction 11 followed by Boscombe Road
3. A5 Northbound followed by Boscombe Road
4. A5 Southbound followed by Boscombe Road

Consultees were also asked about future plans for development and whether they felt the existing traffic conditions posed problems for their business.

2.4.2 Consultation Results

A total of 16 questionnaires were returned, generating a response rate of 17%, which represents a statistically significant sample.

The returned questionnaires represented a total of 741 journeys per week 52% of which were light goods vehicles (LGV’s) and 48% were HGV’s.
As can be seen from the above table the vast majority of HGV movements originate from the M1, which is to be expected given the close proximity of junction 11. It is also evident that the majority of HGV drivers approaching the estate from the M1 are electing to travel along Poynters Road rather than travelling further along the A505 and turning right at the Boscombe Road junction. It also appears that the A505 / Boscombe Road junction is more frequently used by HGV's leaving the estate toward the M1 than those approaching it from the M1. These two factors could be explained by the fact that drivers are avoiding potential delays in turning right at the Boscombe Road junction.
2.5 **Topography and Climate, Land Use, Property and Industry**

Appendix C shows the study area for this assessment.

**Topography and Climate**

*Topography*

The study area lies within the South Bedfordshire and North Luton districts of Bedfordshire and includes the parishes of Chalton, Houghton Regis and Dunstable.

Houghton Regis is a residential area lying to the north of Dunstable. It is surrounded by open / agricultural land to the north, east and west. The Woodside Industrial area and the Dunstable town lay to the south.

Two water courses lay within the study area; Ouzel Brook which appears to originate within agricultural land to the northeast and meets the River Ouzel to the east and Houghton Brook which appears to originate near Houghton Hall and meets the River Lea to the southeast. Both water courses include small tributaries.

The comprehensive network of public rights of way in the area includes the long – distance Icknield Way path.

*Climate*

The study area, in terms of rainfall, sunshine and temperatures is fairly close to the all – England statistical norm.

2.5.1 **Land Use**

The Agricultural Land Classification (ALC) shows that the majority of the study area is classed as Urban with areas of Grade 3 agricultural to the north, Grade 2 agricultural to the northeast, and non-agricultural land to the northwest (Appendix D). A large proportion of the study area is designated as an area of Adopted Green Belt under the South Bedfordshire Local Plan.

The agricultural land contains features such as field margins, hedgerows, neutral grasslands, ponds and ditches, which are important areas for wildlife and support rare floral and faunal species.

It is understood that there is the possibility of future urban expansion along the northern boundary of Houghton Regis, as outlined in the Milton Keynes and South Midlands (MKSM) Sub Regional Strategy. However, the details, current status and timescales have yet to be decided.

The South Bedfordshire Local Plan Review (2004) identifies the area of land between Houghton Brook, Sandringham Drive and Wheatfield Road
(shown on the community constraints map in Appendix F) as proposed open space to be enhanced for a mix of formal and informal recreation.

2.5.2 Property

A considerable number of residential properties are located within the study area.

2.5.3 Industry

Most of the industry in the general area is concentrated within the industrial area of Dunstable, which includes the Woodside Industrial Estate, Apex Business centre, Nimbus Park, Pro Logis Park, White Lion Retail Park and the Christian Salvesen and Renault Truck depots on Boscombe Road.

The HGV movements to and from these areas are a major contributing factor to the congestion experienced along the A5 High Street / A505 Church Street, within Dunstable town centre and along the A505 Luton Road and are the primary reason for this study.

2.6 Watercourses and Drainage

In addition to a reservoir adjacent to Houghton Road, two watercourses lay within the study area. The Ouzel Brook rises at a spring near Chalton Cross Farm and drains generally in a westerly / south - westerley direction to the River Ouzel. It is also fed by springs in its upper catchment and by land drainage ditches. The Houghton Brook appears to originate near Houghton Hall in the central area of the site and meets the River Lea to the east. Houghton Brook is designated by the Environment Agency (EA) as main river and therefore, under the Water Resources act 1991 and Land Drainage Byelaws, prior written consent will be required from EA for any proposed works or structures in, under, over or within 9m of the top of the bank of the brook.

Ouzel Brook in the western area of the site lies within Flood Zone 2 (extreme flooding from rivers or sea without defences and Flood Zone 3 (flooding from rivers or sea without defences). Houghton Brook to the east lies within Flood Zone 2 with small areas within Flood Zone 3. The areas surrounding these watercourses are therefore at risk of flooding.

2.7 Geology and Soils

2.7.1 Solid Geology

The Solid and Drift Geology plan of Leighton Buzzard indicates that the area of Houghton Regis is underlain by outcropping Lower Chalk of the Upper Cretaceous period. The geological long section indicates that the Lower Chalk under the site lies between 80 and 20 m AOD. The Lower Chalk overlies Lower Cretaceous formations.
An outcrop of Totternhoe Stone (2 - 4.5m in thickness) is shown to the north of Houghton Regis (with a southwest to northeast strike) running along the northern edge of the town. An outcrop of Melbourn Rock (2 - 3m in thickness) is shown to south of the town, marking the boundary with the Middle Chalk that underlies Dunstable. An outcrop of Limestone, up to 300m wide, running in a southwest to northeast orientation, is also shown approximately 250m north of the Melbourn Rock outcrop.

No geological SSSIs are located in the area.

2.7.2 Drift Geology

There are no drift deposits overlying the Lower Chalk across most of Houghton Regis and the surrounding area. A thin band of Quaternary Head deposits, less than 100m wide, is located in the Parkside region of Houghton Regis. Further deposits of Head are located immediately east of the town, to the west of the M1 (crossed by Options 1A, 1B and 1C). Till is located at the northern extent of Options 1A and 1B at the junction with the M1.

A deposit of Glacial Sand and Gravel is located to the southeast of Houghton Regis, approximately 250m east of the M1. A further small deposit of Glacial Sand and Gravel and a larger deposit of Glacial Till is located to the north east at Chaltam Cross.

2.7.3 Hydrogeology

The Hydrogeological plan of England and Wales indicates the groundwater level just north of Houghton Regis is at 60m AOD.

The site lies within a major aquifer. These are highly permeable formations, usually with a known or probable presence of significant fracturing. They may be highly productive and able to support large abstractions for public water supply and other purposes.

The site lies within a Nitrate Vulnerable Zone (NVZ). These are areas which have been designated to protect drinking water supplies from nitrate pollution where water is being polluted or is at risk of being polluted by nitrates.

2.7.4 Soils

The majority of the site lies on soils of high leaching potential, however soil information relating to restored mineral working or urban areas is based on fewer examples than elsewhere, for the purposes of this report a worst case vulnerability classification has been assumed. The southeastern area of the site lies on soils of an intermediate leaching potential. These are soils which can possibly transmit a wide range of pollutants.
2.7.5 Made Ground and Contaminated Land

A number of areas of made and worked out ground are present within the site. These include the Chalk Quarry adjacent to the A5, an area to the northeast of the industrial estate and the site of the sewage treatment works adjacent to the A5.

The potential risks from made ground will require further assessment and site investigations. Further areas of made ground may also be present in the area.

Six closed landfill sites are present within the Dunstable / Houghton Regis area. The largest being the Houghton Road Quarry which is believed to contain slurry, lime and cement wastes.

2.8 Environmental Status

2.8.1 Study Area

A constraints map showing a summary of the main environmental constraints within the study area is provided in Appendix E.

2.8.2 Issues relating to affects on humans

The main factors relating to humans are;

- Air Quality
- Disruption due to Construction
- Landscape Effects
- Land Use
- Traffic Noise and Vibration
- Pedestrians, Cyclists, Equestrians and community effects.

The impact of the proposed route corridors on the above factors is summarised in section 5 of the report.

2.8.3 Issues relating to the natural and cultural environment

The key issues relating to the natural and cultural environment are;

- Cultural Heritage
- Ecology
- Landscape Effects

The impact of the proposed route corridors on the above factors is summarised in section 5 of the report. Environmental constraints maps are provided in Appendix F for each of these factors.
2.9 Summary of Planning Factors

2.9.1 National Planning Policy

White Papers

White papers indicate the direction in which government policy is heading and while being formal documents, are intended to stimulate debate and may pave the way for legislation. However, neither the government nor local authorities are obliged to act in accordance with their contents.

Planning Policy Guidance

Government advice on land use planning has been given at a national level in a series of planning Policy Guidance Notes (PPG's) and Planning Policy Statements (PPS's). These cover issues such as flood risk, archaeology and nature conservation.

2.9.2 Regional Planning Policy

Regional land use planning and development guidance is given in the Regional Planning Guidance (RPG) for the South East published in March 2001. This contains policies on housing, transport, economic development and the environment.

