

APP 23 -
M62 J9 Proposed Mitigation *Scheme* RSA1 *Report* 2018

**Peel Hall, Warrington
M62 Junction 9 Mitigation Measures
Road Safety Audit Stage 1**

Report No 17/2018

April 2018

***Alan Consultancy Ltd
Road Safety and Traffic Consultants***

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1. Introduction

1.1 This report results from a Stage 1 Road Safety Audit carried out on M62 Junction 9 Mitigation Measures (forming part of the Peel Hall, Warrington proposals) at the request of Highgate Transportation Limited, First Floor, 43 - 45 Park Street, Bristol, BS1 5NL and as approved by Ben Laverick, Highway England's Project Sponsor. The Road Safety Audit was carried out in April 2018.

1.2 The Road Safety Audit Team membership was as follows:

J Kevin Nicholson	BSc, CMaths, MCIHT, FSoRSA Independent Consultant (Certificate of Competency in Road Safety Audit gained May 2015)
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Alan Rookes	IEng, FCIHT, FSoRSA, RegRSA (IHE) Director, Alan Consultancy Limited (Certificate of Competency in Road Safety Audit gained January 2013)
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1.3 The Road Safety Audit took place on-site on 12th April 2018. The Road Safety Audit was undertaken in accordance with the Road Safety Audit Brief approved by Ben Laverick, Project Sponsor, Manchester Regional Office. The Road Safety Audit comprised of an examination of the documents provided as listed in the Annex. The documents consisted of drawings detailing the proposed highway arrangements, other related drawings and collision data. The Audit Team visited together the site on 12th April 2018 between 1330 and 1440 hours. During the site visit it was overcast and dry and the existing road surface was dry. Traffic conditions were free flowing.

1.4 The terms of reference of the Road Safety Audit are as described in HD 19/15. The Road Safety Audit Team has reported only on the road safety implications of the scheme as presented and has not examined or verified the compliance of the design to any other criteria.

1.5 All comments and recommendations are referenced to the preliminary design drawings and the locations are indicated on the attached A4 plan.

1.6 The proposed M62 Junction 9 Mitigation Measures incorporates the widening of the M62 eastbound on-slip from one to two lanes, the provision of a third lane on the M62 westbound off-slip and modifications to the carriageway markings on the north eastern quadrant of the M62/A49 roundabouts circulatory carriageway. In accordance with paragraph 2.20 of HD 19/15, the Road Safety Audit Team has noted that recommendations to make significant changes to the scheme are unlikely to be acceptable.

1.8 Some items in Section 3 refer to issues that would usually be evaluated as part of a Stage 2 (detailed design) Road Safety Audit. However, notwithstanding that this is a Stage 1 Audit, those issues are raised in order that they can be given due consideration as the detailed design progresses.

2. Items Raised at this Stage 1 Road Safety Audit

2.1 The Junctions

2.1.1 Problem

Location: M62 Eastbound On-Slip and M62 Westbound Off-Slip. (*Drawing No 1107 77*)

Summary: Loss of control collisions could occur where the carriageway has been widened or realigned.

The scheme involves local widening of the slip road carriageways which will result in areas of new surface abutting the existing. If vehicles have their nearside and offside wheels on sections of carriageway surface with significantly different wet skid resistance, spin can be imparted and drivers could lose control of their vehicles or overturn. In addition, motorists will have to negotiate the longitudinal joint (if present) which could itself present difficulties for grip if not properly constructed.

Recommendation

It is recommended that the joints between the existing and new surfaces are structurally secure, clean and sound. In addition, a wearing course should be provided on the new sections of carriageway with a similar wet skid resistance to the existing surface (assuming that the existing surface is above investigatory levels). Alternatively, a new wearing course could be provided for the full width of the carriageway throughout the improved sections.

2.2 Non-Motorised Users (NMU's)

2.2.1 Problem

Location: Pedestrian and Cyclist Crossing Place on the M62 Westbound Off-Slip. (*Drawing No 1107 77*)

Summary: Pedestrian and Cyclist visibility to the right will be impaired and consequently vehicle/pedestrian and vehicle/cyclist collisions could occur.

Visibility to the right for pedestrians and cyclists seeking to cross the slip road from its southern verge will be restricted by control cabinets, street furniture and the embankment. Vehicle/pedestrian and vehicle/cyclist collisions could consequently occur.

Recommendation

It is recommended that a clear visibility splay to the right is provided by removing and relocating the cabinets and street furniture and by reducing the height of the embankment.

2.2.2 Problem

Location: Pedestrian and Cyclist Crossing Places on the M62 Eastbound On—Slip and M62 Westbound Off-Slip. (*Drawing No 1107 77*)

Summary: Widening of both slip road carriageways will increase the likelihood of vehicle/pedestrian and vehicle/cyclist collisions.

Due to the widening of the carriageways, pedestrians and cyclists crossing both slip roads will be exposed to risk with vehicles for a greater period of time, particularly on the westbound off-slip road where cyclists and pedestrians will have to cross 3 lanes. Vehicle/pedestrian and vehicle/cyclist collisions could consequently occur.

Recommendation

It is recommended that a Toucan Crossing is provided on the westbound off-slip road. In addition, it is recommended that a warning sign to Diagram 950, together with the supplementary plate 'cycle crossing', is erected in advance of the eastbound on-slip.

2.3 Signing and Lighting

2.3.1 Problem

Location: M62 Westbound Off-Slip. (Drawing No 1107 77)

Summary: The proposed right turn arrows in lane 3 may cause drivers to turn right onto the roundabout circulatory carriageway with resultant collisions with circulating vehicles.

The proposed right turn arrows in lane 3 of the slip road may encourage drivers unfamiliar with the area (particularly foreign drivers) to turn directly right as they enter the roundabout. In doing so they could collide head-on with vehicles negotiating the roundabout in the correct manner.

Recommendation

It is recommended that the right turn arrows are not provided and only ahead only arrows are provided in lane 3.

2.3.2 Problem

Location: M62/A49 roundabout circulatory carriageway at the M62 Eastbound On-Slip. (Drawing No 1107 77)

Summary: The layout of the lane markings may confuse drivers leading to shunt type collisions.

The proposed lane markings in and adjacent to lane 2 of the circulatory carriageway may cause some drivers to be unclear if they can leave the roundabout and enter lane 2 on the slip road or bear right into what becomes lane 1 on the circulatory carriageway. These confused drivers may brake and slow resulting in shunt type collisions on the circulatory carriageway.

Recommendation

It is recommended that the markings cutting across the lanes are not provided and hence a clear route is apparent to those enter both the slip and continuing on the roundabouts circulatory carriageway.

2.3.3 Problem

Location: M62/A49 roundabout circulatory carriageway at the M62 Eastbound On-Slip. (*Drawing No 1107 77*)

Summary: Minimal road markings are proposed to deflect vehicles off the nosing of the central island. Vehicles could consequently collide with the kerb.

Although there are existing chevron road markings in advance of the nosing of the central island, only a single mark is shown on the drawings. In the absence of sufficient deflection, vehicles could collide with the kerb at the nosing and lose control.

Recommendation

It is recommended that appropriate chevron type markings are provided at the nosing and shown as such on the drawings for clarity.

4. Audit Team Statement

We certify that this Road Safety Audit has been carried out in accordance with HD 19/15.

Road Safety Audit Team Leader

J Kevin Nicholson
BSc, CMaths, MCIHT, FSoRSA
Independent Consultant

Signed 

Date 17/04/17

Road Safety Audit Team Member

Alan Rookes
IEng, FCIHT, FSoRSA, RegRSA(IHE)
Director
Alan Consultancy Limited

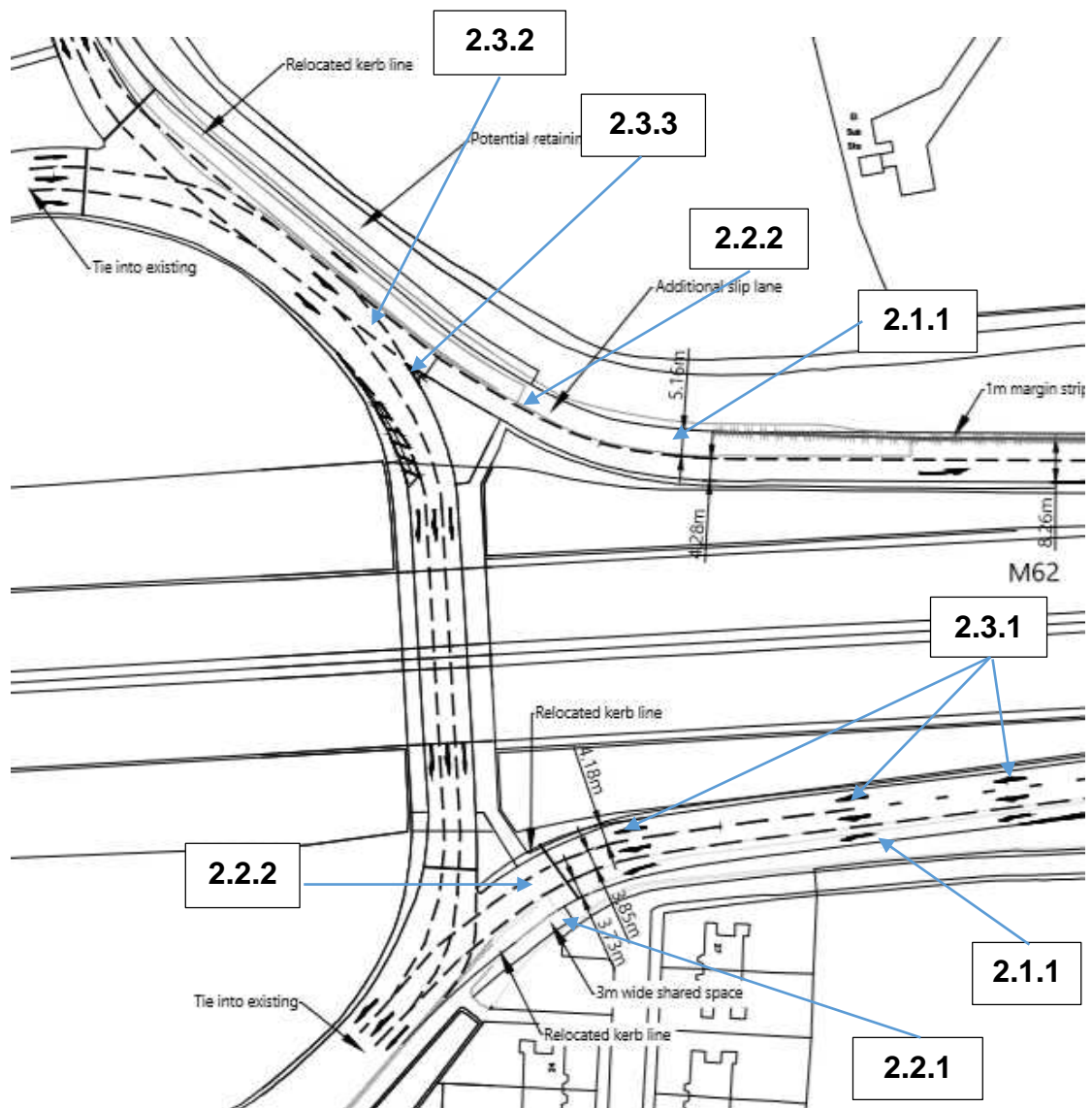
Signed 

Date 17/04/17

Annex: List of Documents Provided for this Stage 1 Road Safety Audit

Document/Drawing Reference No	Title	Date
1107/RSA1BRIEF/01	Road Safety Audit Brief M62 Junction 9 Road Safety Audit (Stage 1)	March 2018
1107 75	Peel Hall – Junction 9 M62 with Potential Improvements Overview	15/12/17
1107 77	Peel Hall – Junction 9 M62 with Potential Improvements – Western Section	15/12/17
1107 78	Peel Hall – Junction 9 M62 with Potential Improvements – Eastern Section	15/12/17
1107/RSA1BRIEF/01	Location Plan – M62 J9	Undated
1107/RSA1BRIEF/01	Extract from WBC Accident Plot	Undated
Un-numbered	Summary of Accidents and Stick Diagram 01/01/13 to 31/12/17	Undated
Un-numbered	C5696 North Warrington Report (Crash Reports)	21/03/18
Un-numbered	C5696 North Warrington Accident Plot	Un-dated

Reference Plan



APP 24 -
M62 J9 Proposed Mitigation *Scheme* RSA1 *Designers Response* 2018

RSA1 DESIGNERS RESPONSE

PROJECT: Peel Hall, Warrington

RSA DATE: April 2018

RSA REF.: 17/2018 - Peel Hall, Warrington M62 Junction 9 Mitigation Measures

The Junctions

Para. No.	Problem	Recommendation	Designers Response
2.1.1	<p>M62 Eastbound On-Slip and M62 Westbound Off-Slip.</p> <p>The scheme involves local widening of the slip road carriageways which will result in areas of new surface abutting the existing. If vehicles have their nearside and offside wheels on sections of carriageway surface with significantly different wet skid resistance, spin can be imparted and drivers could lose control of their vehicles or overturn. In addition, motorists will have to negotiate the longitudinal joint (if present) which could itself present difficulties for grip if not properly constructed.</p>	<p>It is recommended that the joints between the existing and new surfaces are structurally secure, clean and sound. In addition, a wearing course should be provided on the new sections of carriageway with a similar wet skid resistance to the existing surface (assuming that the existing surface is above investigatory levels). Alternatively, a new wearing course could be provided for the full width of the carriageway throughout the improved sections.</p>	Accepted.

Non-motorised users (NMUs)

Para. No.	Problem	Recommendation	Designers Response
2.2.1	<p>Pedestrian and Cyclist Crossing Place on the M62 Westbound Off-Slip.</p> <p>Visibility to the right for pedestrians and cyclists seeking to cross the slip road from its southern verge will be restricted by control cabinets, street furniture and the embankment. Vehicle/pedestrian and vehicle/cyclist collisions could consequently occur.</p>	It is recommended that a clear visibility splay to the right is provided by removing and relocating the cabinets and street furniture and by reducing the height of the embankment.	Accepted.
2.2.2	<p>Pedestrian and Cyclist Crossing Places on the M62 Eastbound On—Slip and M62 Westbound Off-Slip.</p> <p>Due to the widening of the carriageways, pedestrians and cyclists crossing both slip roads will be exposed to risk with vehicles for a greater period of time, particularly on the westbound off-slip road where cyclists and pedestrians will have to cross 3 lanes. Vehicle/pedestrian and vehicle/cyclist collisions could consequently occur.</p>	It is recommended that a Toucan Crossing is provided on the westbound off-slip road. In addition, it is recommended that a warning sign to Diagram 950, together with the supplementary plate 'cycle crossing', is erected in advance of the eastbound on-slip.	Accepted.

Signing and Lighting

Para. No.	Problem	Recommendation	Designers Response
2.3.1	<p>M62 Westbound Off-Slip.</p> <p>The proposed right turn arrows in lane 3 of the slip road may encourage drivers unfamiliar with the area (particularly foreign drivers) to turn directly right as they enter the roundabout. In doing so they could collide head-on with vehicles negotiating the roundabout in the correct manner.</p>	It is recommended that the right turn arrows are not provided and only ahead only arrows are provided in lane 3.	Accepted.
2.3.2	<p>M62/A49 roundabout circulatory carriageway at the M62 Eastbound On-Slip.</p> <p>The proposed lane markings in and adjacent to lane 2 of the circulatory carriageway may cause some drivers to be unclear if they can leave the roundabout and enter lane 2 on the slip road or bear right into what becomes lane 1 on the circulatory carriageway. These confused drivers may brake and slow resulting in shunt type collisions on the circulatory carriageway.</p>	It is recommended that the markings cutting across the lanes are not provided and hence a clear route is apparent to those enter both the slip and continuing on the roundabouts circulatory carriageway.	Accepted.
2.3.3	<p>M62/A49 roundabout circulatory carriageway at the M62 Eastbound On-Slip.</p> <p>Although there are existing chevron road markings in advance of the nosing of the central island, only a single mark is shown on the drawings. In the absence of sufficient deflection, vehicles could collide with the kerb at the nosing and lose control.</p>	It is recommended that appropriate chevron type markings are provided at the nosing and shown as such on the drawings for clarity.	Accepted.

APP26 -
SCGH *September* 2020_Signed

Land at Peel Hall, Warrington
Statement of Common Ground
On
Highway and Transportation Matters

(APP/M0655/W/17/3178530)

September 2020

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Appendices

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Appendix SCG/2	Site and Local Highway Network
Appendix SCG/3	Highway Adoption Records
Appendix SCG/4	Plan of Existing 20mph Speed Limits in the Vicinity of the Site
Appendix SCG/5	Bus Services
Appendix SCG/6	Proposed Access Arrangements
Appendix SCG/7	2018 Flow Diagrams
Appendix SCG/8	Future Year Flow Diagrams
Appendix SCG/9	Development Flow Diagrams
Appendix SCG/10	Mitigation Measures

1.0 Introduction

- 1.1 This is an agreed Statement of Common Ground (SoCG) on highways and transportation matters, which has been prepared by Warrington Borough Council (the Council) in its capacity as local highway authority and Highgate Transportation Limited (HTp) on behalf of the appellant. The Rule 6 Party is also party to this agreement. This Statement sets out areas of agreement and disagreement in connection with the highways and transportation issues associated with the appeal scheme.
- 1.2 The appeal site is located approximately 5.0 kilometres to the north of Warrington town centre (when measured from the edge of the town centre to the edge of the development site) and approximately 7.0 kilometres from the centre of the town centre to the centre of the development site. The site is within the Warrington urban area, bounded by the M62 to the north and the surrounding area is residential to the east, south and west.
- 1.3 A single public right of way (PRoW 2) passes through the site from Mill Lane to the north east, along Peel Cottage Lane to the footbridge over the M62. There are no other registered or statutory footpaths or PRoW within the site.

2.0 Existing Local Transport Network

- 2.1 The site is bound by the M62 to the north, Mill Lane to the east, Poplars Avenue to the south and Birch Avenue and Elm Road to the west. The location of the site and wider highway network are shown in the plan of the study area that forms **Appendix SCG/1**, the existing Peel Hall site and the local highway network are shown in the plan that forms **Appendix SCG/2**.
- 2.2 Congestion frequently occurs during the peak periods along the main corridors in the area including M62, Winwick Road, Sandy Lane West, Long Lane, Blackbrook Avenue and Birchwood Way, as well as elsewhere within the study area and across Warrington.
- 2.3 **Appendix SCG/3** contains extracts of the highway adoption records in the vicinity of the appeal site.
- 2.4 Mill Lane immediately north of its priority junction with Mill Lane is subject to the national speed limit, before it becomes Delph Lane and reduces to 40mph. The A49 Winwick Road is subject to a 40mph speed limit. The A574 Birchwood Way is subject to 50mph. Blackbrook Avenue and the A50 Long Lane/Orford Green are subject to a 30mph speed limit. Poplars Avenue between the A50 and Cleveland Road is subject to a 30mph, along with Capesthorne Road between Poplars Avenue and Blackbrook Avenue.

2.5 Much of the residential area to the south of the appeal site is already subject to a 20mph speed restrictions (see plan contained at **Appendix SCG/4**), including:

- i. Poplars Avenue between Loweswater Close and Cotswold Road
- ii. Capesthorne Road west of Poplars Avenue
- iii. Cotswold Road
- iv. Cleveland Road
- v. Howson Road
- vi. Statham Avenue
- vii. Greenwood Crescent
- viii. Lancing Avenue
- ix. The cul-de-sac section of Poplars Avenue adjacent to the A49

Existing Bus Services

2.6 Local bus services and routes are shown in **Appendix SCG/5**, which also includes bus timetable information for services 25 and 20/21.

3.0 Proposed Development and Access Arrangements

3.1 For the purposes of this assessment the development is assumed to comprise:

- i. Up to 1,200 residential dwellings. This will include a mix of market and affordable homes as well as houses and apartments. The houses are expected to be a mix of two, three and four bedroomed houses and one and two bedroomed apartments.
- ii. A 100 bedroomed care home.
- iii. A local centre comprising a food store of up to 2,000sqm GFA plus up to a further 600sqm GFA of local centre type facilities (such as A1-A5 and D1) plus a family pub and restaurant of up to 800sqm GFA. The local centre car park will be located so that it can also be used as a school drop off facility.
- iv. Up to a two-form entry primary school with a maximum of up to 420 pupils (for robust modelling purposes as the application proposed a 1 form entry only).
- v. Relocating and upgrading of existing sports pitches to provide like-for-like replacement in land area terms with the number of pitches and the provision of ancillary facilities increased, which are expected to include changing facilities for up to four teams at any one time and a function room that can be used for local community uses such as a mother and toddler group, as at present.

3.2 The internal highway layout serving the appeal site including the emergency accesses (and its means of control), and the pedestrian and cycle links within the site, will be subject to reserved matters applications. An emergency access plan would also be subject to the Reserved Matters application.

3.3 The access strategy is for a non through route arrangement, with the development served by six separate access points as follows (see **Appendix SCG/6**):

- i. A new roundabout on Mill Lane to the north of the existing roundabout junction of Mill Lane and Blackbrook Avenue. This access will serve approximately 700 dwellings and the primary school.
- ii. A new priority junction with right turn lane on Poplars Avenue located between Newhaven Road and Windermere Avenue. This access will serve approximately 180 dwellings and the local centre.
- iii. An extension of Mill Lane into the site. This access will serve approximately 150 dwellings.
- iv. A new priority junction on Poplars Avenue located between Cotswold Road and Newhaven Road. This access will serve approximately 150 dwellings.
- v. An extension of Birch Avenue and a new priority junction. These accesses will serve approximately 20 dwellings.
- vi. Improvement works to the existing access on Grasmere Avenue. This access will serve the sports pitches and clubhouse and facilitates coach access.

4.0 Transport Assessment and Mitigation Measures

4.1 Use of the Council's WMMTM16 was commissioned in April 2019 to assess the impact of the appeal scheme by creating a highway-only cordon model. The WMMTM16 is used by the Council in their Local Plan Assessment, which includes the Peel Hall site in the Local Plan future year scenario modelling. The use of WMMTM16 for a highway-only cordon model is agreed to be the most appropriate traffic model for assessing the impact of the Peel Hall development. The use of the Peel Hall model rather than the WMMTM16 was the main area of disagreement between the parties at the 2018 appeal.

4.2 The following committed developments were explicitly modelled in WMMTM16 for the Peel Hall assessment as agreed with WBC:

- i. J9 Retail Park (2016/29425)
- ii. Parkside Phase 1 (2018/32247)
- iii. Birchwood Park (2015/26044)

4.3 The base flow diagrams for 2018 (AM and PM) are contained in **Appendix SCG/7**. These are Do Minimum (no development) only.

4.4 The agreed future years of assessment with WMMTM16 are as follows (all AM and PM peak hours):

2022 - Opening Year

- a. Do Minimum (no development)
- b. Do Something (120 dwellings – to test actual impact forecast for year of opening)
- c. Do Something (full development - to define mitigation for HE)

2027 - Five Years After Opening

- a. Do Minimum (no development)

b. Do Something (part development - 600 dwellings and Local Centre)

2032 - 10 years After Opening

a. Do Minimum (no development)

b. Do Something (full development)

4.5 These flow diagrams are provided at **Appendix SCG/8** and development-only flow diagrams are contained at **Appendix SCG/9**.

4.6 The list of junctions agreed with the Council to be taken forward for more detailed modelling following a review of the Peel Hall WMMTM16 data, aside from the site access junctions, are:

- i. Golborne Road/Myddleton Lane
- ii. Delph Lane/Myddleton Lane
- iii. A49 M62 Junction 9 roundabout[§]
- iv. A50/Hilden Road roundabout and A50/Poplars Avenue
- v. A50/Hallfields Road
- vi. A49/A50/Hawleys Lane crossroads[§]
- vii. A49/JunctionNINE Retail Park[§]
- viii. Blackbrook Avenue roundabout with Enfield Park Road and Ballater Drive
- ix. Blackbrook Avenue roundabout with Enfield Park Road and Capesthorpe Road
- x. Poplars Avenue roundabout with Capesthorpe Road
- xi. Cromwell Avenue/Calver Road linked with Sandy Lane West/A49 roundabout*

- 4.7 It was also agreed that going forward, those junctions on the A49 corridor⁽⁵⁾ would be modelled in VISSIM rather than as stand-alone models, in order to assess knock-on impacts of queuing and delay.
- 4.8 The individual junction capacity models for the above junctions (i, ii, iv, v, viii, ix, and x) set out in **paragraph 4.6** are agreed, with the modelling for the VISSIM corridor and mitigation at the A50/Hilden Road still to be agreed.
- 4.9 The number of external development trips using each of the proposed site accesses during the AM and PM peak hour is set out in **Table 4.1** for a full development scenario.

Table 4.1: External development trips at each site access (full development)

Access	Quantum of Development	AM Arrival	AM Departure	PM Arrival	PM Departure
Poplars Avenue (Central)	180 dwellings	41	94	89	55
	care home	7	7	8	8
	food store*	28	18	54	57
	local shops	0	0	0	0
	family pub	0	0	23	15
	<i>Sub Total**</i>		<i>48</i>	<i>101</i>	<i>120</i>
Poplars Avenue (West)	150 dwellings	34	79	74	46
Mill Lane	150 dwellings	34	79	74	46
Mill Lane/Blackbrook Avenue	700 dwellings	158	366	347	215
	primary school	57	40	10	14
Birch Avenue	20 dwellings	5	11	10	6
Grasmere Avenue	community uses	10	5	7	8
Total**		346	681	642	413

* pass-by trips only

** excluding pass-by

4.10 The mitigation measures proposed by the appellant with an indication of what is agreed and still to be agreed, are (drawings contained in **Appendix SCG/10**):

- i. A full and comprehensive Travel Plan supported by extensive travel plan measures, to enhance and support sustainable travel of future residents.
- ii. An effective bus mitigation strategy based on extending existing bus services into the site, in the east and south (see **paragraphs 4.11** and **4.12**).
- iii. A50 Orford Green/Hilden Road Roundabout – junction improvement scheme. Modification to be agreed. Trigger to be agreed.
- iv. A49/A50/Hawleys Lane signal junction – provide a contribution to upgrade the signal junction to MOVA operation (to cover controller, additional loops and testing). Amount and trigger to be agreed.
- v. A50/Hallfields Road signal junction – provide a contribution to upgrade the signal junction to MOVA operation (to cover controller, additional loops and testing). Amount to be agreed and trigger to be 300th dwelling occupied.
- vi. A49 Newton Road/Golborne Road – provide a scheme of widening and a ghost right turn lane if not provided by other committed schemes, prior to occupation of the 300th dwelling.
- vii. Golborne Road/Myddleton Lane - proposed provision of Keep Clear markings on the southbound A49 arm across the Golborne Road arm to improve junction performance by removing obstructions to the A46 right-turning movement. Triggered prior to occupation.
- viii. Delph Lane – contribution of £35,000 towards Council's traffic management scheme. Triggered prior to occupation of development accessed from Mill Lane.

- ix. Myddleton Lane/Delph Lane junction – proposed traffic signal junction. Trigger to be agreed.
- x. Birch Avenue/A49 – proposed provision of Keep Clear markings on the A49 nearside southbound lane across the Birch Avenue junction. Triggered prior to occupation of dwellings accessed from Birch Avenue.
- xi. Measures that could be provided in the area to the south if considered to be required and necessary:
 - a. provide a scheme for uncontrolled dropped kerb pedestrian crossing improvements with tactile paving across arms of all roads intersecting with Poplars Avenue and upgrade existing locations for pedestrians to cross Poplars Avenue to promote attractive pedestrian routes, enhance highway safety and assist pedestrians with crossing movements, should this be considered appropriate.
 - b. provide a scheme of cycle-friendly measures on Poplars Avenue such as painting cycle markings on carriageway near junctions to warn motorists of cycles. Also, the provision of cycle warning signing where suitable poles for doing so at key areas such as the approaches to the Poplars Avenue/ Capesthorpe Road roundabout, should this be considered appropriate.
 - c. provide a scheme of verge parking at locations along Poplars Avenue and Capesthorpe Road, should this be considered appropriate.
 - d. provide a scheme to extend the 20mph speed limit through Poplars Avenue and Capesthorpe Road.

- e. provide a scheme of traffic calming measures on the area to the immediate south of the Peel Hall development such as Poplars Avenue, Cleveland Road, Statham Avenue, Howson Road and Capesthorne Road, should this be considered appropriate. This will involve replacement of measures along Capesthorne Road with more appropriate traffic calming and additional traffic calming and traffic management measures in the wider area.
- f. to be secured in the S106 Agreement by means of a future scheme to be submitted and agreed.

Bus Mitigation

- 4.11 Bus mitigation measures have been agreed on the basis of developer funding for five years to support service extensions to existing route 25 into the site from Mill Lane in the east and existing route 20 from Poplars Avenue in the south, with the potential to also extend route 21 into the site from Poplars Avenue should demand exceed capacity.
- 4.12 Service 25 operates Monday to Saturday every 30 minutes. Service 20 operates up to every 10 minutes Monday to Friday and every 12-13 minutes on Saturday, with a reduced service on Sundays.

5.0 S106 and Highway Related Draft Planning Conditions

5.1 The following are expected to be secured by a S106 Agreement:

- i. Bus mitigation
- ii. Delph Lane contribution
- iii. Contribution to A50/Hallfields Road signal junction MOVA works
- iv. Contribution to A49/A50/Hawleys Lane signal junction MOVA works
- v. Mitigation measures in the area to the south if required (e.g. traffic management, traffic calming, verge parking and associated works)

5.2 The following are expected to be secured by a suitably worded planning condition:

- i. Mitigation scheme at Hilden Road/A50
- ii. Works for the widening and provision of a ghost right turn lane at the A49/Golborne Road junction
- iii. Keep Clear markings at the Golborne Road/Myddleton Lane junction and the Birch Avenue junction with the southbound A49
- iv. Site access junctions
- v. Travel Plan
- vi. Mitigation measures at the A49/Cromwell Avenue/Sandy Lane West junction
- vii. Signalisation of the Delph Lane/Myddleton Road junction

6.0 Areas of Agreement and Disagreement

6.1 The areas of agreement with the Council can be summarised as:

- i. The use of WMMTM16 as the most appropriate tool to extract data for detailed modelling of individual junctions, and to forecast growth for the approved VISSIM model.
- ii. The description of the local transport network in Section 2.0 above.
- iii. The traffic flow figures detailed in Section 4.0 that have been used in the Transport Assessment.
- iv. Development trip rates.
- v. Trip rates for committed development.
- vi. That the layout of the internal access roads will be determined as part of Reserved Matters.
- vii. An emergency access plan will be determined as part of Reserved Matters.
- viii. A plan defining the Greenway Network will be produced as part of Reserved Matters.
- ix. The level of car parking for the appeal scheme will be controlled through condition.
- x. The provision of the Travel Plan will be controlled through condition.
- xi. Existing local bus services and routes.
- xii. The principle of the bus gate to prevent a through route to general traffic.
- xiii. Residents located off the Poplars Avenue accesses in the early phases of development will be able to use the existing bus stops at Poplars Avenue as they will be within 400 metres walking distance.

- xiv. Proximity of existing local services and amenities.
- xv. The provision of a Construction Management Plan will be controlled through condition.
- xvi. Assessment periods.
- xvii. The individual junction capacity models.
- xviii. The use of VISSIM for a corridor study of the A49 and to assess impact of the development on that corridor including the A49/Golborne Road; A49/Winick Link Road; A49/Delph Lane; M62 Junction 9; A49/Cromwell Avenue/Sandy Lane West; A49/Junction NINE Retail Park; and A49/A50 Long Lane and Hawleys Lane.
- xix. When highway engineering works measures have been agreed, off-site junction obligations will be secured under a Grampian condition and procured via a Section 278 Agreement.
- xx. A Section 38 Agreement would be entered into between the developer and the Council for the construction and delivery of the internal road network.
- xxi. Proposed bus mitigation strategy, which will be secured through a S106 Agreement with the Council.
- xxii. A contribution of £35,000 to be provided by the applicant towards traffic management measures on Delph Lane.
- xxiii. A scheme of traffic signalisation to be provided by the applicant at the Delph Lane/ Myddleton Lane junction.
- xxiv. A scheme of mitigation to be provided at the A50/Hilden Road roundabout.

- xxv. A contribution to be secured for works to the A50/Hallfields Road signal junction MOVA upgrade (including lining and loops).
- xxvi. A contribution to be secured for works to the A49/A50/Hawleys Lane signal junction MOVA upgrade (including lining and loops).
- xxvii. Widening and ghost right turn lane at the A49/Golborne Road junction.
- xxviii. Keep Clear markings at the junction of A49/Birch Avenue and also the Golborne Road/Myddleton Lane junction.
- xxix. A scheme of cycle and pedestrian improvement works in the area to the south if required.
- xxx. Mitigation measures in the area to the south if required (e.g. traffic management, traffic calming, verge parking and associated works).
- xxxi. Transport policies NPPF paragraphs 108 and 109 are agreed to be relevant.
- xxxii. Some triggers for mitigation.

6.2 Further areas expected to be agreed with the Council can be summarised as:

- i. The identified impact from the VISSIM of the junctions identified in (6.1 xviii) above and their approach arms.
- ii. Need for mitigation at A49/Cromwell Avenue/Sandy Lane West junction as a result of the Peel Hall development.
- iii. Form of mitigation at the A50/Hilden Road.
- iv. VISSIM base model and future year assessments.
- v. Levels of contribution at certain locations.

6.3 Areas not expected to be agreed with the Council can be summarised as:

- i. Means of assessing link capacity in the area to the south.

- ii. Some triggers for mitigation.
- iii. Levels of contribution at certain locations.

6.4 Areas of disagreement with the Rule 6 Party can be summarised as:

- i. The development trips set out in Table 4.1.
- ii. That the proposed bus mitigation will be effective.
- iii. The traffic flow figures used.
- iv. Trips rates used for committed development.
- v. That an emergency access plan should be determined as part of Reserved Matters.
- vi. A plan defining the Greenway Network should be produced as part of Reserved Matters.
- vii. The adequacy of the proposed scheme of cycle and pedestrian improvement works in the area to the south.
- viii. That there will be an unacceptable impact on highway safety as a result of the development, that cumulative impact of the development on the road network will be severe and that these impacts cannot be mitigated for.
- ix. The traffic calming measures, including the 20mph extension will lead to congestion.
- x. The effectiveness of verge parking and whether it can be accommodated.

Paul Clisby

PAUL CLISBY
LEGAL SERVICES MANAGER (CORPORATE)

Signed on behalf of Warrington Borough Council on ~~September 2020~~
27 January 2021

Paul Tyle


Signed on behalf of the appellant on 9th September 2020

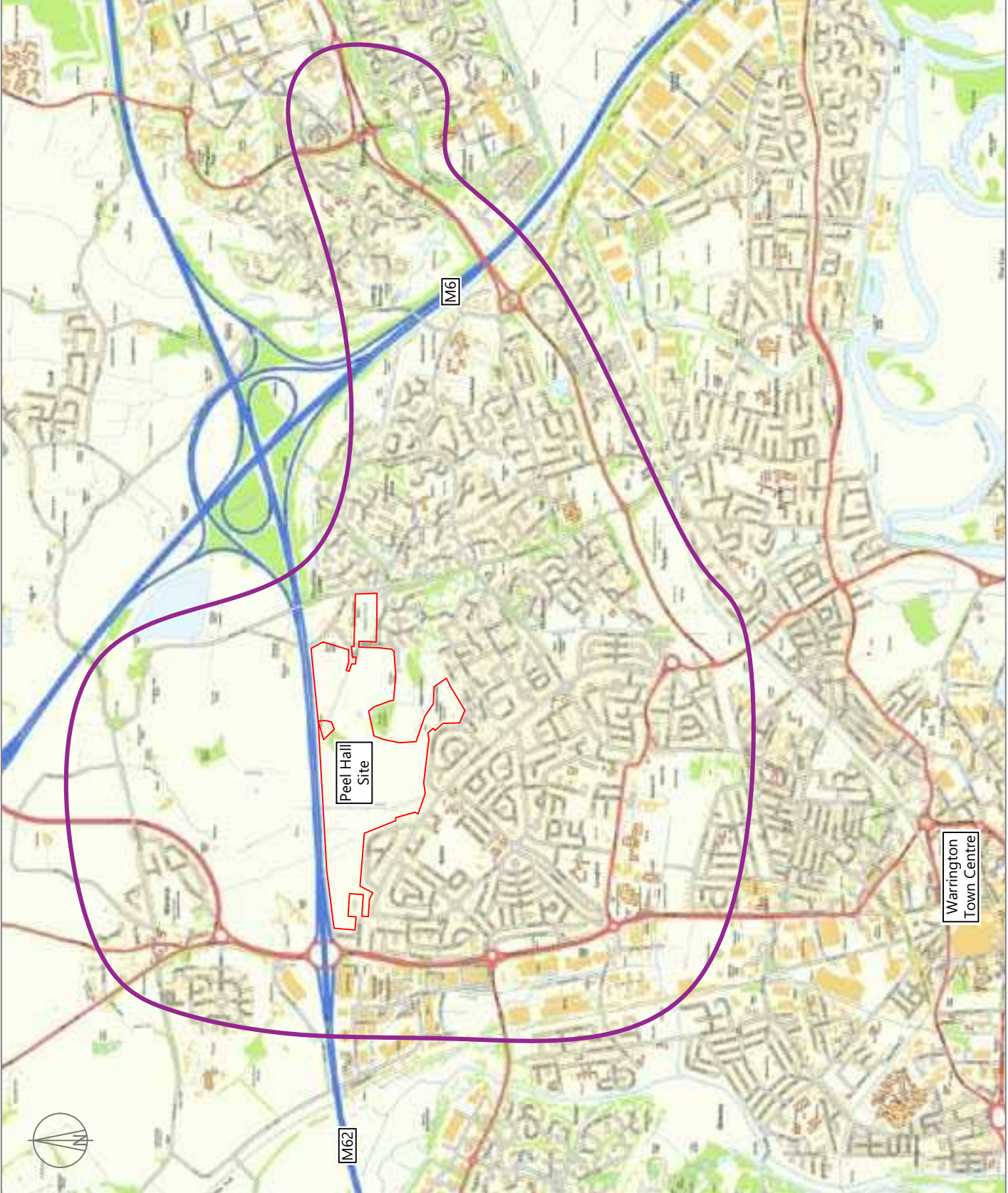


Signed on behalf of the Rule 6 Party on ... September 2020

Appendix SCG/1

Study Area

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<p>KEY:</p>  <p>Study Area</p>	<table border="1"> <tr> <th>ISSUE</th> <th>REASON FOR REVISION</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	ISSUE	REASON FOR REVISION	DATE			
ISSUE	REASON FOR REVISION	DATE					



<p>PROJECT:</p> <p>PEEL HALL, WARRINGTON</p>		
<p>CLIENT:</p> <p>SATNAM MILLENNIUM LTD</p>		
<p>PROJECT REFERENCE</p> <p>1107</p>	<p>DRAWING NUMBER</p> <p>ES T1</p>	<p>SCALE:</p> <p>NOT TO SCALE</p>

<p>HighgateTransportation</p> <p>www.highgatetransportation.co.uk First Floor, 43-45 Park Street Bristol BS1 5NL 0117 934 9121</p> <p>© Highgate Transportation Limited</p>		
<p>TITLE:</p> <p>ASSESSMENT STUDY AREA</p>		
<p>DATE</p> <p>24/01/18</p>	<p>DRAWN BY</p> <p>FB</p>	<p>CHECKED</p> <p>DT</p>

Appendix SCG/2

Site and Local Highway Network

A	Additional Roads Highlighted	03/09/2020	DATE
	REASON FOR REVISION		

PROJECT:
**PEEL HALL,
WARRINGTON**

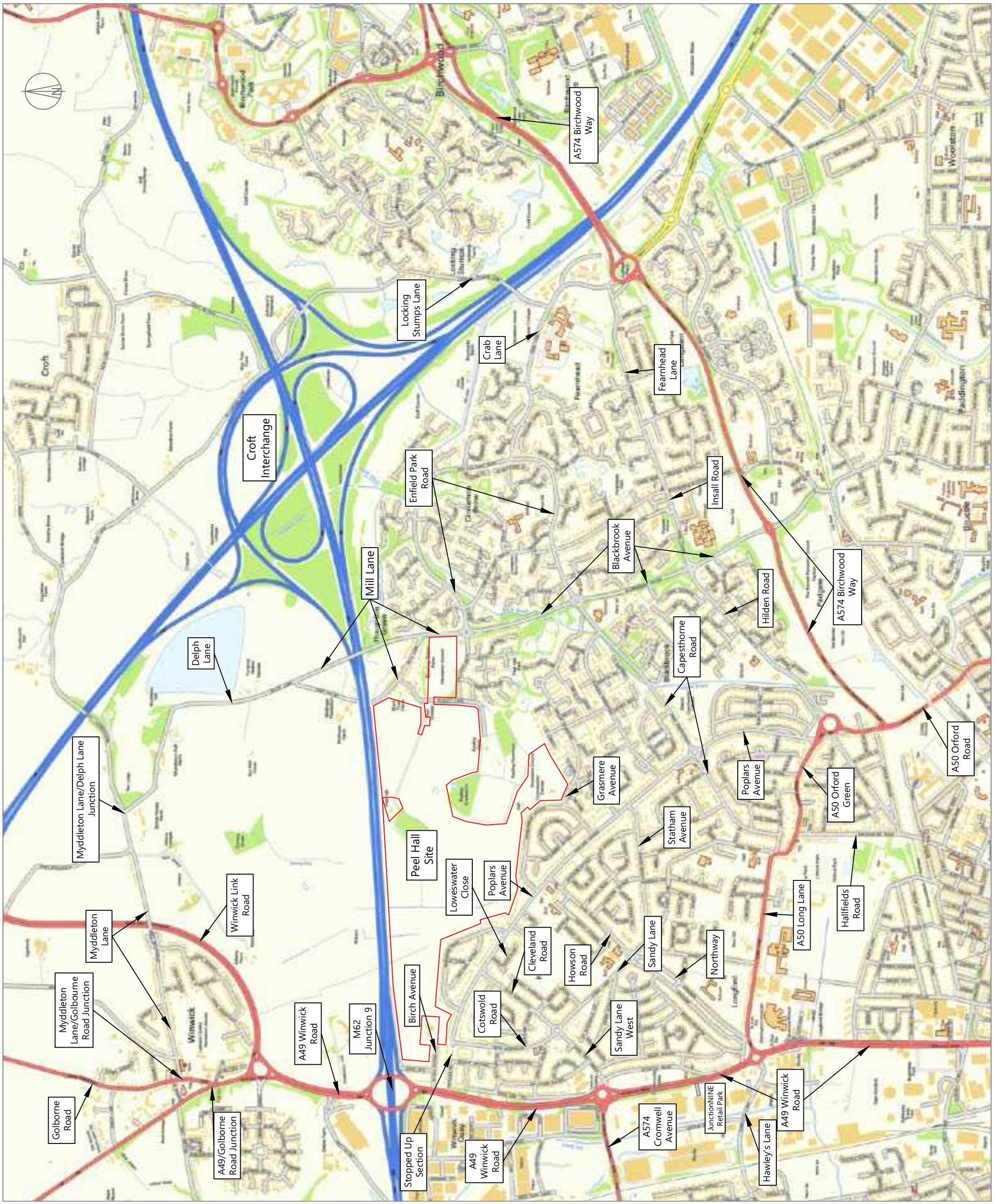
CLIENT:
**SATNAM MILLENNIUM
LTD**

PROJECT REFERENCE	DRAWING NUMBER	SCALE
1901	100	NOT TO SCALE

HighgateTransportation
www.highgatetransportation.co.uk
Box 13, 42 Triangle West
Park Street, Bristol BS8 1ES
07973 375 937 / 07595 892 217
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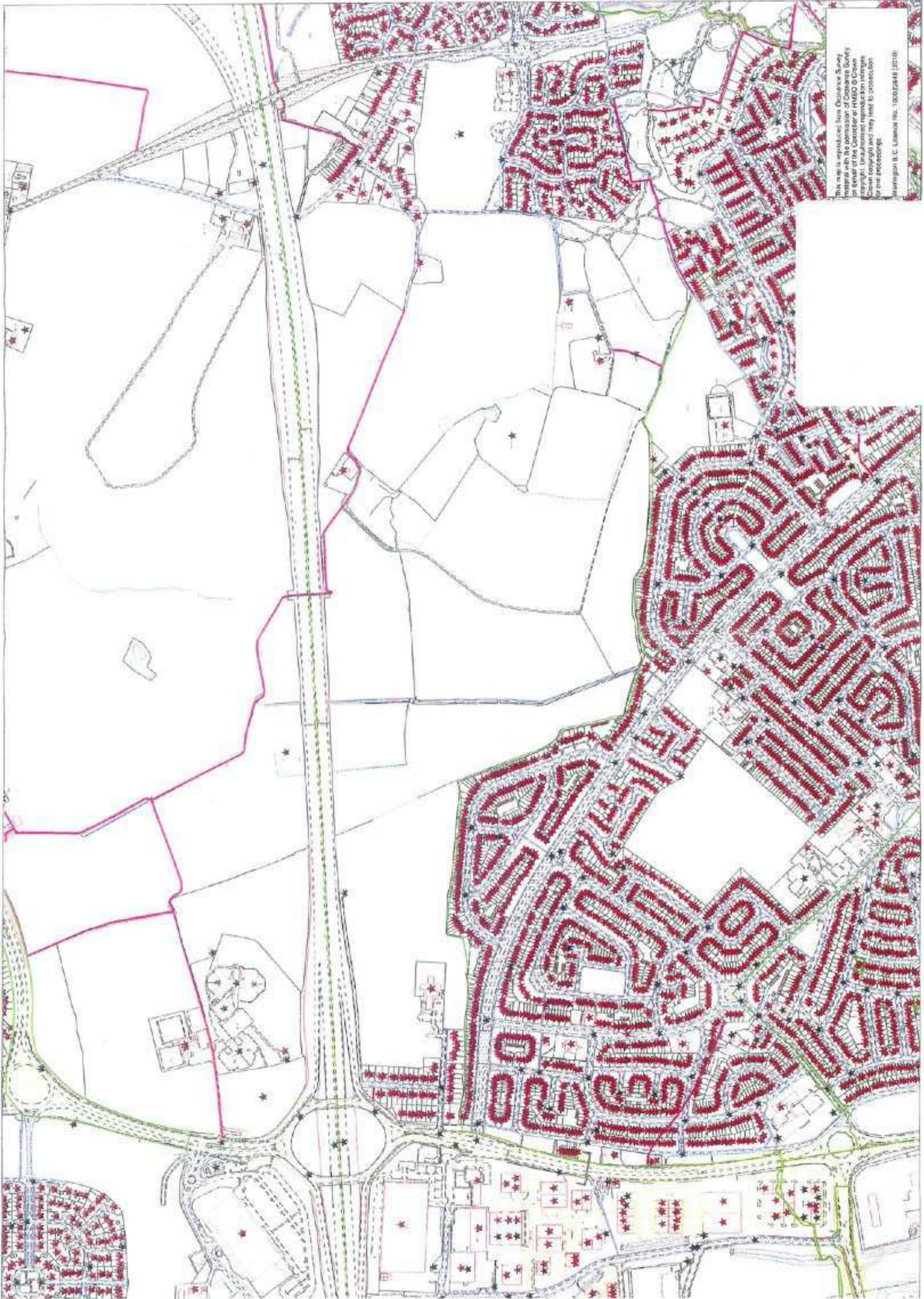
TITLE:
**EXISTING HIGHWAY NETWORK
WITHIN STUDY AREA**

DATE	DRAWN BY:	CHECKED:
17/03/20	FB	DT



Appendix SCG/3

Highway Adoption Records



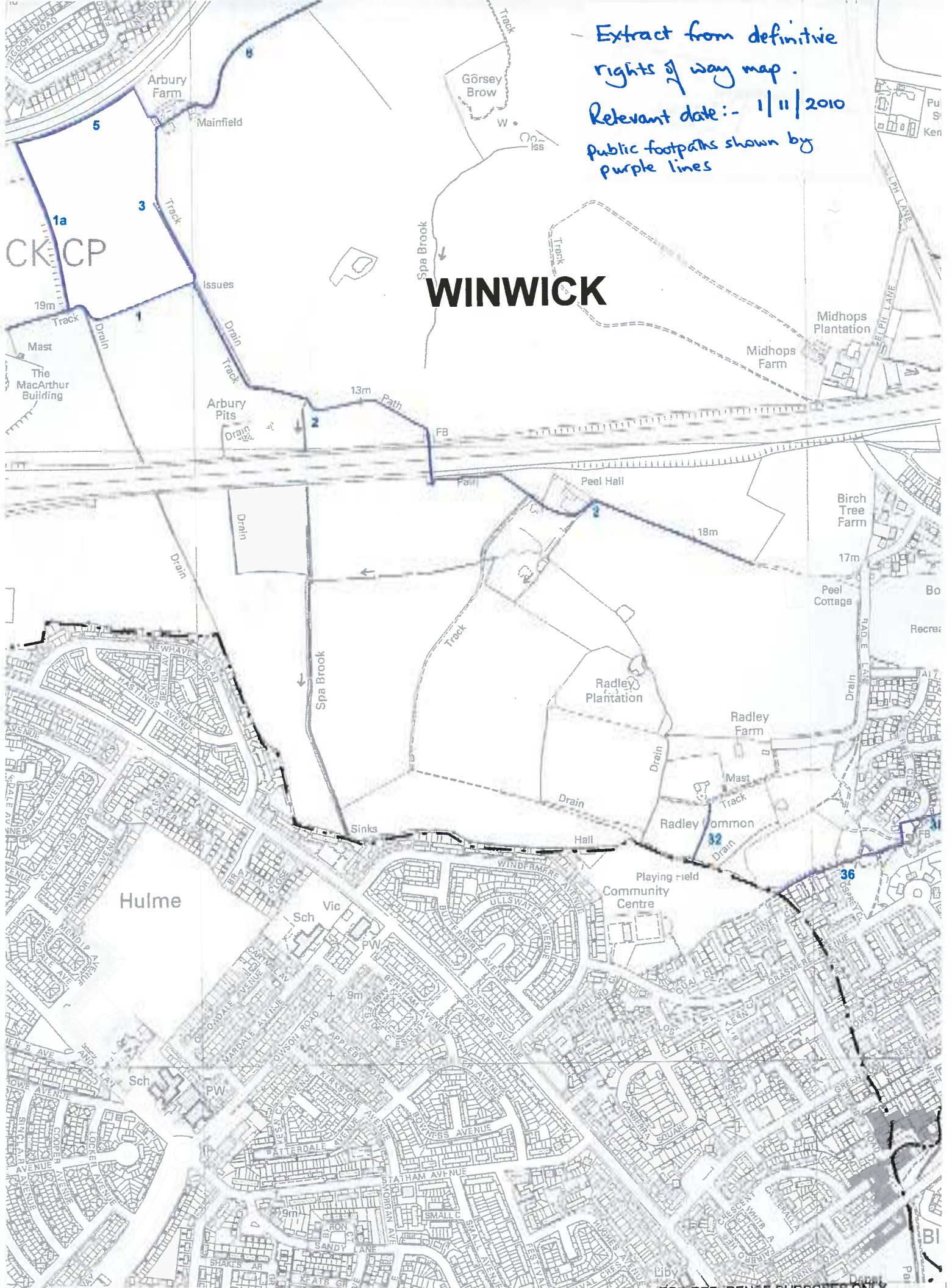
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Warrington B.C. Licence No. 10002948 (2010)

Extract from definitive rights of way map.
Relevant date:- 1/11/2010
public footpaths shown by purple lines

CK/CP

WINWICK



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Highway Boundary Information based on Warrington BC online mapping service

Project: 1901 – Date September 2020



Highway Boundary Information based on Warrington BC online mapping service

Project: 1901 – Date September 2020

A49 / Sandy Lane / Cromwell Avenue and Calver Road / Cromwell Avenue



Highway Boundary Information based on Warrington BC online mapping service

Project: 1901 – Date September 2020

A50 Orford Green / Poplars Avenue and Hilden Avenue





Highway Boundary Information based on Warrington BC online mapping service

Project: 1901 – Date September 2020

Capesthorne Road / Poplars Avenue





Highway Boundary Information based on Warrington BC online mapping service

Project: 1901 – Date September 2020

Sections of A49 Newtown Road, Poplars Avenue and Birch Avenue



Poplars Avenue between its junctions with Newhaven Road and Windermere Road



Highway Boundary Information based on Warrington BC online mapping service

Project: 1901 – Date September 2020



Highway Boundary Information based on Warrington BC online mapping service

Project: 1901 – Date September 2020

Section of Grasmere Avenue



Highway Boundary Information based on Warrington BC online mapping service

Project: 1901 – Date September 2020

Mill Lane and Radley Lane








Appendix SCG/4

Plan of Existing 20mph Speed Limits in the Vicinity of the Site

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Key

- Study area of 20mph speed restrictions
- Indicative extents of 20mph speed restrictions
- Indicative only - based on on-site observations and desk studies

ISSUE	REASON FOR REVISION	DATE

PROJECT:
 PEEL HALL,
 WARRINGTON

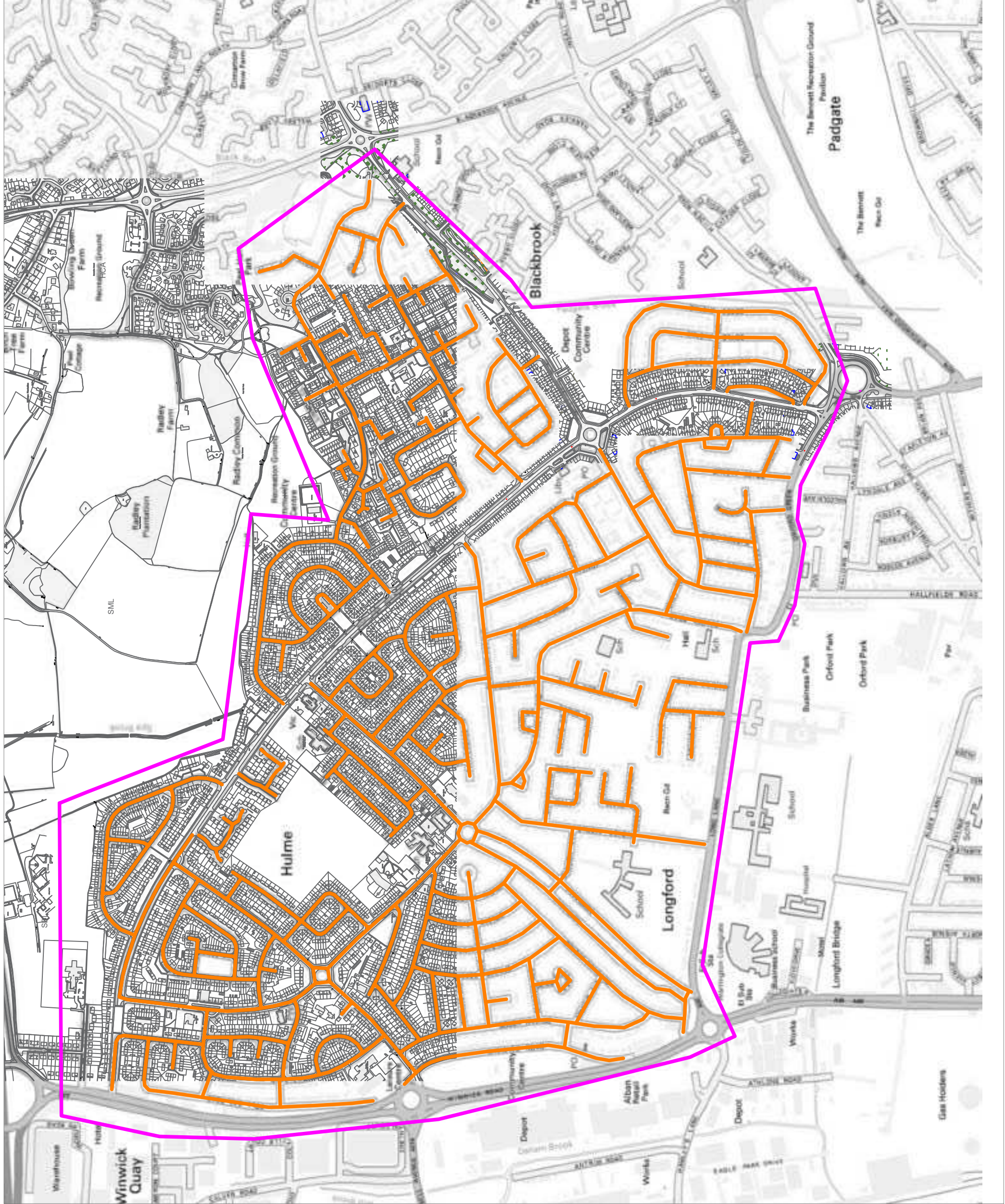
CLIENT:
 SATNAM MILLENNIUM
 LTD

PROJECT REFERENCE	DRAWING NUMBER	SCALE
1901	22	Not to Scale

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TITLE:
 INDICATIVE EXTENTS OF 20MPH SPEED
 RESTRICTIONS IN THE POPLARS AVENUE AREA

DATE	DRAWN BY:	CHECKED:
10.07.20	BL	FB



Appendix SCG/5

Bus Services

From 30 August to 06 December

Monday-Friday, Sunday - towards Warrington Bus Interchange

	329 ¹
St Helens Bus Station	1420
St Helens Central Station	1420
Pocket Nook Phoenix Brow	1420
Finger Post Traverse Street	1421
Finger Post Parr Stocks Road	1422
Parr Stocks Ramford Street	1423
Parr Stocks Tickle Avenue	1423
Broad Oak Hargreaves Street	1424
Broad Oak Moorfoot Road	1425
Derbyshire Hill Provident Street	1426
Derbyshire Hill Swan Avenue	1427
Derbyshire Hill Rudd Avenue	1428
Derbyshire Hill Waring Avenue	1428
Collins Green Broad Lane Corner	1431
Collins Green Bold Lane	1431
Burtonwood Green Lane	1433
Burtonwood Bridge Inn	1434
Burtonwood Chapel House	1435
Burtonwood Perrins Road	1435
Burtonwood Cambourne Road	1436
Burtonwood Fir Tree Lane	1436
Burtonwood Coopers Farm	1438
Burtonwood Fiddle in Bag	1439
Winwick Alder Root Lane	1440
Winwick Hollins Park Hospital	1441
Winwick Park	1442
Winwick St Oswald Church	1443
Winwick B&Q	1445
Hulme Mill Lane	1446
Hulme Fordton Leisure	1447
Hulme Sandy Lane West	1448
Longford Winwick Road College	1450
Longford Alder Lane	1451
Longford Ireland Street	1452
Bewsey Owen Street	1453
Bewsey Tesco	1453
Warrington Central Station	1455
Warrington Bus Interchange	1456

¹ Only During Bank Holidays

Monday-Friday - towards St Helens Bus Station

	329	329	329	329	329	329	329	329	329	329	329	329	329	329	329	329
Warrington Bus Interchange	0651	0728	0759	0827	0903	0935	1005	1035	1105	1135	1205	1235	1305	1341	1400	1425
Warrington Central Station	0651	0728	0759	0827	0903	0935	1005	1035	1105	1135	1205	1235	1305	1341	1400	1425
Bewsey Tesco	0653	0730	0801	0829	0905	0937	1007	1037	1107	1137	1207	1237	1307	1343	1402	1428
Bewsey Owen Street	0654	0731	0802	0830	0906	0938	1008	1038	1108	1138	1208	1238	1308	1344	1403	1428
Longford Ireland Street	0655	0732	0803	0831	0907	0939	1009	1039	1109	1139	1209	1239	1309	1345	1404	1429
Longford Alder Lane	0656	0733	0804	0832	0908	0940	1010	1040	1110	1140	1210	1240	1310	1346	1405	1431
Longford Winwick Road College	0657	0734	0805	0833	0909	0941	1011	1041	1111	1141	1211	1241	1311	1347	1406	1432
Longford Alban Retail Park	0658	0735	0806	0834	0910	0942	1012	1042	1112	1142	1212	1242	1312	1348	1407	1433
Hulme Sandy Lane West	0659	0736	0807	0835	0911	0943	1013	1043	1113	1143	1213	1243	1313	1349	1409	1435
Hulme Mill Lane	0701	0738	0809	0837	0913	0945	1015	1045	1115	1145	1215	1245	1315	1351	1411	1437
Winwick B&Q	0704	0741	0812	0840	0916	0948	1018	1048	1118	1148	1218	1248	1318	1354	1414	1440
Winwick St Oswald Church	0705	0742	0813	0841	0917	0949	1019	1049	1119	1149	1219	1249	1319	1355	1415	1441
Winwick Park	0705	0742	0813	0841	0917	0949	1019	1049	1119	1149	1219	1249	1319	1355	1415	1441
Winwick Hollins Park Hospital	0706	0743	0814	0842	0918	0950	1020	1050	1120	1150	1220	1250	1320	1356	1416	1442
Winwick Watery Lane	0707	0744	0815	0843	0919	0951	1021	1051	1121	1151	1221	1251	1321	1357	1417	1443
Winwick Alder Root Lane	0708	0745	0816	0844	0920	0952	1022	1052	1122	1152	1222	1252	1322	1358	1418	1444
Burtonwood Fiddle in Bag	0709	0746	0817	0845	0921	0953	1023	1053	1123	1153	1223	1253	1323	1359	1419	1445
Burtonwood Coopers Farm	0710	0747	0818	0846	0922	0954	1024	1054	1124	1154	1224	1254	1324	1400	1420	1446

	329	329	329	329	329	329	329	329	329	329	329	329	329	329	329	329
Burtonwood Fir Tree Lane	0711	0748	0819	0847	0923	0955	1025	1055	1125	1155	1225	1255	1325	1401	1421	1447
Burtonwood Cambourne Road	0712	0749	0820	0848	0924	0956	1026	1056	1126	1156	1226	1256	1326	1402	1422	1448
Burtonwood Perrins Road	0713	0750	0821	0849	0925	0957	1027	1057	1127	1157	1227	1257	1327	1403	1423	1449
Burtonwood Post Office	0714	0751	0822	0850	0926	0958	1028	1058	1128	1158	1228	1258	1328	1404	1424	1450
Burtonwood Bridge Inn	0714	0751	0822	0850	0926	0958	1028	1058	1128	1158	1228	1258	1328	1404	1424	1450
Burtonwood Green Lane	0715	0752	0823	0851	0927	0959	1029	1059	1129	1159	1229	1259	1329	1405	1425	1451
Collins Green Bold Lane	0716	0753	0824	0852	0928	1000	1030	1100	1130	1200	1230	1300	1330	1406	1426	1452
Collins Green Broad Lane Corner	0716	0754	0825	0853	0929	1001	1031	1101	1131	1201	1231	1301	1331	1407	1427	1453
Collins Green Broad Lane	0718	0755	0827	0855	0930	1002	1032	1102	1132	1202	1232	1302	1332	1408	1428	1454
Derbyshire Hill Road	0719	0756	0828	0856	0931	1003	1033	1103	1133	1203	1233	1303	1333	1409	1429	1455
Derbyshire Hill Road	0719	0757	0828	0856	0932	1004	1034	1104	1134	1204	1234	1304	1334	1410	1430	1456
Derbyshire Hill Swan Avenue	0720	0757	0829	0857	0932	1004	1034	1104	1134	1204	1234	1304	1334	1410	1430	1456
Derbyshire Hill Provident Street	0720	0758	0830	0858	0933	1005	1035	1105	1135	1205	1235	1305	1335	1411	1431	1457
Broad Oak Mendip Grove	0721	0759	0830	0858	0934	1006	1036	1106	1136	1206	1236	1306	1336	1412	1432	1458
Broad Oak Nicholson Street	0722	0800	0831	0859	0935	1007	1037	1107	1137	1207	1237	1307	1337	1413	1433	1459
Parr Stocks Boardmans Lane	0722	0800	0832	0900	0935	1007	1037	1107	1137	1207	1237	1307	1337	1413	1433	1459
Parr Stocks Gaskell Street	0723	0801	0833	0901	0936	1008	1038	1108	1138	1208	1238	1308	1338	1414	1434	1500
Parr Stocks Ramford Street	0724	0801	0833	0901	0936	1008	1038	1108	1138	1208	1238	1308	1338	1414	1434	1500
Finger Post Sorogold Street	0724	0802	0834	0902	0937	1009	1039	1109	1139	1209	1239	1309	1339	1415	1435	1501
Finger Post Langtree Street	0725	0803	0835	0903	0938	1010	1040	1110	1140	1210	1240	1310	1340	1416	1436	1502
Finger Post Phoenix Brow	0726	0803	0835	0903	0938	1010	1040	1110	1140	1210	1240	1310	1340	1416	1436	1502
St Helens Central Station	0726	0804	0836	0904	0939	1011	1041	1111	1141	1211	1241	1311	1341	1417	1437	1503
St Helens Bus Station	0727	0805	0837	0905	0940	1012	1042	1112	1142	1212	1242	1312	1342	1418	1438	1504

Monday-Friday - towards St Helens Bus Station

	329	329	329	329	329	329	329	329
Warrington Bus Interchange	1500	1530	1602	1635	1715	1752	1831	1911
Warrington Central Station	1500	1530	1602	1636	1716	1752	1831	1911
Bewsey Tesco	1503	1533	1605	1638	1718	1755	1833	1913
Bewsey Owen Street	1503	1533	1605	1639	1719	1755	1834	1913
Longford Ireland Street	1504	1534	1606	1640	1720	1756	1835	1914
Longford Alder Lane	1506	1536	1608	1642	1722	1758	1836	1915
Longford Winwick Road College	1507	1537	1609	1643	1723	1759	1837	1916
Longford Alban Retail Park	1508	1538	1610	1644	1724	1800	1838	1917
Hulme Sandy Lane West	1510	1540	1612	1647	1727	1802	1839	1918
Hulme Mill Lane	1512	1542	1614	1650	1730	1804	1841	1920
Winwick B&Q	1515	1545	1617	1653	1733	1807	1844	1922
Winwick St Oswald Church	1516	1546	1618	1654	1734	1808	1845	1923
Winwick Park	1516	1546	1618	1655	1735	1808	1845	1923
Winwick Hollins Park Hospital	1517	1547	1619	1656	1736	1809	1846	1924
Winwick Watery Lane	1518	1548	1620	1657	1737	1810	1847	1925
Winwick Alder Root Lane	1519	1549	1621	1657	1737	1811	1848	1926
Burtonwood Fiddle in Bag	1520	1550	1622	1658	1738	1812	1849	1927
Burtonwood Coopers Farm	1521	1551	1623	1659	1739	1813	1850	1928
Burtonwood Fir Tree Lane	1522	1552	1624	1701	1741	1814	1851	1929
Burtonwood Cambourne Road	1523	1553	1625	1702	1742	1815	1852	1930
Burtonwood Perrins Road	1524	1554	1626	1703	1743	1816	1853	1931
Burtonwood Post Office	1525	1555	1627	1704	1744	1817	1854	1932
Burtonwood Bridge Inn	1525	1555	1627	1704	1744	1817	1854	1932
Burtonwood Green Lane	1526	1556	1628	1705	1745	1818	1855	1932
Collins Green Bold Lane	1527	1557	1629	1706	1746	1819	1856	1934
Collins Green Broad Lane Corner	1528	1558	1630	1707	1747	1820	1856	1934
Collins Green Broad Lane	1529	1559	1631	1709	1749	1822	1858	1936
Derbyshire Hill Road	1530	1600	1632	1710	1750	1823	1859	1937
Derbyshire Hill Road	1531	1601	1633	1710	1750	1823	1859	1937
Derbyshire Hill Swan Avenue	1531	1601	1633	1711	1751	1824	1900	1937
Derbyshire Hill Provident Street	1532	1602	1634	1712	1752	1825	1900	1938
Broad Oak Mendip Grove	1533	1603	1635	1712	1752	1825	1901	1939
Broad Oak Nicholson Street	1534	1604	1636	1713	1753	1826	1902	1939
Parr Stocks Boardmans Lane	1534	1604	1636	1714	1754	1827	1902	1940
Parr Stocks Gaskell Street	1535	1605	1637	1715	1755	1828	1903	1941
Parr Stocks Ramford Street	1535	1605	1637	1715	1755	1828	1904	1941
Finger Post Sorogold Street	1536	1606	1638	1716	1756	1829	1904	1941
Finger Post Langtree Street	1537	1607	1639	1717	1757	1830	1905	1942
Finger Post Phoenix Brow	1537	1607	1639	1717	1757	1830	1906	1943
St Helens Central Station	1538	1608	1640	1718	1758	1831	1906	1943
St Helens Bus Station	1539	1609	1641	1719	1759	1832	1907	1944

Monday-Friday - towards Warrington Bus Interchange

	329	329	329	329	329	329	329	329	329	329	329	329	329	329	329	329
St Helens Bus Station	0613	0643	0707	0734	0809	0844	0918	0948	1018	1048	1118	1148	1218	1248	1318	1348
St Helens Central Station	0613	0643	0707	0734	0809	0844	0918	0948	1018	1048	1118	1148	1218	1248	1318	1348
Pocket Nook Phoenix Brow	0613	0643	0708	0735	0809	0844	0918	0948	1018	1048	1118	1148	1218	1248	1318	1348
Finger Post Traverse Street	0614	0644	0708	0736	0810	0845	0919	0949	1019	1049	1119	1149	1219	1249	1319	1349
Finger Post Parr Stocks Road	0615	0645	0710	0737	0811	0846	0920	0950	1020	1050	1120	1150	1220	1250	1320	1350
Parr Stocks Ramford Street	0616	0646	0710	0738	0812	0847	0921	0951	1021	1051	1121	1151	1221	1251	1321	1351
Parr Stocks Tickle Avenue	0616	0646	0711	0739	0812	0847	0921	0951	1021	1051	1121	1151	1221	1251	1321	1351
Broad Oak Hargreaves Street	0617	0647	0712	0740	0813	0848	0922	0952	1022	1052	1122	1152	1222	1252	1322	1352
Broad Oak Moorfoot Road	0618	0648	0713	0741	0814	0849	0923	0953	1023	1053	1123	1153	1223	1253	1323	1353
Derbyshire Hill Provident Street	0619	0649	0715	0743	0815	0850	0924	0954	1024	1054	1124	1154	1224	1254	1324	1354
Derbyshire Hill Swan Avenue	0620	0650	0716	0744	0816	0851	0925	0955	1025	1055	1125	1155	1225	1255	1325	1355
Derbyshire Hill Rudd Avenue	0621	0651	0716	0744	0817	0852	0926	0956	1026	1056	1126	1156	1226	1256	1326	1356
Derbyshire Hill Waring Avenue	0621	0651	0717	0745	0817	0852	0926	0956	1026	1056	1126	1156	1226	1256	1326	1356
Collins Green Broad Lane Corner	0624	0654	0720	0749	0820	0855	0929	0959	1029	1059	1129	1159	1229	1259	1329	1359
Collins Green Bold Lane	0624	0654	0721	0749	0820	0855	0929	0959	1029	1059	1129	1159	1229	1259	1329	1359
Burtonwood Green Lane	0626	0656	0723	0752	0822	0857	0931	1001	1031	1101	1131	1201	1231	1301	1331	1401
Burtonwood Bridge Inn	0627	0657	0724	0753	0823	0858	0932	1002	1032	1102	1132	1202	1232	1302	1332	1402
Burtonwood Chapel House	0628	0658	0725	0754	0824	0859	0933	1003	1033	1103	1133	1203	1233	1303	1333	1403
Burtonwood Perrins Road	0628	0658	0725	0755	0825	0859	0933	1003	1033	1103	1133	1203	1233	1303	1333	1403
Burtonwood Cambourne Road	0629	0659	0726	0756	0826	0900	0934	1004	1034	1104	1134	1204	1234	1304	1334	1404
Burtonwood Fir Tree Lane	0629	0659	0727	0756	0826	0900	0934	1004	1034	1104	1134	1204	1234	1304	1334	1404
Burtonwood Coopers Farm	0631	0701	0729	0759	0829	0902	0936	1006	1036	1106	1136	1206	1236	1306	1336	1406
Burtonwood Fiddle in Bag	0632	0702	0730	0800	0830	0903	0937	1007	1037	1107	1137	1207	1237	1307	1337	1407
Winwick Alder Root Lane	0633	0703	0732	0802	0832	0904	0938	1008	1038	1108	1138	1208	1238	1308	1338	1408
Winwick Hollins Park Hospital	0634	0704	0733	0804	0834	0905	0939	1009	1039	1109	1139	1209	1239	1309	1339	1409
Winwick Park	0635	0705	0735	0805	0835	0906	0940	1010	1040	1110	1140	1210	1240	1310	1340	1410
Winwick St Oswald Church	0636	0706	0736	0806	0836	0907	0941	1011	1041	1111	1141	1211	1241	1311	1341	1411
Winwick B&Q	0638	0708	0738	0809	0839	0909	0943	1013	1043	1113	1143	1213	1243	1313	1343	1413
Hulme Mill Lane	0639	0709	0739	0811	0841	0911	0944	1014	1044	1114	1144	1214	1244	1314	1344	1414
Hulme Fordton Leisure	0640	0710	0740	0812	0842	0912	0945	1015	1045	1115	1145	1215	1245	1315	1345	1415
Hulme Sandy Lane West	0641	0711	0742	0813	0843	0913	0946	1016	1046	1116	1146	1216	1246	1316	1346	1416
Longford Winwick Road College	0643	0713	0744	0816	0846	0916	0948	1018	1048	1118	1148	1218	1248	1318	1348	1418
Longford Alder Lane	0644	0714	0745	0817	0847	0917	0949	1019	1049	1119	1149	1219	1249	1319	1349	1419
Longford Ireland Street	0645	0715	0746	0818	0848	0918	0950	1020	1050	1120	1150	1220	1250	1320	1350	1420
Bewsey Owen Street	0646	0716	0747	0820	0850	0920	0951	1021	1051	1121	1151	1221	1251	1321	1351	1421
Bewsey Tesco	0646	0716	0748	0820	0850	0920	0951	1021	1051	1121	1151	1221	1251	1321	1351	1421
Warrington Central Station	0648	0718	0750	0823	0853	0923	0953	1023	1053	1123	1153	1223	1253	1323	1353	1423
Warrington Bus Interchange	0649	0719	0751	0824	0854	0924	0954	1024	1054	1124	1154	1224	1254	1324	1354	1424

Monday-Friday - towards Warrington Bus Interchange

	329	329	329	329	329	329	329
St Helens Bus Station	1448	1518	1555	1620	1655	1726	1805
St Helens Central Station	1448	1518	1555	1620	1655	1726	1805
Pocket Nook Phoenix Brow	1448	1519	1556	1621	1656	1726	1805
Finger Post Traverse Street	1449	1519	1556	1621	1656	1727	1806
Finger Post Parr Stocks Road	1450	1521	1558	1623	1658	1728	1807
Parr Stocks Ramford Street	1451	1521	1558	1623	1658	1729	1807
Parr Stocks Tickle Avenue	1452	1522	1559	1624	1659	1729	1808
Broad Oak Hargreaves Street	1453	1523	1600	1625	1700	1730	1809
Broad Oak Moorfoot Road	1454	1524	1601	1626	1701	1731	1810
Derbyshire Hill Provident Street	1455	1526	1603	1628	1703	1732	1811
Derbyshire Hill Swan Avenue	1455	1527	1604	1629	1704	1733	1811
Derbyshire Hill Rudd Avenue	1456	1527	1604	1629	1704	1734	1812
Derbyshire Hill Waring Avenue	1456	1528	1605	1630	1705	1734	1812
Collins Green Broad Lane Corner	1500	1531	1608	1633	1708	1737	1815
Collins Green Bold Lane	1500	1532	1609	1634	1709	1737	1816
Burtonwood Green Lane	1502	1534	1611	1636	1711	1739	1817
Burtonwood Bridge Inn	1503	1535	1612	1637	1712	1740	1818
Burtonwood Chapel House	1504	1536	1613	1638	1713	1741	1819
Burtonwood Perrins Road	1504	1536	1613	1638	1713	1741	1819
Burtonwood Cambourne Road	1505	1537	1614	1639	1714	1742	1820
Burtonwood Fir Tree Lane	1505	1537	1614	1639	1714	1742	1820
Burtonwood Coopers Farm	1507	1539	1616	1641	1716	1744	1822
Burtonwood Fiddle in Bag	1508	1540	1617	1642	1717	1745	1823
Winwick Alder Root Lane	1509	1541	1618	1643	1718	1746	1824
Winwick Hollins Park Hospital	1510	1542	1619	1644	1719	1747	1825

	329	329	329	329	329	329	329
Winwick Park	1511	1543	1620	1645	1720	1748	1826
Winwick St Oswald Church	1512	1544	1621	1646	1721	1749	1827
Winwick B&Q	1514	1546	1623	1648	1723	1751	1829
Hulme Mill Lane	1515	1547	1624	1649	1724	1752	1830
Hulme Fordton Leisure	1516	1548	1625	1650	1725	1753	1831
Hulme Sandy Lane West	1517	1549	1626	1651	1727	1754	1832
Longford Winwick Road College	1519	1551	1628	1653	1729	1756	1834
Longford Alder Lane	1521	1553	1630	1655	1730	1757	1835
Longford Ireland Street	1521	1553	1630	1655	1731	1758	1836
Bewsey Owen Street	1523	1555	1632	1657	1732	1759	1837
Bewsey Tesco	1523	1555	1632	1657	1733	1759	1837
Warrington Central Station	1525	1557	1634	1659	1735	1801	1839
Warrington Bus Interchange	1526	1558	1635	1700	1736	1802	1840

Saturday,Sunday - towards Warrington Bus Interchange

	329 ¹	329 ¹	329 ¹	329 ¹	329 ¹
St Helens Bus Station	0920	1120	1320	1520	1720
St Helens Central Station	0920	1120	1320	1520	1720
Pocket Nook Phoenix Brow	0920	1120	1320	1520	1720
Finger Post Traverse Street	0921	1121	1321	1521	1721
Finger Post Parr Stocks Road	0922	1122	1322	1522	1722
Parr Stocks Ramford Street	0923	1123	1323	1523	1723
Parr Stocks Tickle Avenue	0923	1123	1323	1523	1723
Broad Oak Hargreaves Street	0924	1124	1324	1524	1724
Broad Oak Moorfoot Road	0925	1125	1325	1525	1725
Derbyshire Hill Provident Street	0926	1126	1326	1526	1726
Derbyshire Hill Swan Avenue	0927	1127	1327	1527	1727
Derbyshire Hill Rudd Avenue	0928	1128	1328	1528	1728
Derbyshire Hill Waring Avenue	0928	1128	1328	1528	1728
Collins Green Broad Lane Corner	0931	1131	1331	1531	1731
Collins Green Bold Lane	0931	1131	1331	1531	1731
Burtonwood Green Lane	0933	1133	1333	1533	1733
Burtonwood Bridge Inn	0934	1134	1334	1534	1734
Burtonwood Chapel House	0935	1135	1335	1535	1735
Burtonwood Perrins Road	0935	1135	1335	1535	1735
Burtonwood Cambourne Road	0936	1136	1336	1536	1736
Burtonwood Fir Tree Lane	0936	1136	1336	1536	1736
Burtonwood Coopers Farm	0938	1138	1338	1538	1738
Burtonwood Fiddle in Bag	0939	1139	1339	1539	1739
Winwick Alder Root Lane	0940	1140	1340	1540	1740
Winwick Hollins Park Hospital	0941	1141	1341	1541	1741
Winwick Park	0942	1142	1342	1542	1742
Winwick St Oswald Church	0943	1143	1343	1543	1743
Winwick B&Q	0945	1145	1345	1545	1745
Hulme Mill Lane	0946	1146	1346	1546	1746
Hulme Fordton Leisure	0947	1147	1347	1547	1747
Hulme Sandy Lane West	0948	1148	1348	1548	1748
Longford Winwick Road College	0950	1150	1350	1550	1750
Longford Alder Lane	0951	1151	1351	1551	1751
Longford Ireland Street	0952	1152	1352	1552	1752
Bewsey Owen Street	0953	1153	1353	1553	1753
Bewsey Tesco	0953	1153	1353	1553	1753
Warrington Central Station	0955	1155	1355	1555	1755
Warrington Bus Interchange	0956	1156	1356	1556	1756

¹ Only During Bank Holidays

Saturday - towards St Helens Bus Station

	329	329	329	329	329	329	329	329	329	329	329	329	329	329	329	
Warrington Bus Interchange	0758	0838	0918	0958	1038	1118	1158	1238	1318	1358	1438	1518	1558	1638	1718	1758
Warrington Central Station	0758	0838	0918	0958	1038	1118	1158	1238	1318	1358	1438	1518	1558	1638	1718	1758
Bewsey Tesco	0800	0840	0920	1000	1040	1120	1200	1240	1320	1400	1440	1520	1600	1640	1720	1800
Bewsey Owen Street	0801	0841	0921	1001	1041	1121	1201	1241	1321	1401	1441	1521	1601	1641	1721	1801
Longford Ireland Street	0802	0842	0922	1002	1042	1122	1202	1242	1322	1402	1442	1522	1602	1642	1722	1802
Longford Alder Lane	0803	0843	0923	1003	1043	1123	1203	1243	1323	1403	1443	1523	1603	1643	1723	1803
Longford Winwick Road College	0804	0844	0924	1004	1044	1124	1204	1244	1324	1404	1444	1524	1604	1644	1724	1804
Longford Alban Retail Park	0805	0845	0925	1005	1045	1125	1205	1245	1325	1405	1445	1525	1605	1645	1725	1805

	329	329	329	329	329	329	329	329	329	329	329	329	329	329	329	329
Hulme Sandy Lane West	0806	0846	0926	1006	1046	1126	1206	1246	1326	1406	1446	1526	1606	1646	1726	1806
Hulme Mill Lane	0808	0848	0928	1008	1048	1128	1208	1248	1328	1408	1448	1528	1608	1648	1728	1808
Winwick B&Q	0811	0851	0931	1011	1051	1131	1211	1251	1331	1411	1451	1531	1611	1651	1731	1811
Winwick St Oswald Church	0812	0852	0932	1012	1052	1132	1212	1252	1332	1412	1452	1532	1612	1652	1732	1812
Winwick Park	0812	0852	0932	1012	1052	1132	1212	1252	1332	1412	1452	1532	1612	1652	1732	1812
Winwick Hollins Park Hospital	0813	0853	0933	1013	1053	1133	1213	1253	1333	1413	1453	1533	1613	1653	1733	1813
Winwick Watery Lane	0814	0854	0934	1014	1054	1134	1214	1254	1334	1414	1454	1534	1614	1654	1734	1814
Winwick Alder Root Lane	0815	0855	0935	1015	1055	1135	1215	1255	1335	1415	1455	1535	1615	1655	1735	1815
Burtonwood Fiddle in Bag	0816	0856	0936	1016	1056	1136	1216	1256	1336	1416	1456	1536	1616	1656	1736	1816
Burtonwood Coopers Farm	0817	0857	0937	1017	1057	1137	1217	1257	1337	1417	1457	1537	1617	1657	1737	1817
Burtonwood Fir Tree Lane	0818	0858	0938	1018	1058	1138	1218	1258	1338	1418	1458	1538	1618	1658	1738	1818
Burtonwood Cambourne Road	0819	0859	0939	1019	1059	1139	1219	1259	1339	1419	1459	1539	1619	1659	1739	1819
Burtonwood Perrins Road	0820	0900	0940	1020	1100	1140	1220	1300	1340	1420	1500	1540	1620	1700	1740	1820
Burtonwood Post Office	0821	0901	0941	1021	1101	1141	1221	1301	1341	1421	1501	1541	1621	1701	1741	1821
Burtonwood Bridge Inn	0821	0901	0941	1021	1101	1141	1221	1301	1341	1421	1501	1541	1621	1701	1741	1821
Burtonwood Green Lane	0822	0902	0942	1022	1102	1142	1222	1302	1342	1422	1502	1542	1622	1702	1742	1822
Collins Green Bold Lane	0823	0903	0943	1023	1103	1143	1223	1303	1343	1423	1503	1543	1623	1703	1743	1823
Collins Green Broad Lane Corner	0824	0904	0944	1024	1104	1144	1224	1304	1344	1424	1504	1544	1624	1704	1744	1824
Collins Green Broad Lane	0825	0905	0945	1025	1105	1145	1225	1305	1345	1425	1505	1545	1625	1705	1745	1825
Derbyshire Hill Road	0826	0906	0946	1026	1106	1146	1226	1306	1346	1426	1506	1546	1626	1706	1746	1826
Derbyshire Hill Road	0827	0907	0947	1027	1107	1147	1227	1307	1347	1427	1507	1547	1627	1707	1747	1827
Derbyshire Hill Swan Avenue	0827	0907	0947	1027	1107	1147	1227	1307	1347	1427	1507	1547	1627	1707	1747	1827
Derbyshire Hill Provident Street	0828	0908	0948	1028	1108	1148	1228	1308	1348	1428	1508	1548	1628	1708	1748	1828
Broad Oak Mendip Grove	0829	0909	0949	1029	1109	1149	1229	1309	1349	1429	1509	1549	1629	1709	1749	1829
Broad Oak Nicholson Street	0830	0910	0950	1030	1110	1150	1230	1310	1350	1430	1510	1550	1630	1710	1750	1830
Parr Stocks Boardmans Lane	0830	0910	0950	1030	1110	1150	1230	1310	1350	1430	1510	1550	1630	1710	1750	1830
Parr Stocks Gaskell Street	0831	0911	0951	1031	1111	1151	1231	1311	1351	1431	1511	1551	1631	1711	1751	1831
Parr Stocks Ramford Street	0831	0911	0951	1031	1111	1151	1231	1311	1351	1431	1511	1551	1631	1711	1751	1831
Finger Post Sorogold Street	0832	0912	0952	1032	1112	1152	1232	1312	1352	1432	1512	1552	1632	1712	1752	1832
Finger Post Langtree Street	0833	0913	0953	1033	1113	1153	1233	1313	1353	1433	1513	1553	1633	1713	1753	1833
Finger Post Phoenix Brow	0833	0913	0953	1033	1113	1153	1233	1313	1353	1433	1513	1553	1633	1713	1753	1833
St Helens Central Station	0834	0914	0954	1034	1114	1154	1234	1314	1354	1434	1514	1554	1634	1714	1754	1834
St Helens Bus Station	0835	0915	0955	1035	1115	1155	1235	1315	1355	1435	1515	1555	1635	1715	1755	1835

Saturday - towards St Helens Bus Station

	329	329
Warrington Bus Interchange	1838	1918
Warrington Central Station	1838	1918
Bewsey Tesco	1840	1920
Bewsey Owen Street	1841	1921
Longford Ireland Street	1842	1922
Longford Alder Lane	1843	1923
Longford Winwick Road College	1844	1924
Longford Alban Retail Park	1845	1925
Hulme Sandy Lane West	1846	1926
Hulme Mill Lane	1848	1928
Winwick B&Q	1851	1931
Winwick St Oswald Church	1852	1932
Winwick Park	1852	1932
Winwick Hollins Park Hospital	1853	1933
Winwick Watery Lane	1854	1934
Winwick Alder Root Lane	1855	1935
Burtonwood Fiddle in Bag	1856	1936
Burtonwood Coopers Farm	1857	1937
Burtonwood Fir Tree Lane	1858	1938
Burtonwood Cambourne Road	1859	1939
Burtonwood Perrins Road	1900	1940
Burtonwood Post Office	1901	1941
Burtonwood Bridge Inn	1901	1941
Burtonwood Green Lane	1902	1942
Collins Green Bold Lane	1903	1943
Collins Green Broad Lane Corner	1904	1944
Collins Green Broad Lane	1905	1945
Derbyshire Hill Road	1906	1946
Derbyshire Hill Road	1907	1947
Derbyshire Hill Swan Avenue	1907	1947
Derbyshire Hill Provident Street	1908	1948
Broad Oak Mendip Grove	1909	1949

