Document 14.1, Appendix 6

Applicant's Post Hearing Submissions (CAH, ISH 2 and ISH3)
TN 42 Station Drive Closure

The West Midlands Rail Freight Interchange Order 201X

Four Ashes Limited

West Midlands Interchange

Four Ashes Ltd

WEST MIDLANDS INTERCHANGE

Transport Technical Note 42 – Impact of Closing Station Drive at the Rail Bridge.

Job Title	West Midlands Interchange	**Project Number**	70001979
Client	Four Ashes Limited		
TTN No.	42	**Date of Issue**	14 June 2019
Subject	Impact of Closing Station Drive		
Author	Laura Bazley	**Authorised**	Ian Fielding
Distribution			

1 INTRODUCTION

1.1 Following questions raised by interested parties and the Examining Authority during the Issue Specific Hearing 4 (Transport and Accessibility) during the DCO examination period, this Technical Note considers the possible road closure between Station Road and Station Drive (at the rail bridge) as an alternative to the right turn ban into Station Drive for northbound vehicles on the A449.

1.2 Specifically, representations have been submitted by New River Retail, in respect of the Four Ashes Public House suggesting an alternative to the proposals to modify the A449 / Station Drive junction. It is noted that the owners of the Four Ashes Public House did not make representations during either Stage 1 or Stage 2 DCO Consultation.

1.3 To help the Examination, consideration has been given to the operation of the junction with all traffic movements available, the likely re-assignment of traffic and a comparison of these effects with the proposed mitigation banning the right turn.

2 CONTEXT & PROPOSALS TO MODIFY A449 / STATION DRIVE JUNCTION

2.1 Currently, the junction of the A449 / Station Drive is an all movements junction. Station Drive provides access to 16 dwellings and the Four Ashes Public House to the west of the bridge. To the east of the bridge, where Station Drive becomes Station Road, the road serves Four Ashes Industrial Estate. Further to the east, the route becomes Vicarage Road, where it forms a priority junction with Straight Mile. Approximately 1.5 km to the north, Vicarage Road connects to the A5 at a traffic signal junction.

2.2 At Stage One DCO Consultation carried out in June 2016 the applicant received feedback from local people expressing concern that the Station Drive / Station Road / Vicarage Road link is currently used as an alternative route by traffic wishing to avoid Gailey Roundabout, particularly in order to travel to/from M6 Junction 12 as well as the east towards the A5 and Cannock.

2.3 In addition, residents expressed concern over HGV's inadvertently using Station Drive and striking the rail bridge, despite signs warning road users of the reduced height bridge. Currently, HGVs that are not able to drive beneath the bridge do not have sufficient space to turn around in order to avoid the bridge. In attempting to turn around, the applicant was advised by residents that such HGV movements do cause disruption and consequently concern was expressed that unmitigated, the situation may worsen with WMI.

2.4 Having discussed these matters with the Highways Authority's, Highways England and Staffordshire County Council, the recommendation was to do what was physically possible to ban movements into Station Drive, but ensure they were re-provided for elsewhere within the network – these being via the proposed A449 roundabout.

2.5 In order to respond to these comments, the applicant proposed to modify the A449 / Station Drive junction to ban right turn movements from the A449 south. The purpose of this modification was to: -

- Seek to reassign existing traffic travelling from south to east from Vicarage Road to the proposed A449/A5 link road and reduce rat running traffic;
- Act as a traffic management measure to ensure WMI traffic travelling from the south, in particular HGV's could not utilise Station Drive/Vicarage Road to access the site, thus reducing traffic along this route.
- Banning the right turn would also physically prevent HGV's from the south from utilising this route and encountering the reduced height bridge or striking it if attempting to pass beneath it. ; and
- In general terms, to provide a highway mitigation strategy that would provide sufficient measures to ensure that traffic utilised the primary road network, rather than leading to a position that may lead to traffic using inappropriate routes.

2.6 The approach was supported by SCC (ie the physical ban of the right turn) and further tested through the South Staffordshire VISSIM Model, together with the A449/A5 link road which was shown to not have a detrimental impact on the A449 / Station Drive junction operation and would not require CPO. This position was accepted by HE and SCC and is the case in highway terms presented at Stage 2 DCO Consultation and within the DCO Transport Assessment **(Document 6.2, APP-114)**. The provision of the HGV turning area would supplement the banned right turn by providing a facility for any HGV's that erroneously turn into Station Drive from the north.

2.7 Through the provision of the A449 roundabout, existing users of Station Drive would be able to travel north and then U turn at the junction before heading to the south, then turning left into Station Drive. This facility would serve existing residents, customers of the Four Ashes Public House and the Four Ashes Industrial Estate.

2.8 It is important to note that the banned right turn for vehicular traffic would not be in force until the A449 roundabout is completed.

2.9 In terms of the impact on other local road users, for example, those visiting or working at the Four Ashes Industrial Estate off Station Road, drivers would be able to access Station Road from the east via the A5/Vicarage Road and from Station Drive via the A449 (via a short diversion up to the new roundabout if travelling from the south). This would result in a diversion of just over 2km or approximately 2 minutes, which in our judgement is not material and likely to result in drivers continuing to use the primary road network.

2.10 The proposed modifications to the A449 / Station Drive junction were promoted primarily as a traffic management measure. However, given that the modifications would remove the right turn from the south, this would will also have some benefit in junction capacity terms.

2.11 Other options considered from a qualitative perspective were completely closing Station Drive, to the west of the bridge, provision of carriageway narrowing beneath the bridge and signed banned turns. However, these were not supported in principle by the Local Highway Authority (SCC) or the Strategic Highway Authority (HE). This was confirmed at a meeting held on 20 September 2016, as set out in the Minutes of the meeting, details of which are provided within Appendix B of the Transport Assessment **(Document 6.2, APP-131)**.

2.12 The closure of Station Drive / Road at the rail bridge will result in the diversion of employee traffic accessing the Four Ashes Industrial Estate as this will no longer be accessible from the A449. Figure TN42-1 shows the routes which could be used to commute to the estate if Station Road is closed at

the rail bridge. The diversion for traffic to the north, east and west is most likely going to be onto the A5 and then south onto Vicarage Road which is an appropriate route for traffic to use. In order to avoid long diversions, it is considered that traffic from the south is likely to use inappropriate routes through the local villages to the south of the estate including Featherstone, Shareshill and Calf Heath.

2.13 Since the Issue Specific Hearing, following questions raised by Interested Parties and the examining Authority, this matter has been discussed once again with the relevant Highway Authorities. In the case of SCC, the applicant understands that the local highway authority would not support the full closure of Station Drive to the west of the bridge, given that in their view, it would be likely to increase the use of inappropriate routes (rat-running through lanes nearby).

2.14 In the case of Highways England, the applicant understands that the position of the strategic highway authority is that the mitigation put forward by the applicant remains acceptable and does not result in any adverse effects on the Strategic Road Network.

2.15 Notwithstanding the above, in order to assist the Examining Authority, the applicant has considered the effects of closing Station Drive to the west of the bridge.

3 JUNCTION OPERATION

3.1 If Station Drive is closed to all vehicular traffic at the rail bridge the operation of the signal junction with the A449 will continue to operate with all movements available although the volume of traffic turning into and out of Station Drive will be significantly reduced.

3.2 In order to consider the effects of closing Station Drive to the west of the bridge, an assessment has been undertaken of the operation of the junction with the A449 assuming all vehicular traffic movements are possible, but it would only serve the Four Ashes Public House and the existing 16 dwellings. This has been undertaken using the LINSIG computer programme, which is the industry accepted package for assessing the operation of traffic signal junctions.

3.3 The closure of Station Drive would require reassignment of current modelled traffic flows using the junction, which would under the situation assessed, need to take a different route.

3.4 In order to assess a robust position, it has been assumed that reassigned traffic would be on the basis provided below. This has regard to the forecast traffic flows as provided in **Document 6.2, APP-146 at Figures T5 – T8**, which assume the proposed A449 roundabout, the A449 / A5 link road and Crateford Lane one way section would all be in place. This reassignment has been undertaken on the following basis: -

- All Station Drive left turn traffic would reassign to A449 ahead southbound;
- All Station Drive ahead traffic would reassign to A449 right turn into Four Ashes Road;
- All Station Drive right turn traffic removed from assessment – assumed will re route via the east and A5. Allowances included within assessment for 16 dwellings and the Public House;
- A449 left turn to Station Drive reduced to account for reassignment elsewhere as per above. Only existing dwellings and Public House served via this movement;
- A449 right turn to Station Drive. Only existing dwellings and Public House served via this movement;
- A449 ahead – north bound – no change as traffic reassignment already accounted for; and
- Four Ashes Road – ahead movement removed and reassigned 90% to the left to movement during the AM peak and 85% during the PM peak. The balance of traffic flow is reallocated to the right turn movement.

3.5 The results of the modelling undertaken are provided at Annex A to this TN. These show that the junction would operate satisfactorily with the closure of Station Drive. The results of this assessment have not been discussed in detail with either HE or SCC.

3.6 Notwithstanding the above, given the level of inconvenience that would result to road users, it is considered that the assessment of the effects of the closure of Station Drive should not simply concern junction operation. It is considered that any displaced road users may seek to take alternative routes, using less suitable sections of the highway network. This concern has also been raised by SCC during informal discussions since the Issue Specific Hearing. This matter is considered in the Section 4.

4 DIVERSION ROUTES

4.1 If Station Drive is closed to all vehicular traffic at the rail bridge it will only continue to serve 16 dwellings and the Four Ashes Pub whilst the entire Four Ashes Industrial Estate will no longer be accessible from the A449. As a result, all traffic for the industrial estate will have to find an alternative route. Also, if any of the residents of the 16 properties west of the bridge have an origin / destination to the east, they will no longer be able to continue along Station Drive / Station Road / Vicarage Road and will need to divert via the A449.

4.2 These routes are mainly narrow single track roads with occasional passing places. Increasing traffic on these links is likely to increase the risk of accidents for vulnerable road users (pedestrians, cyclists and equestrians) as well as drivers. There will be other environmental impacts from an increase in traffic on these routes too.

4.3 In considering mitigation measures for the scheme FAL has had regard to the local concern over the use of local lanes for traffic in the area. The proposals have been tested and agreed by the Highways Authorities and their consultants. As a 'failsafe' FAL has agreed to set up a Contingent Traffic Management Fund which will be used to monitor and fund measures to prevent inappropriate use of these roads by WMI traffic. To put in place the closure of Station Drive/Road at the rail bridge is likely to drive traffic to the seek out the very routes that local people are concerned about.

4.4 Measures could be put in place to prevent the use of these inappropriate routes such as directional signage and traffic calming, however, those local to the area are likely to still use the routes they perceive to be quicker and shorter compared to the appropriate diversion route. Table 1 below sets out a comparison of distances from M54 J2 to the Four Ashes Industrial Estate using a selection of routes, including the position proposed by the applicant.

Table 1: Comparison of Distances to Four Ashes Industrial Estate

Route	Distance to Four Ashes Industrial Estate from M54 J2
Existing Route via A449 and Station Drive	4.5km
Appropriate diversion route – Via A449, A5 / A449 Link Road, A5 and Vicarage Road	10.7km
Via M54, A460, Saredon Road and Straight Mile	10.4km
Via A449, Old Stafford Road, New Road, Featherstone Lane, Latherford Lane and Straight Mile	9km
With a right turn ban into Station Drive (rather than full closure at the bridge) and U-turn opportunity at WMI junction	6.8km

4.5 From the above, it can be seen that there would be increases in journey distances for those using the appropriate route to reach the Four Ashes Industrial estate in the event that Station Drive were closed,

which would amount to around 4 km beyond the position proposed by the applicant. Accordingly, this may have unintended consequences and give rise to an increase in the use of inappropriate routs by traffic that would be required to reassign away from the junction.

5 SUMMARY

5.1 In summary, the TN concludes that the provision of the closure of Station Drive to the west of the existing railway bridge would not provide suitable mitigation. By closing Station Drive, it is considered that the resultant highway network would be less resilient and would be likely to have unintended consequences in relation to displaced traffic having to re route onto other less appropriate routes.

5.2 The mitigation proposed by the applicant by way of the right turn ban provides a balanced approach to traffic management in order to seek to prevent rat running along the Station Drive / Station Road / Vicarage Road corridor and reducing the likelihood of erroneous HGV movements. It is accepted that there will be some traffic that is required to undertake a diversion but this would take place on an appropriate route using the primary road network. The approach proposed seeks to minimise to whom this diversion would apply by limiting it to traffic arriving from the south. All other movements can be undertaken at the A449 for users of Station Drive, both to the west and east of the bridge.

5.3 Given that the mitigation proposed has been accepted by both the Strategic and Local Highway Authority's, it is the conclusion of the applicant that the banned right turn at the A449 / Station Drive junction remains valid.

Key

- Site Location
- Four Ashes Industrial Units Accesses
- Existing Route
- Multiple Routes
- Alternative Route 1
- Alternative Route 2
- Alternative Route 3
- Alternative Route 4
- Alternative Route 5
- Alternative Route 6

A5
A449 Stafford Rd
A5
A5
A5 Watling St
A449 / A5 Link Rd
Vicarage Rd
Straight Mile
Kings Rd
Saredon Ln
Great Saredon Rd
Station Dr
A449 Stafford Rd
Latherford Ln
Brewood Rd
Saredon Rd
Church Rd
New Rd
Old Stafford Rd
Featherstone Ln
Cannock Rd
Featherstone Ln
A460
Brookhouse Ln
M54
Cat and Kittens Ln
A449 Stafford Rd

S:\70001979 - WMI SRFI\E Models and Drawings\Development\COREL

wsp

TITLE:

Rerouting Impact of Closing Station Drive to Vehicles Accessing Four Ashes Industrial Units

FIGURE No:

TN42 - Fig 1

WEST MIDLANDS INTERCHANGE

Transport Technical Note 42 – Impact of Closing Station Drive at the Rail Bridge.

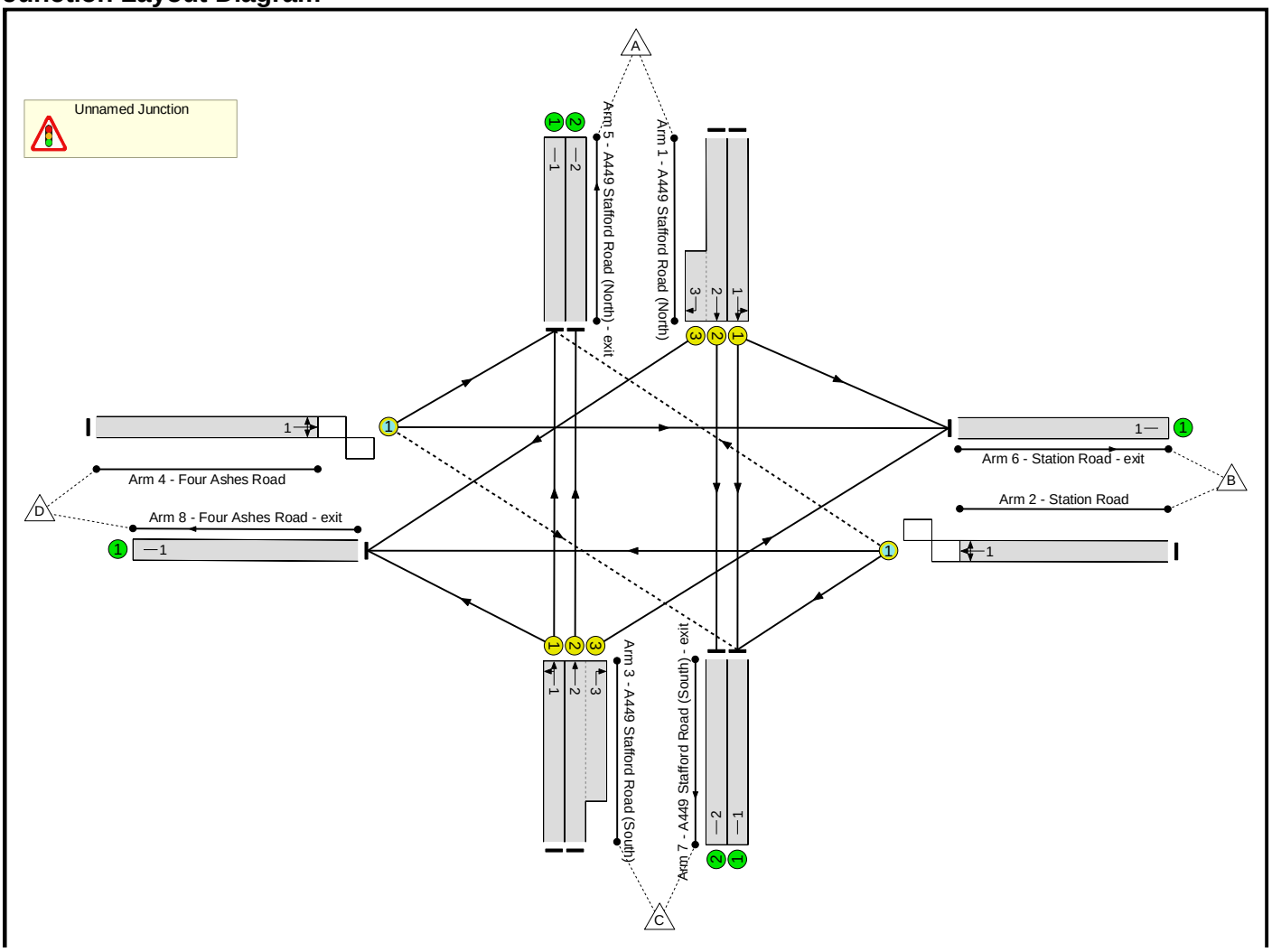
Annex A – A449 / Station Drive Capacity Assessment – with Closure of Station Drive

TA Report

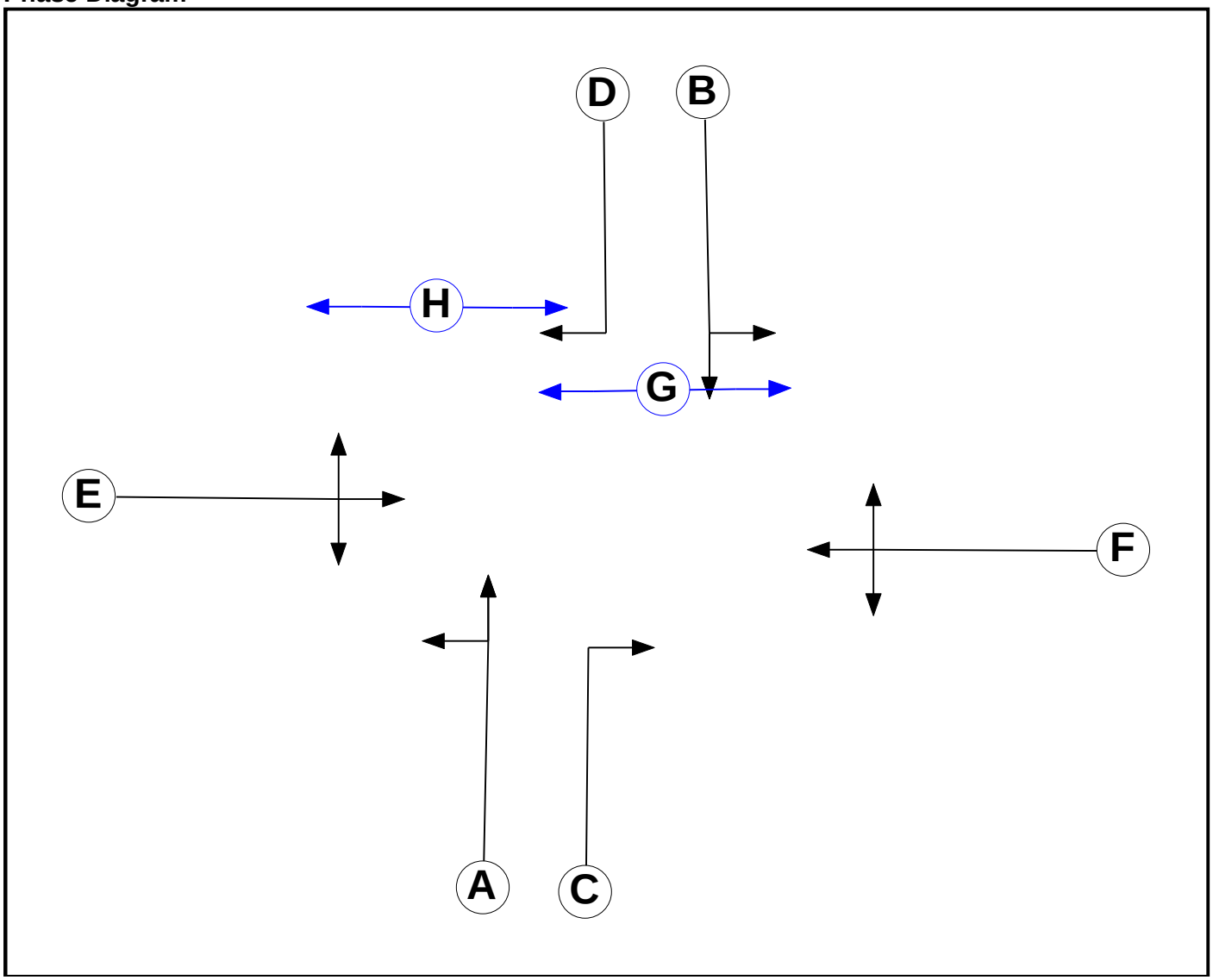
User and Project Details

Project:	**WMI SRFI**
Title:	**Analysis of Station Drive Closure on A449 / Station Drive Signal Junction**
Location:	
Client:	West Midlands Interchange
Site Ref(s):	A449 at Station Drive
Design Layout Ref:	Doc 2.9A - Highway General Arrangement Plan 101
Date Completed:	June 2019
Model Purpose:	To identify the impact of closing Station Drive at the rail bridge on the operation of the A449 / Station Drive signal junction.
Checked By:	LEB
Checked By Date:	June 2019
Additional detail:	
File name:	A449-Station Rd-Four Ashes Rd Junction - Existing - Closed Station Dr test.lsg3x
Author:	RJM
Company:	
Address:	

Junction Layout Diagram



Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Traffic		7	7
E	Traffic		7	7
F	Traffic		7	7
G	Pedestrian		7	7
H	Pedestrian		7	7

Phase Intergreens Matrix

		Starting Phase							
		A	B	C	D	E	F	G	H
Terminating Phase	A		-	-	6	6	7	-	9
	B	-		6	-	7	5	5	-
	C	-	5		-	6	6	-	-
	D	6	-	-		6	-	-	-
	E	6	6	6	6		-	-	8
	F	5	6	6	-	-		-	6
	G	-	12	-	-	-	-		-
	H	10	-	-	-	10	10	-	

Scenario 3: '2021 AM Peak adjusted with Station Drive closure' (FG3: '2021 AM Peak adjusted with Station Road closure', Plan 1: 'Network Control Plan 1')

Traffic Flows, Actual

Actual Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	1	1760	84	1845
	B	4	0	4	2	10
	C	1519	1	0	20	1540
	D	184	0	73	0	257
	Tot.	1707	2	1837	106	3652

Phase Timings

Phase Name	Description	Phase	Green Period 1			Green Period 2		
			Total Green	Start Time	End Time	Total Green	Start Time	End Time
A	A449 Stafford Road (South) Ahead Left A449 Stafford Rd (South) - Ahead	Traffic	56	6	62	59	111	170
B	A449 Stafford Road (North) Left Ahead A449 Stafford Rd (North) - Ahead	Traffic	60	18	78	60	123	183
C	A449 Stafford Road (South) Right A449 Stafford Rd (South) - Right	Traffic	7	6	13	7	111	118
D	A449 Stafford Road (North) Right A449 Stafford Rd (North) - Right	Traffic	10	68	78	7	176	183
E	Four Ashes Road Left Ahead Right Four Ashes Rd	Traffic	17	88	105	20	190	0
F	Station Road Right Left Ahead Station Rd	Traffic	17	88	105	22	188	0
G	Pedestrians across A449 Stafford Rd (North) - Peds Across SB	Pedestrian	22	83	105			
H	Pedestrians across A449 Stafford Rd (North) - Peds Across NB	Pedestrian	7	71	78			

TA Report

TA Report

Link Results

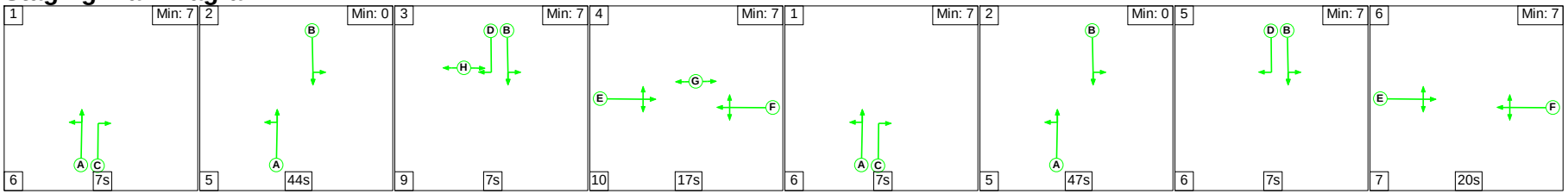
Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Analysis of Station Drive Closure on A449 / Station Drive Signal Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**81.2%**
Unnamed Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**81.2%**
1/1	A449 Stafford Road (North) Left Ahead	U	N/A	N/A	B		2	120	-	848	1980	1150	73.7%
1/2+1/3	A449 Stafford Road (North) Ahead Right	U	N/A	N/A	B D		2	120:17	-	997	2120:1588	1124+103	81.2 : 81.2%
2/1	Station Road Right Left Ahead	O	N/A	N/A	F		2	39	-	10	1932	248	4.0%
3/1	A449 Stafford Road (South) Ahead Left	U	N/A	N/A	A		2	115	-	739	1975	1100	67.2%
3/2+3/3	A449 Stafford Road (South) Ahead Right	U	N/A	N/A	A C		2	115:14	-	801	2120:1753	1179+1	67.8 : 67.8%
4/1	Four Ashes Road Left Ahead Right	O	N/A	N/A	E		2	37	-	257	1722	320	80.4%

TA Report

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Analysis of Station Drive Closure on A449 / Station Drive Signal Junction	**-**	**-**	**76**	**0**	**1**	**19.2**	**7.5**	**0.0**	**26.8**	**-**	**-**	**-**	**-**
Unnamed Junction	**-**	**-**	**76**	**0**	**1**	**19.2**	**7.5**	**0.0**	**26.8**	**-**	**-**	**-**	**-**
1/1	848	848	-	-	-	3.8	1.4	-	5.2	22.0	17.9	1.4	19.3
1/2+1/3	997	997	-	-	-	5.3	2.1	-	7.5	26.9	22.2	2.1	24.4
2/1	10	10	4	0	0	0.1	0.0	0.0	0.1	43.6	0.2	0.0	0.3
3/1	739	739	-	-	-	3.4	1.0	-	4.4	21.4	15.6	1.0	16.6
3/2+3/3	801	801	-	-	-	3.7	1.0	-	4.7	21.3	17.1	1.0	18.2
4/1	257	257	72	0	1	2.9	1.9	0.0	4.9	68.0	7.3	1.9	9.2