Bedfordshire will however, fall under the Regional Spatial Strategy (RSS) for the east of England (scheduled for 2007 and currently undergoing public consultation). The draft revision of the RSS supersedes the above RPG.

2.9.3 Local Planning Policy

The area falls within the administrative boundary of South Bedfordshire District Council (SBDC). At local level guidance on planning and development is given in the South Bedfordshire Local Plan Review (2004).

In addition to the SBDC planning guidance the following planning documents are relevant to the area;

- Bedfordshire and Luton Structure Plan (2011)
- Bedfordshire County Council Local Transport Plan (2006/7 to 2010/11)
- Luton, Dunstable & Houghton Regis Local Transport Plan (2006-2011)
3 Description of Scheme Options

3.1 Route Options

A drawing showing each of the route options is included within Appendix G.

3.1.1 Woodside Connection Option 1A

Option 1A starts from the roundabout forming part of the M1 Jct 11A and aligned in a South West direction. The road would run for approx 400m through open agricultural land before following the alignment of Sundon Road for a further 250m. At this point a roundabout junction comprising of 3 arms would be constructed. Sundon Road would continue South West on its existing alignment with the Woodside Connection running in a South East direction from the roundabout.

Still in open agricultural land the road would continue South East for 450m crossing a small watercourse as it starts to curve to the right on a radius of 800m for 1200m. Whilst on this radius the road will be carried on embankment and will cross a further 4 watercourses the largest being Houghton Brook. A farm track would also have to be crossed with the track passing through an underpass along with one of the 4 watercourses. Pastures Way will have to be crossed by an overbridge as the road reaches the end of the radius and the vertical alignment returns to grade.

After Pastures Way the road enters the urban area of Houghton Regis aligned in a South West direction, here the road will be in a shallow cutting. The road follows a corridor of land containing several High Voltage overhead cables for a length of 1000m crossing a cycleway / footpath and running through the area identified in the South Bedfordshire Local Plan as Proposed Open Space.

The road ties into the roundabout junction of Poynters Road and Porz Avenue to the North East corner of The Woodside Industrial Estate.

Total Length of Option 1A - 3.3 km

3.1.2 Woodside Connection Option 1B

As with option 1A route 1B starts from the proposed Jct 11A. The road would be aligned in a southerly direction and would be carried on an embankment of maximum height 1.5m as it passes within 45m of Chalton Cross Farm. The length of the embankment would be 300m before the road returns to ground level and enters a shallow cutting for 120m. Still passing through agricultural land and now following the line of existing high voltage overhead cables the road would start to rise and take on the same alignment as Option 1A.

Total Length of Option 1B - 2.8 km
3.1.3 **Woodside Connection Option 1C**

Option 1C starts from the proposed A5 – M1 Link at the roundabout junction with the A5120 Bedford Road. From here the road is aligned in an Easterly direction and is carried on an embankment which reaches a height of 6m as it crosses a second watercourse 420m from the roundabout.

After crossing the second watercourse the road gently curves southwards for 1200m and remains at ground level apart from a section of cutting 200m long to a max depth of 1m.

At this point the road reaches a 3 armed roundabout junction that would be constructed where the road meets Sundon Road. After the roundabout the road continues along the same alignment as option 1A.

Total Length of Option 1C - 4.7 km

3.1.4 **Woodside Connection Option 2**

Option 2 starts from the roundabout junction at the West end of the A5-M1 Link where it connects with the A5. The road will make up 1 of 4 legs of the roundabout and will be aligned in a South Westerly direction. The road will leave the roundabout passing through agricultural land at existing ground level and will gently curve to the South whilst rising up on embankment.

After 250m the road passes over Thorn Road followed by Ouzel Brook after a further 260m. At this point the road runs parallel to the A5 with the sewerage works to the East and the embankment rises where an access track is crossed.

Once passed the sewerage works the road starts to enter a cutting which carries the road through the disused Houghton Regis Chalk Pit. After the chalk pit the road enters an urban environment and meets the A5120 where there will be a signalised junction. The road then follows the alignment of Townsend Farm Road for 200m, before heading south through industrial land for 600m. The road then joins the roundabout junction at the Northern end of Boscombe Road along with Arenson Way and Porz Avenue.

Total Length of Option 2 - 3.12 km

3.1.5 **Woodside Connection Option 3A**

Option 3 starts from the proposed A5 – M1 Link Road at the roundabout junction with the A5120 Bedford Road. From here the road is aligned in a southerly direction and shortly after leaving the roundabout the road gently curves to the West. The road then travels through agricultural land in a shallow cutting heading in a south westerly direction for 440m, before crossing Thorn Road.
Where the road crosses Thorn Road it will pass within 80m of Berry Corner Farm and starts to rise up an embankment. The road runs along the embankment in a southerly direction on a straight alignment for 900m crossing Ouzel Brook and two footpaths.

The road will then curve to the east as it passes through the eastern side of Houghton Regis Chalk Pit in cutting. Just prior to reaching the A5120 the road will be on the same alignment as Option 2 and will follow this alignment to the roundabout junction at the Northern end of Boscombe Road.

Total Length of Option 3A - 3.3 km

3.1.6 Woodside Connection Option 3B

Option 3B connects to the A5-M1 link by firstly utilising 1200m of the A5120 where alignment improvements would be required (i.e. removal of double bend between Dunsabilians Rugby Club and Calcutt Lodge). A new road would then connect to the A5120 by means of a roundabout junction 35m north of the Old Red Lion Public House. The road would be aligned in a south westerly direction and would be carried across agricultural land for 300m on an embankment. The alignment would take the road through a small wooded area before entering a cutting through agricultural land for a further 600m. Following the cutting the road would southwards passing through the Eastern edge of Houghton Regis Chalk Pit where it would meet the alignment of Option 3A which it would then follow to the roundabout junction at the Northern end of Boscombe Road.

Total Length of Option 3B – 2.14 km + Alignment Improvements to A5120.

3.1.7 Cost Estimates

Scheme cost estimates have been determined in accordance with the latest guidance given in H.M. Treasury’s Green Book on Appraisal – January 2003 and the Highways Agency’s CHE Memo 121/03. The six estimate figures include inflation and VAT, and also include strategic risk and optimism bias.

The rates used in the estimate have been obtained from SPON’s 2007, Civil Engineering and Highway Works Price Book. Prior financial experience recently gained from designing and detailing other similar projects was also utilised in developing cost estimates.

Land costs used for the development of the cost estimates in Table 3.1 are based on estimates of current land value. The impact of potential growth on land values has been considered separately within the cost estimate report.

A detailed break down of the cost estimates for each option is included within the separate Woodside Connection Cost Estimation Report.
Non-Road Solutions

The following non-road options have been considered during this assessment. They relate to both HGV and non-HGV traffic.

Consolidation Centres

Consolidation centres can be used for incoming and outgoing consignment, and are generally located off-site or remotely. The first step in establishing the feasibility of a consolidation centre is the availability of suitable sites. In considering site suitability it is important to consider the following factors; i) can the site offer sufficient capacity, ii) is the site on existing desire lines and is it certain that additional journey kilometres will not be created. Secondly, how the consolidation centre will be funded and operated will need to be considered. The most successful

Table 3.1 – Option Cost Estimates

<table>
<thead>
<tr>
<th>Option</th>
<th>1A (£k)</th>
<th>1B (£k)</th>
<th>1C (£k)</th>
<th>2 (£k)</th>
<th>3A (£k)</th>
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<td>918</td>
<td>774</td>
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<td>Land Costs (inc Part 1 Claims)</td>
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<td>12,512</td>
<td>11,573</td>
<td>11,889</td>
<td>12,123</td>
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<tr>
<td>Archaeology Costs</td>
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<td>150</td>
<td>300</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Environmental Mitigation</td>
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<td>315</td>
<td>400</td>
<td>561</td>
<td>594</td>
<td>406</td>
</tr>
<tr>
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<td>971</td>
<td>1,424</td>
<td>685</td>
<td>697</td>
<td>436</td>
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<tr>
<td><strong>Sub Total</strong></td>
<td><strong>21,689</strong></td>
<td><strong>21,577</strong></td>
<td><strong>28,180</strong></td>
<td><strong>19,104</strong></td>
<td><strong>19,560</strong></td>
<td><strong>16,915</strong></td>
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<tr>
<td>VAT, Optimism Bias and Risk</td>
<td>11,450</td>
<td>11,416</td>
<td>15,304</td>
<td>10,113</td>
<td>10,339</td>
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<tr>
<td>Inflation</td>
<td>2,556</td>
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<td>3,330</td>
<td>2,180</td>
<td>2,226</td>
<td>1,751</td>
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<tr>
<td><strong>Total Estimated Scheme Cost</strong></td>
<td><strong>35,695</strong></td>
<td><strong>35,418</strong></td>
<td><strong>46,814</strong></td>
<td><strong>31,397</strong></td>
<td><strong>32,125</strong></td>
<td><strong>27,187</strong></td>
</tr>
</tbody>
</table>

*Assumes that VAT is recoverable on Land Acquisition, Statutory Undertakers and Preparation / Supervision costs.