	329	329
Broad Oak Nicholson Street	1910	1950
Parr Stocks Boardmans Lane	1910	1950
Parr Stocks Gaskell Street	1911	1951
Parr Stocks Ramford Street	1911	1951
Finger Post Sorogold Street	1912	1952
Finger Post Langtree Street	1913	1953
Finger Post Phoenix Brow	1913	1953
St Helens Central Station	1914	1954
St Helens Bus Station	1915	1955

Saturday - towards Warrington Bus Interchange

	329	329	329	329	329	329	329	329	329	329	329	329	329
St Helens Bus Station	0720	0800	0840	1000	1040	1200	1240	1400	1440	1600	1640	1800	1840
St Helens Central Station	0720	0800	0840	1000	1040	1200	1240	1400	1440	1600	1640	1800	1840
Pocket Nook Phoenix Brow	0720	0800	0840	1000	1040	1200	1240	1400	1440	1600	1640	1800	1840
Finger Post Traverse Street	0721	0801	0841	1001	1041	1201	1241	1401	1441	1601	1641	1801	1841
Finger Post Parr Stocks Road	0722	0802	0842	1002	1042	1202	1242	1402	1442	1602	1642	1802	1842
Parr Stocks Ramford Street	0723	0803	0843	1003	1043	1203	1243	1403	1443	1603	1643	1803	1843
Parr Stocks Tickle Avenue	0723	0803	0843	1003	1043	1203	1243	1403	1443	1603	1643	1803	1843
Broad Oak Hargreaves Street	0724	0804	0844	1004	1044	1204	1244	1404	1444	1604	1644	1804	1844
Broad Oak Moorfoot Road	0725	0805	0845	1005	1045	1205	1245	1405	1445	1605	1645	1805	1845
Derbyshire Hill Provident Street	0726	0806	0846	1006	1046	1206	1246	1406	1446	1606	1646	1806	1846
Derbyshire Hill Swan Avenue	0727	0807	0847	1007	1047	1207	1247	1407	1447	1607	1647	1807	1847
Derbyshire Hill Rudd Avenue	0728	0808	0848	1008	1048	1208	1248	1408	1448	1608	1648	1808	1848
Derbyshire Hill Waring Avenue	0728	0808	0848	1008	1048	1208	1248	1408	1448	1608	1648	1808	1848
Collins Green Broad Lane Corner	0731	0811	0851	1011	1051	1211	1251	1411	1451	1611	1651	1811	1851
Collins Green Bold Lane	0731	0811	0851	1011	1051	1211	1251	1411	1451	1611	1651	1811	1851
Burtonwood Green Lane	0733	0813	0853	1013	1053	1213	1253	1413	1453	1613	1653	1813	1853
Burtonwood Bridge Inn	0734	0814	0854	1014	1054	1214	1254	1414	1454	1614	1654	1814	1854
Burtonwood Chapel House	0735	0815	0855	1015	1055	1215	1255	1415	1455	1615	1655	1815	1855
Burtonwood Perrins Road	0735	0815	0855	1015	1055	1215	1255	1415	1455	1615	1655	1815	1855
Burtonwood Cambourne Road	0736	0816	0856	1016	1056	1216	1256	1416	1456	1616	1656	1816	1856
Burtonwood Fir Tree Lane	0736	0816	0856	1016	1056	1216	1256	1416	1456	1616	1656	1816	1856
Burtonwood Coopers Farm	0738	0818	0858	1018	1058	1218	1258	1418	1458	1618	1658	1818	1858
Burtonwood Fiddle in Bag	0739	0819	0859	1019	1059	1219	1259	1419	1459	1619	1659	1819	1859
Winwick Alder Root Lane	0740	0820	0900	1020	1100	1220	1300	1420	1500	1620	1700	1820	1900
Winwick Hollins Park Hospital	0741	0821	0901	1021	1101	1221	1301	1421	1501	1621	1701	1821	1901
Winwick Park	0742	0822	0902	1022	1102	1222	1302	1422	1502	1622	1702	1822	1902
Winwick St Oswald Church	0743	0823	0903	1023	1103	1223	1303	1423	1503	1623	1703	1823	1903
Winwick B&Q	0745	0825	0905	1025	1105	1225	1305	1425	1505	1625	1705	1825	1905
Hulme Mill Lane	0746	0826	0906	1026	1106	1226	1306	1426	1506	1626	1706	1826	1906
Hulme Fordton Leisure	0747	0827	0907	1027	1107	1227	1307	1427	1507	1627	1707	1827	1907
Hulme Sandy Lane West	0748	0828	0908	1028	1108	1228	1308	1428	1508	1628	1708	1828	1908
Longford Winwick Road College	0750	0830	0910	1030	1110	1230	1310	1430	1510	1630	1710	1830	1910
Longford Alder Lane	0751	0831	0911	1031	1111	1231	1311	1431	1511	1631	1711	1831	1911
Longford Ireland Street	0752	0832	0912	1032	1112	1232	1312	1432	1512	1632	1712	1832	1912
Bewsey Owen Street	0753	0833	0913	1033	1113	1233	1313	1433	1513	1633	1713	1833	1913
Bewsey Tesco	0753	0833	0913	1033	1113	1233	1313	1433	1513	1633	1713	1833	1913
Warrington Central Station	0755	0835	0915	1035	1115	1235	1315	1435	1515	1635	1715	1835	1915
Warrington Bus Interchange	0756	0836	0916	1036	1116	1236	1316	1436	1516	1636	1716	1836	1916

Sunday - towards St Helens Bus Station

	329 ¹	329 ¹	329 ¹	329 ¹	329 ¹	329 ¹	329 ¹	329 ¹	329 ¹	329 ¹	329 ¹	329 ¹	329 ¹
Warrington Bus Interchange	0910	1010	1110	1210	1310	1410	1510	1610	1710	1810			
Warrington Central Station	0910	1010	1110	1210	1310	1410	1510	1610	1710	1810			
Bewsey Tesco	0912	1012	1112	1212	1312	1412	1512	1612	1712	1812			
Bewsey Owen Street	0913	1013	1113	1213	1313	1413	1513	1613	1713	1813			
Longford Ireland Street	0914	1014	1114	1214	1314	1414	1514	1614	1714	1814			
Longford Alder Lane	0915	1015	1115	1215	1315	1415	1515	1615	1715	1815			
Longford Winwick Road College	0916	1016	1116	1216	1316	1416	1516	1616	1716	1816			
Longford Alban Retail Park	0917	1017	1117	1217	1317	1417	1517	1617	1717	1817			
Hulme Sandy Lane West	0918	1018	1118	1218	1318	1418	1518	1618	1718	1818			
Hulme Mill Lane	0920	1020	1120	1220	1320	1420	1520	1620	1720	1820			
Winwick B&Q	0923	1023	1123	1223	1323	1423	1523	1623	1723	1823			
Winwick St Oswald Church	0924	1024	1124	1224	1324	1424	1524	1624	1724	1824			
Winwick Park	0924	1024	1124	1224	1324	1424	1524	1624	1724	1824			

	329 ¹	329 ¹	329 ¹	329 ¹	329 ¹	329 ¹	329 ¹	329 ¹	329 ¹	329 ¹
Winwick Hollins Park Hospital	0925	1025	1125	1225	1325	1425	1525	1625	1725	1825
Winwick Watery Lane	0926	1026	1126	1226	1326	1426	1526	1626	1726	1826
Winwick Alder Root Lane	0927	1027	1127	1227	1327	1427	1527	1627	1727	1827
Burtonwood Fiddle in Bag	0928	1028	1128	1228	1328	1428	1528	1628	1728	1828
Burtonwood Coopers Farm	0929	1029	1129	1229	1329	1429	1529	1629	1729	1829
Burtonwood Fir Tree Lane	0930	1030	1130	1230	1330	1430	1530	1630	1730	1830
Burtonwood Cambourne Road	0931	1031	1131	1231	1331	1431	1531	1631	1731	1831
Burtonwood Perrins Road	0932	1032	1132	1232	1332	1432	1532	1632	1732	1832
Burtonwood Post Office	0933	1033	1133	1233	1333	1433	1533	1633	1733	1833
Burtonwood Bridge Inn	0933	1033	1133	1233	1333	1433	1533	1633	1733	1833
Burtonwood Green Lane	0934	1034	1134	1234	1334	1434	1534	1634	1734	1834
Collins Green Bold Lane	0935	1035	1135	1235	1335	1435	1535	1635	1735	1835
Collins Green Broad Lane Corner	0936	1036	1136	1236	1336	1436	1536	1636	1736	1836
Collins Green Broad Lane	0937	1037	1137	1237	1337	1437	1537	1637	1737	1837
Derbyshire Hill Road	0938	1038	1138	1238	1338	1438	1538	1638	1738	1838
Derbyshire Hill Road	0939	1039	1139	1239	1339	1439	1539	1639	1739	1839
Derbyshire Hill Swan Avenue	0939	1039	1139	1239	1339	1439	1539	1639	1739	1839
Derbyshire Hill Provident Street	0940	1040	1140	1240	1340	1440	1540	1640	1740	1840
Broad Oak Mendip Grove	0941	1041	1141	1241	1341	1441	1541	1641	1741	1841
Broad Oak Nicholson Street	0942	1042	1142	1242	1342	1442	1542	1642	1742	1842
Parr Stocks Boardmans Lane	0942	1042	1142	1242	1342	1442	1542	1642	1742	1842
Parr Stocks Gaskell Street	0943	1043	1143	1243	1343	1443	1543	1643	1743	1843
Parr Stocks Ramford Street	0943	1043	1143	1243	1343	1443	1543	1643	1743	1843
Finger Post Sorogold Street	0944	1044	1144	1244	1344	1444	1544	1644	1744	1844
Finger Post Langtree Street	0945	1045	1145	1245	1345	1445	1545	1645	1745	1845
Finger Post Phoenix Brow	0945	1045	1145	1245	1345	1445	1545	1645	1745	1845
St Helens Central Station	0946	1046	1146	1246	1346	1446	1546	1646	1746	1846
St Helens Bus Station	0947	1047	1147	1247	1347	1447	1547	1647	1747	1847

¹ Only During Bank Holidays

Sunday - towards Warrington Bus Interchange

	329 ¹	329 ¹	329 ¹	329 ¹
St Helens Bus Station	0820	1020	1220	1620
St Helens Central Station	0820	1020	1220	1620
Pocket Nook Phoenix Brow	0820	1020	1220	1620
Finger Post Traverse Street	0821	1021	1221	1621
Finger Post Parr Stocks Road	0822	1022	1222	1622
Parr Stocks Ramford Street	0823	1023	1223	1623
Parr Stocks Tickle Avenue	0823	1023	1223	1623
Broad Oak Hargreaves Street	0824	1024	1224	1624
Broad Oak Moorfoot Road	0825	1025	1225	1625
Derbyshire Hill Provident Street	0826	1026	1226	1626
Derbyshire Hill Swan Avenue	0827	1027	1227	1627
Derbyshire Hill Rudd Avenue	0828	1028	1228	1628
Derbyshire Hill Waring Avenue	0828	1028	1228	1628
Collins Green Broad Lane Corner	0831	1031	1231	1631
Collins Green Bold Lane	0831	1031	1231	1631
Burtonwood Green Lane	0833	1033	1233	1633
Burtonwood Bridge Inn	0834	1034	1234	1634
Burtonwood Chapel House	0835	1035	1235	1635
Burtonwood Perrins Road	0835	1035	1235	1635
Burtonwood Cambourne Road	0836	1036	1236	1636
Burtonwood Fir Tree Lane	0836	1036	1236	1636
Burtonwood Coopers Farm	0838	1038	1238	1638
Burtonwood Fiddle in Bag	0839	1039	1239	1639
Winwick Alder Root Lane	0840	1040	1240	1640
Winwick Hollins Park Hospital	0841	1041	1241	1641
Winwick Park	0842	1042	1242	1642
Winwick St Oswald Church	0843	1043	1243	1643
Winwick B&Q	0845	1045	1245	1645
Hulme Mill Lane	0846	1046	1246	1646
Hulme Fordton Leisure	0847	1047	1247	1647
Hulme Sandy Lane West	0848	1048	1248	1648
Longford Winwick Road College	0850	1050	1250	1650
Longford Alder Lane	0851	1051	1251	1651
Longford Ireland Street	0852	1052	1252	1652
Bewsey Owen Street	0853	1053	1253	1653
Bewsey Tesco	0853	1053	1253	1653

	329 ¹	329 ¹	329 ¹	329 ¹
Warrington Central Station	0855	1055	1255	1655
Warrington Bus Interchange	0856	1056	1256	1656

¹ Only During Bank Holidays

Monday-Friday - towards Warrington Bus Interchange

	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360
Wigan Bus Station	0628	--	0655	0718	0831	0905	0933	1003	1033	1103	1133	1203	1233	1303	1332	1403	
Wigan Wallgate	0628	--	0655	0718	0831	0905	0933	1003	1033	1103	1133	1203	1233	1303	1332	1403	
Wigan Rodney Street	0629	--	0657	0720	0833	0907	0935	1005	1035	1105	1135	1205	1235	1305	1334	1405	
Wigan Derby House	0630	--	0657	0721	0833	0907	0935	1006	1036	1106	1136	1206	1236	1306	1335	1406	
Scholes	0630	--	0658	0721	0834	0908	0936	1006	1036	1106	1136	1206	1236	1306	1335	1406	
Wigan Walmersley Street	0631	--	0658	0721	0834	0908	0936	1006	1036	1106	1136	1206	1236	1306	1335	1406	
Lower Ince Redbrook Road	0632	--	0700	0723	0836	0910	0938	1008	1038	1108	1138	1208	1238	1308	1337	1408	
Lower Ince Windleshaw Street	0633	--	0700	0724	0836	0910	0938	1009	1039	1109	1139	1209	1239	1309	1338	1409	
Lower Ince Cemetery Road	0634	--	0702	0725	0838	0912	0940	1010	1040	1110	1140	1210	1240	1310	1339	1410	
Spring View Marlborough Avenue	0635	--	0703	0727	0839	0913	0941	1012	1042	1112	1142	1212	1242	1312	1341	1412	
Spring View Taylors Lane	0636	--	0704	0728	0840	0914	0942	1013	1043	1113	1143	1213	1243	1313	1342	1413	
Spring View Coronation Street	0637	--	0704	0728	0840	0914	0942	1013	1043	1113	1143	1213	1243	1313	1342	1413	
Platt Bridge Neville Street	0638	--	0706	0730	0842	0916	0944	1015	1045	1115	1145	1215	1245	1315	1344	1415	
Platt Bridge Queens Arms	0639	--	0707	0731	0843	0917	0945	1016	1046	1116	1146	1216	1246	1316	1345	1416	
Platt Bridge Millers Lane	0640	--	0708	0732	0844	0918	0946	1017	1047	1117	1147	1217	1247	1317	1346	1417	
Abram Simpkin Street	0640	--	0708	0732	0844	0918	0946	1017	1047	1117	1147	1217	1247	1317	1346	1417	
Abram School Street	0641	--	0709	0733	0845	0919	0947	1018	1048	1118	1148	1218	1248	1318	1347	1418	
Abram Alexandra Street	0641	--	0709	0734	0845	0919	0947	1018	1048	1118	1148	1218	1248	1318	1347	1418	
Abram Council Offices	0642	--	0710	0734	0846	0920	0948	1019	1049	1119	1149	1219	1249	1319	1348	1419	
Abram Park Lane	0643	--	0711	0735	0847	0921	0949	1020	1050	1120	1150	1220	1250	1320	1349	1420	
Dover Crankwood Road	0643	--	0711	0736	0847	0921	0949	1020	1050	1120	1150	1220	1250	1320	1349	1420	
Dover Aye Bridge Farm	0645	--	0713	0738	0849	0923	0951	1022	1052	1122	1152	1222	1252	1322	1351	1422	
Dover Balmer's Farm	0646	--	0714	0739	0850	0924	0952	1023	1053	1123	1153	1223	1253	1323	1352	1423	
Dover Windy Bank Farm	0647	--	0715	0740	0851	0925	0953	1024	1054	1124	1154	1224	1254	1324	1353	1424	
Golborne Ashton Road	0648	--	0716	0742	0852	0926	0954	1025	1055	1125	1155	1225	1255	1325	1354	1425	
Golborne Red Lion	0649	--	0717	0742	0853	0927	0955	1026	1056	1126	1156	1226	1256	1326	1355	1426	
Golborne Church Green Gardens	0650	--	0718	0743	0854	0928	0956	1027	1057	1127	1157	1227	1257	1327	1356	1427	
Golborne Railway Road	0650	--	0718	0744	0854	0928	0956	1027	1057	1127	1157	1227	1257	1327	1356	1427	
Golborne John Street	0651	--	0719	0745	0855	0929	0957	1028	1058	1128	1158	1228	1258	1328	1357	1428	
Golborne School Street	0652	0628	0720	0746	0856	0930	0958	1029	1059	1129	1159	1229	1259	1329	1358	1429	
Golborne Queen Anne	0652	0628	0721	0747	0856	0930	0958	1029	1059	1129	1159	1229	1259	1329	1358	1429	
Golborne Golf Course	0654	0629	0723	0750	0858	0931	0959	1030	1100	1130	1200	1230	1300	1330	1359	1430	
Newton le Willows Parkside Road	0656	0631	0727	0753	0900	0933	1001	1032	1102	1132	1202	1232	1302	1332	1401	1432	
Newton le Willows Waterworks Drive	0657	0632	0728	0755	0901	0934	1002	1033	1103	1133	1203	1233	1303	1333	1402	1433	
Newton le Willows Newton-le-Willows Rail Station	0700	0634	0732	0759	0903	0936	1004	1035	1105	1135	1205	1235	1305	1335	1404	1435	
Newton le Willows Newton Park Drive	0701	0634	0733	0800	0903	0936	1004	1035	1105	1135	1205	1235	1305	1335	1404	1435	
Newton le Willows Cholmley Drive	0702	0635	0734	0801	0904	0937	1005	1036	1106	1136	1206	1236	1306	1336	1405	1436	
Newton le Willows Farm Way	0703	0635	0735	0802	0905	0938	1006	1037	1107	1137	1207	1237	1307	1337	1406	1437	
Hermitage Green Cop Holt Farm	0705	0637	0737	0804	0906	0939	1007	1038	1108	1138	1208	1238	1308	1338	1407	1438	
Winwick Old School House Lane	0706	0638	0739	0806	0908	0941	1008	1039	1109	1139	1209	1239	1309	1339	1408	1439	
Winwick St Oswald Church	0708	0638	0740	0807	0909	0942	1009	1040	1110	1140	1210	1240	1310	1340	1409	1440	
Winwick B&Q	0710	0640	0743	0810	0910	0943	1010	1041	1111	1141	1211	1241	1311	1341	1410	1441	
Hulme Mill Lane	0712	0641	0745	0812	0912	0945	1012	1043	1113	1143	1213	1243	1313	1343	1412	1443	
Hulme Fordton Leisure	0712	0641	0745	0813	0913	0945	1012	1043	1113	1144	1214	1244	1314	1344	1413	1444	
Hulme Sandy Lane West	0713	0642	0746	0814	0914	0946	1013	1044	1115	1145	1215	1245	1315	1345	1414	1445	
Longford Winwick Road College	0715	0644	0748	0817	0916	0948	1015	1046	1117	1147	1217	1247	1317	1347	1416	1447	
Longford Alder Lane	0716	0645	0749	0818	0917	0949	1016	1047	1118	1148	1218	1248	1318	1348	1417	1448	
Longford Ireland Street	0717	0645	0750	0819	0918	0950	1017	1048	1119	1149	1219	1249	1319	1349	1418	1449	
Bewsey Owen Street	0718	0646	0751	0820	0919	0951	1018	1049	1120	1150	1220	1250	1320	1350	1419	1450	
Bewsey Tesco	0718	0647	0751	0821	0920	0951	1018	1049	1120	1151	1221	1251	1321	1351	1420	1451	
Warrington Central Station	0720	0648	0753	0823	0922	0953	1020	1051	1122	1153	1223	1253	1323	1353	1422	1453	
Warrington Bus Interchange	0721	0649	0754	0824	0923	0954	1021	1052	1123	1154	1224	1254	1324	1354	1423	1454	

Monday-Friday - towards Warrington Bus Interchange

	360	360	360	360	360	360	360	360	360
Wigan Bus Station	1433	1503	1533	1605	1639	1715	1752	1822	1910
Wigan Wallgate	1434	1504	1534	1606	1640	1716	1752	1822	1910
Wigan Rodney Street	1435	1505	1536	1608	1642	1718	1754	1823	1911
Wigan Derby House	1436	1506	1537	1609	1644	1720	1755	1824	1912
Scholes	1436	1507	1538	1610	1644	1720	1755	1824	1912

	360	360	360	360	360	360	360	360	360	360	360	360	360	360
Wigan Walmersley Street	1437	1507	1538	1610	1645	1721	1755	1825	1913					
Lower Ince Redbrook Road	1438	1509	1541	1613	1648	1724	1757	1826	1914					
Lower Ince Windleshaw Street	1439	1510	1542	1614	1649	1725	1758	1827	1915					
Lower Ince Cemetery Road	1441	1512	1544	1616	1652	1728	1759	1828	1916					
Spring View Marlborough Avenue	1442	1514	1546	1618	1654	1730	1801	1829	1917					
Spring View Taylors Lane	1443	1515	1548	1620	1655	1731	1802	1830	1918					
Spring View Coronation Street	1444	1515	1548	1620	1656	1732	1802	1831	1919					
Platt Bridge Neville Street	1446	1518	1551	1623	1659	1735	1804	1832	1920					
Platt Bridge Queens Arms	1447	1518	1552	1624	1700	1736	1805	1833	1921					
Platt Bridge Millers Lane	1448	1520	1554	1626	1702	1738	1806	1834	1922					
Abram Simpkin Street	1448	1520	1554	1626	1702	1738	1806	1834	1922					
Abram School Street	1449	1521	1555	1627	1703	1739	1807	1835	1923					
Abram Alexandra Street	1449	1521	1555	1627	1703	1739	1807	1835	1923					
Abram Council Offices	1450	1522	1556	1628	1704	1740	1808	1836	1923					
Abram Park Lane	1451	1523	1557	1629	1705	1741	1808	1836	1924					
Dover Crankwood Road	1451	1523	1558	1630	1705	1741	1809	1837	1924					
Dover Aye Bridge Farm	1453	1525	1600	1632	1707	1743	1810	1838	1926					
Dover Balmer's Farm	1454	1526	1601	1633	1708	1744	1811	1839	1926					
Dover Windy Bank Farm	1455	1527	1602	1634	1709	1745	1812	1840	1927					
Golborne Ashton Road	1456	1528	1603	1635	1710	1746	1813	1841	1928					
Golborne Red Lion	1457	1529	1604	1636	1711	1747	1813	1841	1928					
Golborne Church Green Gardens	1458	1530	1604	1636	1712	1748	1814	1842	1929					
Golborne Railway Road	1458	1530	1605	1637	1712	1748	1815	1843	1930					
Golborne John Street	1459	1531	1606	1638	1713	1749	1815	1843	1930					
Golborne School Street	1500	1532	1607	1639	1714	1750	1816	1844	1931					
Golborne Queen Anne	1500	1532	1607	1639	1714	1750	1816	1844	1931					
Golborne Golf Course	1501	1533	1608	1640	1716	1751	1817	1845	1932					
Newton le Willows Parkside Road	1503	1535	1610	1642	1719	1753	1819	1846	1933					
Newton le Willows Waterworks Drive	1504	1536	1611	1643	1720	1754	1820	1847	1933					
Newton le Willows Newton-le-Willows Rail Station	1506	1538	1613	1645	1723	1756	1822	1849	--					
Newton le Willows Newton Park Drive	1506	1538	1613	1646	1724	1757	1822	1849	--					
Newton le Willows Cholmley Drive	1507	1539	1614	1647	1725	1758	1823	1850	--					
Newton le Willows Farm Way	1508	1540	1615	1647	1726	1758	1824	1851	--					
Hermitage Green Cop Holt Farm	1509	1541	1616	1649	1728	1800	1825	1852	--					
Winwick Old School House Lane	1510	1543	1618	1650	1730	1801	1827	1853	--					
Winwick St Oswald Church	1511	1544	1619	1651	1731	1802	1828	1854	--					
Winwick B&Q	1512	1545	1620	1653	1734	1804	1829	1855	--					
Hulme Mill Lane	1514	1547	1622	1655	1736	1806	1831	1857	--					
Hulme Fordton Leisure	1514	1547	1622	1656	1737	1807	1831	1857	--					
Hulme Sandy Lane West	1516	1549	1624	1657	1738	1808	1832	1858	--					
Longford Winwick Road College	1518	1551	1626	1659	1740	1810	1834	1900	--					
Longford Alder Lane	1519	1552	1627	1700	1741	1811	1835	1901	--					
Longford Ireland Street	1520	1553	1628	1701	1742	1812	1836	1901	--					
Bewsey Owen Street	1521	1554	1629	1702	1743	1813	1837	1902	--					
Bewsey Tesco	1521	1554	1629	1703	1744	1814	1837	1903	--					
Warrington Central Station	1523	1556	1631	1705	1746	1816	1839	1904	--					
Warrington Bus Interchange	1524	1557	1632	1706	1747	1817	1840	1905	--					

Monday-Friday - towards Wigan Bus Station

	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360
Warrington Bus Interchange	--	--	--	0656	0723	0754	0832	0908	0940	1011	1041	1111	1141	1211	1241	1311
Warrington Central Station	--	--	--	0656	0723	0754	0832	0908	0940	1011	1041	1111	1141	1211	1241	1311
Bewsey Tesco	--	--	--	0658	0725	0756	0834	0910	0942	1013	1043	1113	1143	1213	1243	1313
Bewsey Owen Street	--	--	--	0658	0725	0756	0834	0910	0942	1013	1043	1113	1143	1213	1243	1313
Longford Ireland Street	--	--	--	0659	0726	0757	0835	0911	0943	1014	1044	1114	1144	1214	1244	1314
Longford Alder Lane	--	--	--	0700	0727	0758	0836	0912	0944	1015	1045	1115	1145	1215	1245	1315
Longford Winwick Road College	--	--	--	0701	0728	0759	0837	0913	0944	1015	1045	1115	1145	1216	1246	1316
Longford Alban Retail Park	--	--	--	0701	0728	0759	0837	0913	0945	1016	1046	1116	1146	1217	1247	1317
Hulme Sandy Lane West	--	--	--	0703	0730	0801	0839	0915	0946	1017	1047	1117	1147	1218	1248	1318
Hulme Mill Lane	--	--	--	0704	0731	0802	0840	0916	0948	1019	1049	1119	1149	1220	1250	1320
Winwick B&Q	--	--	--	0706	0733	0804	0842	0918	0949	1020	1050	1120	1150	1222	1252	1322
Winwick St Oswald Church	--	--	--	0709	0736	0807	0845	0921	0952	1023	1053	1123	1153	1225	1255	1325
Winwick Old School House Lane	--	--	--	0709	0736	0807	0845	0921	0952	1023	1053	1123	1153	1225	1255	1325
Hermitage Green Cop Holt Farm	--	--	--	0710	0737	0808	0846	0922	0953	1024	1054	1124	1154	1226	1256	1326
Newton le Willows Farm Way	--	--	--	0712	0739	0810	0848	0924	0955	1026	1056	1126	1156	1228	1258	1328
Newton le Willows Cholmley Drive	--	--	--	0712	0739	0810	0848	0924	0955	1026	1056	1126	1156	1228	1258	1328
Newton le Willows Newton Park Drive	--	--	--	0713	0740	0811	0849	0925	0956	1027	1057	1127	1157	1229	1259	1329

	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360
Newton le Willows Mill Meadow	--	--	--	0713	0740	0811	0849	0925	0956	1027	1057	1127	1157	1229	1259	1329
Newton le Willows Newton-le-Willows Rail Station	--	--	0645	0714	0741	0812	0850	0926	0957	1028	1058	1128	1158	1230	1300	1330
Newton le Willows Newton-le-Willows Station	--	--	0645	0714	0741	0812	0850	0926	0957	1028	1058	1128	1158	1230	1300	1330
Newton le Willows Waterworks Drive	--	--	0646	0715	0742	0813	0851	0927	0958	1029	1059	1129	1159	1231	1301	1331
Newton le Willows Parkside Road	--	--	0647	0716	0743	0814	0852	0928	0959	1030	1100	1130	1200	1232	1302	1332
Golborne Golf Course	--	--	0648	0718	0745	0816	0854	0929	1000	1031	1101	1131	1201	1233	1303	1333
Golborne Queen Anne	0601	0621	0650	0720	0747	0818	0856	0931	1002	1033	1103	1133	1203	1235	1305	1335
Golborne School Street	0603	0623	0651	0721	0748	0819	0857	0932	1003	1034	1104	1134	1204	1236	1306	1336
Golborne John Street	0603	0623	0651	0721	0748	0819	0857	0932	1003	1034	1104	1134	1204	1236	1306	1336
Golborne Railway Road	0603	0623	0652	0722	0749	0820	0858	0933	1004	1035	1105	1135	1205	1237	1307	1337
Golborne Manor Street	0604	0624	0652	0723	0750	0821	0859	0934	1005	1036	1106	1136	1206	1237	1307	1337
Golborne May Street	0605	0625	0653	0724	0751	0822	0900	0934	1005	1036	1106	1136	1206	1238	1308	1338
Golborne Ashton Road	0605	0625	0654	0724	0752	0823	0900	0935	1006	1037	1107	1137	1207	1239	1309	1339
Dover Windy Bank Farm	0606	0626	0655	0726	0754	0825	0902	0936	1007	1038	1108	1138	1208	1240	1310	1340
Dover Balmer's Farm	0607	0627	0656	0727	0755	0826	0903	0937	1008	1039	1109	1139	1209	1241	1311	1341
Dover Aye Bridge Farm	0608	0628	0657	0728	0756	0827	0904	0938	1009	1040	1110	1140	1210	1242	1312	1342
Dover Crankwood Road	0609	0629	0658	0730	0758	0829	0906	0940	1011	1042	1112	1142	1212	1243	1313	1343
Abram Park Lane	0610	0630	0659	0731	0759	0830	0907	0941	1012	1043	1113	1143	1213	1244	1314	1344
Abram Post Office	0610	0630	0700	0732	0800	0831	0908	0941	1012	1043	1113	1143	1213	1245	1315	1345
Abram Alexandra Street	0611	0631	0701	0733	0801	0832	0909	0943	1014	1045	1115	1145	1215	1246	1316	1346
Abram School Street	0611	0631	0701	0734	0802	0833	0910	0943	1014	1045	1115	1145	1215	1246	1316	1346
Abram Bickershaw Lane	0612	0632	0702	0735	0803	0834	0911	0944	1015	1046	1116	1146	1216	1247	1317	1347
Platt Bridge Millers Lane	0613	0633	0703	0736	0804	0835	0912	0945	1016	1047	1117	1147	1217	1248	1318	1348
Platt Bridge Queens Arms	0613	0633	0703	0736	0804	0835	0912	0945	1016	1047	1117	1147	1217	1248	1318	1348
Platt Bridge Stapleton Street	0614	0634	0704	0737	0805	0836	0913	0946	1017	1048	1118	1148	1218	1249	1319	1349
Spring View Coronation Street	0615	0635	0705	0739	0808	0839	0915	0947	1018	1049	1119	1149	1219	1250	1320	1350
Spring View Taylors Lane	0616	0636	0706	0740	0809	0840	0916	0948	1019	1050	1120	1150	1220	1251	1321	1351
Spring View Marlborough Avenue	0616	0636	0706	0741	0810	0841	0917	0949	1020	1051	1121	1151	1221	1251	1321	1351
Lower Ince Cemetery Road	0617	0637	0707	0742	0811	0842	0918	0950	1021	1052	1122	1152	1222	1252	1322	1352
Lower Ince Westwood Lane	0618	0638	0708	0743	0812	0843	0919	0950	1021	1052	1122	1152	1222	1253	1323	1353
Lower Ince Chorley Street	0618	0638	0708	0744	0813	0844	0920	0951	1022	1053	1123	1153	1223	1253	1323	1353
Lower Ince Frederick Street	0619	0639	0709	0744	0814	0845	0921	0951	1022	1053	1123	1153	1223	1254	1324	1354
Wigan Orrell Street	0620	0640	0710	0746	0816	0847	0923	0953	1024	1055	1125	1155	1225	1255	1325	1355
Wigan Sovereign Road	0620	0640	0710	0746	0817	0848	0923	0953	1024	1055	1125	1155	1225	1255	1325	1355
Wigan Job Centre	0621	0641	0711	0747	0818	0849	0924	0954	1025	1056	1126	1156	1226	1256	1326	1356
Wigan Wallgate	0621	0641	0711	0748	0819	0850	0925	0954	1025	1056	1126	1156	1226	1256	1326	1356
Wigan Bus Station	0623	0643	0713	0750	0821	0852	0927	0956	1027	1058	1128	1158	1228	1258	1328	1358

Monday-Friday - towards Wigan Bus Station

	360	360	360	360	360	360	360	360	360	360	360
Warrington Bus Interchange	1336	1406	1436	1506	1537	1609	1640	1705	1741	1811	
Warrington Central Station	1336	1406	1436	1506	1537	1609	1641	1706	1741	1811	
Bewsey Tesco	1338	1408	1438	1508	1539	1611	1643	1708	1743	1813	
Bewsey Owen Street	1338	1408	1439	1509	1540	1612	1644	1709	1744	1813	
Longford Ireland Street	1339	1409	1439	1509	1540	1613	1645	1710	1745	1814	
Longford Alder Lane	1340	1410	1441	1511	1542	1614	1647	1712	1746	1815	
Longford Winwick Road College	1341	1411	1441	1511	1542	1615	1648	1713	1747	1815	
Longford Alban Retail Park	1342	1412	1442	1512	1543	1616	1649	1714	1748	1816	
Hulme Sandy Lane West	1343	1413	1444	1514	1545	1618	1652	1717	1749	1817	
Hulme Mill Lane	1345	1415	1446	1516	1547	1620	1655	1720	1751	1819	
Winwick B&Q	1347	1417	1448	1518	1549	1622	1658	1723	1754	1820	
Winwick St Oswald Church	1350	1420	1451	1521	1552	1626	1702	1727	1757	1823	
Winwick Old School House Lane	1350	1420	1451	1521	1552	1626	1702	1728	1757	1823	
Hermitage Green Cop Holt Farm	1351	1421	1452	1522	1553	1628	1704	1730	1758	1824	
Newton le Willows Farm Way	1353	1423	1454	1524	1555	1629	1706	1732	1800	1826	
Newton le Willows Cholmley Drive	1353	1423	1454	1524	1555	1630	1707	1733	1800	1826	
Newton le Willows Newton Park Drive	1354	1424	1455	1525	1556	1631	1708	1734	1801	1827	
Newton le Willows Mill Meadow	1354	1424	1455	1525	1556	1631	1709	1735	1801	1827	
Newton le Willows Newton-le-Willows Rail Station	1355	1425	1456	1526	1557	1632	1710	1736	1802	1828	
Newton le Willows Newton-le-Willows Station	1355	1425	1456	1526	1558	1633	1711	1737	1802	1828	
Newton le Willows Waterworks Drive	1356	1426	1457	1527	1559	1634	1712	1738	1803	1829	
Newton le Willows Parkside Road	1357	1427	1458	1528	1600	1635	1713	1739	1804	1830	
Golborne Golf Course	1358	1428	1459	1529	1602	1637	1716	1741	1805	1831	
Golborne Queen Anne	1400	1430	1501	1531	1604	1639	1718	1743	1807	1833	
Golborne School Street	1401	1431	1502	1532	1605	1640	1720	1744	1808	1834	
Golborne John Street	1401	1431	1502	1532	1605	1640	1720	1744	1808	1834	
Golborne Railway Road	1402	1432	1503	1533	1606	1641	1721	1745	1809	1835	

	360	360	360	360	360	360	360	360	360	360	360	360	360	360
Golborne Manor Street	1403	1433	1504	1534	1607	1642	1722	1745	1809	1835				
Golborne May Street	1403	1433	1505	1535	1608	1643	1723	1746	1810	1836				
Golborne Ashton Road	1404	1434	1505	1536	1609	1643	1723	1747	1810	1836				
Dover Windy Bank Farm	1405	1435	1507	1538	1611	1645	1725	1748	1812	1838				
Dover Balmer's Farm	1406	1436	1508	1539	1612	1646	1726	1749	1812	1838				
Dover Aye Bridge Farm	1407	1437	1509	1540	1613	1647	1727	1750	1813	1839				
Dover Crankwood Road	1409	1439	1511	1542	1615	1649	1729	1751	1815	1841				
Abram Park Lane	1410	1440	1512	1543	1616	1650	1730	1752	1815	1841				
Abram Post Office	1410	1440	1513	1544	1617	1651	1731	1753	1816	1842				
Abram Alexandra Street	1412	1442	1514	1545	1618	1652	1732	1754	1817	1843				
Abram School Street	1412	1442	1515	1546	1619	1653	1733	1754	1817	1843				
Abram Bickershaw Lane	1413	1443	1516	1547	1620	1654	1734	1755	1818	1844				
Platt Bridge Millers Lane	1414	1444	1517	1548	1621	1655	1735	1756	1819	1845				
Platt Bridge Queens Arms	1414	1444	1517	1548	1621	1655	1735	1756	1819	1845				
Platt Bridge Stapleton Street	1415	1445	1518	1549	1622	1656	1736	1757	1820	1846				
Spring View Coronation Street	1416	1446	1519	1550	1624	1658	1738	1758	1821	1847				
Spring View Taylors Lane	1417	1447	1520	1551	1625	1659	1738	1759	1822	1848				
Spring View Marlborough Avenue	1417	1447	1520	1552	1626	1700	1739	1800	1823	1849				
Lower Ince Cemetery Road	1418	1448	1521	1553	1627	1701	1740	1801	1824	1850				
Lower Ince Westwood Lane	1419	1449	1522	1553	1627	1702	1741	1801	1824	1850				
Lower Ince Chorley Street	1419	1449	1522	1554	1628	1703	1741	1802	1825	1851				
Lower Ince Frederick Street	1420	1450	1523	1554	1629	1704	1742	1802	1825	1851				
Wigan Orrell Street	1421	1451	1524	1556	1630	1706	1743	1804	1827	1853				
Wigan Sovereign Road	1421	1451	1524	1556	1631	1706	1744	1804	1827	1853				
Wigan Job Centre	1422	1452	1525	1557	1631	1707	1745	1805	1828	1854				
Wigan Wallgate	1422	1452	1525	1557	1632	1708	1745	1805	1828	1854				
Wigan Bus Station	1424	1454	1527	1559	1634	1710	1747	1807	1830	1856				

Saturday - towards Warrington Bus Interchange

	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360
Wigan Bus Station	--	0741	0821	0901	0941	1021	1101	1141	1221	1301	1341	1421	1501	1541	1621	1701
Wigan Wallgate	--	0741	0821	0901	0941	1021	1101	1141	1221	1301	1341	1421	1501	1541	1621	1701
Wigan Rodney Street	--	0743	0823	0903	0943	1023	1103	1143	1223	1303	1343	1423	1503	1543	1623	1703
Wigan Derby House	--	0743	0823	0903	0943	1023	1103	1143	1223	1303	1343	1423	1503	1543	1623	1703
Scholes	--	0744	0824	0904	0944	1024	1104	1144	1224	1304	1344	1424	1504	1544	1624	1704
Wigan Walmersley Street	--	0744	0824	0904	0944	1024	1104	1144	1224	1304	1344	1424	1504	1544	1624	1704
Lower Ince Redbrook Road	--	0746	0826	0906	0946	1026	1106	1146	1226	1306	1346	1426	1506	1546	1626	1706
Lower Ince Windleshaw Street	--	0746	0826	0906	0946	1026	1106	1146	1226	1306	1346	1426	1506	1546	1626	1706
Lower Ince Cemetery Road	--	0748	0828	0908	0948	1028	1108	1148	1228	1308	1348	1428	1508	1548	1628	1708
Spring View Marlborough Avenue	--	0749	0829	0909	0949	1029	1109	1149	1229	1309	1349	1429	1509	1549	1629	1709
Spring View Taylors Lane	--	0750	0830	0910	0950	1030	1110	1150	1230	1310	1350	1430	1510	1550	1630	1710
Spring View Coronation Street	--	0750	0830	0910	0950	1030	1110	1150	1230	1310	1350	1430	1510	1550	1630	1710
Platt Bridge Neville Street	--	0752	0832	0912	0952	1032	1112	1152	1232	1312	1352	1432	1512	1552	1632	1712
Platt Bridge Queens Arms	--	0753	0833	0913	0953	1033	1113	1153	1233	1313	1353	1433	1513	1553	1633	1713
Platt Bridge Millers Lane	--	0754	0834	0914	0954	1034	1114	1154	1234	1314	1354	1434	1514	1554	1634	1714
Abram Simpkin Street	--	0754	0834	0914	0954	1034	1114	1154	1234	1314	1354	1434	1514	1554	1634	1714
Abram School Street	--	0755	0835	0915	0955	1035	1115	1155	1235	1315	1355	1435	1515	1555	1635	1715
Abram Alexandra Street	--	0755	0835	0915	0955	1035	1115	1155	1235	1315	1355	1435	1515	1555	1635	1715
Abram Council Offices	--	0756	0836	0916	0956	1036	1116	1156	1236	1316	1356	1436	1516	1556	1636	1716
Abram Park Lane	--	0757	0837	0917	0957	1037	1117	1157	1237	1317	1357	1437	1517	1557	1637	1717
Dover Crankwood Road	--	0757	0837	0917	0957	1037	1117	1157	1237	1317	1357	1437	1517	1557	1637	1717
Dover Aye Bridge Farm	--	0759	0839	0919	0959	1039	1119	1159	1239	1319	1359	1439	1519	1559	1639	1719
Dover Balmer's Farm	--	0800	0840	0920	1000	1040	1120	1200	1240	1320	1400	1440	1520	1600	1640	1720
Dover Windy Bank Farm	--	0800	0840	0920	1000	1040	1120	1200	1240	1320	1400	1440	1520	1600	1640	1720
Golborne Ashton Road	--	0802	0842	0922	1002	1042	1122	1202	1242	1322	1402	1442	1522	1602	1642	1722
Golborne Red Lion	--	0802	0842	0922	1002	1042	1122	1202	1242	1322	1402	1442	1522	1602	1642	1722
Golborne Church Green Gardens	--	0803	0843	0923	1003	1043	1123	1203	1243	1323	1403	1443	1523	1603	1643	1723
Golborne Railway Road	--	0803	0843	0923	1003	1043	1123	1203	1243	1323	1403	1443	1523	1603	1643	1723
Golborne John Street	--	0804	0844	0924	1004	1044	1124	1204	1244	1324	1404	1444	1524	1604	1644	1724
Golborne School Street	0725	0805	0845	0925	1005	1045	1125	1205	1245	1325	1405	1445	1525	1605	1645	1725
Golborne Queen Anne	0725	0805	0845	0925	1005	1045	1125	1205	1245	1325	1405	1445	1525	1605	1645	1725
Golborne Golf Course	0726	0806	0846	0926	1006	1046	1126	1206	1246	1326	1406	1446	1526	1606	1646	1726
Newton le Willows Parkside Road	0728	0808	0848	0928	1008	1048	1128	1208	1248	1328	1408	1448	1528	1608	1648	1728
Newton le Willows Waterworks Drive	0729	0809	0849	0929	1009	1049	1129	1209	1249	1329	1409	1449	1529	1609	1649	1729
Newton le Willows Newton-le-Willows Rail Station	0731	0811	0851	0931	1011	1051	1131	1211	1251	1331	1411	1451	1531	1611	1651	1731
Newton le Willows Newton Park Drive	0731	0811	0851	0931	1011	1051	1131	1211	1251	1331	1411	1451	1531	1611	1651	1731
Newton le Willows Cholmley Drive	0732	0812	0852	0932	1012	1052	1132	1212	1252	1332	1412	1452	1532	1612	1652	1732

	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360
Newton le Willows Farm Way	0733	0813	0853	0933	1013	1053	1133	1213	1253	1333	1413	1453	1533	1613	1653	1733	
Hermitage Green Cop Holt Farm	0734	0814	0854	0934	1014	1054	1134	1214	1254	1334	1414	1454	1534	1614	1654	1734	
Winwick Old School House Lane	0735	0815	0855	0935	1015	1055	1135	1215	1255	1335	1415	1455	1535	1615	1655	1735	
Winwick St Oswald Church	0736	0816	0856	0936	1016	1056	1136	1216	1256	1336	1416	1456	1536	1616	1656	1736	
Winwick B&Q	0737	0817	0857	0937	1017	1057	1137	1217	1257	1337	1417	1457	1537	1617	1657	1737	
Hulme Mill Lane	0739	0819	0859	0939	1019	1059	1139	1219	1259	1339	1419	1459	1539	1619	1659	1739	
Hulme Fordton Leisure	0739	0819	0859	0939	1019	1059	1139	1219	1259	1339	1419	1459	1539	1619	1659	1739	
Hulme Sandy Lane West	0740	0820	0900	0940	1020	1100	1140	1220	1300	1340	1420	1500	1540	1620	1700	1740	
Longford Winwick Road College	0742	0822	0902	0942	1022	1102	1142	1222	1302	1342	1422	1502	1542	1622	1702	1742	
Longford Alder Lane	0743	0823	0903	0943	1023	1103	1143	1223	1303	1343	1423	1503	1543	1623	1703	1743	
Longford Ireland Street	0744	0824	0904	0944	1024	1104	1144	1224	1304	1344	1424	1504	1544	1624	1704	1744	
Bewsey Owen Street	0745	0825	0905	0945	1025	1105	1145	1225	1305	1345	1425	1505	1545	1625	1705	1745	
Bewsey Tesco	0745	0825	0905	0945	1025	1105	1145	1225	1305	1345	1425	1505	1545	1625	1705	1745	
Warrington Central Station	0747	0827	0907	0947	1027	1107	1147	1227	1307	1347	1427	1507	1547	1627	1707	1747	
Warrington Bus Interchange	0748	0828	0908	0948	1028	1108	1148	1228	1308	1348	1428	1508	1548	1628	1708	1748	

Saturday - towards Warrington Bus Interchange

	360	360	360
Wigan Bus Station	1741	1821	1901
Wigan Wallgate	1741	1821	1901
Wigan Rodney Street	1743	1823	1902
Wigan Derby House	1743	1823	1903
Scholes	1744	1824	1903
Wigan Walmersley Street	1744	1824	1904
Lower Ince Redbrook Road	1746	1826	1905
Lower Ince Windleshaw Street	1746	1826	1906
Lower Ince Cemetery Road	1748	1828	1907
Spring View Marlborough Avenue	1749	1829	1908
Spring View Taylors Lane	1750	1830	1909
Spring View Coronation Street	1750	1830	1910
Platt Bridge Neville Street	1752	1832	1911
Platt Bridge Queens Arms	1753	1833	1912
Platt Bridge Millers Lane	1754	1834	1913
Abram Simpkin Street	1754	1834	1913
Abram School Street	1755	1835	1914
Abram Alexandra Street	1755	1835	1914
Abram Council Offices	1756	1836	1914
Abram Park Lane	1757	1837	1915
Dover Crankwood Road	1757	1837	1915
Dover Aye Bridge Farm	1759	1839	1917
Dover Balmer's Farm	1800	1840	1917
Dover Windy Bank Farm	1800	1840	1918
Golborne Ashton Road	1802	1842	1919
Golborne Red Lion	1802	1842	1919
Golborne Church Green Gardens	1803	1843	1920
Golborne Railway Road	1803	1843	1921
Golborne John Street	1804	1844	1921
Golborne School Street	1805	1845	1922
Golborne Queen Anne	1805	1845	1922
Golborne Golf Course	1806	1846	1923
Newton le Willows Parkside Road	1808	1848	1924
Newton le Willows Waterworks Drive	1809	1849	1924
Newton le Willows Newton-le-Willows Rail Station	1811	1851	--
Newton le Willows Newton Park Drive	1811	1851	--
Newton le Willows Cholmley Drive	1812	1852	--
Newton le Willows Farm Way	1813	1853	--
Hermitage Green Cop Holt Farm	1814	1854	--
Winwick Old School House Lane	1815	1855	--
Winwick St Oswald Church	1816	1856	--
Winwick B&Q	1817	1857	--
Hulme Mill Lane	1819	1859	--
Hulme Fordton Leisure	1819	1859	--
Hulme Sandy Lane West	1820	1900	--
Longford Winwick Road College	1822	1902	--
Longford Alder Lane	1823	1903	--
Longford Ireland Street	1824	1904	--
Bewsey Owen Street	1825	1905	--

	360	360	360
Bewsey Tesco	1825	1905	--
Warrington Central Station	1827	1907	--
Warrington Bus Interchange	1828	1908	--

Saturday - towards Wigan Bus Station

	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360
Warrington Bus Interchange	--	--	0809	0849	0929	1009	1049	1129	1209	1249	1329	1409	1449	1529	1609	1649	
Warrington Central Station	--	--	0809	0849	0929	1009	1049	1129	1209	1249	1329	1409	1449	1529	1609	1649	
Bewsey Tesco	--	--	0811	0851	0931	1011	1051	1131	1211	1251	1331	1411	1451	1531	1611	1651	
Bewsey Owen Street	--	--	0811	0851	0931	1011	1051	1131	1211	1251	1331	1411	1451	1531	1611	1651	
Longford Ireland Street	--	--	0812	0852	0932	1012	1052	1132	1212	1252	1332	1412	1452	1532	1612	1652	
Longford Alder Lane	--	--	0813	0853	0933	1013	1053	1133	1213	1253	1333	1413	1453	1533	1613	1653	
Longford Winwick Road College	--	--	0813	0853	0933	1013	1053	1133	1213	1253	1333	1413	1453	1533	1613	1653	
Longford Alban Retail Park	--	--	0814	0854	0934	1014	1054	1134	1214	1254	1334	1414	1454	1534	1614	1654	
Hulme Sandy Lane West	--	--	0815	0855	0935	1015	1055	1135	1215	1255	1335	1415	1455	1535	1615	1655	
Hulme Mill Lane	--	--	0817	0857	0937	1017	1057	1137	1217	1257	1337	1417	1457	1537	1617	1657	
Winwick B&Q	--	--	0818	0858	0938	1018	1058	1138	1218	1258	1338	1418	1458	1538	1618	1658	
Winwick St Oswald Church	--	--	0821	0901	0941	1021	1101	1141	1221	1301	1341	1421	1501	1541	1621	1701	
Winwick Old School House Lane	--	--	0821	0901	0941	1021	1101	1141	1221	1301	1341	1421	1501	1541	1621	1701	
Hermitage Green Cop Holt Farm	--	--	0822	0902	0942	1022	1102	1142	1222	1302	1342	1422	1502	1542	1622	1702	
Newton le Willows Farm Way	--	--	0824	0904	0944	1024	1104	1144	1224	1304	1344	1424	1504	1544	1624	1704	
Newton le Willows Cholmley Drive	--	--	0824	0904	0944	1024	1104	1144	1224	1304	1344	1424	1504	1544	1624	1704	
Newton le Willows Newton Park Drive	--	--	0825	0905	0945	1025	1105	1145	1225	1305	1345	1425	1505	1545	1625	1705	
Newton le Willows Mill Meadow	--	--	0825	0905	0945	1025	1105	1145	1225	1305	1345	1425	1505	1545	1625	1705	
Newton le Willows Newton-le-Willows Rail Station	--	--	0826	0906	0946	1026	1106	1146	1226	1306	1346	1426	1506	1546	1626	1706	
Newton le Willows Newton-le-Willows Station	--	--	0826	0906	0946	1026	1106	1146	1226	1306	1346	1426	1506	1546	1626	1706	
Newton le Willows Waterworks Drive	--	--	0827	0907	0947	1027	1107	1147	1227	1307	1347	1427	1507	1547	1627	1707	
Newton le Willows Parkside Road	--	--	0828	0908	0948	1028	1108	1148	1228	1308	1348	1428	1508	1548	1628	1708	
Golborne Golf Course	--	--	0830	0910	0950	1030	1110	1150	1230	1310	1350	1430	1510	1550	1630	1710	
Golborne Queen Anne	0711	0751	0832	0912	0952	1032	1112	1152	1232	1312	1352	1432	1512	1552	1632	1712	
Golborne School Street	0715	0755	0833	0913	0953	1033	1113	1153	1233	1313	1353	1433	1513	1553	1633	1713	
Golborne John Street	0715	0755	0833	0913	0953	1033	1113	1153	1233	1313	1353	1433	1513	1553	1633	1713	
Golborne Railway Road	0715	0755	0834	0914	0954	1034	1114	1154	1234	1314	1354	1434	1514	1554	1634	1714	
Golborne Manor Street	0716	0756	0834	0914	0954	1034	1114	1154	1234	1314	1354	1434	1514	1554	1634	1714	
Golborne May Street	0717	0757	0835	0915	0955	1035	1115	1155	1235	1315	1355	1435	1515	1555	1635	1715	
Golborne Ashton Road	0717	0757	0836	0916	0956	1036	1116	1156	1236	1316	1356	1436	1516	1556	1636	1716	
Dover Windy Bank Farm	0718	0758	0837	0917	0957	1037	1117	1157	1237	1317	1357	1437	1517	1557	1637	1717	
Dover Balmer's Farm	0719	0759	0838	0918	0958	1038	1118	1158	1238	1318	1358	1438	1518	1558	1638	1718	
Dover Aye Bridge Farm	0720	0800	0839	0919	0959	1039	1119	1159	1239	1319	1359	1439	1519	1559	1639	1719	
Dover Crankwood Road	0721	0801	0840	0920	1000	1040	1120	1200	1240	1320	1400	1440	1520	1600	1640	1720	
Abram Park Lane	0722	0802	0841	0921	1001	1041	1121	1201	1241	1321	1401	1441	1521	1601	1641	1721	
Abram Post Office	0722	0802	0842	0922	1002	1042	1122	1202	1242	1322	1402	1442	1522	1602	1642	1722	
Abram Alexandra Street	0723	0803	0843	0923	1003	1043	1123	1203	1243	1323	1403	1443	1523	1603	1643	1723	
Abram School Street	0723	0803	0843	0923	1003	1043	1123	1203	1243	1323	1403	1443	1523	1603	1643	1723	
Abram Bickershaw Lane	0724	0804	0844	0924	1004	1044	1124	1204	1244	1324	1404	1444	1524	1604	1644	1724	
Platt Bridge Millers Lane	0725	0805	0845	0925	1005	1045	1125	1205	1245	1325	1405	1445	1525	1605	1645	1725	
Platt Bridge Queens Arms	0725	0805	0845	0925	1005	1045	1125	1205	1245	1325	1405	1445	1525	1605	1645	1725	
Platt Bridge Stapleton Street	0726	0806	0846	0926	1006	1046	1126	1206	1246	1326	1406	1446	1526	1606	1646	1726	
Spring View Coronation Street	0727	0807	0847	0927	1007	1047	1127	1207	1247	1327	1407	1447	1527	1607	1647	1727	
Spring View Taylors Lane	0728	0808	0848	0928	1008	1048	1128	1208	1248	1328	1408	1448	1528	1608	1648	1728	
Spring View Marlborough Avenue	0729	0809	0849	0929	1009	1049	1129	1209	1249	1329	1409	1449	1529	1609	1649	1729	
Lower Ince Cemetery Road	0730	0810	0850	0930	1010	1050	1130	1210	1250	1330	1410	1450	1530	1610	1650	1730	
Lower Ince Westwood Lane	0730	0810	0850	0930	1010	1050	1130	1210	1250	1330	1410	1450	1530	1610	1650	1730	
Lower Ince Chorley Street	0731	0811	0851	0931	1011	1051	1131	1211	1251	1331	1411	1451	1531	1611	1651	1731	
Lower Ince Frederick Street	0731	0811	0851	0931	1011	1051	1131	1211	1251	1331	1411	1451	1531	1611	1651	1731	
Wigan Orrell Street	0733	0813	0853	0933	1013	1053	1133	1213	1253	1333	1413	1453	1533	1613	1653	1733	
Wigan Sovereign Road	0733	0813	0853	0933	1013	1053	1133	1213	1253	1333	1413	1453	1533	1613	1653	1733	
Wigan Job Centre	0734	0814	0854	0934	1014	1054	1134	1214	1254	1334	1414	1454	1534	1614	1654	1734	
Wigan Wallgate	0734	0814	0854	0934	1014	1054	1134	1214	1254	1334	1414	1454	1534	1614	1654	1734	
Wigan Bus Station	0736	0816	0856	0936	1016	1056	1136	1216	1256	1336	1416	1456	1536	1616	1656	1736	

Saturday - towards Wigan Bus Station

	360	360
Warrington Bus Interchange	1729	1809
Warrington Central Station	1729	1809

	360	360
Bewsey Tesco	1731	1811
Bewsey Owen Street	1731	1811
Longford Ireland Street	1732	1812
Longford Alder Lane	1733	1813
Longford Winwick Road College	1733	1813
Longford Alban Retail Park	1734	1814
Hulme Sandy Lane West	1735	1815
Hulme Mill Lane	1737	1817
Winwick B&Q	1738	1818
Winwick St Oswald Church	1741	1821
Winwick Old School House Lane	1741	1821
Hermitage Green Cop Holt Farm	1742	1822
Newton le Willows Farm Way	1744	1824
Newton le Willows Cholmley Drive	1744	1824
Newton le Willows Newton Park Drive	1745	1825
Newton le Willows Mill Meadow	1745	1825
Newton le Willows Newton-le-Willows Rail Station	1746	1826
Newton le Willows Newton-le-Willows Station	1746	1826
Newton le Willows Waterworks Drive	1747	1827
Newton le Willows Parkside Road	1748	1828
Golborne Golf Course	1750	1830
Golborne Queen Anne	1752	1832
Golborne School Street	1753	1833
Golborne John Street	1753	1833
Golborne Railway Road	1754	1834
Golborne Manor Street	1754	1834
Golborne May Street	1755	1835
Golborne Ashton Road	1756	1836
Dover Windy Bank Farm	1757	1837
Dover Balmer's Farm	1758	1838
Dover Aye Bridge Farm	1759	1839
Dover Crankwood Road	1800	1840
Abram Park Lane	1801	1841
Abram Post Office	1802	1842
Abram Alexandra Street	1803	1843
Abram School Street	1803	1843
Abram Bickershaw Lane	1804	1844
Platt Bridge Millers Lane	1805	1845
Platt Bridge Queens Arms	1805	1845
Platt Bridge Stapleton Street	1806	1846
Spring View Coronation Street	1807	1847
Spring View Taylors Lane	1808	1848
Spring View Marlborough Avenue	1809	1849
Lower Ince Cemetery Road	1810	1850
Lower Ince Westwood Lane	1810	1850
Lower Ince Chorley Street	1811	1851
Lower Ince Frederick Street	1811	1851
Wigan Orrell Street	1813	1853
Wigan Sovereign Road	1813	1853
Wigan Job Centre	1814	1854
Wigan Wallgate	1814	1854
Wigan Bus Station	1816	1856

Warrington - Croft - Culcheth - Leigh

Warrington - Birchwood - Culcheth - Leigh

19/28

28A/28E

Mondays to Fridays
except public holidays

route number	19	28	19	28A	19	28	19	28	19	19	28	19	28	19	28	19	28		
Warrington, Interchange	0548	0554	0625	0634	0650	0702	0744	0813	0817	0902	0918	1002	18	02	1318	1402	1418	1456	1517
Winwick Road, McDonalds	0551	▼	0628	▼	0653	▼	0747	▼	0821	0906	▼	1006	▼	06	▼	1406	▼	1500	▼
Winwick Road, Collegiate Inst	0554	▼	0631	▼	0656	▼	0751	▼	0823	0908	▼	1008	▼	08	▼	1408	▼	1502	▼
Winwick, B&Q	0558	▼	0635	▼	0701	▼	0757	▼	0829	0914	▼	1014	▼	14	▼	1414	▼	1508	▼
Winwick, Post Office	0600	▼	0637	▼	0703	▼	0801	▼	0831	0916	▼	1016	▼	16	▼	1416	▼	1510	▼
Croft, Horseshoe	0604	▼	0641	▼	0708	▼	0808	▼	0838	0923	▼	1023	▼	23	▼	1423	▼	1517	▼
Padgate Ln, St Oswald's Church	▼	0603	▼	0643	▼	0713	▼	0826	▼	0931	▼		31	▼	1331	▼	1431	▼	1531
Padgate, Railway Station	▼	0605	▼	0645	▼	0715	▼	0828	▼	0933	▼		33	▼	1333	▼	1433	▼	1533
Longbarn, Blackburne Close	▼	0608	▼	0648	▼	0718	▼	0831	▼	0936	▼		36	▼	1336	▼	1436	▼	1536
Glover Road, Turf & Feather	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼		▼	▼	mins.	▼	▼	▼	▼
Birchwood Centre	▼	0613	▼	▼	▼	0725	▼	0839	▼	0943	▼		43	▼	then	▼	▼	▼	▼
Birchwood, Railway Station	▼	0614	▼	▼	▼	0727	▼	0841	▼	0945	▼		45	▼	at	▼	▼	▼	▼
Heathfield House	▼	0618	▼	0652	▼	0733	▼	0848	▼	0950	▼		50	▼	past	▼	▼	▼	▼
Oakwood, Keyes Close	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼		▼	▼	each	▼	▼	▼	▼
Glover Road, Turf & Feather	▼	0619	▼	0653	▼	0734	▼	0849	▼	0951	▼		51	▼	hour	▼	▼	▼	▼
Locking Stumps, Copperfield Cl	▼	0620	▼	0654	▼	0736	▼	0851	▼	0953	▼		53	▼	until	▼	▼	▼	▼
Risley, H.M. Prison	▼	0624	▼	0659	▼	0741	▼	0856	▼	0956	▼		56	▼	1350	▼	1450	▼	1550
Culcheth, Library arr	0610	0628	0647	0703	0714	0745	0815	0900	0844	0929	1000	1029	00	29	1400	1429	1500	1523	1600
Culcheth, Library dep	0611	0630	0650	0705	0717	0747	0817	0902	0847	0932	1002	1032	02	32	1402	1432	1502	1526	1602
Warrington Rd, Greyhound Hotel	0617	0636	0656	0711	0723	0755	0825	0910	0855	0940	1010	1040	10	40	1410	1440	1510	1538	1610
Butts Bridge, Central Avenue	0619	0639	0659	0714	0726	0757	0828	0912	0857	0942	1012	1042	12	42	1412	1442	1512	1540	1612
Leigh, Bus Station	0625	0645	0705	0720	0735	0805	0835	0920	0905	0950	1020	1050	20	50	1420	1450	1520	1550	1620

route number	19	28	19	28	19	28	28E	28E	19	28E	28E	19	28E
Warrington, Interchange	1556	1605	1702	1711	1756	1809	1920	2020	2021	2120	2220	2221	2320
Winwick Road, McDonalds	1601	▼	1707	▼	1801	▼	▼	▼	2025	▼	▼	2225	▼
Winwick Road, Collegiate Inst	1605	▼	1713	▼	1804	▼	▼	▼	2027	▼	▼	2227	▼
Winwick, B&Q	1612	▼	1720	▼	1810	▼	▼	▼	2031	▼	▼	2231	▼
Winwick, Post Office	1615	▼	1723	▼	1813	▼	▼	▼	2033	▼	▼	2233	▼
Croft, Horseshoe	1621	▼	1729	▼	1819	▼	▼	▼	2041	▼	▼	2241	▼
Padgate Ln, St Oswald's Church	▼	1620	▼	1726	▼	1822	1929	2029	▼	2129	2229	▼	2329
Padgate, Railway Station	▼	1622	▼	1728	▼	1824	1931	2031	▼	2131	2231	▼	2331
Longbarn, Blackburne Close	▼	1625	▼	1731	▼	1827	1934	2034	▼	2134	2234	▼	2334
Crab Lane, Locking Stumps Lane	▼	▼	▼	▼	▼	▼	1936	2036	▼	2136	2236	▼	2336
Glover Road, Turf & Feather	▼	▼	▼	▼	▼	▼	1939	2039	▼	2139	2239	▼	2339
Birchwood Centre	▼	1633	▼	1739	▼	1835	1944	2044	▼	2144	2244	▼	2344
Birchwood, Railway Station	▼	1635	▼	1741	▼	1837	1946	2046	▼	2146	2246	▼	2346
Heathfield House	▼	1641	▼	1747	▼	1843	▼	▼	▼	▼	▼	▼	▼
Oakwood, Keyes Close	▼	▼	▼	▼	▼	▼	1949	2049	▼	2149	2249	▼	2349
Gorse Covert, Spar Store	▼	▼	▼	▼	▼	▼	1952	2052	▼	2152	2252	▼	2352
Gorse Covert, Ashdown Lane	▼	▼	▼	▼	▼	▼	1954	2054	▼	2154	2254	▼	2354
Glover Road, Turf & Feather	▼	1642	▼	1748	▼	1844	▼	▼	▼	▼	▼	▼	▼
Locking Stumps, Copperfield Cl	▼	1644	▼	1750	▼	1846	▼	▼	▼	▼	▼	▼	▼
Risley, H.M. Prison	▼	1652	▼	1756	▼	1850	1959	2059	▼	2159	2259	▼	▼
Culcheth, Library arr	1627	1656	1735	1800	1825	1855	2003	2103	2049	2203	2303	2249	▼
Culcheth, Library dep	1630	1658	1737	1802	1827	1857	2003	2103	▼	2203	2303	▼	▼
Warrington Rd, Greyhound Hotel	1638	1708	1745	1810	1835	1905	2009	2109	▼	2209	2309	▼	▼
Butts Bridge, Central Avenue	1640	1710	1747	1812	1837	1907	2011	2111	▼	2211	2311	▼	▼
Leigh, Bus Station	1650	1720	1755	1820	1845	1915	2016	2116	▼	2216	2316	▼	▼



Warrington - Croft - Culcheth - Leigh Warrington - Birchwood - Culcheth - Leigh

19/28 28A/28E

Saturdays

route number	28	28	19	28	19	28	19	28	19	28	19	28	19	28	19	28A	28E	28E	19
Warrington, Interchange	0629	0655	0706	0723	0802	18	02	1418	1502	1518	1605	1618	1705	1725	1805	1827	1920	2020	2021
Winwick Road, McDonalds	▼	▼	0710	▼	0806	▼	06	▼	1506	▼	1609	▼	1709	▼	1809	▼	▼	▼	2025
Winwick Road, Collegiate Inst	▼	▼	0712	▼	0808	▼	08	▼	1508	▼	1611	▼	1711	▼	1811	▼	▼	▼	2027
Winwick, B&Q	▼	▼	0718	▼	0814	▼	14	▼	1514	▼	1617	▼	1717	▼	1817	▼	▼	▼	2031
Winwick, Post Office	▼	▼	0720	▼	0816	▼	16	▼	1516	▼	1619	▼	1719	▼	1819	▼	▼	▼	2033
Croft, Horseshoe	▼	▼	0725	▼	0823	▼	23	▼	1523	▼	1626	▼	1726	▼	1824	▼	▼	▼	2041
Padgate Ln, St Oswald's Church	0637	0703	▼	0735	▼	31	▼	1431	▼	1531	▼	1631	▼	1737	▼	1839	1929	2029	▼
Padgate, Railway Station	0639	0705	▼	0737	▼	33	▼	1433	▼	1533	▼	1633	▼	1739	▼	1841	1931	2031	▼
Longbarn, Blackburne Close	0642	0708	▼	0740	▼	36	▼	1436	▼	1536	▼	1636	▼	1742	▼	1844	1934	2034	▼
Crab Lane, Locking Stumps Lane	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Glover Road, Turf & Feather	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Birchwood Centre	0649	0715	▼	0747	▼	43	mins. past each hour until	1443	▼	1543	▼	1643	▼	1749	▼	▼	▼	▼	▼
Birchwood, Railway Station	0651	0717	▼	0749	▼	45	▼	1445	▼	1545	▼	1645	▼	1751	▼	▼	▼	▼	▼
Oakwood, Keyes Close	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Gorse Covert, Spar Store	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Gorse Covert, Ashdown Lane	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Heathfield House	0656	0722	▼	0754	▼	50	▼	1450	▼	1550	▼	1650	▼	1756	▼	1848	▼	▼	▼
Glover Road, Turf & Feather	0657	0723	▼	0755	▼	51	▼	1451	▼	1551	▼	1651	▼	1757	▼	1849	▼	▼	▼
Locking Stumps, Copperfield Cl	0659	0725	▼	0757	▼	53	▼	1453	▼	1553	▼	1653	▼	1759	▼	1851	▼	▼	▼
Risley, H.M. Prison	0702	0728	▼	0800	▼	56	▼	1456	▼	1556	▼	1656	▼	1802	▼	1854	1959	2059	▼
Culcheth, Library arr	0704	0730	0731	0803	0829	00	29	1500	1529	1600	1632	1700	1732	1805	1830	1857	2003	2103	2049
Culcheth, Library dep	0706	▼	0732	0805	0832	02	32	1502	1532	1602	1635	1702	1735	1807	1832	1859	2003	2103	▼
Warrington Rd, Greyhound Hotel	0712	▼	0740	0812	0840	10	40	1510	1540	1610	1643	1710	1743	1814	1839	1906	2009	2109	▼
Butts Bridge, Central Avenue	0714	▼	0742	0814	0842	12	42	1512	1542	1612	1645	1712	1745	1816	1841	1908	2011	2111	▼
Leigh, Bus Station	0720	▼	0750	0820	0850	20	50	1520	1550	1620	1653	1720	1753	1822	1847	1914	2016	2116	▼

route number	28E	28E	19	28E
Warrington, Interchange	2120	2220	2221	2320
Winwick Road, McDonalds	▼	▼	2225	▼
Winwick Road, Collegiate Inst	▼	▼	2227	▼
Winwick, B&Q	▼	▼	2231	▼
Winwick, Post Office	▼	▼	2233	▼
Croft, Horseshoe	▼	▼	2241	▼
Padgate Ln, St Oswald's Church	2129	2229	▼	2329
Padgate, Railway Station	2131	2231	▼	2331
Longbarn, Blackburne Close	2134	2234	▼	2334
Crab Lane, Locking Stumps Lane	2136	▼	▼	▼
Glover Road, Turf & Feather	2139	▼	▼	▼
Birchwood Centre	2144	2244	▼	2344
Birchwood, Railway Station	2146	2246	▼	2346
Oakwood, Keyes Close	2149	▼	▼	▼
Gorse Covert, Spar Store	2152	▼	▼	▼
Gorse Covert, Ashdown Lane	2154	▼	▼	▼
Risley, H.M. Prison	2159	2259	▼	▼
Culcheth, Library arr	2203	2303	2249	▼
Culcheth, Library dep	2203	2303	▼	▼
Warrington Rd, Greyhound Hotel	2209	2309	▼	▼
Butts Bridge, Central Avenue	2211	2311	▼	▼
Leigh, Bus Station	2216	2316	▼	▼



Warrington - Croft - Culcheth - Leigh

Warrington - Padgate - Culcheth - Leigh

19

28A

Sundays

& public holidays

route number	19	28A	19	28A	19	28A	19	28A
Warrington, Interchange	0850	0927	0946	27	46	1627	1646	1727
Winwick Road, McDonalds	0854	▼	0950	▼	50	▼	1650	▼
Winwick Road, Collegiate Inst	0856	▼	0952	▼	52	▼	1652	▼
Winwick, B&Q	0900	▼	0956	▼	56	▼	1656	▼
Winwick, Post Office	0904	▼	1000	▼	00	▼	1700	▼
Croft, Horseshoe	0912	▼	1008	▼	08	▼	1708	▼
Padgate Ln, St Oswald's Church	▼	0938	▼	38	▼	1638	▼	1738
Padgate, Railway Station	▼	0940	▼	40	▼	mins. 1640	▼	1740
Longbarn, Blackburne Close	▼	0944	▼	44	▼	past 1644	▼	1744
Heathfield House	▼	0948	▼	48	▼	at 1648	▼	1748
Glover Road, Turf & Feather	▼	0949	▼	49	▼	hour 1649	▼	1749
Locking Stumps, Copperfield Cl	▼	0950	▼	50	▼	until 1650	▼	1750
Risley, H.M. Prison	▼	0953	▼	53	▼	1653	▼	1753
Culcheth, Library arr	0920	0958	1016	58	16	1658	1716	1758
Culcheth, Library dep		1000		00		1700		
Warrington Rd, Greyhound Hotel		1008		08		1708		
Butts Bridge, Central Avenue		1010		10		1710		
Leigh, Bus Station		1016		16		1716		



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Leigh - Culcheth - Croft - Warrington Leigh - Culcheth - Birchwood - Warrington

19/28 28A/28E

Mondays to Fridays except public holidays

route number	19	28A	19	28	19	28	19	19	28	19	28	19	19	28	19	28	19	28	19			
Leigh, Bus Station	0630	0650	0710	0740	0810	0840	0910	0954	24	54	1424		1454	1524	1554	1630	1700	1730	1800			
Butts Bridge, Central Avenue	0635	0656	0716	0746	0816	0846	0916	1000	30	00	1430		1500	1530	1600	1636	1706	1736	1806			
Warrington Rd, Greyhound Hotel	0642	0700	0724	0752	0820	0852	0920	1004	34	04	1434		1504	1534	1604	1640	1710	1740	1809			
Holcroft Lane													1509									
Culcheth, Library arr	0648	0707	0731	0759	0827	0859	0927	1011	41	11	1441		1511	1512	1541	1612	1647	1717	1747	1817		
Culcheth, Library dep	0652	0711	0734	0802	0831	0902	0931	1013	43	13	1443		1515	1516	1543	1616	1649	1719	1749	1819		
Risley, H.M. Prison		0716		0808		0908			47		1447			1547		1653		1753				
Locking Stumps, Copperfield Cl		0719		0811		0911			50		1450			1550		1656		1756				
Glover Road, Turf & Feather		0720		0812		0912			51		1451			1551		1657		1757				
Heathfield House		0721		0813		0913			53		1453			1553		1659		1759				
Gorse Covert, Ashdown Lane																						
Oakwood, Keyes Close																						
Birchwood, Railway Station				0820		0920			then at													
Birchwood Centre				0822		0922			00					1500		1600		1706		1806		
Glover Road, Turf & Feather									01					1501		1601		1707		1807		
Longbarn, Blackburne Close		0730		0830		0930																
Padgate, Railway Station		0734		0834		0934			08					1509		1609		1716		1816		
Padgate Ln, St Oswald's Church		0738		0836		0936			12					1513		1613		1720		1820		
Croft, Horseshoe	0658		0742		0837		0937	1019	14					1515		1615		1722		1822		
Winwick, Post Office	0704		0749		0843		0943	1025		19				1521	1522	1622		1724		1824		
Winwick, B&Q	0708		0754		0849		0949	1028		25				1527	1528	1628		1731		1830		
Winwick Road, Collegiate Inst	0714		0803		0858		0958	1033		28				1530	1531	1631		1734		1832		
Winwick Road, McDonalds	0717		0807		0902		1002	1035		33				1536	1537	1637		1740		1837		
Warrington, Interchange	0724	0752	0814	0848	0908	0948	1008	1041		35				1538	1539	1639		1742		1839		
Sch - Runs on Culcheth High School Term Days									26	41				1528	1545	1546	1628	1646	1736	1749	1836	1844
														Sch								

route number	28	19	28E	28E	19	28E	28E	19	28E
Leigh, Bus Station	1825	1850	1920	2020		2120	2220		2320
Butts Bridge, Central Avenue	1830	1856	1923	2023		2123	2223		2323
Warrington Rd, Greyhound Hotel	1832	1859	1925	2025		2125	2225		2325
Culcheth, Library arr	1838	1907	1932	2032		2132	2232		2332
Culcheth, Library dep	1840	1909	1932	2032	2049	2132	2232	2249	2332
Risley, H.M. Prison	1844		1936	2036		2136	2236		2336
Locking Stumps, Copperfield Cl	1847								
Glover Road, Turf & Feather	1848								
Heathfield House	1849								
Gorse Covert, Spar Store			1941	2041		2141	2241		2341
Gorse Covert, Ashdown Lane			1943	2043		2143	2243		2343
Oakwood, Keyes Close			1946	2046		2146	2246		2346
Birchwood, Railway Station	1853		1950	2050		2150	2250		2350
Birchwood Centre	1855		1952	2052		2152	2252		2352
Glover Road, Turf & Feather			1957	2057		2157	2257		2357
Crab Lane, Locking Stumps Lane			2000	2100		2200	2300		0000
Longbarn, Blackburne Close	1900		2003	2103		2203	2303		0003
Padgate, Railway Station	1903		2006	2106		2206	2306		0006
Padgate Ln, St Oswald's Church	1905		2008	2108		2208	2308		0008
Croft, Horseshoe		1914			2054			2254	
Winwick, Post Office		1920			2100			2300	
Winwick, B&Q		1922			2102			2302	
Winwick Road, Collegiate Inst		1927			2107			2307	
Winwick Road, McDonalds		1929			2109			2309	
Wilderspool, St James Church									0014
Warrington, Interchange	1913	1934	2016	2116	2114	2216	2316	2314	



Leigh - Culcheth - Croft - Warrington Leigh - Culcheth - Birchwood - Warrington

19/28 28A/28E

Saturdays

route number	19	28A	19	28	19	28	19	19	28	19	28	19	19	28	19	28	19	28	19		
Leigh, Bus Station	0724	0754	0824	0854			24	54		1524	1554	1630	1700	1730	1800	1830	1850	1920	2020	2120	
Butts Bridge, Central Avenue	0729	0800	0830	0900			30	00		1530	1600	1636	1706	1736	1806	1835	1855	1923	2023	2123	
Warrington Rd, Greyhound Hotel	0733	0804	0834	0904			34	04		1534	1604	1640	1710	1740	1810	1837	1857	1925	2025	2125	
Culcheth, Library arr	0740	0811	0841	0911			41	11		1541	1611	1647	1717	1747	1817	1844	1904	1932	2032	2132	
Culcheth, Library dep	0733	0742	0813	0843	0913		43	13		1543	1613	1649	1719	1749	1819	1846	1906	1932	2032	2049	2132
Risley, H.M. Prison	0746	0847					47			1547	1653	1753			1850			1936	2036	2136	
Locking Stumps, Copperfield Cl	0749	0850					50			1550	1656	1756			1853						
Glover Road, Turf & Feather	0750	0851					51			1551	1657	1757			1854						
Heathfield House	0751	0853					53			1553	1659	1758			1855						
Gorse Covert, Spar Store																		1941	2041	2141	
Gorse Covert, Ashdown Lane																		1943	2043	2143	
Oakwood, Keyes Close																		1946	2046	2146	
Birchwood, Railway Station	0757	0900				then	00		mins.	1600		1706		1804		1859		1950	2050	2150	
Birchwood Centre	0758	0901				at	01		past	1601		1707		1805		1901		1952	2052	2152	
Glover Road, Turf & Feather									hour												
Crab Lane, Locking Stumps Lane									until									1957	2057	2157	
Longbarn, Blackburne Close	0805	0908					08			1608		1714		1812		1906		2003	2103	2203	
Padgate, Railway Station	0808	0912					12			1612		1718		1815		1909		2006	2106	2206	
Padgate Ln, St Oswald's Church	0810	0914					14			1614		1720		1817		1911		2008	2108	2208	
Croft, Horseshoe	0738	0819	0919					19			1619	1725	1825	1911	2054						
Winwick, Post Office	0744	0825	0925					25			1625	1731	1831	1917	2100						
Winwick, B&Q	0746	0828	0928					28			1628	1734	1834	1919	2102						
Winwick Road, Collegiate Inst	0750	0833	0933					33			1633	1739	1839	1924	2107						
Winwick Road, McDonalds	0752	0835	0935					35			1635	1741	1841	1926	2109						
Warrington, Interchange	0757	0820	0841	0926	0941		26	41		1626	1641	1732	1747	1826	1847	1919	1931	2016	2116	2114	2216

route number	28E	19	28E
Leigh, Bus Station	2220		2320
Butts Bridge, Central Avenue	2223		2323
Warrington Rd, Greyhound Hotel	2225		2325
Culcheth, Library arr	2232		2332
Culcheth, Library dep	2232	2249	2332
Risley, H.M. Prison	2236		2336
Gorse Covert, Spar Store	2241		2341
Gorse Covert, Ashdown Lane	2243		2343
Oakwood, Keyes Close	2246		2346
Birchwood, Railway Station	2250		2350
Birchwood Centre	2252		2352
Glover Road, Turf & Feather	2257		2357
Crab Lane, Locking Stumps Lane	2300		0000
Longbarn, Blackburne Close	2303		0003
Padgate, Railway Station	2306		0006
Padgate Ln, St Oswald's Church	2308		0008
Croft, Horseshoe		2254	
Winwick, Post Office		2300	
Winwick, B&Q		2302	
Winwick Road, Collegiate Inst		2307	
Winwick Road, McDonalds		2309	
Wilderspool, St James Church			0014
Warrington, Interchange	2316		2314



Leigh - Culcheth - Croft - Warrington Leigh - Culcheth - Padgate - Warrington

19/28 28A/28E

Sundays
& public holidays

route number	19	19	28A	19	28A	19	28A	19	28A	28A
Leigh, Bus Station			1020		20		1620		1720	
Butts Bridge, Central Avenue			1026		26		1626		1726	
Warrington Rd, Greyhound Hotel			1028		28		1628		1728	
Culcheth, Library arr			1036		36		1636		1736	
Culcheth, Library dep	0924	1024	1038	24	38	1624	1638	1719	1738	1801
Risley, H.M. Prison	▼	▼	1043	▼	43	▼	1643	▼	1743	1806
Locking Stumps, Copperfield Cl	▼	▼	1046	▼	46	▼	1646	▼	1746	1809
Glover Road, Turf & Feather	▼	▼	1047	▼	47	mins. past each hour until	▼	▼	▼	▼
Heathfield House	▼	▼	1048	▼	48	at	▼	▼	▼	▼
Longbarn, Blackburne Close	▼	▼	1052	▼	52		▼	▼	▼	▼
Padgate, Railway Station	▼	▼	1056	▼	56		▼	▼	▼	▼
Padgate Ln, St Oswald's Church	▼	▼	1058	▼	58		▼	▼	▼	▼
Croft, Horseshoe	0930	1030	▼	30	▼	1630	▼	1725	▼	▼
Winwick, Post Office	0937	1037	▼	37	▼	1637	▼	1732	▼	▼
Winwick, B&Q	0940	1040	▼	40	▼	1640	▼	1735	▼	▼
Winwick Road, Collegiate Inst	0944	1044	▼	44	▼	1644	▼	1739	▼	▼
Winwick Road, McDonalds	0946	1046	▼	46	▼	1646	▼	1741	▼	▼
Warrington, Interchange	0952	1052	1107	52	07	1652	1707	1747	1807	1830



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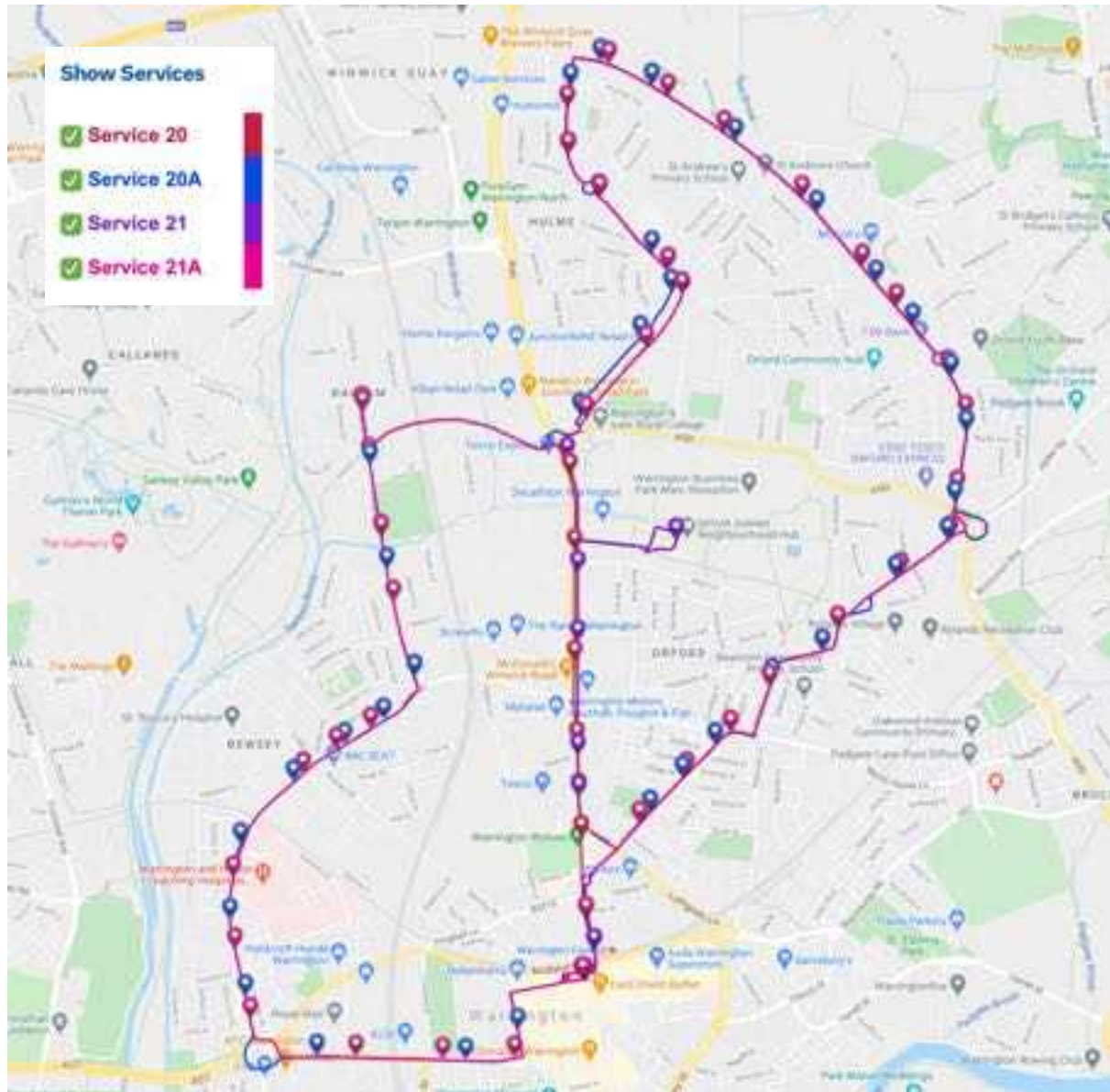



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Service 20, 20A, 21, 21A

Warrington Interchange - Orford/Longford Circulars, via Poplars Avenue



Depart From Arrive At Time On

Services 20 20A 21 21A

Warrington - Longford/Orford Circular (The Pops)