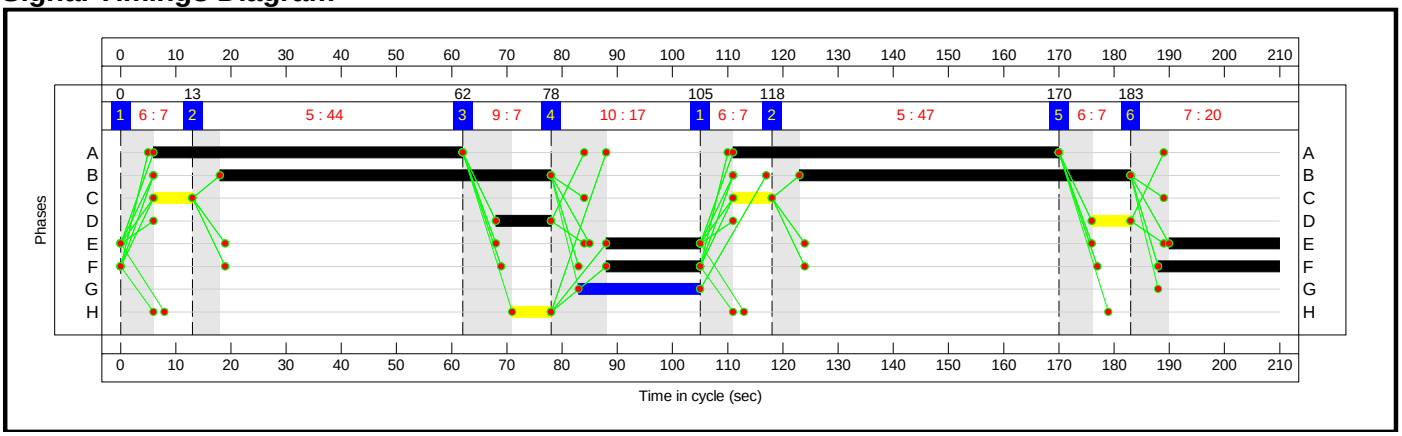
C1 PRC for Signalled Lanes (%): 10.8 Total Delay for Signalled Lanes (pcuHr): 26.76 Cycle Time (s): 210
PRC Over All Lanes (%): 10.8 Total Delay Over All Lanes(pcuHr): 26.76

Staging Plan Diagram



TA Report

Signal Timings Diagram



Scenario 4: '2021 PM Peak adjusted with Station Drive closure' (FG4: '2021 PM Peak adjusted with Station Road closure', Plan 1: 'Network Control Plan 1')

Traffic Flows, Actual

Actual Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	11	1672	98	1781
	B	4	0	4	2	10
	C	1495	11	0	22	1528
	D	69	0	10	0	79
	Tot.	1568	22	1686	122	3398

Phase Timings

Phase Name	Description	Phase	Green Period 1			Green Period 2		
			Total Green	Start Time	End Time	Total Green	Start Time	End Time
A	A449 Stafford Road (South) Ahead Left A449 Stafford Rd (South) - Ahead	Traffic	68	6	74	69	113	182
B	A449 Stafford Road (North) Left Ahead A449 Stafford Rd (North) - Ahead	Traffic	72	18	90	71	125	196
C	A449 Stafford Road (South) Right A449 Stafford Rd (South) - Right	Traffic	7	6	13	7	113	120
D	A449 Stafford Road (North) Right A449 Stafford Rd (North) - Right	Traffic	10	80	90	8	188	196
E	Four Ashes Road Left Ahead Right Four Ashes Rd	Traffic	7	100	107	7	203	0
F	Station Road Right Left Ahead Station Rd	Traffic	7	100	107	9	201	0
G	Pedestrians across A449 Stafford Rd (North) - Peds Across SB	Pedestrian	12	95	107			
H	Pedestrians across A449 Stafford Rd (North) - Peds Across NB	Pedestrian	7	83	90			

TA Report

Link Results

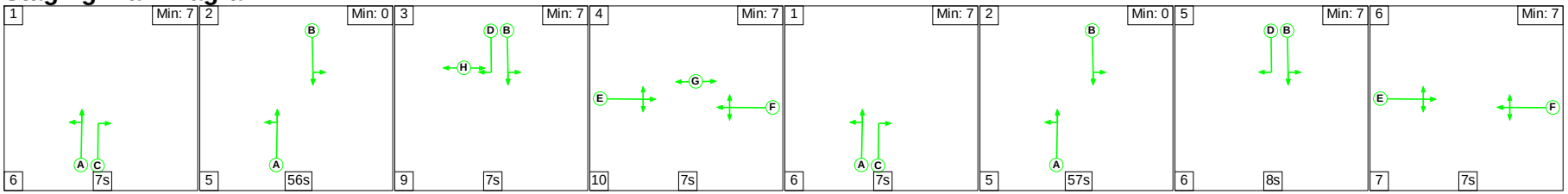
Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Analysis of Station Drive Closure on A449 / Station Drive Signal Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**66.9%**
Unnamed Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**66.9%**
1/1	A449 Stafford Road (North) Left Ahead	U	N/A	N/A	B		2	143	-	810	1977	1365	59.3%
1/2+1/3	A449 Stafford Road (North) Ahead Right	U	N/A	N/A	B D		2	143:18	-	971	2120:1588	1304+146	66.9 : 66.9%
2/1	Station Road Right Left Ahead	O	N/A	N/A	F		2	16	-	10	1932	166	6.0%
3/1	A449 Stafford Road (South) Ahead Left	U	N/A	N/A	A		2	137	-	728	1974	1307	55.7%
3/2+3/3	A449 Stafford Road (South) Ahead Right	U	N/A	N/A	A C		2	137:14	-	800	2120:1753	1385+19	57.0 : 57.0%
4/1	Four Ashes Road Left Ahead Right	O	N/A	N/A	E		2	14	-	79	1702	130	60.9%

TA Report

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Analysis of Station Drive Closure on A449 / Station Drive Signal Junction	**-**	**-**	**14**	**0**	**0**	**10.6**	**3.8**	**0.0**	**14.5**	**-**	**-**	**-**	**-**
Unnamed Junction	**-**	**-**	**14**	**0**	**0**	**10.6**	**3.8**	**0.0**	**14.5**	**-**	**-**	**-**	**-**
1/1	810	810	-	-	-	1.9	0.7	-	2.6	11.8	12.8	0.7	13.6
1/2+1/3	971	971	-	-	-	3.4	1.0	-	4.4	16.3	15.9	1.0	16.9
2/1	10	10	4	0	0	0.1	0.0	0.0	0.2	56.8	0.3	0.0	0.3
3/1	728	728	-	-	-	1.9	0.6	-	2.6	12.7	12.1	0.6	12.8
3/2+3/3	800	800	-	-	-	2.2	0.7	-	2.9	13.1	13.3	0.7	14.0
4/1	79	79	10	0	0	1.0	0.8	0.0	1.8	81.5	2.3	0.8	3.0

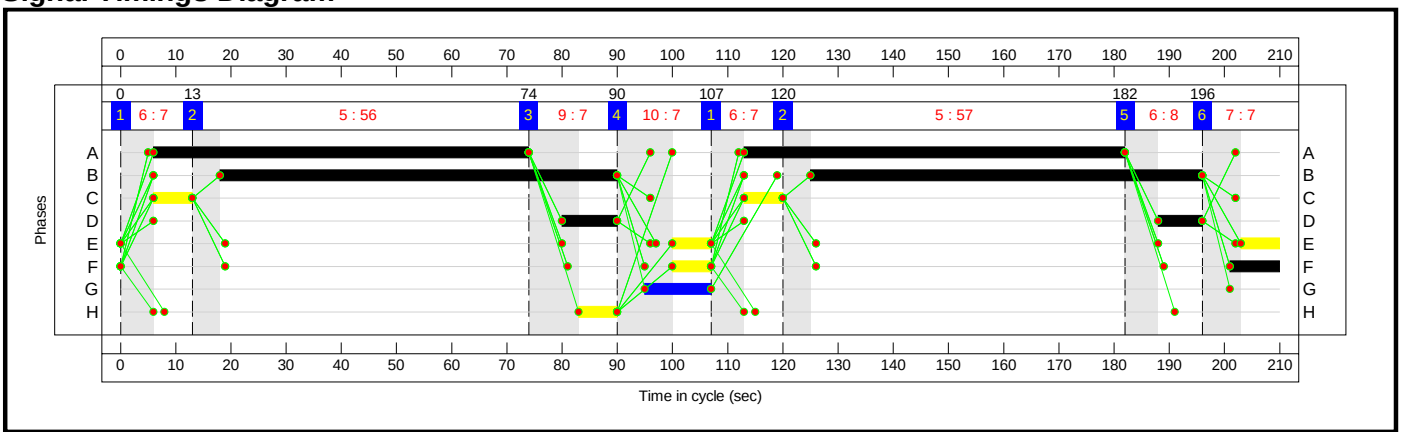
C1 PRC for Signalled Lanes (%): 34.4 Total Delay for Signalled Lanes (pcuHr): 14.45 Cycle Time (s): 210
PRC Over All Lanes (%): 34.4 Total Delay Over All Lanes(pcuHr): 14.45

Staging Plan Diagram



TA Report

Signal Timings Diagram



Applicant's Post Hearing Submissions (CAH, ISH 2 and ISH3)
TN 25 Parking Laybys

The West Midlands Rail Freight Interchange Order 201X

Four Ashes Limited

West Midlands Interchange

Four Ashes Ltd

WEST MIDLANDS INTERCHANGE

Transport Technical Note

Job Title	West Midlands Interchange	**Project Number**	70001979
Client	Four Ashes		
TTN No.	25 Revision A	**Date of Issue**	June 2018
Subject	A449 Laybys		
Author	Nicola Weale/Stephen Foulkes	**Authorised**	Ian Fielding
Distribution			

1.0 INTRODUCTION

1.1 This Technical Note (TN) provides a summary of the proposed relocation of the lay-bys from the A5 between M6 Junction 12 and Gailey Roundabout to the A449 south of Gailey Roundabout.

1.2 This document supersedes a previous version prepared in August 2017 and provides additional information requested by Kier, acting on behalf of Highways England as it relates to the justification of the replacement laybys proposed.

1.3 The document refers to the following standard: Design Manual for Roads and Bridges (DMRB) Volume 6, Section 3 Part 3. TD69/07: The Location and Layout of Lay-bys and Rest Areas.

1.4 This TN provides details of the following information: -

- Usage of existing laybys;
- Design of proposed A449 laybys;
- justification as to location of relocation of proposed laybys;
- changes of AADT arising from West Midlands Interchange on the A5 and A449 in the vicinity of the proposed laybys;
- Details of measures proposed by the WMI Site Wide HGV Management Plan that will accommodate early arrivals by HGV's at the Site; and
- Details of forecast HGV duration of stay at WMI, based upon surveys at Daventry International Rail Freight Terminal (DIRFT) and usage of adjacent HGV parking facilities.

2.0 EXISTING LAY-BYS – GEOMETRY & USAGE

2.1 Due to the proposals for a new roundabout to be sited on the A5, the existing lay-bys are required to be relocated.

2.2 There are currently two existing lay-bys located on the A5 between M6 Junction 12 and Gailey Roundabout. The eastbound lay-by is located immediately east of the canal bridge, opposite the Gailey Marina Access. The westbound lay-by is located approximately 40m further east before the Harrisons Lane priority junction. Their locations are shown in red on Figure 1 below:

FIGURE 1

2.3 Both existing lay-bys have a total length of 80m and are approximately 3.5m wide. The left right stagger distance between the lay-bys is approximately 30m.

2.4 The geometries have been checked against DMRB TD69/07. The existing lay-by geometries do not meet the design standard requirements of DMRB TD69/07, they are however close to those described as 'Type B' with no segregation island as per Figure 4/3 of DMRB TD69/07. Paragraph 4.4 of DMRB TD69/07 states that Type B lay-bys must not be used on dual carriageway roads, or single carriageway roads with a speed limit greater than 40mph. The A5 is a single carriageway road with a speed limit of 50mph. On this basis, the design of the layby's are sub-standard.

2.5 Surveys of the existing lay-bys were undertaken on two consecutive weekdays to analyse the usage and class of vehicle occupants. These surveys were undertaken on 12 and 13 July 2017. Charts have been produced to show the occupancy against capacity of the existing lay-bys to determine the trends of usage. These charts are shown in APPENDIX A of this report. A request has been made from Kier to supply the raw data obtained by the surveys and this has been supplied to them.

2.6 The results of these surveys show that currently, the laybys are predominately used by HGV's but also by standard class vehicles. However, it is necessary to close these laybys in order to facilitate the proposed A5 access roundabout. Given that the laybys are currently shown to be used by the travelling public, it has been agreed that it is necessary to re-provide these layby facilities in order that the Proposed Development mitigates its impact. The maximum usage of the total length of the laybys is shown by the charts to extend to a length of 68 metres of the available 80 metres total length. However for the majority of the survey period this was shown to be much less.

2.7 Given the above, it is proposed to re-provide the existing available length of the laybys at their relocated position. The purpose of this is to ensure that the existing availability to parking facilities on the Strategic Road Network continues for the travelling public.

2.8 Comment has been made by Kier that the surveys of the existing laybys should have considered a greater duration extending to a period of seven days. In the context of this proposal, this is not considered necessary given that the proposal seeks to re-provide the existing layby length. It is not proposed to provide a reduction in length. Given that demand for the laybys can only amount to vehicles that can actually be physically accommodated, it is considered that it is not necessary to carry out demand surveys over a seven day period when the existing provision is being re provided.

2.9 Comment has been made by Kier that the proposed layby length should consider changes in forecast traffic demand arising from the Proposed Development. This is discussed later within this document.

2.10 On the basis of the above, it is considered that it is acceptable that the replacement laybys are provided with a total length of 80 metres as per the current arrangements.

3.0 PROPOSED LAYBYS

3.1 The results of the surveys show that these lay-bys are currently used, with specific overnight usage by OGV's identified. Given that HGV parking is known to be an issue in the area surrounding the site, it is considered that the lay-by's that need to make way to accommodate the proposed roundabout junction with the A5 should be replaced.

3.2 Given that the existing lay-bys are located on the Strategic Road Network, it is considered that the replacement lay-bys should be similarly provided on the Strategic Road Network.

3.3 Due to the number of existing access roads and junctions along the A5, there is insufficient carriageway space to accommodate the relocation of the lay-bys on the A5 between M6 Junction 12 and Gailey Roundabout. Paragraph 3.7 of TD69/07 discusses the required separation distance between a lay-by and a junction or access, both upstream and downstream. The required separation distance from the start / end of the diverge / merge lanes of the laybys should equate to a ratio of 3.75V where V is the mainline design speed in kph.

3.4 On this basis, provision of new laybys would require separation distances of 375 metres on the A449 and 319 metres on the A5.

3.5 The opportunities for re-location are strictly limited not least because a TD 69 compliant lay-by on the A449 requires a separation of at least 375m upstream and downstream from all other junctions and accesses and a transverse width of over 12m plus any embankment or cutting; and over 24m if the lay-bys lie opposite each other as preferred.

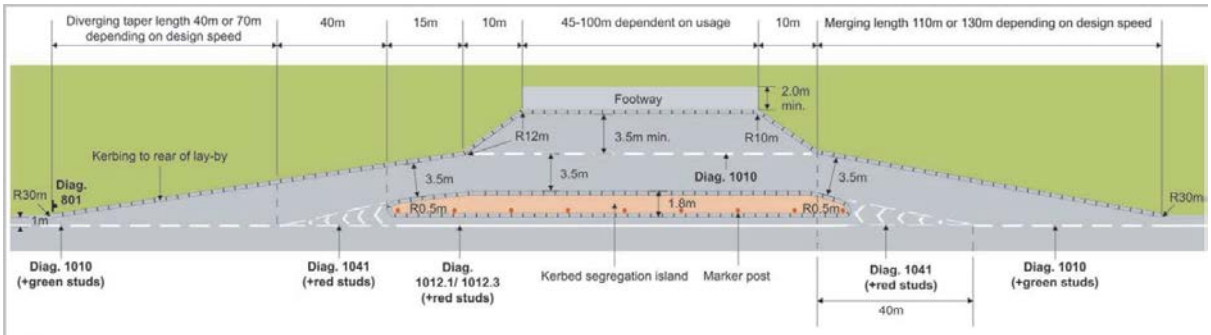
3.6 As can be seen from the attached Drawing 70001979-DS-06 (**APPENDIX B**) which shows the separation distance of 319m from accesses both up and downstream, there is nowhere on the A5 between the M6 and the A449 that can sensibly accommodate a pair of lay-bys. To the east of the M6 there is insufficient land width to provide compliant sized lay-bys and a short distance east of the M6 lies The New Hollies Truck Stop which already provides significant lorry parking. Similar constraints exist on the A5 to the west of the A449.

3.7 It is therefore proposed the lay-bys are placed on the A449, where as shown by drawing 70001979-DS-06 the density of accesses is less. It also has the advantage of being a dual carriageway which physically prohibits right turn in and out of the lay-bys and are consequently considerable safer than the current arrangements.

3.8 The lay-bys can be re-provided along the A449 on land that is under the control of the applicant. There is sufficient space at this location to allow lay-bys to be re-provided that match the current length as well as provide merge/diverge arrangements that meet the geometric requirements of DMRB TD69/07.

3.9 Should vehicle wish to stop whilst travelling east-west along the A5 without turning south onto the A449, there is a lay-by on the westbound carriageway approximately 1.5km west of Gailey Roundabout which can be utilised.

3.10 As set out in DMRB TD69/07 Table 4-1, 'Type A with Merge' lay-bys are required on Dual Carriageway roads with speed limit greater than 40mph. The new lay-bys have been designed to this standard and the geometries meet the standards set out in DMRB TD69/07 Figure 4/2, as per the extract below:



Notes:

1. Diagram numbers refer to **TSRGD**.
2. See paragraphs 4.19 and 4.20 for footway details.
3. Segregation island to have a kerbed and raised surface of contrasting colour
4. Collapsible black and white marker posts with a red reflector to diagram 560 or 561 may be used on the segregation island
5. Diverging taper length: 40m for design speed ≤ 100km/h, 70m for 120km/h
6. Merging length: 110m for design speed ≤ 100km/h, 130m for 120km/h
7. R is the radius indicated

Figure 4/2: Geometric Layout of Type A with Merge Taper Lay-by

3.11 As the lay-by capacity charts showed that neither lay-by reached full capacity, the new lay-bys will have the same storage length to accommodate parked vehicles. As specified above, the proposed layby's will however benefit from having a kerbed segregation island with the A449 and merge/diverge tapers which is in accordance with DMRB TD69/07. The provision of these elements will provide a safer design arrangement than is currently the case at the existing A5 lay-bys.

3.12 There are proposals to improve the north-south footway on the west and cycleway on the east of the A449 which will improve pedestrian and cycle facilities adjacent to both lay-bys.

3.13 Paragraph 3.7 of TD69/07 discusses the required separation distance between a lay-by and a junction or access, both upstream and downstream. Whilst the new lay-bys do not meet the required 3.75V distance from Gailey Roundabout or the Marsh Farm access, these departures have been applied for as discussed in WSP Technical Note 21.

3.14 There are three gaps in the central reservation along the A449 within the vicinity of the proposed lay-bys; these provide access to the adjacent farmland. The farms are within land that it is under the control of the applicant and will either be closed as part of the development proposal or access can be achieved via an alternative route via Marsh Farm. Therefore, the new lay-by design proposals will include closure of the accesses through the central reservation and remove the accesses to the farm land. This will also have safety benefits.

3.15 The new lay-by arrangements are shown on WSP drawing 70001979-GA-105 Revision E which is contained in APPENDIX C at the end of this document.

3.16 Comment has been made previously by HE by way of e-mail dated 19 September 2017 that the existing A449 northbound layby at Coven Heath may be closed and that the possibility of extending the proposed A449 layby should be explored. This exercise has been carried out and whilst theoretically the storage length could be extended to 100m (the maximum permitted by TD69/07) and accommodated within land that is under the control of the Applicant, this would bring the upstream separation distance closer to Gailey Roundabout by approximately 60 metres. This would have the potential to impact upon the departure from designs standards submission should it be taken further, which when considered that it should not be necessary for the proposed laybys to deal with anything other than the impact of the Proposed Development, is not considered reasonable. As specified later within this document, it is demonstrated that it is not necessary to provide a greater length at the proposed relocated laybys than is already provided by the existing laybys.

4.0 TRAFFIC CHANGES

4.1 Comment has been made by Kier, on behalf of HE that the area surrounding the site will experience changes in AADT, particularly on the A5 and A449. TD69/07 states that: -

> 4.6 The length of the bay in which vehicles are expected to park should be based on an estimation of demand, as shown in Figures 4/1 to 4/3.
>
> 4.7 Estimation of demand will be affected by local factors including proximity to major junctions and other facilities. If a high number of large goods vehicles is expected to use the lay-by, the length of the lay-by will need to be at the upper end of the range.

4.2 However, there is no specific methodology which is applicable as to how the length of laybys should be determined.

4.3 Notwithstanding this, consideration is given to changes in traffic passing the location of the proposed laybys with the WMI scheme. Consideration as to potential increases in HGV demand is considered later within the document.

4.4 Provided at **APPENDIX D** is a Figure which sets out the changes in AADT values arising from the scheme at the proposed year of opening at 2021.

4.5 This figure shows that the main changes in AADT values with the Proposed Development are to the south of the proposed A449 access roundabout and to the east of the A5 access roundabout. AADT values passing both the location of the existing and proposed laybys are shown to decrease with the development in place, primarily as a consequence of the A449/A5 link road reassigning journeys in order to bypass the Gailey roundabout. As a consequence, there is nothing to suggest that there will be an increase in background traffic demand that would result in a greater level of demand for usage of the relocated laybys.

4.6 Given that the Proposed Development would be a trip attractor, standard class vehicles associated with the development would by definition not need to use the relocated laybys, given that their origin or destination at WMI would be in the immediate vicinity.

4.7 Actual traffic flows passing each layby can be seen to be less than those that pass the existing A5 facilities. This is due to the presence of the existing central reservation along the length of the A449. Whilst imputatively, each of the A5 laybys will deal with traffic travelling in either an east or west bound direction, it is physically possible for vehicles to undertake U turn movements in order to reach the facilities on the opposite side of the carriageway. This would not be possible with the proposed arrangements and is a key benefit of the location identified for the relocated laybys.

4.8 It is important to stress that the calculation of these AADT values has been based upon the output of the South Staffordshire VISSIM Model (SSVM) which takes account of the effects of the introduction of the link road in terms of network capacity and resilience. Therefore any additional traffic that comes into the area will be reflected by the AADT values presented.

4.9 The AADT values do show increases in HGV volumes with the scheme on the A449 link on the approach to Gailey, however these changes are reflective of WMI journeys to and from the Site. As will be demonstrated later within this TN, it is not forecast that it will be necessary

for either WMI HGV's or other vehicles to visit adjacent lorry parks or laybys in order to complete their journeys either to or from the Proposed Development.

4.10 On the basis of the above, it is not considered that there would be an increase in demand of standard class vehicles that would necessitate a longer provision of laybys to that proposed.

5.0 MEASURES TO FACILITATE WMI HGV'S ON SITE

5.1 A Site Wide HGV Management Plan has been prepared to support the Proposed Development. The purpose of this document is to achieve efficient road freight movements to and from the site on a site wide basis and to help ensure environmental, traffic and amenity impacts are minimised. The Site Wide HGV Management Plan (SWHGVMP) sets out the key requirements and management guidance for individual occupiers to follow and implement. It governs all HGV movements to and from the warehouses and rail terminal. A draft version of this document has been sent to Highways England and their consultants for their review.

5.2 This document has relevance to the provision of the replacement laybys and the propensity of WMI HGV's to utilise these facilities.

5.3 A series of specific and tailored measures are proposed by the SWHGVMP in order to ensure that HGV's associated with WMI will travel straight to the Site rather than seek to park up in the vicinity of the Proposed Development, at either existing HGV parking facilities or at the proposed relocated laybys. These measures are summarised below: -

- Vehicle Booking System – any vehicle delivering or collecting at the Site would make a vehicle booking before the vehicle arrived at the terminal or warehouse. Bookings could be made via an internet based system by the hauliers for a given time slot. This system therefore heavily deters hauliers from sending vehicles to the terminal without a booked time slot, particularly in order to make best use of available driver time.

- Driver welfare facilities – provision within each warehouse of facilities to accommodate statutory breaks, which would include: -

    - Dedicated male and female toilet facilities for HGV drivers;

    - Rest areas with heating/cooling facilities and access to food and drink vending machines; and

    - Electric sockets for charging of mobile phones etc.

- Provision of Early Arrival Bays – in the event that HGV's arrive ahead of their booking slot, provision will be made for a minimum of three early arrival bays for each warehouse, up to a maximum of one space per 7,000 sqm. These arrangements will be dealt with at the detailed application stage where Highways England and Staffordshire County Council will have the opportunity to comment on the arrangements put forward at that time.

- In addition to the early arrival bays, proposed that operators of warehouses of over 5,000 sqm in size, that do not operate on 24 hour basis, will open their facilities earlier than their designated opening hours to allow for HGVs which may have arrived ahead of their booking slot.

- The Proposed Development will have in the order of 2,800 HGV parking spaces. Together with circulation areas, this provides a significant area within which HGV's can be provided if needed and operators will be able to bring vehicles onto site ahead of booking slots if this is needed for operational reasons, rather than allowing vehicles to park in the surrounding area and potentially impact on access to the Site.

5.4 The collective purpose of these measures is to ensure that any early arrivals ahead of booking slots by HGV's do not impact on the operation of the surrounding highway network and do not add to existing demand for HGV parking on the SRN or local highway network. The measures will make it more attractive for WMI HGV's to travel to the Proposed Development rather than to park in other locations, particularly at the relocated laybys where facilities available for drivers would be much less attractive than the superior offer to be provided on site. This provides the necessary facilities to ensure that WMI will have the ability to accommodate its own demand on site as it relates to HGV impact.

5.5 If concerns are reported regarding any unforeseen activity or inappropriate HGV parking, the Contingent Traffic Management Fund will allow surveys to be undertaken of the areas where unforeseen HGV activity has been reported to identify if this is attributed to WMI HGV's. If deemed necessary by the TSG, intervention measures such as further Traffic Regulation Orders could be implemented.

6.0 FORECAST HGV DURATION OF STAY

6.1 As requested by Systra, acting on behalf of Highways England, consideration has been given to the forecast duration of stay of HGVs at WMI. This has also been considered in relation to statutory break periods required under the Driver and Vehicles Standards Agency (DVSA) and the propensity for WMI HGV's to need to utilise the relocated laybys, overnight stopovers after leaving WMI, resulting in increased demand for the proposed relocated laybys.

6.2 Overall, one of the benefits of the Proposed Development is that is anticipated to remove HGV trips from the national road network and thus reduce demand for HGV parking areas on a macro basis.

6.3 Details of HGV duration of stay have been obtained from the June 2016 surveys carried out at Daventry International Rail Freight terminal (DIRFT) which were also used as the basis for determining the forecast and agreed trip generation of WMI. Analysis of the surveys at four of the warehouses at DIRFT was undertaken, which are as follows:-

- Warehouse 1 – DIRFT II Eddie Stobbart – South of A428 Crick Road
- Warehouse 2 – DIRFT II Tesco – South of A428, West of A5
- Warehouse 3 – DIRFT II Sainsbury's – North of A428, West of A5
- Warehouse 4 – DIRFT I Tesco – North of A428, East of A5

6.4 The results of the HGV duration of stay analysis on the DRIFT surveys are attached at **APPENDIX E**.

6.5 Table 1 presents a summary of the daytime and night time average lay over times identified by the DIRFT surveys.

Table 1: DIRFT Survey summary lay over time by Warehouse

Warehouse No.	Warehouse Name	Lay over time
All Day Average		
All	All	1 hour 14 mins
1	Eddie Stobbart	1 hour 49 mins
2	Tesco DIRFT 2	1 hour 8 mins
3	Sainsbury's	1 hour 12 mins
4	Tesco DIRFT 1	1 hour 6 mins
Night Time 6 pm to 6 am		
All	All	1 hour 16 mins
1	Eddie Stobbart	1 hour 30 mins
2	Tesco DIRFT 2	1 hour 21 mins
3	Sainsbury's	1 hour 12 mins
4	Tesco DIRFT 1	1 hour 7 mins
Night Time 10 pm to 6 am		
All	All	1 hour 17 mins
1	Eddie Stobbart	1 hour 31 mins
2	Tesco DIRFT 2	1 hour 27 mins
3	Sainsbury's	1 hour 17 mins
4	Tesco DIRFT 1	57 mins

6.6 Table 1 shows that all average lay over times were greater than one hour (except for the 10pm to 6pm average at Warehouse 4).

6.7 The above duration of stay has been calculated using the ANPR surveys and reviewing the times an HGV enters and leaves each warehouse site.

6.8 It is reasonable to apply the duration of stay identified from the DIRFT surveys in order to forecast activity at WMI, given that the operation of DIRFT is expected to be similar to that at WMI and utilises the same source as that used to determine the agreed trip generation of the Proposed Development.