Optimism bias of 45% has been incorporated in the estimate in accordance with HA CHE memo 121/03
consolidation currently in operation is at Heathrow Terminal 5, however
this site has a number of unique operational points: secure operating
environment, all properties on a rent/lease basis.

The ability for freight to be intercepted and filtered through the use of
consolidation centres will need to be evaluated through the travel plan
approach, which will address supply chain and logistics issues as well as
the potential for reduction in peak hours commuter trips.

The relevance of consolidation centres to the Woodside area will largely
be dictated by the supply chain operations of each of the manufacturing
and distribution companies on site and to a degree the planning process
will not be able to influence this if changes of use/lettings occur without
requiring formal planning permission.

A key issue to consider will be the interface between HGV traffic
accessing the site, versus those vehicles needing to access Dunstable
town centre for access and servicing. Analysis of the way in which the
industrial estate operates (as part of the Zonal travel plan) will help inform
whether the industrial zone is operating as a original site alone, or as a
combined origin/destination location.

It is also important to consider the relative flows from the M1 and the A5
relating to the Woodside area and those that could be filtered from
Dunstable town centre. With the advent of the access road, scope for a
“reverse logistics” solution whereby Woodside becomes the consolidation
zone for Dunstable town centre may need to be considered. The
proposed zonal travel plan will be the correct forum for developing this
idea, particularly if Luton Borough Council become involved in relation to
wider supply chain issues for Luton town centre.

3.2.2 Network Usage Restriction

Physical restriction of the network will be a key factor in removing
unwanted traffic from the nearby residential areas and from the town
centre AQMA.

In order to ensure that safer routes to school programmes are able to
develop fully in the area, active traffic management in the form of further
calming, weight restrictions, improved pedestrian crossing facilities and
20 mph zones should form the measures to be considered for the existing
routes leading to the Woodside area.

This should be accompanied by a robust Lorry Management Plan which
deals with the practical awareness and routing of HGV traffic both in the
interim and when the Woodside Connection is open.

As a part of this strategy an accessibility assessment should be carried
out on Houghton Regis and the areas surrounding the Woodside
industrial zone so that there is a full appreciation of the barriers to
accessibility to the employment zone for pedestrians and cyclists,
including evaluation of “gaps” within the infrastructure, which could
potentially be met for a sustainable transport upgrade fund levered from new residential development.

### 3.2.3 Area Wide Travel plan

In line with government’s latest thinking on sustainable transport it is vital that the role of promotion of travel choice and the options for influencing travel behaviour are properly assessed as part of future of Woodside. At present the full potential of the travel plan tool has not been tapped, as the focus has been on influencing purely commuter trips.

Although it is accepted that the introduction of an employee travel plan would have little impact on the number of HGV movements in the Dunstable area it was considered at an early stage that the development of such a plan could have a significant impact on reducing traffic congestion caused by non-HGV traffic.

Therefore development of a wider, freight, commuter and supply chain based travel plan, using the travel plan as an active management tool, is being examined. The intention is to target both types of trips, and through assessment of likely C02 savings from within Dunstable, but also from within the wider South Bedfordshire/Luton area, to support any environmental assessment required to substantiate the “Woodside Connection” business case.

During early discussions with South Bedfordshire District Council it became apparent that one of the industrial estate management companies had already commissioned a consultant to begin the development of a framework travel plan (FTP) for employees. This covered the central area of the estate shown in figure 3.1.

![Figure 3.1 – Central area of estate](image)

The aims of the FTP were to manage the number of single occupancy car journeys made by employees and visitors in line with local, regional and
national policy objectives. It also aims to encourage an increase in the use of sustainable transport modes such as walking, cycling and public transport as well as promoting car sharing.

The FTP included an initial travel behaviour survey of the 1000 employees within the central estate area. A response rate of 18% was gained. A number of findings from this survey are of interest to this report;

- 86% of respondents work full time;
- 55% of respondents arrive at work during the AM peak (08.00 to 09.00);
- 68% of respondents leave work between the period 16.00 and 18.00 (19% between 16.00 and 17.00 and 49% between 17.00 and 18.00);
- 72% of respondents travel to work by car as single occupants;
- The majority of employees commute on a daily basis from Dunstable, Houghton Regis and Luton.

The FTP also identifies deficiencies in public transport in the vicinity of the estate and sets targets up to 2011 for reduction in car usage, increase in cycling trips and an increase in bus and rail trips.

Although the review of the FTP for the central area of the estate is sufficient for this stage of assessment it is recommended by Amey that a FTP be developed for the entire estate because the full potential of this tool should be explored and tested, and also has the ability to become a “best practice” model for Bedfordshire CC and the Highways Agency because of its location and transport dynamics. The full potential of car sharing, changes in logistics and delivery patterns, and reducing unnecessary private car trips all need to be considered as part of an integrated approach that engages with all employers in the North East Dunstable area.

There is the opportunity to convert this scheme to a high quality travel plan that can actively demonstrate the relevance of collaborative working within Bedfordshire, but also within Luton and Milton Keynes.

### 3.2.4 Public Transport

The FTP reviews the public transport network in the Dunstable area and suggests that the central area of the estate is inadequately served by public transport.

**Bus**

Over 25 bus routes operate within the Luton, Dunstable and Houghton Regis. The network is mainly provided by commercial operators with Arriva being the most dominant with approximately 80% of services.

There are currently no bus services that directly serve the central area of the estate, although two services serve stops located approximately 400m away. Service 24 also passes within 800 metres at Lewsey Farm and St Dominic Square. Bus stops in the vicinity of the estate are generally of poor standard with little information and poor lighting.
During the development of the FTP discussions were held with Arriva regarding the possibility of diverting existing routes to enter the estate. Arriva advised that this would not be possible due to the effect on reliability and running times for existing services.

It is recommended that the provision of additional bus services to and from the industrial estate (particularly during AM and PM peak periods) are investigated further during subsequent assessments.

Rail

Since 1989 there has been no train service in Dunstable which is now one of the largest towns in England without a train station.

The nearest train facility to the estate is located 3km away at Leagrave. Access to the estate can be achieved via bus service 24, although the bus stop is a considerable distance from the station with little signing.

The proposed Translink scheme (figure 1.1) is intended to utilise the disused railway network and would offer an additional link between Leagrave station and the White Lion Retail Park although there would need to be an additional change in mode to reach the more central areas of the estate from the estate from the retail park.

3.2.5 Improvements to Existing Network

Following an initial site visit in December 2006, it was considered that there could be some potential in improving the existing A505 / Boscombe Road Junction. The present layout of the junction is shown in Figure 3.2.

![Figure 3.2 – Boscombe Road Junction](image)

From visual inspection it appears that the congestion experienced at this junction, particularly for westbound traffic wishing to turn right into Boscombe Road, could be relieved if improvements were to be made to the junction.

Although the above improvement could ease the passage of HGV’s into the industrial estate and potentially relieve congestion currently
experienced at this junction, it would not reduce the numbers of HGV’s using the A505 and A5 High Street North.

3.2.6 Promoting Sustainability

In order to deal with the wider issues of town centre urban quality, emissions levels, noise and vibration, pedestrian safety, modal shift and congestion relief, it is felt that the Woodside Connection is needed to mitigate both quantitative and qualitative issues within Dunstable town centre, and on the existing residential routes serving the Woodside estate. However, the way in which traffic chooses to use the new route, and ways in which overall traffic levels could be reduced, must be addressed in parallel with the development of this infrastructure solution.

Both connectivity between Houghton Regis and Dunstable employment areas, and improved public transport accessibility, need to be delivered in parallel with the road infrastructure solution, and full opportunity taken to deliver appropriate soft travel behaviour measures for commuters and supply chain providers. This marriage between infrastructure and travel behaviour solutions is particularly innovative for logistics and freight movements and will add a fresh dimension to travel planning which has traditionally examined journeys to work and school. Therefore there will be in place an ongoing forum for managing the freight and logistics issues affecting the Woodside area in a holistic and effective manner.

The role of demand management has therefore been properly assessed within the wider scope of the Woodside Connection study, with the conclusion that whilst there is a clear role for the implementation of a discrete number of interventions, provision of the link road is still vital for the economic well-being and environmental safeguarding of Dunstable and the wider County.