20/20A

Mondays to Fridays except public holidays

route number	20A	20A	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20			
Warrington, Interchange	0617	0645	0705	0715	0725	0735	0745	0755	0805	0815	0825	0835	0845	0855	0905			1503	1513	1528	1543	1553
Winwick Road, McDonalds	▼	▼	0708	0718	0728	0738	0748	0758	0808	0818	0828	0838	0848	0858	0908			1506	1516	1531	1546	1556
Orford Park Centre			0713	0723	0733	0743	0753	0803	0813	0823	0833	0843	0853	0903	0913			1512	1522	1537	1552	1602
Winwick Road, Collegiate Inst	▼	▼	0715	0725	0735	0745	0755	0805	0815	0825	0835	0845	0855	0905	0915			1514	1524	1539	1554	1604
General Hospital	0622	0650	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼			and at frequent intervals until				
Folly Lane, Tyrol House	0624	0652	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼							
Dallam, Harrison Square	0627	0655	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼							
Longford, Cotswold Road	0633	0701	0721	0731	0741	0751	0801	0811	0821	0831	0841	0851	0901	0911	0921			1520	1530	1545	1600	1610
Poplars Avenue, Cleveland Road	0635	0703	0723	0733	0743	0753	0803	0813	0823	0833	0843	0853	0903	0913	0923			1522	1532	1547	1602	1612
Orford Avenue	0641	0709	0730	0740	0750	0800	0810	0820	0830	0840	0850	0900	0910	0920	0930			1529	1539	1554	1609	1619
Warrington, Interchange	0651	0719	0741	0751	0801	0811	0821	0831	0841	0851	0901	0911	0921	0929	0938			1539	1549	1604	1619	1629

route number	20	20	20	20	20	20	20	20	20	20	20	20	20
Warrington, Interchange	1608	1623	1633	1648	1703	1713	1728	1743	1753	1808	1840		
Winwick Road, McDonalds	1611	1626	1636	1651	1706	1716	1731	1746	1756	1811	1843		
Orford Park Centre	1617	1632	1642	1657	1712	1722	1737	1752	1802	1814	1846		
Winwick Road, Collegiate Inst	1619	1634	1644	1659	1714	1724	1739	1754	1804	1816	1848		
Longford, Cotswold Road	1625	1640	1650	1705	1720	1730	1745	1800	1810	1821	1853		
Poplars Avenue, Cleveland Road	1627	1642	1652	1707	1722	1732	1747	1802	1812	1823	1855		
Orford Avenue	1634	1649	1659	1714	1729	1739	1754	1809	1819	1829	1901		
Warrington, Interchange	1644	1659	1709	1724	1739	1749	1804	1819	1828	1835	1907		

Saturdays

route number	20A	20	20	20	20	20	20	20	20	20	20	20	20	
Warrington, Interchange	0645	0730	0800	0824	0848	0906			1720	1732	1745	1800	1815	1845
Winwick Road, McDonalds	▼	0733	0803	0827	0851	0909			1723	1735	1748	1803	1818	1848
Orford Park Centre	▼	0736	0808	0832	0856	0914			1728	1740	1753	1808	1821	1851
Winwick Road, Collegiate Inst	▼	0738	0810	0834	0858	0916			1730	1742	1755	1810	1823	1853
General Hospital	0652	▼	▼	▼	▼	▼			and at frequent intervals until					
Folly Lane, Tyrol House	0654	▼	▼	▼	▼	▼								
Dallam, Harrison Square	0657	▼	▼	▼	▼	▼								
Longford, Cotswold Road	0703	0743	0816	0840	0904	0922			1736	1748	1801	1816	1828	1858
Poplars Avenue, Cleveland Road	0705	0745	0818	0842	0906	0924			1738	1750	1803	1818	1830	1900
Orford Avenue	0711	0751	0825	0849	0913	0931			1745	1757	1810	1825	1836	1906
Warrington, Interchange	0717	0757	0833	0857	0921	0939			1753	1805	1818	1833	1842	1912

Sundays

& public holidays

route number	20	20	20	20	20
Warrington, Interchange	0915	0945	15	45	1715
Winwick Road, McDonalds	0918	0948	18	48	1718
Orford Park Centre	0922	0952	22	52	mins. 1722
Winwick Road, Collegiate Inst	0924	0954	then at	24	54
Longford, Cotswold Road	0930	1000	at	30	00
Poplars Avenue, Cleveland Road	0932	1002		32	02
Orford Avenue	0939	1009		39	09
Warrington, Interchange	0946	1016		46	16



Warrington - Longford/Orford Circular (The Pops)

21/21A

Mondays to Fridays except public holidays

route number	21A	21A	21A	21A	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	
Warrington, Interchange	0510	0540	0610	0640	0658	0713	0723	0738	0753	0803	0818	0833	0843	0858	0913					
Orford Avenue	0516	0546	0616	0646	0705	0720	0730	0745	0800	0810	0825	0840	0850	0905	0920					
Poplars Avenue , Cleveland Road	0523	0553	0623	0653	0712	0727	0737	0752	0807	0817	0832	0847	0857	0912	0927					
Longford , Cotswold Road	0525	0555	0625	0655	0714	0729	0739	0754	0809	0819	0834	0849	0859	0914	0929					
Winwick Road , Collegiate Inst	▼	▼	▼	▼	0720	0735	0745	0800	0815	0825	0840	0855	0905	0920	0935					
Orford Park Centre	▼	▼	▼	▼	0723	0738	0748	0803	0818	0828	0843	0858	0908	0923	0937					
Winwick Road , McDonalds	▼	▼	▼	▼	0729	0744	0754	0809	0824	0834	0849	0904	0914	0929	0942					
Dallam , Harrison Square	0531	0601	0631	0701	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼					
Folly Lane , Tyrol House	0533	0603	0633	0703	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼					
General Hospital	0536	0606	0636	0706	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼					
Warrington, Interchange	0543	0613	0643	0715	0733	0748	0758	0813	0828	0838	0853	0908	0918	0933	0946					
																1740	1750	1800	1810	1820
																1748	1758	1808	1818	1828
																1756	1806	1816	1826	1836
																1758	1808	1818	1828	1838
																1804	1814	1824	1834	1844
																1806	1816	1826	1836	1846
																1811	1821	1831	1841	1851
																▼	▼	▼	▼	▼
																▼	▼	▼	▼	▼
																▼	▼	▼	▼	▼
																▼	▼	▼	▼	▼
																1815	1825	1835	1844	1854

route number	21	21	21	21	21	21
Warrington, Interchange	1830	1900	2000	2100	2200	2300
Orford Avenue	1838	1906	2006	2106	2206	2306
Poplars Avenue , Cleveland Road	1846	1912	2012	2112	2212	2312
Longford , Cotswold Road	1848	1914	2014	2114	2214	2314
Winwick Road , Collegiate Inst	1854	1919	2019	2119	2219	2319
Orford Park Centre	1856	1921	2021	2121	2221	2321
Winwick Road , McDonalds	1901	1924	2024	2124	2224	2324
Warrington, Interchange	1904	1927	2027	2127	2227	2327

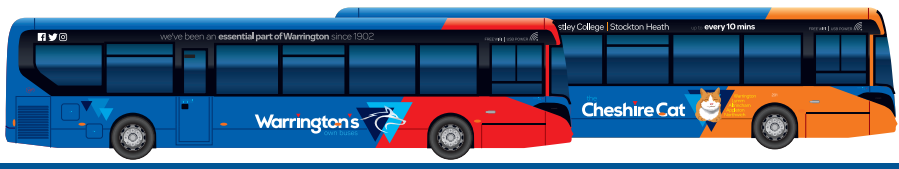
Saturdays

route number	21A	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
Warrington, Interchange	0613	0715	0745	0812	0836	0900				1738	1753	1808	1830	1900	2000	2100	2200	2300
Orford Avenue	0620	0721	0751	0819	0843	0907				1745	1800	1815	1836	1906	2006	2106	2206	2306
Poplars Avenue , Cleveland Road	0627	0727	0757	0826	0850	0914				1752	1807	1822	1842	1912	2012	2112	2212	2312
Longford , Cotswold Road	0629	0729	0759	0828	0852	0916				1754	1809	1824	1844	1914	2014	2114	2214	2314
Winwick Road , Collegiate Inst	▼	0734	0804	0834	0858	0922				1800	1815	1830	1849	1919	2019	2119	2219	2319
Orford Park Centre	▼	0736	0806	0836	0900	0924				1802	1817	1832	1851	1921	2021	▼	▼	▼
Winwick Road , McDonalds	▼	0739	0811	0841	0905	0929				1807	1822	1837	1854	1924	2024	2123	2223	2323
Dallam , Harrison Square	0635	▼	▼	▼	▼	▼				▼	▼	▼	▼	▼	▼	▼	▼	▼
Folly Lane , Tyrol House	0637	▼	▼	▼	▼	▼				▼	▼	▼	▼	▼	▼	▼	▼	▼
General Hospital	0640	▼	▼	▼	▼	▼				▼	▼	▼	▼	▼	▼	▼	▼	▼
Warrington, Interchange	0647	0742	0815	0845	0909	0933				1811	1826	1841	1857	1927	2027	2126	2226	2325

Sundays

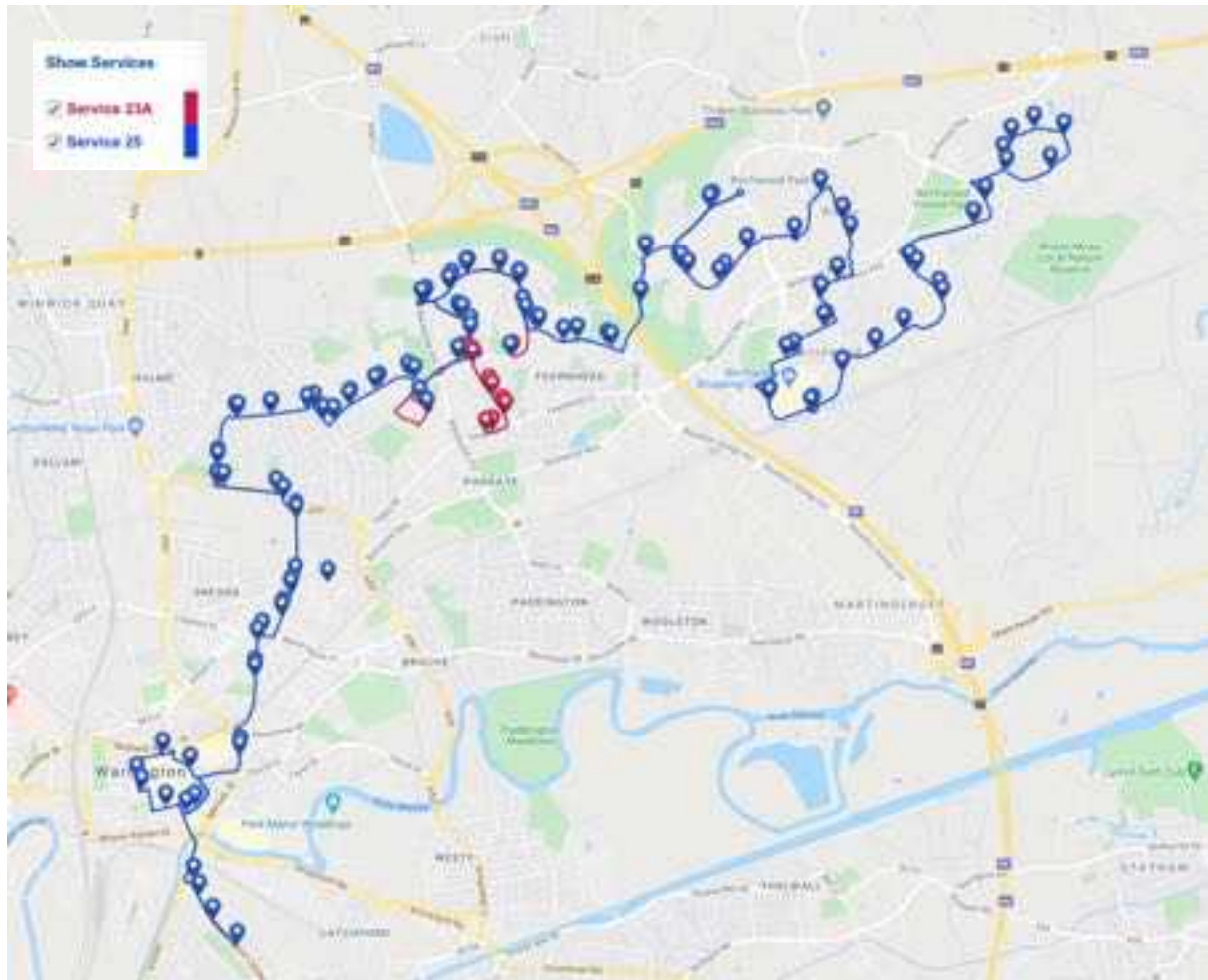
& public holidays

route number	21	21	21	21	21	21
Warrington, Interchange	0900	0930	00	30	1700	1730
Orford Avenue	0907	0937	07	37	1707	1737
Poplars Avenue , Cleveland Road	0914	0944	14	44	mins. 1714	1744
Longford , Cotswold Road	0916	0946	then 16	46	past 1716	1746
Winwick Road , Collegiate Inst	0922	0952	at 22	52	each 1722	1752
Orford Park Centre	0924	0954	24	54	hour 1724	1754
Winwick Road , McDonalds	0928	0958	28	58	1728	1758
Warrington, Interchange	0931	1001	31	01	1731	1801



Service 23A, 25

Warrington Interchange - Gorse Covert, via Orford, Greenwood Crecent or Hilden Road, Fearnhead, Locking Stumps, Birchwood, Orange Grove, Ryfields Village



Depart From: Arrive At: Time: On:

Services: 23A 25

Warrington - Orford - Birchwood - Gorse Covert 25

Mondays to Fridays except public holidays

route number	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Wilderspool, Causeway Avenue																			1608
Wilderspool, St James Church	0504																		1616
Warrington, Interchange arr	▼																		1620
Warrington, Interchange dep	▼	0542	0555	0621	0645	0708	0738	0811	0847	0915	45	15	1345	1415	1445	1515	1545	1620	1620
O'Leary Street	0509	0550	0603	0629	0653	0717	0748	0821	0857	0925	55	25	1355	1425	1455	1526	1556	1631	1631
Ryfields Village	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	57	▼	1357	▼	▼	▼	▼	▼	▼
Statham Avenue, Kirkstone Av	0514	0555	0608	0634	0658	0723	0755	0828	0903	0931	03	31	1403	1431	1501	1532	1602	1637	1637
Greenwood Crescent, Merrick Cl	0517	0559	0612	0638	0702	0728	0800	0833	0907	0935	07	35	1407	1436	1506	1537	1607	1642	1642
Orange Grove, Avery Close	▼	▼	▼	▼	▼	▼	▼	▼	▼	0937	▼	37 mins.	▼	1438	▼	1539	▼	▼	▼
Cinnamon Lane North	▼	0600	0613	0640	0704	0730	0802	0835	0909	▼ then	09	▼ past	1409	1440	1508	1541	1609	1644	1644
Cinnamon Brow, Millhouse Rdbt	▼	0601	0614	0641	0705	0731	0803	0836	0910	▼ at	10	▼ each	1410	1441	1509	1542	1610	1645	1645
Enfield Park Rd, Tweedsmuir Close	0520	0603	0616	0643	0707	0733	0805	0838	0912	0939	12	39 hour	1412	1443	1511	1544	1612	1647	1647
Crab Lane, Uni of Chester	▼	0605	0618	0645	0709	0736	0808	0841	0914		14	until	1414	1446	1514	1547	1615	1650	1650
Locking Stumps, Copperfield Cl	▼	0609	0622	0649	0713	0741	0813	0846	0918		18		1418	1450	1518	1551	1620	1655	1655
Glover Road, Turf & Feather	▼	0611	0624	0651	0715	0743	0815	0848	0920		20		1420	1452	1520	1553	1622	1657	1657
Heathfield House	▼	0612	0625	0652	0716	0744	0816	0849	0921		21		1421	1453	1521	1554	1623	1658	1658
Birchwood Centre	▼	0617	0630	0658	0722	0751	0823	0856	0927		27		1427	1503	1531	1601	1630	1705	1705
Birchwood, Railway Station	▼	0618	0631	0659	0723	0753	0825	0858	0929		29		1429	1505	1533	1604	1633	1708	1708
Oakwood, Keyes Close	▼	0621	0634	0702	0726	0757	0829	0902	0932		32		1432	1509	1537	1608	1637	1712	1712
Gorse Covert, Spar Store	▼	0625	0638	0706	0730	0801	0833	0906	0936		36		1436	1514	1542	1612	1641	1716	1716
Gorse Covert, Ashdown Lane													1438	1516	1544	1614	1643	1718	1718

NSch - Does not run on Priestley College Days
Sch - Runs on Priestley College Term Days

route number	25	25	25	25	25	25	25	25
Warrington, Interchange	1650	1720	1750	1820	1850	1921	2121	2321
O'Leary Street	1701	1732	1801	1829	1859	1931	2131	2331
Statham Avenue, Kirkstone Av	1707	1738	1807	1835	1905	1937	2137	2337
Greenwood Crescent, Merrick Cl	1712	1743	1811	1838	1908	1941	2141	2341
Cinnamon Lane North	1714	1745	1813	1840	1910	▼	▼	▼
Cinnamon Brow, Millhouse Rdbt	1715	1745	1814	1841	1911	▼	▼	▼
Enfield Park Rd, Tweedsmuir Close	1717	1748	1816	1843	1913	1944	2144	2344
Crab Lane, Uni of Chester	1720	1750	1818	1845	1915			
Locking Stumps, Copperfield Cl	1725	1754	1822	1849	1919			
Glover Road, Turf & Feather	1727	1756	1824	1851	1921			
Heathfield House	1728	1757	1825	1852	1922			
Birchwood Centre	1735	1804	1831	1858	1928			
Birchwood, Railway Station	1738	1806	1832	1859	1929			
Oakwood, Keyes Close	1742	1810	1835	1902	1932			
Gorse Covert, Spar Store	1746	1814	1839	1906	1936			
Gorse Covert, Ashdown Lane	1748	1816	1841	1908	1938			



Warrington - Orford - Birchwood - Gorse Covert 25

Saturdays

route number	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Warrington, Interchange	0650	0720	0750	0820	0848	18	48	1718	1748	1818	1921	2121	2321	
O'Leary Street	0700	0730	0800	0830	0858	28	58	1728	1758	1828	1931	2131	2331	
Ryfields Village	▼	▼	▼	▼	▼	▼	00	▼	▼	▼	▼	▼	▼	▼
Statham Avenue, Kirkstone Av	0706	0736	0806	0836	0904	34	06	1734	1804	1834	1937	2137	2337	
Greenwood Crescent, Merrick Cl	0710	0740	0810	0840	0908	38	10	1738	1808	1838	1941	2141	2341	
Orange Grove, Avery Close	▼	▼	▼	▼	▼	40	▼	▼	▼	▼	▼	▼	▼	▼
Cinnamon Lane North	0712	▼	0812	▼	0910	▼	12	▼	1810	▼	▼	▼	▼	▼
Cinnamon Brow, Millhouse Rdbt	0713	▼	0813	▼	0911	▼	13	▼	1811	▼	▼	▼	▼	▼
Enfield Park Rd, Stirrup Close	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Enfield Park Rd, Tweedsmuir Close	0715	0743	0815	0843	0913	42	15	1741	1813	1841	1944	2144	2344	
Crab Lane, Uni of Chester	0717	▼	0817	▼	0915	▼	17	▼	1815	▼	▼	▼	▼	▼
Locking Stumps, Copperfield Cl	0721	▼	0821	▼	0919	▼	21	▼	1819	▼	▼	▼	▼	▼
Glover Road, Turf & Feather	0723	▼	0823	▼	0921	▼	23	▼	1821	▼	▼	▼	▼	▼
Heathfield House	0724	▼	0824	▼	0922	▼	24	▼	1822	▼	▼	▼	▼	▼
Birchwood Centre	0730	▼	0830	▼	0928	▼	30	▼	1828	▼	▼	▼	▼	▼
Birchwood, Railway Station	0732	▼	0832	▼	0930	▼	32	▼	1830	▼	▼	▼	▼	▼
Oakwood, Keyes Close	0735	▼	0835	▼	0933	▼	35	▼	1833	▼	▼	▼	▼	▼
Gorse Covert, Spar Store	0739	▼	0839	▼	0937	▼	39	▼	1837	▼	▼	▼	▼	▼
Gorse Covert, Ashdown Lane									1839					

then
at
mins.
past
hour
until

Sundays

& public holidays

route number	25	25	25	25	25
Warrington, Interchange	0900	1100	1300	1500	1700
O'Leary Street	0908	1108	1308	1508	1708
Statham Avenue, Kirkstone Av	0914	1114	1314	1514	1714
Greenwood Crescent, Merrick Cl	0917	1117	1317	1517	1717
Cinnamon Lane North	0919	1119	1319	1519	1719
Cinnamon Brow, Millhouse Rdbt	0920	1120	1320	1520	1720
Enfield Park Rd, Tweedsmuir Close	0922	1122	1322	1522	1722
Crab Lane, Uni of Chester	0924	1124	1324	1524	1724
Locking Stumps, Copperfield Cl	0928	1128	1328	1528	1728
Glover Road, Turf & Feather	0930	1130	1330	1530	1730
Heathfield House	0931	1131	1331	1531	1731
Birchwood Centre	0937	1137	1337	1537	1737
Birchwood, Railway Station	0938	1138	1338	1538	1738
Oakwood, Keyes Close	0941	1141	1341	1541	1741
Gorse Covert, Spar Store	0945	1145	1345	1545	1745



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Gorse Covert- Birchwood - Orford - Warrington 25

Mondays to Fridays except public holidays

route number	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25		
Gorse Covert, Spar Store			0627	0641	0707	0733	0805	0837	0910	0940		42									
Gorse Covert, Ashdown Lane			0629	0643	0709	0735	0807	0839	0912	0942		44		1442	1520	1548	1618	1647	1722		
Oakwood, Keyes Close			0633	0647	0713	0739	0812	0844	0916	0946		48		1446	1525	1552	1622	1651	1726		
Birchwood, Railway Station			0637	0651	0717	0744	0818	0849	0920	0950		52		1450	1530	1557	1627	1656	1731		
Birchwood Centre			0638	0652	0718	0745	0819	0850	0921	0951		53		1451	1531	1558	1628	1657	1732		
Heathfield House			0644	0658	0725	0752	0826	0857	0928	0958		00		1458	1540	1606	1635	1704	1739		
Glover Road, Turf & Feather			0645	0659	0726	0753	0827	0858	0929	0959		01		1459	1541	1607	1636	1705	1740		
Locking Stumps, Copperfield Cl			0648	0702	0729	0757	0831	0901	0932	1002		04	mins.	1502	1545	1611	1639	1708	1743		
Crab Lane, Uni of Chester			0651	0705	0732	0801	0835	0905	0935	1005	then	07	past	1506	1549	1615	1643	1712	1747		
Enfield Park Rd, Tweedsmuir Close	0520	0622	0652	0707	0734	0803	0837	0907	0937	1007	at	39	09	hour	1439	1508	1551	1617	1645	1714	1749
Cinnamon Brow, Millhouse Rdbt	0522	0624	0654	0709	0736	0805	0839	0909	0939	1009		41	11	until	1441	1510	1553	1619	1647	1716	1751
Cinnamon Lane North	0524	0626	0656	0711	0738	0807	0841	0911	0940	1010		42	12		1442	1511	1554	1620	1648	1717	1752
Orange Grove, Avery Close			↓	↓	↓	↓	↓	↓	↓	0942		44	↓		1443	↓	↓	↓	↓	↓	↓
Greenwood Crescent, Merrick Cl	0526	0628	0658	0713	0741	0810	0844	0913	0944	1012		46	14		1446	1514	1557	1623	1650	1719	1754
Statham Avenue, Kirkstone Av	0528	0630	0702	0717	0745	0815	0849	0917	0948	1016		50	18		1450	1518	1602	1627	1654	1723	1758
Ryfields Village			↓	↓	↓	↓	↓	↓	↓	1022		↓	24		↓	↓	↓	↓	↓	↓	↓
O'Leary Street	0533	0635	0707	0723	0753	0823	0857	0923	0954	1024		56	26		1456	1524	1610	1634	1701	1731	1806
Warrington, Interchange	0539	0641	0716	0733	0803	0833	0907	0932	1002	1032		04	34		1504	1533	1620	1644	1711	1741	1815

route number	25	25	25	25	25	25	25	25
Gorse Covert, Ashdown Lane	1752	1819	1844	1909			1939	
Oakwood, Keyes Close	1756	1822	1847	1912			1942	
Birchwood, Railway Station	1801	1826	1850	1915			1945	
Birchwood Centre	1802	1827	1851	1916			1946	
Heathfield House	1809	1833	1857	1922			1952	
Glover Road, Turf & Feather	1810	1834	1858	1923			1953	
Locking Stumps, Copperfield Cl	1813	1837	1901	1926			1956	
Crab Lane, Uni of Chester	1816	1840	1904	1929			1959	
Enfield Park Rd, Tweedsmuir Close	1818	1842	1906	1930	1945	2000	2145	2345
Cinnamon Brow, Millhouse Rdbt	1820	1844	1908	1932	1947	2002	2147	2347
Cinnamon Lane North	1821	1845	1909	1933	1948	2003	2148	2348
Greenwood Crescent, Merrick Cl	1823	1847	1911	1935	1950	2005	2150	2350
Statham Avenue, Kirkstone Av	1827	1850	1914	1938	1953	2008	2153	2353
O'Leary Street	1834	1855	1919	1943	1958	2013	2158	2358
Warrington, Interchange	1843	1902	1926	1950	2005	2020	2205	0005



Gorse Covert- Birchwood - Orford - Warrington 25

Saturdays

route number	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Gorse Covert, Spar Store		0747		0847		45								
Gorse Covert, Ashdown Lane		0749		0849		47		1747		1840				
Oakwood, Keyes Close		0753		0853		51		1751		1843				
Birchwood, Railway Station		0757		0857		55		1755		1846				
Birchwood Centre		0758		0858		56		1756		1847				
Heathfield House		0805		0905		03		1803		1853				
Glover Road, Turf & Feather		0806		0906		04		1804		1854				
Locking Stumps, Copperfield Cl		0809		0909		07	mins.	1807		1857				
Crab Lane, Uni of Chester		0812		0912	then	10	past	1810		1900				
Enfield Park Rd, Tweedsmuir Close	0744	0814	0844	0914	at	42	12	1742	1812	1842	1902	1945	2145	2345
Cinnamon Brow, Millhouse Rdbt	0746	0816	0846	0916		44	14	1744	1814	1844	1904	1947	2147	2347
Cinnamon Lane North	0747	0817	0847	0917		45	15	1745	1815	1845	1905	1948	2148	2348
Orange Grove, Avery Close		▼		▼		47	▼	▼	▼	▼	▼	▼	▼	▼
Greenwood Crescent, Merrick Cl	0749	0819	0849	0919		49	17	1747	1817	1847	1907	1950	2150	2350
Statham Avenue, Kirkstone Av	0752	0823	0853	0923		53	21	1751	1821	1850	1910	1953	2153	2353
Ryfields Village		▼		▼		▼	27	▼	▼	▼	▼	▼	▼	▼
O'Leary Street	0757	0829	0859	0929		59	29	1757	1827	1855	1915	1958	2158	2358
Warrington, Interchange	0804	0837	0907	0937		07	37	1805	1835	1902	1922	2005	2205	0005

Sundays

& public holidays

route number	25	25	25	25	25
Gorse Covert, Spar Store	0945	1145	1345	1545	1745
Gorse Covert, Ashdown Lane	0948	1148	1348	1548	1748
Oakwood, Keyes Close	0951	1151	1351	1551	1751
Birchwood, Railway Station	0955	1155	1355	1555	1755
Birchwood Centre	0956	1156	1356	1556	1756
Heathfield House	1002	1202	1402	1602	1802
Glover Road, Turf & Feather	1003	1203	1403	1603	1803
Locking Stumps, Copperfield Cl	1005	1205	1405	1605	1805
Crab Lane, Uni of Chester	1009	1209	1409	1609	1809
Enfield Park Rd, Tweedsmuir Close	1011	1211	1411	1611	1811
Cinnamon Brow, Millhouse Rdbt	1013	1213	1413	1613	1813
Cinnamon Lane North	1014	1214	1414	1614	1814
Greenwood Crescent, Merrick Cl	1016	1216	1416	1616	1816
Statham Avenue, Kirkstone Av	1019	1219	1419	1619	1819
O'Leary Street	1025	1225	1425	1625	1825
Warrington, Interchange	1031	1231	1431	1631	1831



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Appendix SCG/6

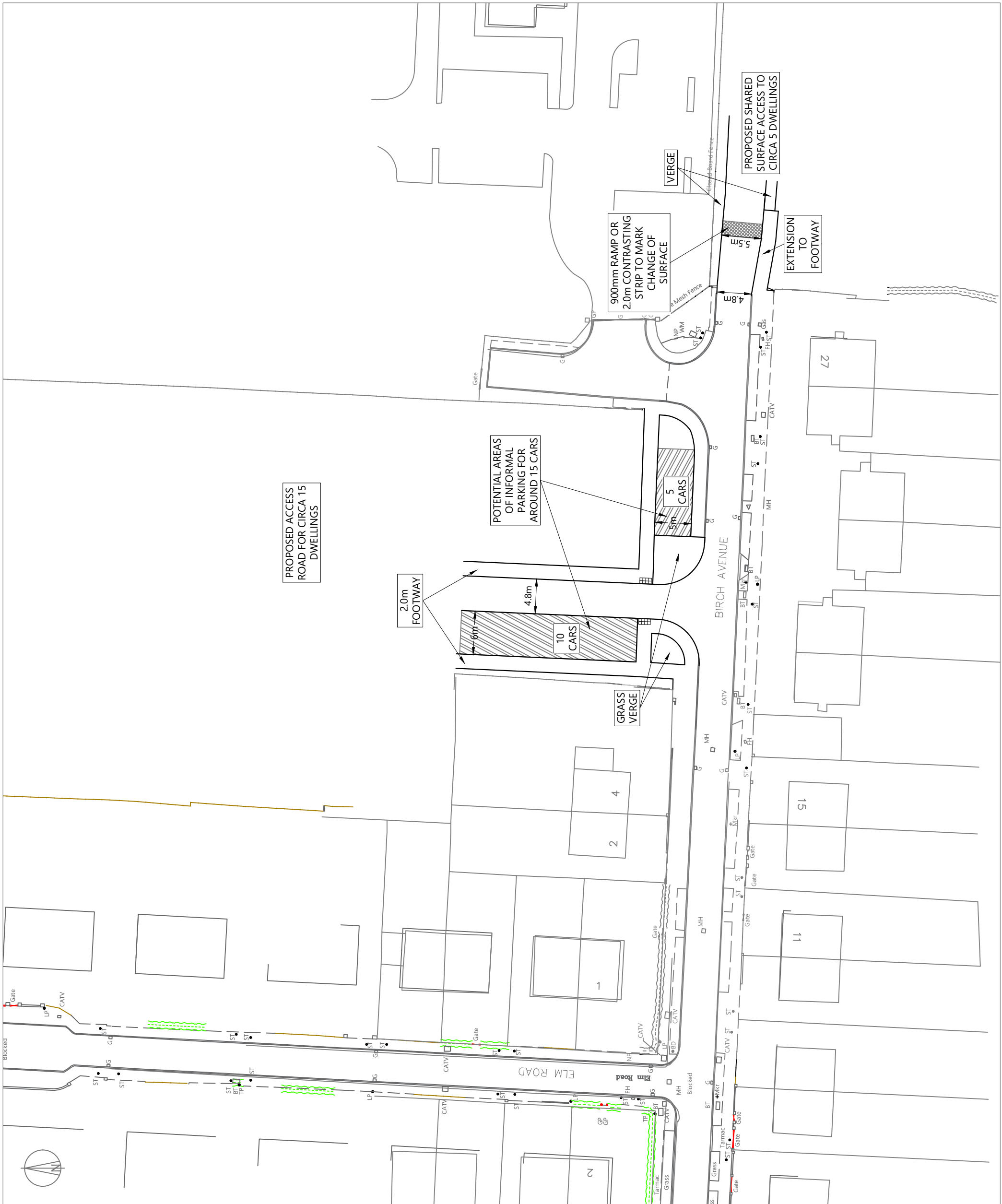
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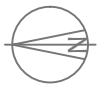
NOTES:
 Drawing based on Geomatic Surveys Ltd topographical survey 01532/01 dated 27/07/15.
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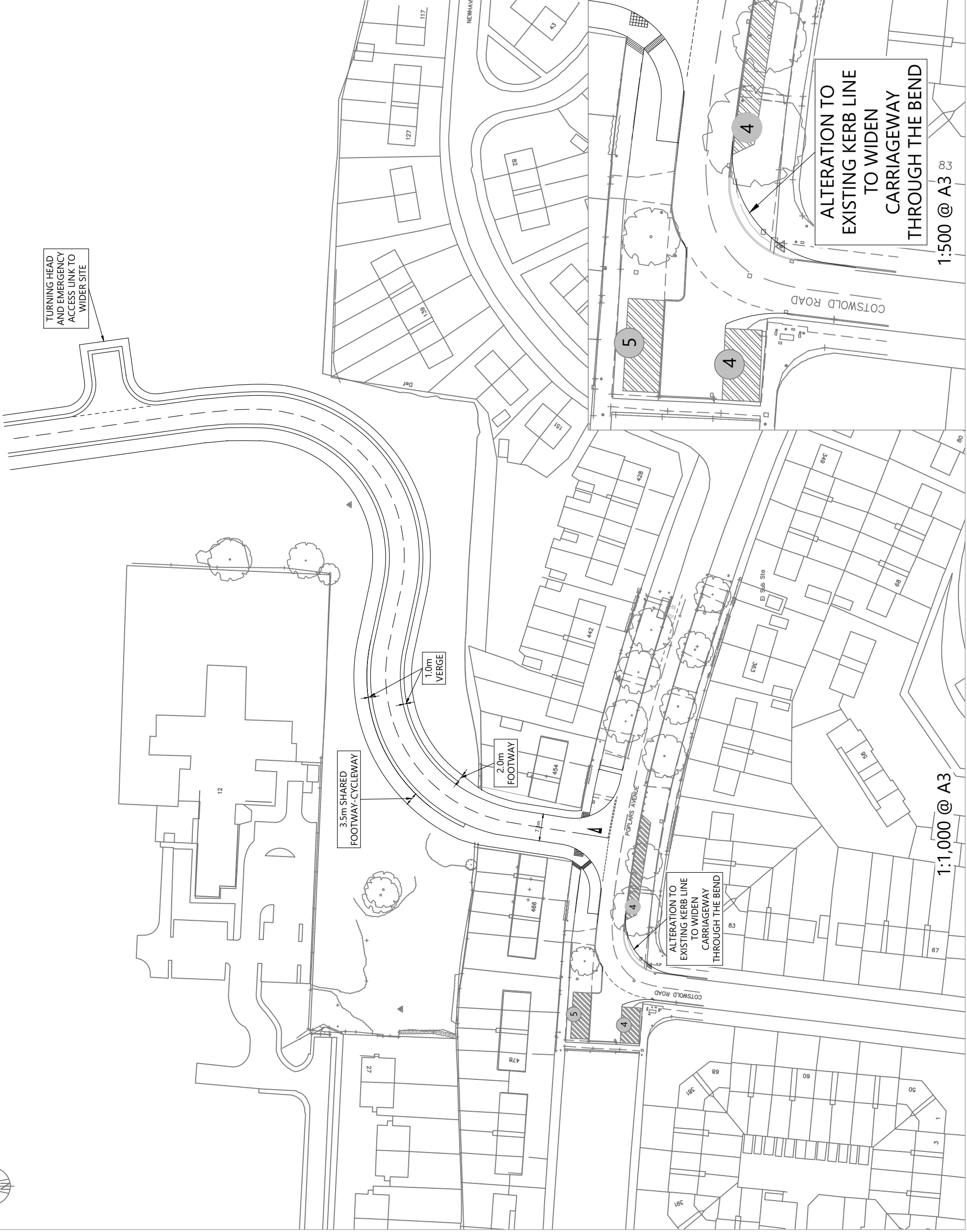
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03/02/17	DT
DRAWN BY:	FB





TURNING HEAD
AND EMERGENCY
ACCESS LINK TO
WIDER SITE



ALTERATION TO
EXISTING KERB LINE
TO WIDEN
CARRIAGEWAY
THROUGH THE BEND
1:500 @ A3

ALTERATION TO
EXISTING KERB LINE
TO WIDEN
CARRIAGEWAY
THROUGH THE BEND
1:1,000 @ A3

NOTES:
Drawing based on Geomatic Surveys Ltd topographical survey 01532/01 dated 27/07/15.
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KEY:
Parking Areas (number of cars that can be accommodated) **6**

6

ISSUE	REASON FOR REVISION	DATE

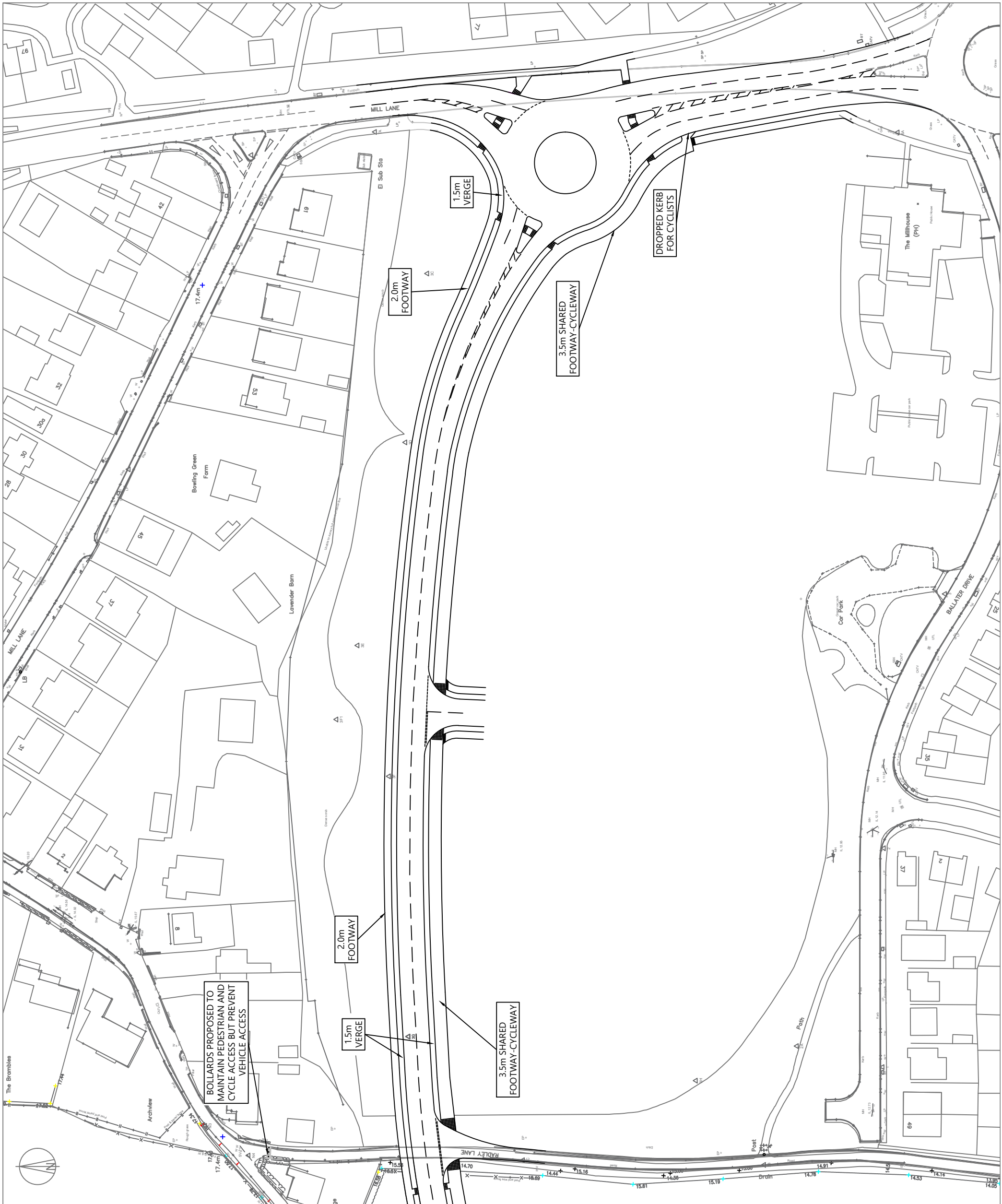
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CLIENT: SATNAM MILLENNIUM LTD		DRAWING NUMBER: 09/M	
PROJECT REFERENCE: 1107			

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PROJECT:	PEEL HALL, WARRINGTON		
CLIENT:	SATNAM MILLENNIUM LTD		
PROJECT REFERENCE:	DRAWING NUMBER:	SCALE:	
1107	10/N	1:1,000 @ A3	

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17/01/18	FB	DT	





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topographical survey 6297_01 dated
25/07/11.

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WARRINGTON

CLIENT:

SATNAM MILLENNIUM
LTD

PROJECT REFERENCE:

1107

DRAWING NUMBER:

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SCALE:

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DATE:

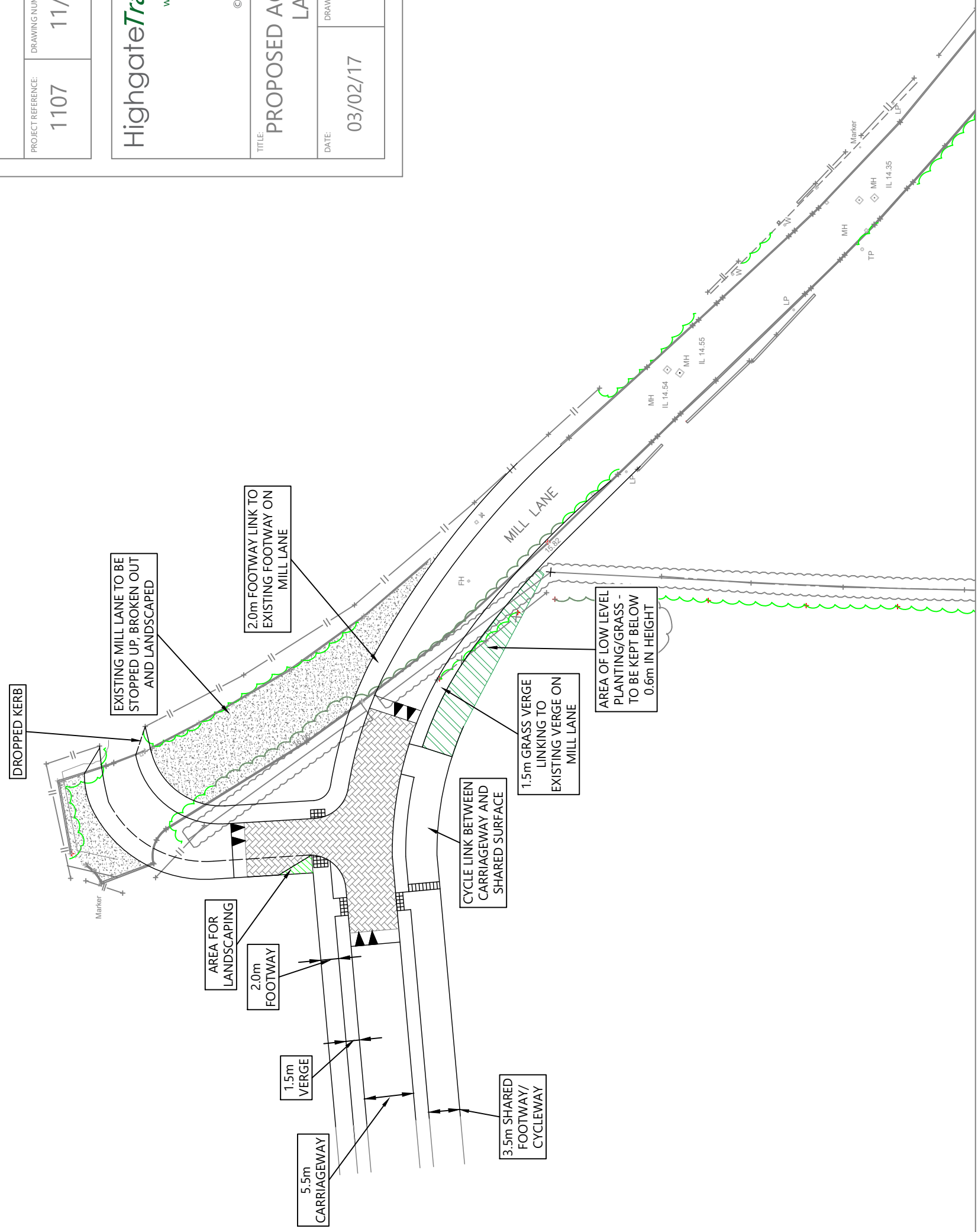
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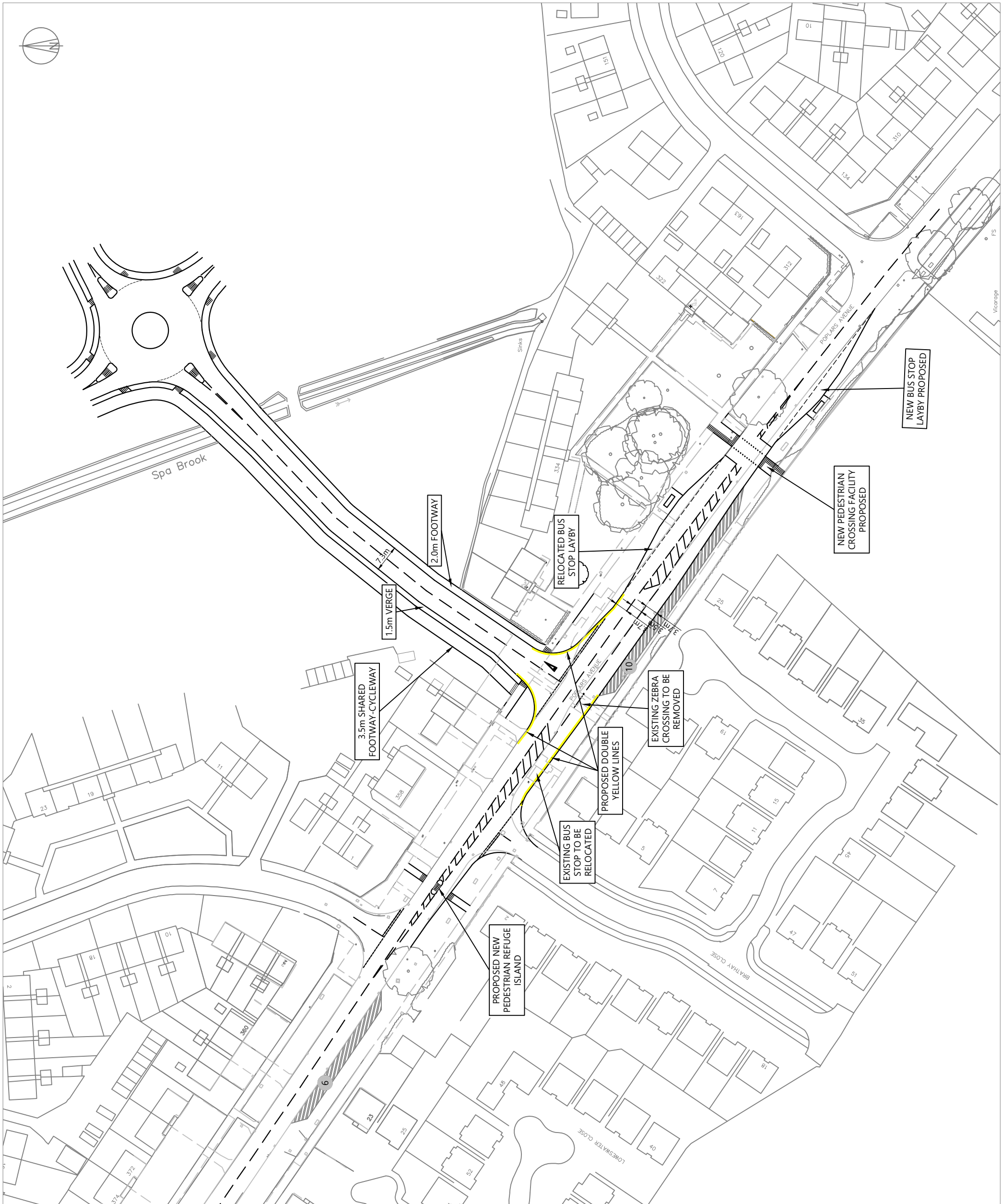
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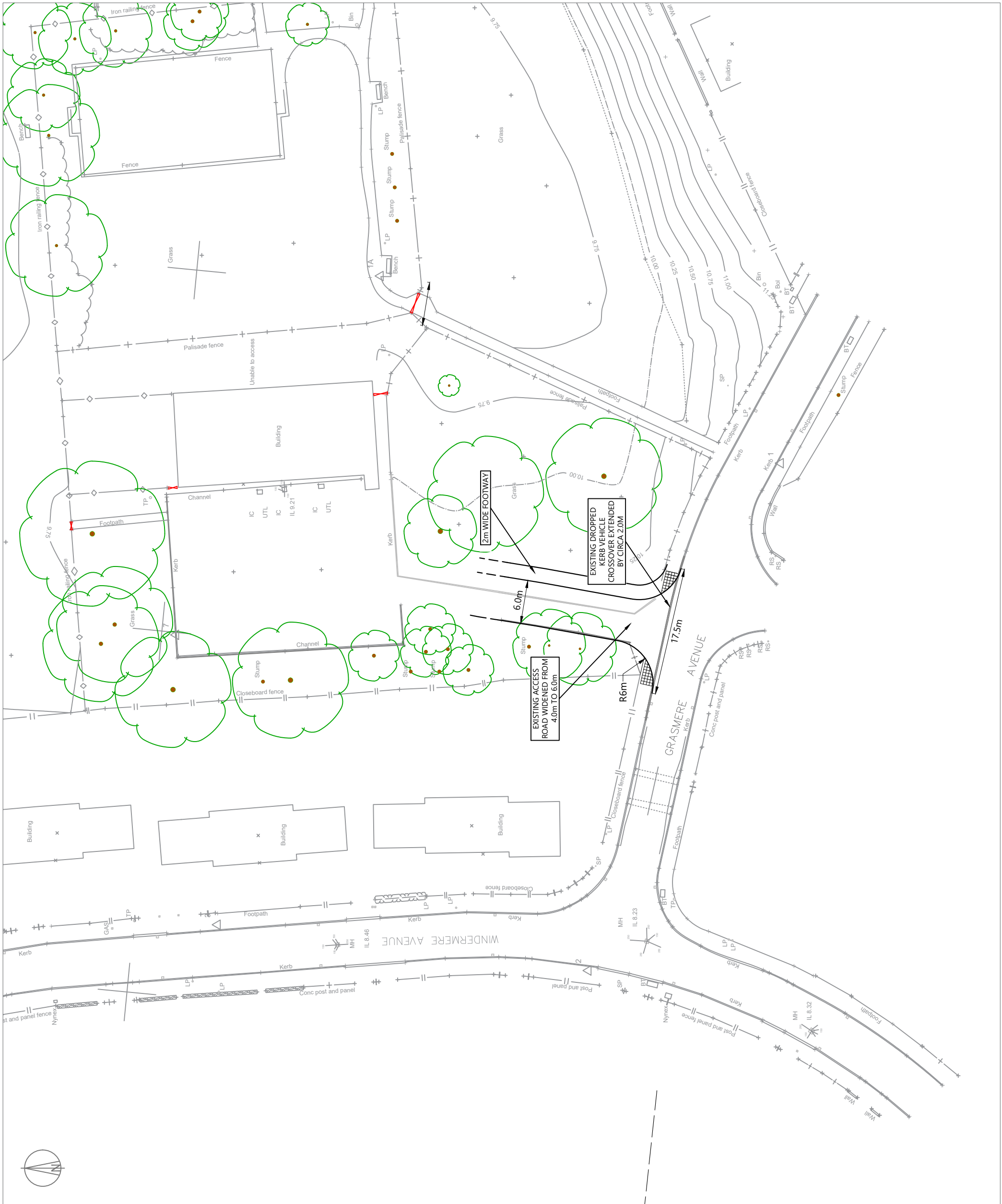


NOTES: Drawing based on Appletons plan 140367-B-001G dated January 2016. © Crown copyright and database rights 2017 OS Licence 100056454.		
KEY: Parking Areas (number of cars that can be accommodated)		6
ISSUE	REASON FOR REVISION	DATE

PROJECT: PEEL HALL, WARRINGTON		
CLIENT: SATNAM MILLENNIUM LTD		
PROJECT REFERENCE:	DRAWING NUMBER:	SCALE:
1107	12/Q	1:1,000 @ A3

HighgateTransportation www.highgatetransportation.co.uk First Floor, 43-45 Park Street Bristol BS1 5NL 01179 349 121 © Highgate Transportation Limited		
TITLE: PROPOSED ACCESS FROM POPLARS AVENUE TO RESIDENTIAL LAND AND LOCAL CENTRE		
DATE:	DRAWN BY:	CHECKED:
03/02/17	FB	DT





NOTES:
Drawing based on Geomatic Surveys Ltd topographical survey 01532/01 dated 27/07/15.
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ISSUE	REASON FOR REVISION	DATE

PROJECT:
**PEEL HALL,
WARRINGTON**

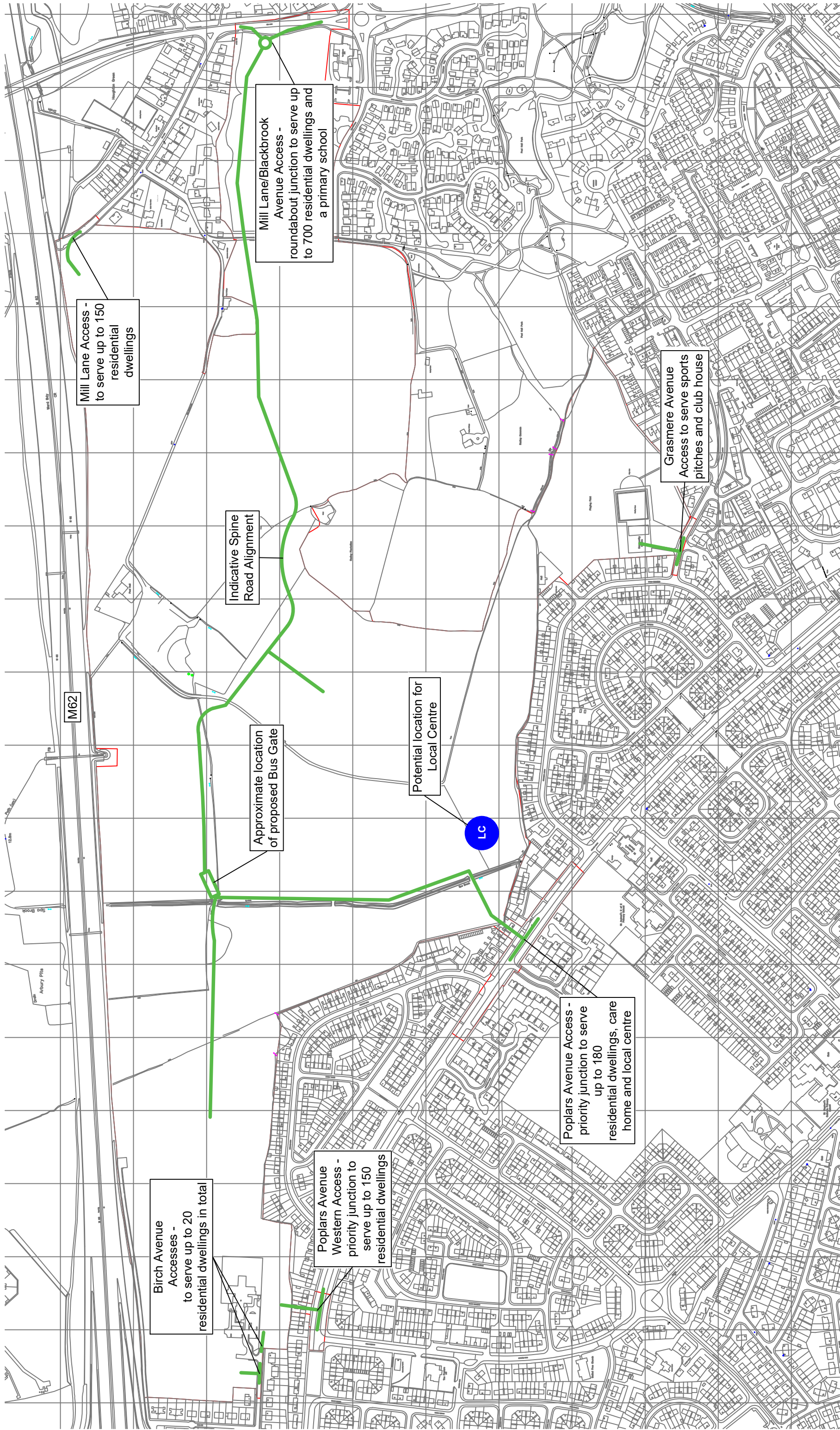
CLIENT:
**SATNAM MILLENNIUM
LTD**

PROJECT REFERENCE: **1107**
DRAWING NUMBER: **30/H**
SCALE: **1:500 @ A3**

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First Floor, 43-45 Park Street
Park Street, Bristol BS1 5NL
01179 349 121
© Highgate Transportation Limited

TITLE:
**PROPOSED ALTERATIONS TO EXISTING
ACCESS AT GRASMERE AVENUE**

DATE: **15/01/18**
DRAWN BY: **BL**
CHECKED: **FB**



Mill Lane Access -
to serve up to 150
residential
dwellings

Mill Lane/Blackbrook
Avenue Access -
roundabout junction to serve up
to 700 residential dwellings and
a primary school

Indicative Spine
Road Alignment

Grasmere Avenue
Access to serve sports
pitches and club house

Approximate location
of proposed Bus Gate

Potential location for
Local Centre

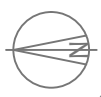
LC

Poplars Avenue Access -
priority junction to serve
up to 180
residential dwellings, care
home and local centre

Birch Avenue
Accesses -
to serve up to 20
residential dwellings in total

Poplars Avenue
Western Access -
priority junction to
serve up to 150
residential dwellings

NOTES:
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ISSUE	REASON FOR REVISION	DATE	CHECKED:
H	Update to development list data	03/07/18	
G	Update to location of local centre	16/07/18	
F	Amendment to annotation	10/09/17	
E	Amendment to bus gate location	04/05/16	
D	Amendment to bus gate location	12/04/16	
C	Alteration to dwelling numbers at access points	04/03/16	
B	Alteration to dwelling numbers at access points	04/03/16	
A	Reduction in number of dwellings shown off Birch Avenue	19/02/16	

DATE: 12/01/15

DRAWN BY: FB

CHECKED: DT

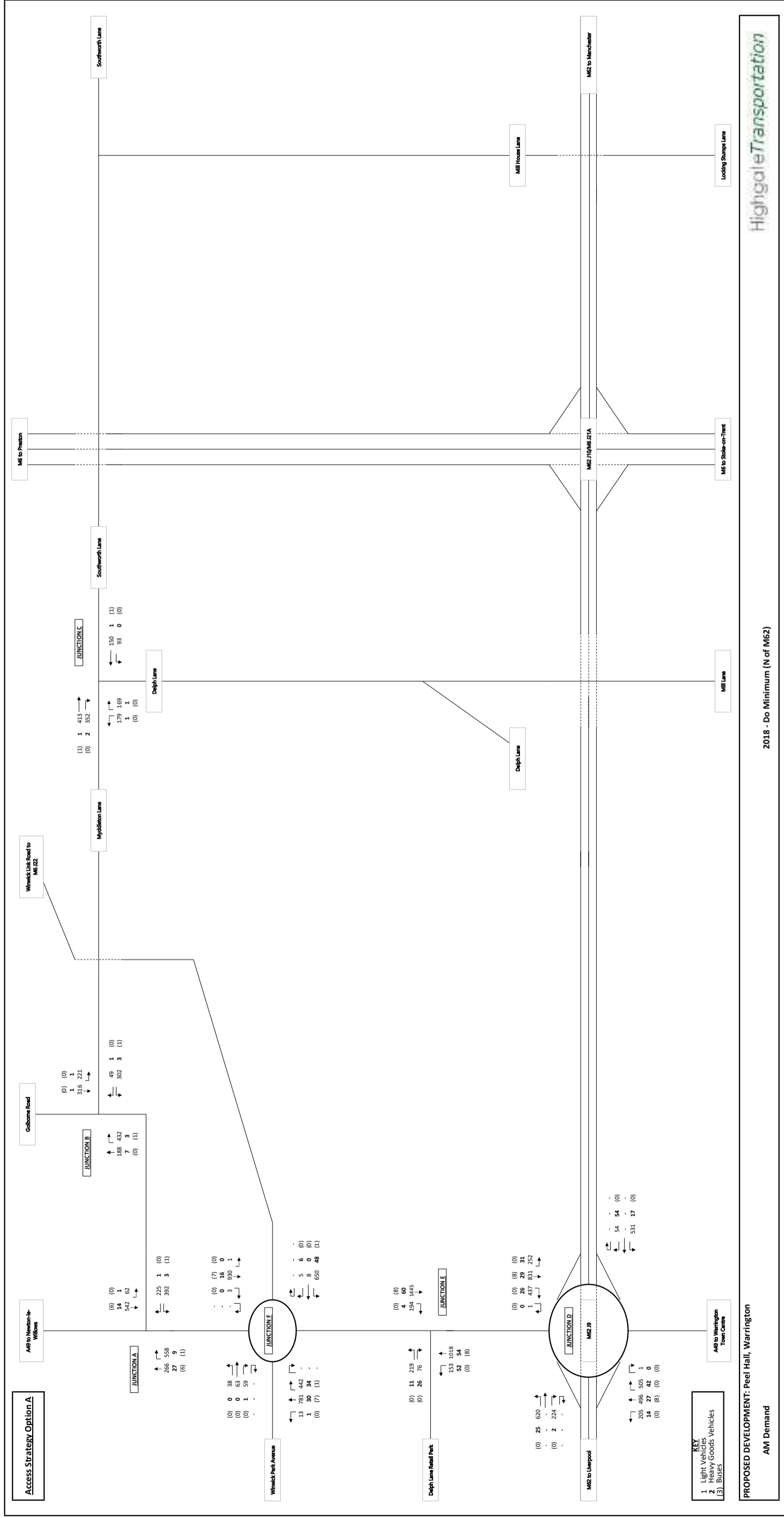
PROJECT: PEEL HALL, WARRINGTON
CLIENT: SATNAM

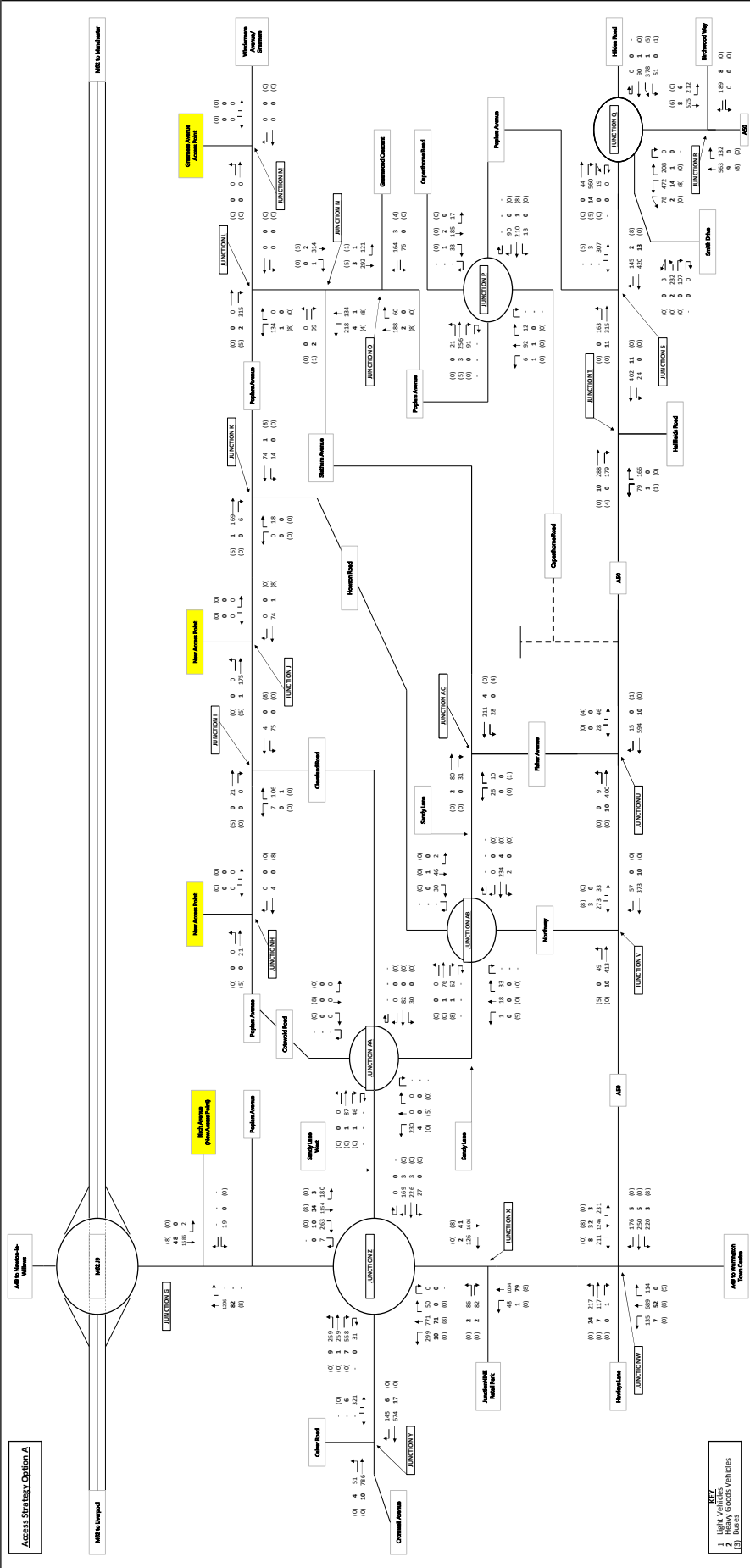
TITLE: PROPOSED ACCESS POINTS
AND INDICATIVE SPINE ROAD
PROJECT REFERENCE: 1107
DRAWING NUMBER: 19
SCALE: Not to scale

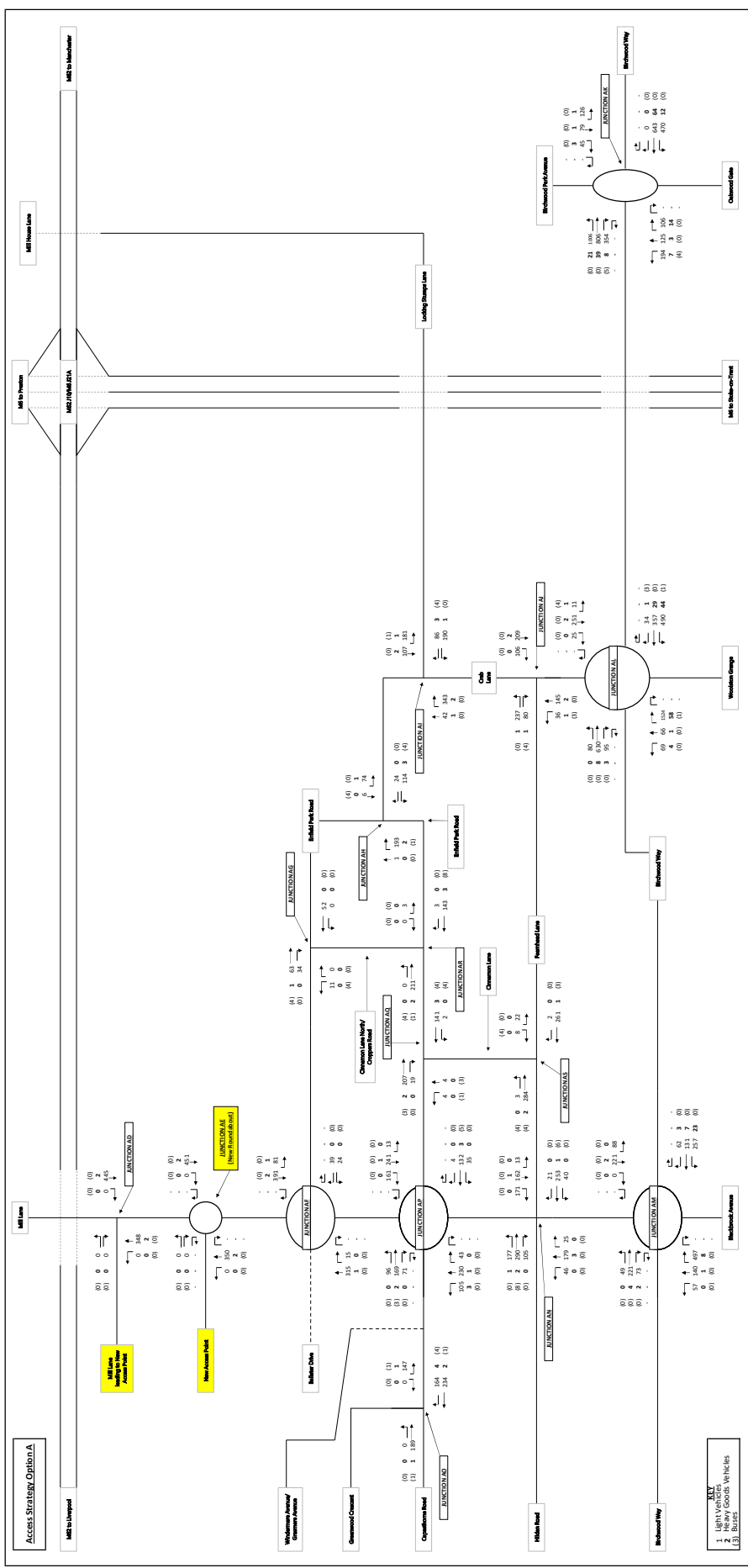
HighgateTransportation
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First Floor, 43-45 Park Street
Bristol BS5 1NL
01179 349 121
©Highgate Transportation Limited

Appendix SCG/7

2018 Flow Diagrams



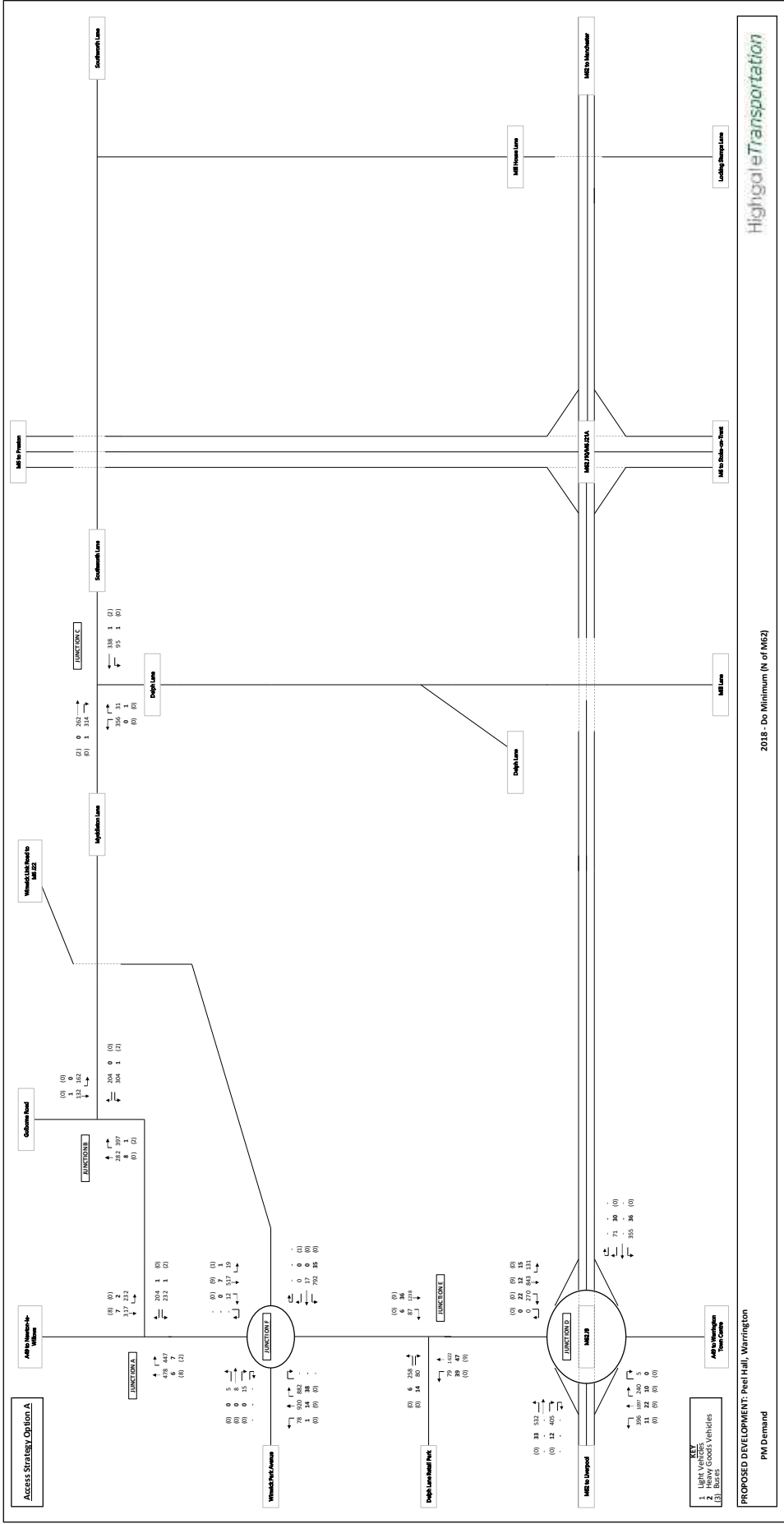




PROPOSED DEVELOPMENT: Peel Hall, Warrington
AM Demand

Highgate Transportation

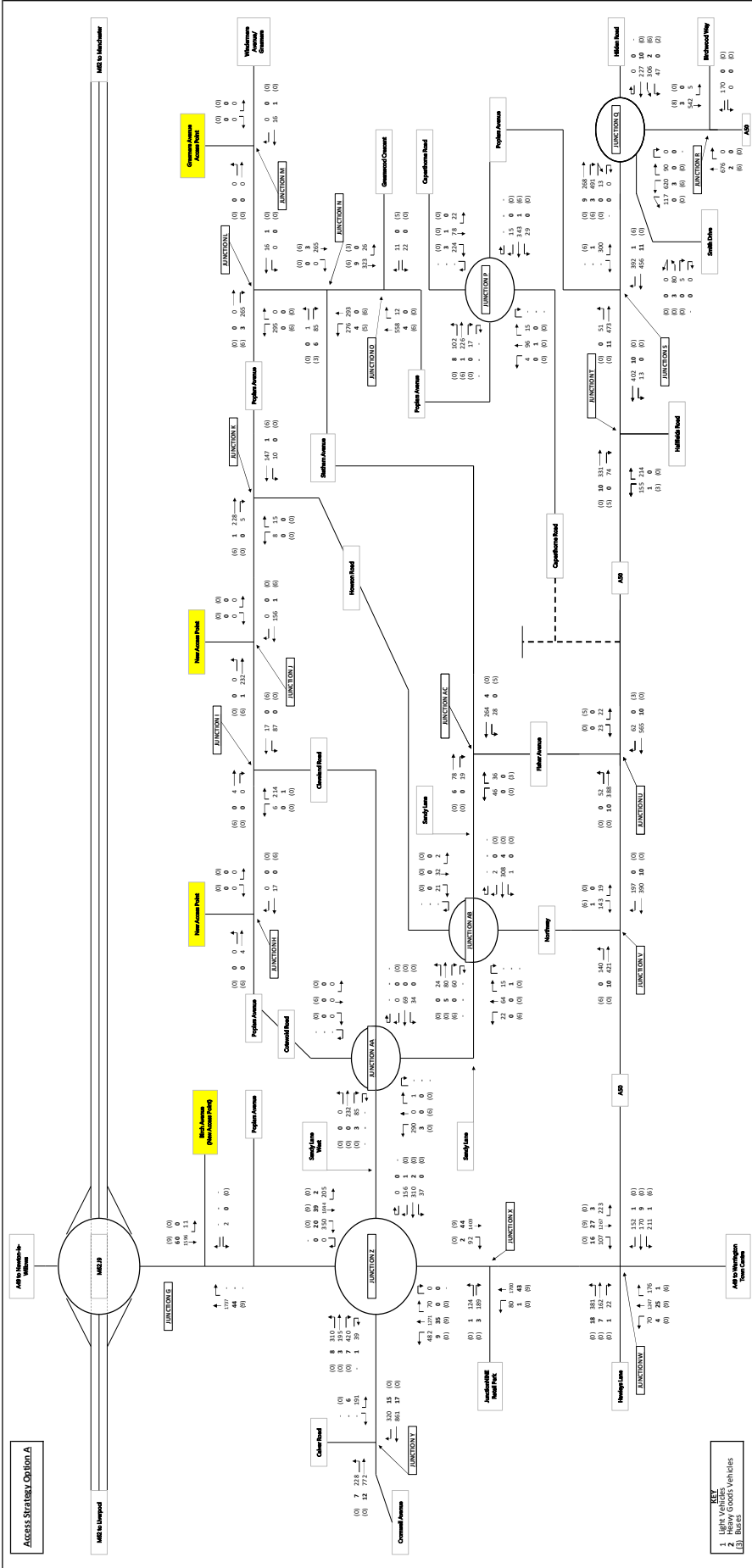
2018 - Do Minimum (SE of MG2)



Highgate Transportation

2018 - Do Minimum (N of M62)

PROPOSED DEVELOPMENT: Peel Hall, Warrington
PM Demand



ACCESS STRATEGY OPTIONS

M62 to Liverpool

M62 to Manchester

A56 to Warrington

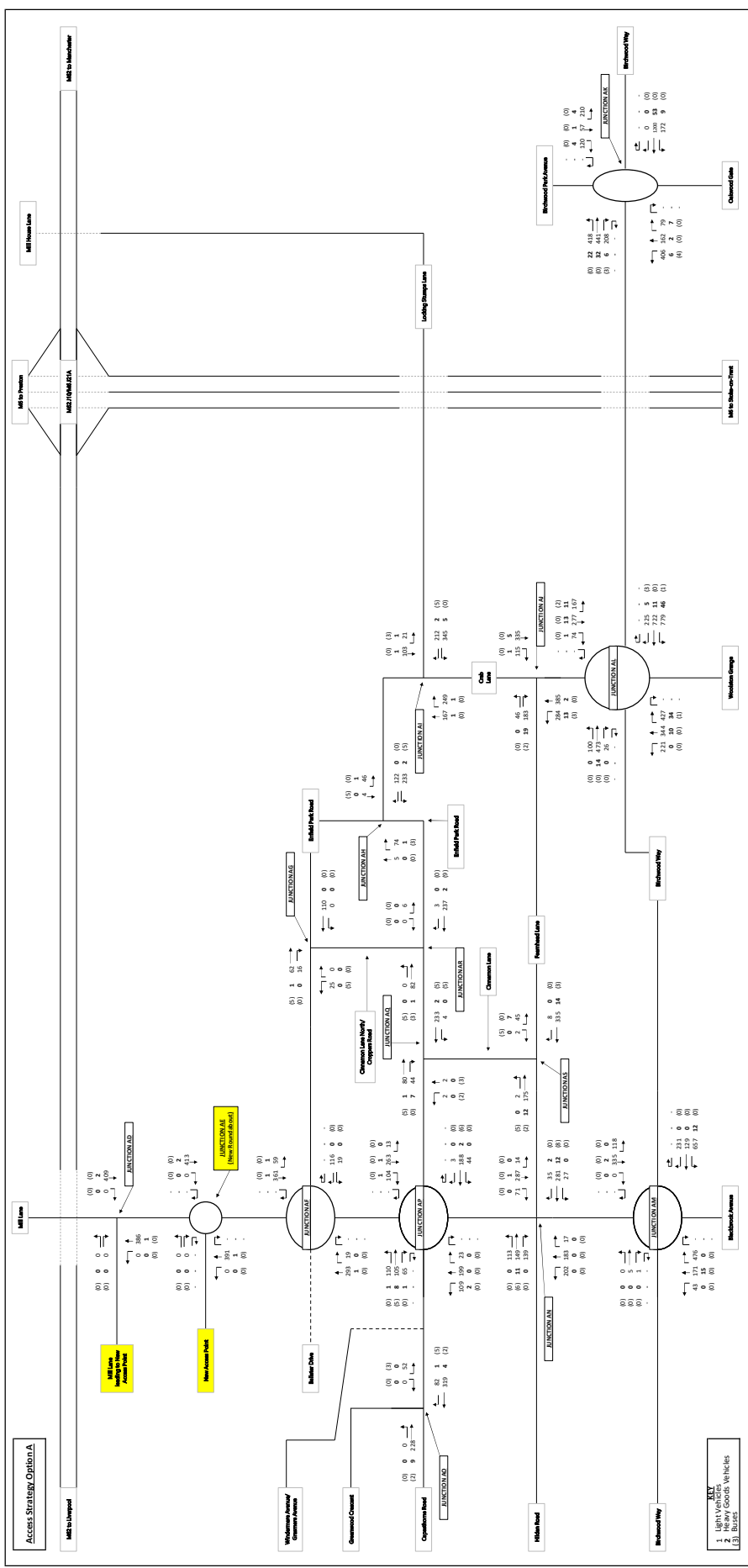
A56 to Warrington Turn Centre

Legend:
 1. Light Vehicles
 2. Heavy Goods Vehicles
 3. Buses

2018 - Do Minimum (SW of M62)

PN Demand

HighgateTransportation



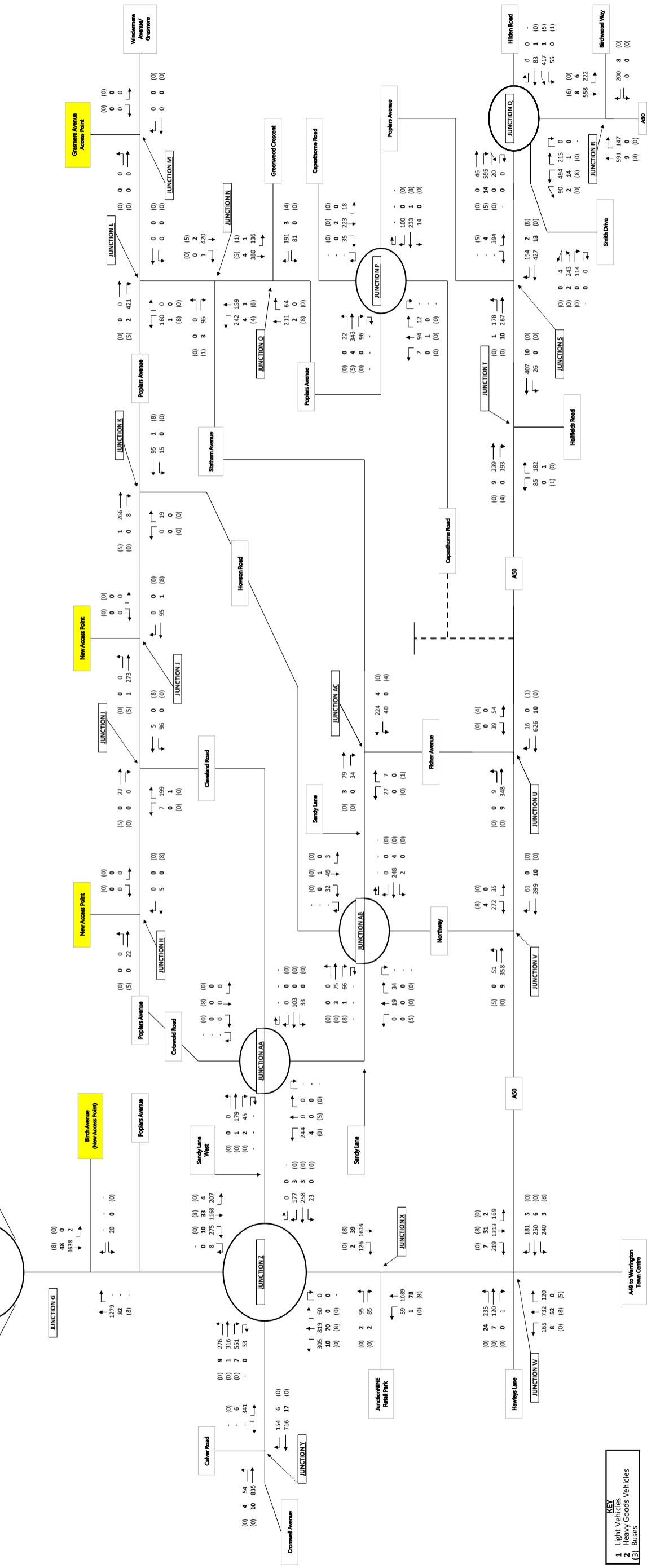
PROPOSED DEVELOPMENT: Peel Hall, Warrington
 PN1 Demand
 2018 - Do Minimum (SE of M62)