7.0 NIGHT TIME LAY OVERS

7.1 To assess the potential of night time stopping in the vicinity of WMI, the DIRFT survey results are to be combined with the trip generation and distribution for HGVs at WMI along with consideration of the HGV driving limits. The DVSA guidance on HGV driving limits and breaks from driving can be found at https://www.gov.uk/guidance/drivers-hours-goods-vehicles/1-eu-and-aetr-rules-on-drivers-hours. In summary the rules allow a maximum drive of 4.5 hours without stopping followed by a minimum 45 minute break. The break may also be split within a 4.5 hour period to an initial break of at least 15 minutes after 2 hrs of driving and a secondary break of at least 30 minutes. The guidance identifies a common break cycle as in Figure 1.

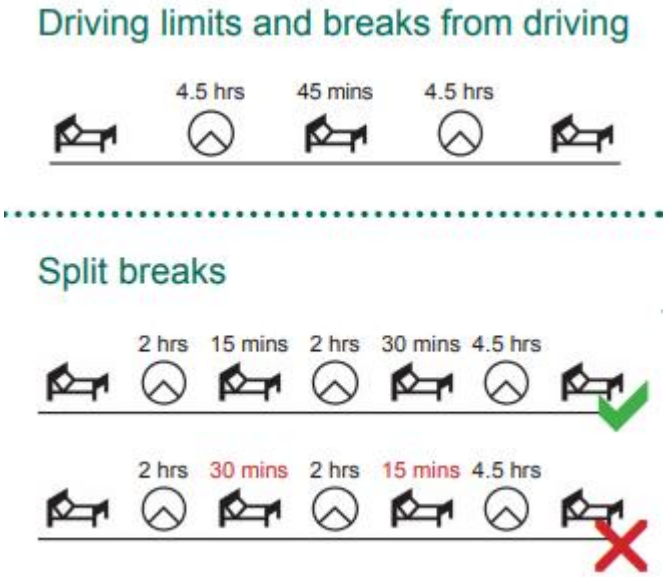


Figure 1: DVSA Break Limits example

7.2 Upon arrival at WMI, there will be a period of time whilst HGVs are either loaded or unloaded, during which time, drivers will be able to take their statutory breaks, using facilities provided within each warehouse.

7.3 On this basis, this shows that for round trips of less than 4 hours (2 hours in each direction) no stopping should be required after leaving WMI. All trips to and from the West Midland's region are anticipated to have a less than 4 hours round trip and therefore can be excluded from any potential night time lay overs. As per the agreed HGV trip distribution, these constitute over 60% of HGV journeys to/from WMI.

7.4 Table 2 shows that generally only journeys to Scotland are unable to complete a round trip in a single day due to the DVSA 10 hour daily drive limit. When considering average journey times to the centroid of each region, they are also the only trips unable to complete a full single direction journey within the maximum 4.5 hours drive time.

Table 2: Trip Distribution and Night Journey Time from / to WMI

O / D Region	Distribution of Trips	Average Night Journey Time (Hours)
North East	0.6%	3.9
North West	7.3%	2.3
Yorkshire and Humber	4.2%	2.7
East Midlands	9.3%	2.3
West Midlands	62.3%	Up to 2 hours
East of England	3.7%	3.3
London	1.4%	3.0
South East	4.0%	3.0
South West	4.0%	2.8
Wales	3.4%	3.0
Scotland	0.6%	6.0

7.5 In combination with average lay over times shown by the DIRFT surveys that are shown to be greater than the 45 minute 'clean slate' minimum to facilitate a statutory break, this indicates that journeys from WMI can take place for up to 4.5 hours. This means that many would reach

their final destination before needing a break or at least be able to travel a considerable distance out of WMI's immediate vicinity before needing a break, in order to make the best of driver time. It will not therefore be necessary for WMI HGV's to utilise the relocated laybys or local Lorry Parks and would not therefore apply additional pressure to the degree that the lay-bys would be required to be extended in length beyond that currently proposed.

7.6 As a fall back measure, it has been proposed that a parking restriction be introduced at the relocated laybys in order to prevent overnight parking. This would prevent parking over a duration of 2 hours between the hours of 6pm and 6am, with no return permitted within 2 hours and would provide mitigation in the unlikely event that WMI HGV's seek to park overnight at these facilities.

7.7 With regard to non HGV trips to/from WMI, intuitively these journeys will consist of workers and visitors travelling to the Proposed Development itself and they would not need to utilise the relocated layby facilities as part of their journey as they would be stopping on site. Therefore non HGV trips associated with WMI will not lead to increased demand at the relocated laybys.

8.0 SUMMARY

8.1 The existing lay-bys require relocation in order to make way for the roundabout junction with the A5 that is proposed to serve the WMI development.

8.2 Traffic surveys have been analysed and conclude that the existing lay-bys have sufficient storage length to accommodate the required demand.

8.3 Due to insufficient space on the A5, it is proposed to relocate the lay-bys onto the A449, south of Gailey Roundabout. This is considered an optimum position as it ensures large vehicles remain on the trunk roads.

8.4 The new lay-bys will be safer than the existing ones as they will have improved geometries and can be provided in a form that delivers the merge / diverge arrangements and parking area that meets the required design standards.

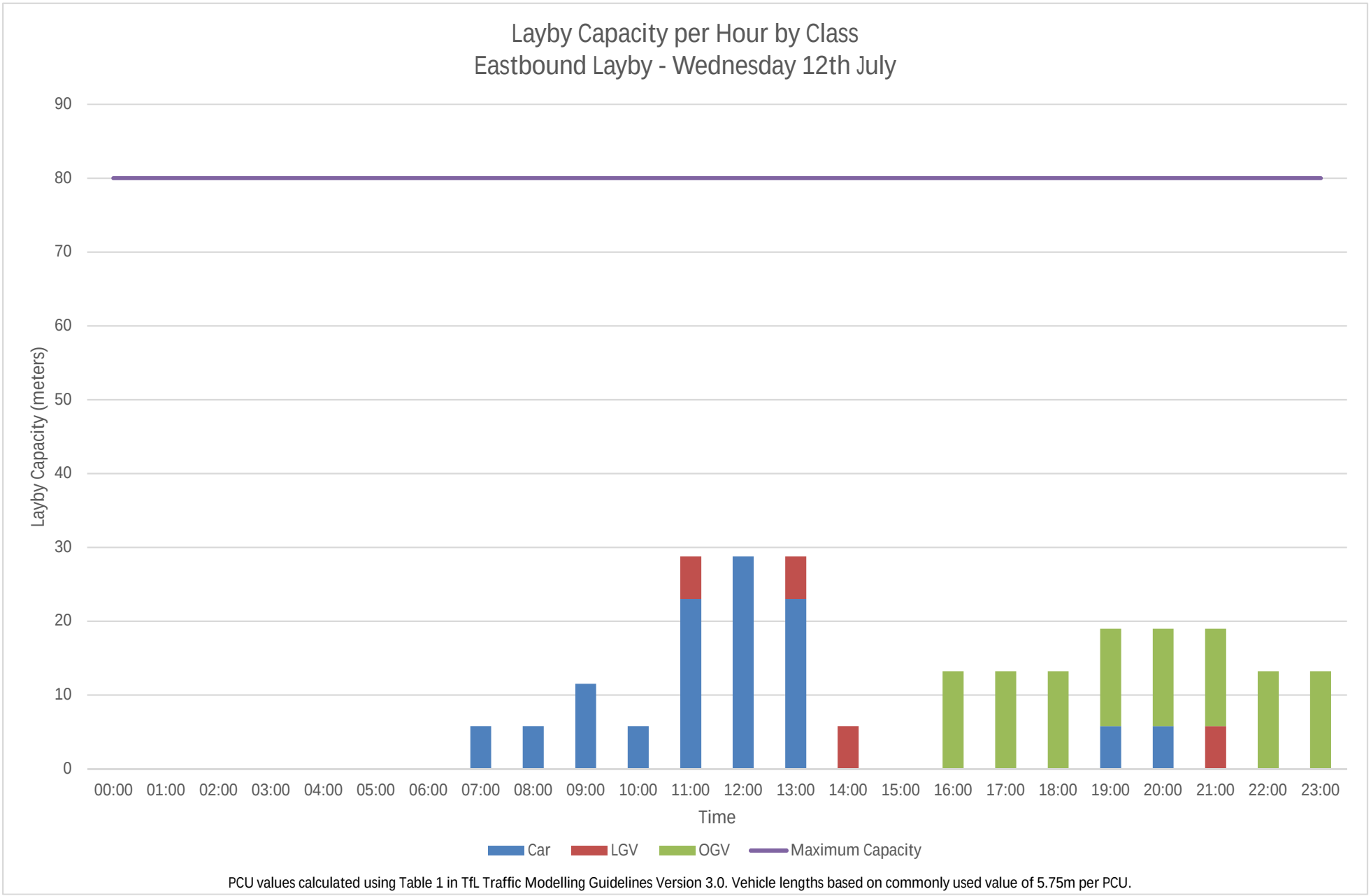
8.5 There would be no additional demand for parking at the relocated laybys as a consequence of WMI. This is because the Proposed Development would offer driver welfare facilities and early arrival bays to accommodate driver's statutory breaks as well as ensuring that any early arrivals can be accommodated on site rather than on areas surrounding the Site. Standard class vehicles would be expected to consist largely of workers and visitors who travel direct to the Site and who would not need to utilise the relocated laybys.

8.6 Overall the Proposed Development is anticipated to remove HGV trips from the national road network and thus reduce demand for HGV parking areas.

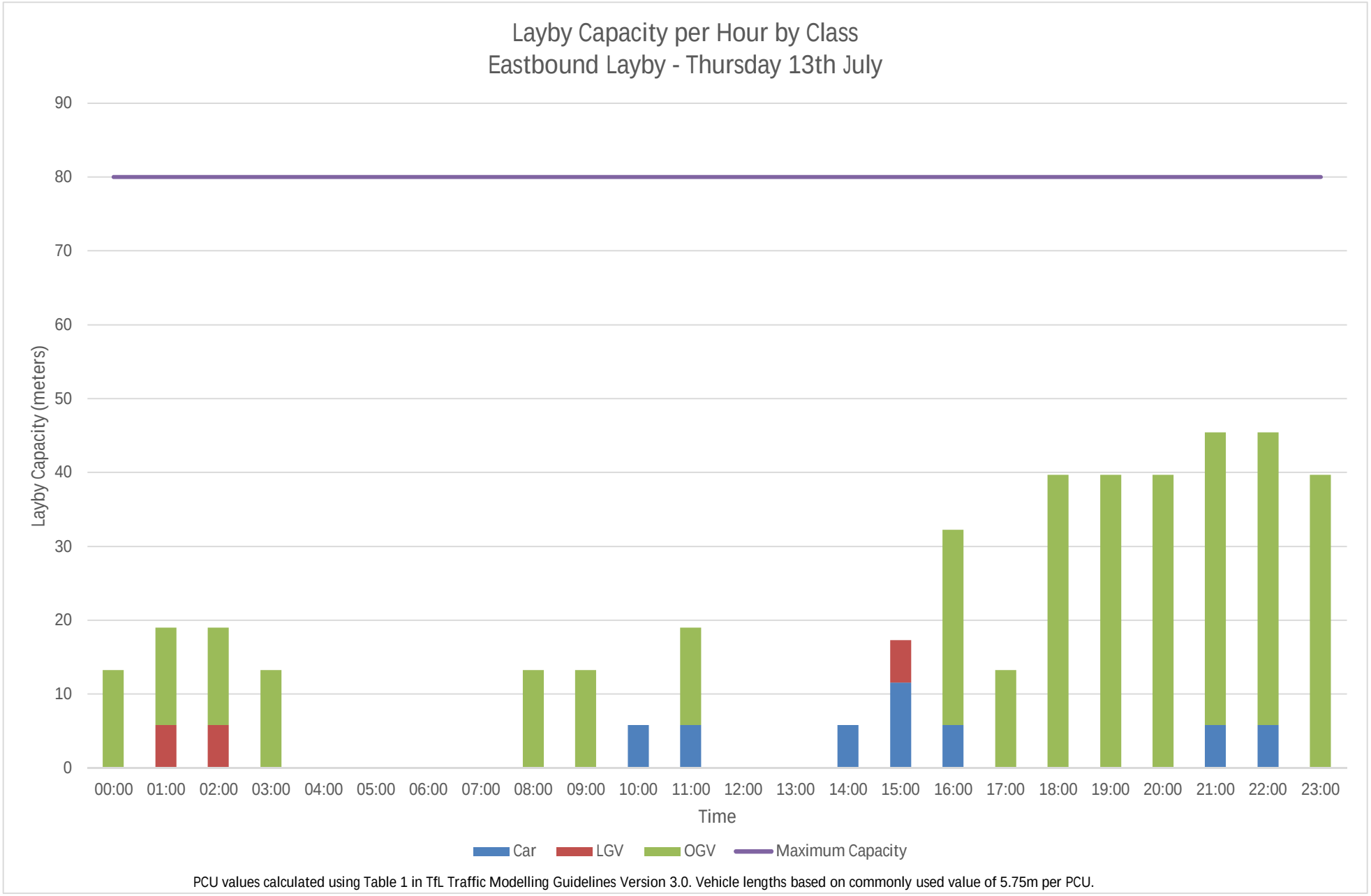
8.7 In view of the above, it is considered that the arrangements proposed by the relocated laybys should be acceptable.

Appendix A

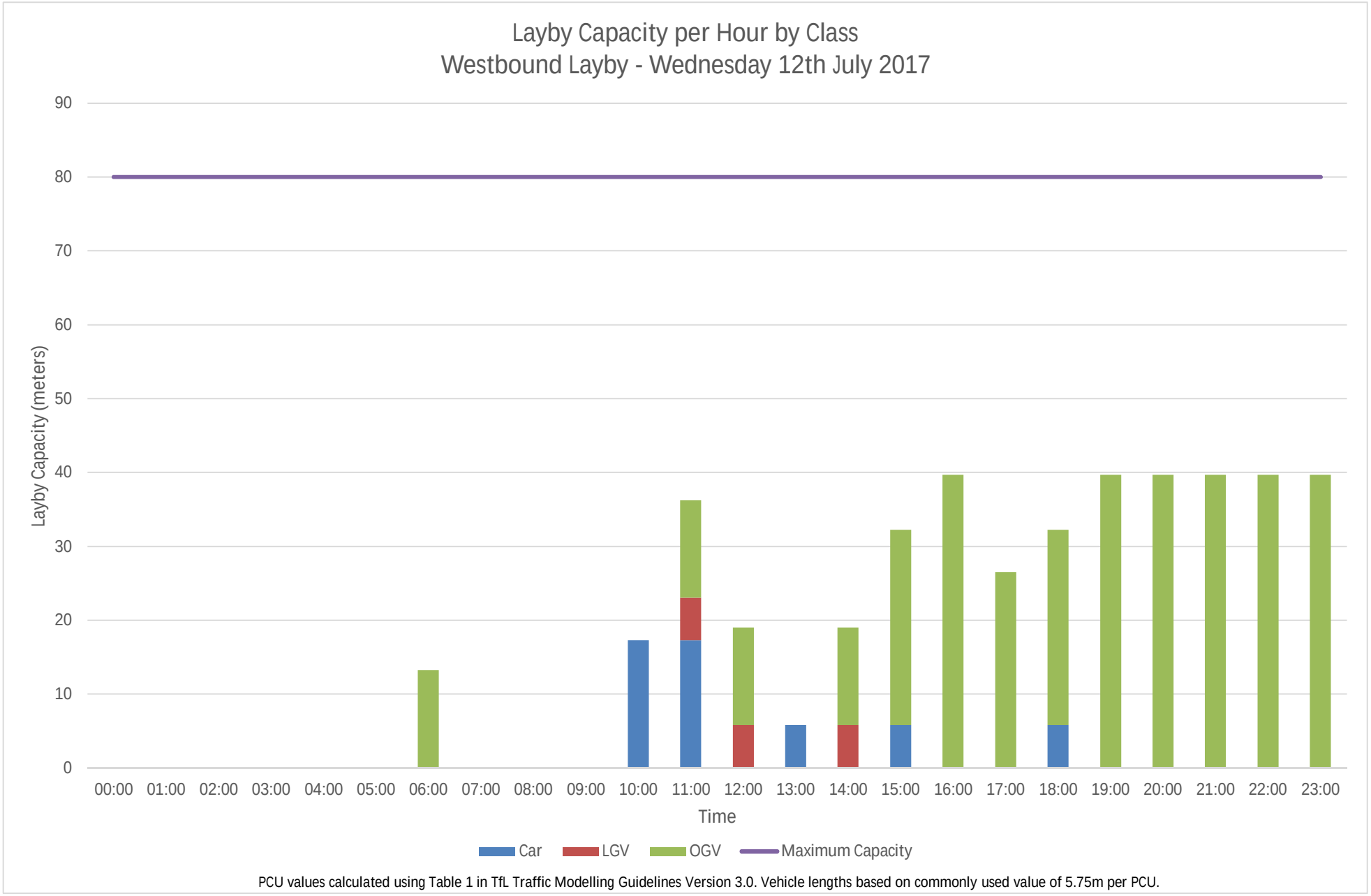
LAYBY USAGE CHARTS



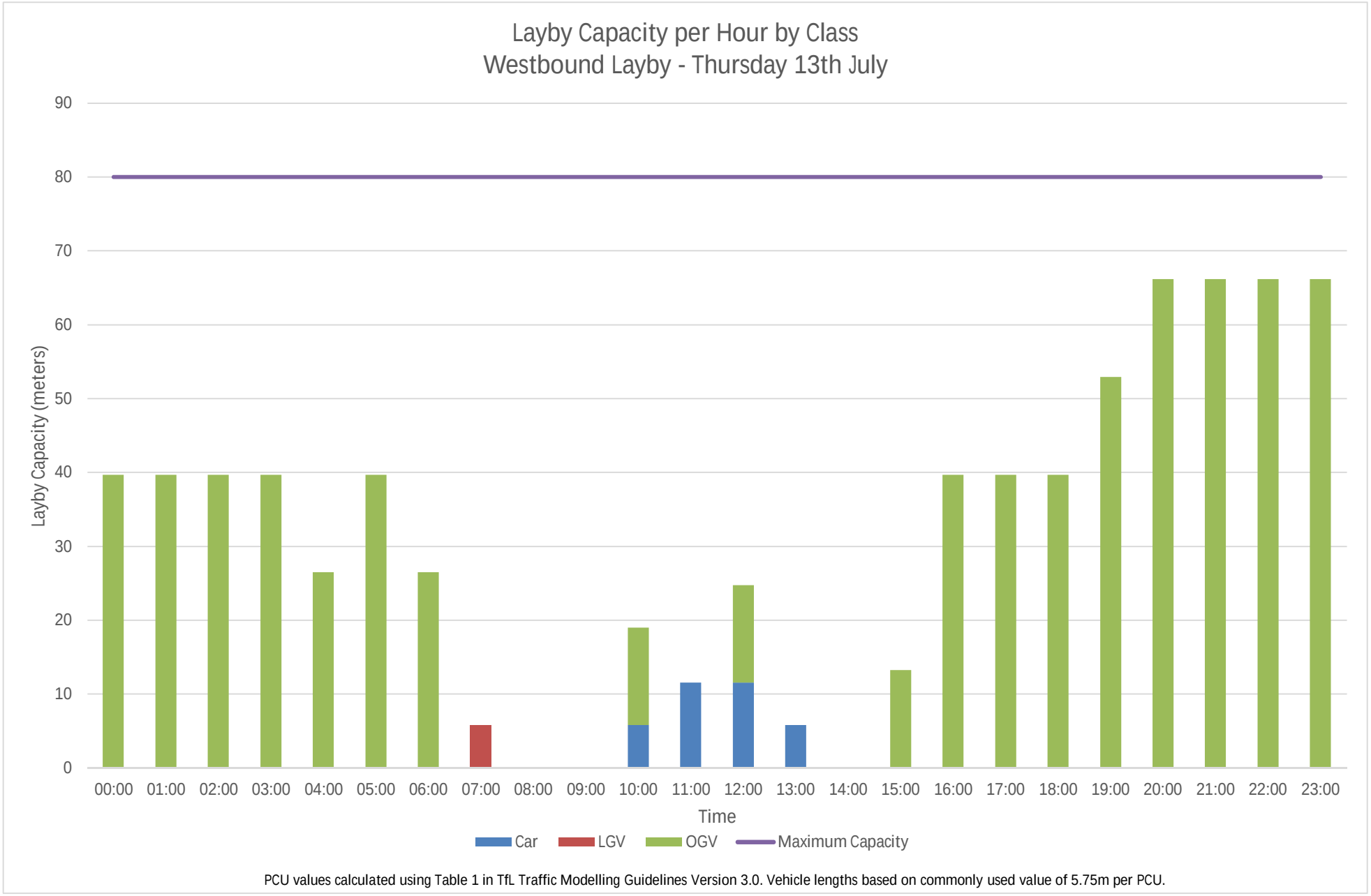
PCU values calculated using Table 1 in TfL Traffic Modelling Guidelines Version 3.0. Vehicle lengths based on commonly used value of 5.75m per PCU.



PCU values calculated using Table 1 in TfL Traffic Modelling Guidelines Version 3.0. Vehicle lengths based on commonly used value of 5.75m per PCU.



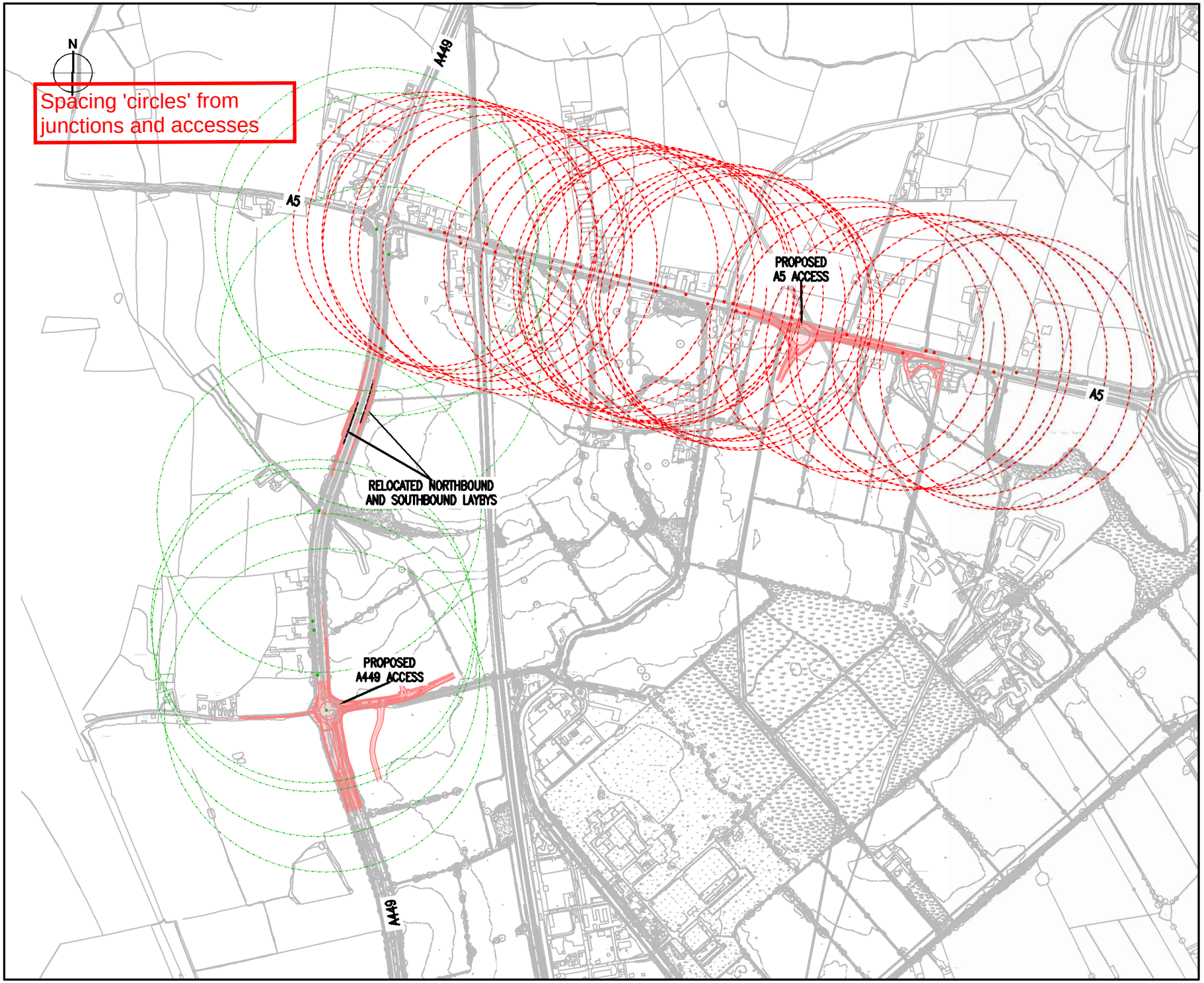
PCU values calculated using Table 1 in TfL Traffic Modelling Guidelines Version 3.0. Vehicle lengths based on commonly used value of 5.75m per PCU.



PCU values calculated using Table 1 in TfL Traffic Modelling Guidelines Version 3.0. Vehicle lengths based on commonly used value of 5.75m per PCU.

Appendix B

LAYBY SEPARATION DISTANCES



KEY

375m RADIUS AROUND ACCESSES ON THE A449

318.8m RADIUS AROUND ACCESSES ON THE A5

PROPOSED INFRASTRUCTURE

Revisions

West Midlands Interchange

Project
THE WEST MIDLANDS RAIL FREIGHT INTERCHANGE ORDER 201X

Drawing Status
CONSULTATION DRAFT

Drawing Title
DEPARTURE FROM STANDARDS DISTANCE FROM JUNCTIONS

Drawing Size A1

Regulation	Document
5 (2) (o)	2.9G

Drawn VZ	Date JUNE 2017	Scale 1: 4000	Rev. since: 1F

Drawing No.
WSP-70001979-DS-006

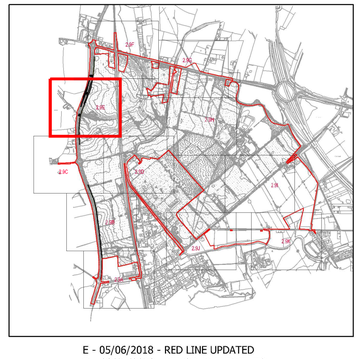
Rev.
A

Appendix C

LAYBY GENERAL ARRANGEMENT

DRAWING

NOTE: LIMITS OF DEVIATION SHOWN ON THE WORKS PLANS (DOCUMENT SERIES 2.2) AND SET OUT IN ARTICLE 4 OF THE DEVELOPMENT CONSENT ORDER.