4 Engineering Assessment

At this stage only outline alignments have been developed for each route option. These alignments have developed using the available OS data and as such only the physical constraints that appear on this data have been considered. A detailed site survey will be required to establish the extent of the various constraints that are present.

Each of the route options have been designed as a de-restricted all purpose single carriageway. At this stage no engineering constraints have been identified that require the need for a departure from highways design standards.

A preliminary assessment of the following factors has been made during the development of the route options;
4.1 Topography

Contour information was obtained from Ordnance Survey (Landform Profile) with contours being indexed every 5 metres. This information was used to assist determining the initial highway alignments.

Options 2 and 3A pass through Chalk Hill and therefore would involve considerably more earthworks than the other options which pass through relatively level ground. No topographical constraints have been identified at this stage that will involve a departure from standard.

4.2 Junction Layouts

Preliminary consideration has been given to the type of junctions required for each option (outlined in section 3.1). No consideration has been given at this stage for the provision of additional junctions / accesses that could be introduced to aid future development.

4.3 Hydrology and Drainage

All but one of the proposed options passes through flood zones, the exception being Option 3B. Options 2 and 3A pass through the flood zone related to the Ouzel Brook and options 1A, 1B and 1C through the Houghton Brook flood zone. All of these options would need EA approval and would also require mitigation such as the provision of flood compensation areas. With regards to all of the initial route alignments the carriageway is carried on earthwork embankments through the flood zones.

It is envisaged that the drainage design will be carried out in-line with Sustainable Urban Drainage System (SUDS) guidelines resulting in features such as balancing ponds and swales with outfalls at the numerous watercourses. The drainage design should be in accordance with Planning Policy Statement PPS25 with flood risk assessments and Consultation with EA.

4.4 Public Utilities

Electricity pylons to the north east of the industrial area especially those that run parallel to Wheatfield Road have affected the alignment of options 1A, 1B and 1C. The horizontal alignment has been adjusted to avoid the pylons, however it should be noted that the position of the pylons has been obtained from OS data, which may prove to be inaccurate when a more detailed survey is carried out. On initial assessment it seems possible to avoid all of the electrical pylons however heights of the cables are not known at this stage. It has been assumed that the pylons will have to be raised in all areas where the alignment of the road passes beneath the cables.
5 Environmental Assessment

5.1 Individual Assessment Reports

5.1.1 Air Quality

Air quality is likely to be adversely affected local to the scheme due to vehicle emissions, however, it is likely to improve in other areas of Dunstable, particularly along the A505 and in Dunstable Town Centre, due to the diversion of a proportion of traffic along the new route. Some adverse impacts on air quality are envisaged during the construction phase.

Options 1A, 1B and 1C are likely to have the greatest air quality impacts on the population due to the large number of residential properties within 200m of the route corridors (Table 5.1). However, there is no significant difference between any of the three options. Options 2 and 3A are likely to have the least impact due to the industrial nature of many of the properties surrounding the route.

The proposed route options are unlikely to adversely affect air quality in the Air Quality Management Area (AQMA), located within Dunstable town centre, due to their distance from the designated area. They are instead, likely to improve air quality in the AQMA due to the diversion of a proportion of the traffic currently using this route to the new route. This may in turn contribute to improved health of the population in this area.

Further assessment will be required as the project progresses and a preferred route is identified.

<table>
<thead>
<tr>
<th>Route Option</th>
<th>Distance from Site</th>
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<th></th>
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<td></td>
<td>0 – 50m</td>
<td>50 – 100m</td>
<td>100 – 150m</td>
<td>150 – 200m</td>
<td>Total</td>
<td></td>
<td></td>
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<td>255</td>
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<td>143</td>
<td>329</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

*Table 5.1 - Number of Residencies*
5.1.2 **Cultural Heritage**

All of the route options are likely to impact archaeology. It appears that Option 2 may have the least impact due to the remains having been removed from Puddlehill Quarry, however archaeological remains may extend to the north of the quarry on undeveloped land.

Options 1C and 3A are likely to have the greatest impacts on archaeology. Option 1C passes through a number of Archaeological Notification Areas (ANAs) along its northern extent, whilst Option 3A passes approximately 20m from an ANA and 120m from the Thorn Spring Scheduled Ancient Monument (SAM). The route may potentially impact the setting of the SAM.

Option 1B is likely to have a slightly greater impact than Option 1A due to the route crossing a greater area of agricultural land near its northern extent, also which is located near an archaeological find in the Chalton Cross Farm area. Option 3B passes within an ANA at its northern extent.

Further assessment will be required as the project progresses and a preferred route is identified, including archaeological field evaluations.

5.1.3 **Disruption due to Construction**

Disruption due to construction is likely to occur to the local community and passers-by, particularly along Options 1A, 1B and 1C which pass adjacent to residential properties. The least disruption is envisaged along Options 2 and 3A due to the industrial nature of many of the properties in this area.

Effective environmental management and a programme of consultation with the local community should contribute towards alleviating the concerns of local residents and minimising the potential impacts identified. Mitigation measures should include effective traffic management, designated routes for construction traffic, dust and noise prevention methods and careful consideration of temporary buildings and structures.

Disruption due to construction should be envisaged as causing temporary impacts which should not cause significant adverse effects in the long term.

Further assessment will be required as the project progresses and a preferred route is identified.

5.1.4 **Ecology and Nature Conservation**

Ecology and nature conservation is likely to be adversely affected by each of the route options due to the open and undeveloped nature of much of the land. All of the proposed route options lie within Green Belt land and protected, rare and other notable species are recorded within 2km of each.
Options 2, 3A and 3B cross two County Wildlife Sites and pass directly adjacent to the Houghton Regis Marl Lakes Site of Special Scientific Interest (SSSI). Options 1A, 1B and 1C cross an area of land previously noted for its conservation importance, however bulldozers have since been on site. A survey would be required in the area to confirm its ecological value.

Based on the data collected to date, Options 2, 3A and 3B are likely to have the greatest impact on ecology and nature conservation. During the consultation process Natural England have advised that it is highly likely that they would object to Option 2 due to the effective destruction of the Houghton Regis Chalk Pit County Wildlife Site and the loss of an important buffer to the SSSI. Natural England also have concerns over Options 3A and 3B due to the similar loss in buffer to the SSSI.

Option 1C is likely to have a greater impact than Options 1A and 1B due to greater intrusion into the countryside.

Further assessment will be required as the project progresses and a preferred route is identified. This should include detailed site surveys by an ecologist.

<table>
<thead>
<tr>
<th>Route Option</th>
<th>Protected Areas On Site</th>
<th>Site Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 1A</td>
<td>Green Belt</td>
<td>South Bedfordshire Green Belt</td>
</tr>
<tr>
<td>Option 1B</td>
<td>Green Belt</td>
<td>South Bedfordshire Green Belt</td>
</tr>
<tr>
<td>Option 1C</td>
<td>Green Belt</td>
<td>South Bedfordshire Green Belt</td>
</tr>
<tr>
<td>Option 2</td>
<td>County Wildlife Sites (CWS)</td>
<td>Dog Kennel Down</td>
</tr>
<tr>
<td></td>
<td>CWS</td>
<td>Houghton Regis Chalk Pit</td>
</tr>
<tr>
<td></td>
<td>Green Belt</td>
<td>South Bedfordshire Green Belt</td>
</tr>
<tr>
<td>Option 3A</td>
<td>CWS</td>
<td>Dog Kennel Down</td>
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</tr>
<tr>
<td></td>
<td>Green Belt</td>
<td>South Bedfordshire Green Belt</td>
</tr>
</tbody>
</table>

*Table 5.2 Protected Areas on Site*
5.1.5 Landscape Effects

Each route option will have impacts on the landscape due to the open and rural nature of much of the land in this area. Option 1A is likely to have the least impact as it limits intrusion into the countryside, however mitigation will be required along the ‘pylon corridor’ where the route passes between areas of housing. Mitigation at the roundabout on Sundon Road will also need to be considered.

Option 1B would have a slightly greater impact on the landscape than Option 1A due to the greater impact on farmland, however, some good hedgerows are located in this area which would assist in screening of the route.

Options 1C, 2, 3A and 3B would have significant impacts on the landscape. Option 1C would have greater intrusion on the countryside than Options 1A and 1B, whilst Options 2, 3A and 3B pass adjacent to the Houghton Regis Quarry SSSI and through the County Wildlife Sites (CWS) which is of unique landscape value. Option 3A has greater intrusion into the countryside than Option 3B.

Extensive landscaping will be required on the chosen route, including planting and screening. Acceptability will depend on innovative design, minimising intrusion and incorporating techniques to mitigate noise. Trees and hedgerows should be conserved where possible and compensated for where unavoidably lost. Green bridges should also be considered where appropriate to reduce the segregation of communities and improve safety.