Appendix SCG/8

Future Year Flow Diagrams

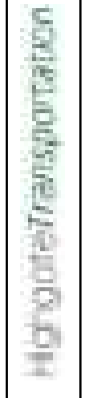
Access Strategy Option A

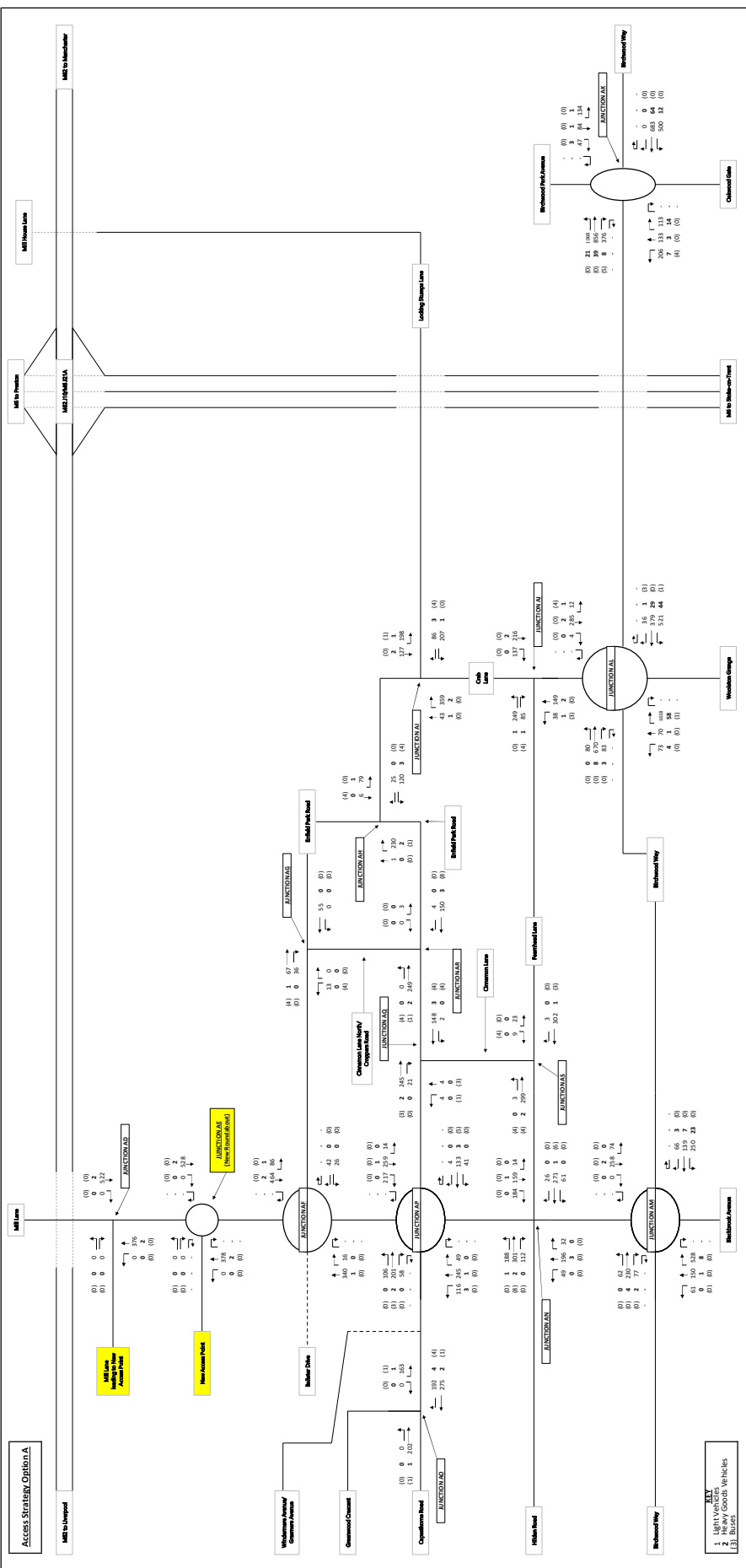
M62 to Liverpool M62 to Manchester

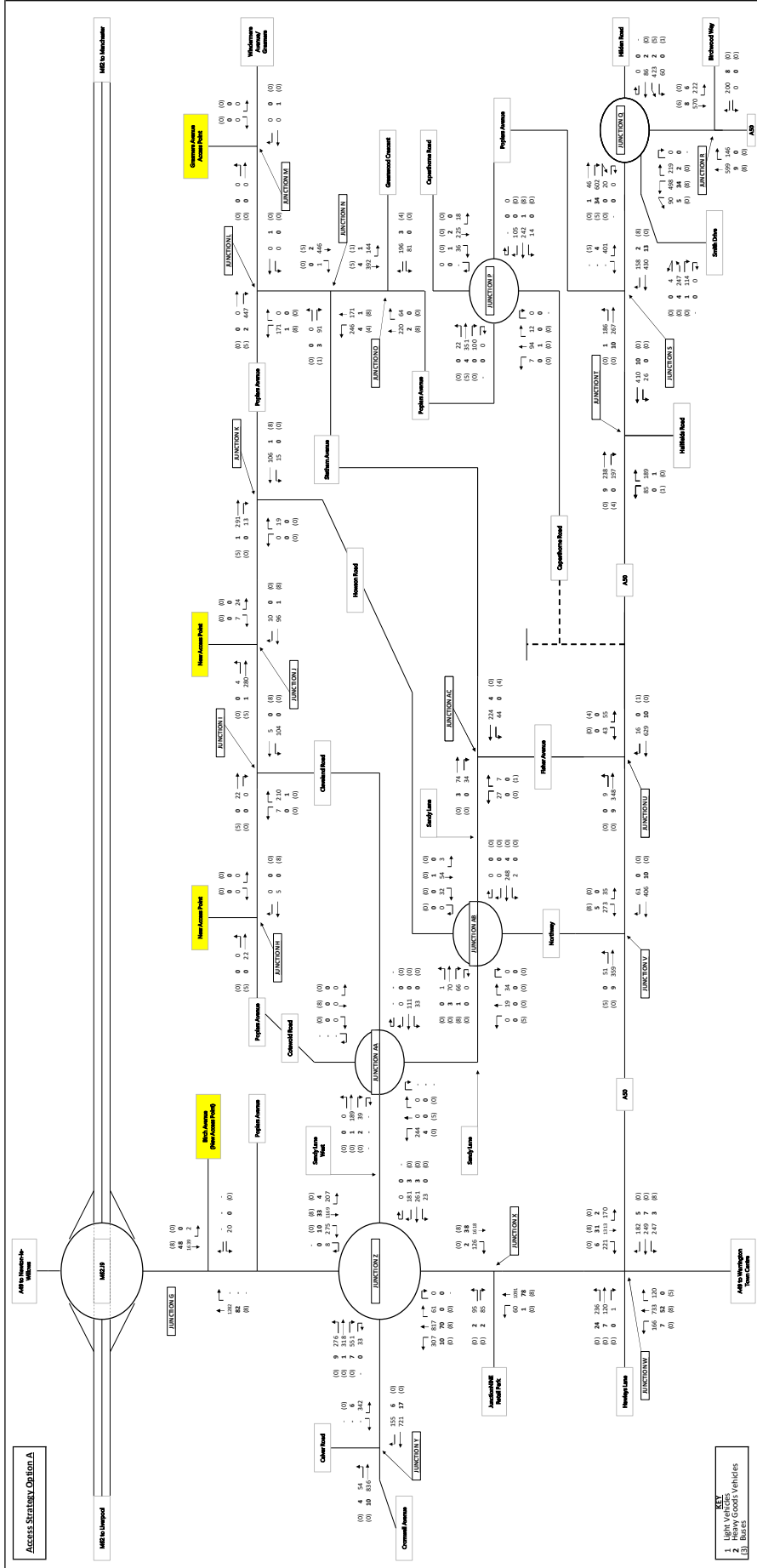


- KEY**
- 1 Light Vehicles
 - 2 Heavy Goods Vehicles
 - 3 Buses

2022 - Do Minimum (SW of M62)
AM Demand





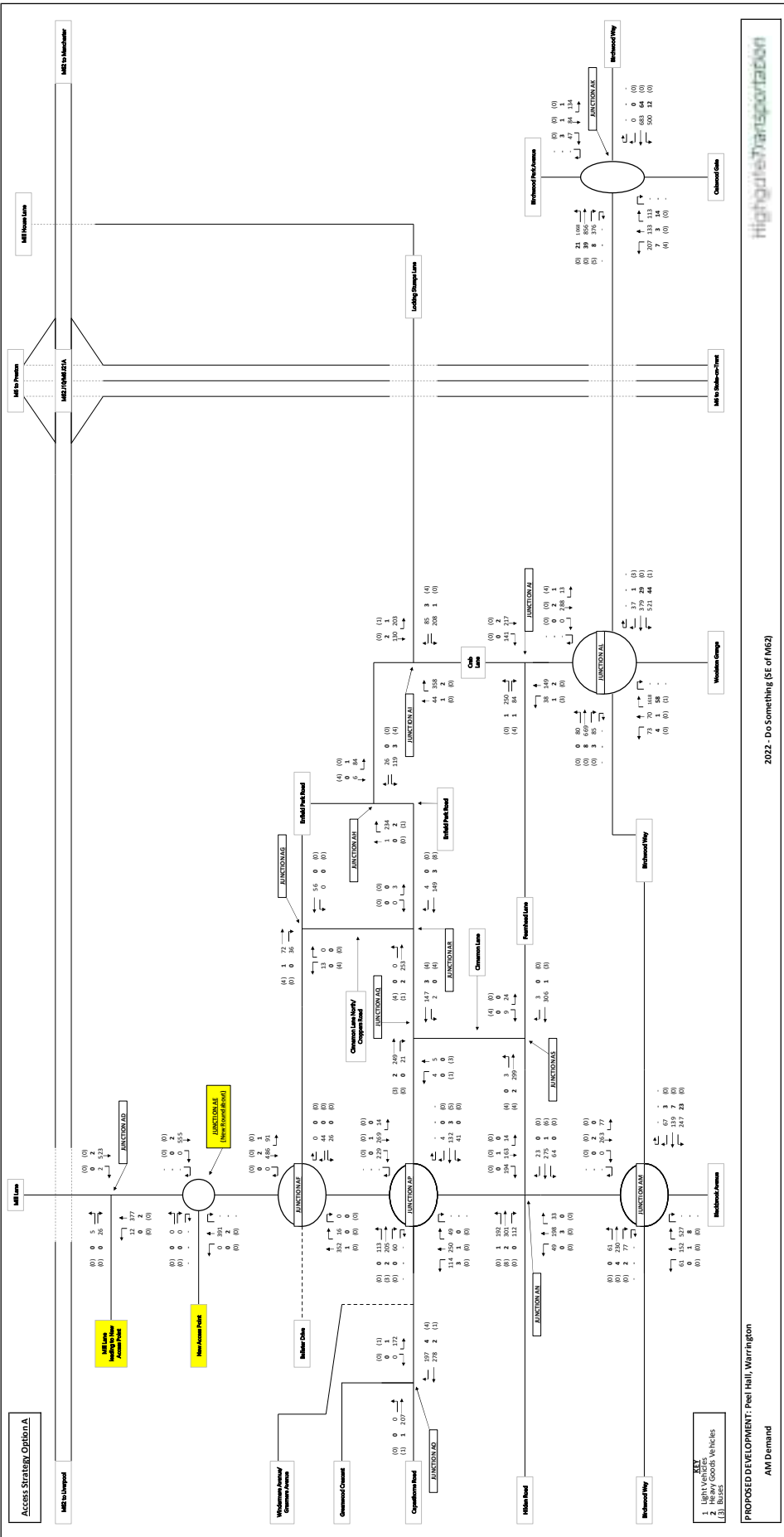


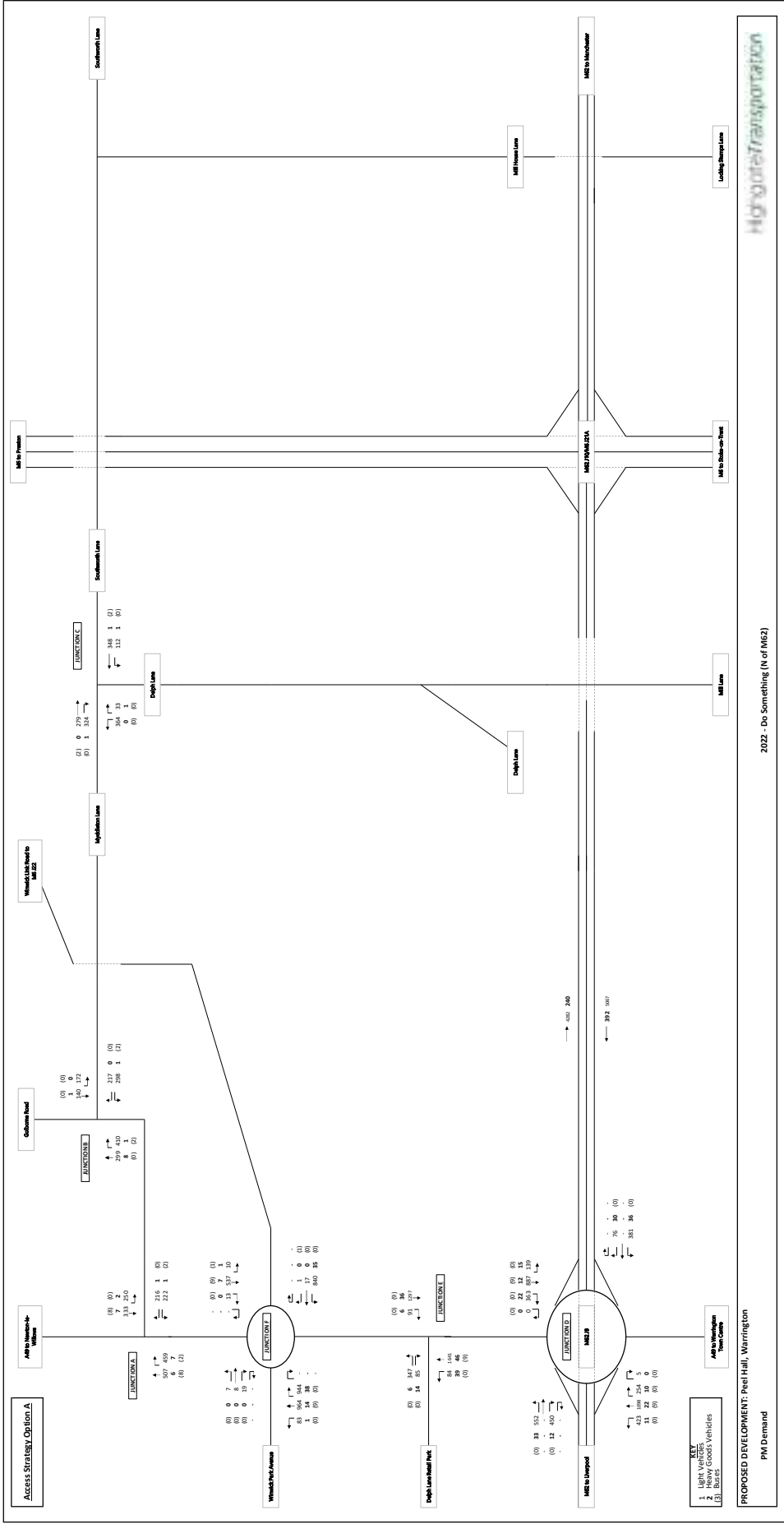
PROPOSED DEVELOPMENT: Peel Hall, Warrington
 AM Demand

2022 - Do Something (SW of M62)

HighwayTransportation

- 1. Light Vehicles
- 2. Heavy Goods Vehicles
- 3. Buses





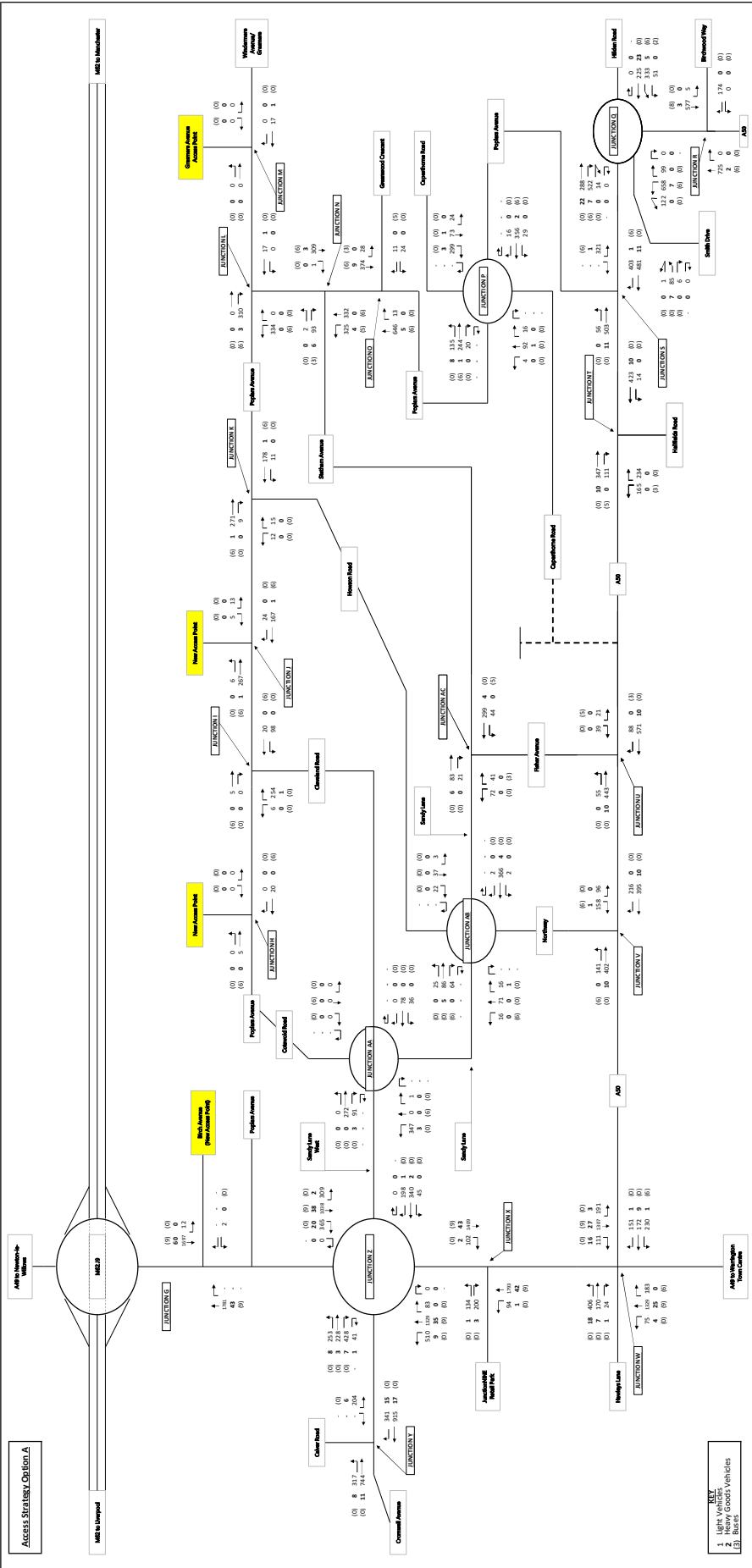
High Quality Transportation

2022 - Do Something (N of M62)

PROPOSED DEVELOPMENT: Peel Hall, Warrington

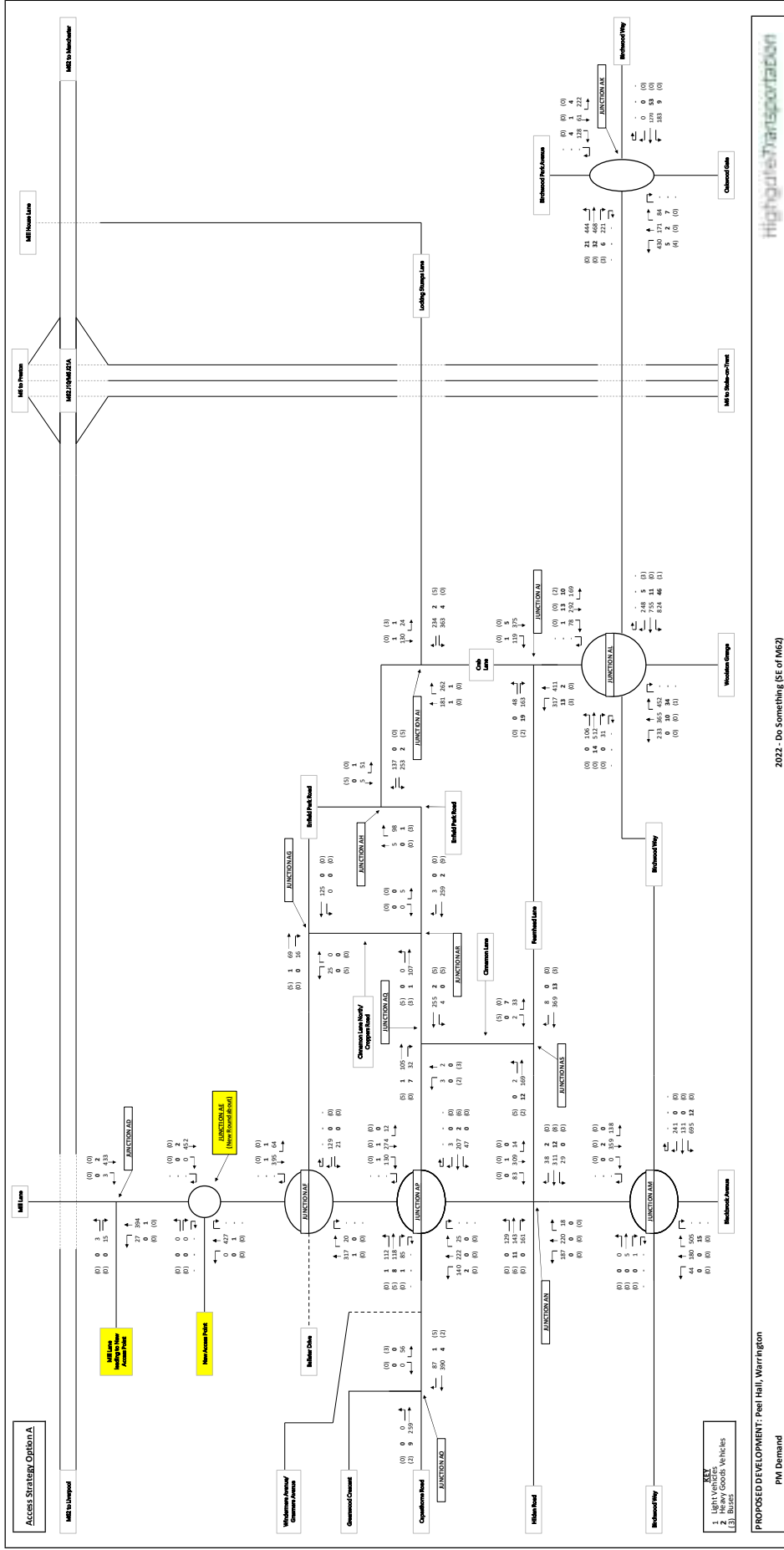
PM Demand

- KEY**
- 1 Light Goods Vehicles
 - 2 Heavy Goods Vehicles
 - 3 Buses

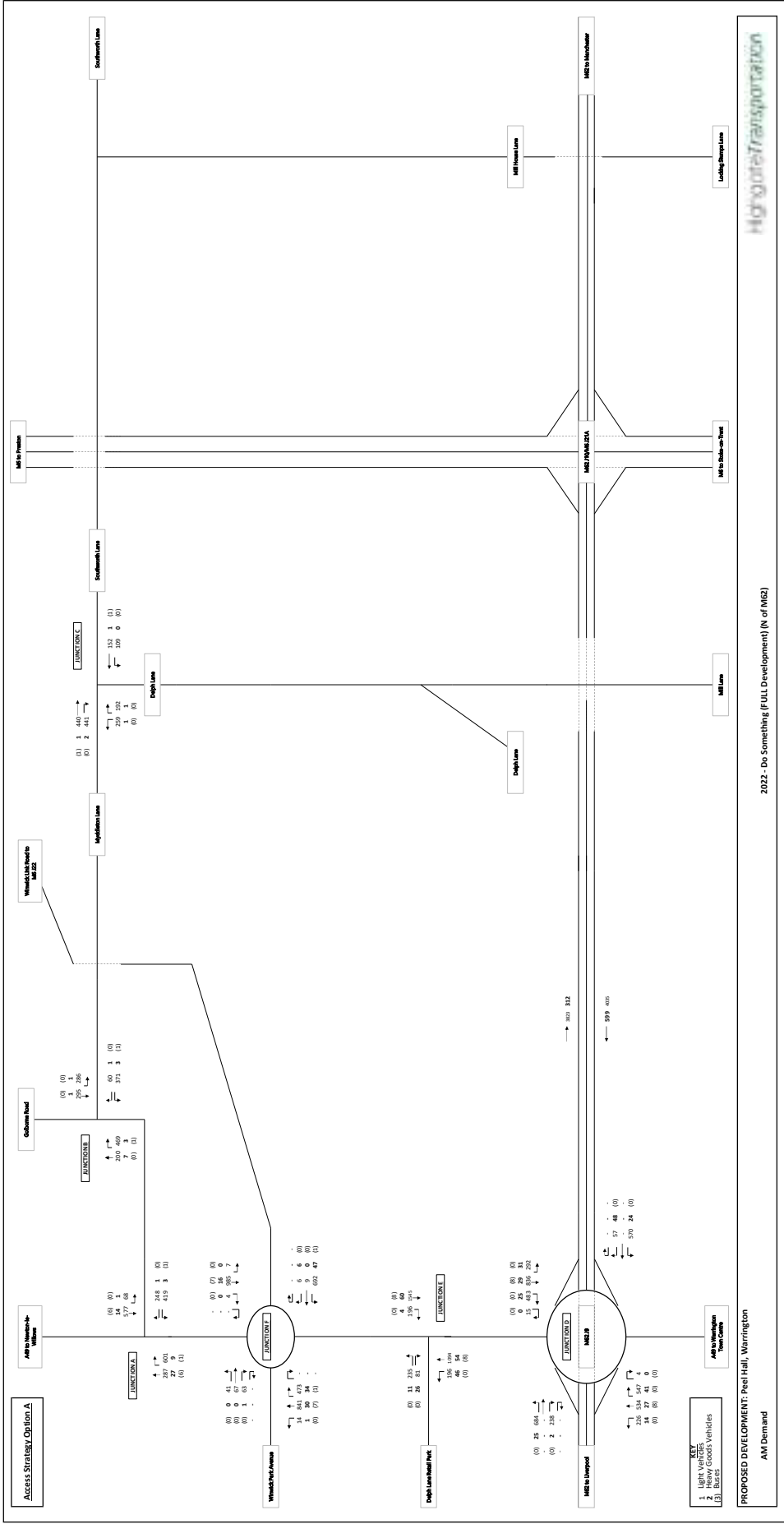


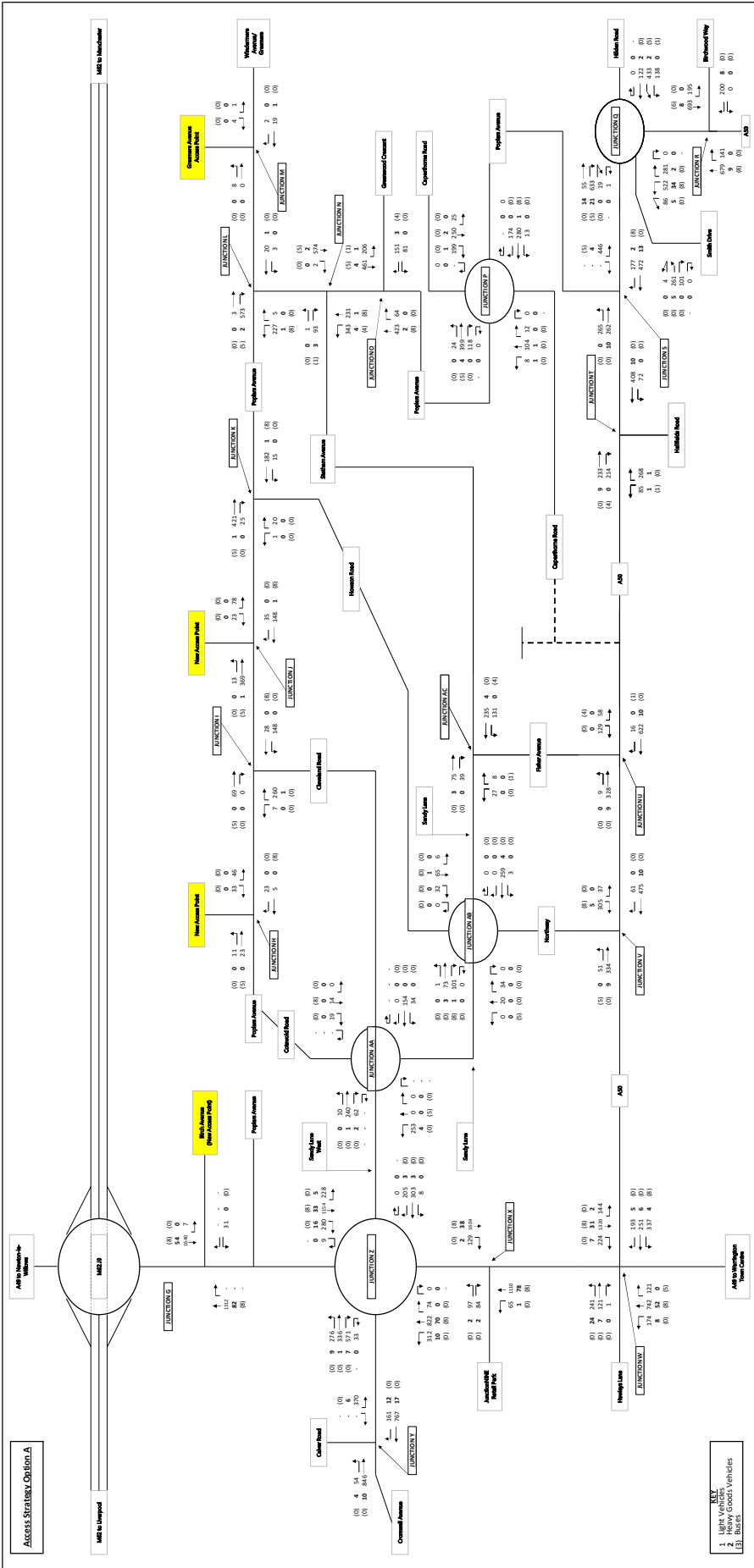
ACCESS STATION ROAD
 M62 TO LIVERPOOL
 M62 TO MANCHESTER
 PROPOSED DEVELOPMENT: Peel Hall, Warrington
 PN Demand
 2022 - Do Something (SW of M62)
 Highway Transportation

- 1 LIGHT VEHICLES
- 2 HEAVY GOODS VEHICLES
- 3 BUSES



- 1 LIGHT VEHICLES
- 2 HEAVY GOODS VEHICLES
- 13 BUSES

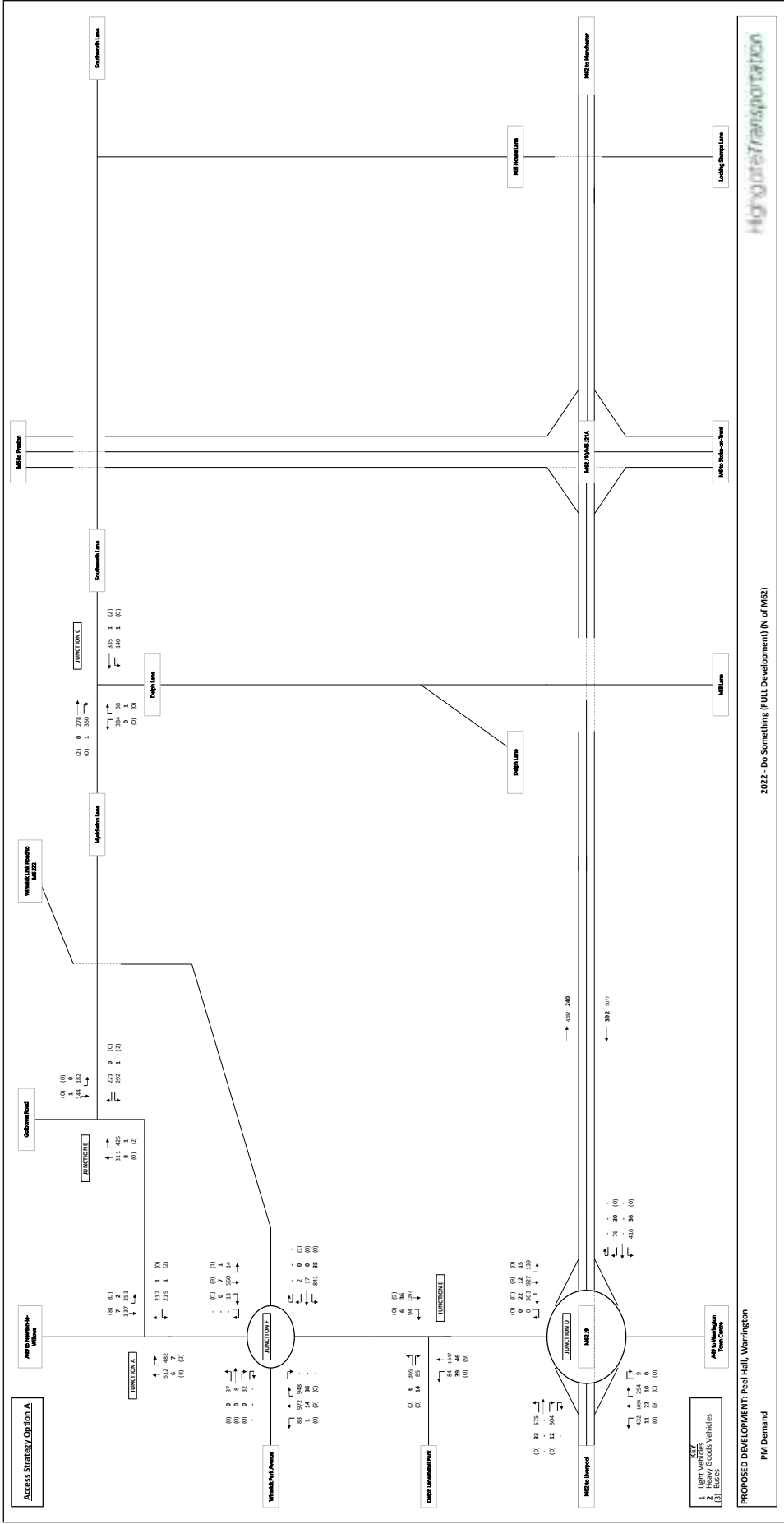




PROPOSED DEVELOPMENT: Peel Hall, Warrington

2022 - Do Something (FULL Development) (SW of M62)

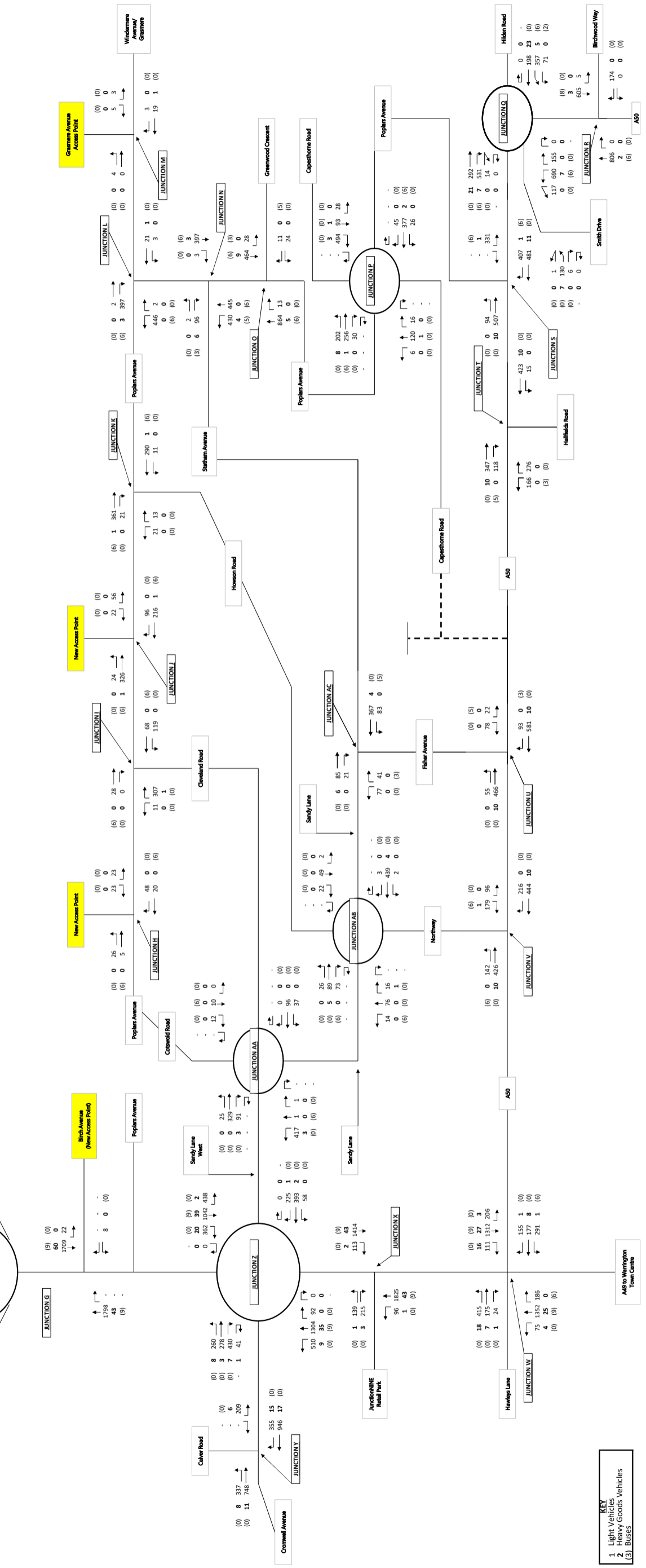
Highways/Transportation



Access Strategy Option A

M62 to Liverpool

M62 to Manchester

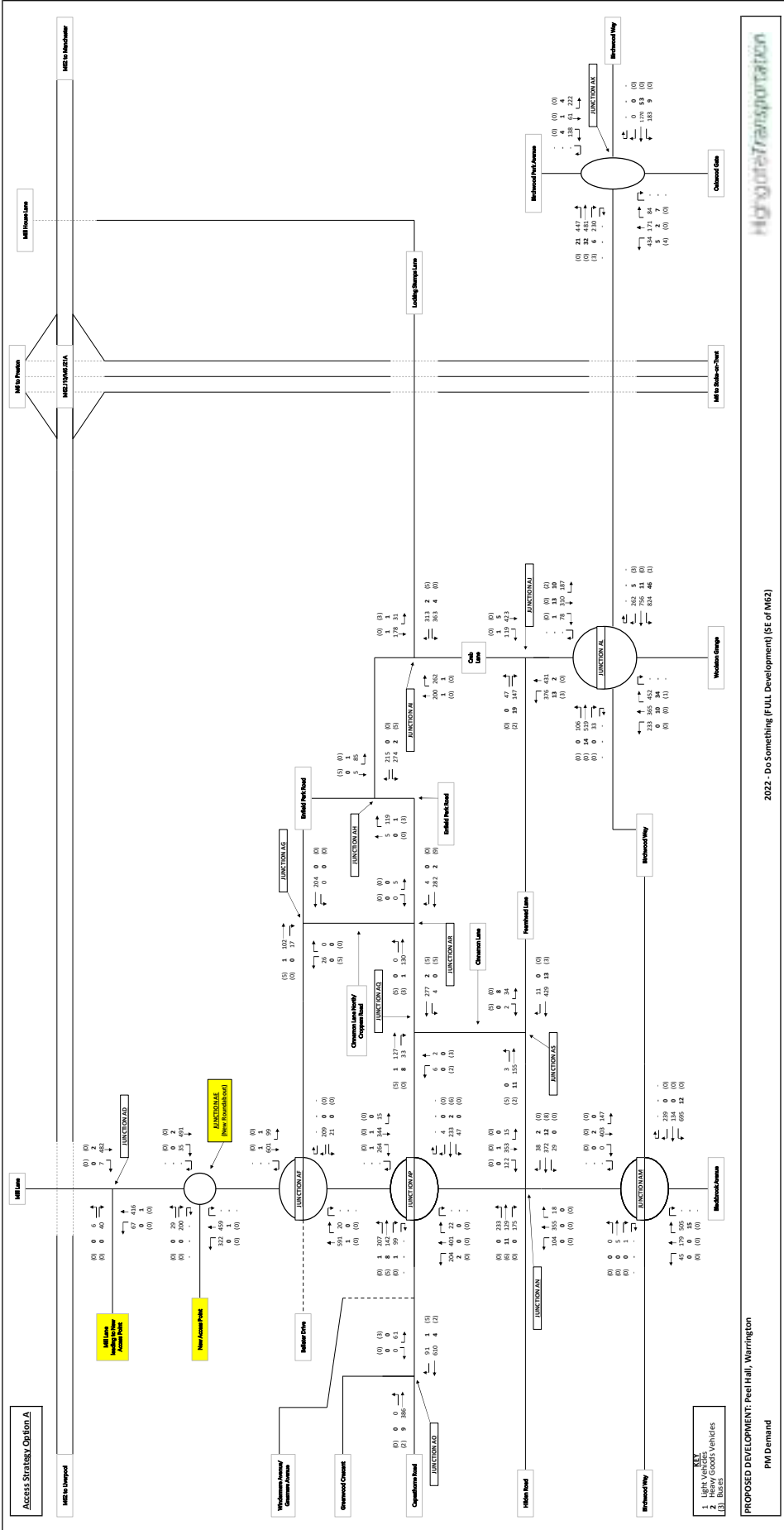


- 1 Light Vehicles
- 2 Heavy Goods Vehicles
- 3 Buses

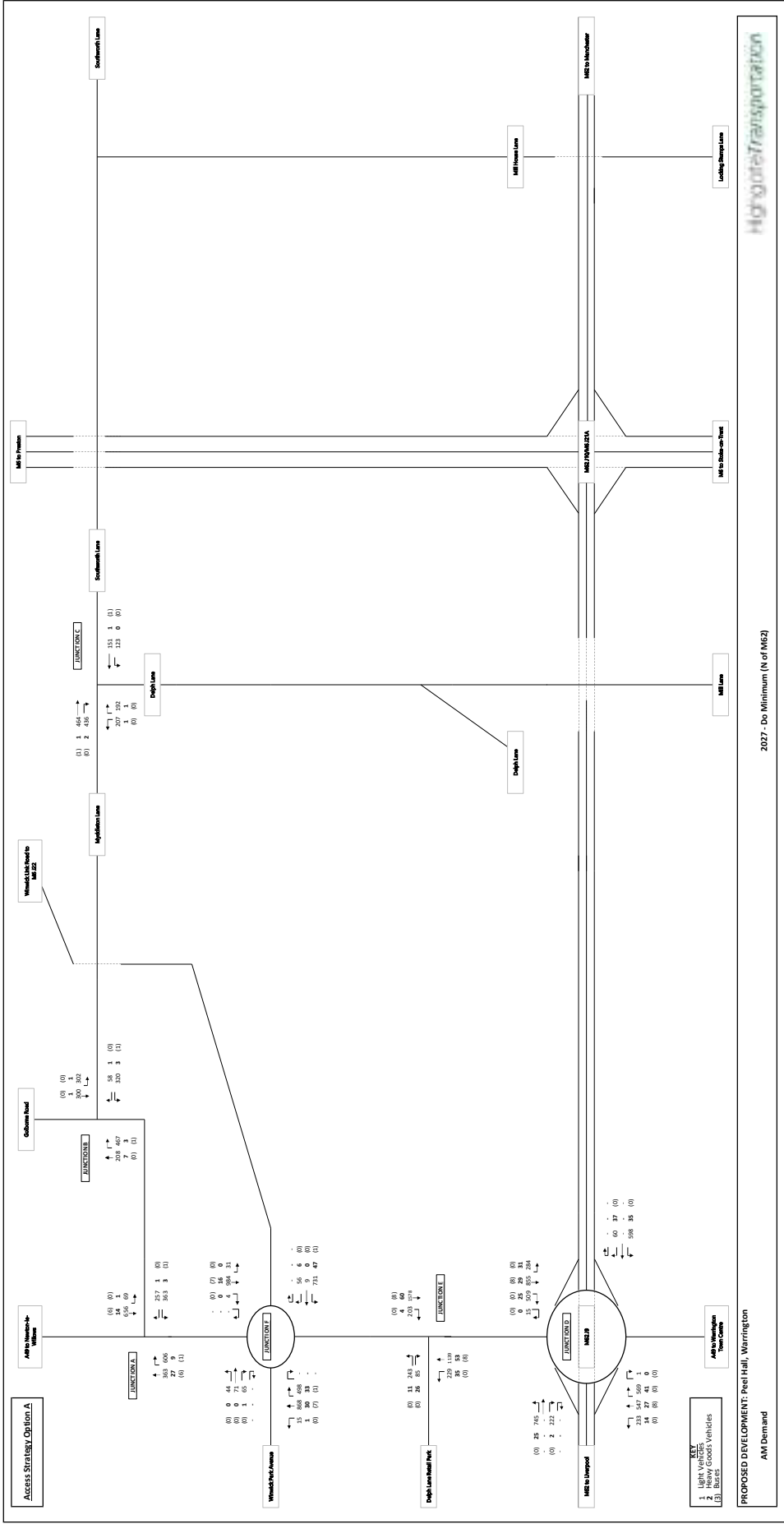
PROPOSED DEVELOPMENT: Peel Hall, Warrington
PMI Demand

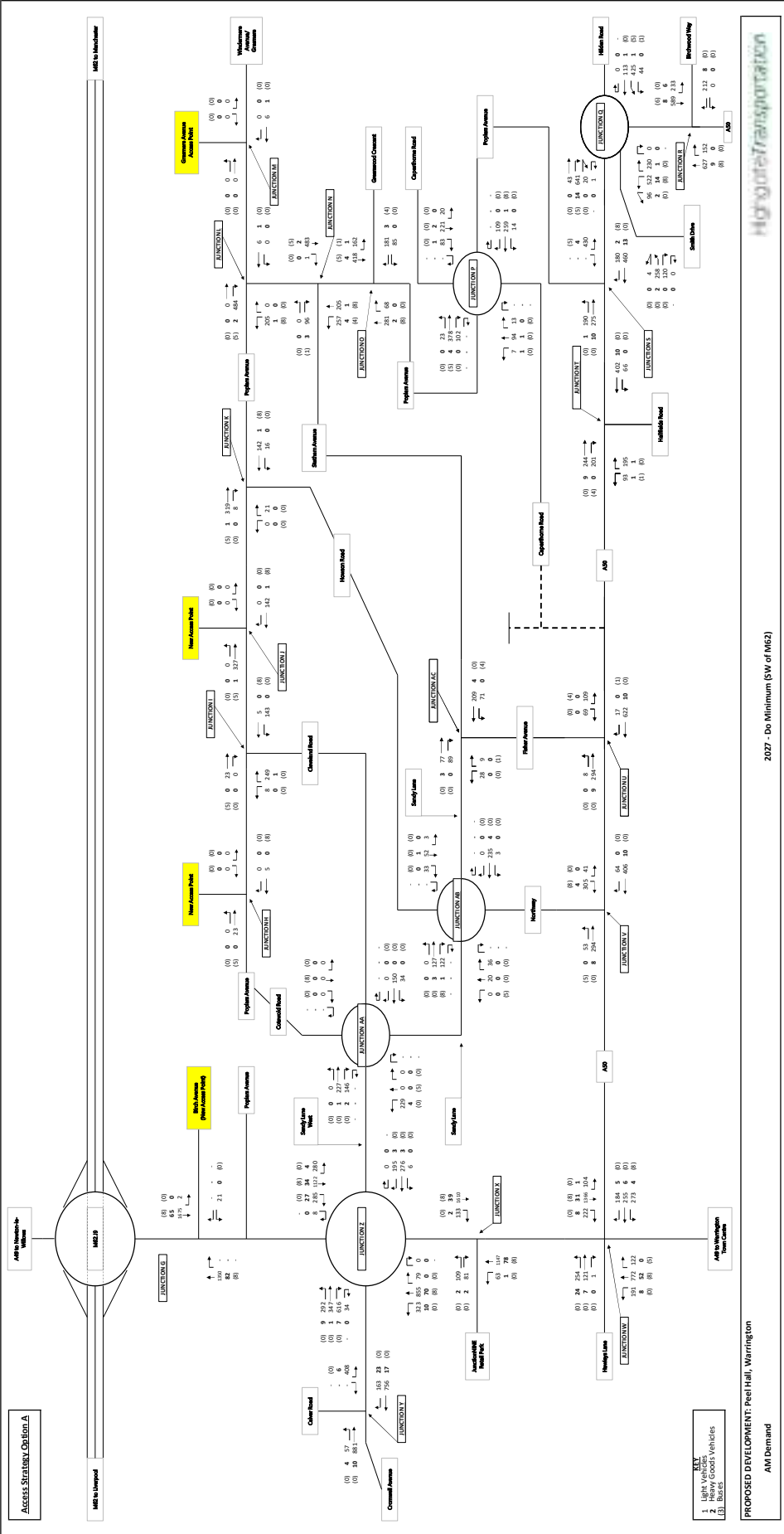
2022 - Do Something (FULL Development) (SW of M62)

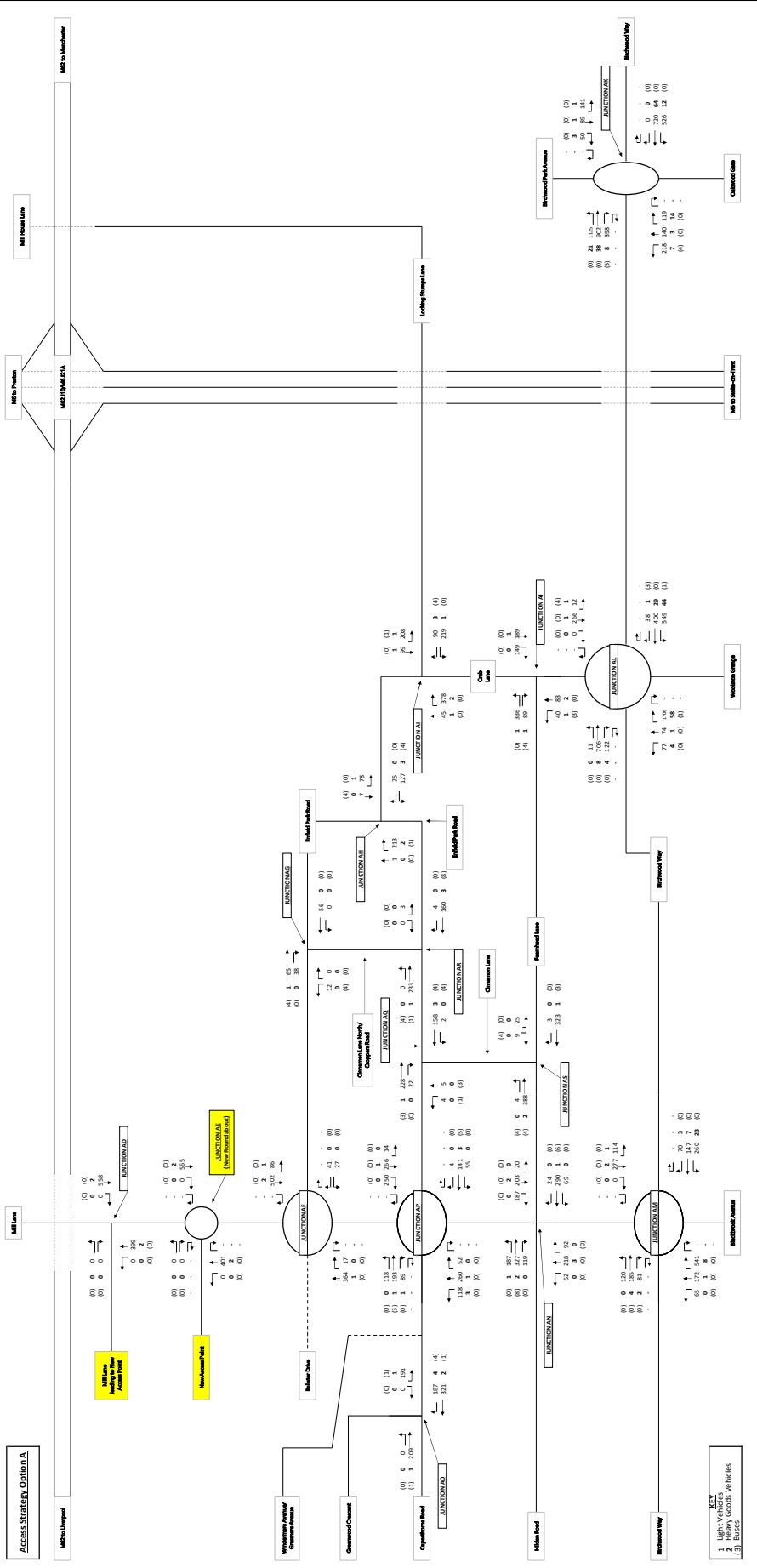




- 1 Light Vehicles
- 2 Heavy Goods Vehicles
- 3 Buses





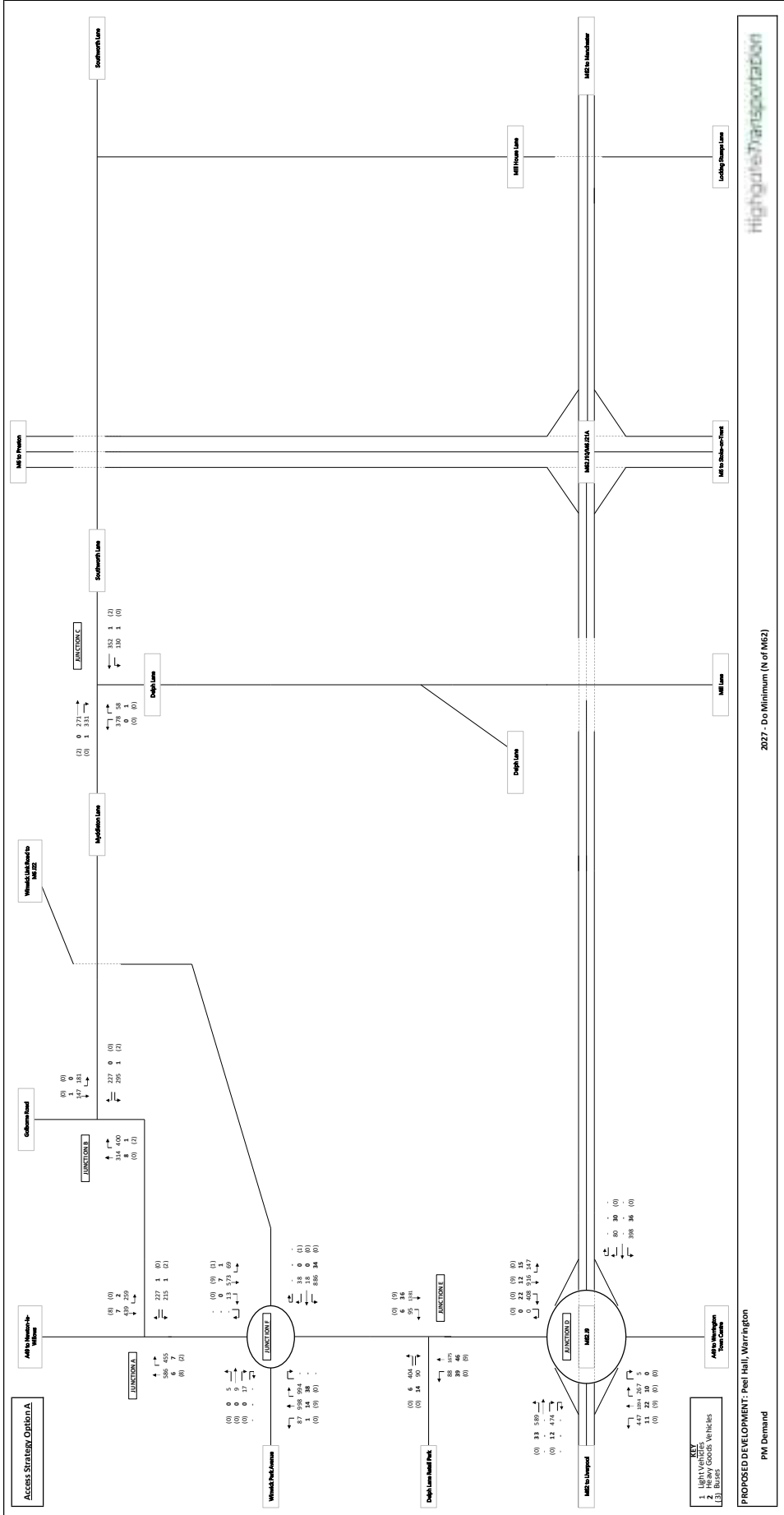


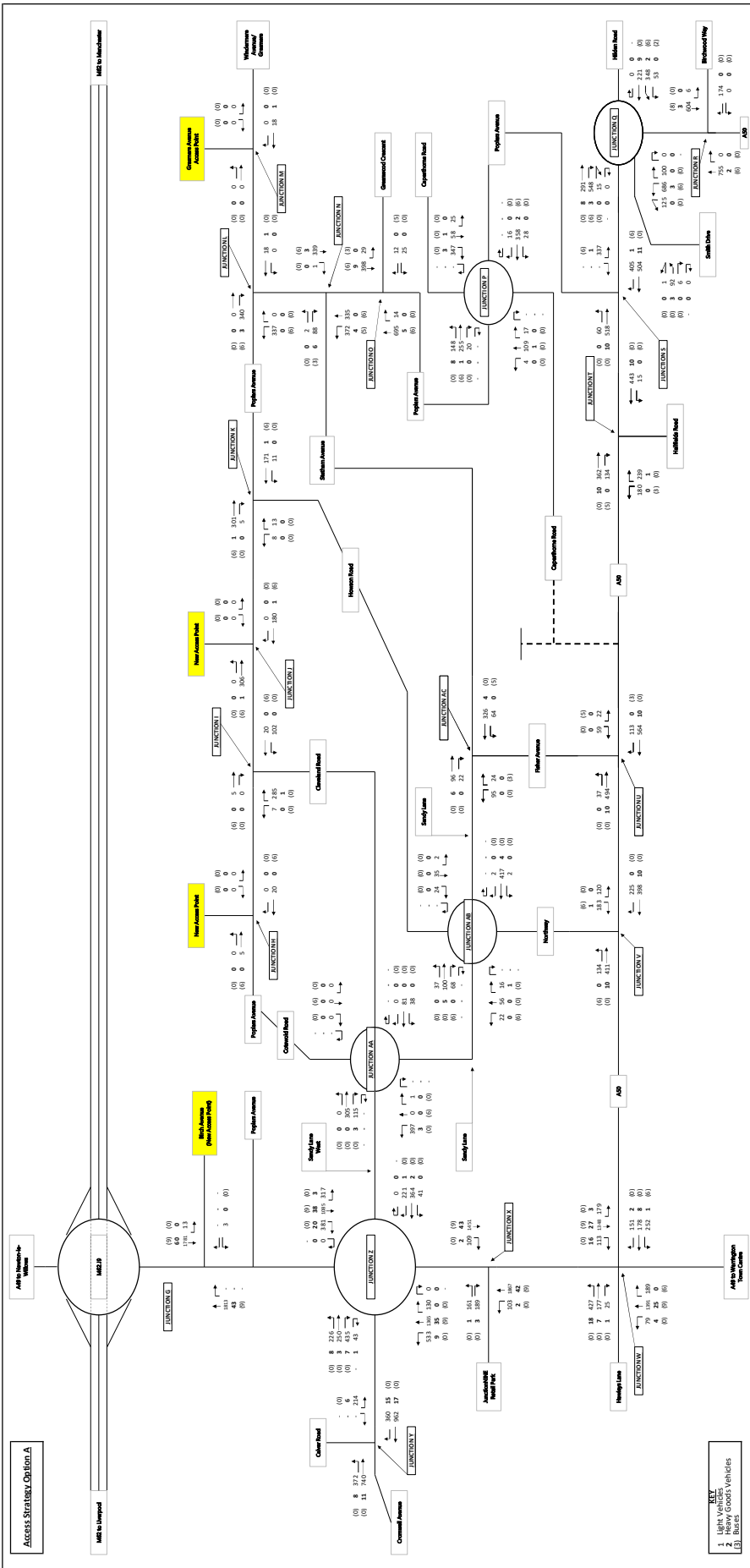
PROPOSED DEVELOPMENT: Peel Hall, Warrington
 AM Demand

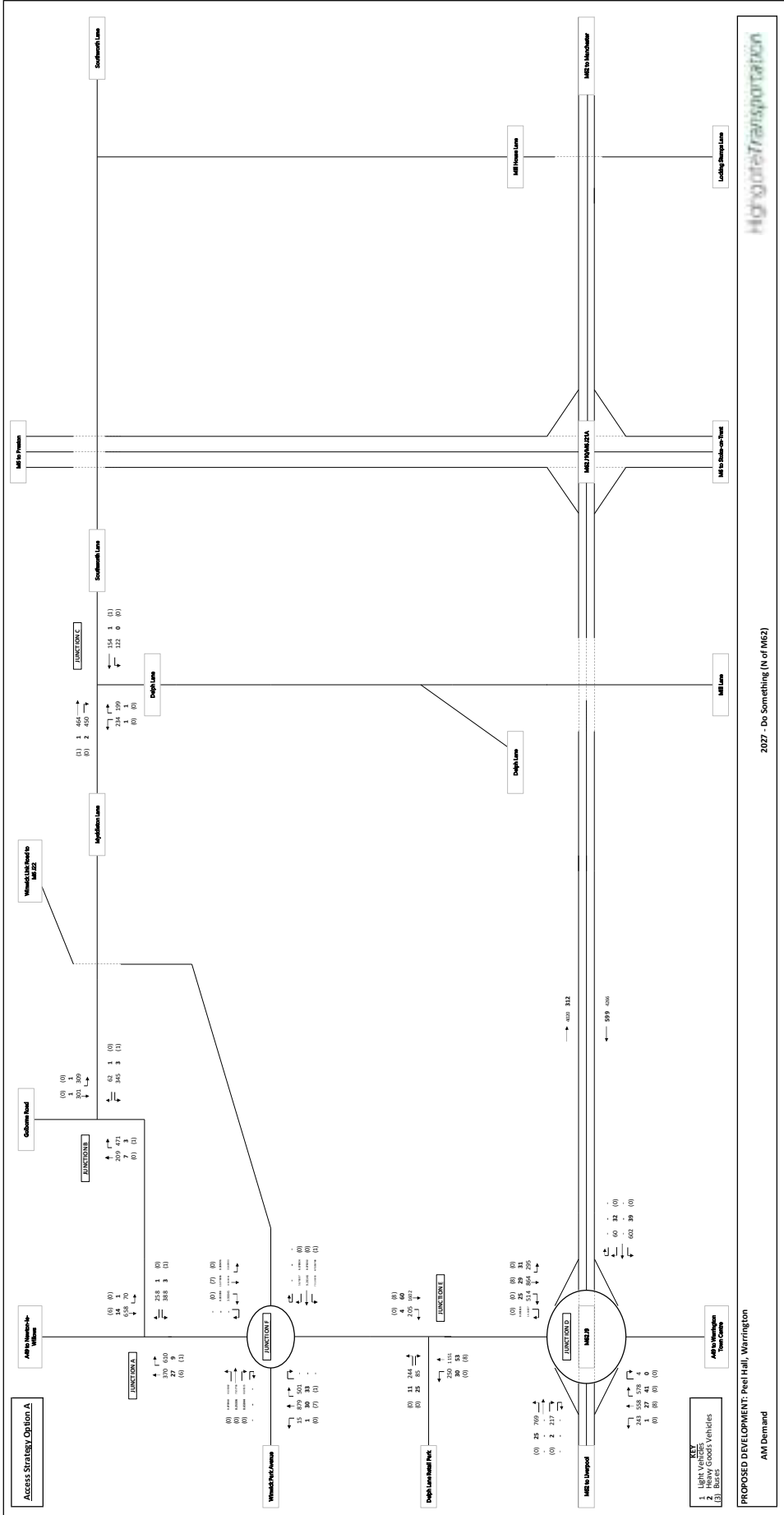
2027 - Do Minimum (SE of M62)

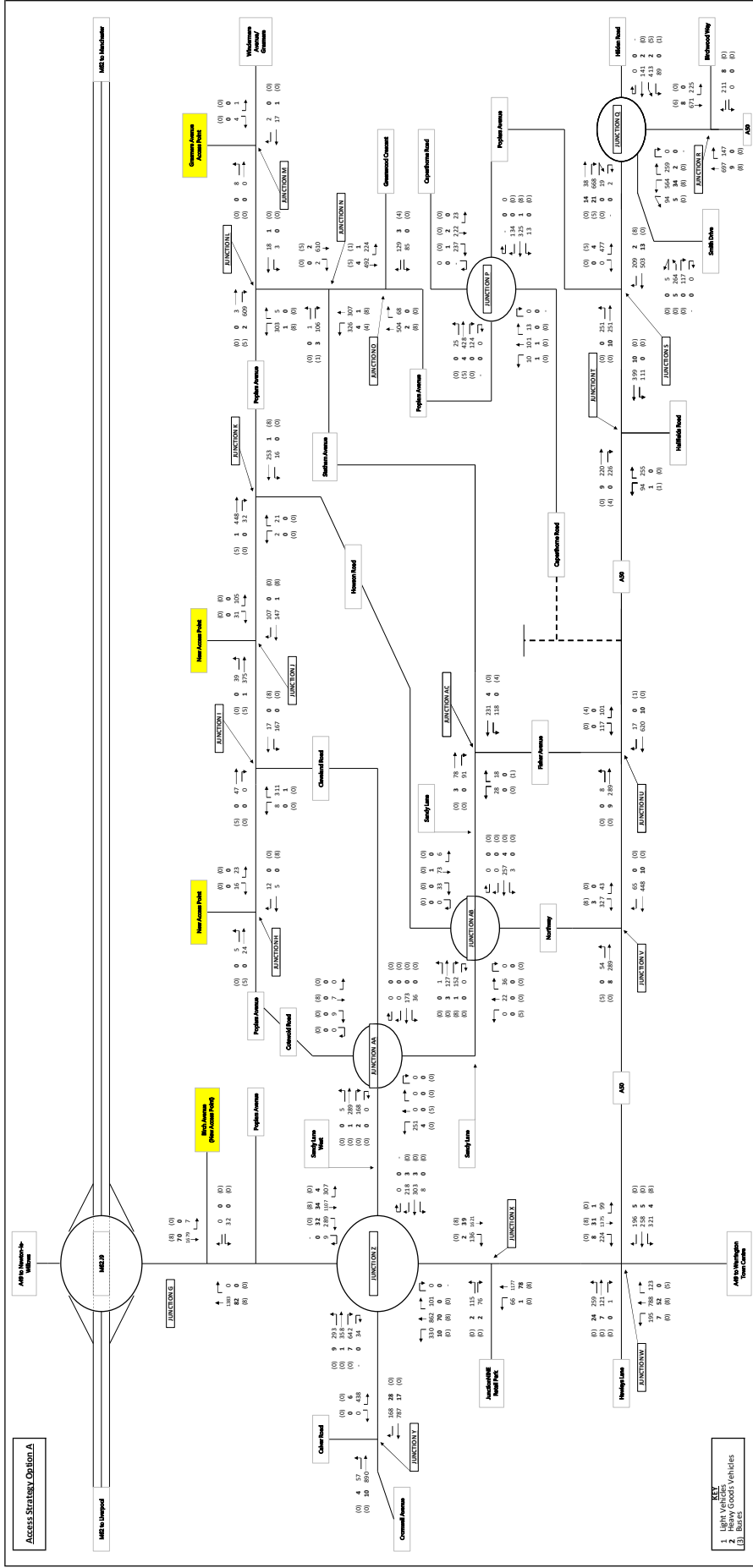
Highway Transportation

- 1 LIGHT VEHICLES
- 2 HEAVY GOODS VEHICLES
- 3 BUSES









ACCESS STRATEGY OPTIONS A

M62 to Liverpool

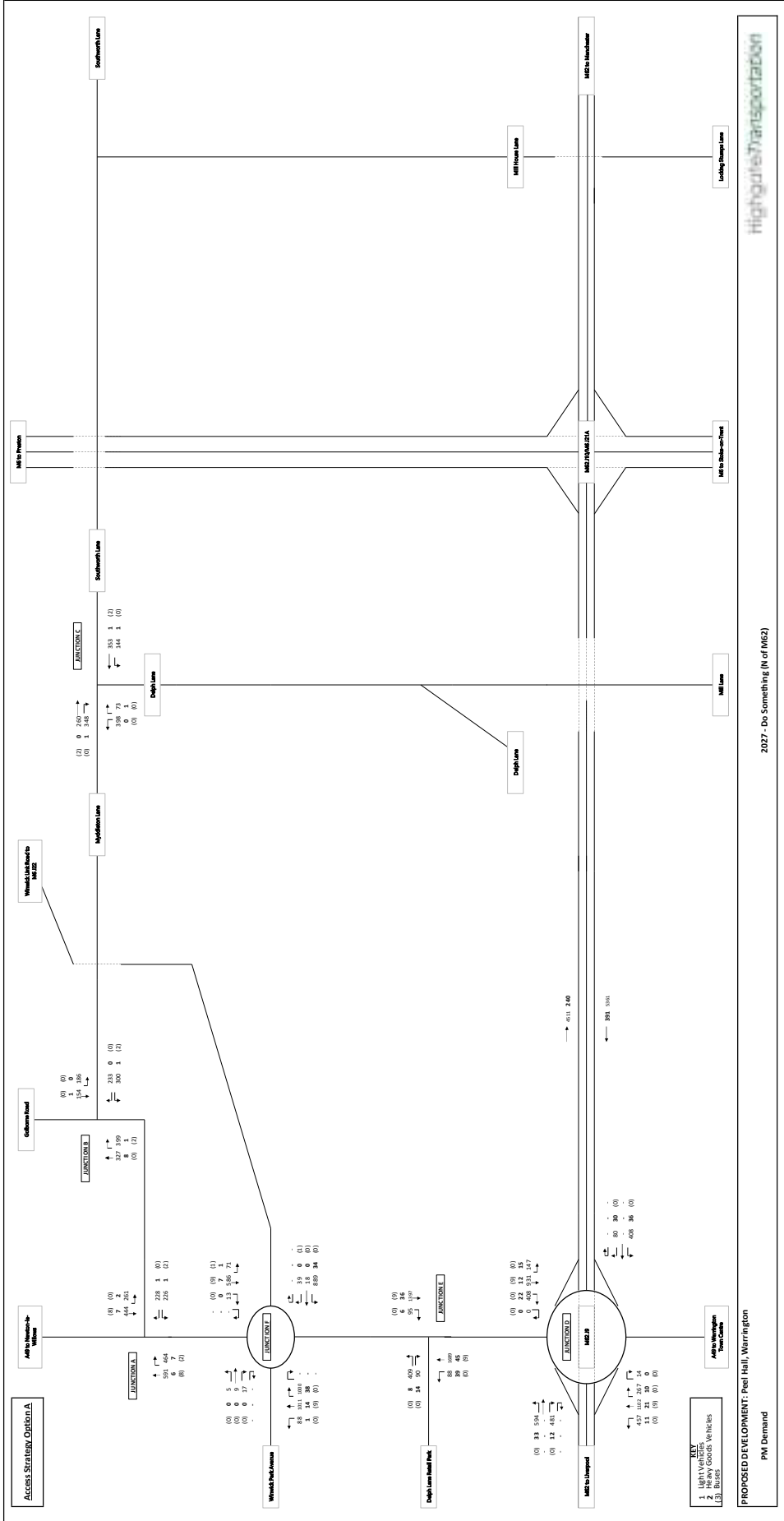
M62 to Manchester

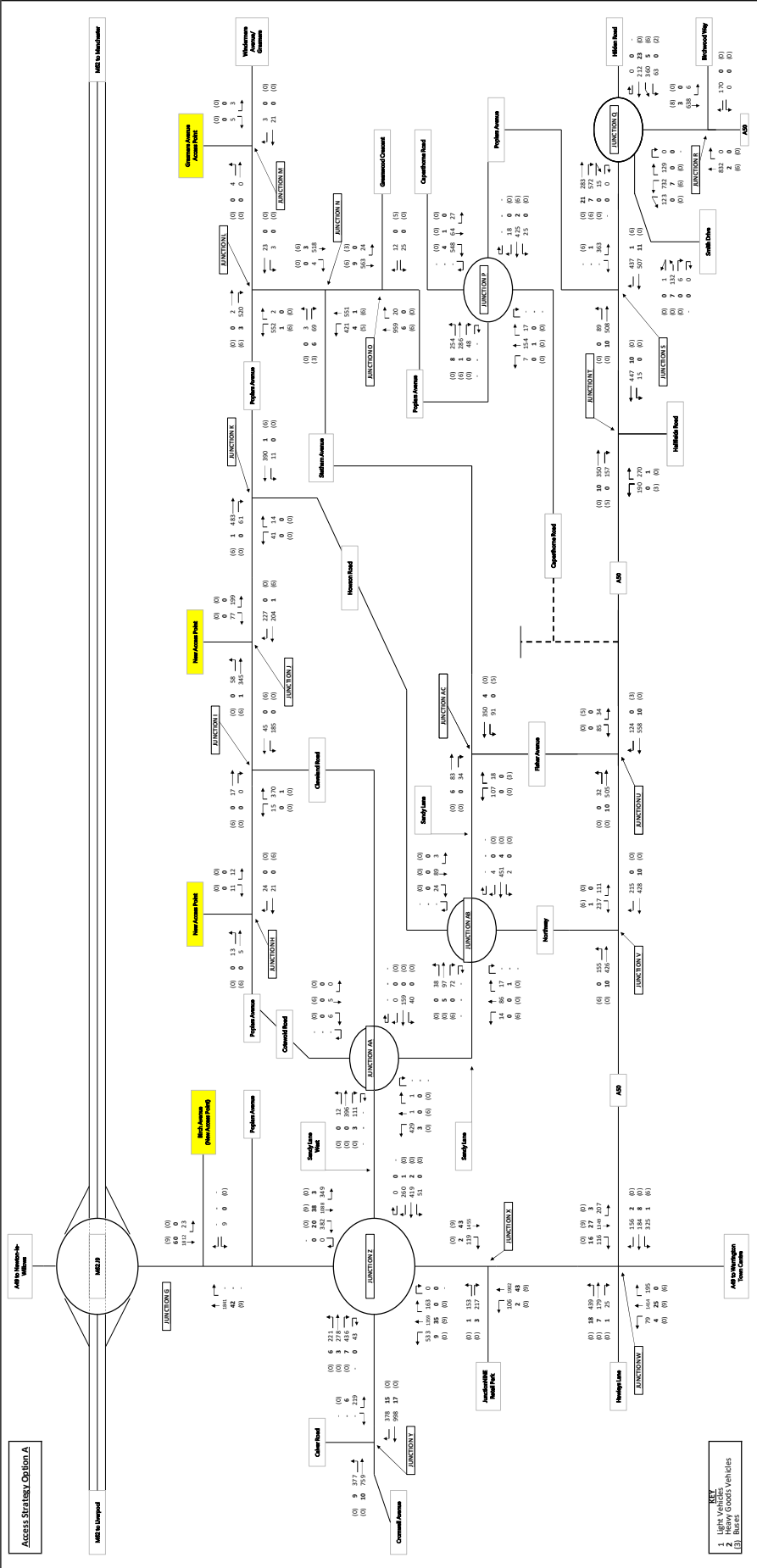
NEW
1. Light Vehicles
2. Heavy Goods Vehicles
3. Buses

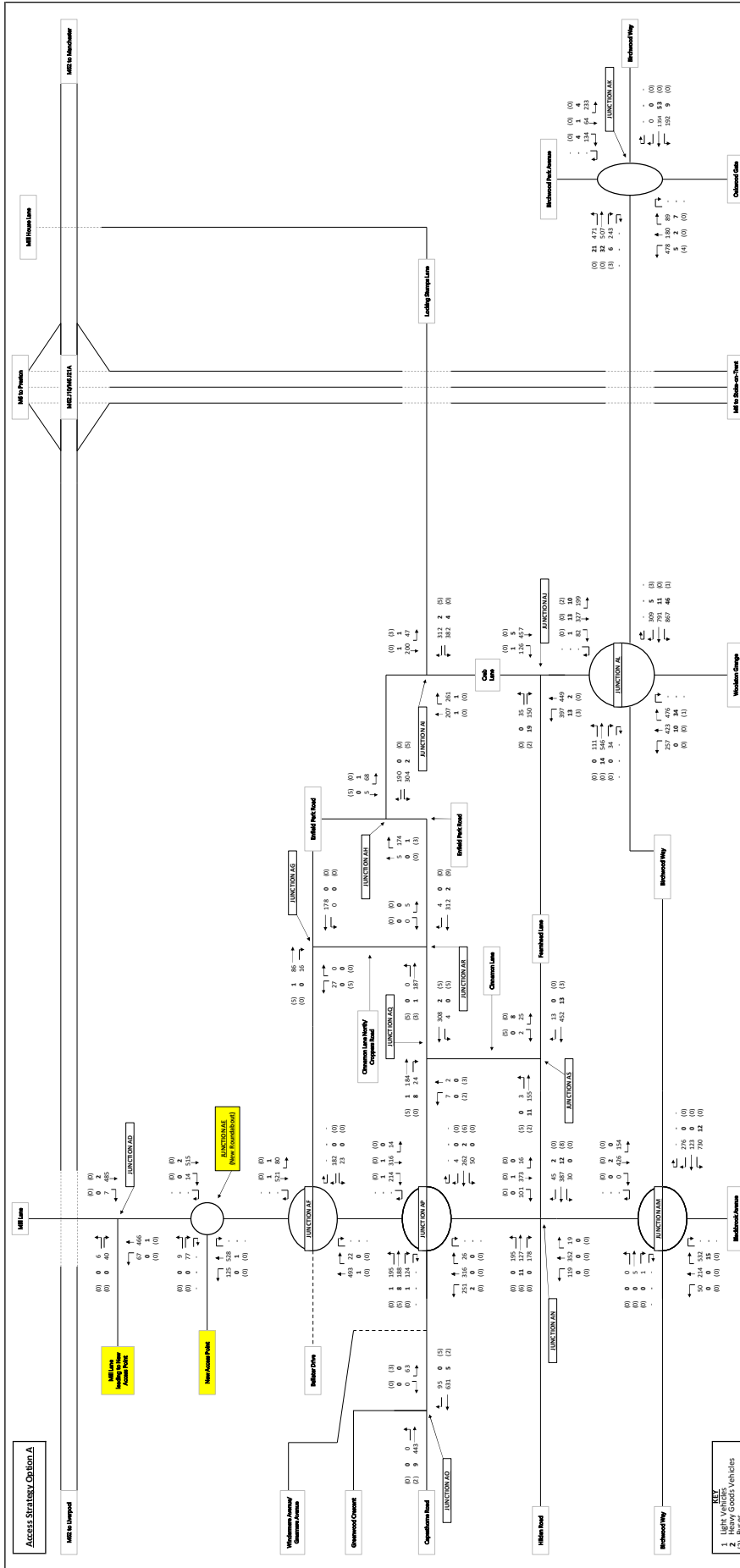
PROPOSED DEVELOPMENT: Peel Hall, Warrington
AM Demand

2027 - Do Something (SW of M62)

Highways/Transportation





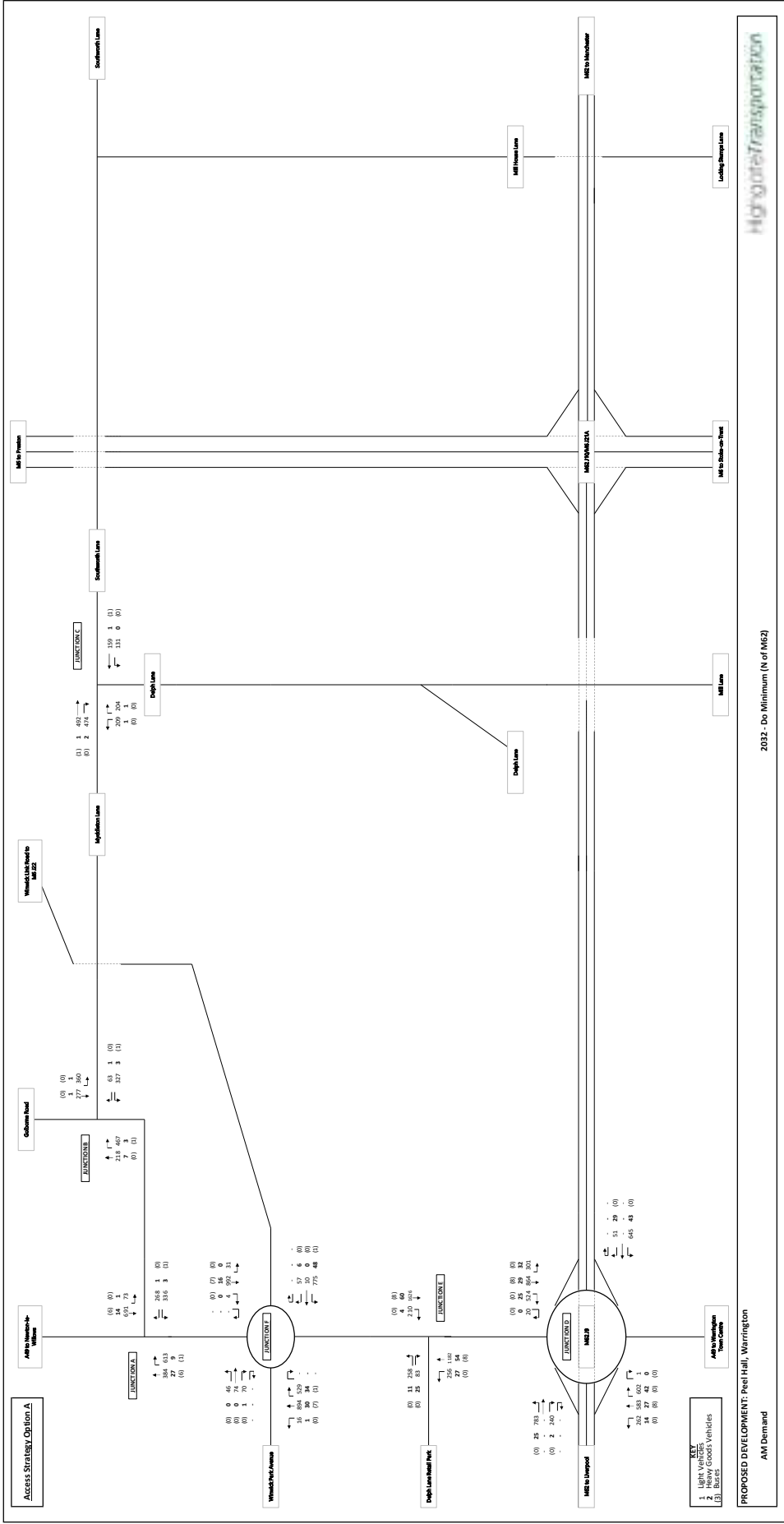


ACCESS STRATEGY OPTION 1A
 PROPOSED DEVELOPMENT: Peel Hall, Warrington
 PN1 Demand

2027 - Do Something (SE of M62)

Highways/Transportation

- 1. Light Vehicles
- 2. Heavy Goods Vehicles
- 3. Buses



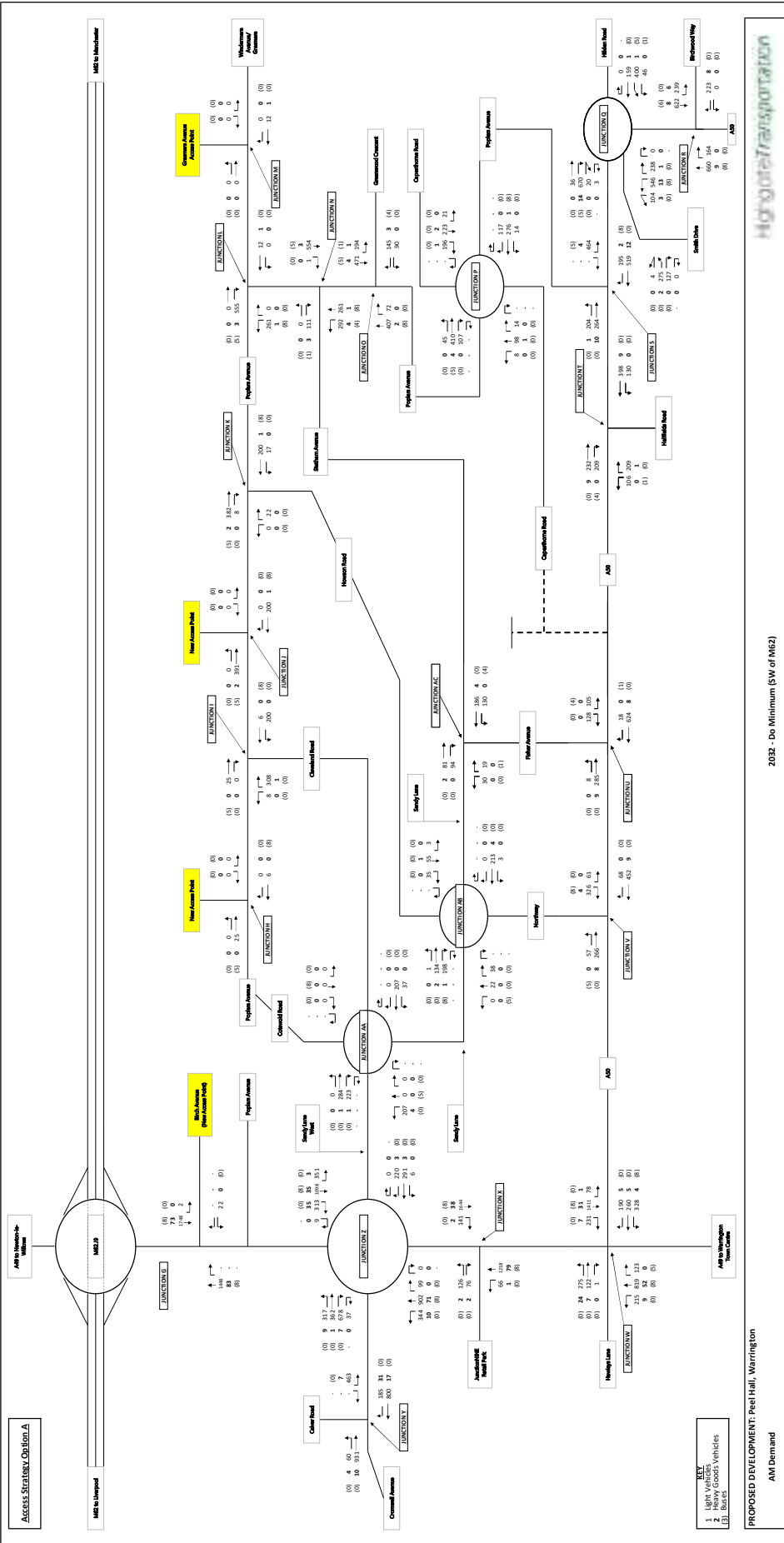
High Quality Transportation

2032 - Do Minimum (N of M62)

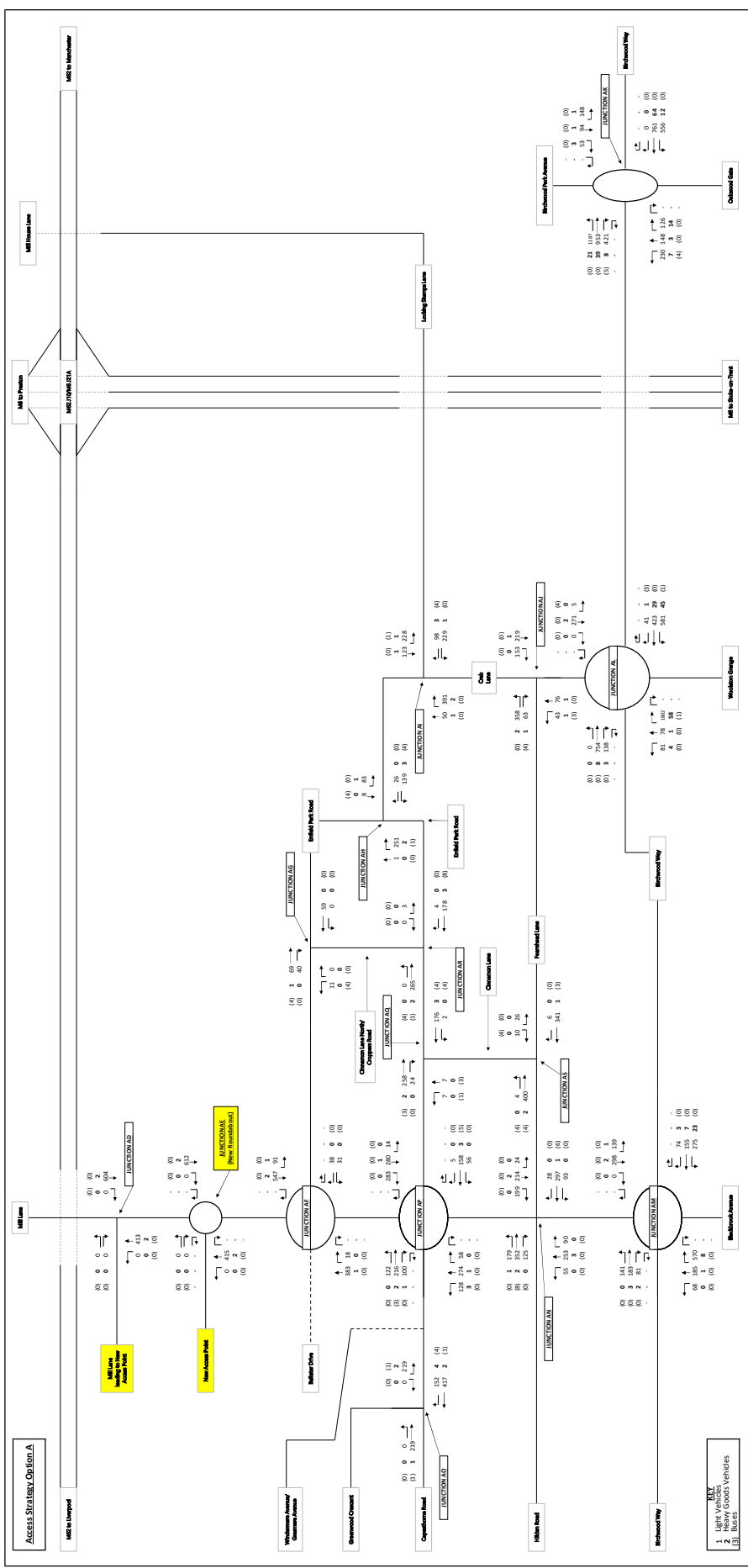
PROPOSED DEVELOPMENT: Peel Hall, Warrington
AM Demand