E - 05/06/2018 - RED LINE UPDATED
D - 08/05/2018 - MINOR AMENDMENTS
C - 20/03/2018 - MINOR AMENDMENTS
B - 02/03/2018 - RED LINE UPDATED
A - FIRST ISSUE

Revisions

West Midlands Interchange

Project
THE WEST MIDLANDS RAIL FREIGHT INTERCHANGE ORDER 201X

Drawing Status
SUBMISSION

Drawing Title — Drawing Size A1
GENERAL ARRANGEMENT PLAN
105

Regulation	Document
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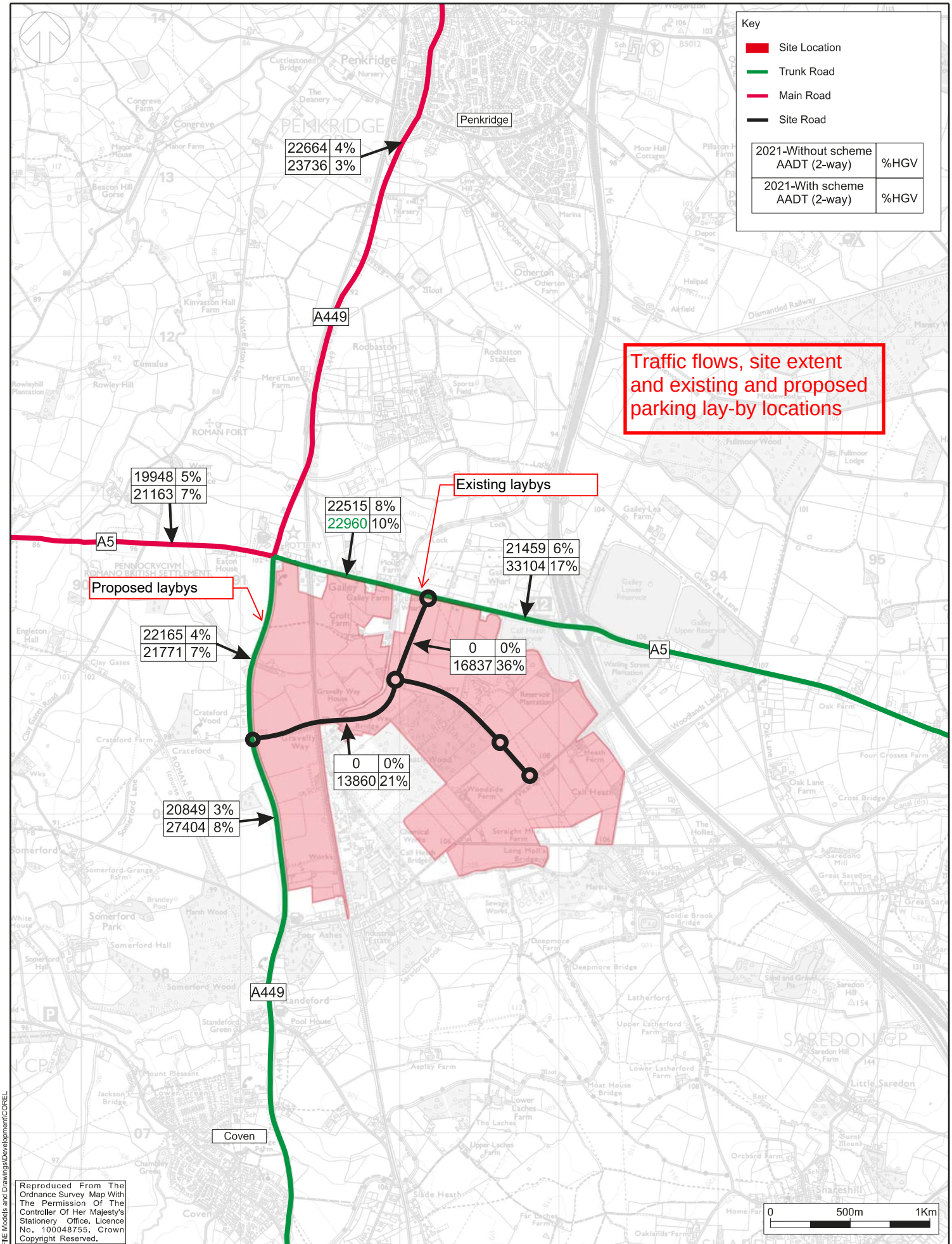
NW	JUNE 2018	1: 1000	IF

Drawing No. WSP-70001979-GA-105

Rev. E

Appendix D

AADT CHANGES



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West Midlands Interchange

wsp

TITLE:

WMI APPLICATION FOR DESIGN DEPARTURES AADT VALUES

FIGURE No:

APPENDIX 3

Appendix E

ANALYSIS OF DIRFT HGV DURATION OF STAY

All Warehouses

Time of Day	Time (in decimal)	Average JT in seconds	Average JT in minutes	Average JT in hours	Count No HGVS	Total JT in seconds	Total JT in minutes	Total JT in hours
00:00:00	0.00	4807.5	80.2	1.3	35	168261	2806	46.9
01:00:00	0.04	6202.7	103.4	1.7	43	266716	4448	74.5
02:00:00	0.08	4479.7	74.7	1.2	59	264303	4406	73.7
03:00:00	0.13	4624.8	77.1	1.3	62	286739	4782	80.1
04:00:00	0.17	4274.2	71.3	1.2	60	256452	4276	72
05:00:00	0.21	4712.4	78.6	1.3	53	249759	4165	69.6
06:00:00	0.25	4508.7	75.1	1.3	60	270520	4506	75.8
07:00:00	0.29	3692.8	61.6	1.0	40	147713	2463	41.4
08:00:00	0.33	5957.2	99.4	1.7	53	315734	5266	88.5
09:00:00	0.38	4284.2	71.4	1.2	66	282759	4711	79
10:00:00	0.42	3569.0	59.5	1.0	41	146327	2441	40.9
11:00:00	0.46	5065.0	84.5	1.4	26	131689	2198	36.7
12:00:00	0.50	3005.6	50.1	0.8	37	111206	1855	31.1
13:00:00	0.54	3738.6	62.4	1.0	40	149542	2494	41.8
14:00:00	0.58	4728.3	78.8	1.3	23	108752	1813	30.4
15:00:00	0.63	5749.3	95.9	1.6	20	114985	1917	32
16:00:00	0.67	3048.2	50.8	0.8	24	73157	1218	20.2
17:00:00	0.71	4055.4	67.6	1.1	31	125718	2097	35.3
18:00:00	0.75	4224.1	70.3	1.2	18	76034	1266	21.3
19:00:00	0.79	4717.7	78.6	1.3	14	66048	1100	18.5
20:00:00	0.83	5285.9	88.1	1.5	21	111004	1851	30.8
21:00:00	0.88	2478.5	41.3	0.7	15	37177	620	10.5
22:00:00	0.92	2181.8	36.3	0.6	10	21818	363	6.2
23:00:00	0.96	1351.8	22.7	0.4	6	8111	136	2.2
00:00:00	1.00							
		4418.699301	73.67132867	1.234965035				

Time Period	Defined period	Average JT in seconds	Average JT in minutes	Average JT in hours	Count No HGVS
All day	0 to 24	4418.699301	73.67132867	1.234965035	857
Night time	22 to 6	4640.728659	77.38414634	1.296341463	328
	6to6	4576.823232	76.31060606	1.278535354	396

Warehouse 1

Time of Day	Time (in decimal)	Average JT in seconds	Average JT in minutes	Average JT in hours	Count No HGVS	Total JT in seconds	Total JT in minutes	Total JT in hours
00:00:00	0.00	3741.7	62.3	1.0	7	26192	436	7.3
01:00:00	0.04	6015.3	100.3	1.7	6	36092	602	9.9
02:00:00	0.08	3545.0	59.0	1.0	5	17725	295	5
03:00:00	0.13	7333.4	122.3	2.0	12	88001	1468	24.5
04:00:00	0.17	4574.1	76.4	1.3	11	50315	840	14.2
05:00:00	0.21	7844.2	130.7	2.2	6	47065	784	13.1
06:00:00	0.25	9802.8	163.3	2.7	12	117633	1960	32.9
07:00:00	0.29	6303.0	105.0	1.8	3	18909	315	5.3
08:00:00	0.33	10934.3	182.4	3.1	8	87474	1459	24.4
09:00:00	0.38	5878.7	98.0	1.6	12	70544	1176	19.7
10:00:00	0.42	3977.5	66.3	1.1	4	15910	265	4.5
11:00:00	0.46	6035.7	100.7	1.7	3	18107	302	5.1
12:00:00	0.50	4221.5	70.5	1.2	4	16886	282	4.7
13:00:00	0.54	14991.3	250.0	4.2	3	44974	750	12.6
14:00:00	0.58	8206.0	137.0	2.3	1	8206	137	2.3
15:00:00	0.63	2455.0	41.0	0.7	1	2455	41	0.7
16:00:00	0.67	4250.0	71.0	1.2	1	4250	71	1.2
17:00:00	0.71	3287.0	55.0	0.9	1	3287	55	0.9
18:00:00	0.75	5618.8	93.8	1.6	4	22475	375	6.4
19:00:00	0.79	#DIV/0!	#DIV/0!	#DIV/0!	0	#DIV/0!	#DIV/0!	#DIV/0!
20:00:00	0.83	3984.0	66.3	1.1	3	11952	199	3.3
21:00:00	0.88	5550.0	92.5	1.6	2	11100	185	3.1
22:00:00	0.92	2058.0	34.0	0.6	1	2058	34	0.6
23:00:00	0.96	394.0	7.0	0.1	1	394	7	0.1
00:00:00	1.00							
		6504.540541	108.4504505	1.818018018				

Time Period	Defined period	Average JT in seconds	Average JT in minutes	Average JT in hours	Count No HGVS
All day	0 to 24	6504.540541	108.4504505	1.818018018	111
Night time	22 to 6	5466.163265	91.14285714	1.524489796	49
	6to6	5402.913793	90.0862069	1.50862069	58

Warehouse 2

Time of Day	Time (in decimal)	Average JT in seconds	Average JT in minutes	Average JT in hours	Count No HGVS	Total JT in seconds	Total JT in minutes	Total JT in hours
00:00:00	0.00	6621.5	110.5	1.9	11	72837	1216	20.4
01:00:00	0.04	7512.5	125.3	2.1	15	112688	1880	31.7
02:00:00	0.08	5345.3	89.1	1.5	21	112251	1872	31.3
03:00:00	0.13	4567.4	76.1	1.3	25	114186	1902	31.9
04:00:00	0.17	4788.7	79.8	1.3	20	95773	1596	26.8
05:00:00	0.21	4466.1	74.5	1.3	16	71457	1192	20.1
06:00:00	0.25	3948.6	65.7	1.1	23	90818	1512	25.2
07:00:00	0.29	3995.6	66.6	1.1	14	55938	932	15.6
08:00:00	0.33	4214.5	70.3	1.2	19	80075	1336	22.7
09:00:00	0.38	4049.1	67.4	1.1	21	85031	1416	23.7
10:00:00	0.42	3613.1	60.3	1.0	15	54197	904	15.2
11:00:00	0.46	4087.3	68.2	1.1	10	40873	682	11.4
12:00:00	0.50	3042.3	50.8	0.9	16	48676	813	13.6
13:00:00	0.54	2467.2	41.1	0.7	14	34541	575	9.7
14:00:00	0.58	1972.9	32.7	0.5	7	13810	229	3.8
15:00:00	0.63	2935.0	49.0	0.8	10	29350	490	8.1
16:00:00	0.67	2015.4	33.6	0.6	9	18139	302	5.1
17:00:00	0.71	3335.2	55.8	0.9	9	30017	502	8.3
18:00:00	0.75	830.0	13.8	0.2	4	3320	55	0.9
19:00:00	0.79	3768.3	62.8	1.1	8	30146	502	8.4
20:00:00	0.83	4656.5	77.6	1.3	11	51221	854	14.2
21:00:00	0.88	990.3	16.5	0.3	4	3961	66	1.1
22:00:00	0.92	1599.5	26.5	0.5	2	3199	53	0.9
23:00:00	0.96	1150.5	19.5	0.3	2	2301	39	0.6
00:00:00	1.00							
		4100.669935	68.36601307	1.146078431				

Time Period	Defined period	Average JT in seconds	Average JT in minutes	Average JT in hours	Count No HGVS
All day	0 to 24	4100.669935	68.36601307	1.146078431	306
Night time	22 to 6	5220.464286	87.05357143	1.461607143	112
	6to6	4844.172662	80.76978417	1.354676259	139

Warehouse 3

Time of Day	Time (in decimal)	Average JT in seconds	Average JT in minutes	Average JT in hours	Count No HGVS	Total JT in seconds	Total JT in minutes	Total JT in hours
00:00:00	0.00	6041.8	100.8	1.7	8	48334	806	13.5
01:00:00	0.04	5161.1	85.9	1.4	9	46450	773	12.9
02:00:00	0.08	4931.3	82.2	1.4	17	83832	1398	23.4
03:00:00	0.13	3603.3	60.2	1.0	11	39636	662	11.1
04:00:00	0.17	4243.7	70.8	1.2	15	63656	1062	17.9
05:00:00	0.21	5395.9	89.9	1.5	16	86334	1439	24
06:00:00	0.25	3392.1	56.4	1.0	10	33921	564	9.6
07:00:00	0.29	3386.9	56.3	0.9	12	40643	676	11.3
08:00:00	0.33	6914.3	115.2	1.9	11	76057	1267	21.2
09:00:00	0.38	5059.3	84.4	1.4	16	80948	1350	22.6
10:00:00	0.42	5354.9	89.2	1.5	10	53549	892	14.8
11:00:00	0.46	5429.3	90.7	1.5	6	32576	544	9.1
12:00:00	0.50	1996.5	33.3	0.6	4	7986	133	2.3
13:00:00	0.54	4492.3	74.9	1.2	8	35938	599	9.9
14:00:00	0.58	7258.8	121.1	2.0	8	58070	969	16.2
15:00:00	0.63	1642.0	27.0	0.5	1	1642	27	0.5
16:00:00	0.67	1369.7	22.9	0.4	7	9588	160	2.6
17:00:00	0.71	2496.8	41.6	0.7	14	34955	583	10.1
18:00:00	0.75	2080.3	34.5	0.6	6	12482	207	3.5
19:00:00	0.79	5390.0	89.5	1.5	4	21560	358	6.1
20:00:00	0.83	1732.0	29.0	0.5	2	3464	58	1
21:00:00	0.88	1082.5	18.3	0.3	4	4330	73	1.3
22:00:00	0.92	2082.8	34.6	0.6	5	10414	173	3
23:00:00	0.96	906.0	15.0	0.3	1	906	15	0.3
00:00:00	1.00							
		4328.15122	72.13658537	1.210731707				

Time Period	Defined period	Average JT in seconds	Average JT in minutes	Average JT in hours	Count No HGVS
All day	0 to 24	4328.15122	72.13658537	1.210731707	205
Night time	22 to 6	4628.804878	77.17073171	1.293902439	82
	6to6	4299.979592	71.67346939	1.204081633	98

Warehouse 4

Time of Day	Time (in decimal)	Average JT in seconds	Average JT in minutes	Average JT in hours	Count No HGVS	Total JT in seconds	Total JT in minutes	Total JT in hours
00:00:00	0.00	2322.0	38.7	0.6	9	20898	348	5.7
01:00:00	0.04	5498.9	91.8	1.5	13	71486	1193	20
02:00:00	0.08	3155.9	52.6	0.9	16	50495	841	14
03:00:00	0.13	3208.3	53.6	0.9	14	44916	750	12.6
04:00:00	0.17	3336.3	55.6	0.9	14	46708	778	13.1
05:00:00	0.21	2993.5	50.0	0.8	15	44903	750	12.4
06:00:00	0.25	1876.5	31.3	0.5	15	28148	470	8.1
07:00:00	0.29	2929.4	49.1	0.8	11	32223	540	9.2
08:00:00	0.33	4808.5	80.3	1.3	15	72128	1204	20.2
09:00:00	0.38	2719.8	45.2	0.8	17	46236	769	13
10:00:00	0.42	1889.3	31.7	0.5	12	22671	380	6.4
11:00:00	0.46	5733.3	95.7	1.6	7	40133	670	11.1
12:00:00	0.50	2896.8	48.2	0.8	13	37658	627	10.5
13:00:00	0.54	2272.6	38.0	0.6	15	34089	570	9.6
14:00:00	0.58	4095.1	68.3	1.2	7	28666	478	8.1
15:00:00	0.63	10192.3	169.9	2.8	8	81538	1359	22.7
16:00:00	0.67	5882.9	97.9	1.6	7	41180	685	11.3
17:00:00	0.71	8208.4	136.7	2.3	7	57459	957	16
18:00:00	0.75	9439.3	157.3	2.6	4	37757	629	10.5
19:00:00	0.79	7171.0	120.0	2.0	2	14342	240	4
20:00:00	0.83	8873.4	148.0	2.5	5	44367	740	12.3
21:00:00	0.88	3557.2	59.2	1.0	5	17786	296	5
22:00:00	0.92	3073.5	51.5	0.9	2	6147	103	1.7
23:00:00	0.96	2255.0	37.5	0.6	2	4510	75	1.2
00:00:00	1.00							
		3928.661017	65.52542373	1.097033898				

Time Period	Defined period	Average JT in seconds	Average JT in minutes	Average JT in hours	Count No HGVS
All day	0 to 24	3928.661017	65.52542373	1.097033898	235
Night time	22 to 6	3412.505882	56.91764706	0.949411765	85
	6to6	4003.118812	66.76237624	1.113861386	101

Lay over time Summary Table

Nightime	Lay over time (s)	Lay over time (min)	Lay over time (hour)
All warehouses	4640.7	77.4	1.3
Warehouse 1	5466.2	91.1	1.5
Warehouse 2	5220.5	87.1	1.5
Warehouse 3	4628.8	77.2	1.3
Warehouse 4	3412.5	56.9	0.9

All day	Lay over time (s)	Lay over time (min)	Lay over time (hour)
All warehouses	4418.7	73.7	1.2
Warehouse 1	6504.5	108.5	1.8
Warehouse 2	4100.7	68.4	1.1
Warehouse 3	4328.2	72.1	1.2
Warehouse 4	3928.7	65.5	1.1

6to6	Lay over time (s)	Lay over time (min)	Lay over time (hour)
All warehouses	4576.8	76.3	1.3
Warehouse 1	5402.9	90.1	1.5
Warehouse 2	4844.2	80.8	1.4
Warehouse 3	4300.0	71.7	1.2
Warehouse 4	4003.1	66.8	1.1

HGV Distribution Summary

Origin Region	Distribution of Trips	Average Night Journey time
North East	0.006	3.875
North West	0.073	2.3
Yorshire and Humbe	0.042	2.65
East Midlands	0.093	2.25
East of England	0.037	3.25
London	0.014	3
South East	0.04	3
South West	0.04	2.75
Wales	0.034	3
Scotland	0.006	6

Applicant's Post Hearing Submissions (CAH, ISH 2 and ISH3) TN 43 HGV Parking

The West Midlands Rail Freight Interchange Order 201X

Four Ashes Limited

West Midlands Interchange

Four Ashes Ltd

WEST MIDLANDS INTERCHANGE

Transport Technical Note 43 – Adequacy of on Site HGV Parking Provision

Job Title	West Midlands Interchange	**Project Number**	70001979
Client	Four Ashes Limited		
TTN No.	43	**Date of Issue**	12 June 2019
Subject	Adequacy of on Site HGV Parking		
Author	Andrew Sturgeon / Ian Fielding	**Authorised**	Ian Fielding
Distribution			

1 INTRODUCTION

1.1 Following a specific question raised by the Examining Authority during Issue Specific Hearing 4 (Transport and Accessibility) this Technical Note (TN) has been prepared in order to demonstrate that sufficient provision is made by the Proposed Development in order to accommodate Heavy Goods Vehicle (HGV) parking.

1.2 Paragraph 107 of the National Planning Policy Framework (2019) states that "*Planning policies and decisions should recognise the importance of providing adequate overnight lorry parking facilities, taking into account any local shortages, to reduce the risk of parking in locations that lack proper facilities or could cause a nuisance. Proposals for new or expanded distribution centres should make provision for sufficient lorry parking to cater for their anticipated use*".

1.3 As part of the Site Wide HGV Management Plan **(AS-040)**, the Proposed Development seeks to provide HGV parking for three specific purposes. These are as follows: -

- Operation HGV Parking Bays
- Early Arrival HGV Parking Bays
- Extended Stay HGV Parking Bays

1.4 The detailed rationale behind each element of HGV parking is set out within Section 6.2 of the Site Wide HGV Management Plan . The Proposed Development would manage HGV arrivals through a Vehicle Booking System (VBS). This is to manage arrival patterns and is discussed at paragraphs 6.2.1 – 6.2.9) of the Site Wide HGV Management Plan.

1.5 In general terms, Early Arrival Bays are provided to cater for those drivers who arrive ahead of their booking slot at the Site, Extended Stay Bays are provided to allow drivers who are required to take a statutory break to remain on Site, whilst Operational Bays are provided to deal with the day to day operations at the Proposed Development, e.g. waiting, parking, loading / unloading.

1.6 The quantum of HGV parking for each specific purpose will be provided as shown in Table 1 below. This is informed by Table 6.1 of Site Wide HGV Management Plan**.** Details are also provided of the maximum provision for each type of HGV parking assuming the maximum floor space proposed by the Proposed Development (743,200 sqm).

Table 1: HGV Parking Provision

Bay Type	Level of Provision	Number of Spaces – Complete WMI
Early Arrival Bays	1 space per 7,000 square metres (GIA) per plot of warehousing constructed as part of the authorised development with a minimum of 3 per plot, unless otherwise agreed in writing with the Local Highway Authority.	106
Extended Stay Bays	1 space per 6,200 square metres (GIA) per plot of warehousing constructed as part of the authorised development plus 10 additional Extended Stay Bays in the rail terminal, unless otherwise agreed in writing with the Local Highway Authority.	120 (warehouse) 10 (Terminal
Operational Bays	1 space per 279 square metres (GIA) per plot of warehousing constructed as part of the authorised development, unless otherwise agreed in writing with the Local Highway Authority.	2664
Total		2900

1.7 The level of provision for each type of HGV parking is enshrined within the Site Wide HGV Management Plan and which has been agreed with both Highways England (HE) and Staffordshire County Council (SCC).

1.8 The adequacy of the level of parking is now considered. Also provided is a comparison of HGV parking provided by other approved SRFIs.

2 EARLY ARRIVAL & OPERATIONAL HGV PARKING BAYS

2.1 Provided at Annex A is a parking accumulation exercise that has been prepared to examine the adequacy of the above HGV parking types, which equates to 2,770 spaces. As is standard practice, this parking accumulation exercise has been based upon trip generation of the scheme. In this case, the agreed trip generation for external HGV's (provided at Annex B) together with allowances for internal HGV movements from the Terminal and warehouse to warehouse movements have been used.

2.2 The duration of stay of HGV's at the Proposed Development has been identified from surveys undertaken at Daventry International Rail Freight Terminal (DIRFT), an established SRFI.

2.3 Both HGV parking types have been assessed together. Demand will be subject to trip arrival and departure patterns which have been identified previously through the trip generation exercises.

2.4 Assuming that 25% of the 2,770 spaces are occupied at the start of the 24-hour period, the parking accumulation calculations show that the maximum level of HGV parking forecast to use both the Early Arrival Bays and Operational Bays would amount to 33% of the available 2,770 spaces. This provides an appropriate level of resilience in operational terms. This is essential for logistics operations and confirms that sufficient provision is made for HGV parking.

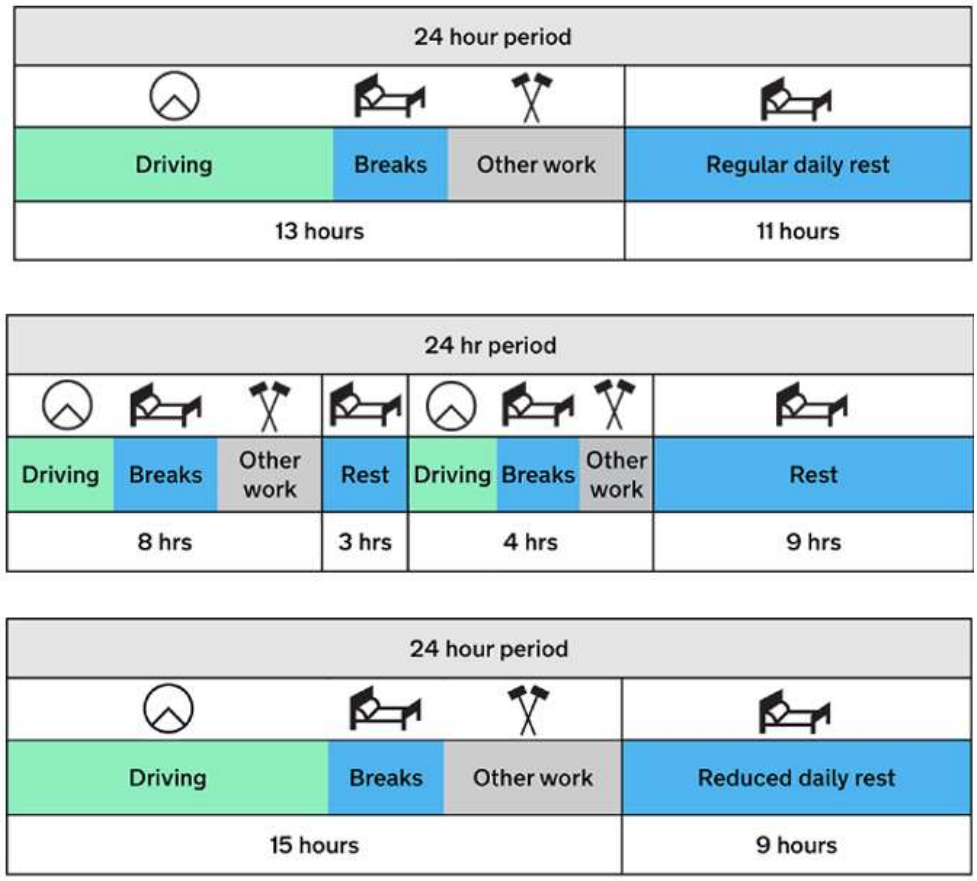
3 EXTENDED STAY HGV PARKING BAYS

3.1 As specified in paragraph 1.5, the purpose of the Extended Stay Bays at the Proposed Development is to allow drivers with business at the Site to take statutory driver time breaks if necessary. These spaces would need to be booked by West Midlands Interchange (WMI) drivers, which would be through the VBS. This will allow WMI drivers to plan their journeys to the Site.

3.2 The Driver and Vehicle Standards Agency (DVSA) requires that HGV drivers abide with maximum limits on driving times, working times and minimum requirement for break and rest periods.

3.3 The DVSA driver time requirements state that over a one-week period, a HGV driver can only drive for a maximum of 56 hours. The examples provided by DVSA of how this driver time can be distributed across the working week are set out within Figure 1 below.

Figure 1: Examples of Drivers Daily Rest Periods[1]



3.4 Discussions with SCC have identified that they, acting as the local highway authority, consider the provision of Extended Stay HGV parking as complimentary to existing HGV parking opportunities that are available.

3.5 The dedicated HGV parking areas provided are designed specifically for longer term breaks. However, in order to ensure that WMI HGV's do not need to use nearby HGV parking areas or park in inappropriate locations, it has been agreed with SCC that it is appropriate that provision is made on site in order to allow WMI HGV drivers to take their statutory breaks, regardless of their duration.

3.6 The exact demand for WMI HGV drivers seeking to use the Extended Stay parking Bays is difficult to forecast, resulting in a precautionary approach being taken to HGV parking seek to minimise any

[1] Source: https://www.gov.uk/guidance/drivers-hours-goods-vehicles/1-eu-and-aetr-rules-on-drivers-hours

issues as far as is reasonably practicable. The demand will be influenced by operational factors and the locations of suppliers to the Site, which are currently not known.

3.7 It is proposed that 120 bays are provided for extended use for WMI HGV drivers across the warehouse units, with an additional 10 Extended Stay Bays provided at the Rail Terminal. The 120 spaces would be provided across the warehouse units rather than within a single destination. This would provide one Extended Stay Bay per 6,200 sqm.

3.8 Providing the Extended Stay HGV parking Bays in this way will ensure that the extended stay facilities are provided within a secure environment that is more efficient for operator management. HGVs would be visiting individual tenants (unless going to the intermodal terminal), rather than the Proposed Development as a whole. Through the VBS and Extended Stay HGV Bays on plot, tenants will be able to manage the use of the Extended Stay Bays at WMI.

3.9 This provision of HGV Extended Stay Bay will allow WMI to ensure that it does not add to any existing local HGV parking issues.

3.10 It should be noted that WMI drivers will also be able to take their shorter statutory breaks whilst vehicles are loaded / unloaded.

3.11 To assess the potential demand for the Extended Stay HGV parking spaces at WMI the HGV trip distribution rates and HGV volume rates have been used (see Annex B) that was agreed with Highways England and Staffordshire County Council during the Transport Assessment scoping process (which forms part of the WMI Development Consent Order application) as set out within the Statements of Common Ground prepared with these parties, as provided at Documents **REP1-007** and **REP1-008** .

3.12 The agreed HGV trip distribution anticipates that the majority of trips to and from WMI (62.3%) will take place within the West Midlands area. Only 13.7% of trips are anticipated from regions over a three-hour drive from WMI.