Further assessment will be required as the project progresses and a preferred route is identified. This should include analysis of the final Landscape Character Assessment (LCA) when it becomes available.

5.1.6 Land Use

Each of the route options requires land take of agricultural land, however, this impact is least with Options 2 and 3B and greatest with Option 1C. The southernmost area of Options 1A, 1B and 1C lay within land used for informal recreation and which is proposed for improvements for recreational use. These options may therefore lead to a loss or severance of land available for recreation.

Options 2, 3A and 3B require land take of two CWSs, one of which is considered a valuable green space within the urban area and the other which is a valuable area of ecological and conservation value. As stated in paragraph 5.1.4, Natural England are likely to object to Option 2 and hold concerns with Options 3A and 3B

Each of the route options also leads to a loss of Green Belt land, although this is least for Options 2 and 3B.
Further assessment will be required as the project progresses and a preferred route is identified, including more detailed Agricultural Land Classification (ALC) surveys.

<table>
<thead>
<tr>
<th>Route Option</th>
<th>Provisional ALC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 1A</td>
<td>Urban and Grade 2</td>
</tr>
<tr>
<td>Option 1B</td>
<td>Urban and Grade 2</td>
</tr>
<tr>
<td>Option 1C</td>
<td>Urban, Grade 2 and Grade 3</td>
</tr>
<tr>
<td>Option 2</td>
<td>Mainly Urban and Non-agricultural</td>
</tr>
<tr>
<td></td>
<td>Small area of Grade 3 at A5 junction</td>
</tr>
<tr>
<td>Option 3A</td>
<td>Urban, Non-agricultural and Grade 3</td>
</tr>
<tr>
<td>Option 3B</td>
<td>Urban, Non-agricultural and Grade 3</td>
</tr>
</tbody>
</table>

Table 5.3 - Provisional Agricultural Land Classification

5.1.7 Traffic Noise and Vibration

The community is likely to be adversely affected local to the scheme due to noise and vibration created by vehicles using the new route, however noise and vibration may reduce in other areas of Dunstable, particularly along the A505 and in Dunstable Town Centre, due to the diversion of a proportion of traffic along the new route. Some adverse impacts from noise and vibration are also envisaged during the construction phase, to humans, flora and fauna.

Option 1C is likely to have the greatest noise and vibration impacts on the population due to the large number of residential properties within 300m of the route corridor. Option 2 is likely to have the least impact due to the industrial nature of much of the area surrounding the route. Further assessment will be required as the project progresses and a preferred route is identified.

5.1.8 Pedestrians, Cyclists, Equestrians and Community Effects

Each route option crosses a number of Rights of Way. Options 1C and 3A cross the greatest number of paths. The use of these routes by pedestrians, cyclists and equestrians may be affected by the construction of a new highway due to severance. Crossing points, bridges and / or minor diversions of paths may therefore be required. The impacts on each Right of Way affected by the scheme will need to be assessed further as the project progresses and a preferred route option is identified.

Residents and the local community are likely to be affected local to the scheme, particularly along Options 1A, 1B and 1C where the highway
passes adjacent to residential properties. This is likely to include visual effects, air quality effects and noise and vibration, both during construction and due to the use of the new route.

Options 1A, 1B and 1C also pass through an area of open land proposed for recreational use in the South Bedfordshire Local Plan. The effects of the route on this proposal will require further assessment as the project progresses.

The provision of footways, cycle paths and additional crossing points along the new highway will also need to be considered to ensure the risk to pedestrians, cyclists and equestrians using the new route is minimised.

<table>
<thead>
<tr>
<th>Route Option</th>
<th>Approximate Number of Crossing Points</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Footpaths</td>
</tr>
<tr>
<td>Option 1A</td>
<td>6</td>
</tr>
<tr>
<td>Option 1B</td>
<td>5</td>
</tr>
<tr>
<td>Option 1C</td>
<td>8</td>
</tr>
<tr>
<td>Option 2</td>
<td>4</td>
</tr>
<tr>
<td>Option 3A</td>
<td>8</td>
</tr>
<tr>
<td>Option 3B</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 5.4 Footpaths, Bridleways & National Trails

5.1.9 Vehicle Travellers

Each of the proposed routes is likely to provide vehicle travellers with views across the landscape, although Option 1C is likely to provide the best views due to the open and rural nature of the majority of the route.

Driver stress is likely to improve from that experienced on the current route network and is likely to be at either low or moderate levels on each of the proposed routes.

Further assessment will be required as the project and design progresses and a preferred route is identified.

5.1.10 Road Drainage and the Water Environment

Each of the route options may impact surface water and groundwater quality. Consideration of appropriate pollution prevention measures for surface water runoff will therefore be required. The location of discharge points for surface water and the possible impacts on receiving watercourses should also be considered. Written EA consent will be required for Options 1A, 1B and 1C which follow the Houghton Brook; designated as EA Main River.
Options 2 and 3A cross the Ouzel Brook floodplain; compensation and mitigation measures would need to be agreed with the Buckingham and River Ouzel Internal Drainage Board.

Options 3A and 3B pass close to the Bluewaters landfill site. A full site investigation would be required to determine the limits of the site and assess the risks associated with the landfill.

Each of the route options will require a Flood Risk Assessment (FRA). Sustainable Urban Drainage System (SUDS) should be considered in accordance with national guidance and best practice.

Further assessment will be required as the project progresses and a preferred route option is identified, including further consultation with the Environment Agency.

5.1.11 Geology and Soils

Geology and soils may be adversely affected by each of the route options, however, this will require further assessment as the project progresses, including site investigations.

The potential risks from made ground and landfill requires further assessment and may require site investigations.

Consideration of appropriate pollution prevention measures will be required to ensure the quality of surface and groundwaters is not compromised, including further consultation with the Environment Agency.

5.1.12 Policies and Plans

The following documentation has been examined in order to assess the potential effects of the proposals on planning policy:

- Planning Policy Guidance Notes (PPGs) and Planning Policy Statements (PPSs)
- Regional Planning Guidance for the South East (RPG9)
- South East Regional Transport Strategy (July 2004)
- Bedfordshire and Luton Structure Plan 2011
- Bedfordshire Local Transport Plan 2006/7 -2010/11
- Luton, Dunstable and Houghton Regis Local Transport Plan 2006 - 2011

The table in Appendix H summarises the potential impacts of the scheme on policies and plans:

The route options support national, regional and local policies to improve the transport network, support economic development and improve accessibility. However, the adverse environmental impacts identified will require mitigation to ensure their effects are not significant and permanent.
5.1.13 Consultation

During the environmental assessment the following bodies have been consulted;

- Historic Environment Record (HER) (Bedfordshire County Council)
- Archaeology Team (Bedfordshire County Council)
- Ecology Team (Bedfordshire County Council)
- Biodiversity Recording and Monitoring Centre - c/o The Wildlife Trust
- Landscape Team and Landscape Character Assessment Information (Bedfordshire County Council)
- Public Rights of Way Team (Bedfordshire County Council)
- Environment Agency
- Natural England
- English Heritage
- Environmental Health
- MAgiC Website (for Agricultural Land Classification)

5.1.14 Summary and Recommendations

Initial Appraisal Summary Tables (ASTs) have been developed in line with Transport Analysis Guidance (TAG) Unit 3.2 (DfT, 2004), using the data collected to date and environmental constraints identified within this report. The ASTs will need to be updated as the project progresses and the environmental assessment is taken forward.

From the data collected to date, it appears that Option 1A is likely to have the least impact on the environment, followed by Option 1B and Option 1C.

Option 2 is likely to have the greatest impact and is likely to be objected to by Natural England due to its likely significant adverse impacts on nature conservation. Options 3A and 3B are also likely to have significant impacts on nature conservation; Natural England holds concerns with these two options.

Mitigation will be required for the chosen route option, including landscaping and visual screening, compensation for lost vegetation and habitats, pollution prevention measures for surface runoff and consideration of SUDS. Best environmental practice should be considered in the design.

We recommend that the environmental assessment is taken forward to Stage 2 for the preferred route option(s).
6 Traffic Assessment

6.1 Introduction

The Halcrow group were commissioned to test the impact of the 6 different route options for the Woodside Connection. The traffic modelling was undertaken using the Luton Northern Bypass (LNB) SATURN highway model. The route options assessment was required for the morning peak average hour for 2011 and 2026.

In order to assess the impact of new road links that connect onto the Woodside industrial estate it was necessary to modify the zoning system around the industrial estate.

In addition whilst the LNB study required the use of a 2001 base year model, for the purpose of the Woodside connection assessment a 2006 base year model was produced.