- 1 Heavy Goods Vehicles
- 2 Heavy Goods Vehicles
- 3 Buses

KEY
1 Heavy Goods Vehicles
2 Heavy Goods Vehicles
3 Buses



PROPOSED DEVELOPMENT: Peel Hall, Warrington
 AM Demand
 2032 - Do Minimum (SW of M62)

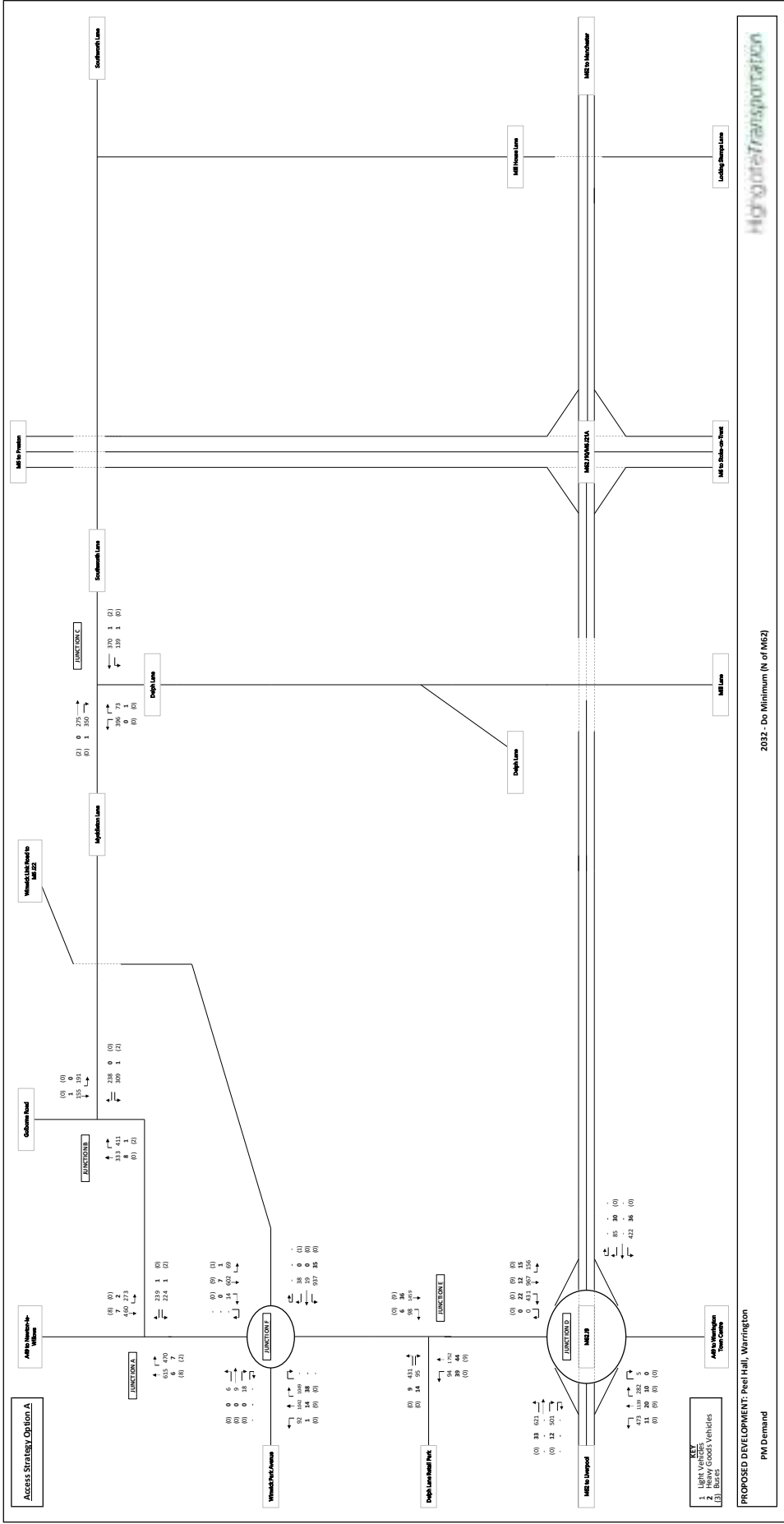


PROPOSED DEVELOPMENT: Peel Hall, Warrington
 AM Demand

Highways/Transportation

2032 - Do Minimum (SE of M62)

- 1. Light Vehicles
- 2. Heavy Goods Vehicles
- 3. Buses

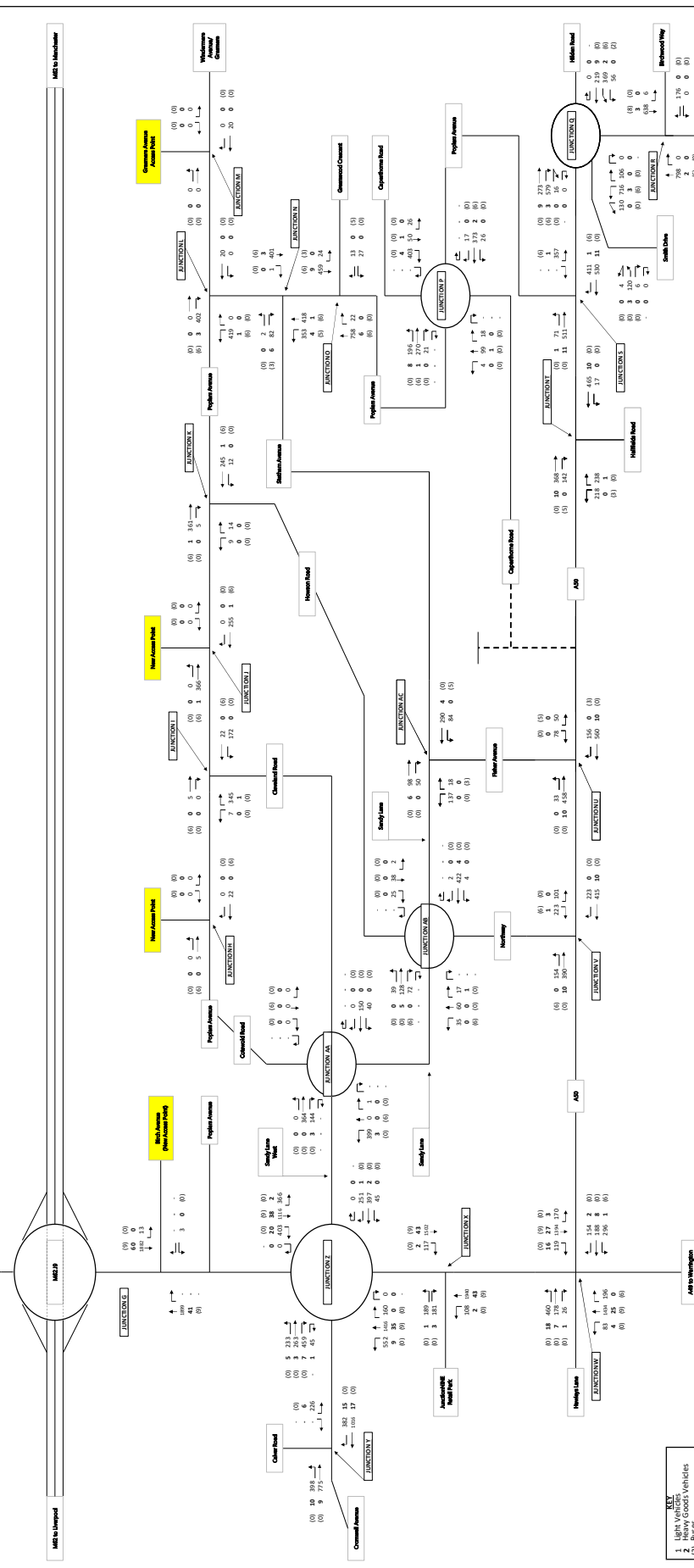


Highways/Transportation

2022 - Do Minimum (N of M62)

PM Demand

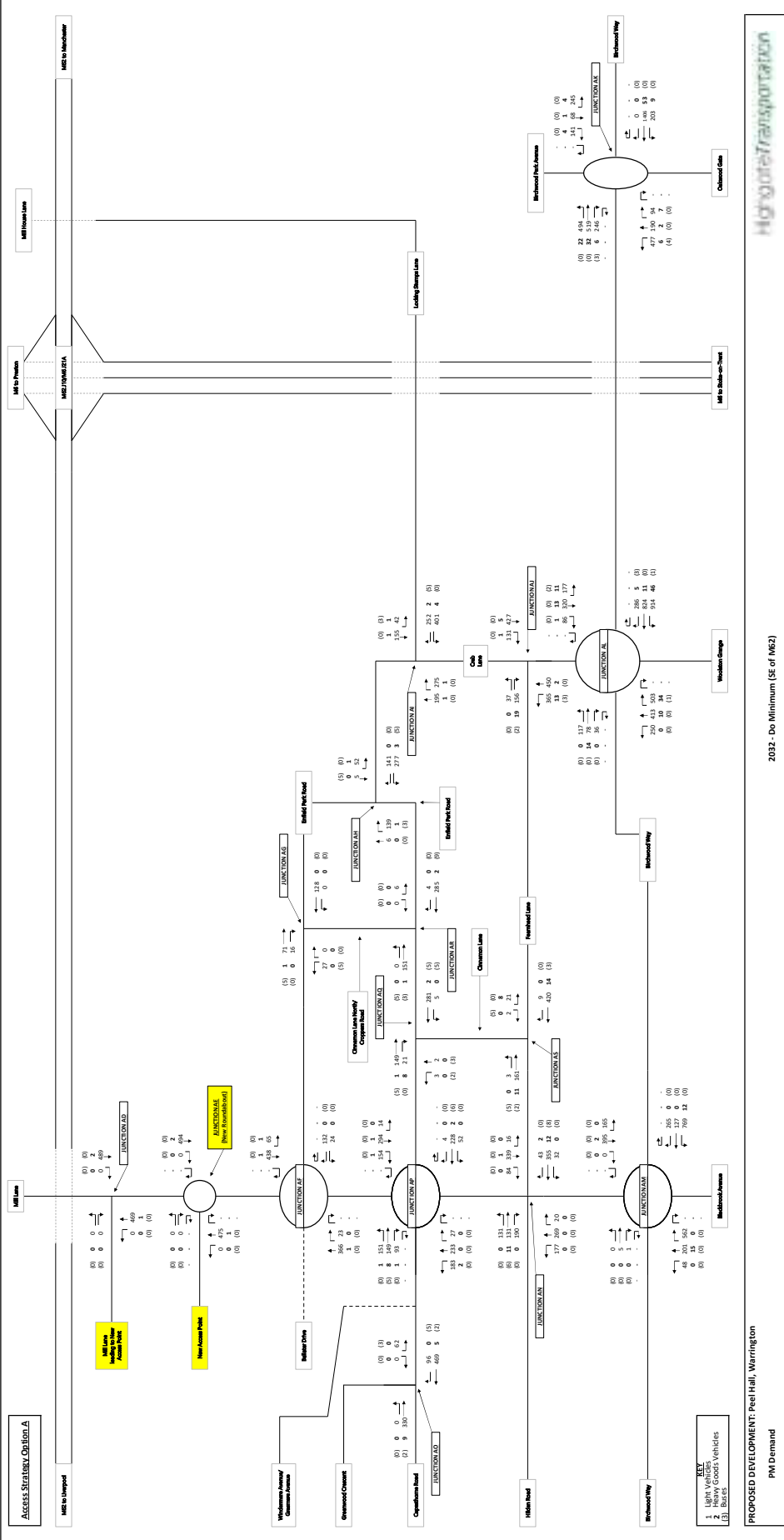
ACCESS STRATEGY OPTIONS A

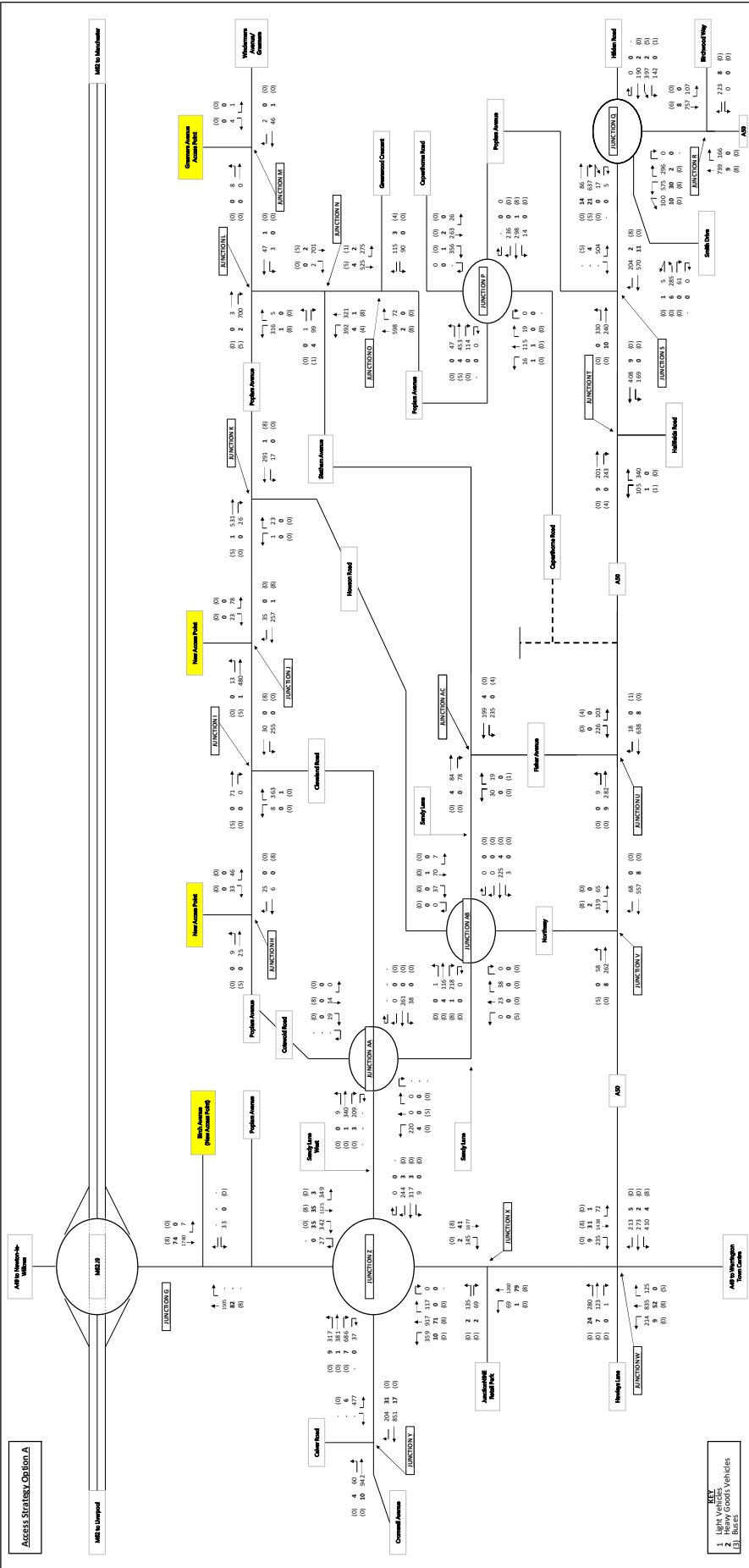


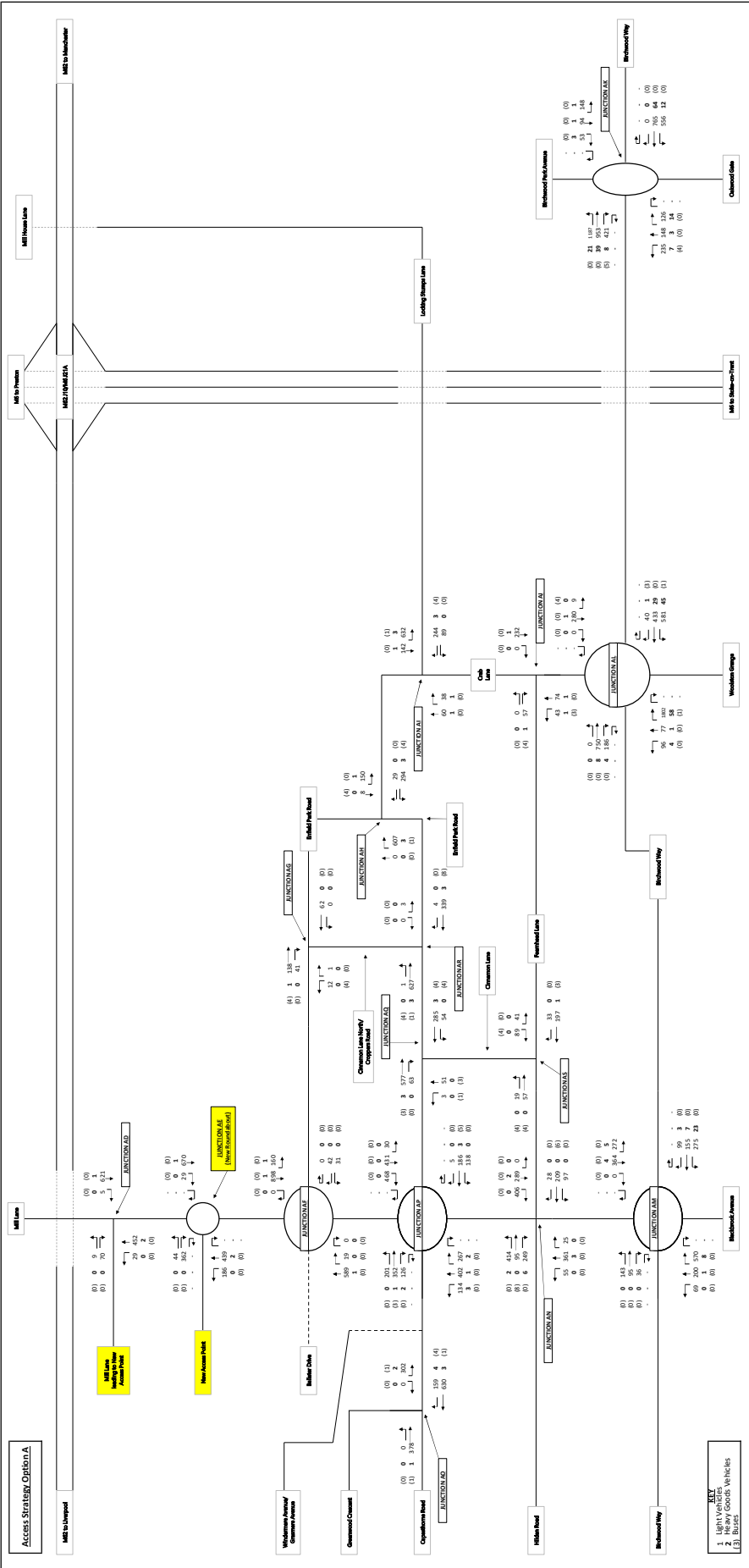
PROPOSED DEVELOPMENT: Peel Hall, Warrington
 PN Demand

2032 - Do Minimum (SW of M62)

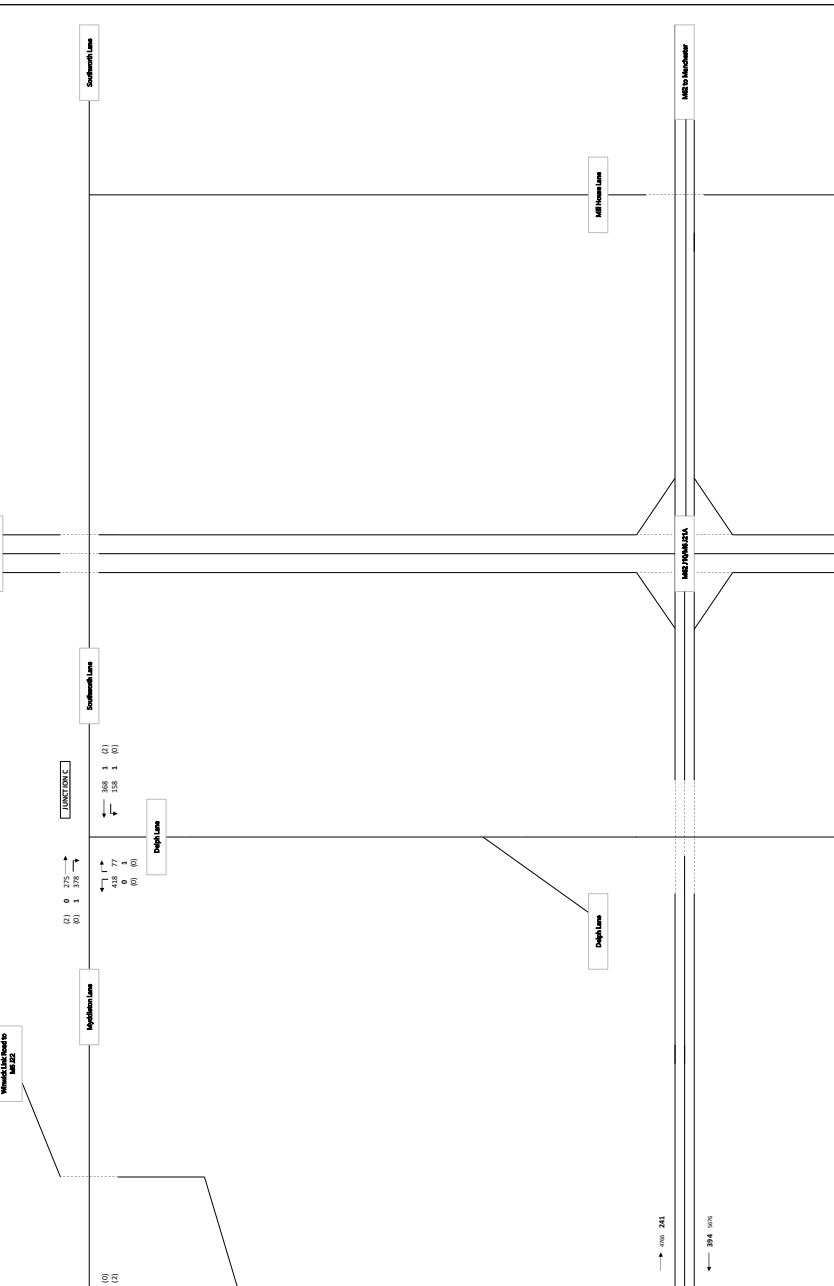
- KEY
- 1 LIGHT VEHICLES
 - 2 HEAVY GOODS VEHICLES
 - 3 BIKES







PROPOSED DEVELOPMENT: Peel Hill, Warrington
 AM Demand
 2032 - do Something (FULL Development) (SE of M62)
 Highways/Transportation

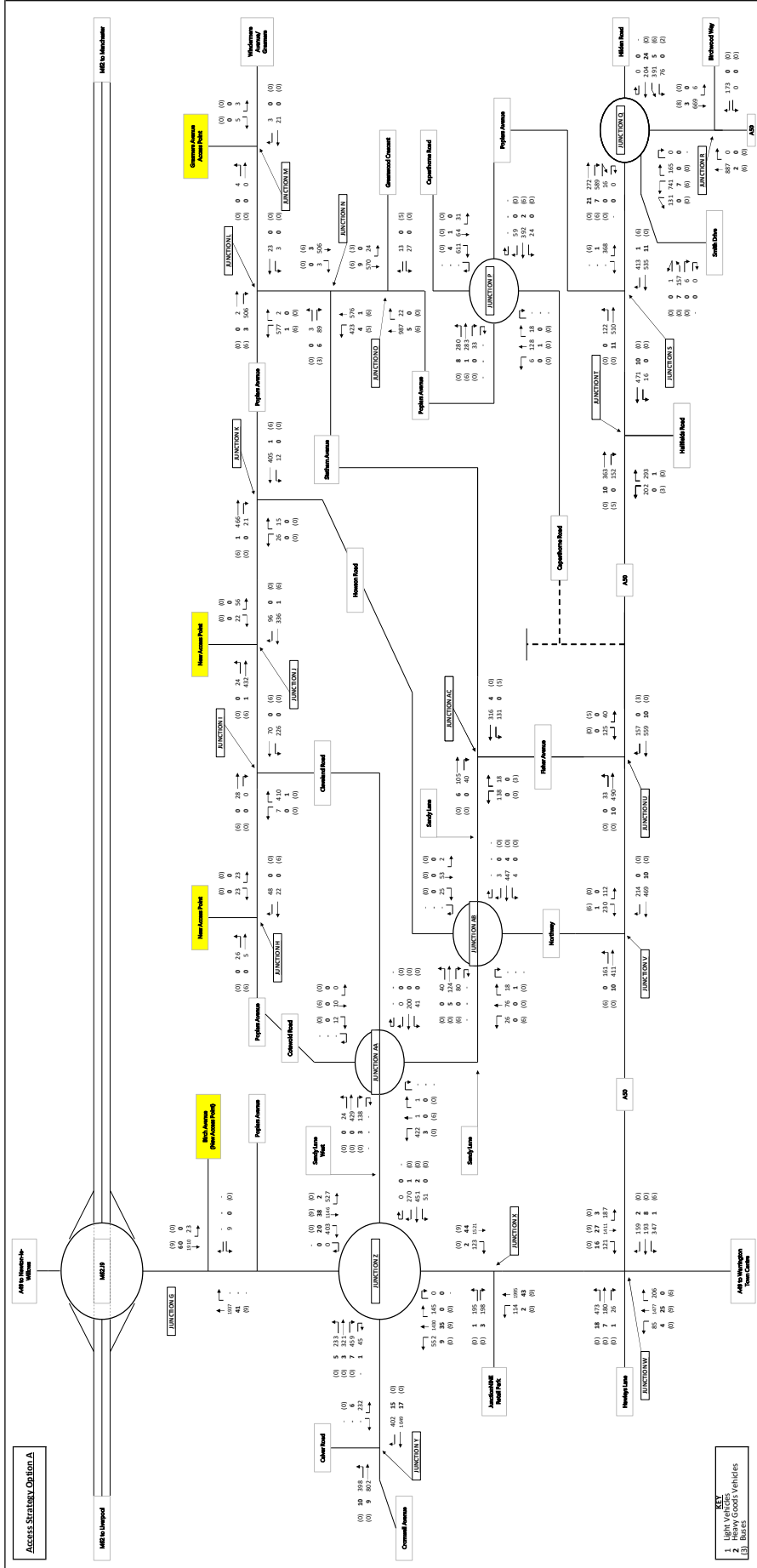


2032 - Do Something (Full Development) (N of M2)

PM Demand

- KEY**
- 1 Light Goods Vehicles
 - 2 Heavy Goods Vehicles
 - 3 Buses

PROPOSED DEVELOPMENT: Peel Hall, Warrington

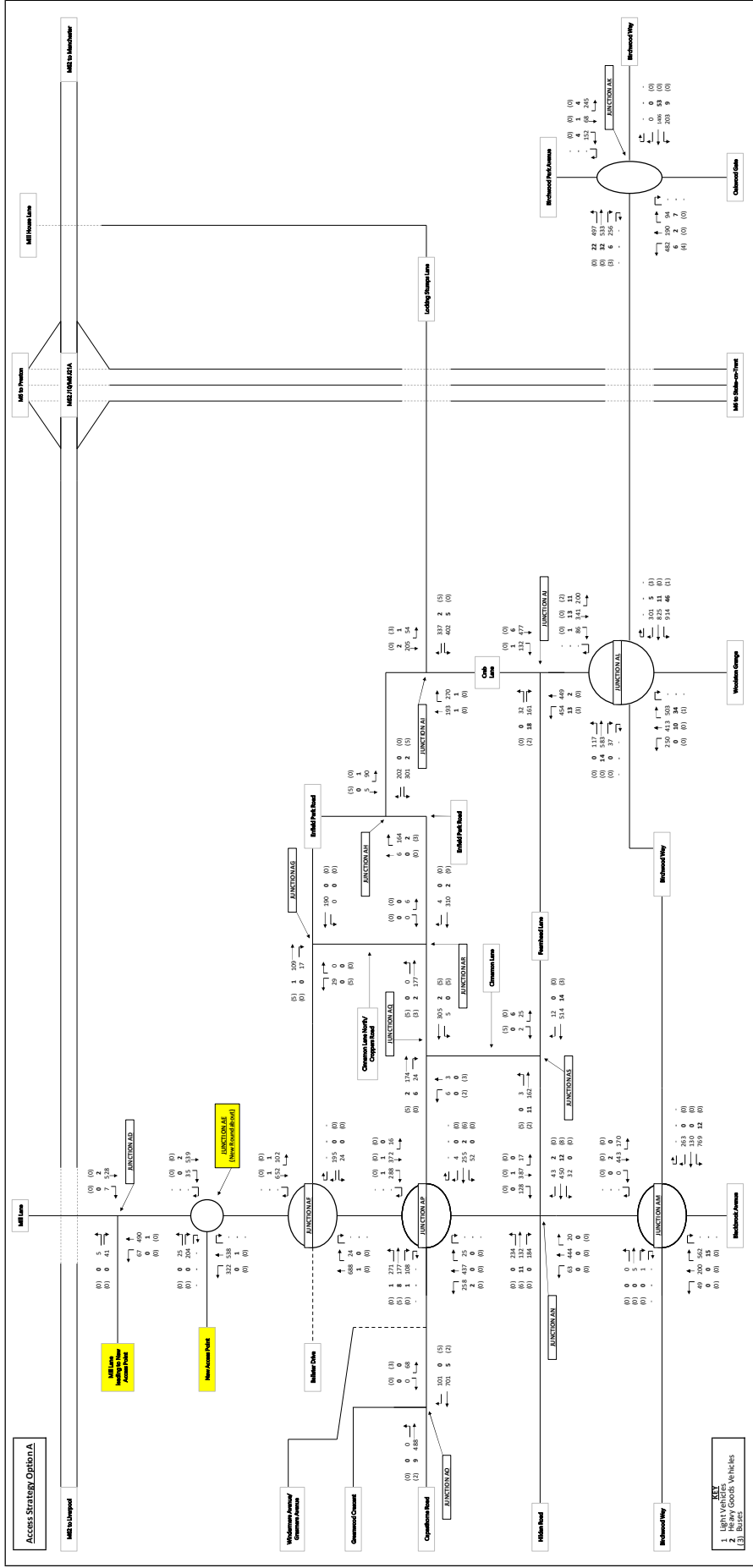


2032 - Do Something (Full Development) (SW of M62)

PROPOSED DEVELOPMENT: Peel Hall, Warrington
 PM Demand

KEY
 1. Light Vehicles
 2. Heavy Goods Vehicles
 3. Buses

HighOrderTransportation



ACCESS STATION ORBITA

M6 to Preston

M6 to Lancaster

M6 to Preston-Trest

M6 to Lancaster-Trest

PROPOSED DEVELOPMENT: Peel Hall, Warrington

PNM Demand

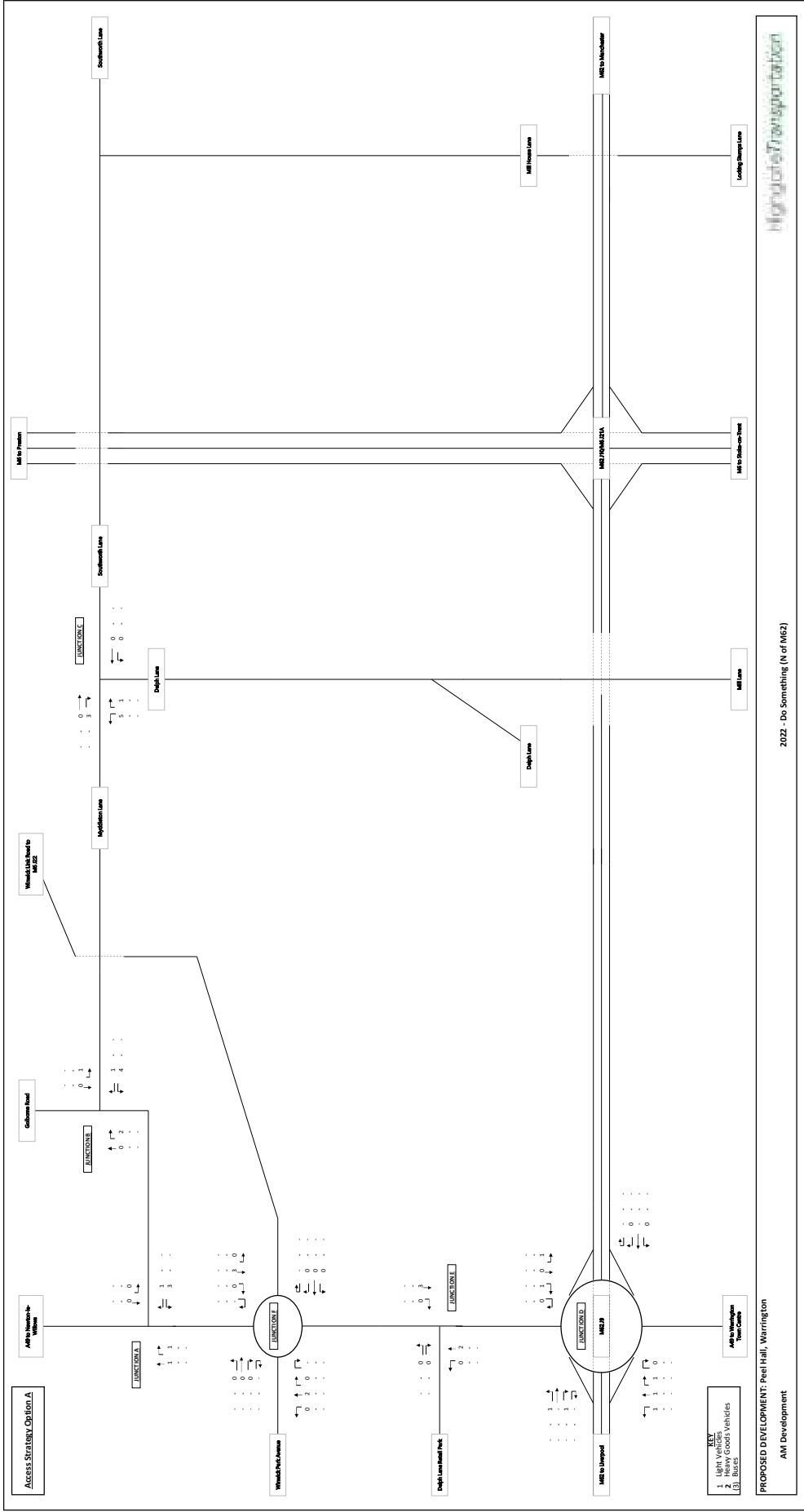
2022 - No Something (FULL Development) (SE of M62)

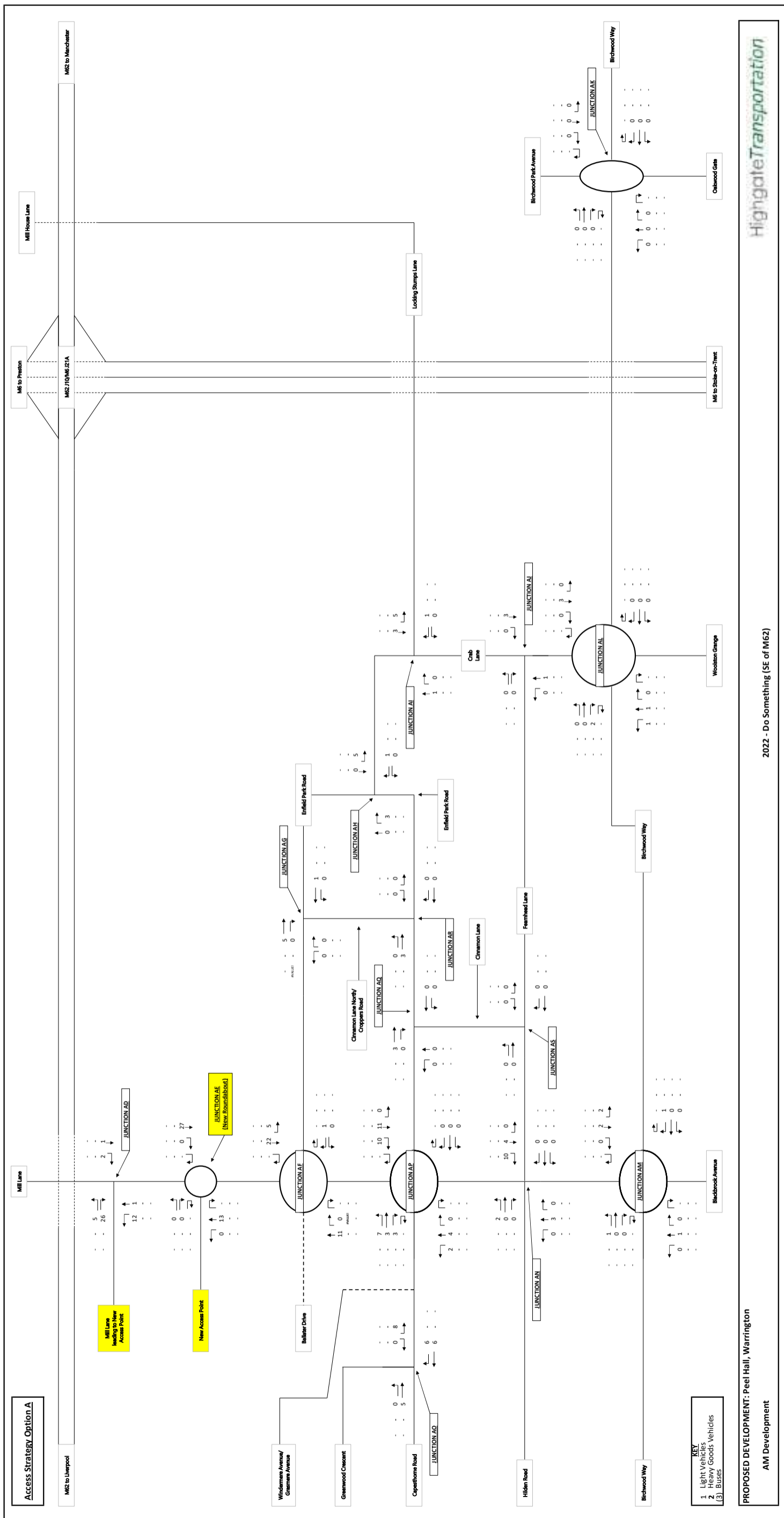
Highway Transportation

- 1 LIGHT VEHICLES
- 2 HEAVY GOODS VEHICLES
- 3 BUSES

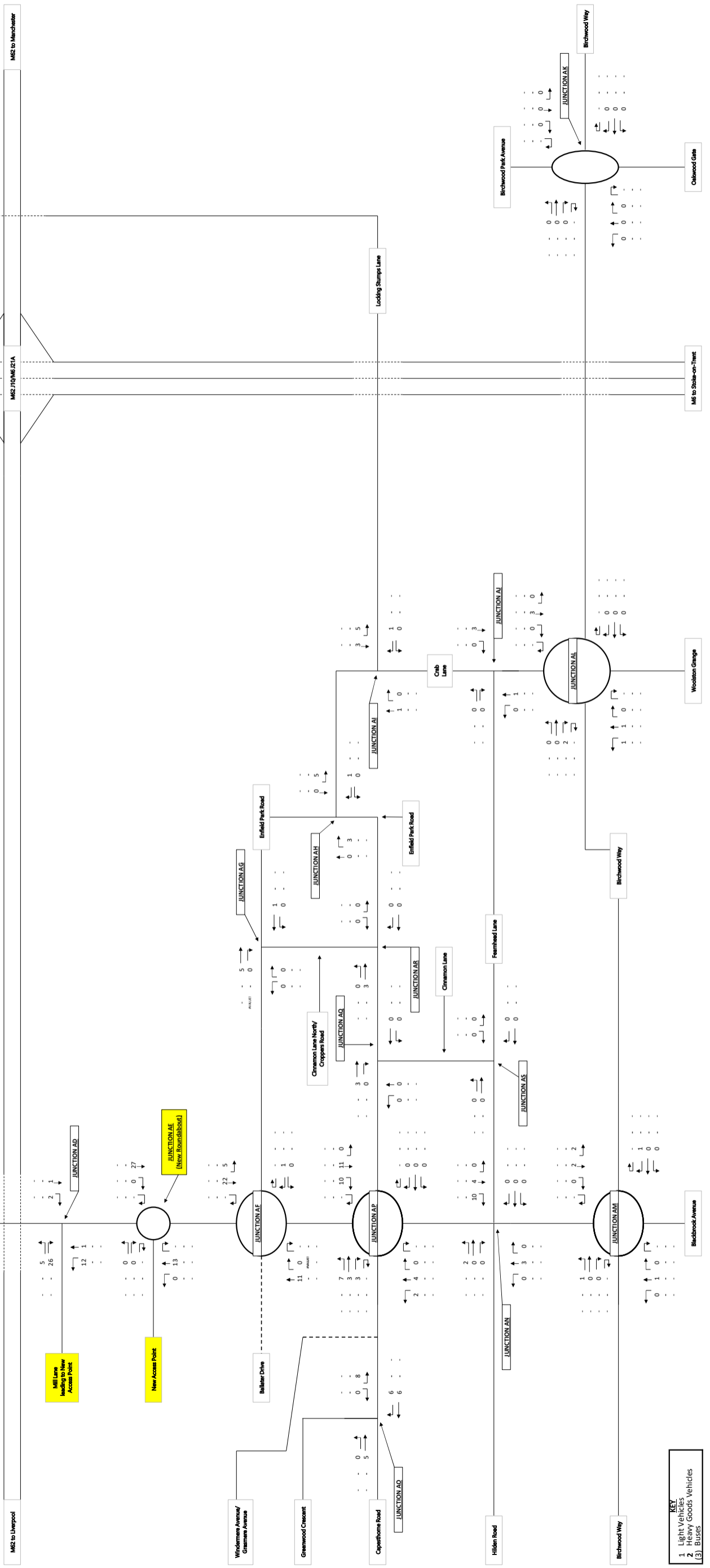
Appendix SCG/9

Development Flow Diagrams





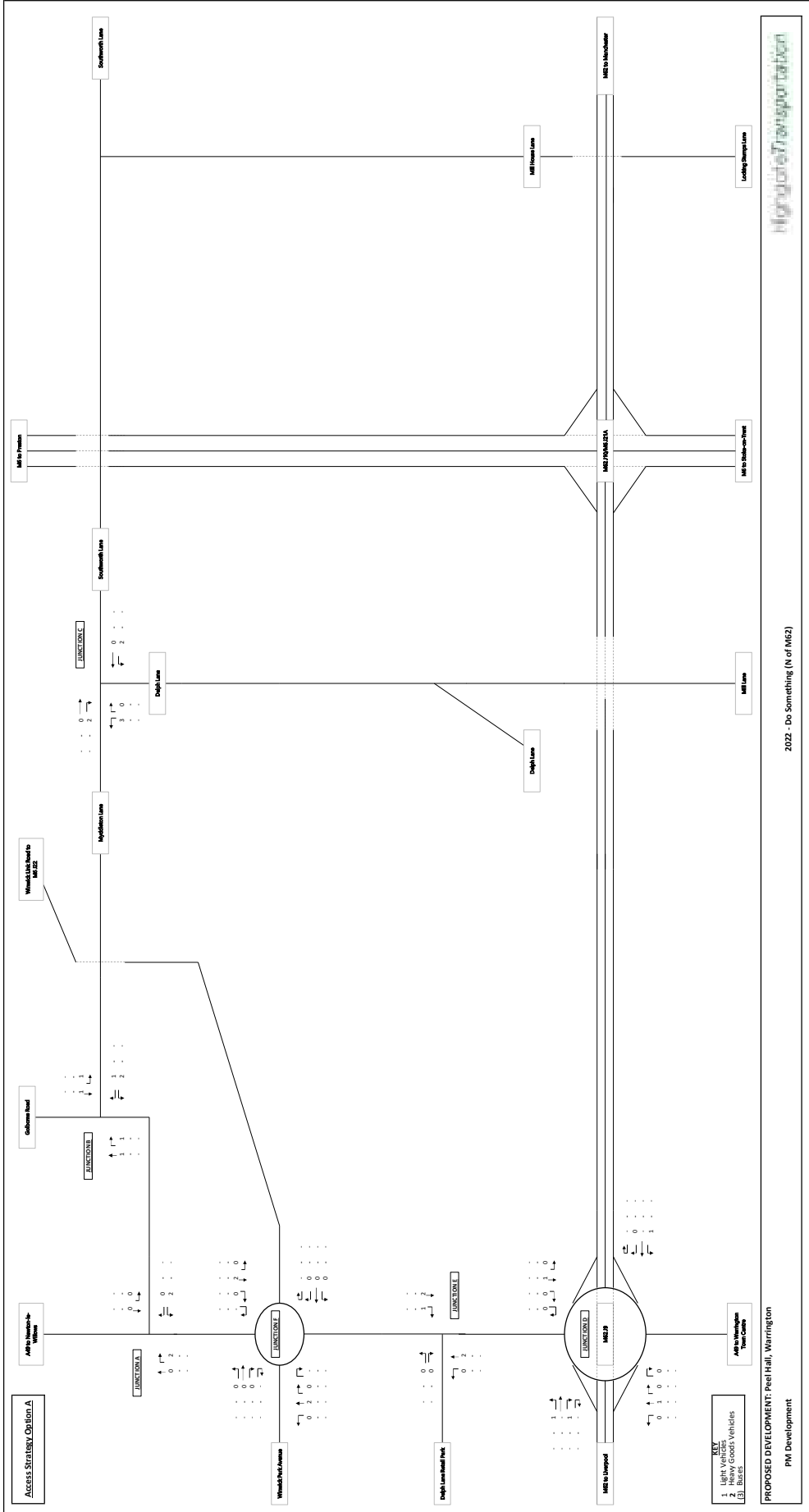
Access Strategy Option A



- KEY**
- 1 Light Vehicles
 - 2 Heavy Goods Vehicles
 - 3 BUSES

PROPOSED DEVELOPMENT: Peel Hall, Warrington
AM Development

2022 - Do Something (SE of M62)



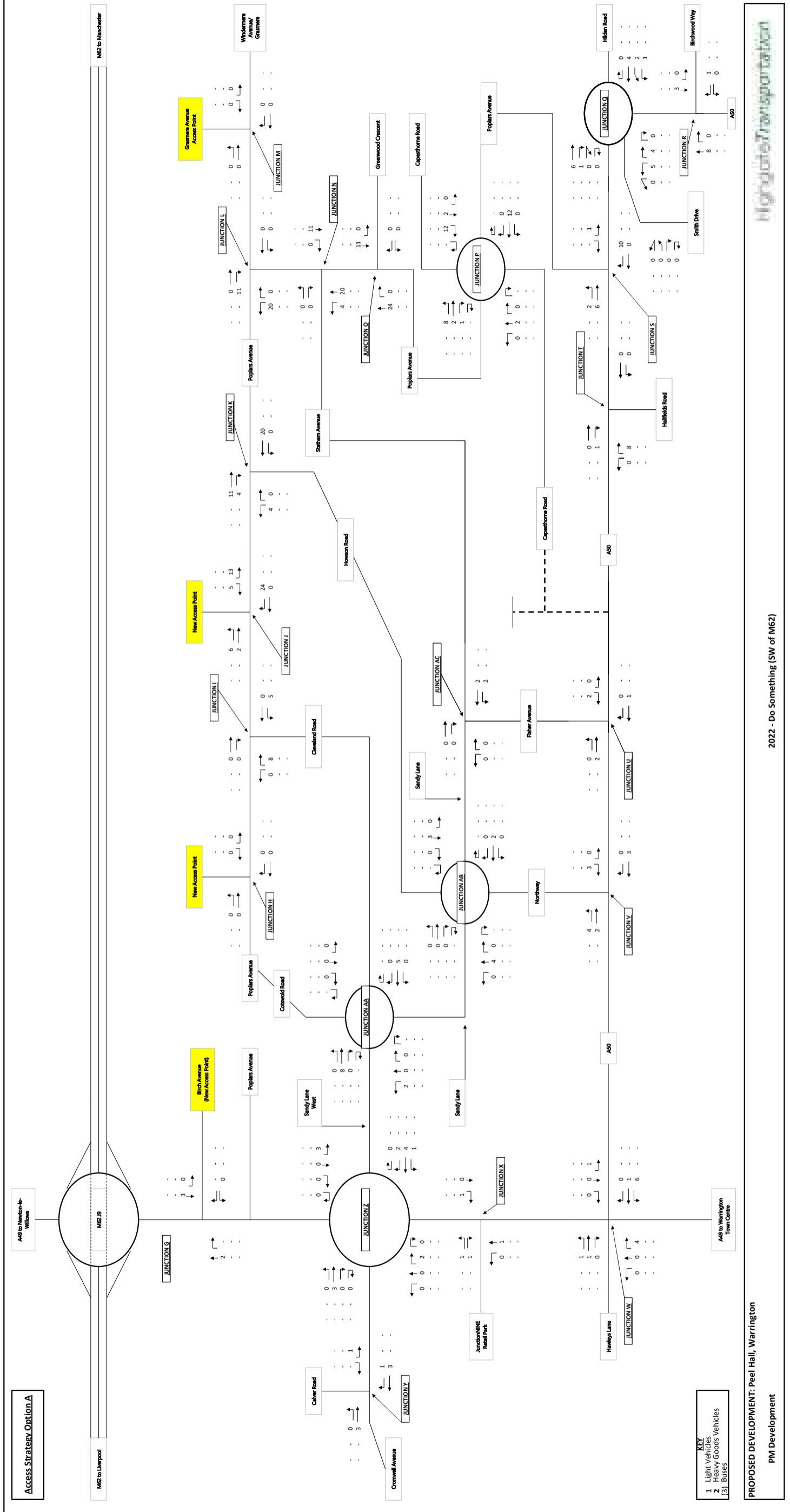
Highway Construction

2022 - Do Something (N of M62)

PROPOSED DEVELOPMENT: Peel Hall, Warrington

PM Development

KEY
 1. Light Vehicles
 2. Heavy Goods Vehicles
 3. Buses



Access Strategy Option A

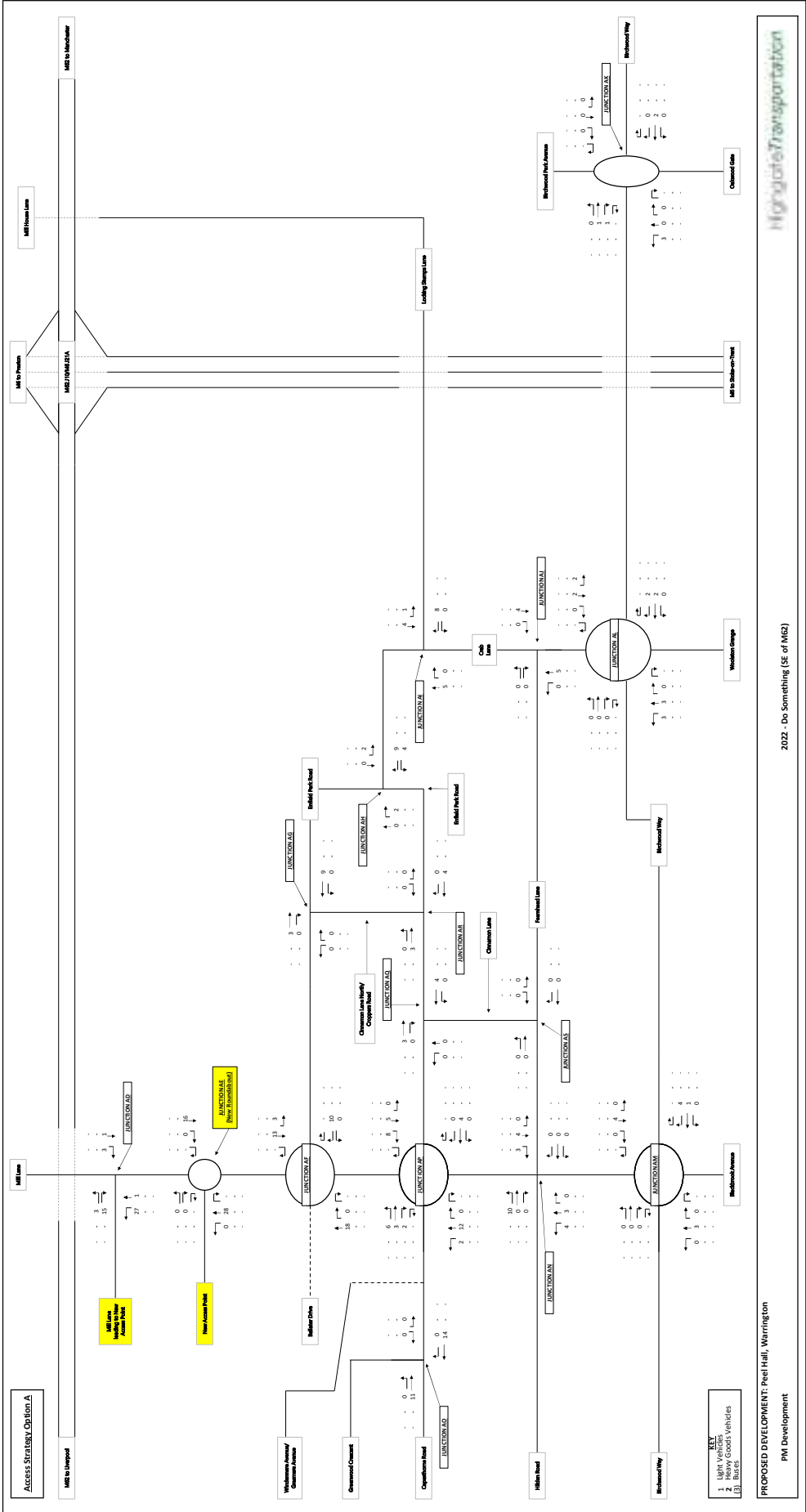
M62 to Liverpool | M62 JP | M62 to Manchester

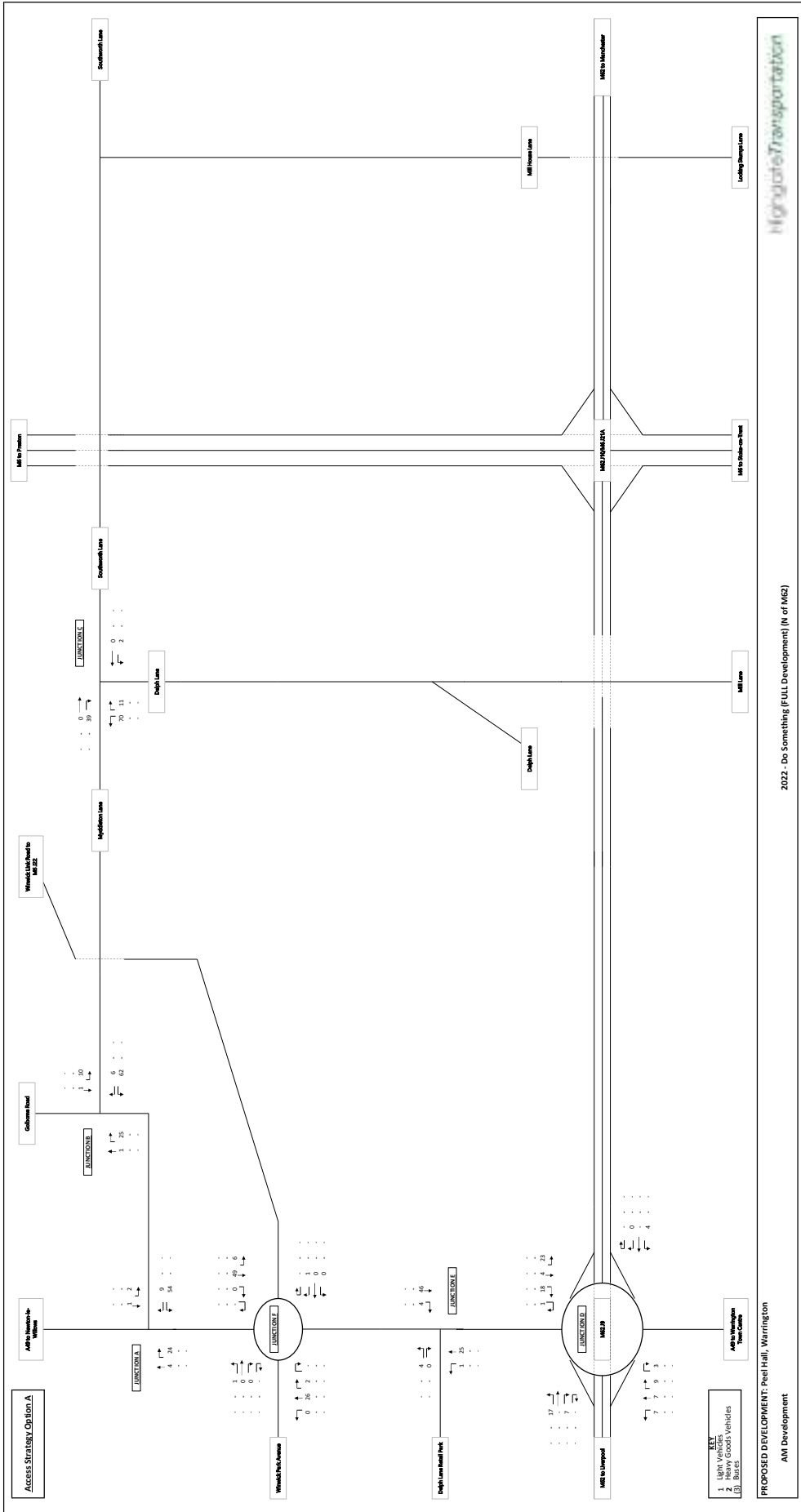
- KEY**
- 1 Light Vehicles
 - 2 Heavy Goods Vehicles
 - 3 Buses

PROPOSED DEVELOPMENT: Peel Hall, Warrington
PM Development

2022 - Do Something (SW of M62)







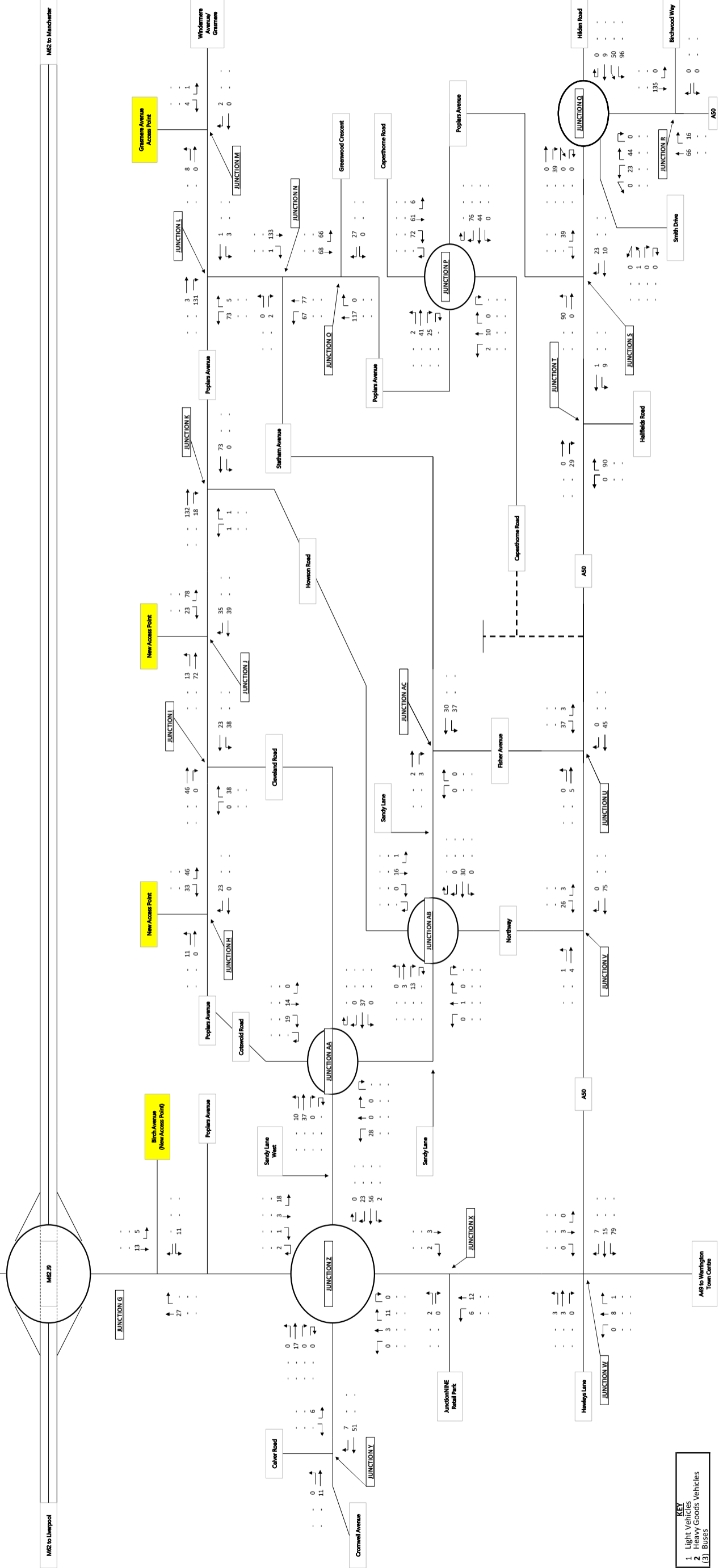
Highways Transportation

2022 - Do Something (FULL Development) (N of MSE)

PROPOSED DEVELOPMENT: Peel Hall, Warrington
AM Development

- 1. Light Vehicles
- 2. Heavy Goods Vehicles
- 3. Buses

Access Strategy Option A



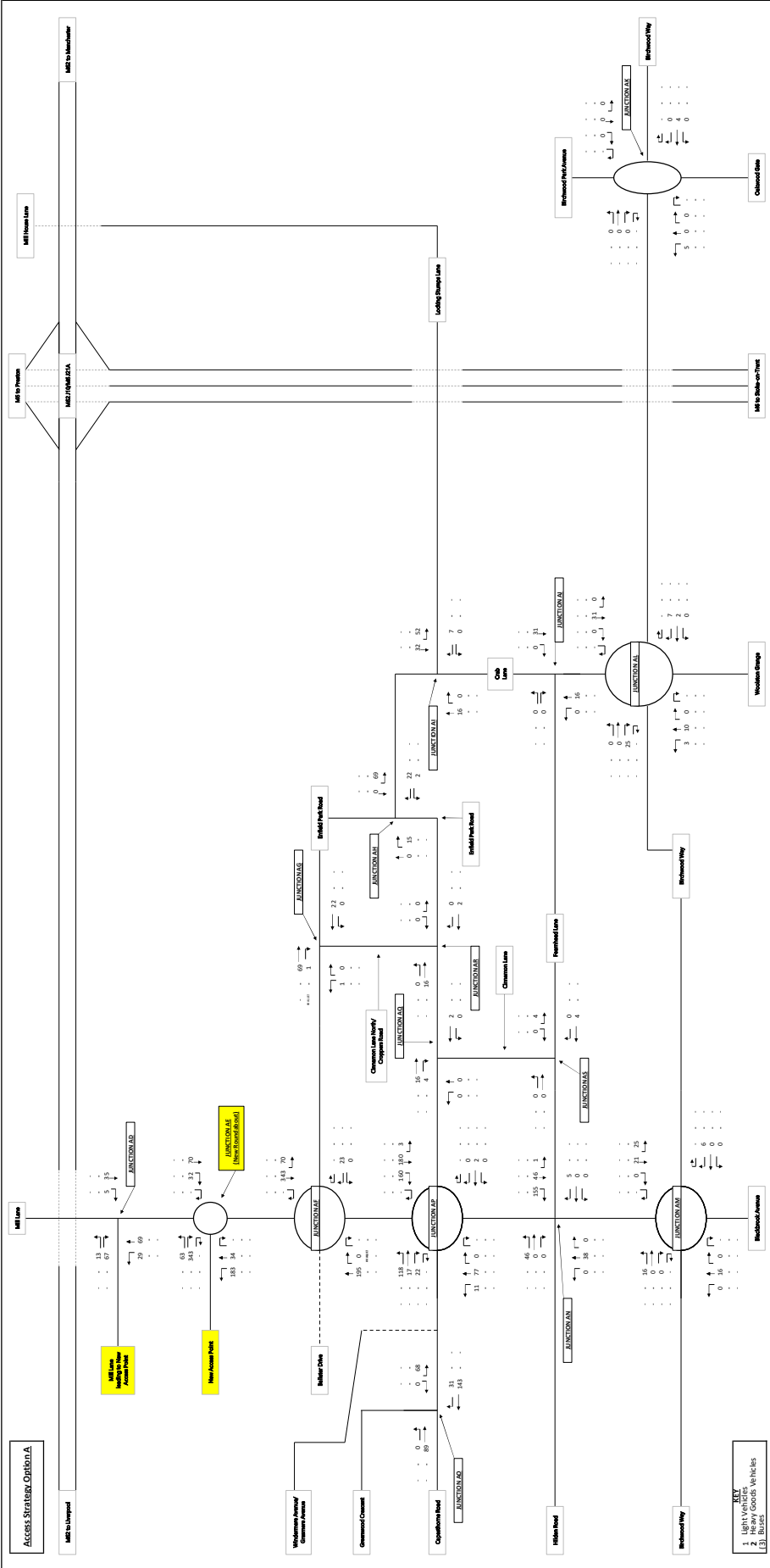
- KEY**
- 1 Light Vehicles
 - 2 Heavy Goods Vehicles
 - 3 Buses

PROPOSED DEVELOPMENT: Peel Hall, Warrington
AM Development

2022 - Do Something (FULL Development) (SW of M62)



M62 to Liverpool | M62 to Manchester



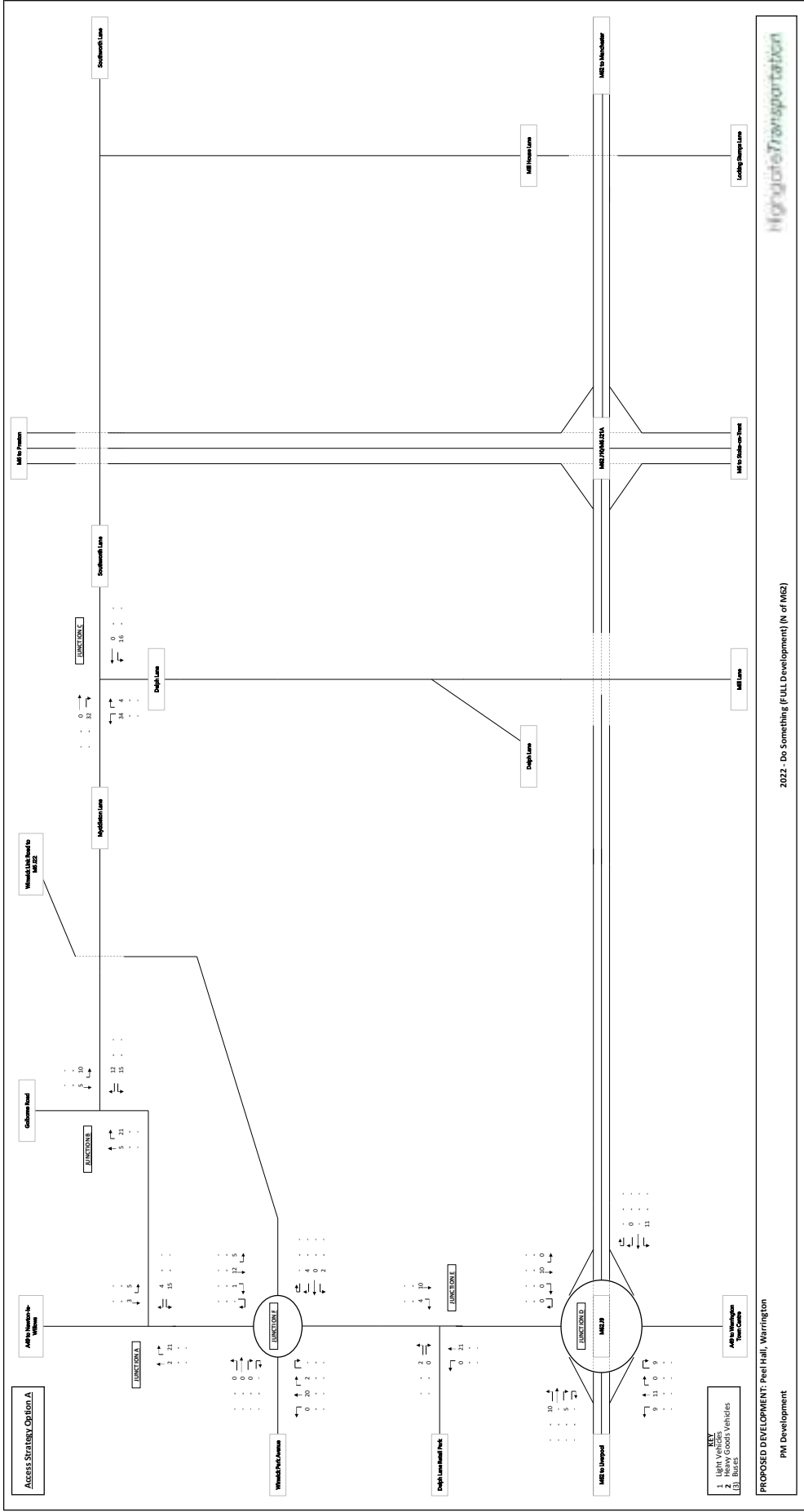
ACCESS STRATEGY OPTIONS

2022 - do Something (FULL Development) (SE of M62)

PROPOSED DEVELOPMENT: Peel Hill, Warrington
AM Development

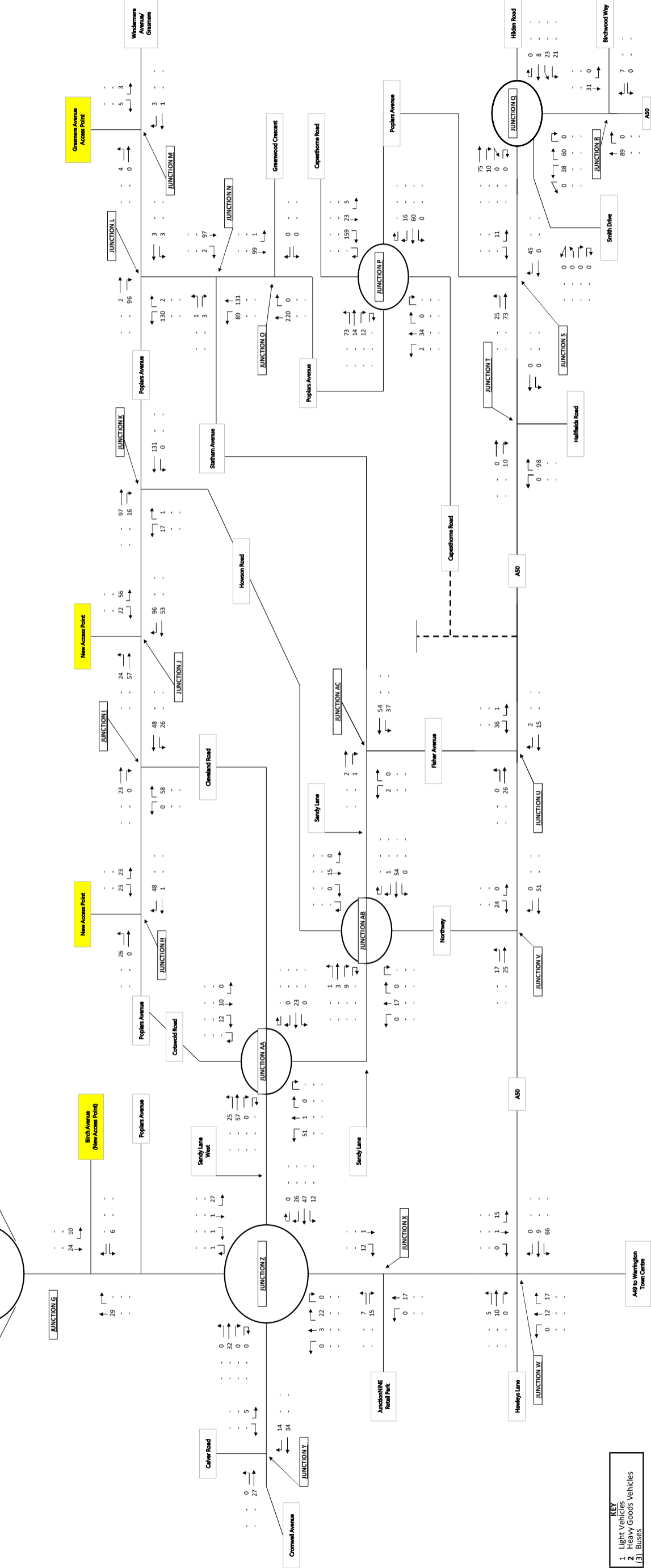
HighgateTransportation

- KEY
- 1 LIGHT VEHICLES
 - 2 HEAVY GOODS VEHICLES
 - 3 BUSES



Access Strategy Option A

M62 to Liverpool M62 JP M62 to Manchester

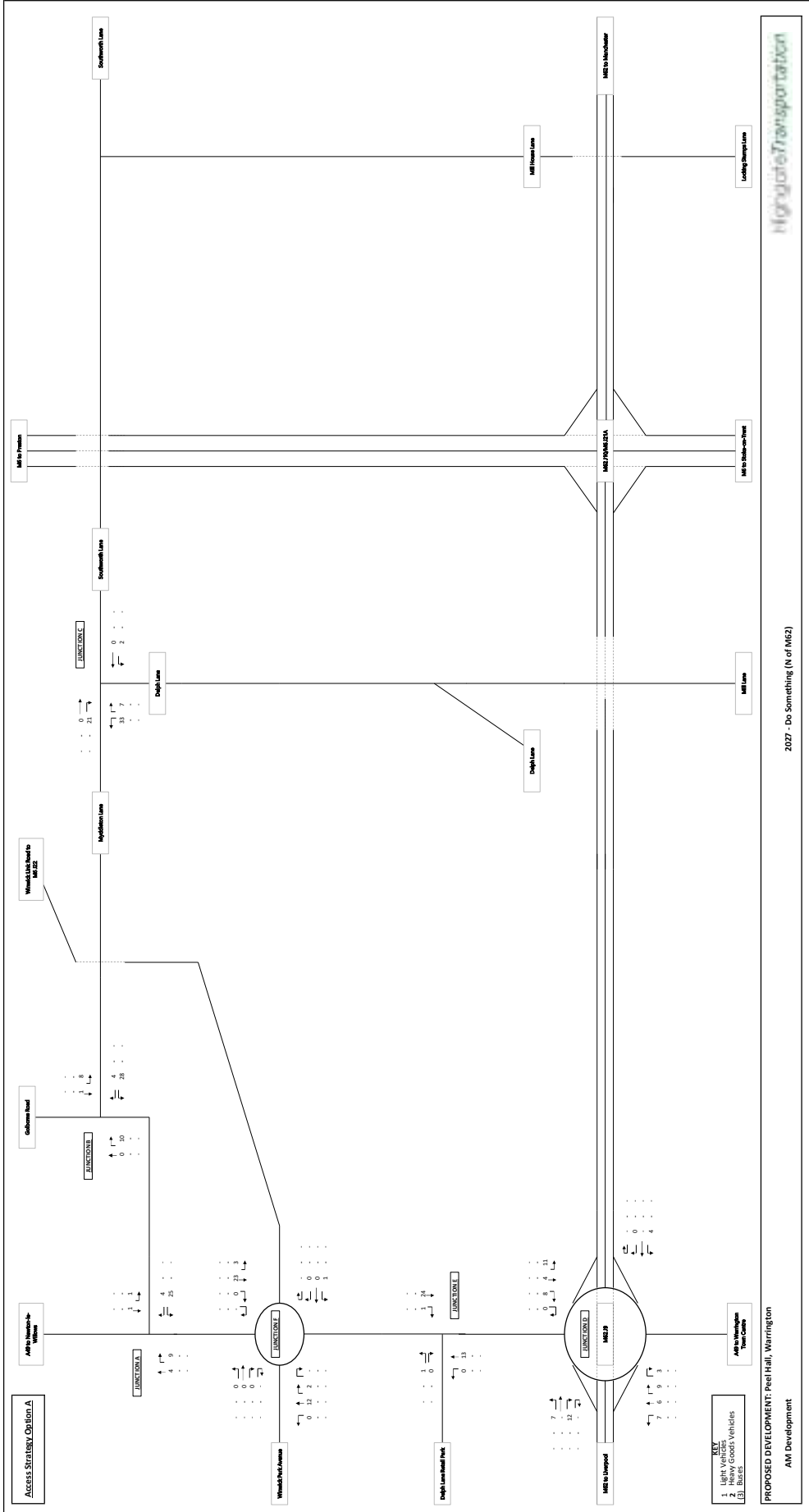


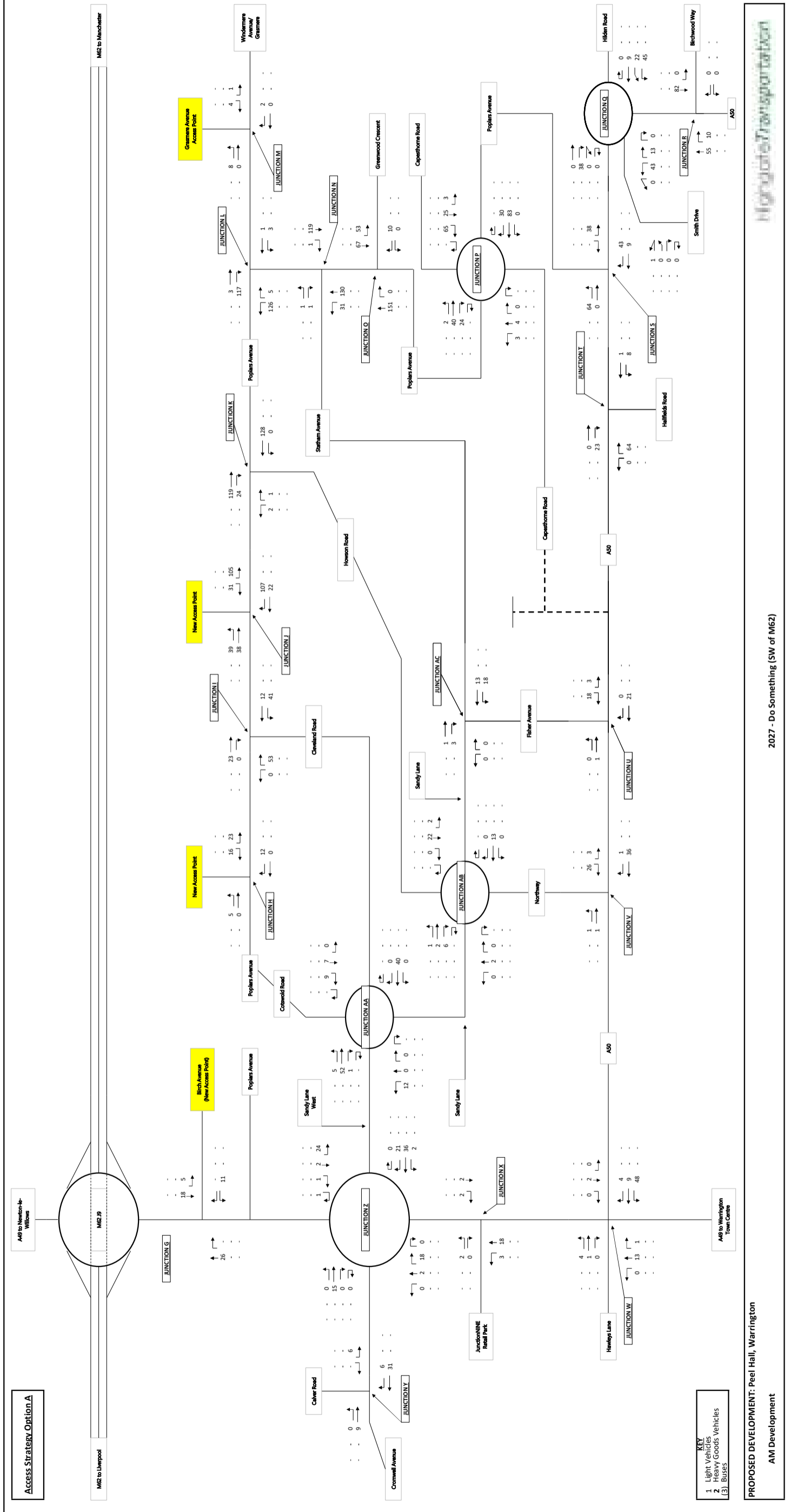
- KEY**
- 1 Light Vehicles
 - 2 Heavy Goods Vehicles
 - 3 Buses

PROPOSED DEVELOPMENT: Peel Hall, Warrington
PM Development

2022 - Do Something (FULL Development) (SW of M62)







Access Strategy Option A

- KEY**
- 1 Light Vehicles
 - 2 Heavy Goods Vehicles
 - 3 Buses

PROPOSED DEVELOPMENT: Peel Hall, Warrington
AM Development

2027 - Do Something (SW of M62)

Highgate Transportation

M62 to Liverpool M62 to Manchester

A66 to Netherfield-Willsons

A66 to Warrington Town Centre

Greenacre Avenue Access Point

New Access Point

New Access Point

Birch Avenue (New Access Point)