3.13 To quantify this into the volume of HGV vehicles, agreed HGV trip volumes are used to assess the demand, specifically during the overnight period of 6pm to 6am. Based on the National Survey of Lorry Parking, 6pm to 6am is when demand for unregulated HGV parking is at its peak.

3.14 During this 12-hour period it has been calculated that 1245 HGVs would arrive at WMI. The majority of these would be from the West Midlands (775 HGVs). Only 170 HGVs would arrive from areas 3 hours or further from WMI.

3.15 It is not expected that all of these 170 HGVs would need to stop in an Extended Stay Bay, however, the provision of a total of 130 Extended Stay HGV spaces at WMI would cater for around 75% of these vehicles.

3.16 Within the Site Wide HGV Management Plan, contingent traffic management measures are stated, which include measures for dealing with larger numbers of HGVs during major unforeseen incidents. When such incidents do occur, there would be liaison between the Site Wide Travel Plan Co-Ordinator and on site occupiers to ensure HGVs stay on site to avoid any impacts on the wider transport network.

3.17 It is considered that, with 2,900 HGV parking spaces available across WMI, there is sufficient space to deal with major unforeseen incidents. There are also numerous vehicle manoeuvring areas across the site that can be utilised for further parking, if required.

4 COMPARATIVE SITES

4.1 Other Strategic Rail Freight Sites (SRFI) have the benefit of an approved Development Consent Order (DCO). These are the extension of the existing Daventry International Rail Freight Interchange

("**DIRFT III**") and East Midlands Gateway Rail Freight Interchange ("**EMG**"). In addition, the iPort SRFI in Doncaster, was approved in 2011 and is now partially operational.

4.2 The key indicators of these schemes in relation to HGV parking are listed in Table 2. The intermodal function (road / rail interchange) and the 24-hour operational nature along with the workers shift patterns are similar within all sites.

Table 2: Extended Stay HGV Parking Provision at Strategic Rail Freight Interchanges

Site	Size (Sqm)	HGV Parking Bays	HGV Parking Bay ratio	Extended Stay HGV Provision	Extended Stay HGV Parking Ratio
WMI	743,200 sqm	2,664	1 per 279 sqm	120 Extended Stay Bays across warehouse units and 10 within Rail Terminal	1 per 5,717 sqm 1 per 6,200 sqm (warehouse only)
DIRFT I,II & III	1,301,741 (I, II & III) 731,000 (III only)	Phase I & II - Unknown Phase III 1,826 (III)	1 per 400 sqm (Phase III only)	311 within HGV Park No on plot facility	1 per 4,186 sqm (Phase I, II & III)
East Midlands Gateway	557,414	1,543	1 per 361 sqm	No HGV Park or on plot facility	N/A
iPort, Doncaster	562,000	2,500	1 per 225 sqm	No HGV Park or on plot facility	N/A

4.3 A comparison with the HGV parking ratio per square metre at the various approved SRFI shows that the overall provision at WMI is greater than that at both EMG and DIRFT III – the only two approved DCO SRFIs.

4.4 WMI will also provide Extended Stay HGV parking, which was not proposed, or provided by either EMG or iPort.

4.5 While a 311 space HGV Park is to be constructed as part of the DIRFT III proposals, this would also be available to HGV drivers using DIRFT I & II, which means that the total provision for Extended Stay HGV parking at DIRFT equates to one space per 4,186 sqm.

4.6 It is understood that the Northampton Gateway DCO submission for a SRFI seeks to provide a 120 space lorry park. This would be provided within a single block and would be for HGV drivers associated with this specific SRFI only. However, this scheme has yet to be approved therefore it is not known whether the approach taken is acceptable and consequently no comparisons are drawn.

4.7 On the basis of a comparison with other approved DCOs for SRFIs within the UK, it can be seen that when expressed as a ratio of parking bays to floor area, WMI proposes a greater provision of HGV parking provision than any other SRFI.

5 SUMMARY

5.1 In summary, it is demonstrated that sufficient HGV parking is provided at WMI and the Proposed Development is able to manage and accommodate the potential demand for all HGV parking within the Site itself. It is therefore in compliance with paragraph 107 of the NPPF (2019). The approach to the provision of on site HGV parking has been agreed with both HE and SCC.

5.2 In terms of Early arrival and operational Bays the appended parking accumulation exercise demonstrates that sufficient levels of parking would be provided in order to cater for the forecast internal and external HGV trip demand and duration of stay. Significant levels of reserve capacity are provided within the parking stock proposed to ensure resilience in operational terms.

5.3 Extended Stay parking Bays will be available for HGV drivers to take statutory breaks. Whilst it is difficult to forecast the demand for Extended stay spaces, the provision of a total of 130 spaces catering for this requirement (120 spaces across the warehouse units and 10 at the terminal) equates to approximately 75% of those HGV's arriving at the site between 6pm and 6am and with an origin that is 3 hours or further from WMI.

5.4 The demand for Extended Stay HGV Bays at WMI has been compared with other approved SRFI sites. These show that WMI has the highest volume of HGV spaces on site, and while it is not proposed to provide a dedicated 'lorry park' (such as that at DIRFT I, II and III), the Extended Stay HGV parking Bays will be provided at WMI should drivers need to use them.

5.5 It is therefore concluded that WMI provides a sufficient level of on site HGV parking provision that caters for all types of HGV parking that the Development will generate.

Annex A

WMI - HGV Parking Accumulation Exercise - Early Arrival & Operational Bays

External HGV Trips			Uplift to Account for Internal HGV Trips		Parking Accumulation	Parking Utilisation
HOUR	**IN**	**OUT**	**In**	**Out**	**690**	**25%**
00:00	107	66	150	92	747	27%
01:00	85	87	119	122	745	27%
02:00	74	68	104	95	753	27%
03:00	74	64	104	90	767	28%
04:00	69	81	97	113	750	27%
05:00	102	91	143	127	766	28%
06:00	136	116	190	162	794	29%
07:00	125	100	175	140	829	30%
08:00	138	142	193	199	823	30%
09:00	170	160	238	224	837	30%
10:00	173	157	242	220	859	31%
11:00	168	177	235	248	847	31%
12:00	191	196	267	274	840	30%
13:00	162	169	227	237	830	30%
14:00	210	161	294	225	899	32%
15:00	204	193	286	270	914	33%
16:00	166	175	232	245	901	33%
17:00	147	178	206	249	858	31%
18:00	114	148	160	207	810	29%
19:00	143	130	200	182	829	30%
20:00	119	115	167	161	834	30%
21:00	105	116	147	162	819	30%
22:00	128	83	179	116	882	32%
23:00	125	112	175	157	900	32%

Number of HGV Spaces (Early Arrival & Operational) **2770**

Annex B

TABLE A1: HGV TRIP DISTRIBUTION BY REGION

O / D REGION	DISTRIBUTION OF TRIPS
North East	0.6%
North West	7.3%
Yorkshire and Humber	4.2%
East Midlands	9.3%
West Midlands	62.3%
East of England	3.7%
London	1.4%
South East	4.0%
South West	4.0%
Wales	3.4%
Scotland	0.6%

TABLE A2: NUMBER OF DAILY EXTERNAL HGV TRIPS AT WMI

HOUR	IN	OUT	TWO WAY
00:00	107	66	173
01:00	85	87	172
02:00	74	68	142
03:00	74	64	138
04:00	69	81	150
05:00	102	91	193
06:00	136	116	252
07:00	125	100	225
08:00	138	142	281
09:00	170	160	329
10:00	173	157	330
11:00	168	177	345
12:00	191	196	386
13:00	162	169	331
14:00	210	161	371
15:00	204	193	397
16:00	166	175	341
17:00	147	178	325
18:00	114	148	262
19:00	143	130	273
20:00	119	115	234
21:00	105	116	221
22:00	128	83	211
23:00	125	112	238

Applicant's Post Hearing Submissions (CAH, ISH 2 and ISH3)
AQ Note

The West Midlands Rail Freight Interchange Order 201X

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WEST MIDLANDS INTERCHANGE

AIR QUALITY - ADDITIONAL INFORMATION IN RESPONSE TO ENVIRONMENTAL MATTERS HEARING (6 JUNE 2019)

1 Impacts and Mitigation at Receptor 7a

1.1 The modelling undertaken for the Environmental Statement (ES) (Document 6.2, Chapter 7, APP-027) predicted exceedances of the daily mean PM_{10} objective and this was the subject of ExQ1 1.8.8 (PD-007) where further information was requested on this predicted exceedance and whether mitigation could be provided. The response provided to ExQ1 1.8.8 (REP2-009) was that the predicted exceedance was primarily due to the existing high background levels with the proposed development contribution being approximately 1% of the total, and that no specific mitigation was proposed at this receptor location.

1.2 At the Environmental Matters hearing (6 June 2019), additional information was requested concerning:

- The number of properties represented by Receptor 7a.
- The available mitigation options for the properties represented by Receptor 7a.

1.3 Receptor location 7a has been modelled on the front façade of the western corner of 343 Darlaston Road. This property is one of a terrace of properties that runs to the east of the M6 motorway, and it is the closest property to the motorway. As the terrace of properties is not perpendicular to the alignment of the motorway, the rear of the property is slightly closer to the motorway than the front of the property. The motorway is elevated by approximately 6m at this point.

1.4 In terms of the number of properties that may be affected by the exceedances predicted in the ES modelling, it is likely to be no more than 3 properties. This is because pollutant concentrations reduce rapidly away from a road source and the required change in concentrations to remove the exceedance is small. At the rear of the properties on the eastern side of the motorway, the closest property (343 Darlaston Road) is approximately 4.7m horizontally from the motorway, whereas the fourth property is approximately 17m from the motorway. However, having further considered the modelling undertaken for the ES, Ramboll does not believe that there will be any exceedances at these properties, for the reasons outlined below.

1.5 For the ES modelling, the receptor was located at an elevation of 1.5m above ground level (corresponding to ground floor level), with the motorway also modelled at grade (i.e. the motorway was not elevated above the properties). The approach to the modelling was deliberately conservative, but following the concerns raised about the predicted exceedances at this location, the modelling approach at this specific location has been refined.

1.6 As noted in Paragraph 1.3 above, the motorway at this location is elevated by approximately 6m compared to the properties below. In addition, at this location there are noise barriers installed along both sides of the motorway which are estimated to be approximately 2.5 to 3m high. At this location the motorway is designed for hard shoulder running (giving four lanes in each direction), with the noise barrier supported external to the carriageway.

1.7 In order to revise the modelling predictions, the motorway has been elevated to 6m at this location. No account has been taken of the noise barrier, but this is likely to reduce further the predicted concentrations for receptors close to the motorway such as Receptor 7a.

1.8 The updated model results are contained in Appendix 1. For completeness, revised results are provided for all of the pollutants modelled in the ES for this receptor location.

1.9 With the motorway elevated in relation to the receptor, the predicted concentrations are significantly lower such that there are no predicted exceedances of air quality strategy objectives, and all of the impacts of the proposed development are negligible. The lower results at the receptor are due to a combination of increased separation distance and improved dispersion from the elevated source. The revised modelling has confirmed that there is no requirement for mitigation at the properties represented by Receptor 7a.

2 Operational Monitoring in the Vicinity of the WMI Site

2.1 ExQ1 1.8.10 (PD-007) requested further information on the monitoring of air quality effects in relation to construction and operation of the development. The response provided to ExQ1 1.8.10 (REP2-009) confirmed the monitoring that is proposed to be undertaken for the construction period and confirmed that the monitoring of operational phase emissions is not proposed to be undertaken. At the Environmental Matters hearing (6 June 2019), additional information was requested about the potential need for monitoring during the operational phase of the development.

2.2 The air quality assessment presented in Chapter 7 of the ES (Document 6.2, APP-027) considered the impact of road traffic emissions on the closest residential receptors to the affected external road network. Whilst the external receptors to the site receive an impact from development traffic (in so far as it is distributed on the external road network), the main contribution to pollutant concentrations at the external receptor locations is the existing traffic flows on the external road network. Within the site itself there is only the development traffic which is distributed across the site and which is lower than the external traffic volumes. In addition, the external receptors to the site are not located close to the internal road network and therefore emissions from traffic on the internal road network would be significantly dispersed before reaching external residential receptor locations. The impacts on external receptors to the site will therefore be lower than have been assessed in the ES. As no significant effects have been predicted for the receptors adjacent to the external road network, there are unlikely to be any significant effects for receptors adjacent to the site. Operational monitoring of road traffic emissions on the site boundary is therefore not considered necessary.

2.3 As noted in Paragraphs 7.166 – 7.168 of the ES (Document 6.2, APP-027), the site does not meet the Defra criteria for an assessment of the impact of railway emissions to be required and therefore this would not lead to a requirement for monitoring.

2.4 As the internal road network will all be paved there will not be the generation of fugitive dust from the movements of vehicles on unpaved roads. All potentially dusty materials received into the site on rail vehicles will be in enclosed wagons and there will be no open air transfer of dusty materials from rail freight vehicles to the distribution warehouses or HGVs. The operations undertaken in the rail freight terminal will therefore not lead to the generation of significant fugitive dust and therefore there is no requirement for fugitive dust monitoring on the boundary of the site.

Appendix 1 – Predicted Concentrations at Receptor 7a

Scenario	Original Results				Revised Results			
	Baseline	With Development	Development Contribution (%)	Impact Descriptor	Baseline	With Development	Development Contribution (%)	Impact Descriptor
Annual Mean NO_2 (µg/m³)								
2021 25% traffic	74.6	74.8	0	Negligible	43.7	43.7	0	Negligible
2028 50% traffic	45.3	45.5	0	Negligible	29.1	29.2	0	Negligible
2036 100% traffic	41.2	41.5	0	Negligible	27.0	27.1	0	Negligible
Annual Mean PM_{10} (µg/m³)								
2021 25% traffic	36.0	36.2	0	Negligible	21.2	21.3	0	Negligible
2028 50% traffic	35.2	35.6	0	Negligible	20.9	21.0	0	Negligible
2036 100% traffic	35.2	35.7	0	Negligible	20.9	21.0	0	Negligible
Number of Exceedances of Daily Mean PM_{10} Concentration (days)								
2021 25% traffic	55	56	1	Negligible	5	5	0	Negligible
2028 50% traffic	51	53	2	Moderate	5	5	0	Negligible
2036 100% traffic	50	53	3	Substantial	5	5	0	Negligible
Annual Mean $PM_{2.5}$ (µg/m³)								
2021 25% traffic	21.6	21.6	0	Negligible	13.7	13.7	0	Negligible
2028 50% traffic	20.7	20.8	1	Negligible	13.2	13.3	0	Negligible

Scenario	Original Results				Revised Results			
	Baseline	With Development	Development Contribution (%)	Impact Descriptor	Baseline	With Development	Development Contribution (%)	Impact Descriptor
2036 100% traffic	20.6	20.9	1	Negligible	13.2	13.3	0	Negligible

Applicant's Post Hearing Submissions (CAH, ISH 2 and ISH3)
Applicant AQ Response to SSDC

The West Midlands Rail Freight Interchange Order 201X

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WEST MIDLANDS INTERCHANGE

RESPONSE TO SOUTH STAFFORDSHIRE DISTRICT COUNCIL REVIEW – REV3

1 Introduction

1.1 South Staffordshire District Council (SSDC) commissioned Air Quality Consultants (AQC) to undertake a review of Chapter 7 of the West Midlands Interchange (WMI) Environmental Statement (AQC reference J3582A/1/F1, dated 4 December 2018).

1.2 A response to the initial AQC Report was provided by Ramboll on behalf of the Applicant on 17th December 2018, the results of which have been incorporated into an updated AQC review dated 8 January 2019 (AQC reference J3582A/1/F2). A revised response note based on the original air quality modelling was prepared and issued on 24th January 2019, and a meeting held with SSDC and AQC on 21st February 2019 to discuss the results.

1.3 Following the meeting, it was agreed that a further review of the ES modelling would be undertaken. This was provided in a note dated 11th March 2019. A further response was received from AQC , dated 1st April 2019, and this note presents a final update of the 11th March 2019 data with respect to the SSDC area. Comments within the 1st April 2019 AQC response are addressed as follows:

- The x and y axis of the graph have now been re-labelled. For the avoidance of doubt the model verification factor was calculated and applied correctly.
- For the motorway verification sites ES4 and PE alone, the model verification factor would have been 1.22 and therefore slightly lower results would have been reported for the motorway receptors than are reported here-in had this factor being used. However, taking into account the need to present a reasonable worst case assessment, and given that it does not adversely impact on the conclusions of the assessment, a single verification factor incorporating these monitoring points is considered acceptable.
- Updated results at receptors 3a, 3b, PS_42a and 41a are included in this note as per our email correspondence of 29th March 2019.
- The results for the baseline concentration of PM_{10} and $PM_{2.5}$ in 2028 have been updated. The increases in PM_{10} and $PM_{2.5}$ concentrations in 2028 are now consistent with the NO_2 results for the same receptor location.

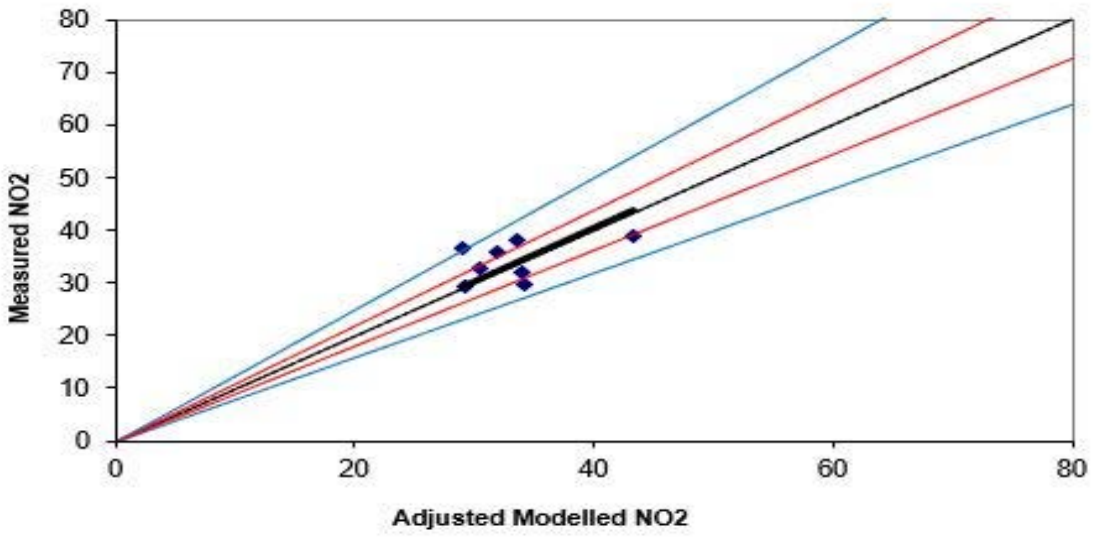
1.4 Overall there is no change to the conclusions of the 11th March 2019 note by the revisions made herein, and we acknowledge AQC's confirmation that the air quality objectives are unlikely to be exceeded in the opening year or beyond and that the overall impacts of WMI will be 'not significant'.

2 Adjustment to the Model Set Up

2.1 In light of the discussions held at the 21st February 2019 meeting, a review of the receptor and monitoring locations has been undertaken and we have taken the opportunity to check all aspects of the model set up. As outlined in the email of 29th March 2019, where receptors are close to an elevated section of the motorway then the motorway has been raised to reflect the relative elevations between the source and receptor.

2.2 Initial comments within the AQC review concerned the model verification and comparison with the monitored data. Only monitoring points where we can verify the location have been used in the assessment and we have corrected monitoring point locations where the grid references provided in the SSDC Annual Status Report have proved to be incorrect. We have further reviewed the Defra guidance TG.16 concerning the use of monitoring points for model verification and in line with paragraph 7.524, all of the monitoring points have been grouped together as they are associated with trunk roads or motorways in open settings, and not urban areas. In particular, monitoring locations ES4 and PE, whilst influenced by emissions from a motorway, are not particularly close to the motorway.

2.3 The resultant model verification factor is 1.3833 compared to 2.2 in the ES which indicates an improved model performance, with the graph of monitored against predicted NO_2 concentrations shown below.



2.4 The following table provides a comparison of the measured and predicted concentrations in 2016, along with the model verification statistics.

Table 1 – Model Verification for SSDC

Monitoring Point	2016 Measured	2016 Modelled
PE - Auto	39.0	43.4
HA2 - DT	37.9	33.6
HA5 - DT	31.9	34.1
HA6 - DT	29.7	34.3
SA2 - DT	32.6	30.4
SA5 - DT	36.5	29.0
SA6 - DT	29.3	29.2
ES4 - DT	35.6	31.9

Table 1 – Model Verification for SSDC		
Monitoring Point	**2016 Measured**	**2016 Modelled**
Verification Statistics		
Correlation co-efficient	0.47	
RMSE	4.2	
Factional bias	0.0	

2.5 In evaluating the model verification there are two pairs of three monitoring points close together in each of the AQMAs; HA2, HA5, HA6 and SA2, SA5 and SA6. Each monitoring point is a similar distance from the road, but the monitoring results are different. In this case, the model predicts similar results at the monitoring locations consistent with the distance from the road.

2.6 In terms of the overall model performance, as noted in 7.541 of TG16, in the first instance the RMSE error is statistic to evaluate. Paragraph 7.542 confirms that where the RMSE is greater than 25% of the objective (i.e. 10µg/m^3 for annual mean NO_2), then the model set up should be re-evaluated. Ideally the RMSE should be less than 4µg/m^3, and the calculated value is just above this which confirms an adequate overall model performance.

2.7 The fractional bias indicates that the model is not tending to overpredict or underpredict.

2.8 Finally, whilst the correlation co-efficient does not indicate a close correlation between the measured and predicted concentrations, paragraph 7.544 of TG16 indicates that that this statistic could be applied in cases where large datasets such as hourly observations are being compared. This is not the case here.

2.9 Overall, it is considered that the model verification is within accepted parameters.

3 Results

3.1 Model results based on the revised model parameters are presented in Appendix 1 for the human health receptors within SSDC area. Where receptors are located at the same location as monitoring points, these have been combined.

3.2 Whilst there are differences in the predicted concentrations at the modelled receptor locations, the pattern of the results and the development impact are consistent between the two sets of predictions.

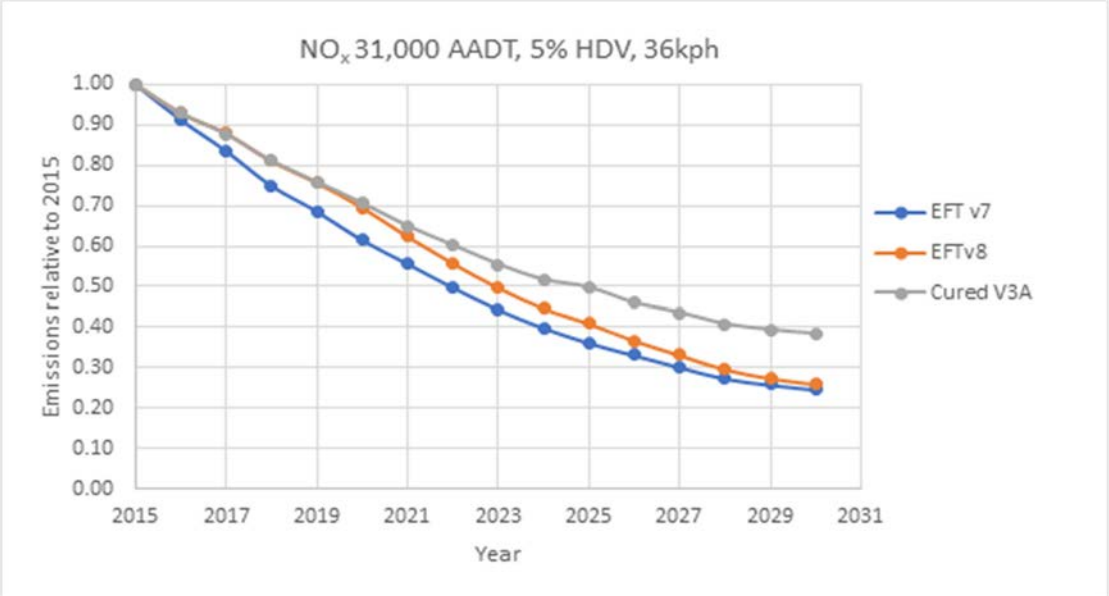
3.3 For NO_2 in 2021, the revised predictions show two slight impacts compared to one previously, with all other impacts negligible. There is one receptor location with a predicted exceedance in the baseline and 'with development' scenarios compared with three in the original modelling, but at this location the development has a negligible impact. The proposed development does not cause any additional exceedances and the impacts within the existing AQMAs are negligible. By 2028, there are no predicted exceedances and all of the impacts are negligible.

3.4 For PM_{10} and $PM_{2.5}$ concentrations, all of the development impacts are negligible for all of the assessed years.

3.5 As discussed at our meeting, the predicted concentrations are a function of the changes in traffic over the lifetime of the development combined with how vehicle emissions are predicted to change.

3.6 In terms of the traffic data, it includes all potential committed developments (as per paragraph 15.125 of the ES) which in many cases are potential schemes. Furthermore, the 2021 traffic data includes all movements associated with the committed developments when many of the schemes may not be operational or complete by this time. In addition, the modelling assumes that 25% of the WMI development (if consented) will be operational in 2021. Given that consent (if granted) won't be issued until 2020 and then there is a period which requires addressing pre-commencement DCO Requirements (like planning conditions) and then the construction period, it is considered highly unlikely that 25% of the development will be operational by 2021. In terms of the traffic data therefore, the predictions for 2021 are likely to overestimate both the total pollutant concentrations and the development contribution.

3.7 In addition, the Defra Emissions Factor Toolkit (EFT) predicts very significant reductions in NO_x emissions from the vehicle fleet. A graph of the relative NO_x emissions from the vehicle fleet over time is shown below; for both the Defra EFT predictions and AQC's CURED.



3.8 The graph illustrates that the reduction in vehicle NO_x emissions is likely to outweigh all but the most significant increases in vehicle flows, so effects (in terms of NO_2) from the WMI development will reduce over time and NO_2 concentrations will decline even as traffic from WMI increases. This effect is illustrated in the modelling results.

4 Conclusions

4.1 As requested, the model set up has been reviewed and revised predictions made. Overall however, there are no changes to the conclusions of the original assessment and the development will not have a significant effect on pollutant concentrations in SSDC.