---

<table>
<thead>
<tr>
<th>OBJECTIVE</th>
<th>SUB-OBJECTIVE</th>
<th>FAVOURED OPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise</td>
<td>Option 2 or 3A</td>
<td></td>
</tr>
<tr>
<td>Local Air Quality</td>
<td>Option 2 or 3A</td>
<td></td>
</tr>
<tr>
<td>Greenhouse Gases</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Landscape</td>
<td>Option 1A</td>
<td></td>
</tr>
<tr>
<td>Townscape</td>
<td>No significant difference</td>
<td></td>
</tr>
<tr>
<td>Heritage of Historic Resources</td>
<td>Option 2</td>
<td></td>
</tr>
<tr>
<td>Biodiversity</td>
<td>Option 1A</td>
<td></td>
</tr>
<tr>
<td>Water Environment</td>
<td>Option 1A or 1B</td>
<td></td>
</tr>
<tr>
<td>Physical Fitness</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Journey Ambience</td>
<td>Option 1C</td>
<td></td>
</tr>
<tr>
<td>ACCESIBILITY</td>
<td>Severance</td>
<td>No significant difference</td>
</tr>
</tbody>
</table>

*Table 5.5 Summary Table*
Information related to floor space and business type for the various units in the industrial estate was compiled and from this TRICS trip rates were derived. Resulting from this the 2006 morning peak matrices assumed

814 highway travel trips travel from the industrial estate of which 37% are HGV’s and 1,729 trips travel to the industrial estate of which 15% are HGV’s.

The Do-Minimum scenario for the Woodside connection assessment includes the following committed schemes:

- M1 – A5 Link (Dunstable Northern Bypass);
- M1 Widening Junction 6-13 (both directions);
- East Luton Corridor Improvements;
- Stoke Hammond and Linslade Western Bypass;
- A421 Upgrade (M1 to Bedford)
- Bedford Western Bypass;
- Baldock Bypass;
- M1 Junction 11a; and
- A507 Ridgmont Bypass

Due to budget constraints and the relative similarity between route options 3A and 3B it was agreed that only option 3B would be considered for traffic modelling purposes. Therefore within the traffic modelling outputs option 3B is referred to as option 3.

The following outputs were produced for each option for 2011 (assumed year of opening) and 2026 to illustrate the impact of changes to the network on:

- traffic flows;
- link based efficiency problems;
- intersection based efficiency problems;
- road safety problems;
- road based accessibility problems (to workforce and employment);
- traffic related noise problems;
- local air quality problems;

For ease of appraisal, this report focuses on traffic flows, link efficiency and junction efficiency for the key links shown (A to D) in figure 6.1. The outputs for the other parameters can be seen in the Halcrow modelling report.
6.2 Existing Conditions (2006)

Traffic Flows

Table 6.1 gives the traffic flows generated by the model for the key links identified in Figure 6.1. Traffic flows are two-way per hour for the AM peak.

<table>
<thead>
<tr>
<th>Link</th>
<th>Two – Way Traffic Flows per hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>A5 (High Street North)</td>
<td>1,500 – 2,000</td>
</tr>
<tr>
<td>A505</td>
<td>2,000 – 3,000</td>
</tr>
<tr>
<td>Park Road North</td>
<td>2,000 – 3,000</td>
</tr>
<tr>
<td>Poynters Road</td>
<td>1,500 – 2,000</td>
</tr>
</tbody>
</table>

Table 6.1 – 2006 Traffic Flows
Link Based Efficiency Problems

The traffic flows in table 6.1 result in the efficiency problems shown in table 6.2. Efficiency is the volume over capacity ratio and is categorised as Serious, Moderate, Slight and No Problem.

<table>
<thead>
<tr>
<th>Link</th>
<th>Link Based Efficiency Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>A5 (High Street North)</td>
<td>Serious Problem</td>
</tr>
<tr>
<td>A505</td>
<td>Moderate Problem</td>
</tr>
<tr>
<td>Park Road North</td>
<td>Moderate Problem</td>
</tr>
<tr>
<td>Poynters Road</td>
<td>Slight Problem</td>
</tr>
</tbody>
</table>

Table 6.2 – 2006 Link Based Efficiency

Table 6.2 shows that the key links in the vicinity of the industrial estate all experience problems, with the A5 High Street North experiencing serious problems.

Intersection Efficiency

The traffic model identifies junctions within the area that experience delays of more than 40 seconds. Junctions are identified as having a Slight (40 to 90 secs), Moderate (90 to 240 secs) or Severe (over 240 secs) problem.

The A5 Junction with the A505 is the only junction in the area identified as having a severe problem. The Halcrow Traffic Modelling report shows the delays experienced at other junctions in the area.

It is noted that the right turn from the A505 into Boscombe Road is not identified as a problem. This is not consistent with what was observed on site and it is recommended that the timings at this junction within the model are reviewed as part of future assessments.

6.3 Future Conditions

6.3.1 Do Minimum

The do minimum scenario assumes the committed schemes listed in section 6.1 are in place.
Traffic Flows and Link Efficiency

Table 6.3 shows the minimum traffic flows compared with the link efficiency for 2011 and 2026.

<table>
<thead>
<tr>
<th>Link</th>
<th>2011</th>
<th>2026</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Flow (two-way per hour)</td>
<td>Flow (two-way per hour)</td>
</tr>
<tr>
<td></td>
<td>Link Efficiency</td>
<td>Efficiency</td>
</tr>
<tr>
<td>A5 (High Street North)</td>
<td>1,000 to 1,500 Serious Problem</td>
<td>1,000 to 1,500 Serious Problem</td>
</tr>
<tr>
<td>A505</td>
<td>1,500 to 2,000 Slight Problem</td>
<td>1,500 to 2,000 Slight Problem</td>
</tr>
<tr>
<td>Park Road North</td>
<td>2,000 to 3,000 Moderate Problem</td>
<td>2,000 to 3,000 Moderate Problem</td>
</tr>
<tr>
<td>Poynters Road</td>
<td>1,500 to 2,000 Slight Problem</td>
<td>1,500 to 2,000 Slight Problem</td>
</tr>
</tbody>
</table>

Table 6.3 – Traffic Flows and Link Efficiency

The A5 is believed to be approaching or at capacity in 2011 and therefore shows little change at 2026. The traffic model predicts minimal change to traffic flows and link efficiency between 2011 and 2026 for Poynters Road and Park Road North.

As stated in section 6.2 it is believed that the signal timings at the A505 / Boscombe Road Junction may need to be refined within the model. It is therefore considered that the slight link efficiency problem identified within table 6.3 may not be an accurate reflection of the problems experienced along the A505.

Intersection Efficiency

There is little change in the efficiency of junctions in the vicinity of the industrial estate between 2011 and 2026. One exception being the development of a slight delay for straight ahead movements for southbound traffic on Park Road North at the roundabout junction with Porz Avenue / Poynters Road.

6.3.2 Effect of Options

It should be noted that, as the development of options is at an early stage, there are a number of uncertainties associated with the traffic assessment for each option. Conclusions drawn below should only be used as a foundation for further assessments and any recommendations for refinement of the model or alterations to the proposed route options (highlighted in the Modelling report) should be considered as part of these future assessments.
Traffic Flows

Two way traffic flows for the AM Peak period along each of the route options are presented in table 6.4.

![Traffic flow diagram]

<table>
<thead>
<tr>
<th>Woodside Connection Options</th>
<th>Map ID</th>
<th>2011</th>
<th>2026</th>
<th>2011</th>
<th>2026</th>
<th>2011</th>
<th>2026</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 1a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Section</td>
<td>1</td>
<td>1,928</td>
<td>2,400</td>
<td>336</td>
<td>293</td>
<td>17</td>
<td>12</td>
</tr>
<tr>
<td>Southern Section</td>
<td>2</td>
<td>642</td>
<td>887</td>
<td>340</td>
<td>362</td>
<td>53</td>
<td>41</td>
</tr>
<tr>
<td>Option 1b</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Section</td>
<td>3</td>
<td>1,083</td>
<td>887</td>
<td>396</td>
<td>504</td>
<td>37</td>
<td>57</td>
</tr>
<tr>
<td>Southern Section</td>
<td>2</td>
<td>1,083</td>
<td>887</td>
<td>396</td>
<td>504</td>
<td>37</td>
<td>57</td>
</tr>
<tr>
<td>Option 1c</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Section</td>
<td>4</td>
<td>1,498</td>
<td>1,976</td>
<td>128</td>
<td>237</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>Southern Section</td>
<td>2</td>
<td>632</td>
<td>1,210</td>
<td>367</td>
<td>512</td>
<td>58</td>
<td>42</td>
</tr>
<tr>
<td>Option 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Section</td>
<td>5</td>
<td>1,162</td>
<td>1,667</td>
<td>419</td>
<td>585</td>
<td>36</td>
<td>35</td>
</tr>
<tr>
<td>Southern Section</td>
<td>6</td>
<td>1,823</td>
<td>2,148</td>
<td>812</td>
<td>912</td>
<td>45</td>
<td>43</td>
</tr>
<tr>
<td>Option 3B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Section</td>
<td>7</td>
<td>789</td>
<td>901</td>
<td>489</td>
<td>512</td>
<td>62</td>
<td>57</td>
</tr>
<tr>
<td>Southern Section</td>
<td>6</td>
<td>1,379</td>
<td>1,591</td>
<td>809</td>
<td>909</td>
<td>59</td>
<td>57</td>
</tr>
</tbody>
</table>

Table 6.4 – Traffic flows along route options

Table 6.4 and the select link analysis indicate that the routes attracting the most industrial estate traffic, in 2026, are options 2 and 3B although both these options have a large proportion of industrial estate traffic joining at the junction with link 6.
Of the three easterly routes, Option 1C attracts the most industrial estate traffic, closely followed by Option 1B. Option 1C does however attract a larger proportion of non industrial estate traffic (up to 88% of all traffic on link 4). Option 1A attracts less industrial estate traffic than 1B and 1C and, given the traffic flows on link 1, appears to be used primarily by traffic accessing or leaving the M1 at Junction 11A.