Culver Road

Sandy Lane West

Sandy Lane

Howson Road

Greenwood Crescent

Widemere Farm Centre

Junction 9NE Retail Park

Sandy Lane

Sandy Lane

Northway

Poplars Avenue

Hindley Lane

Northway

Fisher Avenue

Capetown Road

Poplars Avenue

Hidden Road

Smith Drive

Hidden Road

Hidden Road

Hidden Road

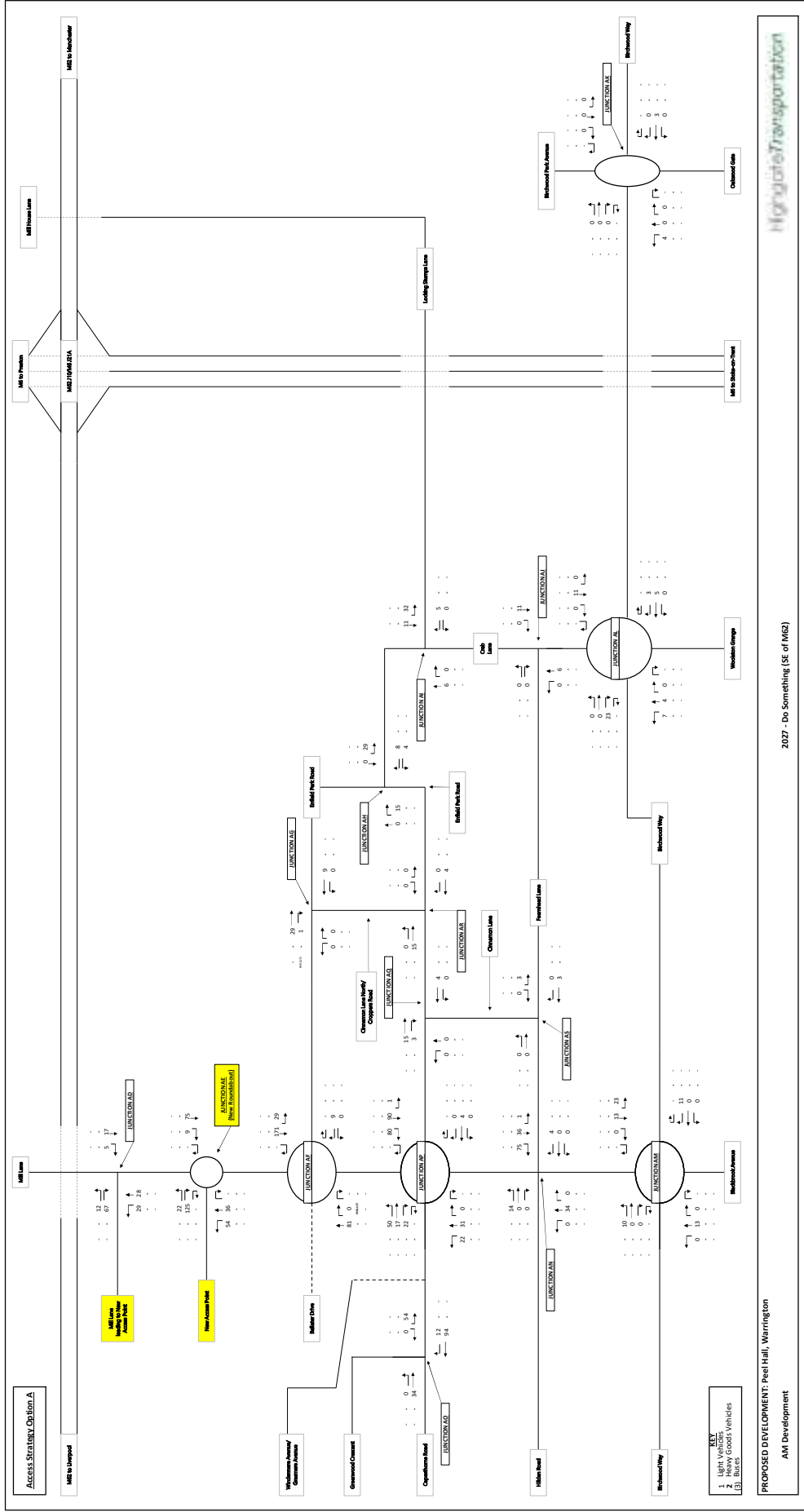
Widemere Farm Centre

Widemere Farm Centre

Widemere Farm Centre

Widemere Farm Centre

Widemere Farm Centre



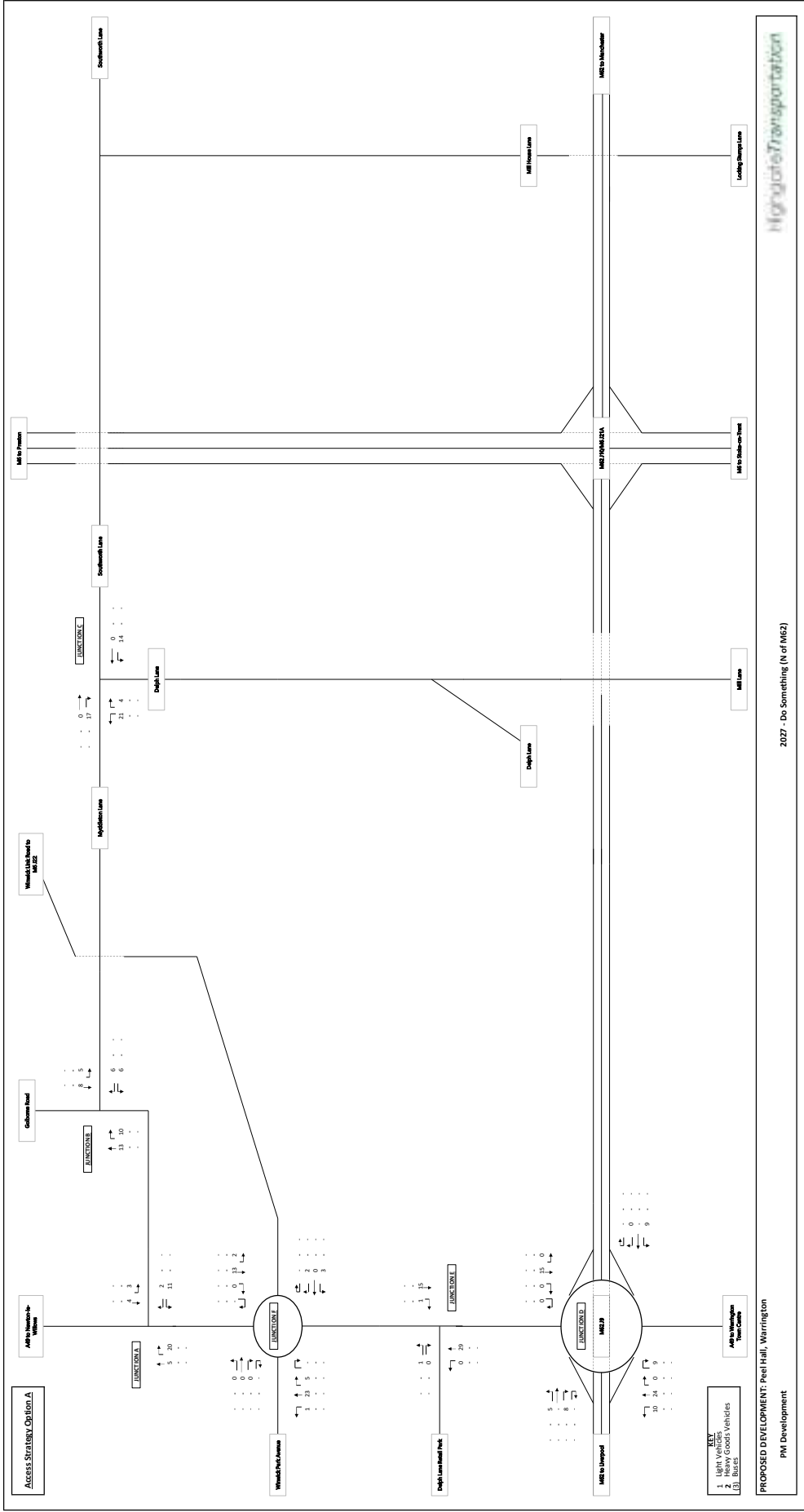
Access Strategy Option A

KEY
 1. Light Vehicles
 2. Heavy Goods Vehicles
 3. Buses

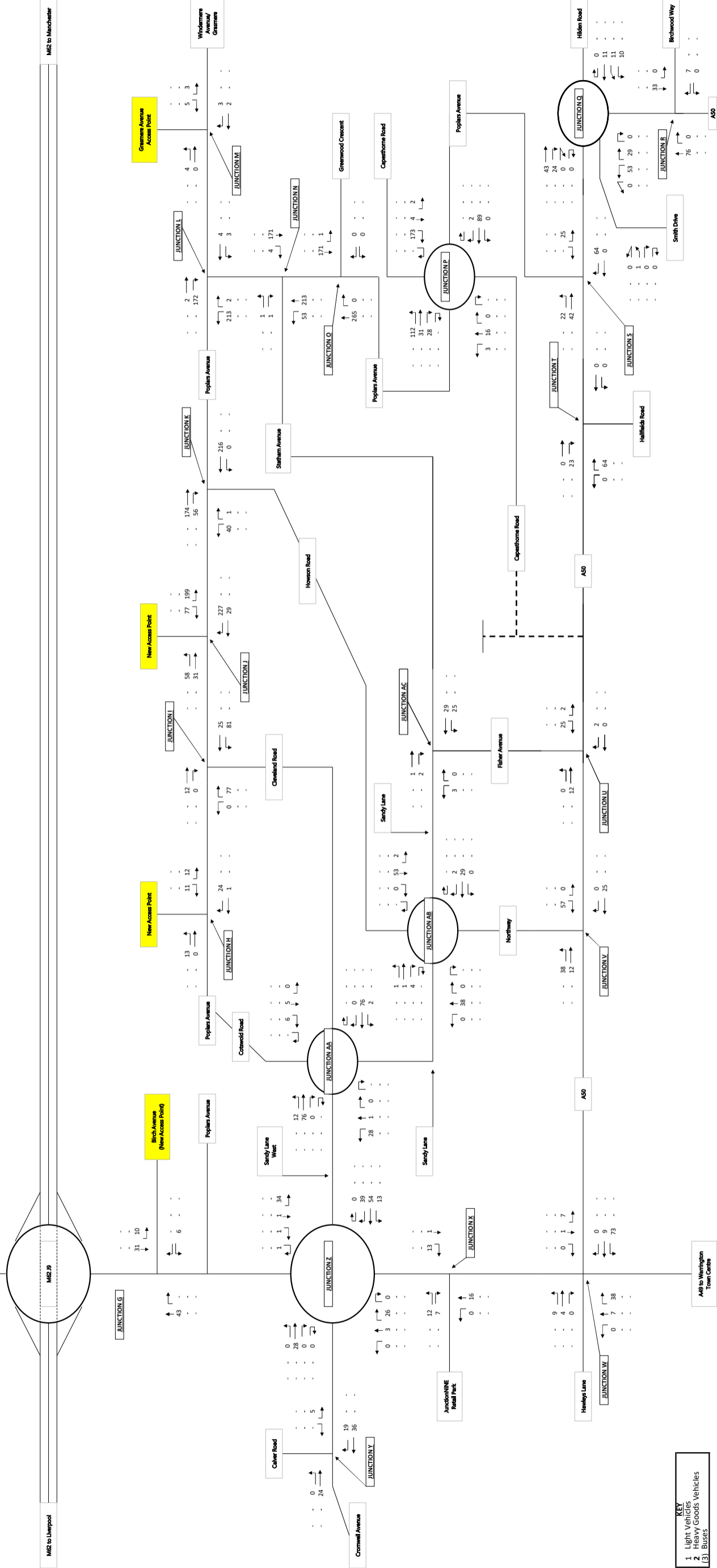
PROPOSED DEVELOPMENT: Peel Hill, Warrington
 AMI Development

2027 - Do Something (SE of M62)

HighwaysTransportation



Access Strategy Option A



KEY
 1 Light Vehicles
 2 Heavy Goods Vehicles
 3 Buses

PROPOSED DEVELOPMENT: Peel Hall, Warrington
 PM Development

2027 - Do Something (SW of M62)



M62 to Liverpool | M62 to Manchester

A66 to Netherfield-Willow

A66 to Warrington Town Centre

Greenwich Avenue Access Point

New Access Point

New Access Point

Birch Avenue (New Access Point)

ASO

ASO

ASO

ASO

ASO

ASO

ASO

ASO

ASO

ASO

ASO

ASO

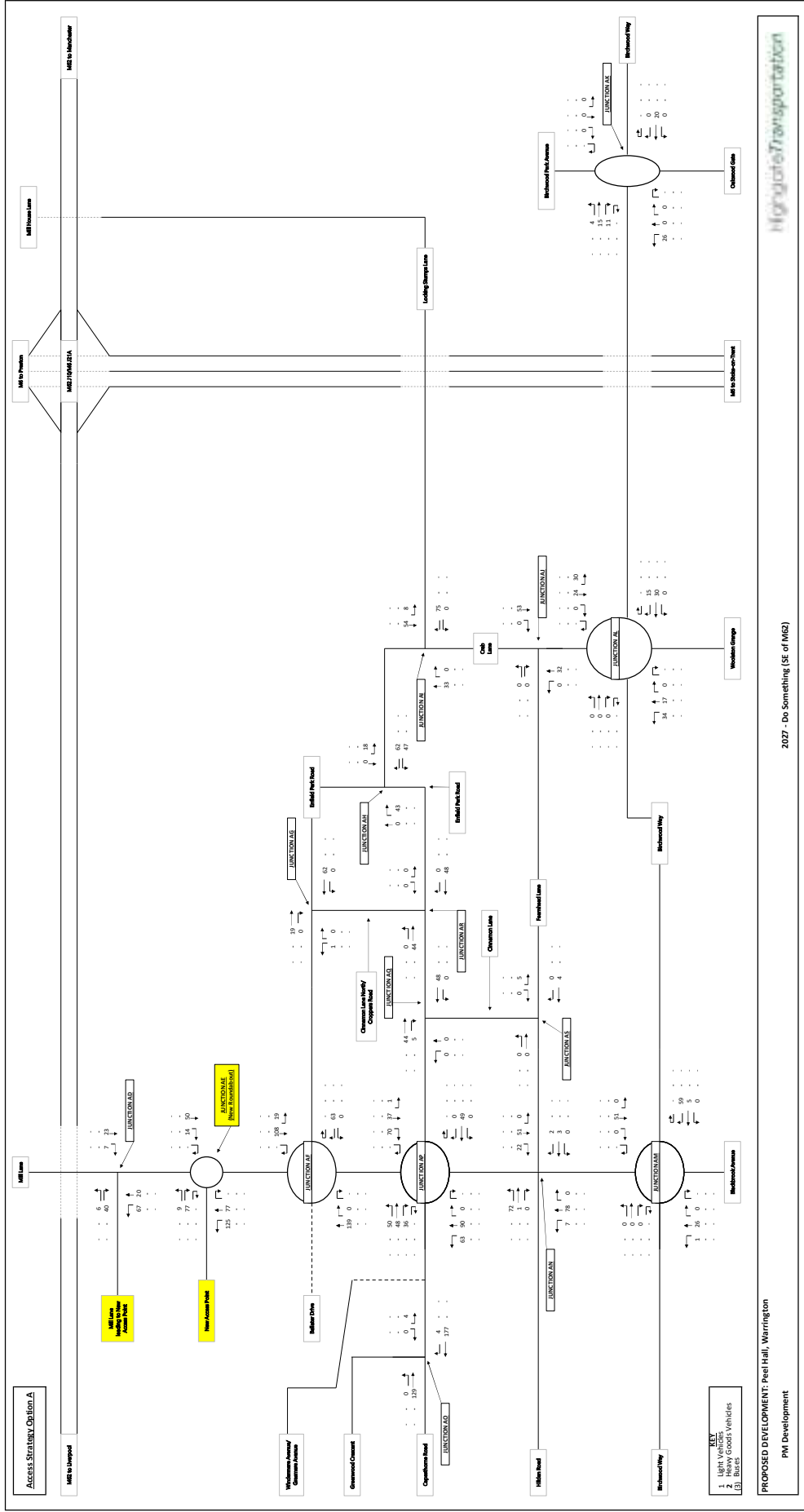
ASO

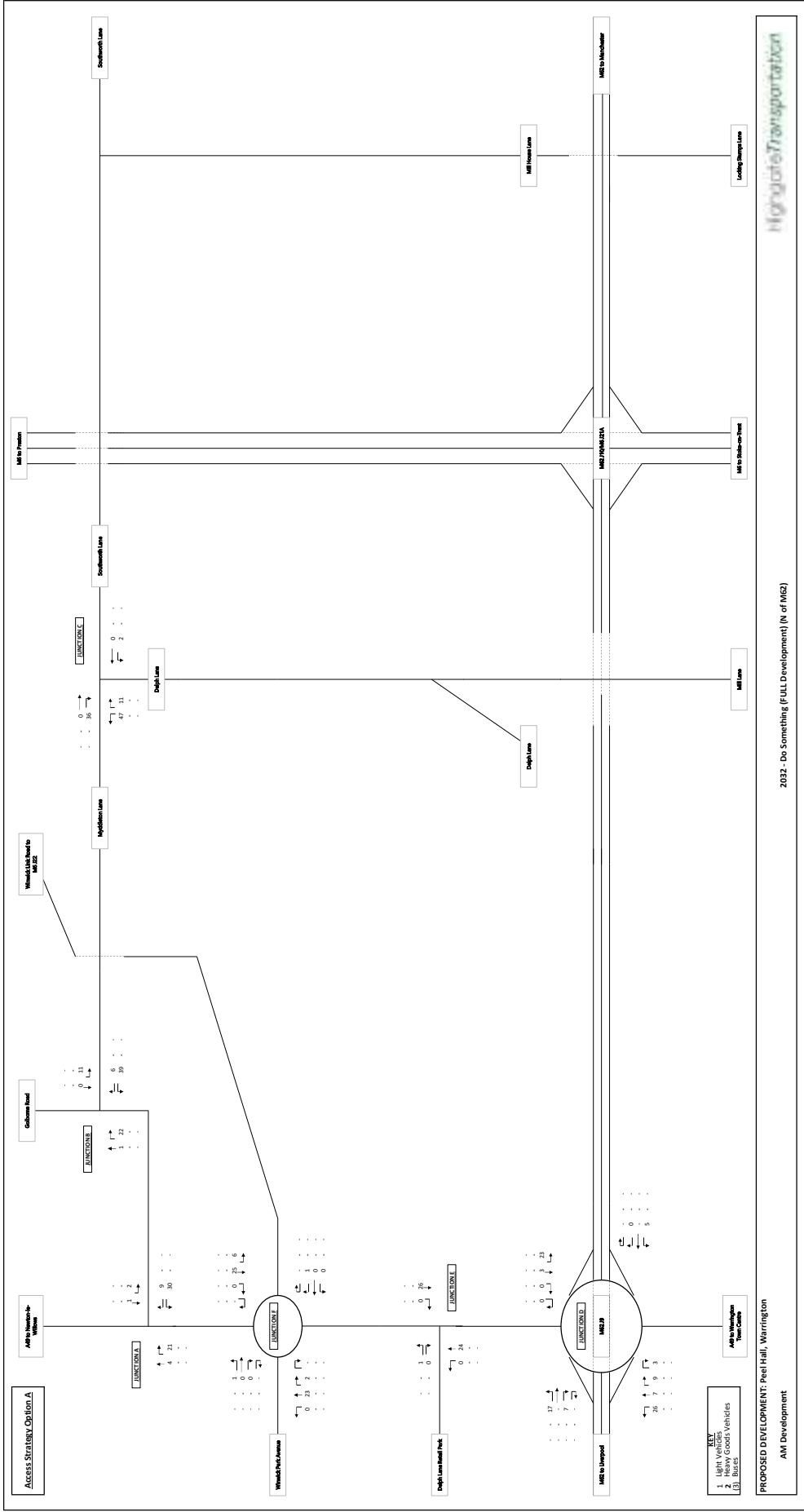
ASO

ASO

ASO

ASO





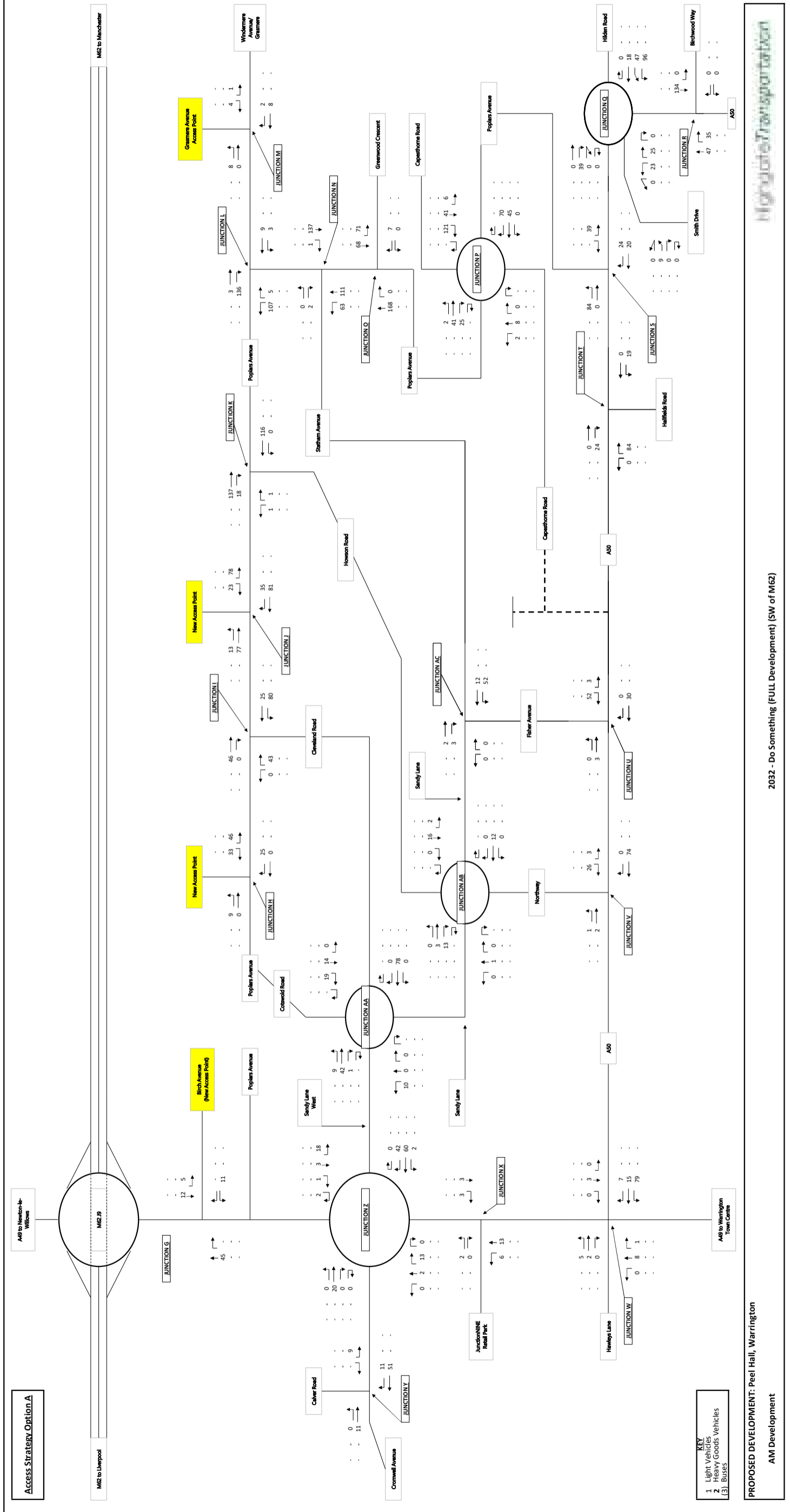
Highways Transportation

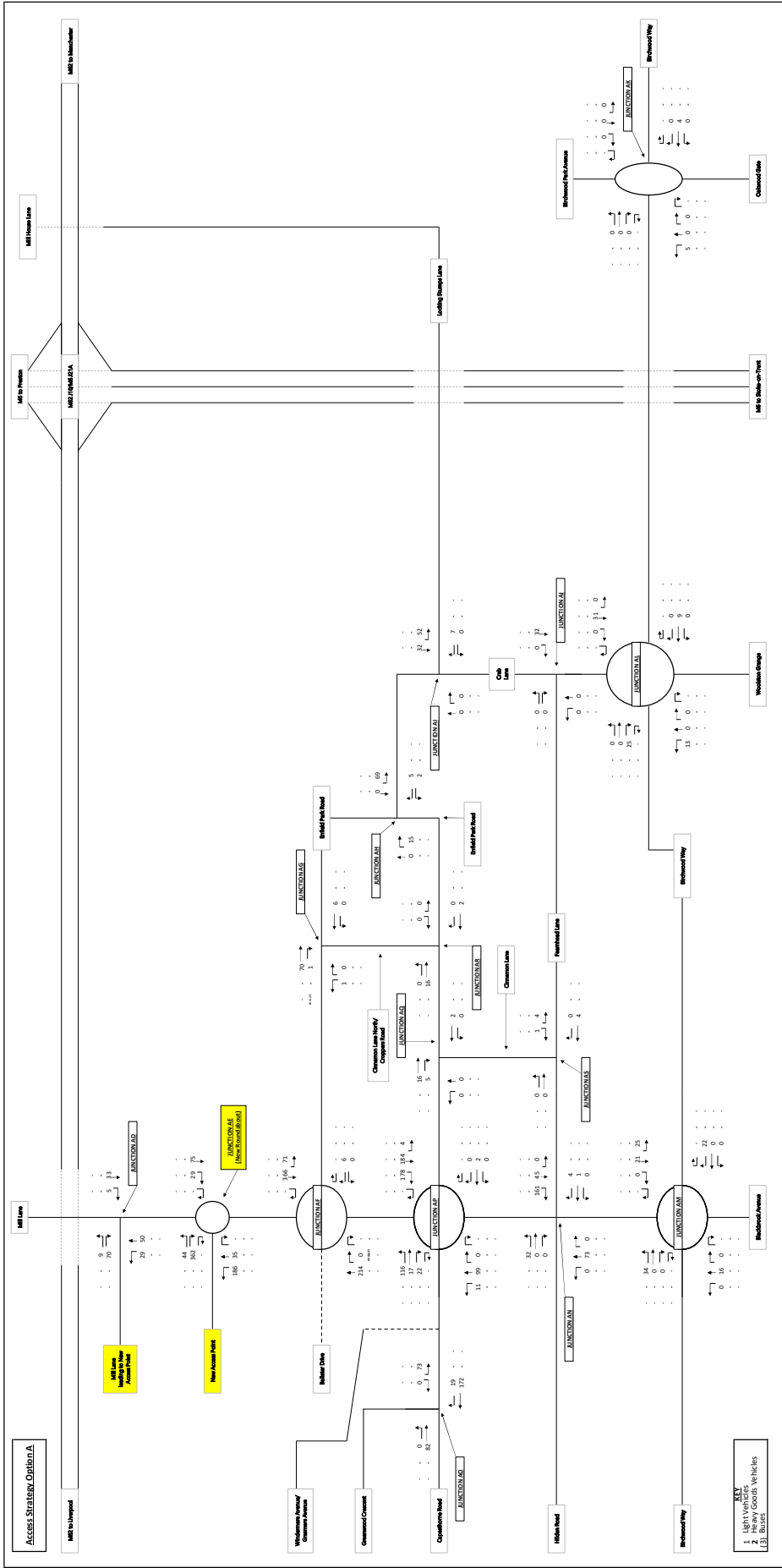
2032 - Do Something (FULL Development) (N. of M62)

PROPOSED DEVELOPMENT: Peel Hall, Warrington

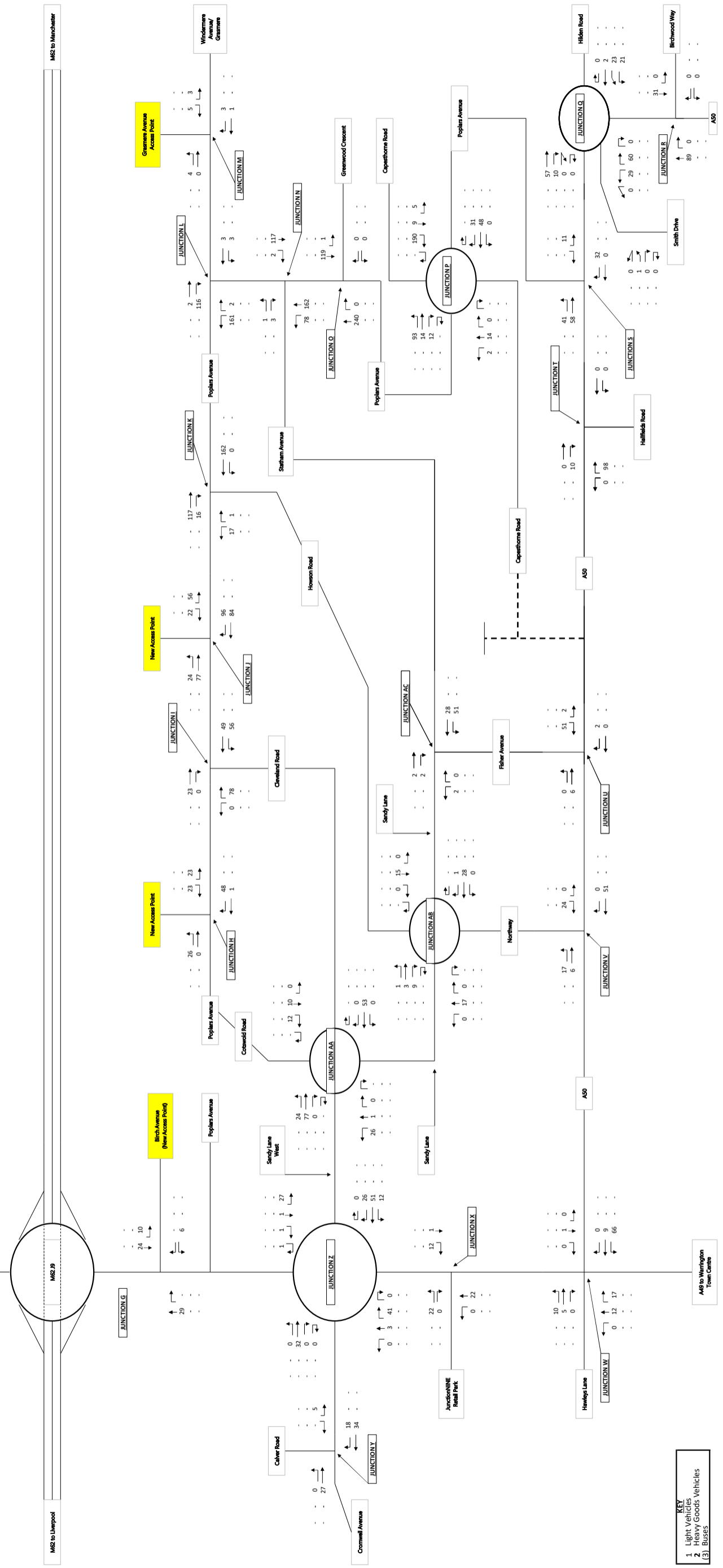
AM Development

- 1. Light Vehicles
- 2. Heavy Goods Vehicles
- 3. Buses





Access Strategy Option A



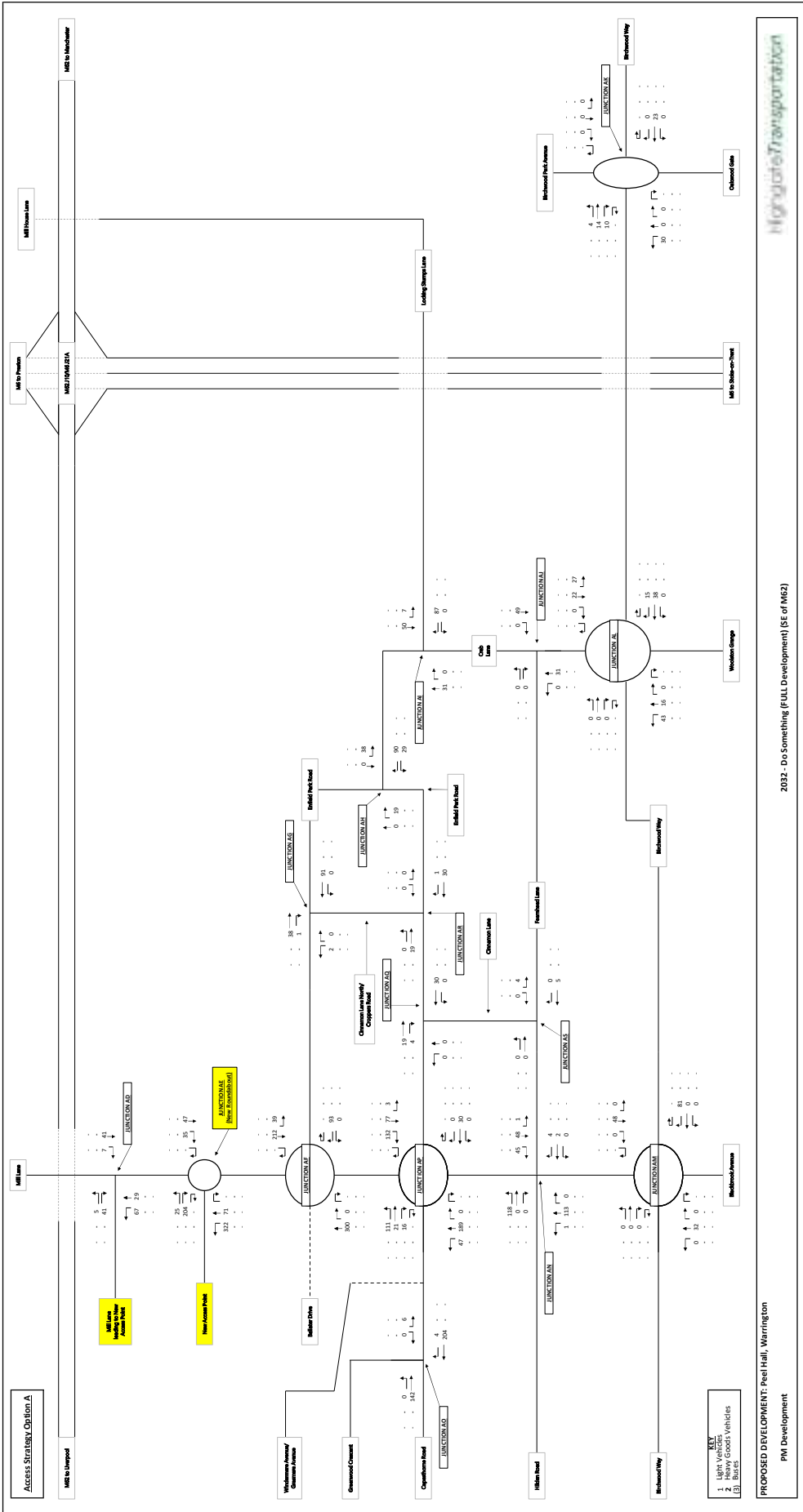
- KEY**
- 1 Light Vehicles
 - 2 Heavy Goods Vehicles
 - 3 Buses

PROPOSED DEVELOPMENT: Peel Hall, Warrington
PM Development

2032 - Do Something (FULL Development) (SW of M62)

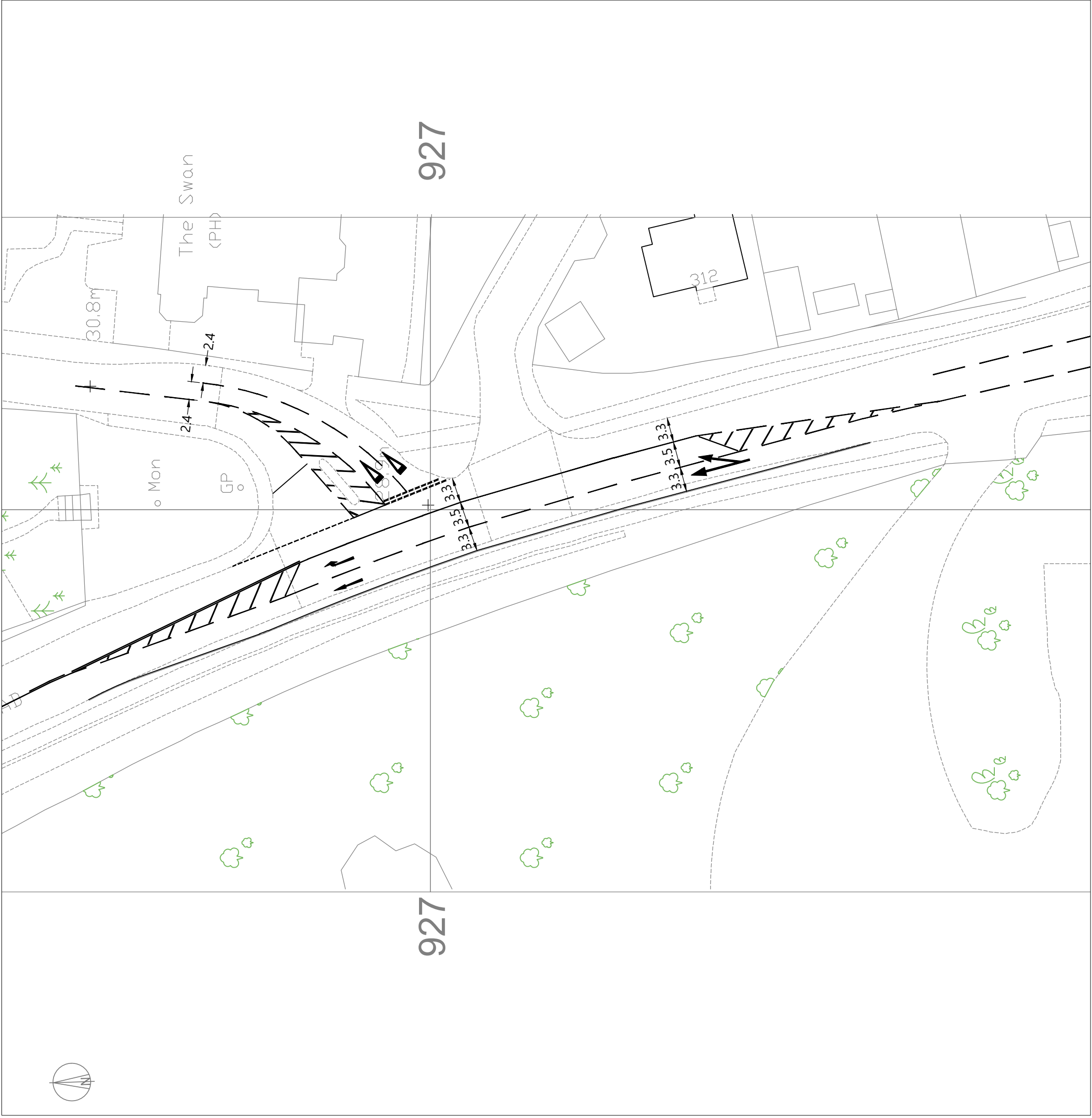


M62 to Liverpool | M62 to Manchester



Appendix SCG/10

Mitigation Measures



NOTES:

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North arrow indicative.

PRELIMINARY

ISSUE	REASON FOR REVISION	DATE

PROJECT: PEEL HALL WARRINGTON	SCALE: 1:500 @ A3
CLIENT: SATNAM MILLENNIUM LTD	DRAWING NUMBER: 08
PROJECT REFERENCE: 1901	

HighgateTransportation

www.highgatetransportation.co.uk

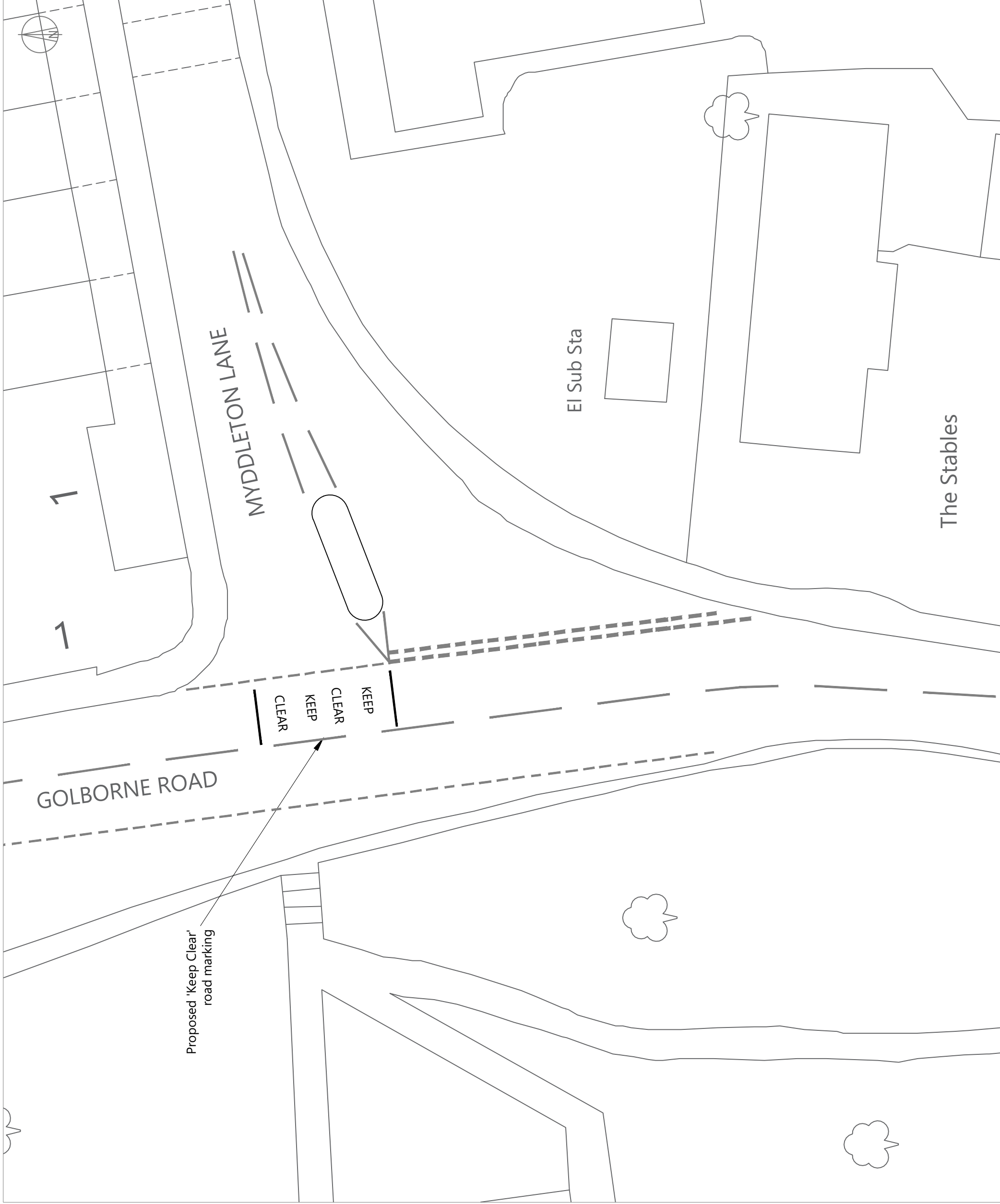
First Floor, 43-45 Park Street
Bristol BS1 5NL
07973 375 937 / 07595 892 217
© Highgate Transportation Limited

TITLE: PROPOSED A49 / GOLBOURNE ROAD JUNCTION IMPROVEMENTS		
DATE: 04/03/20	DRAWN BY: BGS	CHECKED: FB

<p>NOTES: © Crown Copyright and database rights 2020 OS Licence 100056454. Road markings and splitter island shown indicatively only</p>	
ISSUE	REASON FOR REVISION
	DATE

PROJECT: PEEL HALL, WARRINGTON	
CLIENT: SATNAM MILLENNIUM LTD	
PROJECT REFERENCE: 1901	DRAWING NUMBER: 10
SCALE: 1:200 @ A3	

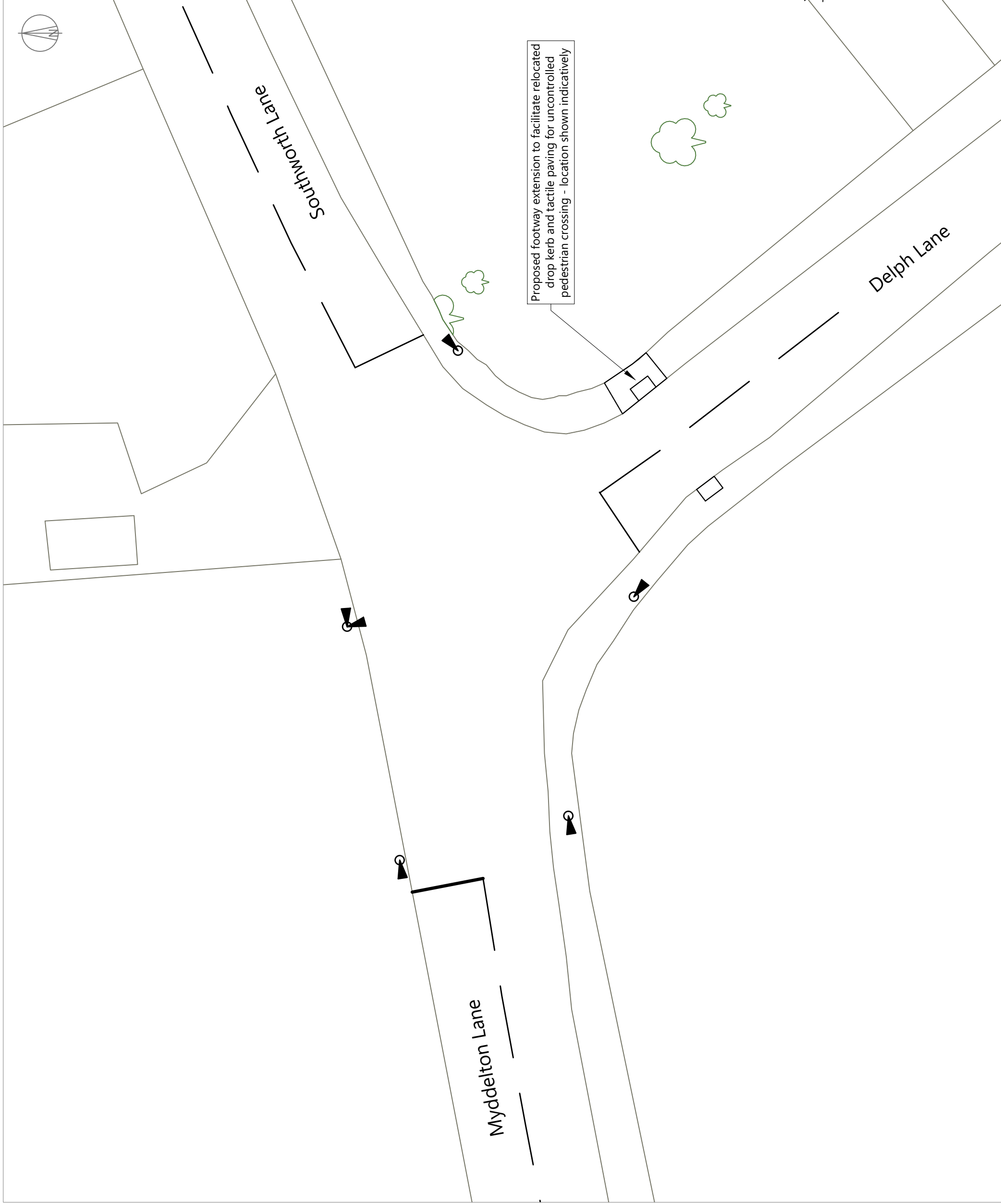
<p>HighgateTransportation www.highgatetransportation.co.uk First Floor, 43-45 Park Street Bristol BS1 5NL 07573 375 937 / 07595 892 217 © Highgate Transportation Limited</p>	
TITLE: POTENTIAL KEEP CLEAR MARKINGS GOLBOURNE RD/MYDDLETON LN	
DATE: 02/03/20	CHECKED: FB DT



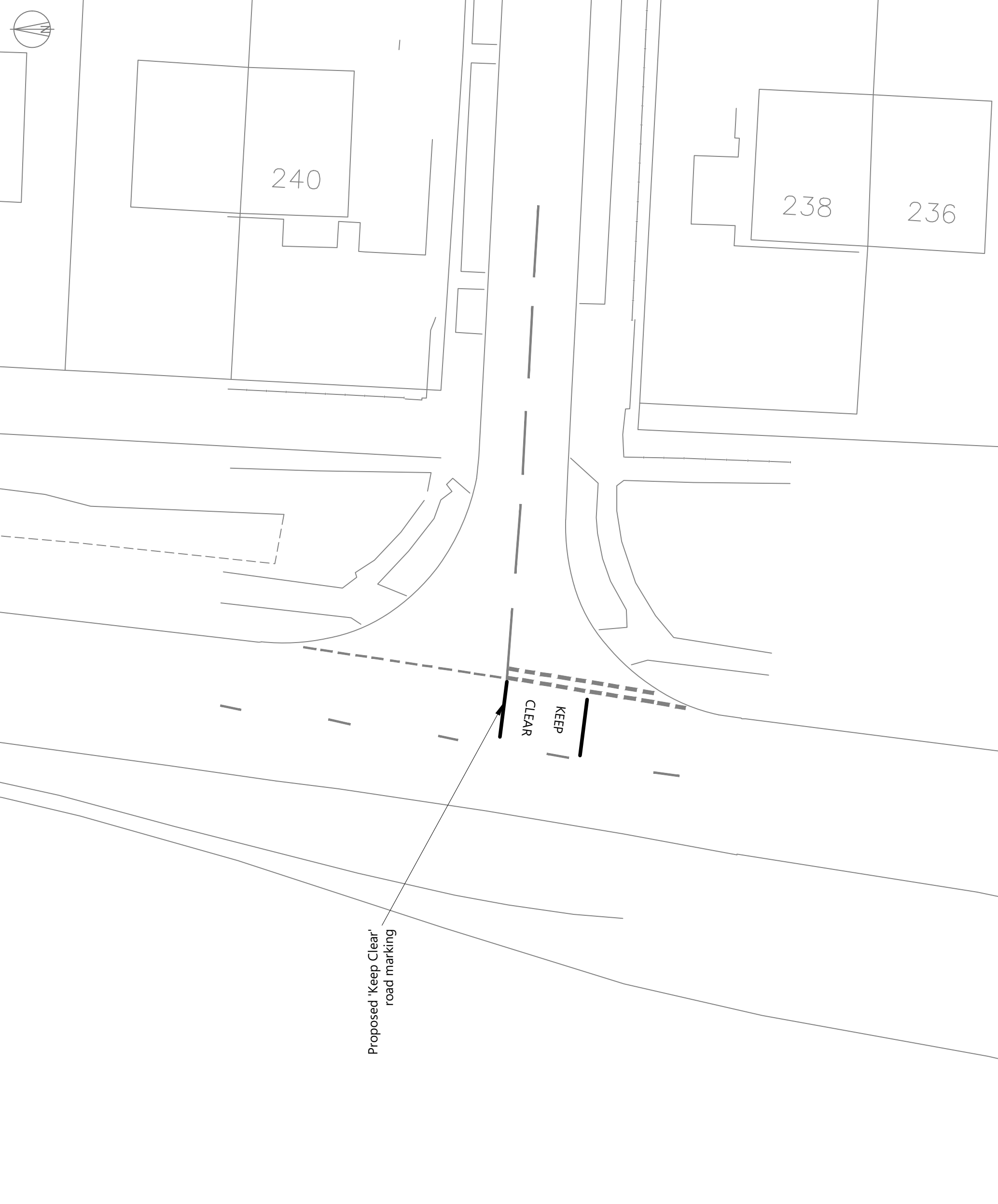
NOTES: © Crown Copyright and database rights 2020 OS Licence 100056454. PRELIMINARY		REASON FOR REVISION	DATE
ISSUE			

PROJECT: PEEL HALL, WARRINGTON		CLIENT: SATNAM MILLENNIUM LTD	
PROJECT REFERENCE: 1901	DRAWING NUMBER: 11	SCALE: 1:200 @ A3	

HighgateTransportation www.highgatetransportation.co.uk First Floor, 43-45 Park Street Bristol BS1 5NL 07973 375 937 / 07595 892 217 © Highgate Transportation Limited		TITLE: POTENTIAL SIGNAL JUNCTION MYDDELTON LANE/DELPH LANE
DATE: 17/03/20	DRAWN BY: FB	CHECKED: DT



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Proposed 'Keep Clear'
road marking

ISSUE	REASON FOR REVISION	DATE

PROJECT: PEEL HALL, WARRINGTON	DRAWING NUMBER: 79	SCALE: 1:250 @ A3
CLIENT: SATNAM MILLENNIUM LTD		
PROJECT REFERENCE: 1107		

HighgateTransportation www.highgatetransportation.co.uk First Floor, 43-45 Park Street Bristol BS8 1ES 07973 375 937 / 07595 892 217 © Highgate Transportation Limited		
TITLE: PEEL HALL POTENTIAL MITIGATION - A49 / BIRCH AVENUE		
DATE: 22/12/17	DRAWN BY: BL	CHECKED: FB

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 of Her Majesty's Stationery Office.

Proposed 20mph restriction to tie into existing 20mph
 restrictions where present.

Key

Potential 20mph speed
 restriction extension



ISSUE	REASON FOR REVISION	DATE



PROJECT:

PEEL HALL,
 WARRINGTON

CLIENT:

SATNAM MILLENNIUM
 LTD

PROJECT REFERENCE:

1901

DRAWING NUMBER:

07

SCALE:

Not to Scale

HighgateTransportation

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First Floor, 43-45 Park Street
 Bristol BS1 5NL

07973 375 937 / 07595 892 217

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TITLE:
 AREA FOR POTENTIAL 20MPH
 SPEED RESTRICTION EXTENSION

DATE:

20/01/20

DRAWN BY:

FB

CHECKED:

DT

APP27-
A50 *Hilden Road* Proposed Mitigation *Scheme* RSA1 2020

Road Safety Audit – A50/Hilden Road Roundabout

Stage: 1

Location: A50/Hilden Road Roundabout, Warrington

Site: Proposed improvements to roundabout

ATSS Ref: 200901

Client Ref: 1901

Date: 12 September 2020



Project Details

Report Title:	Stage 1 Road Safety Audit, A50/Hilden Road Roundabout, Warrington
Date:	12 September 2020
Document reference and revision:	200901 V1
Prepared by:	Avon Traffic & Safety Services Ltd
On behalf of:	Highgate Transportation Ltd

Report Control Sheet

	Name	Position	Date
Audit requested by	Fiona Bennett	Highgate Transportation Ltd	2 September 2020
Team leader	David Boardman	Team Leader	
Team Member	Tasos Papaloucas	Team Member	
Observer			
Draft report issued by	Nick Jeanes	Director	11 September 2020
Final report issued by	Nick Jeanes	Director	12 September 2020
Designer's response issued by			

Avon Traffic & Safety Services Ltd disclaims any responsibility to the Client and others in respect of any matters outside the scope of this report. This report has been prepared with reasonable skill, care and diligence within the terms of the Contract with the Client taking account of the manpower, resources, investigations and testing devoted to it by agreement with the Client. This report is confidential to the Client and Avon Traffic & Safety Services Ltd accepts no responsibility of whatsoever nature to third parties to whom this report or any part thereof is made known. Any such party relies upon the report at their own risk.

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2. Road safety Issues raised in this Stage 1 safety audit	7
3. Other Issues	15
4. Audit Team Statement	16
Appendix A – Information utilised in this safety audit	17
Appendix B - Key Plan showing Audit Problems	18
Appendix C – Site location plan	19
Appendix D – Designer’s Response	separate document

1. Introduction

- 1.1 Avon Traffic & Safety Services Ltd has been commissioned by Highgate Transportation Ltd, to undertake a Stage 1 Road Safety Audit, with regard to the proposals to improve the existing roundabout at A50/Hilden Road roundabout, Warrington. The proposals include the introduction of turbo-style circulatory lane markings, and a new zebra crossing on the southern arm.
- 1.2 The RSA Brief was supplied by Highgate Transportation Ltd and accepted by the Audit Team. The Brief and Audit Team were approved by Fiona Bennett, Director, Highgate Transportation Ltd.
- 1.3 The site is in a busy residential area where the speed limit is 30mph and streetlighting is present. Bus stops are located on the A50, although it was noted that local buses enter the residential estates to the east and west of the A50. All the arms of the roundabout have pedestrian facilities and it was observed that moderate footfall, including several elderly and mobility impaired pedestrians were using the facilities on a regular basis.
- 1.4 The audit team members are:

David Boardman – Team Leader

Tasos Papaloucas – Team Member
- 1.5 The audit took place during September 2020 and comprised of an examination of the documents/plans listed in Appendix A. The auditors visited the site together on Tuesday the 8th September 2020 when the weather conditions were fine and the road surface dry. Vehicle flows were moderate, and speeds appear commensurate with the speed limit. Cycle movements were light, but a shared use path is present circumnavigating the roundabout.
- 1.6 Data supplied show that there have been 11 collisions involving injury, in the 5 years to September 2019 inclusive, in the vicinity of the proposals.
- 1.7 The audit was carried out under the terms and conditions of DMRB GG 119. The team examined and reported only on the road safety implications of the scheme as presented and has not examined or verified the compliance of the design with any other criteria. However, reference may be made to National/Local Guidance in order to verify a point.
- 1.8 Documents and drawings examined in this safety audit are listed at Appendix A.

1.9 General views of site



Hilden Road approach to roundabout



Orford Green approach to roundabout



Orford Road approach to roundabout



Smith Drive approach to roundabout

2. Safety Issues Raised in this Stage 1 Road Safety Audit. (see Appendix B for locations)

2.1 Problem

Location – Hilden Road- approach to the roundabout

Summary – Risk of side swipe collisions

The proposals show that there will be two lanes provided on the approach to the roundabout. However, there appears to be a lack of carriageway width to achieve this, which will lead to vehicle conflicts due to insufficient lane width.



Lack of width on Hilden Road suggests that the proposed two lane approach is not possible

Recommendation – ensure that vehicles can be accommodated within the new layout to reduce the risk of side swipe collisions.

2.2 Problem

Location – Orford Road- exit from roundabout

Summary – Risk of conflict due to increased traffic speed

The proposed kerb realignment on the exit of the roundabout onto Orford Road to accommodate a two-lane approach has reduced the deflection for vehicles exiting the roundabout. This will lead to greater speeds on the exit which increases the risk of shunts and loss of control collisions.



The realigned carriageway will allow for greater speeds at the exit of the roundabout

Recommendation – Maintain the existing single lane exit layout (see also 2.3, 2.4) or improve deflection on exit to accommodate a 2 lane exit

2.3 Problem

Location – Orford Road, proposed zebra crossing

Summary – Risk of pedestrian/vehicular conflict

The proposed layout shows the introduction of a zebra crossing and two-lane exit arrangement. Having priority, pedestrians may step onto the crossing when vehicles stop on the nearside carriageway but be unseen by those using the merge lane leading to pedestrian/vehicle conflict.



Zebra crossing location from the east side of Orford Road

Recommendation – Maintain single lane exit (see also 2.2, 2.4) or upgrade crossing to signal controlled to accommodate a 2 lane exit.

2.4 Problem

Location – Orford Road, bus stop

Summary – Risk of shunts

A bus stop is situated immediately after where the proposed merge lane terminates. When a bus is stationary, vehicles exiting the roundabout and merging into a single lane may have to brake suddenly. The merge lane exacerbates this issue as drivers will be concentrating whilst manoeuvring to get into a single lane. This arrangement will increase the risk of nose to tail/rear-end shunt type collisions.



A stationary bus in the bus stop will cause sudden braking and conflict in an area where vehicles are merging and pedestrians crossing

Recommendation – Maintain a single lane exit arrangement (see also 2.2, 2.3) or relocate the bus stop.

2.5 Problem

Location – Orford Road, cycle lane exit

Summary – Risk of pedestrian/cyclist conflict

The proposed corduroy tactile denoting the start/end of the shared use path is located immediately to the south of the proposed zebra crossing. This proposed location is not inclusive of the section of the shared use path that leads to the cycle exit ramp, and this may result in conflict between cyclists and pedestrians, particularly the visually impaired.

Recommendation – Relocate the corduroy tactile to a position which includes the whole length of shared use path.

2.6 Problem

Location – Smith Drive, the uncontrolled crossing

Summary – Risk of pedestrian/vehicle conflict

The information supplied, appears to omit recent pedestrian improvements incorporating a central refuge on Smith Drive. If the proposed drawings are correct, the lack of refuge will lead to pedestrian/vehicle conflict.



Recent pedestrian improvements have not been taken into account on the proposals

Recommendation – Keep the central refuge and additional improvements in situ.

2.7 Problem

Location – Orford Green, south side zebra crossing

Summary – Risk of pedestrian/vehicle conflict

The proposed layout shows the introduction of a two-lane exit arrangement which goes through the existing zebra crossing. Having priority, pedestrians may step onto the crossing when vehicles in one lane stop but be unseen by those using the other lane leading to pedestrian/vehicle conflict.



Introduction of a second lane will create 'blind spots' when the traffic is stacked

Recommendation – Maintain single lane exit or upgrade crossing to a toucan crossing to accommodate a 2 lane exit .

2.8 Problem

Location – Orford Green, two lane exit

Summary – Risk of shunts and side swipe collisions

It appears that pedestrian improvements (footway widening) have occurred on the southern side of Orford Green since the design of the scheme being audited. These changes have narrowed the carriageway to the extent that adding a second lane would cause side swipe collisions. Additionally, the right turn lane leading into Poplars Avenue is of a substandard width, which will lead to vehicles stopping to turn right overhanging the outside lane leading to nose to tail collisions.



The creation of a second lane will introduce conflict with vehicles waiting to turn right

Recommendation – Maintain single lane exit or widen existing carriageway to accommodate 2 running lanes.

2.9 Problem

Location – Orford Green, north side zebra crossing

Summary – Risk of pedestrian/vehicle conflict

The proposed layout shows the introduction of a two-lane exit arrangement which goes through the existing zebra crossing. Having priority, pedestrians may step onto the crossing when vehicles in one lane stop but be unseen by those using the other lane leading to pedestrian/vehicle conflict. This issue will be exacerbated at busy times, particularly when traffic is stacked through the crossing.

Recommendation – Maintain single lane arrangement or upgrade the Zebra to a Toucan crossing to accommodate a 2 lane exit.

2.10 Problem

Location – Exit of Orford Green to Hilden Road

Summary – Risk of loss of control collisions & pedestrian/vehicle conflicts

The proposals to add a lane onto the exit of Orford Green diminishes the deflection when travelling from Orford Green to Hilden Road. The lack of deflection and good visibility on the approach encourages excessive vehicle speeds which will lead to loss of control collisions. It may also lead to conflict with pedestrians using the uncontrolled crossing facilities on Hilden Road



The introduction of a second lane and realignment will encourage greater entry speeds onto the roundabout

Recommendation – Create deflection on the Orford Green to Hilden Road route or maintain the existing road layout

3. Other Issues

3.1 Signage for the shared use path appears to be missing from various locations within the remits of the scheme.

3.2 It is unclear from the information supplied whether the hatched areas shown on the drawings, creating the proposed 'turbo' arrangement on the roundabout, will be fully constructed or painted.

4. Audit Team Statement

We certify that this audit has been carried out in accordance with DMRB GG 119

Audit Team Leader:

Name: David Boardman MIHE

A handwritten signature in black ink, appearing to read 'D Boardman', written in a cursive style.

Signed:

Date: 12/9/2020

Audit Team Member:

Name: Tasos Papaloucas MCIHT

A handwritten signature in blue ink, appearing to read 'Tasos Papaloucas', written in a cursive style.

Signed:

Date: 12/9/2020

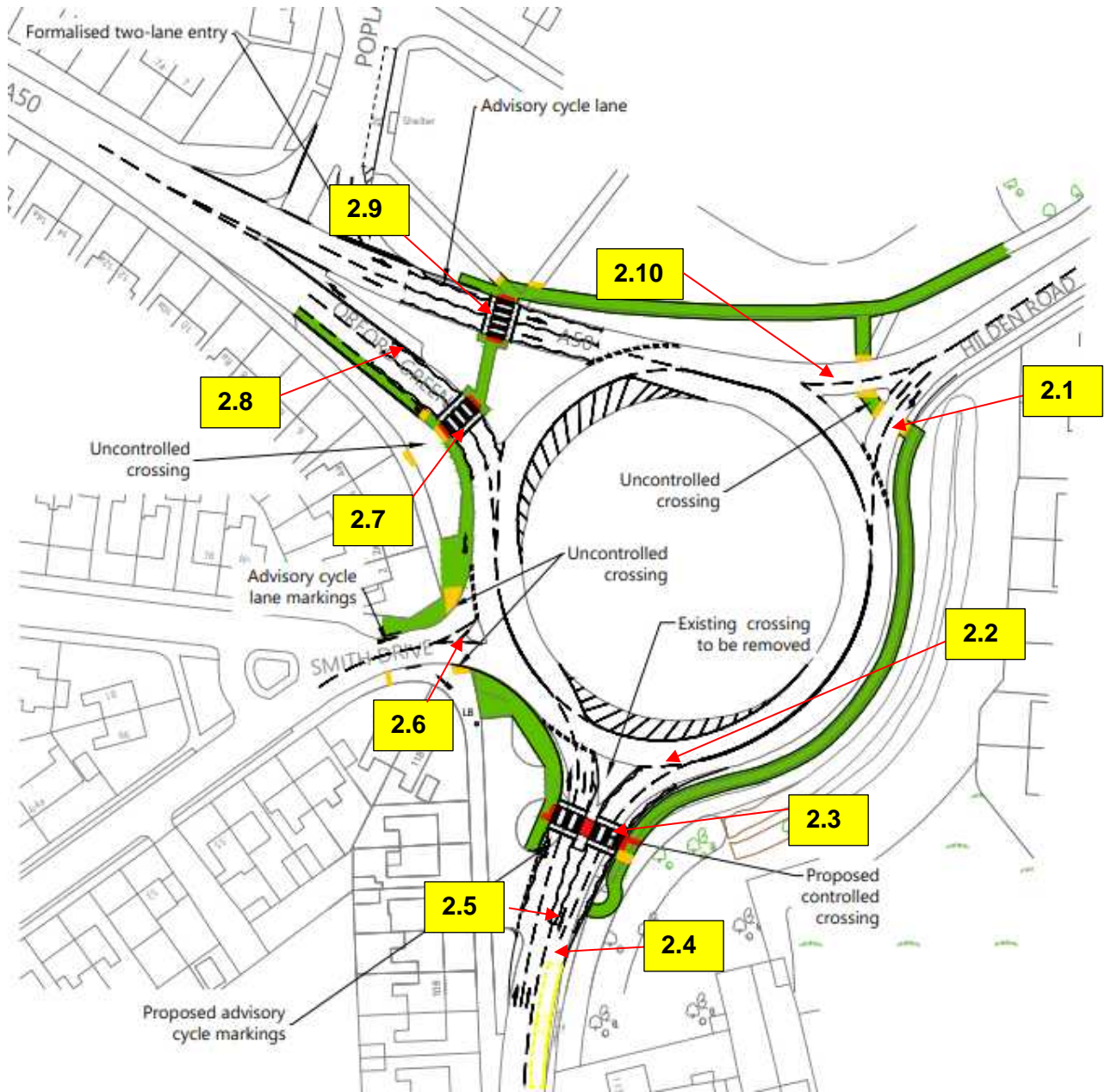
Appendix A: Information Utilised in this Stage 1 Road Safety Audit

Drawings:

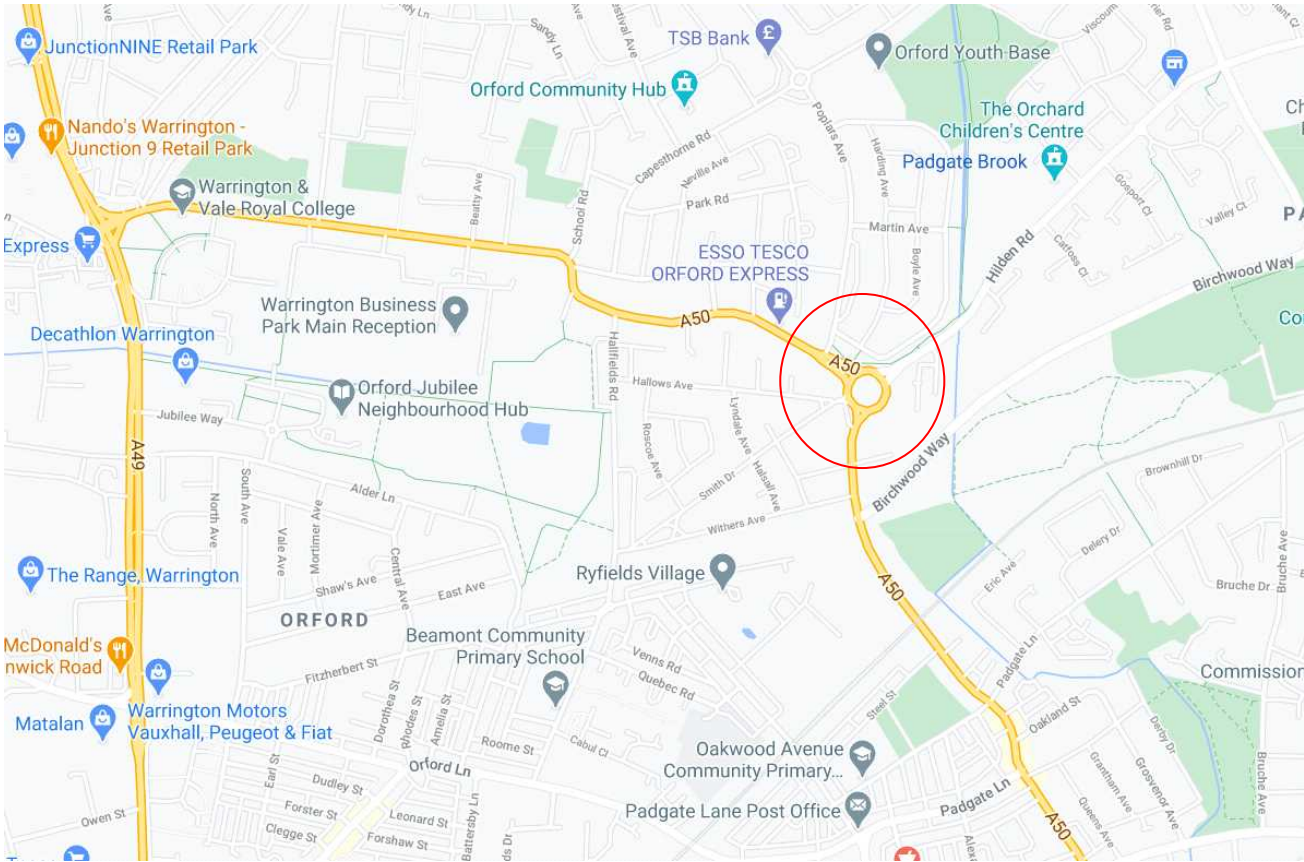
1901 24C Roundabout Mitigation
1901 25A Existing Roundabout
1901 Option A DEMAND Flow Diagrams 2022 DM AM
1901 Option A DEMAND Flow Diagrams 2022 DM PM
1901 Option A DEMAND Flow Diagrams 2022 DS AM
1901 Option A DEMAND Flow Diagrams 2022 DS PM
1901 Option A DEMAND Flow Diagrams 2032 DM AM
1901 Option A DEMAND Flow Diagrams 2032 DM PM
1901 Option A DEMAND Flow Diagrams 2032 DS AM
1901 Option A DEMAND Flow Diagrams 2032 DS PM

Collision data October 2014 – September 2019

Appendix B: Key Plan showing Audit Problems



Appendix C – Site location plan



APP28 -
*A50 Hilden Road Proposed Mitigation Scheme RSA1
Designers Response 2020*

Project Details

Table F.1 Project details

Report title:	Designers response to Stage 1 Road Safety Audit, A50/Hilden Road Roundabout, Warrington
Date:	28 th September 2020
Document reference and revision:	1901/RSA/DR/01
Prepared by:	Highgate Transportation Ltd
On behalf of:	Satnam Millennium Ltd

Table F.2 Authorisation sheet

Report title	Designers Response
Prepared by:	
Name:	Alice Howse
Position	Transport Planner
Signed:	
Organisation:	Highgate Transportation Ltd
Date	28/09/2020
Approved by:	
Name:	Fiona Bennett
Position	Director
Signed:	
Organisation:	Highgate Transportation Ltd
Date:	28/09/2020

Introduction

A Stage 1 Road Safety Audit (ref: 200901 V1) was undertaken by Avon Traffic & Safety Services Ltd on 11th September 2020 with regard to proposed capacity improvements at the A50/Hilden Road roundabout, Warrington. The proposals include the introduction of turbo-style circulatory lane markings and a new zebra crossing on the southern arm.

The Road Safety Audit response has been prepared by Alice Howse, Highgate Transportation Ltd.

Key personnel

Table F.3 Key personnel

Overseeing Organisation:	Warrington Borough Council
RSA team:	Avon Traffic & Safety Services
Design organisation:	Highgate Transportation Ltd

Road safety audit decision log

Table F.4 Road safety audit decision log

RSA problem	RSA recommendation	Design organisation response	Overseeing Organisation response	Agreed RSA action
<p>2.1 Location – Hilden Road-approach to the roundabout</p> <p>Summary – Risk of side swipe collisions.</p> <p>The proposals show that there will be two lanes provided on the approach to the roundabout. However, there appears to be a lack of carriageway width to achieve this, which will lead to vehicle conflicts due to insufficient lane width.</p>	<p>Ensure that vehicles can be accommodated within the new layout to reduce the risk of side swipe collisions.</p>	<p>Agreed. Carriageway widening to be confirmed at detailed design stage with topographical survey and swept path analysis</p>		

RSA problem	RSA recommendation	Design organisation response	Overseeing Organisation response	Agreed action	RSA
<p>2.2 Location – Orford Road - exit from roundabout</p> <p>Summary – Risk of conflict due to increased traffic speed.</p> <p>The proposed kerb realignment on the exit of the roundabout onto Orford Road to accommodate a two-lane approach has reduced the deflection for vehicles exiting the roundabout. This will lead to greater speeds on the exit which increases the risk of shunts and loss of control collisions.</p>	<p>Maintain the existing single lane exit layout (see comments 2.3, 2.4) or improve deflection on exit to accommodate a 2 lane exit.</p>	<p>Deflection will be increased from that shown on HTP/1901/24/C and confirmed at detailed design stage with topographical survey and swept path analysis</p>			

RSA problem	RSA recommendation	Design organisation response	Overseeing Organisation response	Agreed RSA action
<p>2.3 Location – Orford Road, proposed zebra crossing</p> <p>Summary – Risk of pedestrian/vehicular conflict</p> <p>The proposed layout shows the introduction of a zebra crossing and two-lane exit arrangement. Having priority, pedestrians may step onto the crossing when vehicles stop on the nearside carriageway but be unseen by those using the merge lane leading to pedestrian/vehicle conflict.</p>	<p>Maintain single lane exit (see comments 2.2, 2.4) or upgrade crossing to signal controlled to accommodate a 2 lane exit</p>	<p>Signalised crossing to be provided at detailed design stage with topographical survey</p>		

RSA problem	RSA recommendation	Design organisation response	Overseeing Organisation response	Agreed action
<p>2.4 Location – Orford Road, bus stop</p> <p>Summary – Risk of shunts</p> <p>A bus stop is situated immediately after where the proposed merge lane terminates. When a bus is stationary, vehicles exiting the roundabout and merging into a single lane may have to brake suddenly. The merge lane exacerbates this issue as drivers will be concentrating whilst manoeuvring to get into a single lane. This arrangement will lead to nose to tail/rear-end shunt type collisions.</p>	<p>Maintain a single lane exit arrangement (see comment 2.2, 2.3) or relocate the bus stop.</p>	<p>Forward visibility to stationary bus is currently around 52 metres. This will be confirmed at detailed design. It is considered that the bus stop cage could be shortened to reflect positioning of the vehicle at the raised kerb and in recognition that two buses would not be stationary at the same time.</p>		

RSA problem	RSA recommendation	Design organisation response	Overseeing Organisation response	Agreed action
<p>2.5 Location – Orford Road, cycle lane exit</p> <p>Summary – Risk of pedestrian/cyclist conflict</p> <p>The proposed corduroy tactile denoting the start/end of the shared use path is located immediately to the south of the proposed zebra crossing. This proposed location is not inclusive of the section of the shared use path that leads to the cycle exit ramp, and this may result in conflict between cyclists and pedestrians, particularly the visually impaired.</p>	<p>Relocate the corduroy tactile to a position which includes the whole length of shared use path.</p>	<p>Agreed. Corduroy paving around the junction to be discussed and agreed at detailed design and RSA Stage 2</p>		

RSA problem	RSA recommendation	Design organisation response	Overseeing Organisation response	Agreed RSA action
<p>2.6 Location – Smith Drive, the uncontrolled crossing</p> <p>Summary – Risk of pedestrian/vehicle conflict</p> <p>The information supplied, appears to omit recent pedestrian improvements incorporating a central refuge on Smith Drive. If the proposed drawings are correct, the lack of refuge will lead to pedestrian/vehicle conflict.</p>	<p>Keep the central refuge and additional improvements in situ.</p>	<p>No intention of removing the pedestrian crossing. A topographical survey will be obtained for detailed design</p>		

RSA problem	RSA recommendation	Design organisation response	Overseeing Organisation response	Agreed RSA action
<p>2.7 Location – Orford Green, south side zebra crossing</p> <p>Summary – Risk of pedestrian/vehicle conflict</p> <p>The proposed layout shows the introduction of a two-lane exit arrangement which goes through the existing zebra crossing. Having priority, pedestrians may step onto the crossing when vehicles in one lane stop but be unseen by those using the other lane leading to pedestrian/vehicle conflict.</p>	<p>Maintain single lane exit or upgrade crossing to a toucan crossing to accommodate a 2 lane exit.</p>	<p>A toucan crossing will be shown at detailed design stage when a topographical survey is available</p>		

RSA problem	RSA recommendation	Design organisation response	Overseeing Organisation response	Agreed action
<p>2.8 Location – Orford Green, two lane exit</p> <p>Summary – Risk of shunts and side swipe collisions</p> <p>It appears that pedestrian improvements (footway widening) have occurred on the southern side of Orford Green since the design of the scheme being audited. These changes have narrowed the carriageway to the extent that adding a second lane would cause side swipe collisions. Additionally, the right turn lane leading into Poplars Avenue is of a substandard width, which will lead to vehicles stopping to turn right overhanging the outside lane leading to nose to tail collisions.</p>	<p>Maintain single lane exit or widen existing carriageway to accommodate two running lanes</p>	<p>Carriageway widening to be confirmed at detailed design stage with topographical survey and swept path analysis</p>		

RSA problem	RSA recommendation	Design organisation response	Overseeing Organisation response	Agreed action	RSA
<p>2.9 Location – Orford Green, north side zebra crossing</p> <p>Summary – Risk of pedestrian/vehicle conflict</p> <p>The proposed layout shows the introduction of a two-lane exit arrangement which goes through the existing zebra crossing. Having priority, pedestrians may step onto the crossing when vehicles in one lane stop but be unseen by those using the other lane leading to pedestrian/vehicle conflict. This issue will be exacerbated at busy times, particularly when traffic is stacked through the crossing.</p>	<p>Maintain single lane arrangement or upgrade the Zebra to a Toucan crossing to accommodate a 2 lane exit.</p>	<p>A toucan crossing will be shown at detailed design stage when a topographical survey is available</p>			

RSA problem	RSA recommendation	Design organisation response	Overseeing Organisation response	Agreed action	RSA
<p>2.10 Location – Exit of Orford Green to Hilden Road</p> <p>Summary – Risk of loss of control collisions & pedestrian/vehicle conflicts</p> <p>The proposals to add a lane onto the exit of Orford Green diminishes the deflection when travelling from Orford Green to Hilden Road. The lack of deflection and good visibility on the approach encourages excessive vehicle speeds which will lead to loss of control collisions. It may also lead to conflict with pedestrians using the uncontrolled crossing facilities on Hilden Road</p>	<p>Create deflection on the Orford Green to Hilden Road route or maintain the existing road layout</p>	<p>Deflection will be increased and confirmed at detailed design stage with topographical survey and swept path analysis</p>			

Other Issues

RSA Issue	Design organisation response	Overseeing Organisation response	Agreed RSA action
<p>3.1 Signage for the shared use path appears to be missing from various locations within the remits of the scheme.</p>	<p>This will be picked up at detailed design and RSA Stage 2</p>		
<p>3.2 It is unclear from the information supplied whether the hatched areas shown on the drawings, creating the proposed 'turbo' arrangement on the roundabout, will be fully constructed or paint.</p>	<p>To be agreed at detailed design stage with topographical survey and swept path analysis</p>		

Design organisation and Overseeing Organisation statements

Table F.5 Design organisation statement

On behalf of the design organisation I certify that:	
1) The RSA actions identified in response to the road safety audit problems in this road safety audit have been discussed and agreed with the Overseeing Organisation	
Name:	Fiona Bennett
Signed:	
Position:	Director
Organisation:	Highgate Transportation Ltd
Date:	

Table F.6 Overseeing Organisation statement

On behalf of the Overseeing Organisation I certify that:	
1) The RSA actions identified in response to the road safety audit problems in this road safety audit have been discussed and agreed with the design organisation; and	
2) The agreed RSA actions will be progressed.	
Name:	
Signed:	
Position:	
Organisation:	Warrington Borough Council
Date:	

APP29 -

MG0123_A49WarringCorridor_BaseModellingReport_v6.2

MODELLING GROUP

Base Modelling Report

MG0123 – A49 Corridor VISSIM, Warrington

Luke Best

15 October 2020

DOCUMENT CONTROL ISSUE SHEET

Project & Document Details

Project Name	A49 Corridor, Warrington
Project Number	MG0123
Document Title	Base Modelling Report
Document Reference	Version 6

Document History

Issue	Status	Reason for Issue	Issued to
1	Pre-approval	Auditor approval	Fiona Bennet (Highgate Transportation)
2	Pre-approval	Auditor approval	Fiona Bennet (Highgate Transportation)
3	Pre-approval	Auditor approval	Fiona Bennet (Highgate Transportation)
4	Pre-approval	Auditor approval	Fiona Bennet (Highgate Transportation)
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Issue Control

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				Approved	Date
1	10/01/2020	Luke Best		Carl Moreno	10/01/2020
2	22/02/2020	Luke Best		Carl Moreno	22/02/2020
3	15/05/2020	Luke Best		Carl Moreno	15/05/2020
4	17/07/2020	Luke Best		Chris Davis	17/07/2020
5	05/08/2020	Luke Best		Chris Davis	05/08/2020
6	15/10/2020	Luke Best		Carl Moreno	15/10/2020

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APPENDICES

APPENDIX A - TURNING COUNT CALIBRATION RESULTS

APPENDIX B - JOURNEY TIME VALIDATION RESULTS

APPENDIX C - HATRIS MOTORWAY COUNT VALIDATION RESULTS

1. INTRODUCTION

1.1 Background

1.1.1 BestMore Consulting Ltd (now Modelling Group Ltd) has been commissioned by Satnam Millennium Ltd to develop a microsimulation model of the A49 corridor for the area to the north of Warrington, surrounding the M62 junction 9. The aim of this model is to provide a robust platform on which the proposed development (Peel Hall) can be tested and impact upon the highway network assessed. The area of interest is shown in Figure 1.1 below.

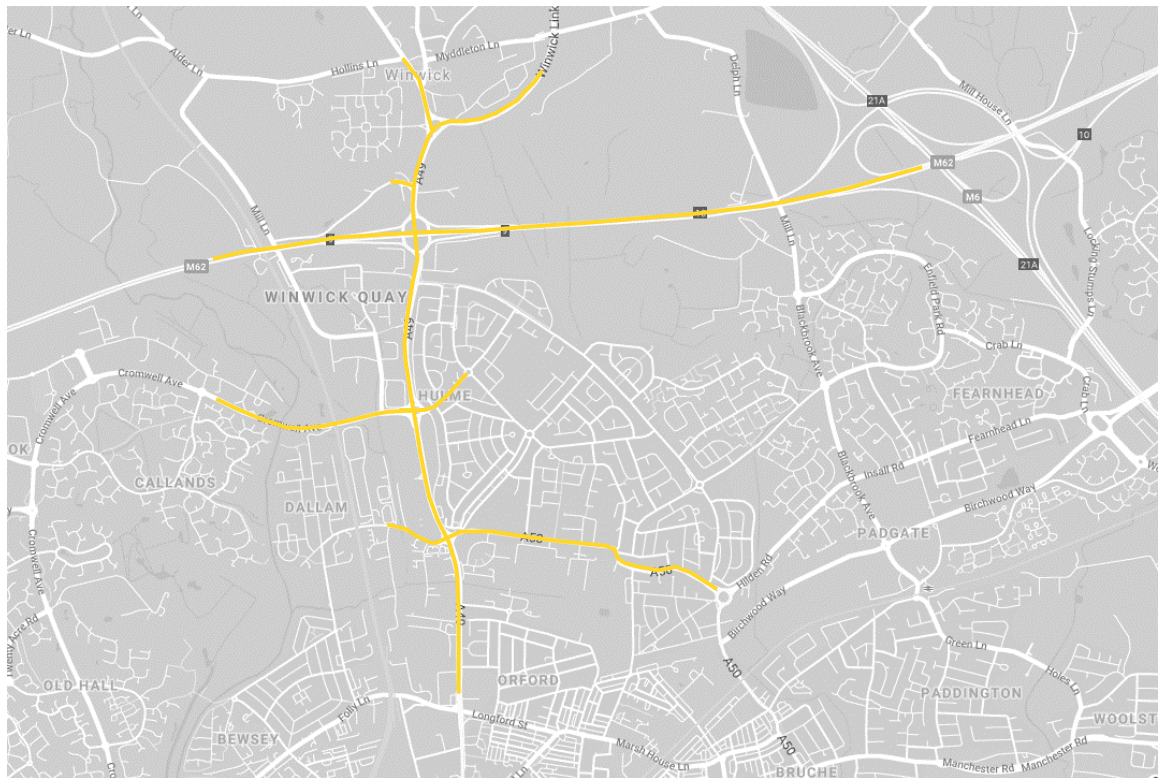


FIGURE 1.1: AREA OF INTEREST

1.2 Report Purpose

1.2.1 The following report summarises the methodology used to build and test the model, as well as the results obtained to determine the suitability of the model for use in proposed option testing.

1.4 Report Structure

The report is structured as follows:

- Section 2: Base Model Development including details on the software used, the model extents alteration process, duration and any changes made to software parameters in line with best-practice recommendations;
- Section 3: Base Model Calibration including a comparison of the previous model with this cordoned model, as well as observed and modelled turning flows;
- Section 4: Model Validation including the comparison of observed and modelled journey times; and
- Section 5: Summary and Recommendations including a summary of the model development process and the overall suitability for future use.

2 BASE MODEL DEVELOPMENT

2.1 Previous Modelling

2.1.1 In 2016/17, a microsimulation model was developed by AECOM of the area surrounded by the A49 corridor to the west and the M6 to the east. The model was validated to 2015 conditions and data and included all of the main junctions and roads within the area defined in Figure 2.1. This model has been provided as a starting point for the revised model extents and model update.

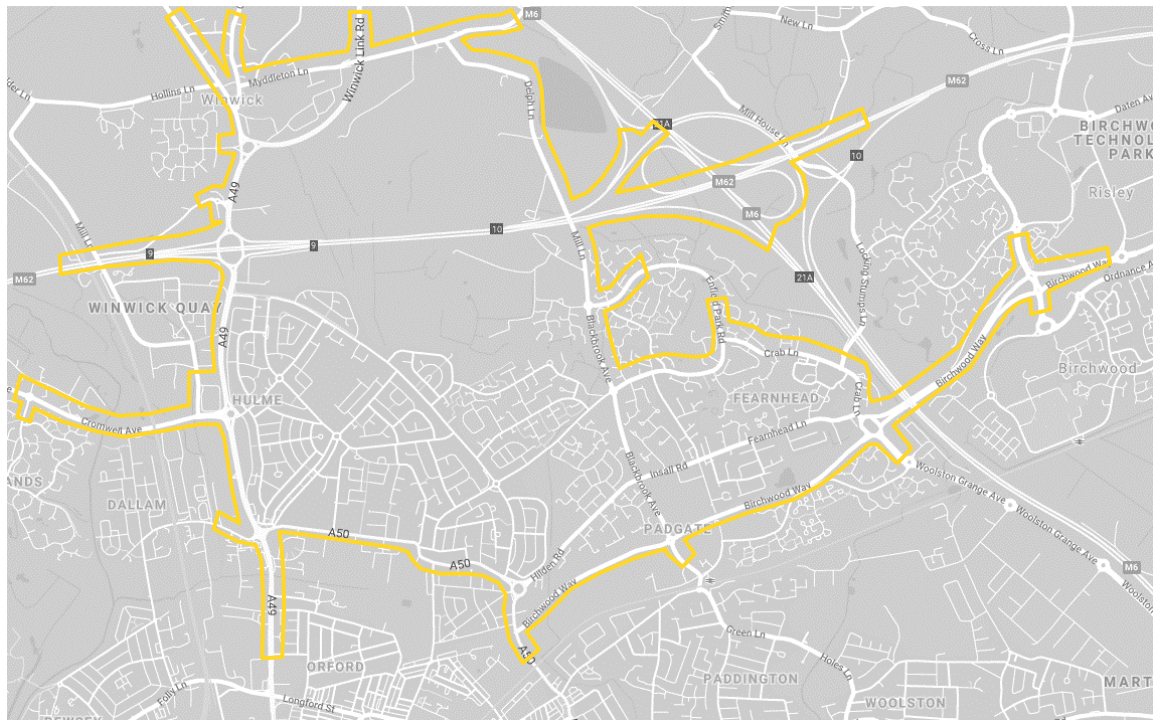


FIGURE 2.1: PREVIOUS MODEL EXTENTS

2.2 Changes to Previous Modelling

2.2.1 As the previous modelling had been carried out in an outdated version (08.00-04) of the software, it was decided to firstly update the network to the latest fully stable and tested version of the software (11.00-13). As a result of this, testing was required to ensure that key model performance indicators were comparable to the original model.

2.2.2 Tables 2.1 and 2.2 shows a comparison between turning volumes at each junction:

AM PEAK	Nodes – Average volume comparison per movement/ time period							
	VEHS (ALL)		VEHS (Car)		VEHS (LGV)		VEHS (HGV)	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
TOTAL	2112		2112		2112		2112	
GEH <=3	2106	99.7%	2106	99.7%	2108	99.8%	2112	100.0%
GEH <=5	2109	99.9%	2109	99.9%	2112	100.0%	2112	100.0%
GEH <=10	2112	100.0%	2112	100.0%	2112	100.0%	2112	100.0%

TABLE 2.1: AM SUMMARY DATA – VOLUME COMPARISON PER MOVEMENT

PM PEAK	Nodes – Average volume comparison per movement/ time period							
	VEHS (ALL)		VEHS (Car)		VEHS (LGV)		VEHS (HGV)	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
TOTAL	2112		2112		2112		2112	
GEH <=3	2107	99.8%	2107	99.8%	2112	100.0%	2112	100.0%
GEH <=5	2109	99.9%	2109	99.9%	2112	100.0%	2112	100.0%
GEH <=10	2112	100.0%	2112	100.0%	2112	100.0%	2112	100.0%

TABLE 2.2: PM SUMMARY DATA – VOLUME COMPARISON PER MOVEMENT

2.2.3 As can be seen, volumes of all vehicle types, at all junctions remained directly comparable. Analysis of journey time data was also carried out – a summary of the results is shown below in Tables 2.3 and 2.4:

AM PEAK – Travel Time Route Volumes						AM Peak – Travel Times			
GEH			Percentage Difference			Percentage Difference		Actual Difference	
Measure	Count	%	Measure	Count	%	Measure	%	Measure	%
TOTAL	99		TOTAL	99		99 TOTAL		99 TOTAL	
GEH <=3	99	100%	GEH <=3	97	98%	79 <>5%	80%	79 <>5%	86%
GEH <=5	99	100%	GEH <=5	99	100%	85 <>10%	86%	85 <>10%	92%
GEH <=10	99	100%	GEH <=10	99	100%	86 <>15%	87%	86 <>15%	96%

TABLE 2.3: AM SUMMARY DATA – TRAVEL TIME ROUTE VOLUMES & TIMES

PM PEAK – Travel Time Route Volumes						PM Peak – Travel Times			
GEH			Percentage Difference			Percentage Difference		Actual Difference	
Measure	Count	%	Measure	Count	%	Measure	%	Measure	%
TOTAL	99		TOTAL	99		99 TOTAL		99 TOTAL	
GEH <=3	99	100%	GEH <=3	85	86%	82 <>5%	83%	79 <>5%	96%
GEH <=5	99	100%	GEH <=5	93	94%	92 <>10%	93%	85 <>10%	100%
GEH <=10	99	100%	GEH <=10	99	100%	96 <>15%	97%	86 <>15%	100%

TABLE 2.4: PM SUMMARY DATA – TRAVEL TIME ROUTE VOLUMES & TIMES

2.2.4 Although there is some variation, likely as a result of revisions made to default vehicle size and performance parameters, along with changes to the random seed algorithms, performance is still comparable to the original model.