Ramboll

3rd April 2019

West Midlands Interchange

Appendix 1 – SSDC Model Results

Table A – Predicted NO_2 Concentrations in 2021 – 25% Development Traffic								
Receptor	**Original Results**				**Revised Results**			
	2021 Baseline	**2021 With Development**	**Development Contribution (%)**	**Impact Descriptor**	**2021 Baseline**	**2021 With Development**	**Development Contribution (%)**	**Impact Descriptor**
PS_PE	**42.9**	**43.0**	0	negligible	36.2	36.3	0	Negligible
PS_HA2+08b	21.6	22.0	1	negligible	25.5	25.9	1	Negligible
PS_HA5	#N/A	#N/A	#N/A	#N/A	25.9	26.2	1	Negligible
PS_HA6	#N/A	#N/A	#N/A	#N/A	26.0	26.4	1	Negligible
PS_SA2+38a	23.7	23.8	0	negligible	27.1	27.1	0	Negligible
PS_SA5	23.6	23.7	0	negligible	25.7	25.7	0	Negligible
PS_SA6+38b	23.6	23.6	0	negligible	25.9	26.0	0	Negligible
PS_ES4	38.9	39.1	0	negligible	27.1	27.2	0	Negligible
PS_ES6	39.5	39.6	0	negligible	29.5	29.5	0	Negligible
PS_02a	18.5	18.7	0	negligible	22.0	22.1	0	Negligible
PS_04a	23.9	24.2	0	negligible	27.0	27.2	1	Negligible
PS_05a	24.4	26.4	5	negligible	26.0	27.5	4	Negligible
PS_06a	25.4	26.0	2	negligible	31.7	32.3	2	Slight
PS_09a	24.4	26.9	6	slight	25.2	26.9	4	Negligible

West Midlands Interchange

Table A – Predicted NO_2 Concentrations in 2021 – 25% Development Traffic								
Receptor	Original Results				Revised Results			
	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor
PS_10a	21.0	21.3	1	negligible	18.8	19.0	1	Negligible
PS_13a	21.6	22.5	2	negligible	27.3	28.2	2	Negligible
PS_14a	26.5	27.7	3	negligible	26.2	26.8	2	Negligible
PS_14b	19.8	20.6	2	negligible	20.5	21.1	2	Negligible
PS_15b	16.9	17.1	0	negligible	19.2	19.3	0	Negligible
PS_15c	28.7	28.9	0	negligible	35.3	35.5	0	Negligible
PS_17a	20.5	21.1	1	negligible	22.4	22.9	1	Negligible
PS_17b	18.5	18.9	1	negligible	19.9	20.3	1	Negligible
PS_18a	12.2	12.5	1	negligible	12.3	12.4	0	Negligible
PS_20a	16.8	16.9	0	negligible	18.7	18.8	0	Negligible
PS_21a	13.0	13.1	0	negligible	14.1	14.1	0	Negligible
PS_21b	14.3	14.3	0	negligible	14.6	14.6	0	Negligible
PS_23a	13.7	13.8	0	negligible	14.8	14.9	0	Negligible
PS_23b	13.8	13.8	0	negligible	14.5	14.5	0	Negligible
PS_29a	12.1	12.1	0	negligible	11.8	11.8	0	Negligible

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Table A – Predicted NO_2 Concentrations in 2021 – 25% Development Traffic								
Receptor	Original Results				Revised Results			
	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor
PS_29b	9.4	9.4	0	negligible	9.7	9.8	0	Negligible
PS_30a	13.1	13.1	0	negligible	12.9	12.9	0	Negligible
PS_30b	13.0	13.1	0	negligible	12.4	12.4	0	Negligible
PS_31b	12.8	12.8	0	negligible	13.6	13.6	0	Negligible
PS_32a	18.2	18.4	0	negligible	22.2	22.3	0	Negligible
PS_32b	16.9	17.1	0	negligible	19.8	19.9	0	Negligible
PS_33a	19.1	19.4	1	negligible	21.1	21.3	1	Negligible
PS_34a	20.6	20.8	1	negligible	22.4	22.7	1	Negligible
PS_34b	18.0	18.3	1	negligible	19.7	20.0	1	Negligible
PS_40b	37.8	37.9	0	negligible	28.4	28.4	0	Negligible
PS_40c	27.3	27.4	0	negligible	34.0	34.1	0	Negligible
PS_42a	34.3	34.4	0	negligible	33.9	34.0	0	Negligible
PS_42d	23.3	23.4	0	negligible	30.2	30.3	0	Negligible
PS_61a	18.3	18.5	0	negligible	22.4	22.5	0	Negligible
PS_62a	26.7	26.7	0	negligible	34.8	34.8	0	Negligible

Table A – Predicted NO_2 Concentrations in 2021 – 25% Development Traffic								
Receptor	**Original Results**				**Revised Results**			
	2021 Baseline	**2021 With Development**	**Development Contribution (%)**	**Impact Descriptor**	**2021 Baseline**	**2021 With Development**	**Development Contribution (%)**	**Impact Descriptor**
PS_64b	28.2	28.2	0	negligible	34.3	34.4	0	Negligible
02b	21.1	21.4	1	negligible	22.3	22.6	1	Negligible
03a	**40.4**	**40.5**	0	negligible	33.9	33.9	0	Negligible
03b	26.5	26.5	0	negligible	33.2	33.3	0	Negligible
08a	26.3	26.7	1	negligible	30.7	31.1	1	Negligible
08c	24.3	24.8	1	negligible	27.7	28.1	1	Negligible
09b	24.1	25.8	4	negligible	19.7	21.1	4	Negligible
10b	22.6	22.8	0	negligible	24.9	25.0	0	Negligible
12a	19.8	20.7	2	negligible	21.4	22.1	2	Negligible
13b	22.5	23.6	3	negligible	23.9	24.9	2	Negligible
15a	20.2	20.4	0	negligible	25.4	25.5	0	Negligible
16a	20.4	21.1	2	negligible	19.4	19.9	1	Negligible
19a	28.1	29.0	2	negligible	28.6	29.4	2	Negligible
19b	22.1	22.7	1	negligible	20.9	21.3	1	Negligible
19c	22.3	22.9	1	negligible	20.8	21.2	1	Negligible

Table A – Predicted NO_2 Concentrations in 2021 – 25% Development Traffic								
Receptor	**Original Results**				**Revised Results**			
	2021 Baseline	**2021 With Development**	**Development Contribution (%)**	**Impact Descriptor**	**2021 Baseline**	**2021 With Development**	**Development Contribution (%)**	**Impact Descriptor**
20b	15.9	15.9	0	negligible	17.0	17.1	0	Negligible
22a	17.3	17.4	0	negligible	18.3	18.4	0	Negligible
22b	16.7	16.8	0	negligible	18.9	19.0	0	Negligible
24a	25.8	26.6	2	negligible	30.8	31.4	2	Slight
24b	29.8	30.4	2	negligible	24.9	25.5	1	Negligible
31a	13.7	13.7	0	negligible	19.2	19.3	0	Negligible
32c	29.4	29.6	0	negligible	32.8	32.9	0	Negligible
33b	19.9	20.2	1	negligible	17.9	18.1	1	Negligible
35b	9.4	9.5	0	negligible	21.7	21.7	0	Negligible
41a	**44.5**	**44.7**	0	negligible	34.5	34.6	0	Negligible
42b	27.4	27.5	0	negligible	36.7	36.8	0	Negligible
42c	34.6	34.8	0	negligible	**44.9**	**45.0**	0	Negligible
43a	35.4	35.8	1	negligible	36.7	36.9	1	Negligible
43b	32.2	32.5	1	negligible	30.9	31.1	0	Negligible
44a	32.2	32.4	0	negligible	32.9	33.0	0	Negligible

Table A – Predicted NO_2 Concentrations in 2021 – 25% Development Traffic								
Receptor	**Original Results**				**Revised Results**			
	2021 Baseline	**2021 With Development**	**Development Contribution (%)**	**Impact Descriptor**	**2021 Baseline**	**2021 With Development**	**Development Contribution (%)**	**Impact Descriptor**
45a	19.9	19.9	0	negligible	24.3	24.3	0	Negligible

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Table B – Predicted NO_2 Concentrations in 2028 – 50% Development Traffic								
Receptor	Original Results				Revised Results			
	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor
PS_PE	25.1	25.3	0	negligible	22.8	23.0	1	Negligible
PS_HA2+08b	14.5	14.9	1	negligible	16.7	17.2	1	Negligible
PS_HA5	#N/A	#N/A	#N/A	#N/A	16.9	17.4	1	Negligible
PS_HA6	#N/A	#N/A	#N/A	#N/A	17.0	17.4	1	Negligible
PS_SA2+38a	15.5	15.5	0	negligible	17.3	17.4	0	Negligible
PS_SA5	15.4	15.5	0	negligible	16.6	16.7	0	Negligible
PS_SA6+38b	15.4	15.5	0	negligible	16.8	16.8	0	Negligible
PS_ES4	23.9	24.0	0	negligible	18.4	18.5	0	Negligible
PS_ES6	24.1	24.3	0	negligible	19.7	19.8	0	Negligible
PS_02a	12.0	12.3	1	negligible	14.2	14.4	1	Negligible
PS_04a	15.8	16.0	1	negligible	17.6	17.8	1	Negligible
PS_05a	16.6	18.7	5	negligible	17.7	19.0	3	Negligible
PS_06a	16.7	17.4	2	negligible	20.4	21.2	2	Negligible
PS_09a	16.6	18.7	5	negligible	17.1	17.8	2	Negligible
PS_10a	13.7	14.2	1	negligible	12.6	12.8	1	Negligible

Table B – Predicted NO_2 Concentrations in 2028 – 50% Development Traffic								
Receptor	Original Results				Revised Results			
	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor
PS_13a	16.1	16.9	2	negligible	19.2	19.7	1	Negligible
PS_14a	18.3	19.6	3	negligible	18.3	18.9	2	Negligible
PS_14b	15.5	16.4	2	negligible	16.0	16.6	1	Negligible
PS_15b	13.5	13.6	0	negligible	14.8	14.9	0	Negligible
PS_15c	18.5	18.8	0	negligible	22.9	23.1	1	Negligible
PS_17a	15.4	15.7	1	negligible	16.5	16.8	1	Negligible
PS_17b	14.3	14.4	0	negligible	15.1	15.2	0	Negligible
PS_18a	9.4	9.5	0	negligible	9.4	9.5	0	Negligible
PS_20a	13.3	13.4	0	negligible	14.3	14.4	0	Negligible
PS_21a	10.0	10.0	0	negligible	10.6	10.6	0	Negligible
PS_21b	10.8	10.8	0	negligible	10.9	11.0	0	Negligible
PS_23a	10.4	10.5	0	negligible	11.1	11.1	0	Negligible
PS_23b	10.8	10.8	0	negligible	11.2	11.2	0	Negligible
PS_29a	9.3	9.3	0	negligible	9.2	9.2	0	Negligible
PS_29b	7.0	7.0	0	negligible	7.2	7.2	0	Negligible

Table B – Predicted NO_2 Concentrations in 2028 – 50% Development Traffic								
Receptor	Original Results				Revised Results			
	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor
PS_30a	9.9	9.9	0	negligible	9.7	9.7	0	Negligible
PS_30b	9.8	9.8	0	negligible	9.5	9.5	0	Negligible
PS_31b	9.7	9.7	0	negligible	10.2	10.2	0	Negligible
PS_32a	12.8	13.0	0	negligible	15.1	15.3	0	Negligible
PS_32b	12.1	12.4	0	negligible	13.8	14.0	1	Negligible
PS_33a	13.2	13.6	1	negligible	14.3	14.7	1	Negligible
PS_34a	13.7	14.1	1	negligible	14.8	15.1	1	Negligible
PS_34b	12.4	12.9	1	negligible	13.4	13.7	1	Negligible
PS_40b	23.4	23.5	0	negligible	19.1	19.2	0	Negligible
PS_40c	17.9	17.9	0	negligible	22.1	22.2	0	Negligible
PS_42a	20.2	20.4	0	negligible	24.9	25.0	0	Negligible
PS_42d	15.1	15.2	0	negligible	19.3	19.5	0	Negligible
PS_61a	13.0	13.0	0	negligible	15.3	15.3	0	Negligible
PS_62a	17.7	17.8	0	negligible	22.8	22.8	0	Negligible
PS_64b	19.8	19.8	0	negligible	23.6	23.7	0	Negligible

Table B – Predicted NO_2 Concentrations in 2028 – 50% Development Traffic								
Receptor	Original Results				Revised Results			
	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor
02b	14.1	14.6	1	negligible	14.9	15.3	1	Negligible
03a	23.8	24.0	0	negligible	30.9	31.0	0	Negligible
03b	16.7	16.8	0	negligible	21.2	21.3	0	Negligible
08a	17.9	18.4	1	negligible	20.6	21.1	1	Negligible
08c	15.6	16.2	1	negligible	17.6	18.2	1	Negligible
09b	15.9	16.4	1	negligible	12.0	12.3	1	Negligible
10b	13.9	14.2	1	negligible	17.7	17.9	1	Negligible
12a	14.8	15.6	2	negligible	16.0	16.3	1	Negligible
13b	16.6	17.8	3	negligible	17.4	18.5	3	Negligible
15a	15.0	15.2	0	negligible	18.7	18.9	0	Negligible
16a	15.8	16.1	1	negligible	14.6	14.7	0	Negligible
19a	19.5	20.4	2	negligible	19.8	20.6	2	Negligible
19b	16.2	16.7	1	negligible	15.5	15.8	1	Negligible
19c	16.3	16.8	1	negligible	15.0	15.4	1	Negligible
20b	12.3	12.3	0	negligible	12.9	13.0	0	Negligible

Table B – Predicted NO_2 Concentrations in 2028 – 50% Development Traffic								
Receptor	Original Results				Revised Results			
	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor
22a	13.1	13.2	0	negligible	13.6	13.7	0	Negligible
22b	12.7	12.8	0	negligible	14.0	14.1	0	Negligible
24a	17.7	18.4	2	negligible	21.6	22.0	1	Negligible
24b	20.9	21.4	1	negligible	16.3	16.8	1	Negligible
31a	10.2	10.2	0	negligible	13.4	13.4	0	Negligible
32c	18.2	18.4	0	negligible	20.8	21.0	0	Negligible
33b	13.3	13.8	1	negligible	11.5	11.8	1	Negligible
35b	7.1	7.1	0	negligible	15.8	15.8	0	Negligible
41a	26.9	27.2	0	negligible	30.5	30.7	0	Negligible
42b	17.2	17.4	0	negligible	23.7	23.8	0	Negligible
42c	21.1	21.4	1	negligible	28.4	28.6	0	Negligible
43a	21.9	22.3	1	negligible	23.5	23.8	1	Negligible
43b	20.2	20.5	1	negligible	18.9	19.1	1	Negligible
44a	20.1	20.3	0	negligible	20.0	20.1	0	Negligible
45a	13.9	13.9	0	negligible	16.5	16.5	0	Negligible

Table C – Predicted NO_2 Concentrations in 2036 – 100% Development Traffic								
Receptor	**Original Results**				**Revised Results**			
	2036 Baseline	**2036 With Development**	**Development Contribution (%)**	**Impact Descriptor**	**2036 Baseline**	**2036 With Development**	**Development Contribution (%)**	**Impact Descriptor**
PS_PE	22.8	23.0	0	negligible	20.8	21.1	1	Negligible
PS_HA2+08b	13.6	14.0	1	negligible	15.5	16.0	1	Negligible
PS_HA5	#N/A	#N/A	#N/A	#N/A	15.7	16.2	1	Negligible
PS_HA6	#N/A	#N/A	#N/A	#N/A	15.7	16.3	1	Negligible
PS_SA2+38a	14.4	14.5	0	negligible	16.0	16.1	0	Negligible
PS_SA5	14.3	14.4	0	negligible	15.4	15.5	0	Negligible
PS_SA6+38b	14.3	14.4	0	negligible	15.5	15.6	0	Negligible
PS_ES4	21.9	22.1	0	negligible	17.2	17.3	0	Negligible
PS_ES6	22.1	22.3	0	negligible	18.3	18.4	0	Negligible
PS_02a	11.1	11.4	1	negligible	13.0	13.3	1	Negligible
PS_04a	14.6	14.9	1	negligible	16.2	16.5	1	Negligible
PS_05a	15.5	18.0	6	slight adverse	16.5	18.0	4	Negligible
PS_06a	15.5	16.4	2	negligible	18.8	19.7	2	Negligible
PS_09a	15.5	18.2	7	slight adverse	16.0	16.8	2	Negligible
PS_10a	12.6	13.2	1	negligible	11.6	11.9	1	Negligible

Table C – Predicted NO_2 Concentrations in 2036 – 100% Development Traffic								
Receptor	Original Results				Revised Results			
	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor
PS_13a	15.2	16.1	2	negligible	17.9	18.5	2	Negligible
PS_14a	17.1	18.6	4	negligible	17.1	17.9	2	Negligible
PS_14b	14.9	15.9	3	negligible	15.3	16.0	2	Negligible
PS_15b	13.0	13.2	0	negligible	14.2	14.3	0	Negligible
PS_15c	17.2	17.5	1	negligible	21.1	21.4	1	Negligible
PS_17a	14.6	15.0	1	negligible	15.5	15.9	1	Negligible
PS_17b	13.6	13.8	0	negligible	14.3	14.4	0	Negligible
PS_18a	8.9	9.1	0	negligible	9.0	9.1	0	Negligible
PS_20a	12.7	12.9	0	negligible	13.6	13.7	0	Negligible
PS_21a	9.5	9.6	0	negligible	10.0	10.1	0	Negligible
PS_21b	10.2	10.3	0	negligible	10.4	10.5	0	Negligible
PS_23a	9.9	10.0	0	negligible	10.5	10.6	0	Negligible
PS_23b	10.3	10.4	0	negligible	10.7	10.7	0	Negligible
PS_29a	8.9	8.9	0	negligible	8.8	8.8	0	Negligible
PS_29b	6.6	6.6	0	negligible	6.8	6.8	0	Negligible

Table C – Predicted NO_2 Concentrations in 2036 – 100% Development Traffic								
Receptor	Original Results				Revised Results			
	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor
PS_30a	9.3	9.4	0	negligible	9.3	9.3	0	Negligible
PS_30b	9.3	9.3	0	negligible	9.0	9.1	0	Negligible
PS_31b	9.2	9.2	0	negligible	9.6	9.6	0	Negligible
PS_32a	12.0	12.2	1	negligible	14.1	14.3	1	Negligible
PS_32b	11.5	11.7	1	negligible	12.9	13.2	1	Negligible
PS_33a	12.4	12.8	1	negligible	13.4	13.8	1	Negligible
PS_34a	12.6	13.1	1	negligible	13.6	14.0	1	Negligible
PS_34b	11.6	12.1	1	negligible	12.5	12.8	1	Negligible
PS_40b	21.5	21.7	0	negligible	17.8	17.9	0	Negligible
PS_40c	16.6	16.7	0	negligible	20.4	20.5	0	Negligible
PS_42a	18.4	18.6	0	negligible	22.7	22.8	0	Negligible
PS_42d	14.0	14.1	0	negligible	17.8	17.9	0	Negligible
PS_61a	12.2	12.3	0	negligible	14.2	14.3	0	Negligible
PS_62a	16.5	16.6	0	negligible	21.0	21.1	0	Negligible
PS_64b	18.6	18.7	0	negligible	22.0	22.1	0	Negligible

Table C – Predicted NO_2 Concentrations in 2036 – 100% Development Traffic								
Receptor	Original Results				Revised Results			
	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor
02b	13.1	13.6	1	negligible	13.8	14.2	1	Negligible
03a	21.6	21.8	0	negligible	28.1	28.3	0	Negligible
03b	15.4	15.5	0	negligible	19.4	19.6	0	Negligible
08a	16.8	17.3	1	negligible	19.2	19.7	1	Negligible
08c	14.4	15.1	2	negligible	16.2	16.9	2	Negligible
09b	14.7	15.4	2	negligible	11.0	11.3	1	Negligible
10b	12.6	13.0	1	negligible	16.6	16.8	1	Negligible
12a	14.1	15.0	2	negligible	15.1	15.5	1	Negligible
13b	15.6	17.1	4	negligible	16.5	17.7	3	Negligible
15a	14.3	14.5	0	negligible	17.7	17.9	0	Negligible
16a	15.2	15.5	1	negligible	13.9	14.0	0	Negligible
19a	18.1	19.2	3	negligible	18.4	19.3	2	Negligible
19b	15.2	15.9	2	negligible	14.7	15.0	1	Negligible
19c	15.3	16.0	2	negligible	14.1	14.5	1	Negligible
20b	11.7	11.8	0	negligible	12.3	12.4	0	Negligible

Table C – Predicted NO_2 Concentrations in 2036 – 100% Development Traffic								
Receptor	**Original Results**				**Revised Results**			
	2036 Baseline	**2036 With Development**	**Development Contribution (%)**	**Impact Descriptor**	**2036 Baseline**	**2036 With Development**	**Development Contribution (%)**	**Impact Descriptor**
22a	12.4	12.5	0	negligible	12.9	13.0	0	Negligible
22b	12.1	12.2	0	negligible	13.3	13.4	0	Negligible
24a	16.5	17.3	2	negligible	20.2	20.7	1	Negligible
24b	19.6	20.2	2	negligible	15.0	15.6	1	Negligible
31a	9.6	9.7	0	negligible	12.5	12.5	0	Negligible
32c	16.7	16.9	0	negligible	19.1	19.3	1	Negligible
33b	12.4	12.9	1	negligible	10.6	11.0	1	Negligible
35b	6.8	6.8	0	negligible	15.0	15.0	0	Negligible
41a	24.7	24.9	1	negligible	27.9	28.1	1	Negligible
42b	15.9	16.0	0	negligible	21.8	21.9	0	Negligible
42c	19.4	19.8	1	negligible	26.0	26.2	1	Negligible
43a	20.1	20.6	1	negligible	21.6	22.0	1	Negligible
43b	18.6	19.0	1	negligible	17.2	17.5	1	Negligible
44a	18.6	18.8	1	negligible	18.1	18.3	1	Negligible
45a	13.1	13.1	0	negligible	15.4	15.4	0	Negligible

Table D – Predicted PM_{10} Concentrations in 2021– 25% Development Traffic								
Receptor	Original Results				Revised Results			
	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor	2021 Baseline	2021` With Development	Development Contribution (%)	Impact Descriptor
PS_PE	23.2	23.2	0	negligible	18.1	18.1	0	Negligible
PS_HA2+08b	16.1	16.2	0	negligible	16.4	16.5	0	Negligible
PS_HA5	#N/A	#N/A	#N/A	#N/A	16.5	16.6	0	Negligible
PS_HA6	#N/A	#N/A	#N/A	#N/A	16.6	16.7	0	Negligible
PS_SA2+38a	16.9	17.0	0	negligible	17.3	17.4	0	Negligible
PS_SA5	16.9	16.9	0	negligible	17.0	17.0	0	Negligible
PS_SA6+38b	16.9	16.9	0	negligible	17.0	17.1	0	Negligible
PS_ES4	22.7	22.8	0	negligible	17.7	17.8	0	Negligible
PS_ES6	22.9	23.0	0	negligible	18.0	18.0	0	Negligible
PS_02a	15.0	15.0	0	negligible	14.8	14.8	0	Negligible
PS_04a	17.8	17.9	0	negligible	18.0	18.1	0	Negligible
PS_05a	17.0	17.6	2	negligible	16.7	17.2	1	Negligible
PS_06a	17.2	17.4	0	negligible	17.6	17.8	1	Negligible
PS_09a	16.8	17.2	1	negligible	16.7	17.1	1	Negligible
PS_10a	16.6	16.7	0	negligible	15.8	15.9	0	Negligible

Table D – Predicted PM_{10} Concentrations in 2021– 25% Development Traffic								
Receptor	Original Results				Revised Results			
	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor	2021 Baseline	2021` With Development	Development Contribution (%)	Impact Descriptor
PS_13a	15.6	15.9	1	negligible	16.8	17.2	1	Negligible
PS_14a	17.0	17.5	1	negligible	16.1	16.4	1	Negligible
PS_14b	14.1	14.4	1	negligible	14.0	14.2	1	Negligible
PS_15b	14.3	14.3	0	negligible	14.1	14.1	0	Negligible
PS_15c	19.1	19.2	0	negligible	18.3	18.3	0	Negligible
PS_17a	15.4	15.6	0	negligible	15.6	15.8	1	Negligible
PS_17b	14.9	15.1	0	negligible	15.0	15.1	0	Negligible
PS_18a	12.9	12.9	0	negligible	12.6	12.7	0	Negligible
PS_20a	14.2	14.2	0	negligible	14.3	14.4	0	Negligible
PS_21a	13.9	13.9	0	negligible	13.9	13.9	0	Negligible
PS_21b	14.2	14.2	0	negligible	14.0	14.0	0	Negligible
PS_23a	14.0	14.1	0	negligible	14.0	14.0	0	Negligible
PS_23b	13.1	13.1	0	negligible	12.9	12.9	0	Negligible
PS_29a	12.8	12.8	0	negligible	12.6	12.6	0	Negligible
PS_29b	12.1	12.1	0	negligible	12.0	12.0	0	Negligible

Table D – Predicted PM_{10} Concentrations in 2021– 25% Development Traffic								
Receptor	Original Results				Revised Results			
	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor	2021 Baseline	2021` With Development	Development Contribution (%)	Impact Descriptor
PS_30a	13.0	13.0	0	negligible	12.8	12.8	0	Negligible
PS_30b	13.0	13.0	0	negligible	12.7	12.7	0	Negligible
PS_31b	13.0	13.0	0	negligible	13.0	13.0	0	Negligible
PS_32a	14.7	14.7	0	negligible	14.6	14.6	0	Negligible
PS_32b	14.3	14.4	0	negligible	14.5	14.5	0	Negligible
PS_33a	14.9	14.9	0	negligible	14.9	14.9	0	Negligible
PS_34a	15.0	15.0	0	negligible	15.0	15.1	0	Negligible
PS_34b	14.3	14.3	0	negligible	14.4	14.4	0	Negligible
PS_40b	22.3	22.3	0	negligible	18.0	18.0	0	Negligible
PS_40c	18.8	18.8	0	negligible	18.5	18.5	0	Negligible
PS_42a	21.2	21.3	0	negligible	17.6	17.6	0	Negligible
PS_42d	17.4	17.4	0	negligible	17.1	17.1	0	Negligible
PS_61a	15.3	15.4	0	negligible	15.4	15.4	0	Negligible
PS_62a	19.0	19.0	0	negligible	18.5	18.5	0	Negligible
PS_64b	18.1	18.1	0	negligible	17.4	17.4	0	Negligible

Table D – Predicted PM_{10} Concentrations in 2021– 25% Development Traffic								
Receptor	Original Results				Revised Results			
	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor	2021 Baseline	2021` With Development	Development Contribution (%)	Impact Descriptor
02b	15.1	15.2	0	negligible	14.9	15.0	0	Negligible
03a	22.3	22.4	0	negligible	17.1	17.1	0	Negligible
03b	17.9	18.0	0	negligible	16.3	16.3	0	Negligible
08a	17.1	17.2	0	negligible	16.9	17.0	0	Negligible
08c	17.1	17.2	0	negligible	17.4	17.6	0	Negligible
09b	16.6	17.0	1	negligible	16.4	16.8	1	Negligible
10b	15.6	15.7	0	negligible	14.5	14.5	0	Negligible
12a	14.6	14.7	0	negligible	14.6	14.8	0	Negligible
13b	15.8	16.2	1	negligible	15.9	16.3	1	Negligible
15a	15.1	15.2	0	negligible	14.8	14.8	0	Negligible
16a	14.3	14.5	0	negligible	13.9	14.1	0	Negligible
19a	16.9	17.3	1	negligible	16.7	17.1	1	Negligible
19b	15.4	15.6	1	negligible	14.8	15.0	0	Negligible
19c	15.4	15.7	1	negligible	15.0	15.2	0	Negligible
20b	13.7	13.7	0	negligible	13.6	13.6	0	Negligible

Table D – Predicted PM_{10} Concentrations in 2021– 25% Development Traffic								
Receptor	Original Results				Revised Results			
	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor	2021 Baseline	2021` With Development	Development Contribution (%)	Impact Descriptor
22a	14.0	14.0	0	negligible	13.9	14.0	0	Negligible
22b	13.9	13.9	0	negligible	13.9	13.9	0	Negligible
24a	16.3	16.6	1	negligible	15.8	16.1	1	Negligible
24b	18.4	18.7	1	negligible	18.4	18.7	1	Negligible
31a	13.2	13.2	0	negligible	13.1	13.1	0	Negligible
32c	19.1	19.1	0	negligible	18.0	18.0	0	Negligible
33b	14.8	14.8	0	negligible	14.5	14.5	0	Negligible
35b	11.6	11.6	0	negligible	11.5	11.5	0	Negligible
41a	24.1	24.2	0	negligible	18.7	18.7	0	Negligible
42b	18.3	18.3	0	negligible	17.3	17.4	0	Negligible
42c	20.9	20.9	0	negligible	18.8	18.9	0	Negligible
43a	21.2	21.3	0	negligible	18.8	18.9	0	Negligible
43b	20.2	20.3	0	negligible	18.8	18.9	0	Negligible
44a	22.3	22.3	0	negligible	21.3	21.3	0	Negligible
45a	17.2	17.2	0	negligible	17.2	17.2	0	Negligible