2011

The only option to have an impact on the key links identified in figure 6.1 (A-D) in terms of traffic flow, when compared to the Do Minimum scenario in 2011, is option 2. The model shows that the introduction of option 2 reduces traffic flows on Park Road North (link C). All options except for option 2 do not appear to have a significant impact on traffic flows on any of the four key links.

2026

As with 2011 option 2 is the only option to achieve a reduction in traffic flow along any of the four key links, which in this case, as before, is Park Road North. It should be noted that all options increase traffic flows along at least one of the key routes when compared to the 2026 Do Minimum scenario. Options 1A, 1B, 2 & 3B increase traffic flows along High Street North and options 1B, 1C, 2 & 3B increase traffic flows along Poynters Road.

Link Efficiency

2011

Options 2 & 3B have the most significant impact on link based efficiency with both reducing the problem on High Street North from serious to moderate. In addition to the High Street North problem options 2 & 3B also reduce the problem on Park Road North from moderate to slight, however they do both increase the problem on Poynters road from slight to moderate. With regards to efficiency problems on the options themselves all have slight problems with the exception of option 1C which has no problems.

2026

All options in 2026 will result in increased problems on Poynters Road from slight to moderate. In all cases the problem on High Street North remains serious and the problem on the A505 remains slight. Options 2 & 3B are the only routes to have a positive impact on link based efficiency by reducing the problem on Park Road North from moderate to slight. With regards to efficiency problems on the options, 1A has a serious problem, 1B,1C & 2 have a moderate problem and 3B has a slight problem.
Intersection Efficiency

2011

The severity of the High Street North / A505 junction efficiency problem is reduced by all options from severe to moderate. The moderate problems with the A5120 / The Green junction and The Green / Park Road North Junction, are eliminated by options 1A, 1C, 2 & 3B.

2026

The only two options that reduce the severe problem at the High Street North / A505 junction are options 2 & 3B, these two options however result in an increase in problem from slight to moderate at the Boscombe Road / A505 junction.

6.4 Industrial Estate - Select Link Analysis

To enable a more focussed assessment of traffic movements generated by the industrial estate, Halcrow provided link traffic flows for trips to and from the industrial estate zone only. The findings of this analysis for 2026 are presented in table 6.4. For summary purposes the pcu/hour values within the table are based on the total number of vehicles travelling to and from the industrial estate during the AM peak periods. A more detailed breakdown is included within the Halcrow Traffic Assessment Report.

<table>
<thead>
<tr>
<th>Option</th>
<th>Industrial Estate Traffic Using A505 - Boscombe Road</th>
<th>Industrial Estate Traffic Using High Street North</th>
<th>Industrial Estate Traffic Using Park Road North</th>
<th>Industrial Estate Traffic Using Poynters Road</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[pcu/hour, % Reduction]</td>
<td>[pcu/hour, % Reduction]</td>
<td>[pcu/hour, % Reduction]</td>
<td>[pcu/hour, % Reduction]</td>
</tr>
<tr>
<td>DM</td>
<td>1,745, 0</td>
<td>178, 0</td>
<td>449, 0</td>
<td>352, 0</td>
</tr>
<tr>
<td>1A</td>
<td>1,659, 5</td>
<td>115, 35.4</td>
<td>384, 14.5</td>
<td>197, 44</td>
</tr>
<tr>
<td>1B</td>
<td>1,609, 7.8</td>
<td>95, 46.7</td>
<td>263, 41.5</td>
<td>229, 35</td>
</tr>
<tr>
<td>1C</td>
<td>1,617, 7.4</td>
<td>100, 43.8</td>
<td>267, 40.6</td>
<td>217, 38.5</td>
</tr>
<tr>
<td>2</td>
<td>1,367, 11.7</td>
<td>0, 100</td>
<td>74, 83.5</td>
<td>243, 31</td>
</tr>
<tr>
<td>3B</td>
<td>1,374, 21.3</td>
<td>29, 83.7</td>
<td>32, 82.9</td>
<td>311, 11.7</td>
</tr>
</tbody>
</table>

Table 6.5 – Select Link Analysis Summary

Table 6.4 shows that options 2 and 3B provide the largest reduction of industrial estate traffic on all of the key links by a considerable margin.
It is noted that the select link analysis does not show any vehicles using the southern section of Poynters Road to gain access to the estate. This is not consistent with site observations and the findings of the questionnaire survey. It is therefore recommended that additional surveys are carried out as part of future assessments and the results of these are used in validating the traffic model for industrial estate traffic.

6.5 Economics

The following outputs are considered relevant when identifying potential sources of economic benefits;

Junction Delays

Assessments made regarding effects on congestion (i.e. junction delays) in section 6 were focussed on the key links in the vicinity of the industrial estate. The wider impacts of options on intersection efficiency in 2026 in the wider Dunstable Houghton Regis area are summarised in Table 6.6. Figures relate to the number of junctions experiencing serious, moderate and slight delays.

<table>
<thead>
<tr>
<th>Route Option</th>
<th>Serious Problems</th>
<th>Moderate Problems</th>
<th>Slight Problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do Minimum</td>
<td>1</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Option 1A</td>
<td>1</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Option 1B</td>
<td>1</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Option 1C</td>
<td>1</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>Option 2</td>
<td>0</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Option 3B</td>
<td>0</td>
<td>7</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 6.6 – Junction Delays

This shows that 2 and 3B are the only options to reduce the number of serious junction delay problems, however they do increase the number of moderate problems. Overall options 1A and 1B result in a worse situation with the number of moderate and slight problems increasing and the number of serious problems remaining the same.
Accidents

Table 6.7 shows the impact of each of the route options on accidents compared to the do minimum. Figures relate to the number of roads with serious, moderate or slight safety problems within the Dunstable / Houghton Regis area.

<table>
<thead>
<tr>
<th>Route Option</th>
<th>Road Safety Problems 2026</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Serious Problem</td>
</tr>
<tr>
<td>Do Minimum</td>
<td>29</td>
</tr>
<tr>
<td>Option 1A</td>
<td>29</td>
</tr>
<tr>
<td>Option 1B</td>
<td>27</td>
</tr>
<tr>
<td>Option 1C</td>
<td>29</td>
</tr>
<tr>
<td>Option 2</td>
<td>28</td>
</tr>
<tr>
<td>Option 3B</td>
<td>31</td>
</tr>
</tbody>
</table>

*Table 6.7 – Road Safety*

Option 1B is the only option to reduce the number of serious, moderate and slight problems, option 2 is the only other route that reduces the number of serious problems. It should be noted that the implementation of Option 3B increases the number of serious road safety problems.

Disruption due to Construction

All options require new junctions to connect into the existing network which could cause potential delays. It is believed that Option 3B is likely to cause the delays during construction as it requires the most number of junctions (3) in the more built up areas of Dunstable and Houghton Regis. Options 2 and 3A will require two junctions and Options 1A, 1B and 1C will require 1 connection in the more built up areas.

With regards to the impacts on local residents Options 1A, 1B, 1C and 3B will have the most impacts on local residents due to the number of residential properties adjacent to the proposed routes.

Accessibility

The traffic model included the creation of an accessibility model covering the Luton, Dunstable and Houghton Regis conurbation. This was used to examine both Employment Accessibility (i.e the each with which people can reach existing employment opportunities) and the Accessibility to Potential Workforces (i.e. the extent to which employment sites have access to its potential workforce). Tables 6.8 and 6.9 give a summary of the impacts for each option on Accessibility to Potential Workforce and
Employment Accessibility respectively. Figures relate to the number of areas which have a serious, moderate or slight problem with accessibility.