2.3 Changes to Network Extents

2.3.1 As there was only a need for testing of effects to the operation of the A49 corridor itself, it was decided that it would be more efficient to cordon the network, as shown in Figure 1.1. In order to ensure that the traffic assignment remained the same, effectively frozen, the model was transformed from a dynamic assignment model to a static assignment model. As there was to be no strategic route choice in the newly cordoned area, this approach would still leave a perfectly functional model for the proposed testing.

2.3.2 In the same manner as previously (paragraph 2.2.1), a comparison of key model performance indicators was carried out to ensure that turning volumes, route volumes and travel times were acceptably similar after the process of conversion to static assignment and cordoning of network extents and the subsequent adjustment to all vehicle routing had been completed.

2.3.3 Tables 2.5 and 2.6 show a comparison between turning volumes at each junction:

AM PEAK	Nodes – Average volume comparison per movement/ time period							
	VEHS (ALL)		VEHS (Car)		VEHS (LGV)		VEHS (HGV)	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
TOTAL	642		642		642		642	
GEH <=3	627	97.7%	627	97.7%	640	97.7%	642	100.0%
GEH <=5	638	99.4%	638	99.4%	642	100.0%	642	100.0%
GEH <=10	642	100.0%	642	100.0%	642	100.0%	642	100.0%

TABLE 2.5: AM SUMMARY DATA – VOLUME COMPARISON PER MOVEMENT

PM PEAK	Nodes – Average volume comparison per movement/ time period							
	VEHS (ALL)		VEHS (Car)		VEHS (LGV)		VEHS (HGV)	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
TOTAL	642		642		642		642	
GEH <=3	584	91.0%	582	90.7%	637	99.2%	637	99.2%
GEH <=5	614	95.6%	614	95.6%	642	100.0%	642	100.0%
GEH <=10	640	99.7%	640	99.7%	642	100.0%	642	100.0%

TABLE 2.6: PM SUMMARY DATA – VOLUME COMPARISON PER MOVEMENT

2.3.4 As can be seen, volumes of all vehicle types, at all junctions in the newly cordoned area remained comparable. Analysis of journey time data was also carried out – a summary of results is shown in Tables 2.7 and 2.8:

AM PEAK – Travel Time Route Volumes						AM Peak – Travel Times			
GEH			Percentage Difference			Percentage Difference		Actual Difference	
Measure	Count	%	Measure	Count	%	Measure	%	Measure	%
TOTAL	54		TOTAL	54		54 TOTAL		54 TOTAL	
GEH <=3	51	94%	GEH <=3	51	94%	47 <>5%	87%	52 <>5%	96%
GEH <=5	54	100%	GEH <=5	53	98%	47 <>10%	87%	52 <>10%	96%
GEH <=10	54	100%	GEH <=10	53	98%	50 <>15%	93%	52 <>15%	96%

TABLE 2.7: AM SUMMARY DATA – TRAVEL TIME ROUTE VOLUMES & TIME

PM PEAK – Travel Time Route Volumes						PM Peak – Travel Times			
GEH			Percentage Difference			Percentage Difference		Actual Difference	
Measure	Count	%	Measure	Count	%	Measure	%	Measure	%
TOTAL	54		TOTAL	54		54 TOTAL		54 TOTAL	
GEH <=3	34	63%	GEH <=3	37	69%	39 <>5%	72%	44 <>5%	81%
GEH <=5	46	85%	GEH <=5	43	80%	43 <>10%	80%	52 <>10%	96%
GEH <=10	53	98%	GEH <=10	50	93%	49 <>15%	91%	53 <>15%	98%

TABLE 2.8: PM SUMMARY DATA – TRAVEL TIME ROUTE VOLUMES & TIME

2.3.5 As can be seen, both the volumes of vehicles on journey time routes, and the journey times themselves, remain comparable on all key routes.

2.4 Updating of Modelled Year

- 2.4.1 As a result of the original AECOM model having a base year of 2015, it was agreed that testing needed to be carried out against an up to date dataset in order to ensure that the model was representative of current onsite conditions, and therefore a suitably robust platform for testing of proposed scenarios.
- 2.4.2 Manual Classified Count data had already been collected in early April 2019 for the locations shown in Figure 2.2. To complement this and ensure the survey dataset was representative historical travel time data was also collated for the corridor (Streetwise - TomTom data) for neutral days (Tuesday, Wednesday & Thursday) for the month of April 2019 – shown in Figure 2.3.

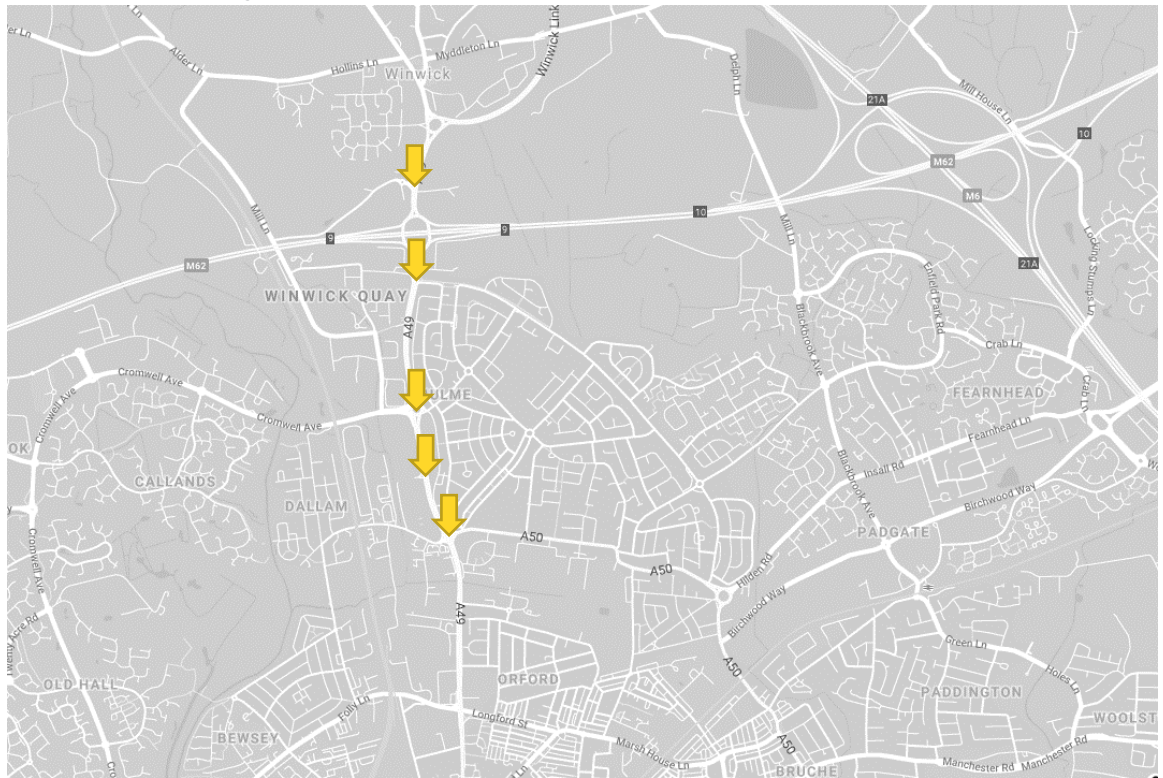


FIGURE 2.2: APRIL 2019 MANUAL CLASSIFIED COUNT SITES



FIGURE 2.3: APRIL 2019 HISTORICAL TOMTOM DATA TRAVEL TIME ROUTE (NORTH & SOUTH)



FIGURE 2.4: APRIL 2019 HISTORICAL TOMTOM DATA TRAVEL TIME ROUTES (EAST & WEST)

2.4.3 However, when initial results were run, it was clear that the models did not validate well to the 2019 data, meaning that there had been some changes in local conditions, flow profiles and route choice in the area.

2.4.4 Tables 2.9 and 2.10 show the summary turning count validation data for the AM and PM peak models, respectively. It was clear that some additional refining of the models would be needed in order to ensure that they were representative of current conditions.

AM PEAK (08:00-09:00) TURNING COUNT VALIDATION	
Total number of counts considered	40
VISSIM model counts with GEH <=3	14
% of VISSIM counts with GEH <=3	35.5%
VISSIM model counts with GEH <=5	20
% of VISSIM counts with GEH <=5	50.0%
VISSIM model counts with GEH <=10	31
% of VISSIM counts with GEH <=10	77.5%
VISSIM model counts meeting WebTAG Unit 3.1 criteria	28
% of VISSIM model counts meeting WebTAG Unit 3.1 criteria	70.0%

TABLE 2.9: SUMMARY DATA – AVERAGE VOLUME COMPARISON PER MOVEMENT

PM PEAK (17:00-18:00) TURNING COUNT VALIDATION	
Total number of counts considered	40
VISSIM model counts with GEH <=3	13
% of VISSIM counts with GEH <=3	32.5%
VISSIM model counts with GEH <=5	21
% of VISSIM counts with GEH <=5	52.5%
VISSIM model counts with GEH <=10	30
% of VISSIM counts with GEH <=10	75.0%
VISSIM model counts meeting WebTAG Unit 3.1 criteria	25
% of VISSIM model counts meeting WebTAG Unit 3.1 criteria	62.5%

TABLE 2.10: SUMMARY DATA – AVERAGE VOLUME COMPARISON PER MOVEMENT

2.5 Traffic Signals

2.5.1 The modelled network includes the following signal-controlled junctions:

- Site 1156 – Winwick Link
- Site 1150 – Delph Lane (B&Q)
- Site 1146 – M62 J9 South
- Site 1147 – M62 J9 North
- Site 1083 – Winwick Road/ Cromwell Avenue
- Site 1204 – Calver Road
- Site 1216 – J9 Retail Park
- Site 1077 – Long Lane

- 2.5.2 As the existing signal controllers in the model were set-up as fixed time controllers, this same set-up has been carried through to the updated models. Warrington UTMC has provided some updated controller specification and average stage and cycle time captures, which have been used to modify the signal controllers where necessary to aid in achieving validation.

Model Assignment

- 2.5.3 The network modelled has no route choice as the focus is on the A49 corridor. As a result of this and the methodology to freeze the previous 2015 assignment volumes into the model during the cordoning exercise, the model has been setup using static routing assignment.
- 2.5.4 During the process to convert the original model from dynamic assignment to static assignment, an option to remove any routes with less than 0.02 relative volume and/or less than 2 absolute minimum volume was selected in an attempt to minimise the subsequent total amount of static routes to work with. Subsequently, static routes were added from all origin points to all destination points to ensure the future availability of all possible network routes.

2.6 Driving Behaviour Parameters

- 2.6.1 As a large number of custom behaviours had been created in the original 2015 AECOM model set-up, for specific areas of the model. Where still relevant in the reduced, cordoned model extent any bespoke driving behaviours were largely left with the same set-up in lieu of empirical evidence to inform changes or updates since the AECOM modelling and validation exercise. Any unused driver behaviours have been deleted from the model.
- 2.6.2 However, after reviewing model behaviour, driver behaviour number 1, which is the general Urban (motorized) behaviour in use in most of the model, was altered to improve on the car following settings. This involved increasing the minimum look ahead and minimum look back distances to 30m and 20m respectively, to improve vehicle to vehicle interaction.
- 2.6.3 As a result of the now available refinement to individually define the number of interaction objects and interaction vehicles since VISSIM version 8, this was also changed to 10 interaction objects and 4 interaction vehicles. These values are based on professional experience taken from other projects when modelling congested urban scenarios.
- 2.6.4 Cooperative lane change was also turned off for driver behaviour number 1. Previous experience of modelling congested urban scenarios has showed that Advanced merging and cooperative lane changing can appear to cancel each other out, so we use Advanced merging as the general behaviour and have cooperative lane changing setup for links with more localised merging, such as lane drops.

2.7 Base Data – Functions

2.7.1 During model audits (February 2020), it was noticed that information relating to acceleration and deceleration functions for HGV traffic had been carried forwards from VISSIM version 8. As a result, all default values for Maximum Acceleration & Deceleration, and Desired Acceleration and Deceleration for HGV have been updated to match the default values found in the very latest version of VISSIM, which at the time of this change was version 2020.

2.8 Base Data – Speed Distributions

2.8.1 As with the driving behaviours, the original 2015 AECOM model contained a number of custom speed profiles. Where still relevant in the reduced, cordoned model extent, any bespoke speed profiles have been left as per the original model usage, in lieu of empirical evidence to inform changes or updates since the AECOM modelling and validation exercise.

2.8.2 Speed profiles have been edited, or added, in order to validate delays due to queueing originating from beyond the model extents at the model exit points in the following locations:

- Northbound A49 Newton Road (South of Hollins Lane junction)
- Eastbound M62 (east of M6 slip roads)
- Southbound A49 Winwick Road (South of Hawley's Lane/Long Lane junction)

2.8.3 An additional speed profile has been created to simulate delays, particularly in the morning peak, happening on Sandy Lane West for westbound traffic. It appears from journey time data that the eastern portion of Sandy Lane West is severely restricted, likely due to traffic going to and/or from unmodelled side roads.

2.8.4 This does not affect the back of queue or turning counts arriving at the A49 junction stopline but is purely meant to mimic the delays being experienced in this area.

2.9 Model Specification

VISSIM Version – 11.00-13.

Base Year – 2019.

Model Time Periods

- Weekday AM – 07:00-08:00 (warm-up), 08:00-09:00 (peak period), 09:00-09:30 (cool-down).
- Weekday PM – 16:00-17:00 (warm-up), 17:00-18:00 (peak period), 18:00-18:30 (cool-down).
- Vehicle Types
 - Cars
 - LGVs
 - HGVs
 - PT Buses (static routes)

2.9.1 Results have been output with a model simulation resolution of 5-time steps / second, as per the original modelling. Random seeds were set at 5 with an increase per run of 5, as per the original models (meaning seeds 5,10, 15, 20 etc were used).

3 MODEL CALIBRATION

This section summarises the calibration process undertaken and identifies sources of traffic flow data used to check and refine the flow profiles within the VISSIM model.

3.1 Traffic Flow Sources

3.1.1 Manual classified count (MCC) surveys were undertaken on Wednesday 3rd April 2019 at the locations highlighted in Figure 3.1. These include:

- A49/Delph Lane
- A49/ Poplars Avenue
- A49/Cromwell Avenue/Sandy Lane West
- A49/Junction Nine Retail Park
- A49/Hawley's Lane/ Long Lane

3.1.2 Link counts (April 2019) from the HATRIS Database for were checked for the sections of motorway included in the model, taken from the following site locations (see Figure 3.1):

- M62 Westbound Mainline (M62/1260B) – west of junction 9
- M62 Eastbound Mainline (M62/1260A) – west of junction 9
- M62 Westbound Mainline (M62/1270B) – east of junction 9
- M62 Eastbound Mainline (M62/1269A) – east of junction 9
- M62 Westbound Mainline (M62/1275B) – east of junction 9
- M62 Eastbound Mainline (M62/1274A) – east of junction 9
- Link from M62 Eastbound to M6 (M6/7073K)



FIGURE 3.1: AVAILABLE 2019 TRAFFIC DATA

3.2 Changes in Flows 2015 – 2019

3.2.1 Initially, it was found that at these locations traffic flows had changed, in some places considerably, between 2015 and 2019 with differences for individual movements up to 400-500 vehicles/ hour.

3.2.2 As the base model needs to be used to test in current and future years, it therefore needs to be shown to robustly represent current conditions. Given this, a decision had to be made regarding how to manage this difference in flow, as described in the options below:

1. Scale up the 2015 model flow globally in an attempt to match the link counts provided, which would essentially increase either the flow or levels of congestion, or both, throughout the whole model; or
2. Limit any scaling of traffic to specific movements and key routes, in an attempt to, as far as possible, keep all other movements/proportions consistent with those in the 2015 model.

3.2.3 Option 2 was considered the best way forward, in agreement with the model auditors WSP and Atkins, as it had the least impact on the distribution of flows around the cordoned network. This option was taken forward as current 2019 data is not available for all junctions modelled in the network. This creates the possibility of updating the model without the need for a full rebuild and validation exercise.

3.3 Traffic Compositions

As with the original models, three traffic compositions were used in the model: Cars, LGVs and HGVs. As Cars made up the vast majority of the overall volume in both peaks, tweaks to volumes and routing were primarily focussed here when carrying out the recalibration and validation exercise.

Vehicle Type	AM % Distribution	PM % Distribution
Car	83.7%	91.7%
LGV	8.4%	4.2%
HGV	7.9%	4.1%

TABLE 3.1: TRAFFIC COMPOSITION SUMMARY

3.4 Flow Calibration

The process of flow calibration has involved multiple iterations of minor adjustments to both the vehicle inputs and static routing proportions at key locations and on key routes. The calculated GEH statistic for the observed and modelled flows was considered for each of the junction turning counts in accordance with the criteria stated in WebTAG Unit 3.1. To consider day to day variation in driver behaviour, the models were run, and results averaged over ten random seeds, as per the original model specification. Table 3.2 summarises the flow calibration results.

	AM Peak	PM Peak
Criteria	08:00-09:00	17:00-18:00
85% of VISSIM counts with GEH <=3	90.0%	92.5%
85% of VISSIM counts with GEH <=5	100.0%	100.0%
100% of VISSIM counts with GEH <=10	100.0%	100.0%
85% of VISSIM counts meeting WebTAG Unit 3.1 flow criteria	100.0%	100.0%

TABLE 3.2: FLOW CALIBRATION SUMMARY

3.4.1 For transparency, completeness and robustness, these results also include a comparison against the TfL criteria for key links, using a GEH value of 3 or under. It has now been possible to achieve the ideal minimum 85% count, demonstrating that a strong flow calibration result has been achieved. A full breakdown of model calibration results can be found in Appendix A.

3.5 Signal Recalibration

3.5.1 Another element which was suspected to have likely changed on the ground since the 2015 model construction and validation is the traffic signal set-up and timing configuration. Subsequently, traffic signal specifications and drawings were obtained from Warrington UTMC for the following junctions:

- Site 1156 Winwick Link
- Site 1150 Delph Lane (B&Q)
- Site 1146 M62 J9 South
- Site 1147 M62 J9 North
- Site 1083 Cromwell Aveune / Winwick Road
- Site 1204 Calver Road
- Site 1216 J9 Retail Park
- Site 1077 Long Lane

3.5.2 Additionally, a capture of 1 weeks' worth of phase, stage and cycle timing data was carried out for each of the following nodes in December 2019 (with the exception of those highlighted):

- Site 1156 Winwick Link
- Site 1150 Delph Lane (B&Q)
- Site 1146 M62 J9 South – No comms to site
- Site 1147 M62 J9 North – No comms to site
- Site 1083 Cromwell Avenue / Winwick Road
- Site 1204 Calver Road
- Site 1216 J9 Retail Park - Unavailable due to roadworks
- Site 1077 Long Lane

3.5.3 The signal data showed that although some locations were running with exactly the same setup and timings as found in the 2015 model, most key signal controllers required timings to be recalibrated in line with current operation. This recalibration was then carried out.

3.6 Calibration Summary

3.6.1 Overall, based on the flow comparison results highlighted in section 3.4, a good fit between observed and modelled traffic flows has been achieved.

4 MODEL VALIDATION

This section summarises the goodness of fit between modelled and observed outputs, independently collected.

4.1 Journey Time Validation

4.1.1 The journey time validation has been carried out using TomTom data collected for the network. This was chosen as it provides a high sample rate dataset which improves the overall robustness of the validation comparison. The data is provided in small link sections, so these were combined into more reasonable lengths from junction to junction in the network, which assisted the calibration of the model. The journey time data is averaged over April 2019, for Tuesdays, Wednesdays and Thursdays. The Easter break period was considered, and the date range removed from the travel time dataset (Easter holidays in Warrington were 6th April 2019 – 22nd April 2019*).

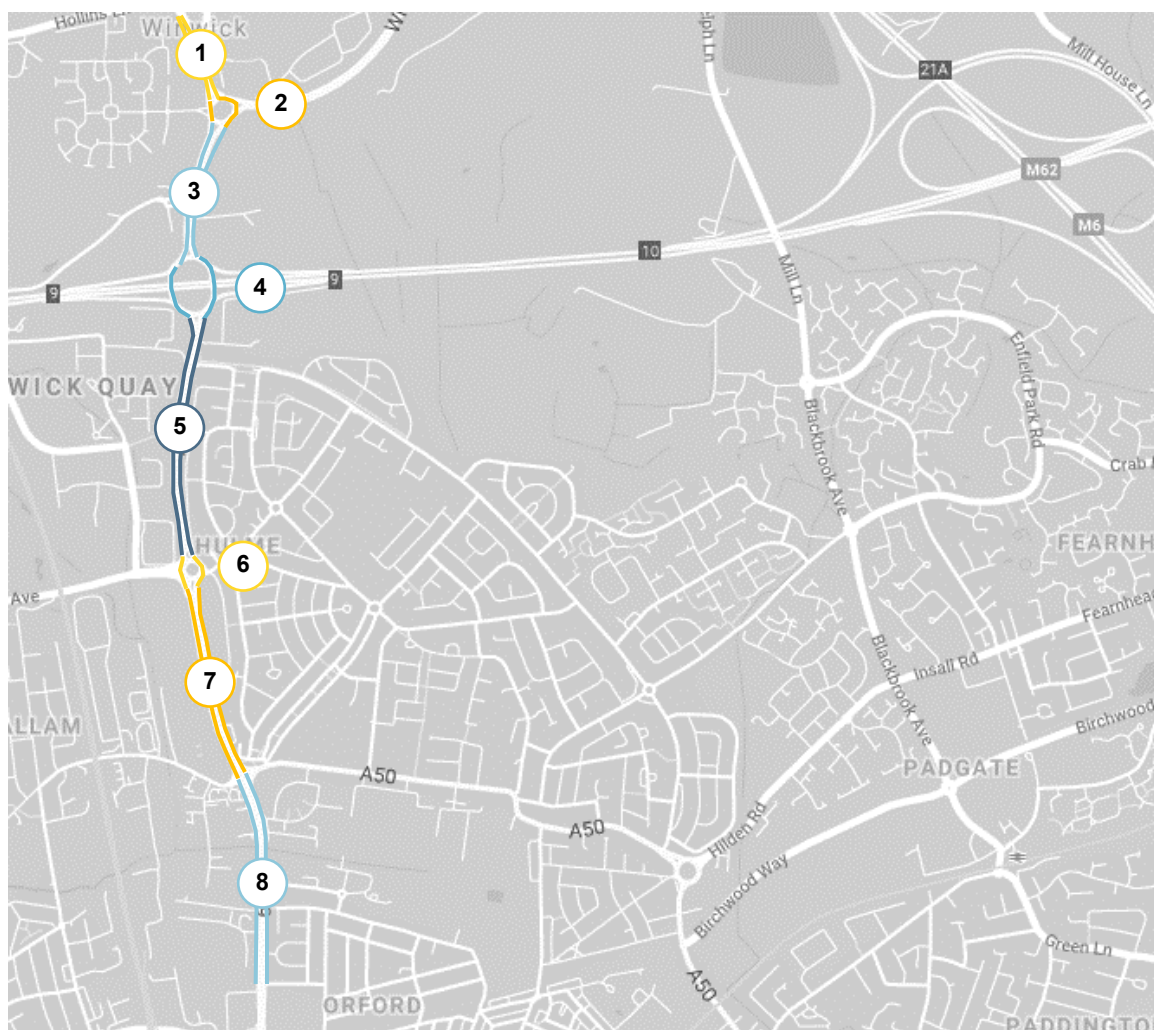


FIGURE 4.1: JOURNEY TIME VALIDATION ROUTE SECTIONS – NORTH-SOUTH

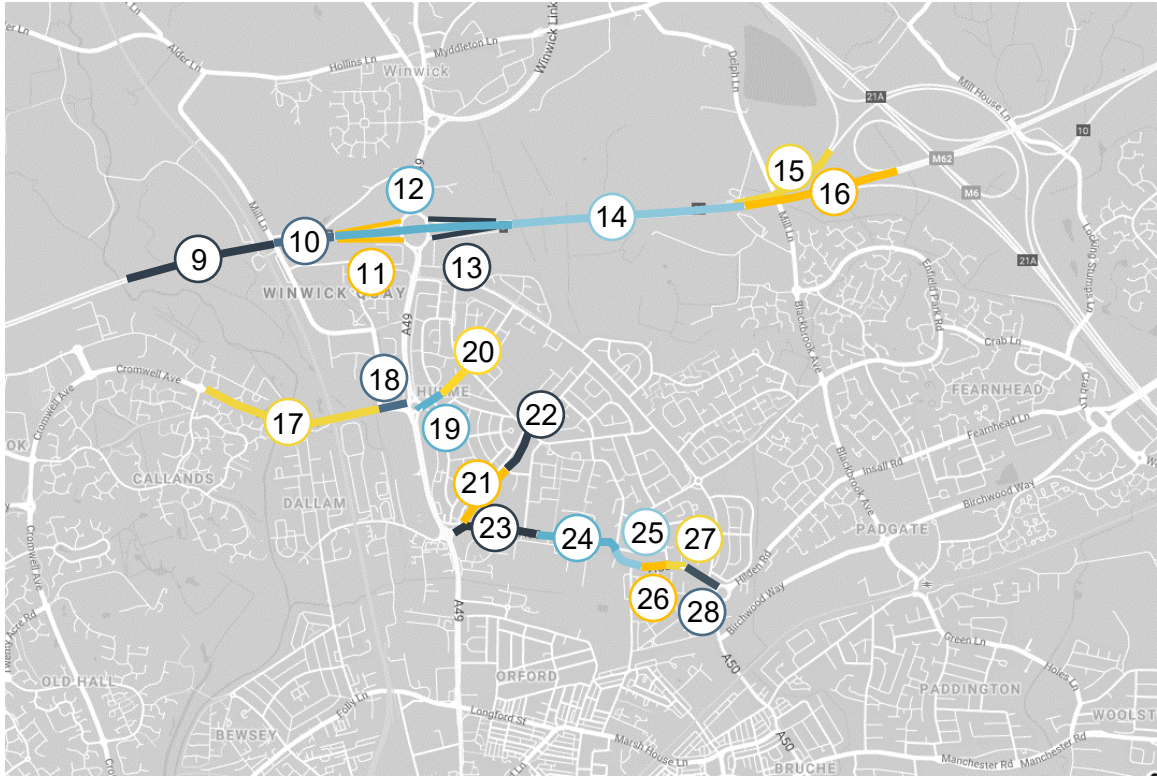


FIGURE 4.2: JOURNEY TIME VALIDATION ROUTE SECTIONS – EAST-WEST

4.2 Journey Time Data

4.2.1 Table 4.1 below shows the overall summary for all journey time routes and sections for the network. On the following pages, Tables 4.2 – 4.13 show a more detailed breakdown of that data:

Whole Routes	AM Peak	PM Peak
Criteria	08:00-09:00	17:00-18:00
85% of measures within 15%	100%	100%
85% of measures within 60 seconds	100%	100%

Route Sections	AM Peak	PM Peak
Criteria	08:00-09:00	17:00-18:00
85% of measures within 15%	85%	88%
85% of measures within 60 seconds	100%	100%

TABLE 4.1: OVERALL NETWORK PERFORMANCE OF ROUTES & SECTIONS

Section	Direction	Description		Observed		Modelled			AM Peak 08:00 - 09:00 Validation - Northbound				
		From	To	Dist.	Avg.	Min.	Avg.	Max.	Actual Diff.	% Diff.	Within 15%	Within 1 min.	Validates
1	NB	Winwick Link Rd	Hollins Ln	384m	75	65	72	78	-3	-4%	✓	✓	✓
2	NB	Roundabout		43m	6	5	6	7	0	3%	✓	✓	✓
3	NB	M62 Junction 9	Winwick Link Rd	447m	81	70	75	84	-6	-7%	✓	✓	✓
4	NB	M62 Junction 9		254m	36	36	37	39	1	4%	✓	✓	✓
5	NB	Cromwell Ave	M62 Junction 9	810m	68	74	75	75	6	10%	✓	✓	✓
6	NB	Roundabout		63m	5	6	6	6	1	10%	✓	✓	✓
7	NB	Hawleys Ln	Cromwell Ave	645m	94	89	94	102	0	0%	✓	✓	✓
8	NB	Ireland St	Hawleys Ln	720m	104	101	102	103	-1	-1%	✓	✓	✓
TOTAL	NB	Ireland St	Hollins Ln	3364m	468	458	467	486	-1	0%	✓	✓	✓

Section	Direction	Description		Observed		Modelled			AM Peak 08:00 - 09:00 Validation - Southbound				
		From	To	Dist.	Avg.	Min.	Avg.	Max.	Actual Diff.	% Diff.	Within 15%	Within 1 min.	Validates
1	SB	Hollins Ln	Winwick Link Rd	356m	64	59	70	83	6	9%	✓	✓	✓
2	SB	Roundabout		110m	21	18	19	21	-1	-5%	✓	✓	✓
3	SB	Winwick Link Rd	M62 Junction 9	492m	115	105	119	135	4	3%	✓	✓	✓
4	SB	M62 Junction 9		232m	42	44	45	46	3	7%	✓	✓	✓
5	SB	M62 Junction 9	Sandy Ln	811m	158	133	164	204	6	4%	✓	✓	✓
6	SB	Roundabout		68m	11	10	10	10	0	-4%	✓	✓	✓
7	SB	Sandy Ln	Long Ln	650m	144	114	132	156	-12	-8%	✓	✓	✓
8	SB	Long Ln	Ireland St	725m	82	77	80	84	-2	-3%	✓	✓	✓
TOTAL	SB	Hollins Ln	Ireland St	3444m	637	585	640	710	3	0%	✓	✓	✓

TABLE 4.2: NORTH-SOUTH A49 JOURNEY TIME SECTIONS – AM PEAK

Section	Direction	Description			Observed		Modelled			AM Peak 08:00 - 09:00 Validation - Eastbound				
		From	-	To	Dist.	Avg.	Min.	Avg.	Max.	Actual Diff.	% Diff.	Within 15%	Within 1 min.	Validates
9	EB	EB M62	-	EB M62	1313m	58	55	55	55	-3	-5%	✓	✓	✓
10	EB	EB M62	-	EB M62 offslip	347m	16	15	15	15	-2	-9%	✓	✓	✓
11	EB	EB M62 offslip	-	M62 J9	291m	71	48	66	98	-5	-7%	✓	✓	✓
12	EB	EB M62 @ J9	-	EB M62 @ J9	869m	47	40	40	40	-6	-14%	✓	✓	✓
13	EB	M62 J9	-	EB M62 onslip	433m	30	30	30	30	0	-2%	✓	✓	✓
14	EB	EB M62 onslip	-	EB M62	1074m	65	51	52	52	-14	-21%	✗	✓	✓
15	EB	EB M62/M6	-	M6	624m	28	28	28	29	1	3%	✓	✓	✓
16	EB	EB M62	-	EB M62	1115m	256	154	249	339	-7	-3%	✓	✓	✓
TOTAL	EB	EB M62	-	EB M62	6065m	570	421	534	658	-36	-6%	✓	✓	✓

Section	Direction	Description			Observed		Modelled			AM Peak 08:00 - 09:00 Validation - Westbound				
		From	-	To	Dist.	Avg.	Min.	Avg.	Max.	Actual Diff.	% Diff.	Within 15%	Within 1 min.	Validates
16	WB	WB M62	-	WB M62	454m	16	17	17	17	1	6%	✓	✓	✓
14	WB	WB M62	-	WB M62 offslip	1739m	63	67	68	68	5	7%	✓	✓	✓
13	WB	WB M62 offslip	-	M62 J9	413m	110	82	106	129	-4	-3%	✓	✓	✓
12	WB	WB M62 @ J9	-	WB M62 @ J9	958m	31	35	36	36	4	14%	✓	✓	✓
11	WB	M62 J9	-	WB M62 onslip	399m	21	21	21	22	1	4%	✓	✓	✓
10	WB	WB M62 onslip	-	WB M62	220m	9	9	9	9	0	-3%	✓	✓	✓
9	WB	WB M62	-	WB M62	1344m	60	61	62	62	2	3%	✓	✓	✓
TOTAL	WB	WB M62	-	WB M62	5527m	309	293	318	340	9	3%	✓	✓	✓

TABLE 4.3: EAST-WEST M62 JOURNEY TIME SECTIONS – AM PEAK

Section	Direction	Description			Observed		Modelled			AM Peak 08:00 - 09:00 Validation - Eastbound				
		From	-	To	Dist.	Avg.	Min.	Avg.	Max.	Actual Diff.	% Diff.	Within 15%	Within 1 min.	Validates
17	EB	Callands Rd	-	Calver Rd	901m	106	113	115	116	9	9%	✓	✓	✓
18a	EB	Calver Rd	-	Cromwell Ave LT	153m	35	29	29	30	-5	-15%	✓	✓	✓
18b	EB	Calver Rd	-	Cromwell Ave RT	156m	34	32	33	34	-1	-3%	✓	✓	✓
TOTAL	EB	Callands Rd	-	A49 Winwick Rd	1210m	174	174	177	180	3	2%	✓	✓	✓

Section	Direction	Description			Observed		Modelled			AM Peak 08:00 - 09:00 Validation - Westbound				
		From	-	To	Dist.	Avg.	Min.	Avg.	Max.	Actual Diff.	% Diff.	Within 15%	Within 1 min.	Validates
18	WB	A49 Winwick Rd	-	Calver Rd	107m	14	16	16	17	2	16%	×	✓	✓
17	WB	Calver Rd	-	Callands Rd	958m	64	57	57	57	-8	-12%	✓	✓	✓
TOTAL	WB	A49 Winwick Rd	-	Callands Rd	1065m	79	73	73	74	-5	-7%	✓	✓	✓

TABLE 4.4: EAST-WEST CROMWELL AVENUE JOURNEY TIME SECTIONS – AM PEAK

Section	Direction	Description			Observed		Modelled			AM Peak 08:00 - 09:00 Validation - Eastbound				
		From	-	To	Dist.	Avg.	Min.	Avg.	Max.	Actual Diff.	% Diff.	Within 15%	Within 1 min.	Validates
19	EB	A49 Winwick Rd	-	Chiltern Rd	117m	22	17	18	18	-4	-18%	×	✓	✓
20	EB	Chiltern Rd	-	Sandy Lane	179m	24	24	24	24	0	0%	✓	✓	✓
TOTAL	EB	A49 Winwick Rd	-	Sandy Lane	296m	45	41	41	42	-4	-9%	✓	✓	✓

Section	Direction	Description			Observed		Modelled			AM Peak 08:00 - 09:00 Validation - Westbound				
		From	-	To	Dist.	Avg.	Min.	Avg.	Max.	Actual Diff.	% Diff.	Within 15%	Within 1 min.	Validates
20	WB	Sandy Lane	-	Chiltern Rd	187m	166	83	135	167	-31	-19%	×	✓	✓
19	WB	Chiltern Rd	-	A49 Winwick Rd	115m	70	63	74	84	3	5%	✓	✓	✓
TOTAL	WB	Sandy Lane	-	A49 Winwick Rd	302m	236	146	209	250	-28	-12%	✓	✓	✓

TABLE 4.5: EAST-WEST SANDY LANE WEST JOURNEY TIME SECTIONS – AM PEAK

Section	Direction	Description			Observed		Modelled			AM Peak 08:00 - 09:00 Validation - Westbound				
		From	-	To	Dist.	Avg.	Min.	Avg.	Max.	Actual Diff.	% Diff.	Within 15%	Within 1 min.	Validates
21	WB	Sandy Lane	-	Clough Ave	260m	32	29	30	32	-2	-7%	✓	✓	✓
22	WB	Clough Ave	-	A50 Long Lane	344m	89	70	80	107	-8	-9%	✓	✓	✓
TOTAL	WB	Sandy Lane	-	A50 Long Lane	604m	121	100	110	137	-11	-9%	✓	✓	✓

TABLE 4.6: WESTBOUND NORTHWAY JOURNEY TIME SECTIONS – AM PEAK

Section	Direction	Description		Observed		Modelled			AM Peak 08:00 - 09:00 Validation - Eastbound				
		From	To	Dist.	Avg.	Min.	Avg.	Max.	Actual Diff.	% Diff.	Within 15%	Within 1 min.	Validates
23	EB	A49 Winwick Rd	Fisher Ave	399m	39	40	42	43	2	6%	✓	✓	✓
24	EB	Fisher Ave	Birtles Rd	486m	67	65	69	77	2	4%	✓	✓	✓
25	EB	Birtles Rd	Hallfields Rd	129m	47	43	45	49	-3	-6%	✓	✓	✓
26	EB	Hallfields Rd	Birtles Rd	203m	19	21	21	21	2	12%	✓	✓	✓
27	EB	Birtles Rd	Bruce Ave	67m	7	7	7	7	0	3%	✓	✓	✓
28	EB	Bruce Ave	Poplars Ave	145m	20	19	19	19	-1	-6%	✓	✓	✓
TOTAL	EB	A49 Winwick Rd	Poplars Ave	1429m	200	197	203	216	3	2%	✓	✓	✓

Section	Direction	Description		Observed		Modelled			AM Peak 08:00 - 09:00 Validation - Westbound				
		From	To	Dist.	Avg.	Min.	Avg.	Max.	Actual Diff.	% Diff.	Within 15%	Within 1 min.	Validates
28	WB	Poplars Ave	Birtles Rd	145m	29	19	21	23	-7	-26%	×	✓	✓
27	WB	Bruce Ave	Birtles Rd	65m	9	7	7	8	-2	-24%	×	✓	✓
26	WB	Birtles Rd	Hallfields Rd	205m	50	41	44	46	-6	-13%	✓	✓	✓
25	WB	Hallfields Rd	Birtles Rd	132m	21	24	26	27	6	27%	×	✓	✓
24	WB	Birtles Rd	Fisher Ave	483m	74	67	70	74	-4	-5%	✓	✓	✓
23	WB	Fisher Ave	A49 Winwick Rd	397m	72	73	76	82	4	6%	✓	✓	✓
TOTAL	WB	Poplars Ave	A49 Winwick Rd	1426m	255	234	245	251	-10	-4%	✓	✓	✓

TABLE 4.7: EAST-WEST A50 LONG LANE JOURNEY TIME SECTIONS – AM PEAK

Section	Direction	Description		Observed		Modelled			PM Peak 17:00 - 18:00 Validation - Northbound				
		From	To	Dist.	Avg.	Min.	Avg.	Max.	Actual Diff.	% Diff.	Within 15%	Within 1 min.	Validates
1	NB	Winwick Link Rd	- Hollins Ln	384m	84	80	83	86	-2	-2%	✓	✓	✓
2	NB	Roundabout		43m	5	5	5	6	0	2%	✓	✓	✓
3	NB	M62 Junction 9	- Winwick Link Rd	447m	105	91	95	101	-10	-10%	✓	✓	✓
4	NB	M62 Junction 9		254m	40	35	37	40	-3	-8%	✓	✓	✓
5	NB	Cromwell Ave	- M62 Junction 9	810m	86	78	79	80	-7	-8%	✓	✓	✓
6	NB	Roundabout		63m	6	6	6	6	-1	-9%	✓	✓	✓
7	NB	Hawleys Ln	- Cromwell Ave	645m	137	136	143	153	5	4%	✓	✓	✓
8	NB	Ireland St	- Hawleys Ln	720m	251	214	262	290	11	4%	✓	✓	✓
TOTAL	NB	Ireland St	- Hollins Ln	3364m	716	670	709	727	-7	-1%	✓	✓	✓

Section	Direction	Description		Observed		Modelled			PM Peak 17:00 - 18:00 Validation - Southbound				
		From	To	Dist.	Avg.	Min.	Avg.	Max.	Actual Diff.	% Diff.	Within 15%	Within 1 min.	Validates
1	SB	Hollins Ln	- Winwick Link Rd	356m	64	63	64	69	0	0%	✓	✓	✓
2	SB	Roundabout		110m	17	17	17	17	0	2%	✓	✓	✓
3	SB	Winwick Link Rd	- M62 Junction 9	492m	114	95	121	136	7	6%	✓	✓	✓
4	SB	M62 Junction 9		232m	30	34	34	35	4	13%	✓	✓	✓
5	SB	M62 Junction 9	- Sandy Ln	811m	94	88	92	97	-2	-2%	✓	✓	✓
6	SB	Roundabout		68m	15	12	12	13	-3	-20%	×	✓	✓
7	SB	Sandy Ln	- Long Ln	650m	97	85	92	99	-5	-5%	✓	✓	✓
8	SB	Long Ln	- Ireland St	725m	75	71	71	71	-4	-5%	✓	✓	✓
TOTAL	SB	Hollins Ln	- Ireland St	3444m	507	468	504	535	-2	0%	✓	✓	✓

TABLE 4.8: NORTH-SOUTH A49 JOURNEY TIME SECTIONS – PM PEAK

Section	Direction	Description			Observed		Modelled			PM Peak 17:00 - 18:00 Validation - Eastbound				
		From	-	To	Dist.	Avg.	Min.	Avg.	Max.	Actual Diff.	% Diff.	Within 15%	Within 1 min.	Validates
9	EB	EB M62	-	EB M62	1313m	56	56	56	57	0	0%	✓	✓	✓
10	EB	EB M62	-	EB M62 offslip	347m	17	15	15	15	-2	-12%	✓	✓	✓
11	EB	EB M62 offslip	-	M62 J9	291m	169	127	164	213	-4	-3%	✓	✓	✓
12	EB	EB M62 @ J9	-	EB M62 @ J9	869m	35	37	37	37	2	6%	✓	✓	✓
13	EB	M62 J9	-	EB M62 onslip	433m	25	27	28	28	2	10%	✓	✓	✓
14	EB	EB M62 onslip	-	EB M62	1074m	42	47	47	47	5	11%	✓	✓	✓
15	EB	EB M62/M6	-	M6	624m	26	25	26	26	0	-1%	✓	✓	✓
16	EB	EB M62	-	EB M62	1115m	65	65	65	66	1	1%	✓	✓	✓
TOTAL	EB	EB M62	-	EB M62	6065m	434	401	438	488	4	1%	✓	✓	✓

Section	Direction	Description			Observed		Modelled			PM Peak 17:00 - 18:00 Validation - Westbound				
		From	-	To	Dist.	Avg.	Min.	Avg.	Max.	Actual Diff.	% Diff.	Within 15%	Within 1 min.	Validates
16	WB	WB M62	-	WB M62	454m	16	17	17	17	1	7%	✓	✓	✓
14	WB	WB M62	-	WB M62 offslip	1739m	66	68	69	70	4	5%	✓	✓	✓
13	WB	WB M62 offslip	-	M62 J9	413m	53	53	54	55	1	2%	✓	✓	✓
12	WB	WB M62 @ J9	-	WB M62 @ J9	958m	32	37	37	38	5	15%	✓	✓	✓
11	WB	M62 J9	-	WB M62 onslip	399m	22	20	20	20	-2	-7%	✓	✓	✓
10	WB	WB M62 onslip	-	WB M62	220m	10	9	9	9	0	-3%	✓	✓	✓
9	WB	WB M62	-	WB M62	1344m	63	64	65	66	2	3%	✓	✓	✓
TOTAL	WB	WB M62	-	WB M62	5527m	262	270	272	274	11	4%	✓	✓	✓

TABLE 4.9: EAST-WEST M62 JOURNEY TIME SECTIONS – PM PEAK

Section	Direction	Description			Observed		Modelled			PM Peak 17:00 - 18:00 Validation - Eastbound				
		From	-	To	Dist.	Avg.	Min.	Avg.	Max.	Actual Diff.	% Diff.	Within 15%	Within 1 min.	Validates
17	EB	Callands Rd	-	Calver Rd	901m	154	121	136	150	-17	-11%	✓	✓	✓
18a	EB	Calver Rd	-	Cromwell Ave LT	153m	30	30	32	33	2	7%	✓	✓	✓
18b	EB	Calver Rd	-	Cromwell Ave RT	156m	31	35	36	38	5	16%	×	✓	✓
TOTAL	EB	Callands Rd	-	A49 Winwick Rd	1210m	215	190	204	217	-10	-5%	✓	✓	✓

Section	Direction	Description			Observed		Modelled			PM Peak 17:00 - 18:00 Validation - Westbound				
		From	-	To	Dist.	Avg.	Min.	Avg.	Max.	Actual Diff.	% Diff.	Within 15%	Within 1 min.	Validates
18	WB	A49 Winwick Rd	-	Calver Rd	107m	14	16	16	17	2	14%	✓	✓	✓
17	WB	Calver Rd	-	Callands Rd	958m	65	59	60	60	-6	-9%	✓	✓	✓
TOTAL	WB	A49 Winwick Rd	-	Callands Rd	1065m	80	76	76	77	-4	-4%	✓	✓	✓

TABLE 4.10: EAST-WEST CROMWELL AVENUE JOURNEY TIME SECTIONS – PM PEAK

Section	Direction	Description			Observed		Modelled			PM Peak 17:00 - 18:00 Validation - Eastbound				
		From	-	To	Dist.	Avg.	Min.	Avg.	Max.	Actual Diff.	% Diff.	Within 15%	Within 1 min.	Validates
19	EB	A49 Winwick Rd	-	Chiltern Rd	117m	21	18	19	20	-2	-10%	✓	✓	✓
20	EB	Chiltern Rd	-	Sandy Lane	179m	25	23	24	24	-1	-3%	✓	✓	✓
TOTAL	EB	A49 Winwick Rd	-	Sandy Lane	296m	46	42	43	45	-3	-6%	✓	✓	✓

Section	Direction	Description			Observed		Modelled			PM Peak 17:00 - 18:00 Validation - Westbound				
		From	-	To	Dist.	Avg.	Min.	Avg.	Max.	Actual Diff.	% Diff.	Within 15%	Within 1 min.	Validates
20	WB	Sandy Lane	-	Chiltern Rd	187m	70	44	49	58	-21	-30%	×	✓	✓
19	WB	Chiltern Rd	-	A49 Winwick Rd	115m	47	57	59	64	12	26%	×	✓	✓
TOTAL	WB	Sandy Lane	-	A49 Winwick Rd	302m	117	103	108	122	-9	-8%	✓	✓	✓

TABLE 4.11: EAST-WEST SANDY LANE WEST JOURNEY TIME SECTIONS – PM PEAK

Section	Direction	Description			Observed		Modelled			PM Peak 17:00 - 18:00 Validation - Westbound				
		From	-	To	Dist.	Avg.	Min.	Avg.	Max.	Actual Diff.	% Diff.	Within 15%	Within 1 min.	Validates
21	WB	Sandy Lane	-	Clough Ave	260m	24	26	27	27	2	10%	✓	✓	✓
22	WB	Clough Ave	-	A50 Long Lane	344m	65	51	66	90	1	1%	✓	✓	✓
TOTAL	WB	Sandy Lane	-	A50 Long Lane	604m	90	78	93	117	3	3%	✓	✓	✓

TABLE 4.12: WESTBOUND NORTHWAY JOURNEY TIME SECTIONS – PM PEAK

Section	Direction	Description		Observed		Modelled			PM Peak 17:00 - 18:00 Validation - Eastbound				
		From	To	Dist.	Avg.	Min.	Avg.	Max.	Actual Diff.	% Diff.	Within 15%	Within 1 min.	Validates
23	EB	A49 Winwick Rd	Fisher Ave	399m	34	41	41	42	7	21%	x	✓	✓
24	EB	Fisher Ave	Birtles Rd	486m	57	60	60	62	4	6%	✓	✓	✓
25	EB	Birtles Rd	Hallfields Rd	129m	45	37	39	42	-6	-13%	✓	✓	✓
26	EB	Hallfields Rd	Birtles Rd	203m	18	20	21	22	3	17%	x	✓	✓
27	EB	Birtles Rd	Bruce Ave	67m	8	7	8	8	0	-2%	✓	✓	✓
28	EB	Bruce Ave	Poplars Ave	145m	20	20	20	21	0	0%	✓	✓	✓
TOTAL	EB	A49 Winwick Rd	Poplars Ave	1429m	182	187	190	193	7	4%	✓	✓	✓

Section	Direction	Description		Observed		Modelled			PM Peak 17:00 - 18:00 Validation - Westbound				
		From	To	Dist.	Avg.	Min.	Avg.	Max.	Actual Diff.	% Diff.	Within 15%	Within 1 min.	Validates
28	WB	Poplars Ave	Bruce Ave	145m	25	19	22	25	-3	-11%	✓	✓	✓
27	WB	Bruce Ave	Birtles Rd	65m	10	8	9	10	-1	-10%	✓	✓	✓
26	WB	Birtles Rd	Hallfields Rd	205m	59	53	55	59	-4	-6%	✓	✓	✓
25	WB	Hallfields Rd	Birtles Rd	132m	24	25	27	29	3	12%	✓	✓	✓
24	WB	Birtles Rd	Fisher Ave	483m	84	74	77	84	-7	-8%	✓	✓	✓
23	WB	Fisher Ave	A49 Winwick Rd	397m	119	83	120	138	2	1%	✓	✓	✓
TOTAL	WB	Poplars Ave	A49 Winwick Rd	1426m	320	267	311	340	-10	-3%	✓	✓	✓

TABLE 4.13: EAST-WEST A50 LONG LANE JOURNEY TIME SECTIONS – PM PEAK

4.2.2 In accordance with WebTAG Unit 3.1 criteria, which recommends that the difference between observed and modelled journey times should be within 15% (or 1 minute if higher) for at least 85% of the routes evaluated (although that criteria is ideally designed for route sections over 3km in length) it can be seen from Tables 4.2 – 4.13 (on the preceding pages) that in total 95/108 model route sections (88%) are within 15% and all route sections are within 60 seconds of the observed.

4.2.3 As some of the route sections are very short in length this means that the percentage difference represents a very low actual difference (in seconds). However, the overall route times were within 15% and 60 seconds of the observed timings in both peaks for 100% of routes. This is a very robust validation result, indicative of a good likeness between modelled performance and on-street conditions.

4.2.4 Further details can be found in Appendix B.

4.3 Link Validation

4.3.1 The modelled flows for the M62 have been compared to the motorway flows from the HATRIS Database not used in the flow calibration process. Together these provide an independent dataset to determine the robustness of the model.

	AM Peak	PM Peak
Criteria	08:00-09:00	17:00-18:00
85% of VISSIM counts with GEH <=3	71.4%	100.0%
85% of VISSIM counts with GEH <=5	100.0%	100.0%
100% of VISSIM counts with GEH <=10	100.0%	100.0%
85% of VISSIM counts meeting WebTAG Unit 3.1 flow criteria	100.0%	100.0%

TABLE 4.14: LINK VALIDATION SUMMARY

4.3.2 The results in Table 4.3 show that overall, for each of the peak hours modelled, the GEH is less than five for 100% of cases. Furthermore, WebTAG Unit 3.1 flow criteria is also met.

4.3.3 Although not required within the WebTAG criteria, the counts have also been tested against a more stringent criteria of having a GEH value of less than 3. These results are presented for transparency. In the AM peak, there are just two measures which are over 3 (but still under the required measure of 5), which brings the percentage to 71.4%. In the PM peak, 100% of measures are also below a GEH value of 3.

4.3.4 Appendix C shows the Link Validation in more detail.

4.4 Validation Summary

- 4.4.1 Overall, based on the journey time and link validation results, a good fit between observed and modelled results has been achieved. 100% of AM and 100% of PM peak complete journey time routes validated within the 15% criteria, with 100% of full routes and route sections falling within the 60 second criteria.
- 4.4.2 A breakdown of the smaller sections that make up the complete routes has been provided, showing that 85% fall within 15% in the AM and 88% fall within 15% in the PM. WebTAG stipulates that 85% of assessed journey times should fall within 15% (or 60 seconds, if higher).
- 4.4.3 Although not all route sections validate within the 15% criteria, this is largely as a result of the small tolerance levels when applying percentages to small observed values. This is backed up by TAG Unit M3.1 which states that *“The validation routes should be neither excessively long (greater than 15 km) nor excessively short (less than 3 km)”* At the size of individual sections (average size is below 500m), very small actual differences (typically less than 7 seconds) can equate to more than a 15% difference, due to the section having a very low journey time. In these instances, a common sense judgement has to be applied when deciding the logical cut-off for effort vs reward in terms of contribution to overall model robustness.
- 4.4.4 In the AM peak, 90% of turning counts achieve a GEH value of under 3. In the PM peak, 92.5% of turning counts achieve a GEH value under 3, with the remaining movements all achieving a GEH value under 5. For the seven link count sites on the motorway, all achieve a GEH value of under 5%. This signifies a very robust relationship between model performance and collected site data.
- 4.4.5 This model has been created from a hybrid of different data sources, and considering all audit comments received regarding current levels of queuing and delay within the network (typical data drawn from current Big Data sources such as Google Traffic or anecdotal evidence taken from local knowledge), it is considered that the validation achieved is appropriate. The model is therefore considered to be fit for purpose.

5 SUMMARY & RECOMMENDATIONS

In summary, the results demonstrate a suitable fit between modelled and observed flows with an accurate distribution of traffic and delays around the network, representative of a typical weekday in April 2019 (avoiding the school holidays). As such, the base models are considered an appropriate starting point to test any future impact of the Peel Hall development.

APPENDIX A:

TURNING COUNT CALIBRATION RESULTS



AM Peak (08:00-09:00) Summary

Total number of counts considered	40
VISSIM model counts with GEH <3	36
% of VISSIM counts with GEH <3	90.00%
VISSIM model counts with GEH <5	40
% of VISSIM counts with GEH <5	100.00%
VISSIM model counts with GEH <10	40
% of VISSIM counts with GEH <10	100.00%
VISSIM model counts meeting WebTAG Unit 3.1 criteria	40
% of VISSIM counts meeting WebTAG Unit 3.1 flow criteria	100.00%

Junction	Junction/ Movement	Vehicle Flow		Difference		GEH Criteria Met			Flow Criteria Met			
		Observed	Modelled	Actual	%	Critical	GEH	Pass	FLOW	<700	700-2700	>2700
A49 Newton Road/ Delph Lane	A49 NB	1266	1262	-4	0%	N	0.11	✓	✓			
	A49 NB to Delph Ln	179	197	18	10%	N	1.31	✓	✓			
	A49 SB	1699	1722	23	1%	N	0.56	✓	✓			
	A49 SB to Delph Ln	64	67	3	5%	N	0.37	✓	✓			
	Delph Ln to A49 NB	87	97	10	11%	N	1.04	✓	✓			
	Delph Ln to A49 SB	192	211	19	10%	N	1.34	✓	✓			
A49 Winwick Road @ Poplars Avenue	A49 NB to Woburn Rd	16	26	10	63%	N	2.18	✓	✓			
	A49 NB	1220	1362	142	12%	N	3.95	✓	✓			
	A49 SB	1650	1792	142	9%	N	3.42	✓	✓			
A49 Winwick Road/ A574 Cromwell Avenue/ Sandy Lane West	A49 SB to Sandy Ln	154	167	13	8%	N	1.03	✓	✓			
	A49 SB	1277	1283	6	0%	N	0.17	✓	✓			
	A49 SB to Cromwell Ave	243	277	34	14%	N	2.11	✓	✓			
	Cromwell Ave to A49 NB	250	278	28	11%	N	1.72	✓	✓			
	Cromwell Ave to Sandy Ln	314	351	37	12%	N	2.03	✓	✓			
	Cromwell Ave to A49 SB	645	574	-71	-11%	N	2.88	✓	✓			
	Cromwell Ave to Cromwell Ave (U-turn)	55	55	0	0%	N	0.00	✓	✓			
	A49 NB	776	820	44	6%	N	1.56	✓	✓			
	A49 NB to Sandy Ln	71	73	2	3%	N	0.24	✓	✓			
	A49 NB to Cromwell Ave	424	440	16	4%	N	0.77	✓	✓			
	Sandy Ln to A49 NB	210	265	55	26%	N	3.57	✓	✓			
	Sandy Ln to Sandy Ln (U-turn)	0	0	0	-	N	0.00	✓	✓			
Sandy Ln to A49 SB	81	112	31	38%	N	3.16	✓	✓				
Sandy Ln to Cromwell Ave	203	236	33	16%	N	2.23	✓	✓				
A49 Winwick Road @ Junction NINE Retail Park	A49 SB	1888	1835	-53	-3%	N	1.23	✓	✓			
	A49 SB to Junction NINE Retail	115	126	11	10%	N	1.00	✓	✓			
	A49 NB	1199	1258	59	5%	N	1.68	✓	✓			
	Junction NINE Retail to A49 SB	16	19	3	19%	N	0.72	✓	✓			
	Junction NINE Retail to A49 NB	72	77	5	7%	N	0.58	✓	✓			
A49 Winwick Road/ Hawleys Lane/ A50 Long Lane	A49 SB to Hawleys Lane	199	208	9	5%	N	0.63	✓	✓			
	A49 SB to Long Lane	258	267	9	3%	N	0.56	✓	✓			
	A49 SB	1447	1351	-96	-7%	N	2.57	✓	✓			
	A49 NB to Hawleys Lane	77	82	5	6%	N	0.56	✓	✓			
	A49 NB to Long Lane	236	200	-36	-15%	N	2.44	✓	✓			
	A49 NB	805	805	0	0%	N	0.00	✓	✓			
	Long Lane to A49 SB	390	430	40	10%	N	1.98	✓	✓			
	Long Lane to Hawleys Lane	134	153	19	14%	N	1.59	✓	✓			
	Long Lane to A49 NB	239	282	43	18%	N	2.66	✓	✓			
	Hawleys Lane to Long Lane	113	94	-19	-17%	N	1.87	✓	✓			
Hawleys Lane to A49 SB	58	53	-5	-9%	N	0.67	✓	✓				
Hawleys Lane to A49 NB	174	167	-7	-4%	N	0.54	✓	✓				

PM Peak (17:00-18:00) Summary

Total number of counts considered	40
VISSIM model counts with GEH <3	37
% of VISSIM counts with GEH <3	92.50%
VISSIM model counts with GEH <5	40
% of VISSIM counts with GEH <5	100.00%
VISSIM model counts with GEH <10	40
% of VISSIM counts with GEH <10	100.00%
VISSIM model counts meeting WebTAG Unit 3.1 criteria	40
% of VISSIM counts meeting WebTAG Unit 3.1 flow criteria	100.00%

Junction/ Movement		Vehicle Flow		Difference		GEH Criteria Met			Flow Criteria Met			
Junction	Approach	Observed	Modelled	Actual	%	Critical	GEH	Pass	FLOW	<700	700 - 2700	>2700
A49 Newton Road/ Delph Lane	A49 NB	1739	1726	-13	-1%	N	0.31	✓	✓			
	A49 NB to Delph Ln	203	213	10	5%	N	0.69	✓	✓			
	A49 SB	1273	1250	-23	-2%	N	0.65	✓	✓			
	A49 SB to Delph Ln	111	118	7	6%	N	0.65	✓	✓			
	Delph Ln to A49 NB	195	175	-20	-10%	N	1.47	✓	✓			
	Delph Ln to A49 SB	169	191	22	13%	N	1.64	✓	✓			
A49 Winwick Road @ Poplars Avenue	A49 NB to Woburn Rd	23	14	-9	-39%	N	2.09	✓	✓			
	A49 NB	2008	1978	-30	-1%	N	0.67	✓	✓			
	A49 SB	1345	1323	-22	-2%	N	0.60	✓	✓			
A49 Winwick Road/ A574 Cromwell Avenue/ Sandy Lane West	A49 SB to Sandy Ln	233	220	-13	-6%	N	0.86	✓	✓			
	A49 SB	822	804	-18	-2%	N	0.63	✓	✓			
	A49 SB to Cromwell Ave	306	286	-20	-7%	N	1.16	✓	✓			
	Cromwell Ave to A49 NB	403	377	-26	-6%	N	1.32	✓	✓			
	Cromwell Ave to Sandy Ln	259	315	56	22%	N	3.31	✓	✓			
	Cromwell Ave to A49 SB	517	529	12	2%	N	0.52	✓	✓			
	Cromwell Ave to Cromwell Ave (U-turn)	96	81	-15	-16%	N	1.59	✓	✓			
	A49 NB	1423	1429	6	0%	N	0.16	✓	✓			
	A49 NB to Sandy Ln	104	114	10	10%	N	0.96	✓	✓			
	A49 NB to Cromwell Ave	657	659	2	0%	N	0.08	✓	✓			
	Sandy Ln to A49 NB	205	182	-23	-11%	N	1.65	✓	✓			
	Sandy Ln to Sandy Ln (U-turn)	0	0	0	-	N	0.00	✓	✓			
	Sandy Ln to A49 SB	103	93	-10	-10%	N	1.01	✓	✓			
Sandy Ln to Cromwell Ave	260	236	-24	-9%	N	1.52	✓	✓				
A49 Winwick Road @ Junction NINE Retail Park	A49 SB	1309	1295	-14	-1%	N	0.39	✓	✓			
	A49 SB to Junction NINE Retail	133	127	-6	-5%	N	0.53	✓	✓			
	A49 NB	1923	1945	22	1%	N	0.50	✓	✓			
	Junction NINE Retail to A49 SB	103	104	1	1%	N	0.10	✓	✓			
	Junction NINE Retail to A49 NB	261	259	-2	-1%	N	0.12	✓	✓			
A49 Winwick Road/ Hawleys Lane/ A50 Long Lane	A49 SB to Hawleys Lane	189	200	11	6%	N	0.79	✓	✓			
	A49 SB to Long Lane	319	354	35	11%	N	1.91	✓	✓			
	A49 SB	904	849	-55	-6%	N	1.86	✓	✓			
	A49 NB to Hawleys Lane	70	50	-20	-29%	N	2.58	✓	✓			
	A49 NB to Long Lane	215	164	-51	-24%	N	3.70	✓	✓			
	A49 NB	1357	1374	17	1%	N	0.46	✓	✓			
	Long Lane to A49 SB	246	308	62	25%	N	3.73	✓	✓			
	Long Lane to Hawleys Lane	158	172	14	9%	N	1.09	✓	✓			
	Long Lane to A49 NB	298	336	38	13%	N	2.13	✓	✓			
	Hawleys Lane to Long Lane	134	106	-28	-21%	N	2.56	✓	✓			
	Hawleys Lane to A49 SB	65	76	11	17%	N	1.31	✓	✓			
Hawleys Lane to A49 NB	353	371	18	5%	N	0.95	✓	✓				

APPENDIX B:

JOURNEY TIME VALIDATION RESULTS

APPENDIX C:

HATRIS MOTORWAY COUNT VALIDATION RESULTS

		OBSERVED - AM HATRIS					
		07:00-08:00		08:00-09:00		09:00-09:30	
#		#Veh	Mph	#Veh	Mph	#Veh	Mph
EB_M62_WestOfJ9	13	4844	53.5	4413	55	1979	58
WB_M62_WestOfJ9	14	4661	62	4337	59.25	2124	61
EB_M62_J9	15	3577	38	3150	44.75	1418	58
WB_M62_J9	16	3395	65.75	3278	62	1589	64.5
EB_M62_EastOfJ9	17	4291	34.75	3697	39	1676	56.5
WB_M62_EastOfJ9	18	3908	64.75	3940	62.5	1890	63
EB_M62-M6link	19	2065	43.75	2207	43.75	955	43.5

		OBSERVED - PM HATRIS					
		16:00-17:00		17:00-18:00		18:00-18:30	
#		#Veh	Mph	#Veh	Mph	#Veh	Mph
		5205	59.75	4826	61	2137	59
		5658	51.75	5935	61.5	2713	62
		4219	59.25	3879	60	1618	60
		4569	53.5	4720	64	2253	64
		5120	58	4748	58	1951	59
		5410	52.75	5574	63	2610	63
		2614	47.75	2286	54.75	979	55

		DIFFERENCE - AM ACTUAL					
		07:00-08:00		08:00-09:00		09:00-09:30	
#		#Veh	Mph	#Veh	Mph	#Veh	Mph
EB_M62_WestOfJ9	13	90	-0.8	-245	-1.9	-50	-4.7
WB_M62_WestOfJ9	14	-255	-13	10	-9.4	15	-11
EB_M62_J9	15	271	9.87	135	4.51	149	-8.3
WB_M62_J9	16	50	-4.3	-172	0.32	-13	-2.5
EB_M62_EastOfJ9	17	-6	11.3	293	8.15	188	-8.5
WB_M62_EastOfJ9	18	268	-6.1	98	-4	70	-4.1
EB_M62-M6link	19	68	4.29	48	4.64	7	6.05

		DIFFERENCE - PM ACTUAL					
		16:00-17:00		17:00-18:00		18:00-18:30	
#		#Veh	Mph	#Veh	Mph	#Veh	Mph
		251	-7.2	46	-8.2	-5	-6.1
		-120	-4.4	-79	-14	-41	-14
		283	-7.2	117	-7.7	137	-7.4
		51	7	50	-4.1	-105	-3
		-119	-7.7	-116	-7.3	103	-7.6
		-89	3.72	-99	-6.8	-106	-5.5
		-26	7.66	-1	1.47	6	2.29

		MODELLED - AM VISSIM					
		07:00-08:00		08:00-09:00		09:00-09:30	
#		#Veh	Mph	#Veh	Mph	#Veh	Mph
EB_M62_WestOfJ9	13	4934	52.75	4168	53.14	1929	53.3
WB_M62_WestOfJ9	14	4406	49.37	4347	49.82	2139	49.9
EB_M62_J9	15	3848	47.87	3285	49.26	1567	49.7
WB_M62_J9	16	3445	61.45	3106	62.32	1576	62
EB_M62_EastOfJ9	17	4285	46.08	3990	47.15	1864	48
WB_M62_EastOfJ9	18	4176	58.62	4038	58.47	1960	58.9
EB_M62-M6link	19	2133	48.04	2255	48.39	962	49.6

		MODELLED - PM VISSIM					
		16:00-17:00		17:00-18:00		18:00-18:30	
#		#Veh	Mph	#Veh	Mph	#Veh	Mph
		5456	52.52	4872	52.77	2132	52.9
		5538	47.39	5856	47.09	2672	48.3
		4502	52.01	3996	52.29	1755	52.6
		4620	60.5	4770	59.92	2148	61
		5001	50.31	4632	50.71	2054	51.4
		5321	56.47	5475	56.19	2504	57.5
		2588	55.41	2285	56.22	985	57.3

		DIFFERENCE - AM PERCENTAGE					
		07:00-08:00		08:00-09:00		09:00-09:30	
#		#Veh	Mph	#Veh	Mph	#Veh	Mph
EB_M62_WestOfJ9	13	2%	-1%	-6%	-3%	-3%	-8%
WB_M62_WestOfJ9	14	-5%	-20%	0%	-16%	1%	-18%
EB_M62_J9	15	8%	26%	4%	10%	11%	-14%
WB_M62_J9	16	1%	-7%	-5%	1%	-1%	-4%
EB_M62_EastOfJ9	17	0%	33%	8%	21%	11%	-15%
WB_M62_EastOfJ9	18	7%	-9%	2%	-6%	4%	-6%
EB_M62-M6link	19	3%	10%	2%	11%	1%	14%

		DIFFERENCE - PM PERCENTAGE					
		16:00-17:00		17:00-18:00		18:00-18:30	
#		#Veh	Mph	#Veh	Mph	#Veh	Mph
		5%	-12%	1%	-13%	0%	-10%
		-2%	-8%	-1%	-23%	-2%	-22%
		7%	-12%	3%	-13%	8%	-12%
		1%	13%	1%	-6%	-5%	-5%
		-2%	-13%	-2%	-13%	5%	-13%
		-2%	7%	-2%	-11%	-4%	-9%
		-1%	16%	0%	3%	1%	4%

		DIFFERENCE - AM GEH (VOLUME)					
		07:00-08:00		08:00-09:00		09:00-09:30	
#		#Veh	Mph	#Veh	Mph	#Veh	Mph
EB_M62_WestOfJ9	13	1.3	-1%	3.7	-3%	1.13	-8%
WB_M62_WestOfJ9	14	3.8	-20%	0.2	-16%	0.32	-18%
EB_M62_J9	15	4.4	26%	2.4	10%	3.86	-14%
WB_M62_J9	16	0.9	-7%	3.0	1%	0.33	-4%
EB_M62_EastOfJ9	17	0.1	33%	4.7	21%	4.47	-15%
WB_M62_EastOfJ9	18	4.2	-9%	1.6	-6%	1.60	-6%
EB_M62-M6link	19	1.5	10%	1.0	11%	0.23	14%

		DIFFERENCE - PM GEH (VOLUME)					
		16:00-17:00		17:00-18:00		18:00-18:30	
#		#Veh	Mph	#Veh	Mph	#Veh	Mph
		3.44	-12%	0.7	-13%	0.1	-10%
		1.60	-8%	1.0	-23%	0.8	-22%
		4.29	-12%	1.9	-13%	3.3	-12%
		0.75	13%	0.7	-6%	2.2	-5%
		1.67	-13%	1.7	-13%	2.3	-13%
		1.22	7%	1.3	-11%	2.1	-9%
		0.51	16%	0.0	3%	0.2	4%

APP30 -

MG0123_A49WarringtonCorridor_ChangesRegistry_Oct2020_v1

Prepared by: Luke Best	Reviewed by: Carl Moreno
Client: Satnam Millennium Ltd	Date: 15/10/2020

MG0123 – A49 Warrington, Peel Hall – Changes Registry

1. Introduction

- 1.1. The aim of this note is to provide a detailed technical registry of all changes carried out to the base VISSIM model since the previous audit submission point (September – v5.2). The latest version of the model and all associated spreadsheets and reports will now refer to v6 as the model designation.

2. Speed Control – Reduced Speed Areas (RSA) & Associated Desired Speed Profiles

- **RSA 162, 167, 220, 227** – Southbound A49 approach to Sandy Lane West roundabout – shortened in length to create prior space for the insertion of **RSA 1503, 1507, 1508, 1509** (using 20mph reduced speed profile).
 - Changes aimed at adjusting saturation flow/ queue lengths/ journey times.
- **RSA 1430, 1431, 1445, 1446, 1461, 1462** – Eastbound M62 exit controls – time from and time to points adjusted and associated speed profiles refined in the morning peak.
 - Changes aimed at adjusting saturation flow and queue lengths in order to improve journey times.
- **RSA 1470 & 1471** – Westbound stopline Sandy Lane West – length extended.
 - Changes aimed at adjusting saturation flow to improve queue lengths and journey times.
- **RSA 1473 & 1474** – Eastbound Cromwell Avenue stopline controls at A49 junction – RSA length extended.
 - Changes aimed at adjusting saturation flow in order to improve journey times.
- **RSA 1477** – Westbound Sandy Lane West – RSA length extended further eastwards along Sandy Lane West. Also now assigned a dedicated speed profile (2113–SandyLaneWestWBDelay).
 - Changes aimed at replicating delays from multiple side road entry points.
- **RSA 1478** – Westbound Cromwell Avenue stopline control for right turners at Calver Road – RSA length reduced.
 - Changes aimed at adjusting saturation flow.
- **RSA 1500 & 1501 added** – Northbound A49 stopline controls at Delph Lane junction.
 - Changes to aid in queue length formation/journey time calibration (30mph reduced speed).

- **RSA 1502** – Eastbound Sandy Lane West – *20mph reduced speed* added.
 - Changes aimed at adjusting delay/speed at/near junction mouth.
- **RSA 1510 & 1511** – Eastbound Cromwell Avenue stopline control at Calver Road junction – RSA inserted (*20mph reduced speed profile*).
 - Changes aimed at adjusting saturation flow to affect queuing and delays.

3. Speed Control – Desired Speed Controls

- **#158-161** – eastbound M62 entry – changed to Motorway profile (70mph)
 - Change to correct the speed profile
- **#578-580** – eastbound M62 at offslip – controls to change to 60mph profile in morning peak
 - Refinement based on HATRIS data.
- **#551-584** – westbound M62 at onslip – controls to change to 70mph profile
 - Refinement based on HATRIS data

4. Priority Control

- **#1832** – Sandy Lane West – settings changed to smooth/alter start-stop effect
- **#1939 & 1940** – Northbound A49 ‘yellow box’ type controls to stop junction blocking at Junction Nine Retail Park junction
- **#1937 & 1938** – Northbound A49 ‘yellow box’ type controls to stop junction blocking at Hawley’s Lane/Long Lane junction

5. Vehicle Inputs

- **#444** – Westbound entry A50 Long Lane – change to volume/profile to affect queue lengths at A49 junction
- **#289** – Westbound entry Sandy Lane West – change to volume/profile to affect queue lengths at A49 junction
- **#269 (plus #273 & #221 in the PM peak)** – Side arm entry to Hawley’s Lane – change to volume/profile to affect queue lengths at A49 junction
- **#255** – Side arm entry to A50 Long Lane – change to volume/profile to affect queue lengths at A49 junction/performance of A50 Long Lane
- **#243** – Side arm entry to Sandy Lane West – change to volume/profile to affect queue lengths at A49 junction/performance of Sandy Lane West
- **#235 (#154 in the PM peak)** – Northway entry to A50 Long Lane – change to volume/profile to affect queue lengths at A49 junction/performance of A50 Long Lane/performance on Northway

- **#233** – Side arm entry to A50 Long Lane – change to volume/profile to affect queue lengths at A49 junction/performance of A50 Long Lane
- **#182** – Eastbound entry to Cromwell Avenue – change to volume/profile to affect queue lengths at A49 junction/performance of Cromwell Avenue
- **#171** – Southbound entry to Calver Road – change to volume/profile to affect queue lengths at Cromwell Avenue junction/A49 junction/performance of Cromwell Avenue
- **#167** – Eastbound entry to Delph Lane – change to volume/profile to affect queue lengths at A49 junction
- **#174** – Northbound entry to A49 (PM peak only) - change to volume/profile to affect queue lengths at Long Lane/Hawley's Lane junction
- **#162** – Southbound entry to A49 Winwick Link Road (PM peak only) - change to volume/profile to affect queue lengths at M62 junction 9

Subject: RE: Peel Hall Updated VISSIM Base Model (v6)
Date: Monday, 2 November 2020 at 08:11:53 Greenwich Mean Time
From: Heywood, Robert
To: fiona.bennett@highgatetransportation.co.uk, 'Taylor, Mike'
CC: dave.tighe@highgatetransportation.co.uk, 'Colin Griffiths', 'Wright, Colin', Gavin.Coupe, Wong, Lun, 'Lu, Tao', Laverick, Benjamin
Attachments: 5188540.072 Peel Hall Base Vissim Review.pdf

Fiona,

Please find attached the latest review by Atkins of the Peel Hall VISSIM Base Model v6.

We have found that the latest model results do not validate as well as the previous version of the base model. Despite these findings, the overall journey time differences are still within the acceptable threshold of 15%.

In summary the model '2019AuditBase_v6Final' is found to be fit-for-purpose in the primary area of interest to Highways England to assess the scheme mitigation for this development. Notwithstanding this, it is not necessarily a juxtaposition that Atkins were happy with the modelling and WSP not as the focus of our reviews was different.

Kind regards,

Rob

Robert Heywood, Route Manager

Network Development & Planning Team

Highways England | Atlantic House | Birchwood Boulevard | Warrington | WA3 7WE

Mobile: + 44 (0) 7785 925 993

Web: www.highwaysengland.co.uk

From: Heywood, Robert
Sent: 20 October 2020 16:38
To: fiona.bennett@highgatetransportation.co.uk; 'Taylor, Mike' <mike.taylor@warrington.gov.uk>
Cc: dave.tighe@highgatetransportation.co.uk; 'Colin Griffiths' <colin@satnam.co.uk>; 'Wright, Colin' <Colin.Wright@wsp.com>; Gavin.Coupe <Gavin.Coupe@atkinsglobal.com>; Wong, Lun <Lun.Wong@atkinsglobal.com>; 'Lu, Tao' <Tao.Lu@wsp.com>
Subject: RE: Peel Hall Updated VISSIM Base Model (v6)

Good afternoon Fiona,

We expect to have a response by the 2nd November allowing for leave for key people next week.

Kind regards,

Rob

Robert Heywood, Route Manager

Network Development & Planning Team

Highways England | Atlantic House | Birchwood Boulevard | Warrington | WA3 7WE

Mobile: + 44 (0) 7785 925 993

APP31 -
Peel *Hall* Base Vissim v6 HE-Atkins *Review*

Our reference: 5188540.072

Your reference: NW066 20/21

Robert Heywood
Highways England
Piccadilly Gate
Store Street
Manchester
M1 2WD

atkinsglobal.com
[snclavalin.com](https://www.snclavalin.com)

30 October 2020

Dear Rob

Re: Review of Peel Hall Modelling Information

Atkins has been commissioned by Highways England to audit a Vissim model with associated Local Model Validation Report (LMVR), which have been produced by The Modelling Group (TMG). TMG are working on behalf of Highgate Transportation (HT) who has been commissioned by Satnam Millennium Ltd (Satnam) in support of the proposed development of land at Peel Hall in Warrington.

Background

An ongoing process of modelling reviews has been taking place and we have provided several reviews in the past as well as providing supporting information to the 2018 Public Inquiry (LPA reference: 2016/28492, PINS reference: APP/M0655/W/17/3178530).

Recent document reviews include:

- A review of a submitted Addendum to the previously submitted Transport Assessment (HTp/1107/01/A dated January 2018), in support of the proposals for a new residential neighbourhood on land at Peel Hall to be considered at a forthcoming reopened Public Inquiry. This review was issued on 15th April 2020 and included a further review of the Vissim modelling.
- A review of a submitted documents that make up part of a second Addendum to the Environmental Statement (ES Addendum 2). The following documents (in PDF) were reviewed in a letter issued on 5th June 2020:
 - 1820_Peel Hall- ES Non-Technical Summary- Volume 7
 - 1820_Peel Hall- Environmental Statement ADDENDUM 2 - Volume 8- 2020
 - 1820_Peel Hall- ES Documents and Figures- Volume 9- Part 1 and 2- 02.04.20
- A review of a submitted base Vissim model and supporting LMVR. This review was issued on 5th June 2020.
- A review of a revised base Vissim model and supporting LMVR. The spreadsheet work has also been reviewed which related to the conversion of future year flows from a SATURN model for use in the Vissim model so that scenarios can be created. This review was issued on 31st July 2020.
- A review of the revised base Vissim model, proposed Vissim model and supporting documents and technical notes produced. This review was issued on 7th September 2020.
- Subsequently, a revised base Vissim model, proposed Vissim model and supporting documents were provided by HT on 8th September 2020. This review was issued on 23rd September 2020.

Submitted Documentation

HT submitted the following documentation and model files on 16th October 2020:

Vissim Model

- Vissim model '2019AuditBase_v6Final' which includes the base models cover both Morning and Evening Peak periods

Other documents

- Technical Note 'MG0123_A49WarringCorridor_BaseModellingReport_v6.2'
- Technical Note 'MG0123_A49WarringtonCorridor_ChangesRegistry_Oct2020_v1'; and
- Excel Spreadsheet 'MG0123_A49Warrington_VISSIM_CalVal_v6'

The above documents are reviewed under the following sub-headings.

Peel Hall Vissim Model – Base Model Review

It should be noted at the outset that, as with previous reviews, this review focuses on the parts of the network that are of interest to Highways England. As such, it cannot be said that Highways England agrees or disagrees with any part of the work that does not fall under that heading.

The previous base model submitted on 8th September 2020 has been reviewed and was deemed largely representative of the base year scenario within the primary area of interest to Highways England. As documented in the latest submission, the base model has since been refreshed to address the remaining concerns previously raised by WSP, on behalf of Warrington Borough Council, which is the relevant Planning Authority for this submission. A technical registry 'MG0123_A49 Warrington Corridor_ChangesRegistry_Oct2020_v1' has been provided to detail a change log for ease of reference. Majority of the model network coding changes are focussing on areas to the southern end of the network to better represent the local network queuing conditions, while some of the coding around the M62 junction 9 and mainline motorway have also been adjusted to address the journey time validation concern raised previously. The model has therefore been reviewed in more detail to ascertain its appropriateness for base year model benchmarking and for use in future scenario testing purposes. The table is set out in the same format as in our previous review for ease of reading.

Review Criteria	Comments
Basic Model Coding	The basic model coding is consistent with the previous modelling and is deemed appropriate in the area of interest to Highways England
Use of Modifications	The updated approach for scenario management within Vissim is deemed appropriate (note that this applies to the review of the base model only)
Method of Assignment	It is noted TMG has removed the now unused coding for Dynamic Assignment. This has 'tidied' up the model and is a welcome simplification.
Traffic Volume / Profile Adjustment	<p>Following a discussion between HT, TMG, WSP (on behalf of Warrington Borough Council) and Atkins (on behalf of Highways England) on 24th September 2020, the base model has been amended to better represent existing queue situation in the local road network. In the latest submission, traffic flow entry volume and profiles have been manually adjusted to illustrate the known queuing conditions in the local road network with a particular focus on the A50 Long Lane, Cromwell Avenue and Sandy Lane West. Whilst the methodology of influencing the traffic flow profile to provide a more representative queuing condition appears reasonable, it has been noticed that the traffic volumes have also been altered as part of the model refinement process.</p> <p>While it is understood that by adjusting the traffic volume input on entry links to reflect the latent demand may have a most direct and visible impact on queue length, however, it is important to understand if this has led to a wider impact on the total number of vehicles that actually enter and filter through the wider road network.</p>

Further examination has been undertaken to understand the difference in traffic turning movements at the key junctions which may have been impacted upon as a result of the amendment. A summary tables are provided below:

AM Peak Traffic Turning Movements

Junction/ Movement		Vehicle Flow		
Junction	Approach	Observed	Revised Model	Previous Model
A49 Winwick Road/ A574 Cromwell Avenue/ Sandy Lane West	A49 SB to Sandy Ln	154	167	169
	A49 SB	1277	1283	1280
	A49 SB to Cromwell Ave	243	277	277
	Cromwell Ave to A49 NB	250	278	275
	Cromwell Ave to Sandy Ln	314	351	351
	Cromwell Ave to A49 SB	645	574	616
	Cromwell Ave to Cromwell Ave (U-turn)	55	55	54
	A49 NB	776	820	823
	A49 NB to Sandy Ln	71	73	76
	A49 NB to Cromwell Ave	424	440	425
	Sandy Ln to A49 NB	210	265	231
	Sandy Ln to Sandy Ln (U-turn	0	0	0
	Sandy Ln to A49 SB	81	112	116
	Sandy Ln to Cromwell Ave	203	236	252
A49 Winwick Road/ Hawleys Lane/ A50 Long Lane	A49 SB to Hawleys Lane	199	208	227
	A49 SB to Long Lane	258	267	276
	A49 SB	1447	1351	1385
	A49 NB to Hawleys Lane	77	82	78
	A49 NB to Long Lane	236	200	196
	A49 NB	805	805	792
	Long Lane to A49 SB	390	430	402
	Long Lane to Hawleys Lane	134	153	162
	Long Lane to A49 NB	239	282	273
	Hawleys Lane to Long Lane	113	94	92
	Hawleys Lane to A49 SB	58	53	52
Hawleys Lane to A49 NB	174	167	170	

PM Peak Traffic Turning Movements

Junction/ Movement		Vehicle Flow		
Junction	Approach	Observed	Revised Model	Previous Model
A49 Winwick Road/ A574 Cromwell Avenue/ Sandy Lane West	A49 SB to Sandy Ln	233	220	214
	A49 SB	822	804	803
	A49 SB to Cromwell Ave	306	286	288
	Cromwell Ave to A49 NB	403	377	369
	Cromwell Ave to Sandy Ln	259	315	302
	Cromwell Ave to A49 SB	517	529	505
	Cromwell Ave to Cromwell Ave (U-turn)	96	81	86
	A49 NB	1423	1429	1526
	A49 NB to Sandy Ln	104	114	117
	A49 NB to Cromwell Ave	657	659	683
	Sandy Ln to A49 NB	205	182	181
	Sandy Ln to Sandy Ln (U-turn	0	0	0
	Sandy Ln to A49 SB	103	93	109
	Sandy Ln to Cromwell Ave	260	236	238
A49 Winwick Road/ Hawleys Lane/ A50 Long Lane	A49 SB to Hawleys Lane	189	200	199
	A49 SB to Long Lane	319	354	341
	A49 SB	904	849	844
	A49 NB to Hawleys Lane	70	50	56
	A49 NB to Long Lane	215	164	171
	A49 NB	1357	1374	1455
	Long Lane to A49 SB	246	308	275
	Long Lane to Hawleys Lane	158	172	182
	Long Lane to A49 NB	298	336	321
	Hawleys Lane to Long Lane	134	106	118
	Hawleys Lane to A49 SB	65	76	81
Hawleys Lane to A49 NB	353	371	408	

	<p>As can be seen in the tables provided, most of the traffic turning movements match closely with the values presented in the previous base model submission. One noticeable difference is for the A49 northbound movement in the Evening Peak period where a 7% reduction has been recorded at both the junctions with the A50 Long Lane and Sandy Lane West. The changes appear to improve the goodness of fit for the traffic turning count validation at both junctions.</p> <p>Overall, it is concluded that the actual traffic throughput difference at the two key junctions remain largely similar to the pre-refinement level compared with the previous base model submission. This implies that the traffic adjustment has limited impact on the number of traffic actually entering the wider network, the amount of traffic accessing onto the M62 Strategic Route Network would remain largely unaffected albeit concerns over the methodology.</p>
Temporal Scope	The temporal scope has always been deemed appropriate
Network Layout Coding	The network coding for the base model is now deemed appropriate
Driving Behaviour Parameters	The Driving Behaviour Parameters were updated as recommended in the previous review. It continues to be the case that this provides for more accurate and robust basis for the assessment.
Traffic Functions Setting	All HGV acceleration and deceleration functions were updated as recommended in the previous review to match current default settings found within the latest Vissim version 2020. It continues to be the case that this provides for more accurate and robust basis for the assessment.
Signals	It was understood that traffic signal timings for M62 J9 were acquired from Warrington Borough Council. The information has now been incorporated and re-calibrated in the base model.
Speed Distributions and Speed Decisions	Speed distributions and decisions are deemed appropriate. In the latest submission, the desired speed controls on the M62 slip roads have been refined using 2019 HATRIS data and the reduced speed areas have also been refined in the Morning Peak model with an attempt to enhance the journey time validation along the M62 mainline and to better represent the base year situation.
Calibration to Counts	<p>The LMVR reports 100% of model flows are within a GEH value of less than 5 which is therefore within the TAG threshold albeit it is noted that TAG was not designed for micro-simulation models.</p> <p>Whilst it is noted that this is an improvement on the original modelling thus ratifying our comments which have assisted TMG with the model improvements, it should also be noted that a high level of link count matching does not necessarily mean that the model matches turns at key junctions such as M62 J9 as no turning count validation has been undertaken at this location.</p>
Validation to Journey Times	<p>The key segments which are within the primary area of interest to Highways England are therefore Route Sections 3, 4, 5 (northbound and southbound through M62 J9) and 9 to 16 (The M62 mainline and slip roads from M62 to J9).</p> <p>Compared with the previous base model validation report v5, a significant number of validation statistics have been updated following the changes made in the Vissim network coding as set out in the change log provided within the technical registry 'MG0123_A49 Warrington Corridor_ChangesRegistry_Oct2020_v1'. The number of route sections which are within 15% of the observed records have seen improvement from 79% to 85%, and from 77% to 88%, for the Morning Peak and Evening Peak periods respectively.</p>

Northbound and Southbound Journey times (both Morning and Evening Peak periods)

In the revised base model, it is noted that all of the northbound and southbound Route Sections 3, 4 and 5 are within 15% of the observed values for both peak periods, the values as a whole appear representative to demonstrate a goodness of fit.