Table E – Predicted PM_{10} Concentrations in 2028 – 50% Development Traffic								
Receptor	Original Results				Revised Results			
	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor
PS_PE	22.6	22.8	0	negligible	17.7	17.8	0	Negligible
PS_HA2+08b	15.9	16.1	1	negligible	16.1	16.4	1	Negligible
PS_HA5	#N/A	#N/A	#N/A	#N/A	16.2	16.5	1	Negligible
PS_HA6	#N/A	#N/A	#N/A	#N/A	16.2	16.5	1	Negligible
PS_SA2+38a	16.7	16.7	0	negligible	17.1	17.1	0	Negligible
PS_SA5	16.7	16.7	0	negligible	16.7	16.8	0	Negligible
PS_SA6+38b	16.7	16.7	0	negligible	16.8	16.8	0	Negligible
PS_ES4	22.4	22.5	0	negligible	17.5	17.6	0	Negligible
PS_ES6	22.6	22.7	0	negligible	17.8	17.8	0	Negligible
PS_02a	14.7	14.8	0	negligible	14.5	14.6	0	Negligible
PS_04a	17.5	17.6	0	negligible	17.7	17.8	0	Negligible
PS_05a	16.7	18.0	3	negligible	16.4	17.4	3	Negligible
PS_06a	16.9	17.4	1	negligible	17.2	17.8	2	Negligible
PS_09a	16.5	16.8	1	negligible	16.4	16.7	1	Negligible
PS_10a	16.3	16.5	1	negligible	15.5	15.7	0	Negligible

Table E – Predicted PM_{10} Concentrations in 2028 – 50% Development Traffic								
Receptor	Original Results				Revised Results			
	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor
PS_13a	15.3	15.8	1	negligible	16.5	17.0	1	Negligible
PS_14a	16.7	18.0	3	negligible	15.9	16.5	2	Negligible
PS_14b	13.8	14.5	2	negligible	13.6	14.2	1	Negligible
PS_15b	14.0	14.1	0	negligible	13.9	13.9	0	Negligible
PS_15c	18.8	19.0	0	negligible	17.9	18.1	0	Negligible
PS_17a	15.1	15.3	0	negligible	15.3	15.5	1	Negligible
PS_17b	14.7	14.7	0	negligible	14.7	14.8	0	Negligible
PS_18a	12.6	12.7	0	negligible	12.4	12.5	0	Negligible
PS_20a	13.9	14.0	0	negligible	14.1	14.1	0	Negligible
PS_21a	13.6	13.6	0	negligible	13.6	13.7	0	Negligible
PS_21b	14.0	14.0	0	negligible	13.7	13.8	0	Negligible
PS_23a	13.8	13.9	0	negligible	13.8	13.8	0	Negligible
PS_23b	12.9	12.9	0	negligible	12.8	12.8	0	Negligible
PS_29a	12.6	12.6	0	negligible	12.4	12.4	0	Negligible
PS_29b	11.9	11.9	0	negligible	11.8	11.8	0	Negligible

Table E – Predicted PM_{10} Concentrations in 2028 – 50% Development Traffic								
Receptor	Original Results				Revised Results			
	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor
PS_30a	12.8	12.8	0	negligible	12.6	12.6	0	Negligible
PS_30b	12.8	12.8	0	negligible	12.5	12.5	0	Negligible
PS_31b	12.8	12.8	0	negligible	12.8	12.8	0	Negligible
PS_32a	14.5	14.5	0	negligible	14.3	14.4	0	Negligible
PS_32b	14.1	14.2	0	negligible	14.2	14.3	0	Negligible
PS_33a	14.6	14.8	0	negligible	14.6	14.7	0	Negligible
PS_34a	14.7	14.9	1	negligible	14.7	14.9	1	Negligible
PS_34b	14.0	14.2	0	negligible	14.1	14.3	0	Negligible
PS_40b	21.9	22.0	0	negligible	17.8	17.8	0	Negligible
PS_40c	18.5	18.6	0	negligible	18.2	18.3	0	Negligible
PS_42a	20.8	20.9	0	negligible	17.2	17.2	0	Negligible
PS_42d	17.1	17.1	0	negligible	16.8	16.8	0	Negligible
PS_61a	15.1	15.1	0	negligible	15.1	15.2	0	Negligible
PS_62a	18.7	18.8	0	negligible	18.2	18.3	0	Negligible
PS_64b	17.9	17.9	0	negligible	17.1	17.2	0	Negligible

Table E – Predicted PM_{10} Concentrations in 2028 – 50% Development Traffic								
Receptor	Original Results				Revised Results			
	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor
02b	14.8	15.1	1	negligible	14.6	14.8	1	Negligible
03a	21.8	21.9	0	negligible	14.3	14.3	0	Negligible
03b	17.6	17.7	0	negligible	14.3	14.3	0	Negligible
08a	16.8	17.1	1	negligible	16.6	16.9	1	Negligible
08c	16.8	17.1	1	negligible	17.1	17.5	1	Negligible
09b	16.3	16.5	1	negligible	16.1	16.3	1	Negligible
10b	15.3	15.6	1	negligible	14.2	14.4	1	Negligible
12a	14.3	14.6	1	negligible	14.4	14.6	1	Negligible
13b	15.5	16.3	2	negligible	15.6	16.4	2	Negligible
15a	14.9	15.0	0	negligible	14.5	14.6	0	Negligible
16a	14.0	14.0	0	negligible	13.6	13.6	0	Negligible
19a	16.5	17.1	1	negligible	16.4	16.9	1	Negligible
19b	15.1	15.4	1	negligible	14.6	14.8	0	Negligible
19c	15.2	15.5	1	negligible	14.8	15.0	1	Negligible
20b	13.5	13.5	0	negligible	13.4	13.4	0	Negligible

Table E – Predicted PM_{10} Concentrations in 2028 – 50% Development Traffic								
Receptor	Original Results				Revised Results			
	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor
22a	13.8	13.8	0	negligible	13.7	13.8	0	Negligible
22b	13.6	13.7	0	negligible	13.7	13.7	0	Negligible
24a	16.0	16.5	1	negligible	15.5	15.9	1	Negligible
24b	18.2	18.6	1	negligible	18.2	18.5	1	Negligible
31a	12.9	13.0	0	negligible	12.8	12.8	0	Negligible
32c	18.7	18.8	0	negligible	17.6	17.6	0	Negligible
33b	14.5	14.7	0	negligible	14.2	14.4	0	Negligible
35b	11.4	11.4	0	negligible	11.3	11.3	0	Negligible
41a	23.7	23.9	1	negligible	18.5	18.6	0	Negligible
42b	17.9	18.0	0	negligible	17.0	17.0	0	Negligible
42c	20.5	20.6	0	negligible	18.4	18.5	0	Negligible
43a	20.8	21.1	1	negligible	18.4	18.6	0	Negligible
43b	19.9	20.1	1	negligible	18.4	18.6	0	Negligible
44a	22.2	22.4	0	negligible	21.1	21.2	0	Negligible
45a	17.0	17.0	0	negligible	17.0	17.0	0	Negligible

Table F – Predicted PM_{10} Concentrations in 2036 – 100% Development Traffic								
Receptor	Original Results				Revised Results			
	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor
PS_PE	22.6	22.8	0	negligible	17.7	17.8	0	Negligible
PS_HA2+08b	15.8	16.2	1	negligible	16.1	16.4	1	Negligible
PS_HA5	#N/A	#N/A	#N/A	#N/A	16.2	16.5	1	Negligible
PS_HA6	#N/A	#N/A	#N/A	#N/A	16.2	16.6	1	Negligible
PS_SA2+38a	16.7	16.7	0	negligible	17.1	17.1	0	Negligible
PS_SA5	16.7	16.7	0	negligible	16.7	16.8	0	Negligible
PS_SA6+38b	16.7	16.7	0	negligible	16.8	16.8	0	Negligible
PS_ES4	22.4	22.6	1	negligible	17.5	17.6	0	Negligible
PS_ES6	22.5	22.8	1	negligible	17.8	17.8	0	Negligible
PS_02a	14.7	14.9	1	negligible	14.4	14.6	0	Negligible
PS_04a	17.4	17.6	1	negligible	17.6	17.8	1	Negligible
PS_05a	16.7	18.4	4	negligible	16.4	17.8	4	Negligible
PS_06a	16.9	17.6	2	negligible	17.2	18.0	2	Negligible
PS_09a	16.5	16.9	1	negligible	16.3	16.8	1	Negligible
PS_10a	16.3	16.6	1	negligible	15.5	15.7	1	Negligible

Table F – Predicted PM_{10} Concentrations in 2036 – 100% Development Traffic								
Receptor	Original Results				Revised Results			
	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor
PS_13a	15.3	15.9	2	negligible	16.5	17.1	1	Negligible
PS_14a	16.7	18.4	4	negligible	15.8	16.7	2	Negligible
PS_14b	13.7	14.6	2	negligible	13.6	14.3	2	Negligible
PS_15b	14.0	14.1	0	negligible	13.9	13.9	0	Negligible
PS_15c	18.8	19.0	1	negligible	17.9	18.1	0	Negligible
PS_17a	15.1	15.3	1	negligible	15.3	15.6	1	Negligible
PS_17b	14.7	14.7	0	negligible	14.7	14.8	0	Negligible
PS_18a	12.6	12.7	0	negligible	12.4	12.4	0	Negligible
PS_20a	13.9	14.0	0	negligible	14.1	14.1	0	Negligible
PS_21a	13.6	13.6	0	negligible	13.6	13.6	0	Negligible
PS_21b	13.9	14.0	0	negligible	13.7	13.8	0	Negligible
PS_23a	13.8	13.8	0	negligible	13.8	13.8	0	Negligible
PS_23b	12.8	12.9	0	negligible	12.7	12.7	0	Negligible
PS_29a	12.6	12.6	0	negligible	12.3	12.4	0	Negligible
PS_29b	11.8	11.8	0	negligible	11.8	11.8	0	Negligible

Table F – Predicted PM_{10} Concentrations in 2036 – 100% Development Traffic								
Receptor	Original Results				Revised Results			
	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor
PS_30a	12.8	12.8	0	negligible	12.5	12.6	0	Negligible
PS_30b	12.8	12.8	0	negligible	12.5	12.5	0	Negligible
PS_31b	12.7	12.7	0	negligible	12.7	12.7	0	Negligible
PS_32a	14.4	14.5	0	negligible	14.3	14.4	0	Negligible
PS_32b	14.1	14.2	0	negligible	14.2	14.3	0	Negligible
PS_33a	14.6	14.8	1	negligible	14.6	14.8	1	Negligible
PS_34a	14.7	14.9	1	negligible	14.7	15.0	1	Negligible
PS_34b	14.0	14.2	1	negligible	14.1	14.3	1	Negligible
PS_40b	21.9	22.1	0	negligible	17.8	17.8	0	Negligible
PS_40c	18.5	18.6	0	negligible	18.2	18.3	0	Negligible
PS_42a	20.7	20.8	0	negligible	17.2	17.2	0	Negligible
PS_42d	17.0	17.1	0	negligible	16.7	16.8	0	Negligible
PS_61a	15.1	15.1	0	negligible	15.1	15.2	0	Negligible
PS_62a	18.7	18.8	0	negligible	18.2	18.3	0	Negligible
PS_64b	17.9	17.9	0	negligible	17.1	17.2	0	Negligible

Table F – Predicted PM_{10} Concentrations in 2036 – 100% Development Traffic								
Receptor	Original Results				Revised Results			
	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor
02b	14.8	15.1	1	negligible	14.6	14.9	1	Negligible
03a	21.8	21.9	0	negligible	14.2	14.2	0	Negligible
03b	17.6	17.6	0	negligible	14.2	14.2	0	Negligible
08a	16.7	17.2	1	negligible	16.6	17.0	1	Negligible
08c	16.7	17.2	1	negligible	17.1	17.6	1	Negligible
09b	16.2	16.6	1	negligible	16.1	16.4	1	Negligible
10b	15.2	15.6	1	negligible	14.1	14.4	1	Negligible
12a	14.3	14.6	1	negligible	14.3	14.7	1	Negligible
13b	15.5	16.5	3	negligible	15.6	16.6	3	Negligible
15a	14.9	15.0	0	negligible	14.5	14.6	0	Negligible
16a	13.9	14.0	0	negligible	13.5	13.6	0	Negligible
19a	16.5	17.3	2	negligible	16.4	17.1	2	Negligible
19b	15.1	15.5	1	negligible	14.6	14.8	1	Negligible
19c	15.1	15.6	1	negligible	14.7	15.1	1	Negligible
20b	13.5	13.5	0	negligible	13.4	13.4	0	Negligible

Table F – Predicted PM_{10} Concentrations in 2036 – 100% Development Traffic								
Receptor	Original Results				Revised Results			
	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor
22a	13.8	13.8	0	negligible	13.7	13.8	0	Negligible
22b	13.6	13.7	0	negligible	13.6	13.7	0	Negligible
24a	16.0	16.6	2	negligible	15.5	16.0	1	Negligible
24b	18.2	18.7	1	negligible	18.2	18.6	1	Negligible
31a	12.9	12.9	0	negligible	12.8	12.8	0	Negligible
32c	18.7	18.8	0	negligible	17.5	17.7	0	Negligible
33b	14.5	14.7	1	negligible	14.2	14.4	1	Negligible
35b	11.3	11.3	0	negligible	11.2	11.2	0	Negligible
41a	23.7	24.0	1	negligible	18.5	18.6	0	Negligible
42b	17.9	18.0	0	negligible	16.9	17.0	0	Negligible
42c	20.4	20.6	0	negligible	18.4	18.5	0	Negligible
43a	20.8	21.2	1	negligible	18.4	18.6	1	Negligible
43b	19.8	20.2	1	negligible	18.4	18.6	1	Negligible
44a	22.3	22.5	0	negligible	21.2	21.3	0	Negligible
45a	17.0	17.0	0	negligible	17.0	17.0	0	Negligible

Table G – Predicted $PM_{2.5}$ Concentrations in 2021 – 25% Development Traffic								
Receptor	Original Results				Revised Results			
	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor
PS_PE	10.4	10.4	0	Negligible	11.5	11.6	0	Negligible
PS_HA2+08b	#N/A	#N/A	0	Negligible	10.6	10.6	0	Negligible
PS_HA5	#N/A	#N/A	#N/A	#N/A	10.6	10.7	0	Negligible
PS_HA6	10.8	10.8	#N/A	#N/A	10.6	10.7	0	Negligible
PS_SA2+38a	10.8	10.8	0	Negligible	11.0	11.0	0	Negligible
PS_SA5	10.7	10.8	0	Negligible	10.8	10.8	0	Negligible
PS_SA6+38b	14.0	14.0	0	Negligible	10.8	10.9	0	Negligible
PS_ES4	14.1	14.1	0	Negligible	11.3	11.3	0	Negligible
PS_ES6	9.7	9.8	0	Negligible	11.5	11.5	0	Negligible
PS_02a	11.2	11.3	0	Negligible	9.7	9.7	0	Negligible
PS_04a	10.9	11.2	0	Negligible	11.4	11.4	0	Negligible
PS_05a	10.9	11.0	1	Negligible	10.8	11.0	1	Negligible
PS_06a	10.8	11.0	0	Negligible	11.2	11.4	1	Negligible
PS_09a	10.5	10.5	1	Negligible	10.7	11.0	1	Negligible
PS_10a	10.4	10.5	0	Negligible	10.1	10.1	0	Negligible

Table G – Predicted $PM_{2.5}$ Concentrations in 2021 – 25% Development Traffic								
Receptor	Original Results				Revised Results			
	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor
PS_13a	10.9	11.1	1	Negligible	11.1	11.3	1	Negligible
PS_14a	9.4	9.6	1	Negligible	10.4	10.6	1	Negligible
PS_14b	9.6	9.6	1	Negligible	9.4	9.5	0	Negligible
PS_15b	12.0	12.0	0	Negligible	9.6	9.6	0	Negligible
PS_15c	10.3	10.4	0	Negligible	11.7	11.7	0	Negligible
PS_17a	10.0	10.1	0	Negligible	10.4	10.5	0	Negligible
PS_17b	8.6	8.6	0	Negligible	10.0	10.1	0	Negligible
PS_18a	9.5	9.5	0	Negligible	8.5	8.5	0	Negligible
PS_20a	9.4	9.4	0	Negligible	9.6	9.6	0	Negligible
PS_21a	9.3	9.3	0	Negligible	9.4	9.4	0	Negligible
PS_21b	9.2	9.2	0	Negligible	9.2	9.2	0	Negligible
PS_23a	8.7	8.7	0	Negligible	9.2	9.2	0	Negligible
PS_23b	8.7	8.7	0	Negligible	8.6	8.7	0	Negligible
PS_29a	8.0	8.0	0	Negligible	8.6	8.6	0	Negligible
PS_29b	8.8	8.8	0	Negligible	8.0	8.0	0	Negligible

Table G – Predicted $PM_{2.5}$ Concentrations in 2021 – 25% Development Traffic								
Receptor	Original Results				Revised Results			
	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor
PS_30a	8.8	8.8	0	Negligible	8.7	8.7	0	Negligible
PS_30b	8.8	8.8	0	Negligible	8.6	8.6	0	Negligible
PS_31b	9.8	9.8	0	Negligible	8.8	8.8	0	Negligible
PS_32a	9.6	9.6	0	Negligible	9.8	9.8	0	Negligible
PS_32b	9.9	9.9	0	Negligible	9.7	9.7	0	Negligible
PS_33a	9.7	9.8	0	Negligible	9.9	9.9	0	Negligible
PS_34a	9.3	9.4	0	Negligible	9.8	9.8	0	Negligible
PS_34b	13.7	13.7	0	Negligible	9.4	9.5	0	Negligible
PS_40b	11.7	11.8	0	Negligible	11.4	11.4	0	Negligible
PS_40c	13.1	13.1	0	Negligible	11.7	11.8	0	Negligible
PS_42a	11.0	11.0	0	Negligible	11.3	11.3	0	Negligible
PS_42d	9.9	10.0	0	Negligible	10.9	11.0	0	Negligible
PS_61a	11.9	11.9	0	Negligible	10.0	10.0	0	Negligible
PS_62a	11.5	11.5	0	Negligible	11.8	11.8	0	Negligible
PS_64b	10.0	10.1	0	Negligible	11.2	11.3	0	Negligible

Table G – Predicted $PM_{2.5}$ Concentrations in 2021 – 25% Development Traffic								
Receptor	Original Results				Revised Results			
	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor
02b	13.7	13.7	0	Negligible	9.9	10.0	0	Negligible
03a	11.3	11.3	0	Negligible	11.0	11.0	0	Negligible
03b	10.9	11.0	0	Negligible	10.5	10.5	0	Negligible
08a	10.8	10.9	0	Negligible	10.9	11.0	0	Negligible
08c	10.7	10.9	0	Negligible	11.1	11.2	0	Negligible
09b	10.0	10.0	1	Negligible	10.6	10.8	1	Negligible
10b	9.6	9.7	0	Negligible	9.4	9.4	0	Negligible
12a	10.5	10.7	0	Negligible	9.7	9.8	0	Negligible
13b	10.1	10.1	1	Negligible	10.6	10.8	1	Negligible
15a	9.5	9.6	0	Negligible	10.0	10.0	0	Negligible
16a	11.0	11.2	0	Negligible	9.3	9.4	0	Negligible
19a	10.2	10.3	1	Negligible	10.9	11.1	1	Negligible
19b	10.2	10.3	0	Negligible	9.9	10.0	0	Negligible
19c	9.1	9.1	0	Negligible	10.0	10.1	0	Negligible
20b	9.3	9.3	0	Negligible	9.1	9.1	0	Negligible

Table G – Predicted $PM_{2.5}$ Concentrations in 2021 – 25% Development Traffic								
Receptor	Original Results				Revised Results			
	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor
22a	9.2	9.2	0	Negligible	9.3	9.3	0	Negligible
22b	10.5	10.7	0	Negligible	9.3	9.3	0	Negligible
24a	11.7	11.8	1	Negligible	10.3	10.4	1	Negligible
24b	8.9	8.9	1	Negligible	11.8	11.9	1	Negligible
31a	11.9	11.9	0	Negligible	8.8	8.8	0	Negligible
32c	9.8	9.8	0	Negligible	11.5	11.5	0	Negligible
33b	7.8	7.8	0	Negligible	9.7	9.7	0	Negligible
35b	14.7	14.8	0	Negligible	7.7	7.7	0	Negligible
41a	11.5	11.5	0	Negligible	11.9	11.9	0	Negligible
42b	12.9	12.9	0	Negligible	11.2	11.2	0	Negligible
42c	13.1	13.2	0	Negligible	12.0	12.0	0	Negligible
43a	12.6	12.7	0	Negligible	12.0	12.1	0.16	Negligible
43b	12.6	12.7	0	Negligible	12.1	12.1	0.16	Negligible
44a	11.1	11.1	0	Negligible	12.3	12.3	0	Negligible
45a	10.4	10.4	0	Negligible	11.1	11.1	0	Negligible

Table H – Predicted $PM_{2.5}$ Concentrations in 2028 – 50% Development Traffic								
Receptor	Original Results				Revised Results			
	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor
PS_PE	13.7	13.7	0	Negligible	10.6	11.2	2	Negligible
PS_HA2+08b	10.1	10.2	1	Negligible	10.2	10.4	1	Negligible
PS_HA5	#N/A	#N/A	#N/A	#N/A	10.3	10.4	1	Negligible
PS_HA6	#N/A	#N/A	#N/A	#N/A	10.3	10.5	1	Negligible
PS_SA2+38a	10.5	10.5	0	Negligible	10.7	10.7	0	Negligible
PS_SA5	10.5	10.5	0	Negligible	10.5	10.5	0	Negligible
PS_SA6+38b	10.5	10.5	0	Negligible	10.5	10.6	0	Negligible
PS_ES4	13.5	13.6	0	Negligible	11.0	11.0	0	Negligible
PS_ES6	13.6	13.7	0	Negligible	11.1	11.2	0	Negligible
PS_02a	9.5	9.5	0	Negligible	9.4	9.5	0	Negligible
PS_04a	10.9	11.0	0	Negligible	11.0	11.1	0	Negligible
PS_05a	10.6	11.3	3	Negligible	10.5	11.0	2	Negligible
PS_06a	10.6	10.9	1	Negligible	10.9	11.2	1	Negligible
PS_09a	10.5	10.7	1	Negligible	10.4	10.6	1	Negligible
PS_10a	10.2	10.3	0	Negligible	9.8	9.9	0	Negligible

Table H – Predicted $PM_{2.5}$ Concentrations in 2028 – 50% Development Traffic								
Receptor	Original Results				Revised Results			
	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor
PS_13a	10.1	10.4	1	Negligible	10.7	11.0	1	Negligible
PS_14a	10.6	11.2	3	Negligible	10.1	10.5	1	Negligible
PS_14b	9.1	9.5	1	Negligible	9.0	9.3	1	Negligible
PS_15b	9.4	9.4	0	Negligible	9.3	9.4	0	Negligible
PS_15c	11.7	11.7	0	Negligible	11.3	11.4	0	Negligible
PS_17a	10.0	10.1	0	Negligible	10.1	10.2	1	Negligible
PS_17b	9.7	9.8	0	Negligible	9.8	9.8	0	Negligible
PS_18a	8.4	8.4	0	Negligible	8.3	8.3	0	Negligible
PS_20a	9.3	9.3	0	Negligible	9.4	9.4	0	Negligible
PS_21a	9.1	9.1	0	Negligible	9.1	9.1	0	Negligible
PS_21b	9.1	9.1	0	Negligible	9.0	9.0	0	Negligible
PS_23a	9.0	9.0	0	Negligible	9.0	9.0	0	Negligible
PS_23b	8.5	8.5	0	Negligible	8.4	8.4	0	Negligible
PS_29a	8.5	8.5	0	Negligible	8.4	8.4	0	Negligible
PS_29b	7.8	7.8	0	Negligible	7.8	7.8	0	Negligible

Table H – Predicted $PM_{2.5}$ Concentrations in 2028 – 50% Development Traffic								
Receptor	Original Results				Revised Results			
	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor
PS_30a	8.6	8.6	0	Negligible	8.5	8.5	0	Negligible
PS_30b	8.6	8.6	0	Negligible	8.4	8.4	0	Negligible
PS_31b	8.6	8.6	0	Negligible	8.6	8.6	0	Negligible
PS_32a	9.5	9.6	0	Negligible	9.5	9.5	0	Negligible
PS_32b	9.3	9.4	0	Negligible	9.4	9.5	0	Negligible
PS_33a	9.6	9.7	0	Negligible	9.6	9.7	0	Negligible
PS_34a	9.4	9.6	0	Negligible	9.5	9.6	0	Negligible
PS_34b	9.1	9.2	0	Negligible	9.2	9.3	0	Negligible
PS_40b	13.3	13.3	0	Negligible	11.1	11.1	0	Negligible
PS_40c	11.4	11.4	0	Negligible	11.4	11.4	0	Negligible
PS_42a	12.7	12.7	0	Negligible	10.9	10.9	0	Negligible
PS_42d	10.7	10.7	0	Negligible	10.6	10.6	0	Negligible
PS_61a	9.7	9.7	0	Negligible	9.7	9.7	0	Negligible
PS_62a	11.6	11.6	0	Negligible	11.4	11.4	0	Negligible
PS_64b	11.2	11.3	0	Negligible	10.9	11.0	0	Negligible

Table H – Predicted $PM_{2.5}$ Concentrations in 2028 – 50% Development Traffic								
Receptor	Original Results				Revised Results			
	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor
02b	9.7	9.9	1	Negligible	9.6	9.7	0	Negligible
03a	13.2	13.3	0	Negligible	10.6	10.6	0	Negligible
03b	11.0	11.0	0	Negligible	9.8	9.9	0	Negligible
08a	10.6	10.7	1	Negligible	10.6	10.7	1	Negligible
08c	10.5	10.7	1	Negligible	10.7	10.9	1	Negligible
09b	10.4	10.5	1	Negligible	10.3	10.5	1	Negligible
10b	9.7	9.8	1	Negligible	9.1	9.2	0	Negligible
12a	9.4	9.5	0	Negligible	9.4	9.5	1	Negligible
13b	10.2	10.6	2	Negligible	10.3	10.7	2	Negligible
15a	9.8	9.9	0	Negligible	9.7	9.7	0	Negligible
16a	9.2	9.2	0	Negligible	9.0	9.0	0	Negligible
19a	10.7	11.0	1	Negligible	10.6	10.9	1	Negligible
19b	9.9	10.1	1	Negligible	9.6	9.7	0	Negligible
19c	9.9	10.1	1	Negligible	9.7	9.9	1	Negligible
20b	8.9	8.9	0	Negligible	8.9	8.9	0	Negligible

Table H – Predicted $PM_{2.5}$ Concentrations in 2028 – 50% Development Traffic								
Receptor	Original Results				Revised Results			
	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor
22a	9.1	9.1	0	Negligible	9.0	9.1	0	Negligible
22b	9.0	9.0	0	Negligible	9.0	9.1	0	Negligible
24a	10.2	10.5	1	Negligible	10.0	10.2	1	Negligible
24b	11.4	11.6	1	Negligible	11.4	11.6	1	Negligible
31a	8.7	8.7	0	Negligible	8.6	8.6	0	Negligible
32c	11.6	11.6	0	Negligible	11.1	11.1	0	Negligible
33b	9.5	9.6	0	Negligible	9.4	9.5	0	Negligible
35b	7.6	7.6	0	Negligible	7.5	7.5	0	Negligible
41a	14.2	14.3	0	Negligible	11.5	11.6	0	Negligible
42b	11.2	11.2	0	Negligible	10.8	10.8	0	Negligible
42c	12.4	12.5	0	Negligible	11.6	11.6	0	Negligible
43a	12.7	12.9	1	Negligible	11.6	11.7	0	Negligible
43b	12.2	12.3	1	Negligible	11.6	11.7	0	Negligible
44a	12.3	12.4	0	Negligible	11.9	12.0	0	Negligible
45a	10.8	10.8	0	Negligible	10.8	10.8	0	Negligible