<table>
<thead>
<tr>
<th>Route Option</th>
<th>Accessibility to Potential Workforce 2026</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Serious Problem</td>
</tr>
<tr>
<td>Do Minimum</td>
<td>3</td>
</tr>
<tr>
<td>Option 1A</td>
<td>0</td>
</tr>
<tr>
<td>Option 1B</td>
<td>0</td>
</tr>
<tr>
<td>Option 1C</td>
<td>1</td>
</tr>
<tr>
<td>Option 2</td>
<td>0</td>
</tr>
<tr>
<td>Option 3B</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 6.8 – Accessibility to Potential Workforce

<table>
<thead>
<tr>
<th>Route Option</th>
<th>Employment Accessibility 2026</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Serious Problem</td>
</tr>
<tr>
<td>Do Minimum</td>
<td>7</td>
</tr>
<tr>
<td>Option 1A</td>
<td>3</td>
</tr>
<tr>
<td>Option 1B</td>
<td>3</td>
</tr>
<tr>
<td>Option 1C</td>
<td>3</td>
</tr>
<tr>
<td>Option 2</td>
<td>4</td>
</tr>
<tr>
<td>Option 3B</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 6.9 – Employment Accessibility

All options are beneficial with regards to Accessibility to Potential Workforce and Employment Accessibility as all reduce the number of serious.
Future Economic Assessment

Due to the early stage of this assessment, only a broad assessment of the economic impacts of options has been made. It is recommended that that a more detailed Cost Benefit Analysis be carried out as part of the Stage 2 assessment. This will allow further development of the route options and refinement of the traffic model before more accurate assumptions can be made relating to the economic performance of options.

7 Conclusions

7.1 Conclusions and Recommendations

The development of Dunstable, Houghton Regis and Leighton Buzzard has increased urban congestion, impacting on the quality of life and the prosperity of the town centre as well as the environment. The principal aims of the study and the route options considered support national, regional and local policies, in particular The Milton Keynes and South Midlands Sub Regional Strategy.

Options 1A, 1B and 1C

The southern link into the industrial estate for these three options is broadly similar and therefore each pose similar environmental impacts. All options will result in a loss in green belt and each will pass close to considerably more residential properties than the alternative options.

Each of these options pass through the area of land proposed in the South Bedfordshire Local Plan as open space to be enhanced for formal and informal recreation. Implications of this to together with the possibility of relocating the proposed open space locally will need to be explored as part of future assessments.

The Houghton Brook floodplain is also crossed by each of these options. The Houghton Brook is designated as Main River, therefore liaison will be required with the Environment Agency to determine possible mitigation measures.

Each of these options runs adjacent to a number of electricity pylons and under the associated high voltage cables. This is likely to cause significant problems in the area between Wheatfield Road and Sandringham Drive. This would also rule out the use of earth bunds and landscaping for noise / visual intrusion mitigation in this area. Mitigation measures are therefore likely to consist of more visually intrusive fencing.

For the purposes of this report, and for the development of the outline cost estimates, it has been assumed that cables crossing the potential route options can be raised. Early consultation with the service provider
will be required as part of future assessments to determine whether this approach is feasible and to confirm likely costs for raising / diverting cables.

Options 1A and 1B

Both 1A and 1B will require connections at the proposed Junction 11A. The possibility of such connections has been rejected by the Secretary of State during the development of the preferred route for the A5-M1 Link.

Given the early stage of this assessment, no conclusive findings have been made that would suggest that 1A and 1B are significantly more favourable solutions that the other route options discussed. It would therefore be difficult to support any application to review this decision at this stage. However, it is noted that preliminary traffic assessment do not take into account the possible shift by long distance traffic from the A5 to M1 that may result if a connection to the industrial estate were made at Junction 11A. It is considered that, should such a shift take place, additional industrial estate traffic would use a connection at the M1 to that currently displayed in the model. This would lead to a reduction in HGV traffic using the A5 and travelling through the congested town centre of Dunstable.

Option 1A

Option 1A will result in the least amount of impact on landscape as it limits intrusion into the countryside.

The select link analysis shows that Option 1A would be used by the least amount of industrial estate traffic, instead, being used predominantly by vehicles accessing or leaving the M1 at the proposed Junction 11A.

Option 1B

Option 1B will provide a direct link into the industrial estate and the majority of traffic (57%) using this link would be travelling to or from the industrial estate.

Option 1B has a slightly greater impact on the landscape than Option 1C due to greater impact on Farmland.

Option 1C

Option 1C will be used by marginally more industrial estate traffic than Option 1B but would have a more severe impact on landscape and intrusion into the countryside and would require mitigation. Along with Option 3A, 1C also crosses the greatest number of Public Rights of Way.

Although there are significant environmental impacts associated with Option 1C it should be noted that, due to its location and length, it could assist with future plans for growth and may reduce the need for future road construction.

Option 1C is likely to be of the highest cost.
Option 2

Although Option 2 will result in the least loss of green belt it will have the most significant impact on ecology and conservation. Option 2 runs adjacent to the Houghton Regis Marl Lakes SSSI and through the Houghton Regis Chalk Pit County Wildlife Site (CWS). During early consultations, English Nature (EN) have confirmed that Option two would lead to the effective destruction of the CWS and a loss in valuable buffer to the SSSI. Consequently EN have said that they are highly likely to object to this option. Option 2 also crosses the floodplain for the Ouzel Brook and mitigation will therefore need to be agreed with the Buckingham and River Ouzel Drainage Board.

Although Option 2 has the most impact of all the route options on the environment, the traffic modelling shows that, along with Option 3B, it will attract the most industrial estate traffic and will reduce the severe delay at the A5 / A505 junction from severe to moderate.

During early consultations, the Highways Agency have advised that they have concerns, on grounds of capacity, over the potential connection of Option 2 to the new A5 / link road roundabout. Early liaison will therefore be required with the Highways Agency to determine whether this connection will be acceptable or whether an alternative connection at the existing A5/A505 roundabout should be considered.

It is recommended that, prior to any additional assessment, further consultation be carried out with English Nature to determine whether there are any mitigation measures that could be put in place to overcome this potential objection.

Options 3A and 3B

Although not to the same extent as Option 2, Options 3A and 3B also pass through the Houghton Regis CWS and adjacent to the SSSI. Consequently, English Nature have advised that they have concerns over both these options due to the loss in buffer to the SSSI.

Of the two options Option 3A will be greater intrusion on the countryside than 3B and will require the procurement of significantly more land. However, similar to Option 1C, Option 3A could potentially benefit future growth.

Along with Option 2, Option 3B will attract the most industrial estate traffic with 57% of all traffic in 2026 using the route to travel to and from the estate. The addition of this route will also reduce the amount of industrial estate traffic using the A5 High Street North and will reduce the severe problem at the A505 / A5 to moderate.

Option 3B is likely to be of the lowest cost.

Non – Road Options

In order to deal with the wider issues of town centre urban quality, emissions levels, noise and vibration, pedestrian safety, modal shift and congestion relief, it is considered that the Woodside Connection is needed to mitigate both quantitative and qualitative issues within
Dunstable town centre, and on the existing residential routes serving the Woodside estate. However, the way in which traffic chooses to use the new route, and ways in which overall traffic levels could be reduced, must be addressed in parallel with the development of this infrastructure solution. Both connectivity between Houghton Regis and Dunstable employment areas, and improved public transport accessibility, need to be delivered in parallel with the road infrastructure solution, and full opportunity taken to deliver appropriate “soft” travel behaviour measures for commuters and supply chain providers.

This marriage between infrastructure and travel behaviour solutions is particularly innovative for logistics and freight movements and will add a fresh dimension to travel planning which has traditionally examined journeys to work and school. Therefore there will be in place an ongoing forum for managing the freight and logistics issues affecting the Woodside area in a holistic and effective manner.

The role of demand management has therefore been properly assessed within the wider scope of the Woodside Connection study, with the conclusion that whilst there is a clear role for the implementation of a discrete number of interventions, provision of the link road is still vital for the economic well-being and environmental safeguarding of Dunstable and the wider County.

**Future Consultation**

Close liaison will be required with the Highways Agency regarding the implications of connecting Option 1A and 1B to the proposed Jct 11A. It is recommended that the HA are engaged at an early stage to determine the likely cost implications of the connection and the impact on the existing proposed junction layout.

It is recommended that the further consultation is carried out with the businesses within the industrial estate. In addition to the routing of HGV’s this consultation should be expanded and ask questions that would assist in the development of an area wide travel plan. Where appropriate, results from this consultation should be used to validate future traffic modelling works.