Table I – Predicted $PM_{2.5}$ Concentrations in 2036 – 100% Development Traffic								
Receptor	**Original Results**				**Revised Results**			
	2036 Baseline	**2036 With Development**	**Development Contribution (%)**	**Impact Descriptor**	**2036 Baseline**	**2036 With Development**	**Development Contribution (%)**	**Impact Descriptor**
PS_PE	22.8	23.0	0	negligible	11.1	11.2	0	Negligible
PS_HA2+08b	13.6	13.7	0	Negligible	10.2	10.4	1	Negligible
PS_HA5	10.0	10.2	1	Negligible	10.3	10.5	1	Negligible
PS_HA6	#N/A	#N/A	#N/A	#N/A	10.3	10.5	1	Negligible
PS_SA2+38a	#N/A	#N/A	#N/A	#N/A	10.7	10.7	0	Negligible
PS_SA5	10.4	10.5	0	Negligible	10.5	10.5	0	Negligible
PS_SA6+38b	10.4	10.5	0	Negligible	10.5	10.5	0	Negligible
PS_ES4	10.4	10.4	0	Negligible	10.9	11.0	0	Negligible
PS_ES6	13.5	13.6	0	Negligible	11.1	11.1	0	Negligible
PS_02a	13.6	13.7	0	Negligible	9.4	9.5	0	Negligible
PS_04a	9.4	9.5	0	Negligible	11.0	11.1	0	Negligible
PS_05a	10.9	11.0	0	Negligible	10.4	11.2	3	Negligible
PS_06a	10.6	11.5	4	Negligible	10.8	11.3	2	Negligible
PS_09a	10.6	10.9	1	Negligible	10.4	10.7	1	Negligible
PS_10a	10.5	10.7	1	Negligible	9.8	9.9	1	Negligible

Table I – Predicted $PM_{2.5}$ Concentrations in 2036 – 100% Development Traffic								
Receptor	Original Results				Revised Results			
	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor
PS_13a	10.2	10.3	1	Negligible	10.7	11.0	1	Negligible
PS_14a	10.1	10.4	1	Negligible	10.1	10.6	2	Negligible
PS_14b	10.5	11.4	4	Negligible	9.0	9.4	2	Negligible
PS_15b	9.1	9.5	2	Negligible	9.3	9.3	0	Negligible
PS_15c	9.3	9.4	0	Negligible	11.3	11.4	0	Negligible
PS_17a	11.6	11.7	0	Negligible	10.0	10.2	1	Negligible
PS_17b	9.9	10.1	1	Negligible	9.7	9.8	0	Negligible
PS_18a	9.7	9.7	0	Negligible	8.2	8.3	0	Negligible
PS_20a	8.4	8.4	0	Negligible	9.3	9.4	0	Negligible
PS_21a	9.3	9.3	0	Negligible	9.1	9.1	0	Negligible
PS_21b	9.1	9.1	0	Negligible	8.9	8.9	0	Negligible
PS_23a	9.0	9.1	0	Negligible	9.0	9.0	0	Negligible
PS_23b	9.0	9.0	0	Negligible	8.4	8.4	0	Negligible
PS_29a	8.5	8.5	0	Negligible	8.3	8.3	0	Negligible
PS_29b	8.4	8.4	0	Negligible	7.7	7.7	0	Negligible

Table I – Predicted $PM_{2.5}$ Concentrations in 2036 – 100% Development Traffic								
Receptor	Original Results				Revised Results			
	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor
PS_30a	7.8	7.8	0	Negligible	8.4	8.4	0	Negligible
PS_30b	8.6	8.6	0	Negligible	8.4	8.4	0	Negligible
PS_31b	8.5	8.6	0	Negligible	8.5	8.5	0	Negligible
PS_32a	8.5	8.5	0	Negligible	9.5	9.5	0	Negligible
PS_32b	9.5	9.6	0	Negligible	9.4	9.5	0	Negligible
PS_33a	9.3	9.4	0	Negligible	9.6	9.7	0	Negligible
PS_34a	9.6	9.7	0	Negligible	9.4	9.6	1	Negligible
PS_34b	9.4	9.6	1	Negligible	9.1	9.3	1	Negligible
PS_40b	9.1	9.2	0	Negligible	11.1	11.1	0	Negligible
PS_40c	13.2	13.3	0	Negligible	11.3	11.4	0	Negligible
PS_42a	11.4	11.4	0	Negligible	10.9	10.9	0	Negligible
PS_42d	12.6	12.7	0	Negligible	10.6	10.6	0	Negligible
PS_61a	10.6	10.7	0	Negligible	9.7	9.7	0	Negligible
PS_62a	9.7	9.7	0	Negligible	11.4	11.4	0	Negligible
PS_64b	11.5	11.6	0	Negligible	10.9	10.9	0	Negligible

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Table I – Predicted $PM_{2.5}$ Concentrations in 2036 – 100% Development Traffic								
Receptor	Original Results				Revised Results			
	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor
02b	11.2	11.2	0	Negligible	9.6	9.7	1	Negligible
03a	9.7	9.9	1	Negligible	10.6	10.6	0	Negligible
03b	13.2	13.3	0	Negligible	9.8	9.8	0	Negligible
08a	10.9	11.0	0	Negligible	10.5	10.7	1	Negligible
08c	10.6	10.8	1	Negligible	10.7	10.9	1	Negligible
09b	10.5	10.7	1	Negligible	10.3	10.5	1	Negligible
10b	10.4	10.5	1	Negligible	9.0	9.2	1	Negligible
12a	9.6	9.8	1	Negligible	9.4	9.6	1	Negligible
13b	9.3	9.5	1	Negligible	10.2	10.8	2	Negligible
15a	10.2	10.7	2	Negligible	9.6	9.7	0	Negligible
16a	9.8	9.9	0	Negligible	9.0	9.0	0	Negligible
19a	9.2	9.2	0	Negligible	10.6	11.0	1	Negligible
19b	10.7	11.1	2	Negligible	9.6	9.7	1	Negligible
19c	9.9	10.1	1	Negligible	9.7	9.9	1	Negligible
20b	9.9	10.1	1	Negligible	8.9	8.9	0	Negligible

Table I – Predicted $PM_{2.5}$ Concentrations in 2036 – 100% Development Traffic								
Receptor	Original Results				Revised Results			
	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor
22a	8.9	8.9	0	Negligible	9.0	9.1	0	Negligible
22b	9.0	9.1	0	Negligible	9.0	9.0	0	Negligible
24a	9.0	9.0	0	Negligible	10.0	10.2	1	Negligible
24b	10.2	10.5	1	Negligible	11.4	11.7	1	Negligible
31a	11.4	11.6	1	Negligible	8.6	8.6	0	Negligible
32c	8.6	8.6	0	Negligible	11.0	11.1	0	Negligible
33b	11.5	11.6	0	Negligible	9.4	9.5	0	Negligible
35b	9.5	9.6	1	Negligible	7.5	7.5	0	Negligible
41a	7.5	7.5	0	Negligible	11.5	11.6	0	Negligible
42b	14.2	14.3	1	Negligible	10.8	10.8	0	Negligible
42c	11.1	11.2	0	Negligible	11.5	11.6	0	Negligible
43a	12.4	12.5	0	Negligible	11.6	11.7	1	Negligible
43b	12.7	12.9	1	Negligible	11.6	11.7	1	Negligible
44a	12.2	12.4	1	Negligible	11.9	12.0	0	Negligible
45a	12.3	12.3	0	Negligible	10.7	10.8	0	Negligible

Table J – Predicted Number of days PM_{10} Concentrations>50µg/m^3 in 2021 – 25% Development Traffic								
Receptor	Original Results				Revised Results			
	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor
PS_PE	8	9	0	negligible	1	1	0	Negligible
PS_HA2+08b	0	0	0	negligible	0	1	0	Negligible
PS_HA5	#N/A	#N/A	#N/A	#N/A	1	1	0	Negligible
PS_HA6	#N/A	#N/A	#N/A	#N/A	1	1	0	Negligible
PS_SA2+38a	1	1	0	negligible	1	1	0	Negligible
PS_SA5	1	1	0	negligible	1	1	0	Negligible
PS_SA6+38b	1	1	0	negligible	1	1	0	Negligible
PS_ES4	8	8	0	negligible	1	1	0	Negligible
PS_ES6	8	8	0	negligible	1	1	0	Negligible
PS_02a	0	0	0	negligible	0	0	0	Negligible
PS_04a	1	1	0	negligible	1	1	0	Negligible
PS_05a	1	1	0	negligible	1	1	0	Negligible
PS_06a	1	1	0	negligible	1	1	0	Negligible
PS_09a	1	1	0	negligible	1	1	0	Negligible
PS_10a	1	1	0	negligible	0	0	0	Negligible

Table J – Predicted Number of days PM_{10} Concentrations>50µg/m^3 in 2021 – 25% Development Traffic								
Receptor	Original Results				Revised Results			
	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor
PS_13a	0	0	0	negligible	1	1	0	Negligible
PS_14a	1	1	0	negligible	0	0	0	Negligible
PS_14b	0	0	0	negligible	0	0	0	Negligible
PS_15b	0	0	0	negligible	0	0	0	Negligible
PS_15c	2	2	0	negligible	2	2	0	Negligible
PS_17a	0	0	0	negligible	0	0	0	Negligible
PS_17b	0	0	0	negligible	0	0	0	Negligible
PS_18a	1	1	0	negligible	1	1	0	Negligible
PS_20a	0	0	0	negligible	0	0	0	Negligible
PS_21a	0	0	0	negligible	0	0	0	Negligible
PS_21b	0	0	0	negligible	0	0	0	Negligible
PS_23a	0	0	0	negligible	0	0	0	Negligible
PS_23b	1	1	0	negligible	1	1	0	Negligible
PS_29a	1	1	0	negligible	1	1	0	Negligible
PS_29b	1	1	0	negligible	1	1	0	Negligible

Table J – Predicted Number of days PM_{10} Concentrations>50µg/m^3 in 2021 – 25% Development Traffic								
Receptor	Original Results				Revised Results			
	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor
PS_30a	1	1	0	negligible	1	1	0	Negligible
PS_30b	1	1	0	negligible	1	1	0	Negligible
PS_31b	1	1	0	negligible	1	1	0	Negligible
PS_32a	0	0	0	negligible	0	0	0	Negligible
PS_32b	0	0	0	negligible	0	0	0	Negligible
PS_33a	0	0	0	negligible	0	0	0	Negligible
PS_34a	0	0	0	negligible	0	0	0	Negligible
PS_34b	0	0	0	negligible	0	0	0	Negligible
PS_40b	7	7	0	negligible	1	1	0	Negligible
PS_40c	2	2	0	negligible	2	2	0	Negligible
PS_42a	5	5	0	negligible	2	2	0	Negligible
PS_42d	1	1	0	negligible	1	1	0	Negligible
PS_61a	0	0	0	negligible	0	0	0	Negligible
PS_62a	2	2	0	negligible	2	2	0	Negligible
PS_64b	1	2	0	negligible	1	1	0	Negligible

Table J – Predicted Number of days PM_{10} Concentrations>50µg/m^3 in 2021 – 25% Development Traffic								
Receptor	Original Results				Revised Results			
	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor
02b	0	0	0	negligible	0	0	0	Negligible
03a	7	7	0	negligible	3	3	0	Negligible
03b	1	1	0	negligible	1	1	0	Negligible
08a	1	1	0	negligible	1	1	0	Negligible
08c	1	1	0	negligible	1	1	0	Negligible
09b	1	1	0	negligible	0	1	0	Negligible
10b	0	0	0	negligible	0	0	0	Negligible
12a	0	0	0	negligible	0	0	0	Negligible
13b	0	0	0	negligible	0	0	0	Negligible
15a	0	0	0	negligible	0	0	0	Negligible
16a	0	0	0	negligible	0	0	0	Negligible
19a	1	1	0	negligible	1	1	0	Negligible
19b	0	0	0	negligible	0	0	0	Negligible
19c	0	0	0	negligible	0	0	0	Negligible
20b	0	0	0	negligible	0	0	0	Negligible

Table J – Predicted Number of days PM_{10} Concentrations>50µg/m^3 in 2021 – 25% Development Traffic								
Receptor	Original Results				Revised Results			
	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor	2021 Baseline	2021 With Development	Development Contribution (%)	Impact Descriptor
22a	0	0	0	negligible	0	0	0	Negligible
22b	0	0	0	negligible	0	0	0	Negligible
24a	0	1	0	negligible	0	0	0	Negligible
24b	2	2	0	negligible	2	2	0	Negligible
31a	0	0	0	negligible	0	0	0	Negligible
32c	2	2	0	negligible	1	1	0	Negligible
33b	0	0	0	negligible	0	0	0	Negligible
35b	2	2	0	negligible	2	2	0	Negligible
41a	10	11	0	negligible	4	4	0	Negligible
42b	2	2	0	negligible	1	1	0	Negligible
42c	5	5	0	negligible	2	2	0	Negligible
43a	5	5	0	negligible	2	2	0	Negligible
43b	4	4	0	negligible	2	2	0	Negligible
44a	7	7	0	negligible	5	5	0	Negligible
45a	1	1	0	negligible	1	1	0	Negligible

Table K – Predicted Number of days PM_{10} Concentrations>50µg/m^3 in 2028 – 50% Development Traffic								
Receptor	Original Results				Revised Results			
	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor
PS_PE	7	8	0	negligible	1	1	1	Negligible
PS_HA2+08b	0	0	0	negligible	0	0	0	Negligible
PS_HA5	#N/A	#N/A	#N/A	#N/A	0	0	0	Negligible
PS_HA6	#N/A	#N/A	#N/A	#N/A	0	1	0	Negligible
PS_SA2+38a	1	1	0	negligible	0	1	0	Negligible
PS_SA5	1	1	0	negligible	0	1	0	Negligible
PS_SA6+38b	1	1	0	negligible	0	1	0	Negligible
PS_ES4	7	7	0	negligible	1	1	0	Negligible
PS_ES6	7	8	0	negligible	1	1	0	Negligible
PS_02a	0	0	0	negligible	0	0	0	Negligible
PS_04a	1	1	0	negligible	1	1	1	Negligible
PS_05a	1	1	1	negligible	0	1	1	Negligible
PS_06a	1	1	0	negligible	0	1	1	Negligible
PS_09a	1	1	0	negligible	0	1	0	Negligible
PS_10a	0	1	0	negligible	0	0	0	Negligible

Table K – Predicted Number of days PM_{10} Concentrations>50µg/m^3 in 2028 – 50% Development Traffic								
Receptor	Original Results				Revised Results			
	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor
PS_13a	0	0	0	negligible	0	1	0	Negligible
PS_14a	1	1	1	negligible	0	1	0	Negligible
PS_14b	0	0	0	negligible	0	0	0	Negligible
PS_15b	0	0	0	negligible	0	0	0	Negligible
PS_15c	2	2	0	negligible	1	1	1	Negligible
PS_17a	0	0	0	negligible	0	0	0	Negligible
PS_17b	0	0	0	negligible	0	0	0	Negligible
PS_18a	1	1	0	negligible	1	1	0	Negligible
PS_20a	0	0	0	negligible	0	0	0	Negligible
PS_21a	0	0	0	negligible	0	0	0	Negligible
PS_21b	0	0	0	negligible	0	0	0	Negligible
PS_23a	0	0	0	negligible	0	0	0	Negligible
PS_23b	1	1	0	negligible	1	1	0	Negligible
PS_29a	1	1	0	negligible	1	1	0	Negligible
PS_29b	1	1	0	negligible	1	1	0	Negligible

Table K – Predicted Number of days PM_{10} Concentrations>50µg/m^3 in 2028 – 50% Development Traffic								
Receptor	Original Results				Revised Results			
	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor
PS_30a	1	1	0	negligible	1	1	0	Negligible
PS_30b	1	1	0	negligible	1	1	0	Negligible
PS_31b	1	1	0	negligible	1	1	0	Negligible
PS_32a	0	0	0	negligible	0	0	0	Negligible
PS_32b	0	0	0	negligible	0	0	0	Negligible
PS_33a	0	0	0	negligible	0	0	0	Negligible
PS_34a	0	0	0	negligible	0	0	0	Negligible
PS_34b	0	0	0	negligible	0	0	0	Negligible
PS_40b	6	6	0	negligible	1	1	0	Negligible
PS_40c	2	2	0	negligible	1	2	1	Negligible
PS_42a	4	5	0	negligible	1	1	1	Negligible
PS_42d	1	1	0	negligible	0	1	0	Negligible
PS_61a	0	0	0	negligible	0	0	0	Negligible
PS_62a	2	2	0	negligible	1	2	0	Negligible
PS_64b	1	1	0	negligible	1	1	0	Negligible

Table K – Predicted Number of days PM_{10} Concentrations>50µg/m^3 in 2028 – 50% Development Traffic								
Receptor	Original Results				Revised Results			
	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor
02b	0	0	0	negligible	0	0	0	Negligible
03a	6	6	0	negligible	1	2	1	Negligible
03b	1	1	0	negligible	0	1	0	Negligible
08a	1	1	0	negligible	0	1	0	Negligible
08c	1	1	0	negligible	0	1	1	Negligible
09b	0	1	0	negligible	0	0	0	Negligible
10b	0	0	0	negligible	0	0	0	Negligible
12a	0	0	0	negligible	0	0	0	Negligible
13b	0	0	0	negligible	0	0	0	Negligible
15a	0	0	0	negligible	0	0	0	Negligible
16a	0	0	0	negligible	0	0	0	Negligible
19a	1	1	0	negligible	0	1	1	Negligible
19b	0	0	0	negligible	0	0	0	Negligible
19c	0	0	0	negligible	0	0	0	Negligible
20b	0	0	0	negligible	0	0	0	Negligible

Table K – Predicted Number of days PM_{10} Concentrations>50µg/m^3 in 2028 – 50% Development Traffic								
Receptor	Original Results				Revised Results			
	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor	2028 Baseline	2028 With Development	Development Contribution (%)	Impact Descriptor
22a	0	0	0	negligible	0	0	0	Negligible
22b	0	0	0	negligible	0	0	0	Negligible
24a	0	0	0	negligible	0	0	0	Negligible
24b	2	2	0	negligible	1	2	1	Negligible
31a	1	1	0	negligible	1	1	0	Negligible
32c	2	2	0	negligible	1	1	1	Negligible
33b	0	0	0	negligible	0	0	0	Negligible
35b	2	2	0	negligible	2	2	0	Negligible
41a	10	10	0	negligible	3	4	1	Negligible
42b	1	1	0	negligible	0	1	0	Negligible
42c	4	4	0	negligible	1	2	1	Negligible
43a	4	5	0	negligible	1	2	1	Negligible
43b	3	4	0	negligible	1	2	1	Negligible
44a	7	7	0	negligible	4	5	1	Negligible
45a	1	1	0	negligible	1	1	0	Negligible

Table L – Predicted Number of days PM_{10} Concentrations>50µg/m^3 in 2036 – 100% Development Traffic								
Receptor	Original Results				Revised Results			
	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor
PS_PE	7	8	0	negligible	1	1	0	Negligible
PS_HA2+08b	0	0	0	negligible	0	0	0	Negligible
PS_HA5	#N/A	#N/A	#N/A	#N/A	0	1	0	Negligible
PS_HA6	#N/A	#N/A	#N/A	#N/A	0	1	0	Negligible
PS_SA2+38a	1	1	0	negligible	1	1	0	Negligible
PS_SA5	1	1	0	negligible	1	1	0	Negligible
PS_SA6+38b	1	1	0	negligible	1	1	0	Negligible
PS_ES4	7	7	0	negligible	1	1	0	Negligible
PS_ES6	7	8	0	negligible	1	1	0	Negligible
PS_02a	0	0	0	negligible	0	0	0	Negligible
PS_04a	1	1	0	negligible	1	1	0	Negligible
PS_05a	1	2	1	negligible	0	1	1	Negligible
PS_06a	1	1	0	negligible	1	1	1	Negligible
PS_09a	1	1	0	negligible	0	1	0	Negligible
PS_10a	0	1	0	negligible	0	0	0	Negligible

Table L – Predicted Number of days PM_{10} Concentrations>50µg/m^3 in 2036 – 100% Development Traffic								
Receptor	Original Results				Revised Results			
	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor
PS_13a	0	0	0	negligible	0	1	0	Negligible
PS_14a	1	2	1	negligible	0	1	0	Negligible
PS_14b	0	0	0	negligible	0	0	0	Negligible
PS_15b	0	0	0	negligible	0	0	0	Negligible
PS_15c	2	2	0	negligible	1	1	0	Negligible
PS_17a	0	0	0	negligible	0	0	0	Negligible
PS_17b	0	0	0	negligible	0	0	0	Negligible
PS_18a	1	1	0	negligible	1	1	0	Negligible
PS_20a	0	0	0	negligible	0	0	0	Negligible
PS_21a	0	0	0	negligible	0	0	0	Negligible
PS_21b	0	0	0	negligible	0	0	0	Negligible
PS_23a	0	0	0	negligible	0	0	0	Negligible
PS_23b	1	1	0	negligible	1	1	0	Negligible
PS_29a	1	1	0	negligible	1	1	0	Negligible
PS_29b	1	1	0	negligible	1	1	0	Negligible

Table L – Predicted Number of days PM_{10} Concentrations>50µg/m^3 in 2036 – 100% Development Traffic								
Receptor	Original Results				Revised Results			
	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor
PS_30a	1	1	0	negligible	1	1	0	Negligible
PS_30b	1	1	0	negligible	1	1	0	Negligible
PS_31b	1	1	0	negligible	1	1	0	Negligible
PS_32a	0	0	0	negligible	0	0	0	Negligible
PS_32b	0	0	0	negligible	0	0	0	Negligible
PS_33a	0	0	0	negligible	0	0	0	Negligible
PS_34a	0	0	0	negligible	0	0	0	Negligible
PS_34b	0	0	0	negligible	0	0	0	Negligible
PS_40b	6	6	0	negligible	1	1	0	Negligible
PS_40c	2	2	0	negligible	2	2	0	Negligible
PS_42a	4	5	0	negligible	1	1	0	Negligible
PS_42d	1	1	0	negligible	1	1	0	Negligible
PS_61a	0	0	0	negligible	0	0	0	Negligible
PS_62a	2	2	0	negligible	2	2	0	Negligible
PS_64b	1	1	0	negligible	1	1	0	Negligible

Table L – Predicted Number of days PM_{10} Concentrations>50µg/m^3 in 2036 – 100% Development Traffic								
Receptor	Original Results				Revised Results			
	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor
02b	0	0	0	negligible	0	0	0	Negligible
03a	6	6	0	negligible	2	2	0	Negligible
03b	1	1	0	negligible	1	1	0	Negligible
08a	1	1	0	negligible	1	1	0	Negligible
08c	1	1	0	negligible	1	1	0	Negligible
09b	0	1	0	negligible	0	0	0	Negligible
10b	0	0	0	negligible	0	0	0	Negligible
12a	0	0	0	negligible	0	0	0	Negligible
13b	0	0	0	negligible	0	1	0	Negligible
15a	0	0	0	negligible	0	0	0	Negligible
16a	0	0	0	negligible	0	0	0	Negligible
19a	1	1	0	negligible	0	1	0	Negligible
19b	0	0	0	negligible	0	0	0	Negligible
19c	0	0	0	negligible	0	0	0	Negligible
20b	0	0	0	negligible	0	0	0	Negligible

Table L – Predicted Number of days PM_{10} Concentrations>50µg/m^3 in 2036 – 100% Development Traffic								
Receptor	Original Results				Revised Results			
	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor	2036 Baseline	2036 With Development	Development Contribution (%)	Impact Descriptor
22a	0	0	0	negligible	0	0	0	Negligible
22b	0	0	0	negligible	0	0	0	Negligible
24a	0	1	0	negligible	0	0	0	Negligible
24b	2	2	0	negligible	2	2	0	Negligible
31a	1	1	0	negligible	1	1	0	Negligible
32c	2	2	0	negligible	1	1	0	Negligible
33b	0	0	0	negligible	0	0	0	Negligible
35b	2	2	0	negligible	2	2	0	Negligible
41a	9	10	1	negligible	4	4	0	Negligible
42b	1	1	0	negligible	1	1	0	Negligible
42c	4	4	0	negligible	2	2	0	Negligible
43a	4	5	1	negligible	2	2	0	Negligible
43b	3	4	0	negligible	2	2	0	Negligible
44a	7	7	0	negligible	5	5	0	Negligible
45a	1	1	0	negligible	1	1	0	Negligible

Applicant's Post Hearing Submissions (CAH, ISH 2 and ISH3)
Applicant Noise Response to SSDC

The West Midlands Rail Freight Interchange Order 201X

Four Ashes Limited

West Midlands Interchange

Four Ashes Ltd

RE: WMI Noise

From: Matthew Royall
Sent: 06 February 2019 10:41
To: Gerring, John
Cc: Green, Wendy; John Rhodes; Mike Brownstone
Subject: RE: WMI Noise

Dear John

Many thanks for forwarding the letter from Hepworth Acoustics (dated 7th January 2019).

On the assumption that SSDC's view of the scheme is similar to that of Hepworth Acoustics, there appears to be broad agreement on the following points (referenced paragraph numbering as per Hepworth Acoustics letter):

- the noise assessment is thorough (para 75);
- the approach adopted is in accordance with the EIA requirements (para 76);
- the relevant potential sources of environmental noise impact have been identified and assessed (para 76);
- all relevant British Standards and noise guidelines have been described and employed (paras 14 and 77);
- the baseline noise survey was extensive and employed good practice (para 16 and 17);
- the representative background sound levels used are reasonable (para 19);
- the approach to obtaining 'real life' operational source data is good and robust (para 21);
- the updated baseline noise survey was reasonable and adequate (para 23);
- the number of locations assessed for the construction noise assessment was adequate (para 34);
- the use of a bespoke noise insulation scheme for construction noise is pragmatic (para 39);
- the assessment of cumulative construction noise impact is adequate (para 42);
- the conclusion on construction vibration is reasonable (para 44);
- the operational noise calculation assumptions are stated clearly and are reasonable (para 49);
- the acoustic character corrections are reasonable (para 54);
- it is appropriate to make the case for a bespoke noise insulation scheme for operational noise and for the Planning Inspectorate to weigh that in the balance (para 61);
- the principle of a bespoke sound insulation scheme to control internal sound levels is agreed (para 64); and
- Hepworth Acoustics note that the operational sound level, including the acoustic character corrections, are all within the 55dB criterion at all assessment locations (para 67), which we agree is correct for all residential receptor locations. We note one non-residential receptor location ('Canal Towpath Gravelly Way') is marginally above this threshold at 56dB.

There appear to be the following points of disagreement:

- equating the 'unacceptable' SOAEL to the trigger values in the NIR 1975 and NIR 1996 is not agreed, although Hepworth Acoustics does not state an alternative value (para 12);
- the potential significance of construction vibration impacts at level of between 1mm/s and 10mm/s may be underestimated, although Hepworth Acoustics note that the conclusion of the construction vibration assessment that temporary moderate adverse impacts are likely is reasonable (para 43);
- the threshold for impacts to be considered 'high adverse' instead of 'moderate adverse' could be +8 or +9dB, not +10dB as stated in the ES (para 53);
- the trigger value for the bespoke noise insulation scheme could be +8 or +9dB, not +10dB, and Hepworth Acoustics suggests there may be an argument to trigger eligibility at +5dB (paras 62 and 63). We note that Hepworth Acoustics does not carry this point through to their conclusions; and
- the potential impact on outdoor areas may be underestimated and could rely on the BS4142: 2014 assessment alone (para 68), notwithstanding noise levels falling within the BS8233 criterion.

A draft Statement of Common Ground (SoCG) will be issued shortly, capturing the above points with a response to the above points of disagreement.

We propose that on the scheduled meeting of 21st February to go through the draft SoCG and the Hepworth Acoustics letter, to see if we can develop our respective positions.

Should you have any queries regarding the comments above please don't hesitate to contact me.

Regards

Matt

Yours sincerely
Matt Royall

CEnv, SiLC, MIEMA
Principal

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From: Gerring, John <J.Gerring@sstaffs.gov.uk>
Sent: 11 January 2019 16:13
To: Matthew Royall <MRoyall@ramboll.com>; Mike Brownstone <mike.brownstone@resoundacoustics.co.uk>
Cc: Green, Wendy <Wendy.Green@sstaffs.gov.uk>
Subject: Noise

Dear Matt and Mike,

For your consideration please find attached the response from Hepworth Acoustics on our behalf in relation to noise.

Regards

John Gerring

Environmental Health and Licensing Team Manager
Environmental Health & Licensing
South Staffordshire Council

Tel: 01902696211

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