Eastbound and Westbound Journey times (Morning Peak period)

Throughout the ongoing model review process, Highways England has provided recommendations and support TMG / HT to improve the model calibration and validation to reach a consent. Highways England is generally content with the model coding along motorway section in the previous version of the base model and the journey time validation for the Morning Peak period was deemed acceptable. However, it is unclear why the eastbound M62 exit control has been amended with changes made to the Reduced Speed Areas 1430 to 1462 on the eastern edge of the network to regulate the traffic throughput, which influence the M62 mainline eastbound section travelling away from the M62 J9. As a result of the above changes, the journey times for eastbound direction are generally faster than the observed records. A summary table is provided below:

AM Peak Eastbound Journey Time

Section	Direction	Description			Observed		Revised Model	Previous Model
		From	-	To	Dist.	Avg.	Avg.	Avg.
9	EB	EB M62	-	EB M62	1313m	58	55	62
10	EB	EB M62	-	EB M62 offslip	347m	16	15	16
11	EB	EB M62 offslip	-	M62 J9	291m	71	66	71
12	EB	EB M62 @ J9	-	EB M62 @ J9	869m	47	40	41
13	EB	M62 J9	-	EB M62 onslip	433m	30	30	27
14	EB	EB M62 onslip	-	EB M62	1074m	65	52	60
15	EB	EB M62/M6	-	M6	624m	28	28	32
16	EB	EB M62	-	EB M62	1115m	256	249	248
TOTAL	EB	EB M62	-	EB M62	6065m	570	534	557

As can be seen in the table above, the vehicles are generally traveling faster on nearly all sections compared with the observed values. Of particular concern is Route Section 14 which covers the motorway section travel eastbound from J9. In the previous version of the base model, the journey time for this 1km section was 5 seconds faster than the observed value, whilst in the latest submission, the difference has now extended to 14 seconds with a percentage difference of over 20% compared with the observed record. For the cumulative M62 eastbound journey time figure, the journey time is now 36 seconds faster, compared with the previously modelled difference of 13 seconds.

While it is unclear what is the key driver for the proposed change along the M62 mainline coding in the latest base model which has been accepted previously, the overall journey time differences are still within the acceptable threshold of 15%. The overall impact of such changes would not pose any risks that compromise the ability for the model intended use of future scenario testing and therefore deemed acceptable on this occasion. Caution will have to be applied to the interpretation of any modelling results for the Morning Peak period.

Eastbound and Westbound Journey times (Evening Peak period)

In terms of the eastbound and westbound route sections along the M62 motorway, as highlighted in the model review issued on 7th September 2020, concern was raised regarding the journey times for a number of route sections which are generally slower than the observed records. In the latest base model submission, the overall validation for the Evening Peak model has been improved. The M62 eastbound journey times between Route Sections 12 and 15 have seen the biggest improvement for the Evening Peak period. Majority of the route sections in both directions are now within 15% of the observed value with a tolerance of +/- 5 seconds and the values as a whole deemed acceptable.

Summary

Atkins has been commissioned by Highways England to audit a base Vissim model and associated LMVR document produced by TMG on behalf of Highgate Transportation (HT) who has been commissioned by Satnam Millennium Ltd (Satnam) in support of proposed development of land at Peel Hall in Warrington.

Overall, the revised base model looks to be of a reasonable standard along the main study corridor. A number of issues which have been noted in the previous reviews have now been addressed. Even though the model calibration and validation statistics presented are generally with the TAG threshold, the journey time along the M62 eastbound mainline, particularly for the section travel away from the M62 J9, is modelled to be faster in the Morning Peak period compared with those observed records, caution will have to be applied to the interpretation of any modelling results.

Given the above, the base model '2019AuditBase_v6Final' submitted on 16th October 2020 can be recommended as being fit-for-purpose in the primary area of interest to Highways England to assess the scheme mitigation for this development. Notwithstanding this, it is not necessarily a juxtaposition that Atkins were happy with the modelling and WSP not as the focus of our reviews was different.

Yours faithfully

Lun Wong

APP32 -

Peel *Hall* WBC-WSP *ref* TN11 Base VISSIM *Review*

Subject: RE: Peel Hall Updated VISSIM Base Model (v6)
Date: Monday, 2 November 2020 at 14:47:57 Greenwich Mean Time
From: Taylor, Mike
To: fiona.bennett@highgatetransportation.co.uk
CC: dave.tighe@highgatetransportation.co.uk, 'Colin Griffiths', 'Wright, Colin', 'Heywood, Robert', Dickin, Alan
Attachments: image001.png, image002.png, TN11 A49 Corridor Base VISSIM Model Review Oct2020 final v2.pdf

Fiona,

Apologies for the slight delay. Please find attached WSP's review of the October 2020 version of the VISSIM model.

The conclusion is that in general terms the updated base model reverts to a level of performance commensurate with an earlier July 2020 version that was deemed acceptable, but that it may overstate capacity on the A49 / A574 exit – through non-adherence to circulatory carriageway markings i.e. middle lane is designated as Calver Road only. This is potentially significant when considering future with and without Peel Hall development scenarios and potential mitigation.

Subject to the model being coded appropriately to address the lane designation issue it can be considered fit for purpose.

Let me know if there are any queries.

Regards

Mike

Mike Taylor

Transport Development Control Team Leader

CURRENTLY WORKING FROM HOME

Environment and Transport Directorate
Transport for Warrington
Warrington Borough Council
New Town House, Buttermarket Street, Warrington, WA1 2NH

 mike.taylor@warrington.gov.uk

 Office: 01925 444086 Mobile: 07966 884639

warrington.gov.uk

From: fiona.bennett@highgatetransportation.co.uk [mailto:fiona.bennett@highgatetransportation.co.uk]
Sent: 02 November 2020 08:20
To: Taylor, Mike <mike.taylor@warrington.gov.uk>
Cc: dave.tighe@highgatetransportation.co.uk; 'Colin Griffiths' <colin@satnam.co.uk>; 'Wright, Colin' <Colin.Wright@wsp.com>; 'Heywood, Robert' <Robert.Heywood@highwaysengland.co.uk>
Subject: RE: Peel Hall Updated VISSIM Base Model (v6)

Good morning Mike,



TECHNICAL NOTE 11

DATE:	02 November 2020	CONFIDENTIALITY:	Public
SUBJECT:	A49 VISSIM Base Model Review		
PROJECT:	Peel Hall	AUTHOR:	TL
CHECKED:	GR	APPROVED:	CEW

INTRODUCTION

WSP has been commissioned by Warrington Borough Council (WBC) to provide technical advice regarding transport modelling for a development site at Peel Hall. This includes a Vissim microsimulation model of the A49 Corridor between A49 Winwick Link Road/Newton Road/ Winwick Park Avenue junction and A49/A50/Hawleys Lane junction including the M62 mainline at Junction 9. The Vissim model has been developed by Modelling Group (MG) on behalf of Highgate (and Satnam).

Between January and September 2020, WSP has undertaken a number of reviews of the 2019 base year model and concluded in Technical Note 7, dated 12th August 2020, that the base year model (July 2020 version) was fit for the purpose of testing forecast scenarios. That base year model, however, was subsequently amended in the September 2020 (public inquiry) submission. The public inquiry version of the base model was deemed not acceptable.

Further to the adjourned post inquiry meeting held on 24th September 2020, Vissim base model version 6 was supplied to WSP on the 16th October 2020. This package of information is the subject of this review. Submitted documentation includes:

- Vissim model: '2019AuditBase_v6Final' which includes the base models cover both morning and evening peak periods.
- Technical Note: 'MG0123 – A49 Corridor Vissim Base Modelling Report', dated 15 Oct 2020
- Changes Registry: 'MG0123 – A49 Warrington, Peel Hall – Changes Registry' dated 15 Oct 2020
- Calculation Spreadsheet: 'MG0123_A49Warrington_VISSIM_CalVal_v6.xlsx'

MODEL REVIEW

1. Changes Registry

MG provided changes registry for the changes to the base model since the September (v5.2) version. In the changes registry it lists Reduced Speed Areas (RSA) No 1470 and 1471 has extended to improve queue lengths and journey times. However, they are not in the network. Please could the change registry therefore be reviewed for accuracy.

2. Driving Behaviour Parameters

The network is coded using a range of behaviour types. The driver behaviour parameters and coding have been checked and are regarded as being satisfactory.

3. Signals

Signal timings at A49 Winwick Road / Sandy Lane West have been rechecked and are coded in accordance with WBC's observations.

4. Speed Distributions and Speed Decisions

A new speed distribution 'SandyLaneWestWBDelay' has been added with maximum speed of 16 mph and used on Sandy Lane West westbound to simulate delays from side road entry points, as stated in the Changes Registry. Whilst this is generally acceptable, we would expect to see empirical data or observations to support the parameters used or increase the details of the side roads.

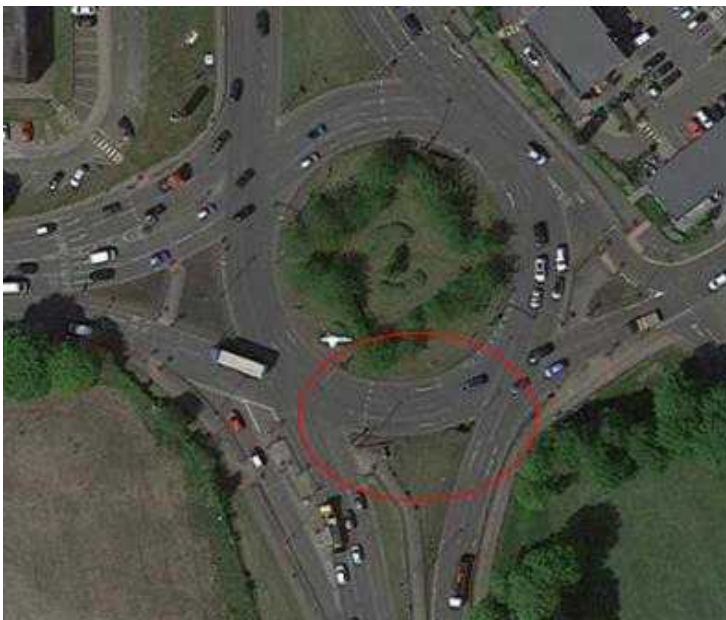
5. Lane Designations (A574 / Calver Road)

Figures 1 and 2 present the lane markings on the southern part of the roundabout circulatory at the A49 / Sandy Lane West junction, which is three lanes wide. The nearside lane is designated for A574 traffic and the middle lane is designated for traffic to Calver Road which turns right at the next downstream junction. In the model, the roundabout circulatory is coded as three lanes, with the nearside lane and middle lane both coded simply as ahead lanes on exit i.e. the model does not distinguish between traffic using the A574 and Calver Road. It is only immediately after exiting the roundabout does the model coding become one lane ahead and one lane dedicated right.

Figure 1 A574 / Calver Road Roundabout Lane Designation Marking



Figure 2 A574 / Calver Road Roundabout Lane Designation Marking



Figures 3 to 6 below track the path of a vehicle going westbound to A574 from the roundabout circulatory, starting in the middle lane of the roundabout circulatory (designated as Calver Road), exiting the roundabout in dedicated right turn lane to Calver Road, only switch to nearside (A574) ahead lane at stop line of the downstream signal controlled junction. This clearly does not accord with the lane designation. Either the utilisation of the lanes at the junction in this way should be demonstrated from clear observation or amended to reflect and ensure vehicles use the designated lanes appropriately. This potential issue, which may overstate junction capacity, is likely to be exacerbated when traffic volumes increase in future scenarios without and with Peel Hall development and alongside any potential mitigation measures.

Figure 3 Lane Designation on A49/ Sandy Lane West / A574 Cromwell Avenue Roundabout

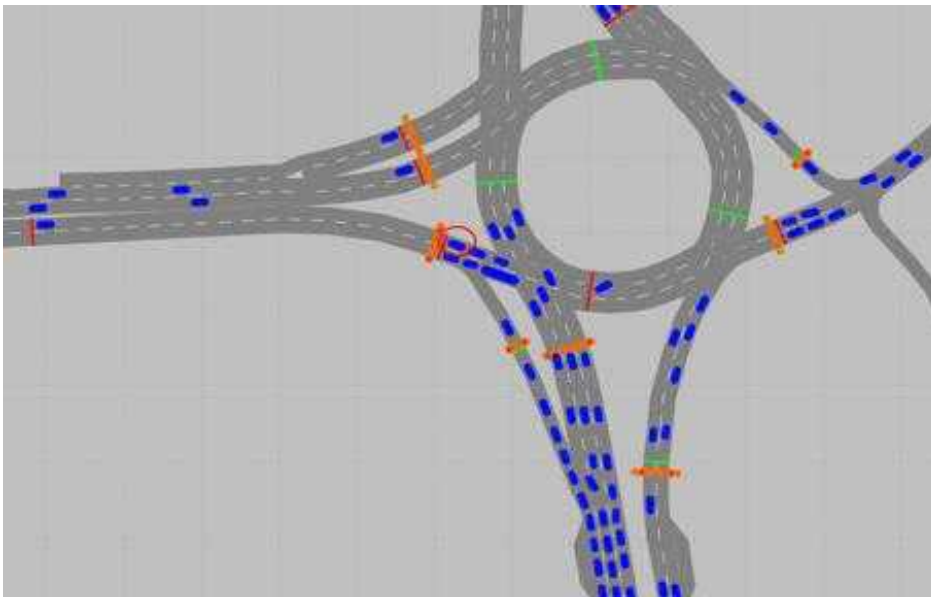


Figure 4 Lane Designation on A49/ Sandy Lane West / A574 Cromwell Avenue Roundabout

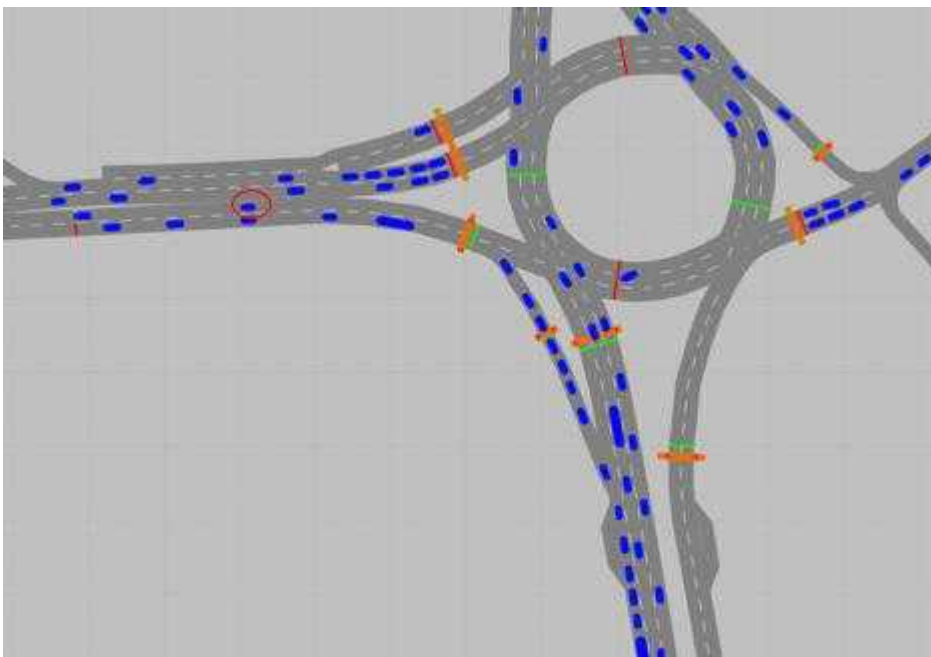


Figure 5 Lane Designation on A49/ Sandy Lane West/ a574 Cromwell Avenue Roundabout

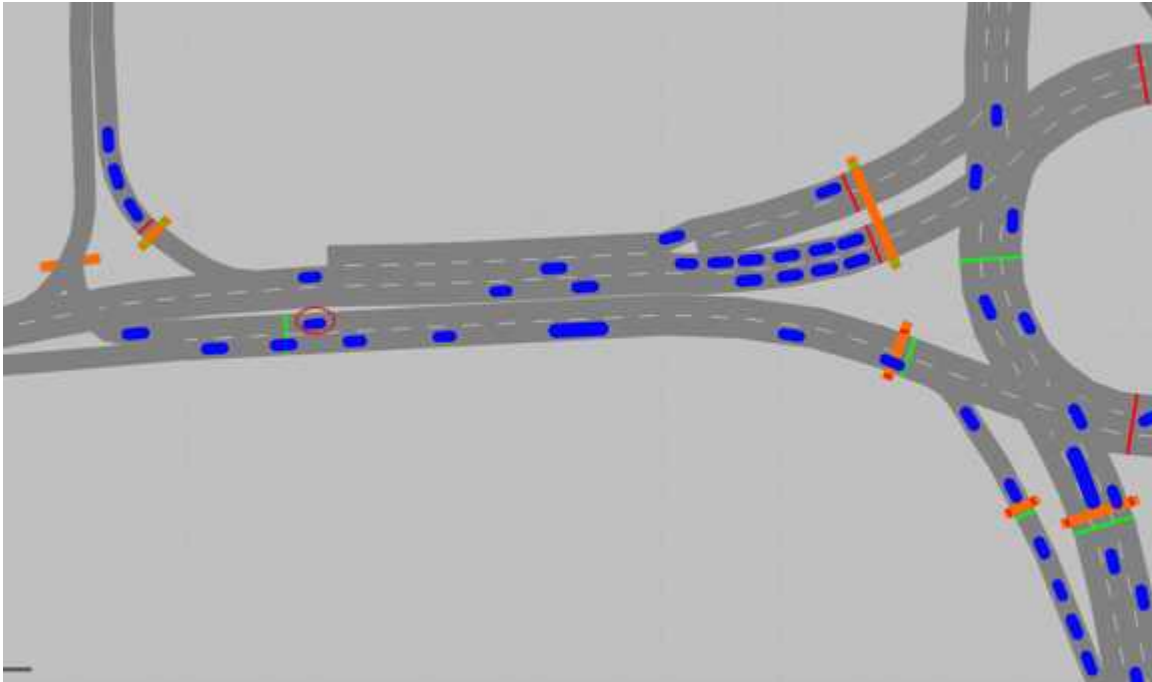
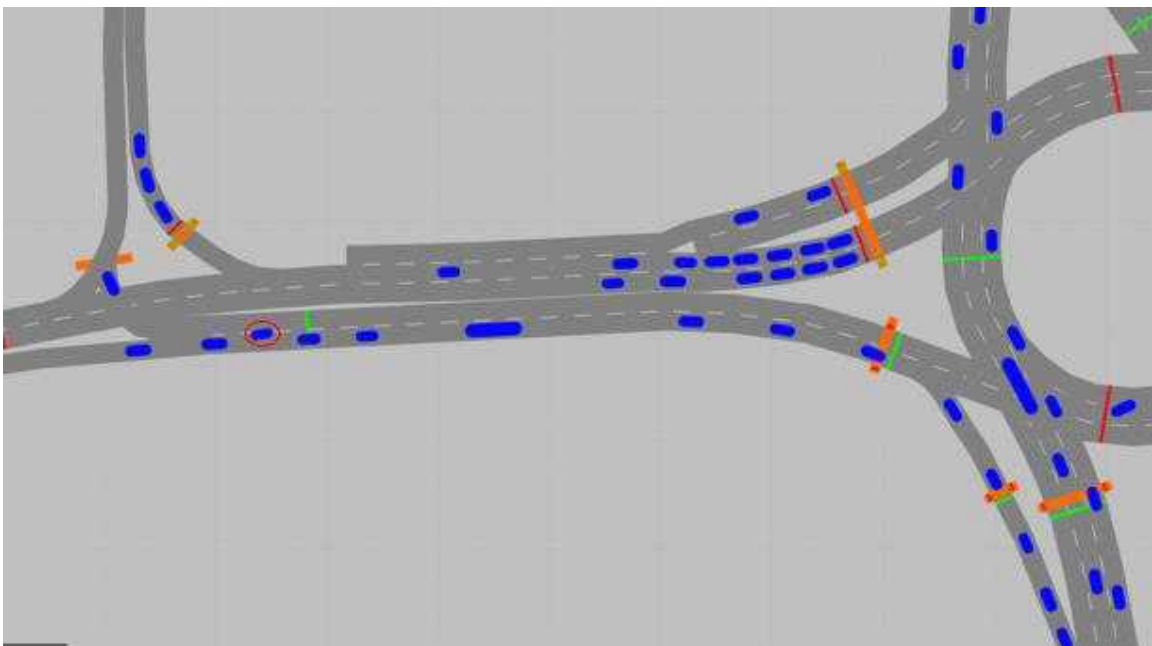


Figure 6 Lane Designation on A49/ Sandy Lane West / A574 Cromwell Avenue Roundabout



6. Calibration/ Validation

Flow calibration and journey time validation have been checked and they meet the modelling criteria set out in DMRB and TAG.

7. Queues on Local Roads

Tables 1 to 4 below present a comparison of the base year modelled queue length outputs from the September 2020 public inquiry submission and October 2020 post adjourned inquiry versions of the model, with the July 2020 version - which Warrington UTMC Team had considered to be representative of typical peak period traffic conditions.

Whilst there are some differences in the queue profiles between the July and October 2020 versions of the model, we are satisfied that the general pattern to be acceptable and to be a significant improvement on the September 2020 public inquiry submission version.

Table 1 Queue Lengths-Sandy Lane West WB AM

Sandy Lane West	Base year - July 2020 Version		Base Year – September 2020 Public Inquiry		Base Year – October 2020 Post Adjourned Inquiry	
	Average Queue (m)	Maximum Queue (m)	Average Queue (m)	Maximum Queue (m)	Average Queue (m)	Maximum Queue (m)
07:00-07:15	89	249	178	487	42	151
07:15-07:30	261	366	435	557	95	196
07:30-07:45	346	447	452	564	92	203
07:45-08:00	369	494	308	421	133	296
08:00-08:15	352	467	316	429	282	386
08:15-08:30	253	381	436	606	289	387
08:30-08:45	258	373	540	710	261	347
08:45-09:00	202	319	687	767	125	258
09:00-09:15	135	248	716	803	56	168

Table 2 Queue Lengths-Sandy Lane West WB PM

Sandy Lane West	Base year - July 2020 Version		Base Year – September 2020 Public Inquiry		Base Year – October 2020 Post Adjourned Inquiry	
	Average Queue (m)	Maximum Queue (m)	Average Queue (m)	Maximum Queue (m)	Average Queue (m)	Maximum Queue (m)
16:00-16:15	21	125	26	127	105	279
16:15-16:30	57	199	123	264	157	272
16:30-16:45	59	188	207	318	162	272
16:45-17:00	78	233	325	465	135	255
17:00-17:15	129	259	379	503	69	201
17:15-17:30	189	322	299	408	56	174
17:30-17:45	144	270	205	349	61	176
17:45-18:00	74	218	80	204	109	244
18:00-18:15	48	167	40	150	79	209

Table 3 Queue Lengths-Long Lane West WB AM

Long Lane	Base year - July 2020 Version		Base Year – September 2020 Public Inquiry		Base Year – October 2020 Post Adjourned Inquiry	
	Average Queue (m)	Maximum Queue (m)	Average Queue (m)	Maximum Queue (m)	Average Queue (m)	Maximum Queue (m)
07:00-07:15	23	86	20	81	21	95
07:15-07:30	31	103	22	82	35	133
07:30-07:45	37	129	29	84	49	149
07:45-08:00	40	139	46	213	50	147
08:00-08:15	46	123	191	436	66	214
08:15-08:30	57	173	165	371	47	135
08:30-08:45	77	213	79	212	56	175
08:45-09:00	57	180	84	273	49	175
09:00-09:15	48	161	50	163	71	196

Table 4 Queue Lengths-Long Lane WB PM

Long Lane	Base year - July 2020 Version		Base Year – September 2020 Public Inquiry		Base Year – October 2020 Post Adjourned Inquiry	
	Average Queue (m)	Maximum Queue (m)	Average Queue (m)	Maximum Queue (m)	Average Queue (m)	Maximum Queue (m)
16:00-16:15	34	167	33	157	23	103
16:15-16:30	129	300	138	301	79	229
16:30-16:45	164	343	157	335	97	245
16:45-17:00	249	596	225	446	136	299
17:00-17:15	503	750	296	515	155	366
17:15-17:30	379	572	230	425	257	463
17:30-17:45	138	369	108	275	152	384
17:45-18:00	58	162	76	196	103	329
18:00-18:15	76	227	47	150	32	114

CONCLUSIONS

The coding of the A49/ Sandy Lane West/ A574 Cromwell Avenue Roundabout does not follow the lane marking designations. Whilst the base year model validation model does not appear to be unduly affected by this mis-coding, there is concern that as a consequence the model could overstate junction capacity, and that this is likely to be exacerbated when traffic volumes increase in future scenarios without and with Peel Hall development and alongside any potential mitigation measures. It is important therefore that this issue is remedied in both the base and future year versions of the model.

Subject: RE: Peel Hall Updated VISSIM Base Model (v6)
Date: Friday, 6 November 2020 at 09:11:34 Greenwich Mean Time
From: fiona.bennett@highgatetransportation.co.uk
To: 'Taylor, Mike'
CC: dave.tighe@highgatetransportation.co.uk, 'Colin Griffiths', 'Wright, Colin', 'Heywood, Robert', 'Dickin, Alan'
Attachments: TN11 A49 Corridor Base VISSIM Model Review Oct2020 final v2.pdf, image003.png, image004.png, image005.png, image006.jpg, image007.png, image008.png, image009.png, image010.png, image011.png, image012.png

Morning Mike,

Thank you for providing WSP's review of the October 2020 VISSIM base model (attached again for ease of reference).

Further to your email (below), we are pleased the WSP report (Technical Note 11) confirms that the base model is considered suitable and fit for purpose.

You have raised a query in relation to the coding of lane destination markings on the A49/Sandy Lane West/Cromwell Avenue southern circulatory section (see the second paragraph of your email).

It can be noted that on page 3 of TN11, WSP describe this issue further and confirm that, "Either the utilisation of the lanes at the junction in this way should be demonstrated from clear observation or amended to reflect and ensure vehicles use the designated lanes appropriately".

We can confirm that the model utilisation of the lanes at this junction can be demonstrated to be this way from 'clear observation' using the video traffic survey data from 2019 – please see link below, particularly from the camera positioned at the Calver Park junction looking along that Cromwell Avenue link.

 [MG0123_LaneChangeExamples.mp4](#)

Furthermore, that:

- It can clearly be seen from a Google Street View in 2019 that the lane destination markings are worn off, and the model was built to replicate the actual situation:





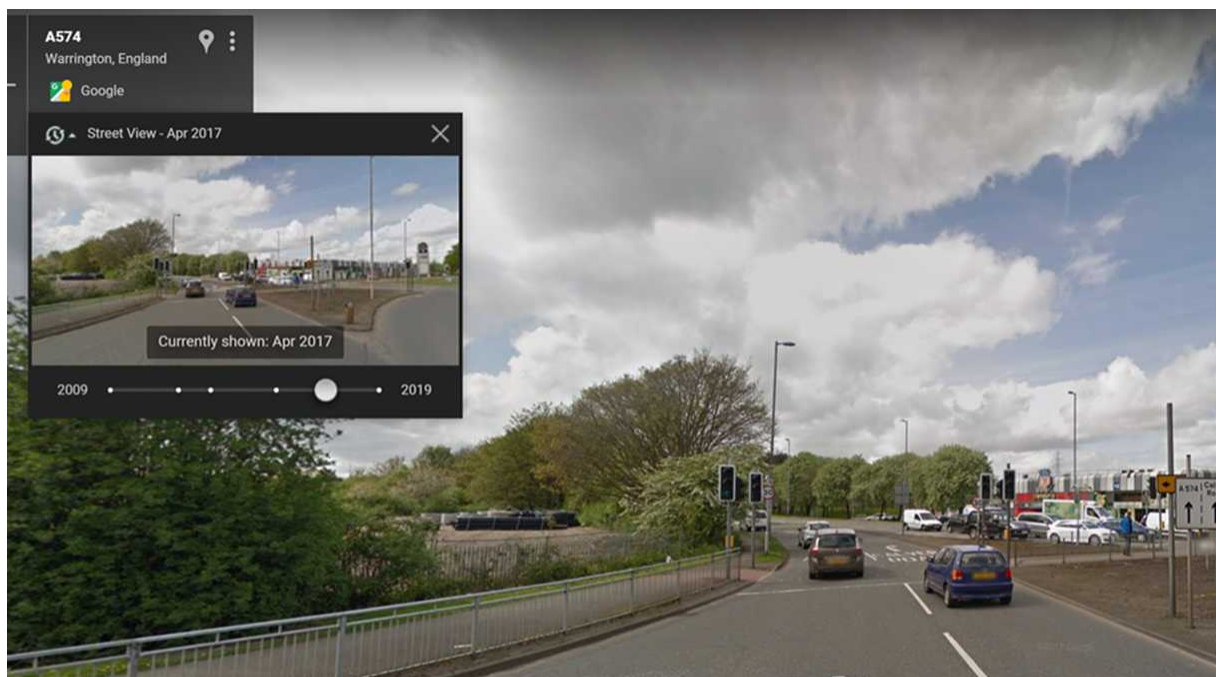
- Importantly, the image provided by WSP in TN11 is from May 2012, some 7 years before the model base year:



- In terms of the 'look-ahead' distance for the Cromwell Avenue lane destination (beyond its junction with Calver Park) is 150m, which is just after the internal stop line on the southern side of the roundabout, as vehicles pull off towards the exit from the roundabout. This was input as a result of the calibration exercise, to ensure the correct volume of traffic got through the junction in the base and that journey times were reflected accurately. In reality, this reflect what happens on site.
- Images from Google Street view of vehicles merging after the circulatory lane destination markings:



And also this sequence:







Changes registry:

We also note the comment in WSP's TN11 regarding Reduced Speed Area Nos 1470 and 1471. These are in the AM models only, to reduce saturation flow and replicate queuing conditions on the Sandy Lane West approach to the roundabout (located across the stop line itself). They are not in the PM models as a result of performance between the AM and PM being very different in this location. This is not a new change and was in the August model submission. Neither WSP, WBC (nor Atkins) have referenced it until now; it is included in the changes registry to cover off the change to the lengths only since the July submission.

In summary therefore the 'clear observation' is that the model assesses this junction correctly in reality and so the WSP point falls away. The evidence given above demonstrates this to be the case.

As such we will now proceed to forecast future year modelling.

Kind regards,
Fiona

Fiona Bennett
Highgate Transportation
Tel: 0117 934 9121
Mob: 07595 892 217

*Highgate Transportation Ltd
First Floor, 43-45 Park Street
BRISTOL BS1 5NL
Company Registration Number: 07500534*

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From: Taylor, Mike <mike.taylor@warrington.gov.uk>

Sent: 02 November 2020 14:48

To: fiona.bennett@highgatetransportation.co.uk

Cc: dave.tighe@highgatetransportation.co.uk; 'Colin Griffiths' <colin@satnam.co.uk>; 'Wright, Colin' <Colin.Wright@wsp.com>; 'Heywood, Robert' <Robert.Heywood@highwaysengland.co.uk>; Dickin, Alan <adickin@warrington.gov.uk>

Subject: RE: Peel Hall Updated VISSIM Base Model (v6)

Fiona,

Apologies for the slight delay. Please find attached WSP's review of the October 2020 version of the VISSIM model.

The conclusion is that in general terms the updated base model reverts to a level of performance commensurate with an earlier July 2020 version that was deemed acceptable, but that it may overstate capacity on the A49 / A574 exit – through non-adherence to circulatory carriageway markings i.e. middle lane is designated as Calver Road only. This is potentially significant when considering future with and without Peel Hall development scenarios and potential mitigation.

Subject to the model being coded appropriately to address the lane designation issue it can be considered fit for purpose.

Subject: RE: Peel Hall Updated VISSIM Base Model (v6)
Date: Thursday, 12 November 2020 at 12:06:45 Greenwich Mean Time
From: Taylor, Mike
To: fiona.bennett@highgatetransportation.co.uk
CC: dave.tighe@highgatetransportation.co.uk, 'Colin Griffiths', 'Wright, Colin', 'Heywood, Robert', Dickin, Alan, Hughes, Martha
Attachments: image001.png, image002.png, image003.png, image011.png, image012.png, image013.jpg, image014.png, image015.png, image016.png, image017.png

Fiona,

Thank you for your email. Your comments are noted.

Can you give me an update as to when the forecasting modelling will be available for review? I am conscious that the PINS deadline is fast approaching.

Regards

Mike

Mike Taylor

Transport Development Control Team Leader

CURRENTLY WORKING FROM HOME

Environment and Transport Directorate
Transport for Warrington
Warrington Borough Council
New Town House, Buttermarket Street, Warrington, WA1 2NH

 mike.taylor@warrington.gov.uk

 Office: 01925 444086 Mobile: 07966 884639

warrington.gov.uk

From: fiona.bennett@highgatetransportation.co.uk [mailto:fiona.bennett@highgatetransportation.co.uk]
Sent: 06 November 2020 09:12
To: Taylor, Mike <mike.taylor@warrington.gov.uk>
Cc: dave.tighe@highgatetransportation.co.uk; 'Colin Griffiths' <colin@satnam.co.uk>; 'Wright, Colin' <Colin.Wright@wsp.com>; 'Heywood, Robert' <Robert.Heywood@highwaysengland.co.uk>; Dickin, Alan <adickin@warrington.gov.uk>
Subject: RE: Peel Hall Updated VISSIM Base Model (v6)

Morning Mike,

Thank you for providing WSP's review of the October 2020 VISSIM base model (attached again for ease of reference).

Further to your email (below), we are pleased the WSP report (Technical Note 11) confirms that the base model is considered suitable and fit for purpose.

You have raised a query in relation to the coding of lane destination markings on the A49/Sandy Lane West/Cromwell Avenue southern circulatory section (see the second paragraph of your email).

Subject: RE: Peel Hall Updated VISSIM Base Model (v6)
Date: Friday, 13 November 2020 at 13:55:28 Greenwich Mean Time
From: Taylor, Mike
To: dave.tighe@highgatetransportation.co.uk
CC: 'Colin Griffiths', 'Robert', Hughes, Martha, Dickin, Alan, Colin.Wright@wsp.com, fiona.bennett@highgatetransportation.co.uk
Attachments: image001.png, image002.png, image003.png, image004.png, image005.png, image006.jpg, image007.png, image008.png, image009.png, image010.png

Dave,

Thank you for your email. I can confirm acceptance of the base model as reflecting current conditions but would reiterate the point that the correct coding is potentially significant when considering future with and without Peel Hall development and potential mitigation. The fact that lane discipline is not currently adhered to is likely to be due to the poor condition of the road markings. As you are aware the layout was designed with specific lane allocations and it is likely that a future mitigation design featuring a departure from those allocations i.e. the delineation of the A574 destination in the central circulatory lane, would raise issues at the design stage and the Road Safety Audit stage. In the meantime I will raise the issue with the Council's Maintenance Team and seek to have the road markings renewed.

Further to my previous email can you give me an update as to when the forecasting modelling will be available for review? I am conscious that the PINS deadline is fast approaching.



Regards

Mike

Mike Taylor
Transport Development Control Team Leader

CURRENTLY WORKING FROM HOME

Environment and Transport Directorate
Transport for Warrington
Warrington Borough Council
New Town House, Buttermarket Street, Warrington, WA1 2NH

 mike.taylor@warrington.gov.uk
 Office: 01925 444086 Mobile: 07966 884639

warrington.gov.uk

From: dave.tighe@highgatetransportation.co.uk [mailto:dave.tighe@highgatetransportation.co.uk]
Sent: 13 November 2020 12:38
To: Taylor, Mike <mike.taylor@warrington.gov.uk>
Cc: 'Colin Griffiths' <colin@satnam.co.uk>; 'Robert' <Robert.Heywood@highwaysengland.co.uk>; Hughes, Martha <Martha.Hughes@warrington.gov.uk>; Dickin, Alan <adickin@warrington.gov.uk>; Colin.Wright@wsp.com; fiona.bennett@highgatetransportation.co.uk
Subject: FW: Peel Hall Updated VISSIM Base Model (v6)

Hi Mike,

We haven't heard back from you regarding the below, so we will assume that if you haven't responded by 5pm today that you have signed off the base model.

Kind Regards,

Dave

Dave Tighe
Highgate *Transportation*

Tel: 0117 934 9121
Mob: 07973375937
dave.tighe@highgatetransportation.co.uk

*Highgate Transportation Ltd,
First Floor, 43-45 Park Street
BRISTOL BS1 5NL
Company Registration Number: 07500534*

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From: fiona.bennett@highgatetransportation.co.uk <fiona.bennett@highgatetransportation.co.uk>
Sent: 12 November 2020 12:20
To: 'Taylor, Mike' <mike.taylor@warrington.gov.uk>
Cc: dave.tighe@highgatetransportation.co.uk; 'Colin Griffiths' <colin@satnam.co.uk>; 'Wright, Colin' <Colin.Wright@wsp.com>; 'Heywood, Robert' <Robert.Heywood@highwaysengland.co.uk>; 'Dickin, Alan' <adickin@warrington.gov.uk>; 'Hughes, Martha' <Martha.Hughes@warrington.gov.uk>
Subject: RE: Peel Hall Updated VISSIM Base Model (v6)

Good afternoon Mike,

Thank you for your email.

For the avoidance of doubt, please can you confirm that you have now signed off the base model?

Kind regards,
Fiona

Fiona Bennett
Highgate *Transportation*
Tel: 0117 934 9121
Mob: 07595 892 217

*Highgate Transportation Ltd
First Floor, 43-45 Park Street
BRISTOL BS1 5NL
Company Registration Number: 07500534*

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From: Taylor, Mike <mike.taylor@warrington.gov.uk>
Sent: 12 November 2020 12:07

APP33 -

ref TN12 MG0123_A49WarringtonCorridor_OptionA_ModellingReport_v6.3

Access Strategy A

MG0123 – A49 Corridor VISSIM, Warrington

Luke Best

30 November 2020

DOCUMENT CONTROL ISSUE SHEET

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Project Number	MG0123
Document Title	Access Strategy A Modelling Report
Document Reference	Version 6.3

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6	03/11/2020	Submission following audit comments	Fiona Bennett
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				Approved	Date
1	04/02/2020	Luke Best		Nicolas Contentin	05/02/2020
2	06/03/2020	Luke Best		Carl Moreno	09/03/2020
3	04/08/2020	Luke Best		Carl Moreno	04/08/2020
4	14/08/2020	Luke Best		Carl Moreno	14/08/2020
5	07/09/2020	Luke Best		Chris Davis	07/09/2020
6	03/11/2020	Luke Best		Carl Moreno	03/11/2020
6.3	30/11/2020	Luke Best		Carl Moreno	30/11/2020

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1. INTRODUCTION

1.1 Background

1.1.1 Modelling Group Ltd has previously developed a base-year microsimulation model of the A49 corridor for the area to the north of Warrington, surrounding the M62 junction 9. For further detailed information relating to this exercise, please refer to 'MG0123_A49WarringCorridor_BaseModellingReport_v6.2'.

1.1.2 The aim of this model has been to provide a robust platform on which the proposed development (Peel Hall) can be tested and impact upon the highway network assessed in the future years 2022, 2027 and 2032. The network extents and location of the development are illustrated in Figure 1.1 below.

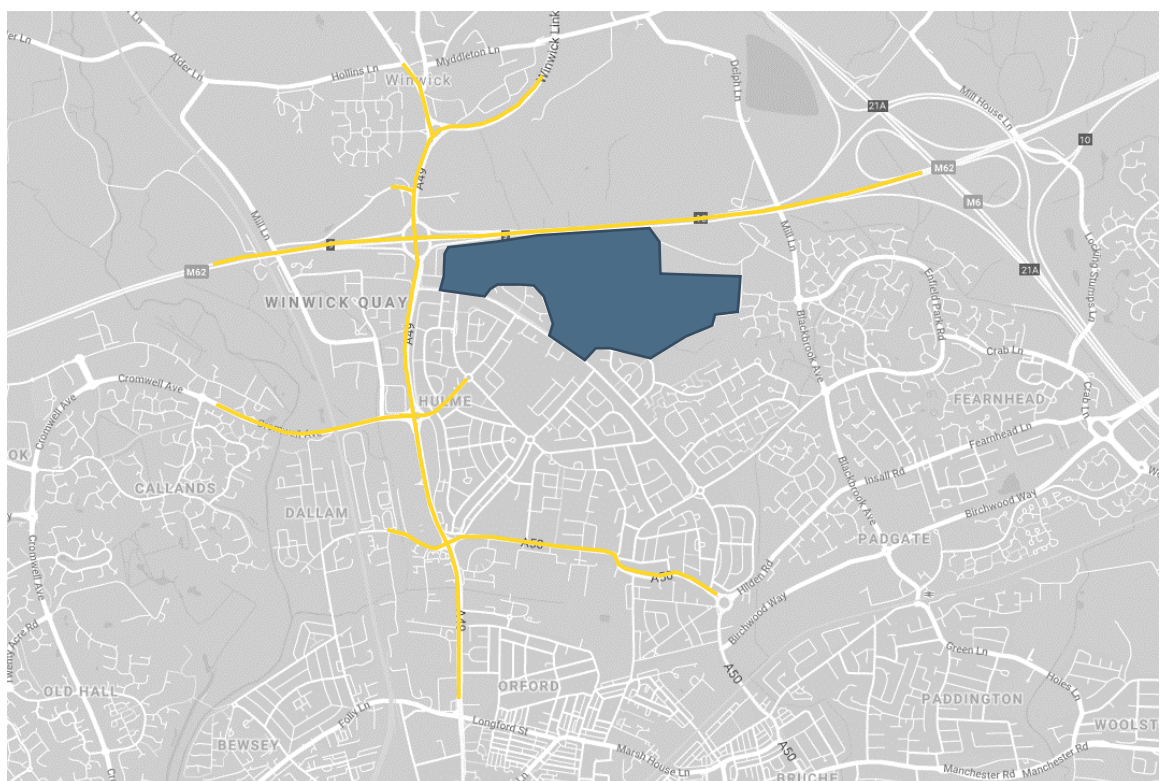


FIGURE 1.1: NETWORK EXTENTS AND APPROXIMATE LOCATION OF DEVELOPMENT

1.2 Report Purpose

1.2.1 The following report summarises the methodology used to build and test the model, as well as the results obtained to determine the comparative performance impacts of Peel Hall Access Strategy A flows within the committed future year networks. It also details the processes involved in the building and testing of all proposed highway and mitigation measures.

1.4 Report Structure

The report is structured as follows:

- **Section 2: Methodology**, including information on the model development and scenarios tested;
- **Section 3: Model Performance**, including network performance statistics, and journey times; and
- **Section 4: Summary and Conclusions.**

2 METHODOLOGY

2.1 Overview

- 2.1.1 The model extent used is consistent with the 2019 base model as highlighted in Figure 2.1. As a result of levels of queueing found during the development of future year models, some links have been extended, in agreement with the Council's audit team, to ensure that demand is able to enter the model.
- 2.1.2 Also consistent with the 2019 base year modelling, the 2022, 2027 and 2032 models are modelled to cover a 2.5-hour period, for the AM and PM traffic peaks.
- 2.1.3 In the AM, this period covers 07:00-09:30, with an hour 'warm-up' from 07:00-08:00, and a half-hour 'cool-down' from 09:00-09:30. In the PM, this period covers 16:00-18:30, with an hour 'warm-up' from 16:00-17:00, and a half-hour 'cool-down' from 18:00-18:30.
- 2.1.4 The model has been developed using the same version of the software as used for the validated base model (PTV VISSIM 11.00-13). Results have been output with a model resolution of 5-time steps per second, as was used in the original modelling. The same random seeds have also been used (starting from 5, increasing by 5 each run, for 10 runs), although each scenario there was a need to run some additional seed runs as a result of model locking, to ensure a total of ten usable runs. Seeds used were kept the same between each group of compared future year scenarios. This approach was discussed during an earlier meeting with the HE and WBC audit teams.

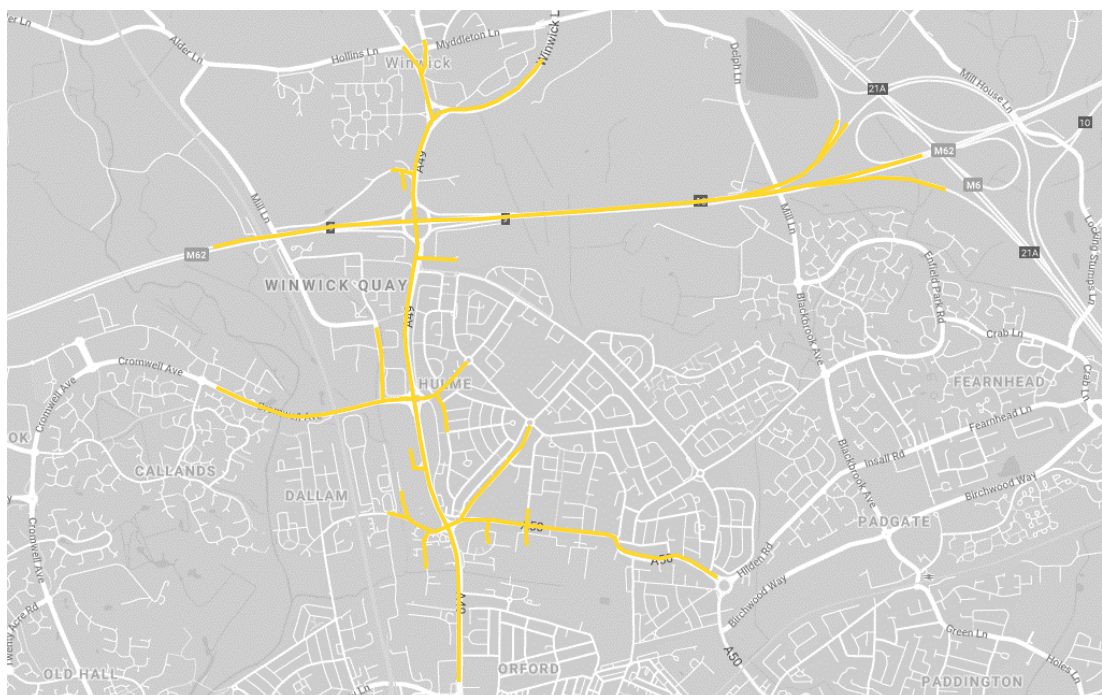


FIGURE 2.1: VALIDATED 2019 MODEL EXTENTS

2.2 Scenarios Tested

2.2.1 The scenarios tested in the model were:

- **2022** Background & Committed Traffic Growth + Committed Mitigation Measures (*Reference Case*)
- **2022** Background & Committed Traffic Growth + Peel Hall Development Traffic (Full Development Scenario) + Committed & Proposed Mitigation Measures (*Proposed Test*)
- **2022** Background & Committed Traffic Growth + Peel Hall Development Traffic (Full Development Scenario) + Committed & Proposed Mitigation Measures + M4 Mitigation Package (*Mitigation Test*)
- **2027** Background & Committed Traffic Growth + Committed Mitigation Measures (*Reference Case*)
- **2027** Background & Committed Traffic Growth + Peel Hall Development Traffic (Part-Build Out with no Internal Link Development Scenario) + Committed & Proposed Mitigation Measures (*Proposed Test*)
- **2027** Background & Committed Traffic Growth + Peel Hall Development Traffic (Part-Build Out with no Internal Link Development Scenario) + Committed & Proposed Mitigation Measures + M4 Mitigation Package (*Mitigation Test*)
- **2032** Background & Committed Traffic Growth + Committed Mitigation Measures (*Reference Case*)
- **2032** Background & Committed Traffic Growth + Peel Hall Development Traffic (Full Development Scenario) + Committed & Proposed Mitigation Measures (*Proposed Test*)
- **2032** Background & Committed Traffic Growth + Peel Hall Development Traffic (Full Development Scenario) + Committed & Proposed Mitigation Measures + M4 Mitigation Package (*Mitigation Test*)

- 2.2.2 The flows for each scenario were provided by Highgate Transportation in the spreadsheet '*Peel Hall Access Strategy A - Flow Diagram Spreadsheet - REISSUE 200120.xlsm*'. The flow diagrams within this were developed using the Council's SATURN model (WMMTM16) outputs provided by AECOM, on behalf of Warrington Borough Council.
- 2.2.3 In order to ensure a fully transparent and traceable process in the conversion of these flows into a useable format for entry into the VISSIM models, the matrices creation module in LinSig 3 was used to develop Origin-Destination matrices for each vehicle type.
- 2.2.4 The current model area does not have any route choice, hence the choice of LinSig was considered appropriate to evaluate the routing for both lights and heavies. A total of 18 different scenarios for Lights and Heavies have been processed. A skeleton model of the area was constructed and turning counts were imported at each junction for validation purposes.
- 2.2.5 Flow consistency checks were undertaken on the SATURN flow diagrams provided to make sure that the number of vehicles leaving one junction were equal to the number of vehicles entering the next one. It was concluded that the flow provided was consistent and could be used for flow estimation in LinSig. Traffic data was processed by LinSig and it was concluded that 100% of the GEH values for all scenarios were below a threshold of 3.
- 2.2.6 The LinSig model has been provided for review as part of the final model submission for Option A, and is detailed further in Appendix B.
- 2.2.7 Further Processing has been carried out to then link the flows taken from the WMMTM16 (SATURN) model to the validated VISSIM base model flows. This process involved creating proportional comparisons between the SATURN base model and the various modelled future year scenarios, then applying those differences as percentage changes to the VISSIM model flows in order to create future scenario origin-destination values. This methodology has been agreed with the Council and Highways England audit teams.
- 2.2.8 Where percentage changes between certain origin-destination pairings seemed disproportionately large, the actual difference values were substituted. The only origin-destination pairings which had this approach was between Winwick Link Road (Zone M), Goldborne Road (Zone N) and A49 Newton Road (Zone O).
- 2.2.9 Exact details of this calculation methodology and all workings can be found in the spreadsheet '*MG0123_Lin2VIS_MtxConv_SATVISSIM_FY_v10.xlsx*'.

2.3 Network Development

2.3.1 Several changes have been made to the model network to reflect planned improvements in the area. These include:

- **A49 Newton Rd/Hollins Lane Junction** – although this junction is outside of the modelled network extents, the effects of delays caused at this location form part of the base model validation (through the use of reduced speed areas on the exiting link to replicate vehicle speeds/delays). As a result of committed future mitigation measures in this location, modelling results from the document '*Former Parkside Colliery, Newton-le-Willows WPC Post Submission Highway Response 1*' were used to alter the reduced speed area profiles, in order to match the stated improvement to northbound capacity through the junction as a result of a left-turn filter lane being added and the junction being optimised.
- **A49 Newton Road/ Winwick Link Road Junction (Winwick Island)** – Widening of the northbound and southbound approaches on Newton Road, widening of the westbound approach from Winwick Link Road including the creation of a segregated left turn lane. Also included, is widening of the circulatory carriageway.
- **A49 Newton Road / Delph Lane Junction** – Additional lane for Newton Road northbound, including widened exit merge.
- **A49 Winwick Road/ Junction Nine Retail Park Junction** – Widening of Winwick Road northbound to facilitate a dedicated left turn lane into the retail park, Widening of Winwick Road southbound to extend the existing dedicated right turn lane into the retail park.

2.3.2 As a result of the level of change these committed mitigation works (ref para 2.3.1) made to flow patterns around the network, it was reasoned to be an acceptable approach to carry out signal optimisation (consisting of small, iterative changes to individual phase and stage green-times, rather than any sort of wholesale change to signal controller operation) where needed, in each future year scenario. This optimisation was carried out in the *Reference Case* scenarios for each future year, then all timings were kept the same in the *Proposed Test* scenarios, in order to provide a fair comparison.

2.3.3 Additionally, as a result of impacts to network performance in future year scenarios, particularly in 2032, a further two mitigation proposals were also tested in all **Proposed Test** scenario models. These were as follows:

- **A49 Newton Road/Golborne Road Junction** – Improvements were made to the existing road widths and layout at this junction in order to increase queuing capacity, particularly for right turning vehicles which contribute heavily to the wider impact on the surrounding network.
- **A49 Winwick Road/ A50 Long Lane/Hawley's Lane Junction** – A much more detailed and responsive signal controller was created at this location, in order to allow a more accurate understanding of the potential impacts of upgrades and improvements to the current vehicle actuated signal control setup.

2.3.4 During the process of testing and optimising the *Proposed Test* scenario models, it became clear that additional mitigation measures would be beneficial. Previous stages of testing, assessment and design have led to the final package of mitigation measures, referred to in all modelling as the M4 package, being developed. This consists of the following additional measures:

- **A49 Winwick Road/Sandy Lane West/A574 Cromwell Avenue Junction** – The northbound left-turn filter lane from A49 Winwick Road to Cromwell Avenue has been widened to two lanes and extended further south. This allowed more storage space to be created for the heavily used left-turn here in both peaks. An additional benefit to this arrangement was the allowance of a rebalancing of signal green-time, providing additional capacity for other approaches. Additionally, as a result of discussion with WBC, modelling in all future year scenarios has been amended to simulate tighter lane discipline. This modification ensures that there is no over-stating of capacity due to poor adherence to lane controls for traffic on the southern section of the roundabout and exiting to the west onto Cromwell Avenue.
- **M62 Junction 9** – The eastbound on-slip has been widened to a two-lane section exiting the junction. There is also some realignment of the A49 Newton Road southbound approach and circulating carriageway in between to accommodate the additional exit lane. This allowed better lane usage on the northern section of the circulatory carriageway for traffic exiting eastbound onto the M62, with an additional knock-on benefit of allowing a rebalancing of stage green-time.

- 2.3.5 Drawings used to model junction mitigations are shown in Appendix C (Committed Mitigation Measures - *Parkside Transport Assessment 2018 (Curtins) & Junction Nine Retail Park Transport Assessment 2016 (Sanderson)*) and D (*Peel Hall Proposed Mitigation (Highgate Transportation)*).
- 2.3.6 Due to the cumulative effect that the combined package of mitigation measures (ref para 2.3.2 - 2.3.4), in unity with the committed mitigation measures already in place, made to flow patterns throughout the surrounding network, it was reasoned to be an acceptable approach to carry out network-wide signal optimisation (consisting of small, iterative changes to individual phase and stage green-times, rather than any sort of wholesale change to signal controller operation) where needed, particularly along the A49 corridor, in each future year scenario.

2.4 Traffic Compositions

As with the original models, three primary traffic compositions were used in the models: Cars, LGVs and HGVs. However, when modelling the 'Do Something' scenario models, additional development related traffic was added as a separate vehicle type, based on the Cars composition.

2.5 Future Year Network Changes

- 2.5.1 All exit arm delays other than the northern end of A49 Newton Road (relating to the Hollins Lane improvements) and the eastern exit link of the M62 eastbound in all 2032 AM peak models (where speeds were increased by 1mph in order to stop the model from 'gridlocking' as this was not felt to be realistic) have been left as per the validated base model.
- 2.5.2 Link layout on the A50 Long approach to the Northway junction has been amended slightly to allow for improved model running. In reality, this approach flares from one lane to three lanes without necessarily defining exactly how traffic would approach each chosen destination lane. However, in VISSIM it is necessary to prescriptively define how a flare is approached (i.e. which side of the single, approaching lane addition lanes are created on).
- 2.5.3 In the base model, there were less issues with congestion and delay on this approach, so it only became apparent during the modelling of future year scenarios that the link structure used during the base model development was not appropriate for the creation of realistic behaviour in the busier future year scenarios.
- 2.5.4 The main adjustment was to then change the single approach link so that it joined to the middle link of what becomes the three lanes approaching the signalised junction, rather than the outer link as in the base model.



FIGURE 2.2 – AERIAL VIEW OF A50 LONG LANE DIVERGE AT NORTHWAY

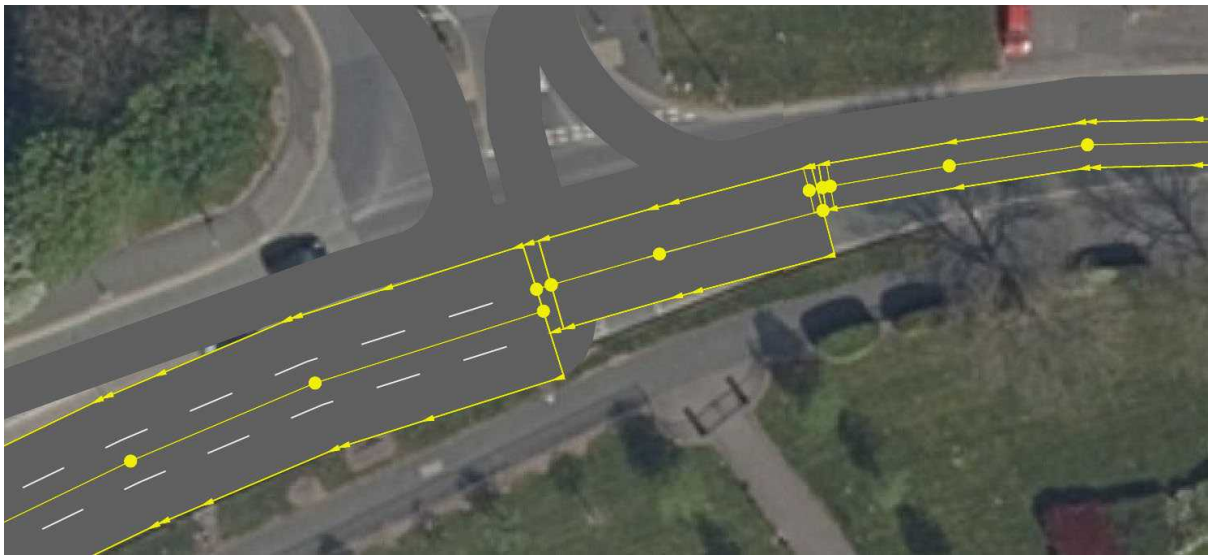


FIGURE 2.3 – ORIGINAL BASE MODEL CODING OF A50 LONG LANE

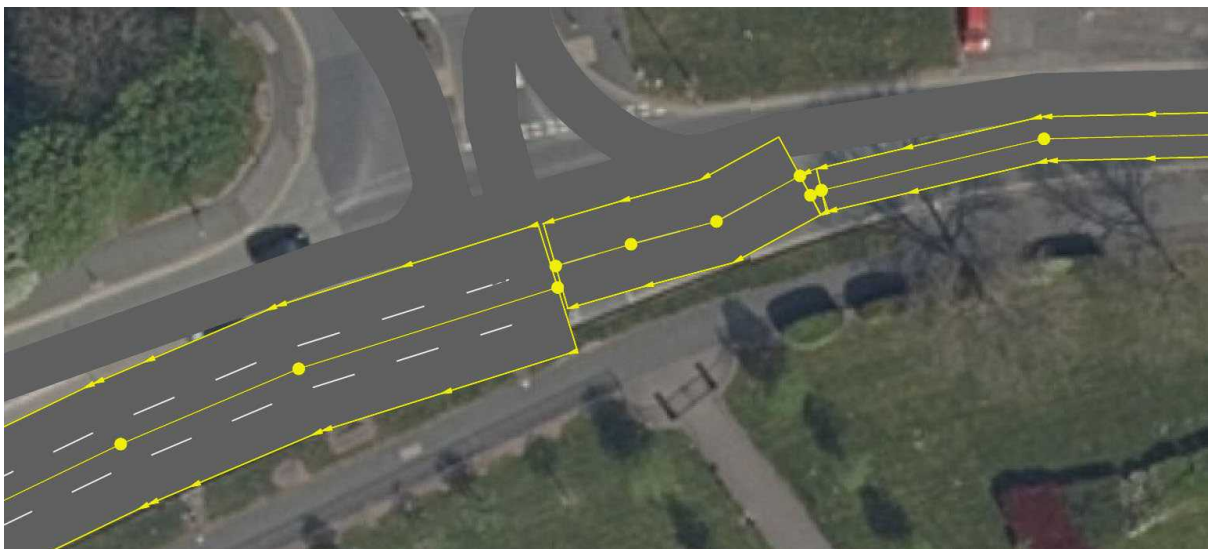


FIGURE 2.4 – REVISED FUTURE YEAR CODING OF A50 LONG LANE

3 MODEL PERFORMANCE

3.1 Overview

3.1.1 The impact of the development on the local highway network has been assessed in 2022, 2027, and 2032, using the following model outputs:

- Overall network performance statistics; including average per vehicle delay/speed, total network delay, latent demand;
- Average journey times and volumes along key routes;
- Details of volume changes at key locations;
- Comparative queue length analysis at key locations;
- Analysis of error files.

3.1.2 All modelled scenario results are averaged over 10 random seed runs, to reflect daily fluctuations in arrival patterns.

3.2 Network Performance Statistics

3.2.1 This section summarises the network performance statistics. Network performance data is split into two main types – average per vehicle data, and total network statistics (taken over the peak hour).

3.2.2 Data is then further broken down as follows:

- Per Trip Average Per Vehicle Data:
 - **Delay** – defined as average time spent in a delay state (i.e. being held below desired speed due to network conditions);
 - **Stops** – defined as the average number of times each vehicle comes to a full stop;
 - **Speed** – defined as the overall average speed per trip, in miles per hour;
 - **Stopped Delay** – defined as the average amount of time spent in an unwanted, stopped state
- Total Network Data
 - **Distance** – defined as the total cumulative distance travelled by all vehicles completing trips within the peak hour;
 - **Travel Time** – defined as the total cumulative travel time of all vehicles completing trips within the peak hour;
 - **Delay Time** – defined as the total cumulative time spent in a delay state by all vehicles during the peak hour;
 - **Stops** – defined as the total cumulative number of vehicle stops within the network during the peak hour;
 - **Stopped Delay** – defined as the total cumulative amount of time spent in an unwanted, stopped state by all vehicles during the peak hour;
 - **Vehicles Active** – defined as the total number of vehicles still active within the network at the end of the peak hour;
 - **Vehicles Arrived** – defined as the total number of completed trips by the end of the peak hour;
 - **Latent Delay** – defined as the total amount of delay stored outside of the network (i.e. experienced by **Latent Demand** – see below, and therefore not counted in the **Delay Time** statistic defined above) at the end of the evaluation interval;
 - **Latent Demand** – defined as the total number of vehicles (demand) stuck outside of the network at the end of the evaluation interval (generally due to queueing and delays).

- 3.2.3 Tables 3.1 and 3.2 show the summary network performance data for the AM and PM modelled peaks, respectively.
- 3.2.4 The committed mitigation measures, along with the associated signal timing optimisation carried out to rebalance each future year scenario, contribute towards the reference case scenarios working well in all future years. Speeds are relatively high, considering the number of signalised junctions along most journeys and levels of peak hour latent demand (vehicles unable to access the network due to congestion/queuing) are relatively low in the peak period. These results do show impact from the addition of traffic growth associated with each subsequent future year period but suggest a network which is coping well with the required level of demand in each Reference Case future year scenario.
- 3.2.5 When Peel Hall development traffic is added to the network, there is an impact on levels of congestion, however something which is immediately clear from the lower granularity, network-wide data is that the full mitigation package creates the ability for fairly consistent network performance in each sequential future year scenario, particularly in the evening peak, even with the inclusion of additional background, committed development and Peel Hall development associated traffic growth.
- 3.2.6 As the journey time data and queue length analysis show in the following sections, what delay there is in the M4 Mitigation scenario tends to be localised, with the majority of the network seeing maintained levels of overall performance when compared against the equivalent Reference Case scenarios. However, as increasing levels of traffic growth are added to the future year scenarios, it is more and more apparent that the Mitigated Peel Hall development scenario networks experience an increasing level of improvement when compared against the Reference Case scenarios.

	08:00-09:00													
	Average Per/Vehicle				Total Network Statistics									
	Delay	Stops	Speed	Stopped Delay	Distance	Travel Time	Delay Time	Stops	Stopped Delay	Vehicles Active	Vehicles Arrived	Latent Delay	Latent Demand	
AM 2022 Background & Committed Traffic Growth + Committed Mitigation Measures	170	9	23	66	66587	6572790	3202541	172053	1244854	1921	16941	2371	1	
AM 2022 Background & Committed Growth + Peel Hall Development Traffic + Committed & Proposed Mitigation Measures	224	12	19	96	67224	7743099	4340595	241481	1850749	2340	17029	245076	153	
AM 2022 Background & Committed Growth + Peel Hall Development Traffic + Committed & Proposed Mitigation Measures plus M4	232	13	19	98	67047	7937735	4506864	243599	1912029	2391	17032	219922	134	
AM 2027 Background & Committed Traffic Growth + Committed Mitigation Measures	251	14	18	96	69764	8635416	5114462	292091	1955698	2618	17716	61665	72	
AM 2027 Background & Committed Growth + Peel Hall Development Traffic + Committed & Proposed Mitigation Measures	281	16	17	111	69804	9284858	5764520	334621	2286657	2805	17724	394050	278	
AM 2027 Background & Committed Growth + Peel Hall Development Traffic + Committed & Proposed Mitigation Measures plus M4	285	16	17	115	69561	9391684	5847960	332910	2367104	2885	17639	378441	279	
AM 2032 Background & Committed Traffic Growth + Committed Mitigation Measures	288	15	17	133	72115	9727996	6113766	317536	2811062	2952	18252	625450	445	
AM 2032 Background & Committed Growth + Peel Hall Development Traffic + Committed & Proposed Mitigation Measures	315	17	16	143	71878	10250904	6661435	358595	3036016	3121	18058	2235859	1123	
AM 2032 Background & Committed Growth + Peel Hall Development Traffic + Committed & Proposed Mitigation Measures plus M4	312	16	16	145	71569	10187091	6576192	342583	3053240	3086	18014	2192542	1162	

TABLE 3.1: AM PEAK NETWORK PERFORMANCE STATISTICS SUMMARY

	17:00-18:00													
	Average Per/Vehicle				Total Network Statistics									
	Delay	Stops	Speed	Stopped Delay	Distance	Travel Time	Delay Time	Stops	Stopped Delay	Vehicles Active	Vehicles Arrived	Latent Delay	Latent Demand	
PM 2022 Background & Committed Traffic Growth + Committed Mitigation Measures	134	4	27	75	79831	6714121	2879292	80962	1621377	1844	19701	623900	294	
PM 2022 Background & Committed Growth + Peel Hall Development Traffic + Committed & Proposed Mitigation Measures	172	7	24	92	80144	7627559	3779869	158280	2006189	2165	19759	1508715	683	
PM 2022 Background & Committed Growth + Peel Hall Development Traffic + Committed & Proposed Mitigation Measures plus M4	143	4	26	81	80509	7006191	3103514	77975	1760701	1904	19865	1935825	827	
PM 2027 Background & Committed Traffic Growth + Committed Mitigation Measures	150	4	25	85	83997	7444040	3424519	98165	1949219	2079	20818	1316518	583	
PM 2027 Background & Committed Growth + Peel Hall Development Traffic + Committed & Proposed Mitigation Measures	165	6	24	88	84216	7820905	3790916	136817	2029053	2121	20844	2164020	955	
PM 2027 Background & Committed Growth + Peel Hall Development Traffic + Committed & Proposed Mitigation Measures plus M4	154	4	25	84	84333	7607667	3537904	100613	1917736	2034	20867	2588861	1072	
PM 2032 Background & Committed Traffic Growth + Committed Mitigation Measures	181	6	23	99	87915	8547140	4369719	138225	2375109	2336	21744	2925046	1250	
PM 2032 Background & Committed Growth + Peel Hall Development Traffic + Committed & Proposed Mitigation Measures	193	7	22	100	88587	8921350	4700628	176376	2425831	2538	21797	3430711	1480	
PM 2032 Background & Committed Growth + Peel Hall Development Traffic + Committed & Proposed Mitigation Measures plus M4	180	6	23	94	88657	8597879	4342486	135799	2267589	2359	21804	4015723	1721	

TABLE 3.2: PM PEAK NETWORK PERFORMANCE STATISTICS SUMMARY

3.3 Journey Times Comparison

3.3.1 Consistent with the base year modelling, average journey times have been extracted and analysed for a single evaluation interval covering the peak hour for both the AM (08:00-09:00) and PM (17:00-18:00) scenario models. The separate routes used for evaluation of the north-south A49 route, the east-west M62 route, and the east-west local road routes were as follows:

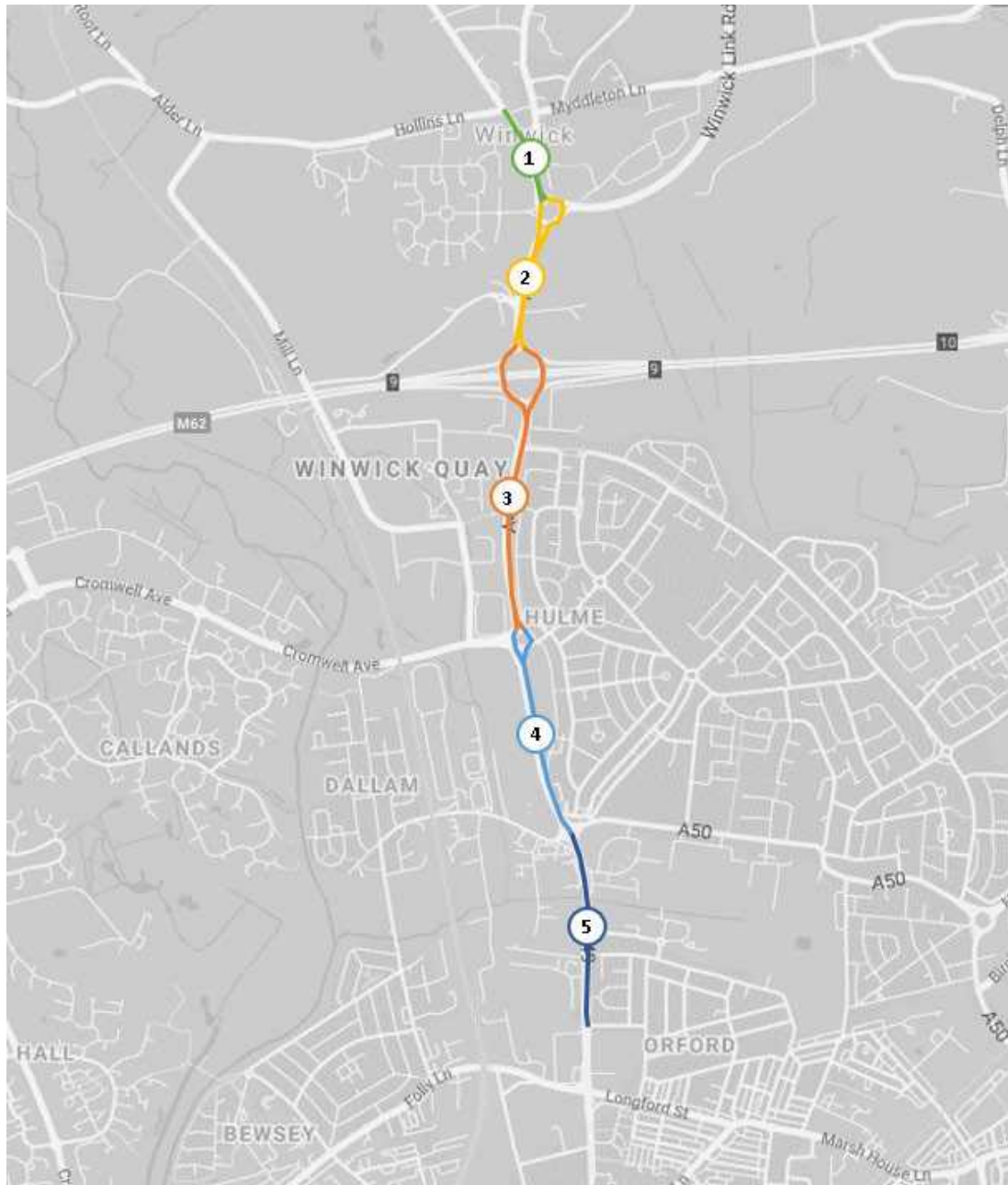


FIGURE 3.1: JOURNEY TIME SECTIONS (A49) ASSESSED

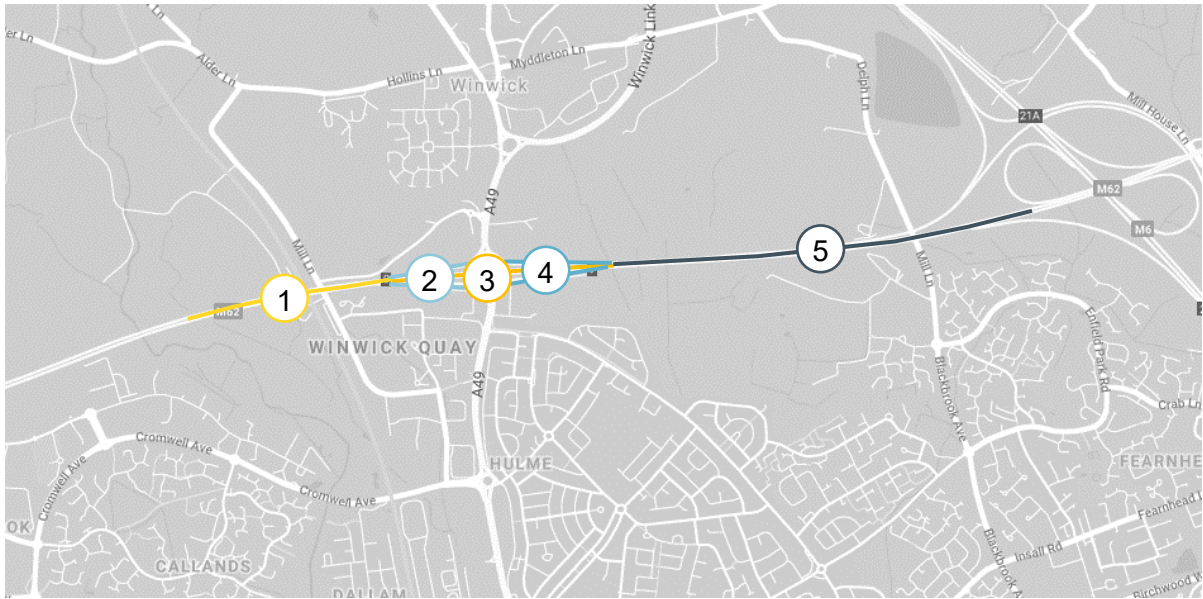


FIGURE 3.2: JOURNEY TIME SECTIONS (M62) ASSESSED

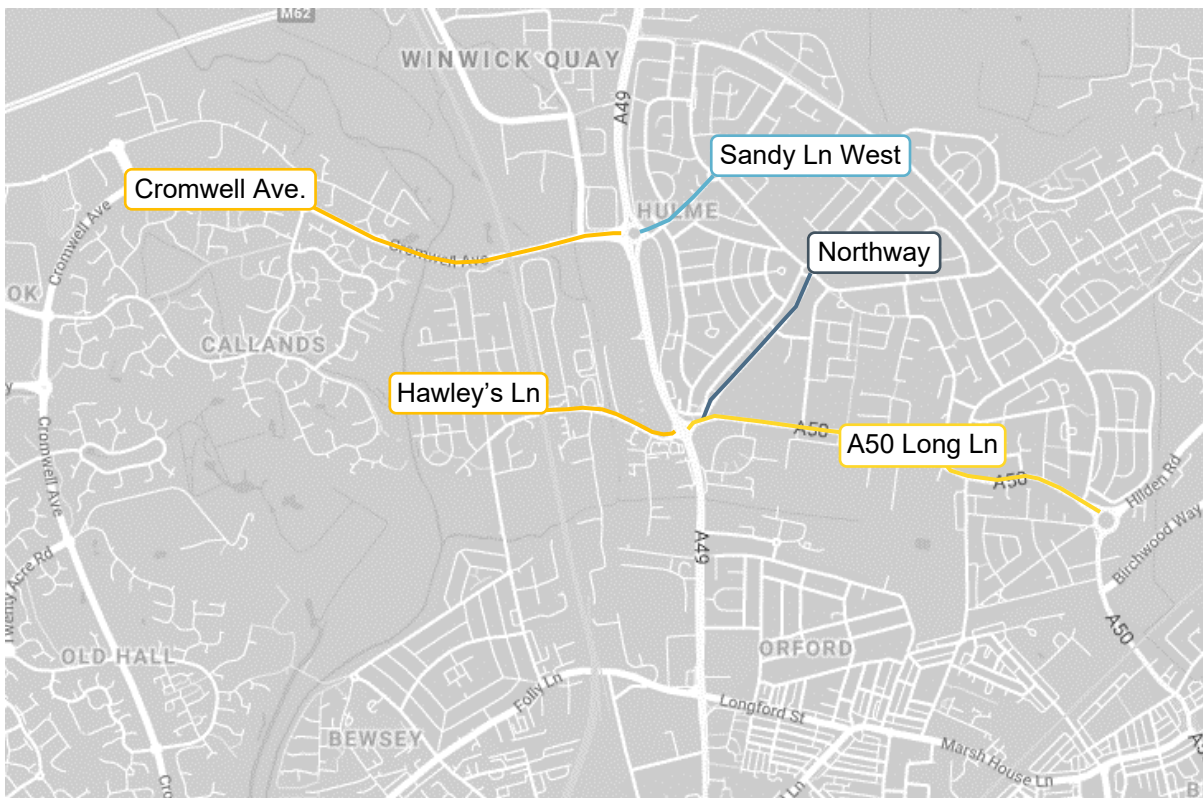


FIGURE 3.3: JOURNEY TIME SECTIONS (LOCAL ROADS) ASSESSED

- 3.3.2 Tables 3.3 – 3.5 summarise the comparative average peak hour journey times for traffic on all routes during the AM peak, for each future year scenario.
- 3.3.3 In 2022 (Table 3.3), it is possible to maintain a comparative level of journey time performance in most assessed sections. For the sections where this is not the case, most are the consequence of restrictions put in place during validation in order to replicate exit arm blocking.
- 3.3.4 At the southern end of the model, for traffic exiting southbound on the A49 Winwick Road, there is a speed reduction in place to replicate journey times in this section due to delays originating further south, beyond the model extents. As a result of the increased flow arriving at this end of the model due to improved network performance through the proposed mitigation, this section can quickly become congested and block back to the A49/A50/Hawley's Lane junction. If the network is not managed with this in mind, southbound traffic (which is the tidal flow direction in the morning peak) can quickly block back all the way to M62 Junction 9.
- 3.3.5 To assist in mitigating against this outcome, a level of gating is included in the north of the modelled area (affecting A49 Section 1 & 2 SB). Other approaches can also be affected by this, most notably A50 Sections 1 & 2 WB and Northway SWB, indirectly as a result of the demand for the left turn movement onto A49 Winwick Road.
- 3.3.6 This results in a total increase in journey time over the entire southbound route (+132 seconds/+17%), however there is a decrease for northbound journey times over the length of the A49 route (-27 seconds/-5%). This improvement is largely experienced for northbound traffic entering on the A49 at the southern end of the model extent. This is as a direct result of the improvements possible due to the more responsive signal controller used at the A49/A50/Hawley's Lane junction, to simulate the reconditioning and recalibration of the onsite MOVA controller. Although the southbound exit congestion prevents traffic travelling southbound from A49/Long Lane/Hawley's Lane from seeing an overall improvement (there is still an improvement up until about halfway through the peak, until the exit blocking occurs), there is no such issue for northbound traffic.
- 3.3.7 A similar effect is also experienced by eastbound traffic on the M62 (M62 Section 4 & 5 EB). In order to validate travel times in the base model, reduced speeds were used on the exit links to replicate delays originating further to the east. This effectively freezes the capacity for traffic exiting the model here at 2019 levels. However, in 2022 this does not affect the rest of the network.

- 3.3.8 For the other approaches to M62 Junction 9 not affected by intentional gating of the flow, it is possible as a direct consequence of the mitigation measures installed to either maintain or improve upon the Reference Case model performance. The A49 northbound (-4 seconds/-3%) and M62 eastbound off-slip (-1 seconds/-2%) approaches are maintained, whilst the M62 westbound off-slip (-32 seconds/-35%) sees a substantial improvement to journey times.
- 3.3.9 On Sandy Lane West, there was a need to create a restriction in the base models in the form of reduced speeds on the entry link. This was also used in order to validate journey times for westbound traffic entering the model on Sandy Lane West. This was to model the effect of multiple side roads and a retail park where they have junctions with Sandy Lane West (data was not available to model the detail of these interactions, so the effect was modelled instead).
- 3.3.10 However, this creates an inherent capacity constraint away from the signalised junction with the A49 Winwick Road. The knock-on effect of this is that, even with increased green time for the relevant stage of the signal controller, there is a limit to how much gain is available for Sandy Lane West. In the morning peak in 2022, an average additional hourly flow of 67 veh/hr (approximately +14%) successfully enters the network from Sandy Lane West in the M4 mitigated scenario, but there are still increased delays (+45 seconds/+35%) experienced for the remaining traffic, due to the link restrictions.

Section	AM 2022 - 08:00 - 09:00							
	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Section 1 SB	58	74	16	28%	58	76	17	30%
A49 Section 2 SB	128	179	51	40%	128	224	97	76%
A49 Section 3 SB	232	256	24	10%	232	241	9	4%
A49 Section 4 SB	210	212	2	1%	210	197	-13	-6%
A49 Section 5 SB	132	136	4	3%	132	154	22	17%
A49 Section 5 NB	151	89	-62	-41%	151	124	-27	-18%
A49 Section 4 NB	101	101	0	0%	101	104	3	3%
A49 Section 3 NB	143	146	2	2%	143	139	-4	-3%
A49 Section 2 NB	68	68	0	0%	68	69	1	1%
A49 Section 1 NB	50	49	-1	-2%	50	50	0	-1%
M62 Section 1 EB	70	71	1	1%	70	71	1	1%
M62 Section 2 EB	39	44	5	13%	39	38	-1	-2%
M62 Section 3 EB	40	40	0	0%	40	40	0	0%
M62 Section 4 EB	30	30	0	1%	30	38	8	28%
M62 Section 5 EB	516	558	42	8%	516	565	49	9%
M62 Section 5 WB	85	87	2	2%	85	85	0	0%
M62 Section 4 WB	91	112	21	23%	91	59	-32	-35%
M62 Section 3 WB	36	36	0	0%	36	36	0	0%
M62 Section 2 WB	22	22	0	2%	22	22	0	-1%
M62 Section 1 WB	71	71	0	0%	71	72	0	0%
Cromwell Ave EB	167	182	15	9%	167	168	1	0%
Cromwell Ave WB	75	76	2	2%	75	76	2	2%
Sandy Lane EB	42	43	1	1%	42	43	1	1%
Sandy Lane WB	129	195	65	50%	129	174	45	35%
Northway SWB	199	711	512	257%	199	712	513	258%
A50 Section 1 EB	115	119	3	3%	115	115	0	0%
A50 Section 2 EB	96	95	-1	-1%	96	95	-1	-1%
A50 Section 2 WB	101	164	62	62%	101	148	47	46%
A50 Section 1 WB	184	333	150	81%	184	269	85	47%
Hawley's Lane EB	71	129	58	81%	71	110	38	54%

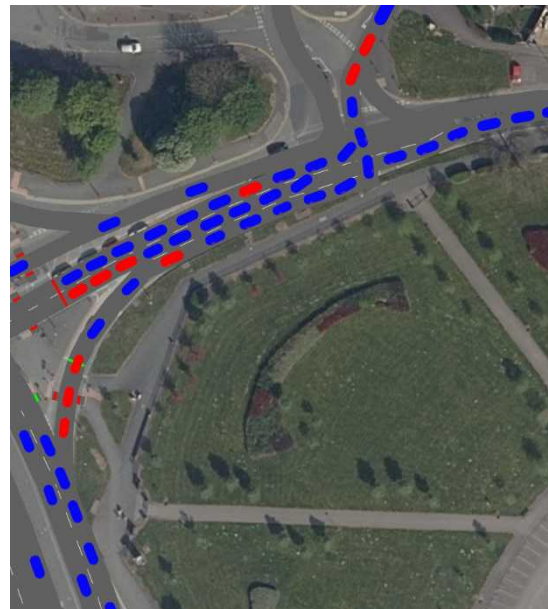
FIGURE 3.3: AM PEAK 2022 JOURNEY TIME COMPARISON

- 3.3.11 In Table 3.4, the journey time comparison for the 2027 morning scenarios is shown. As was the case in 2022, there is a need for some level of gating of the southbound flow, although as a result of the change in development trips added to this scenario, it is possible to spread that effect more evenly over the first three southbound sections.
- 3.3.12 As with the 2022 scenario, some level of delay was experienced either at model exit links due to increased flow where the external restrictions are contained within the model, as expected, or at key points as a result of some level of signal green time gating to balance the delays across the wider network and ensure that the main A49 corridor is kept moving. However, as a result of the change in development traffic scenario (part development build-out only, with retail trips) used in the 2027 scenario, these effects are less concentrated in most locations.
- 3.3.13 The resultant effect on southbound journey times along the length of the A49 is an increase (+107 seconds/+12%), however in the northbound direction, the full corridor has an improvement to journey times (-68 seconds/-12%).
- 3.3.14 As was seen in the 2022 AM data, the northbound improvement is partly (-27 seconds/-19%) as a result of the proposed improvements to the MOVA controlled A49/A50/Hawley's Lane junction. However, in 2027, there is also a significant improvement for the northbound approach to M62 Junction 9 (-42 seconds/-20%), due to the mitigation measures there.
- 3.3.15 It is worth noting that key westbound approaches to the A49 corridor (M62 westbound offslip -73 seconds/-45%, Sandy Lane West +12 seconds/+7% and A50 Long Lane +80 seconds/+19%) all have a much-reduced comparative impact than was seen in the 2022 data.
- 3.3.16 At M62 junction 9, as a direct consequence of the proposed mitigation at this junction, it is possible to optimise the signals in such a way as to create quite significant improvements when compared against the Reference Case scenario models. The additional exit lane allows the green time to be re-assigned, as the northbound circulatory movement makes better use of space and therefore needs less time.

Section	AM 2027 - 08:00 - 09:00							
	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Section 1 SB	73	87	14	19%	73	88	15	20%
A49 Section 2 SB	169	174	4	3%	169	215	46	27%
A49 Section 3 SB	231	213	-18	-8%	231	272	42	18%
A49 Section 4 SB	217	209	-8	-4%	217	224	7	3%
A49 Section 5 SB	169	177	8	5%	169	166	-3	-2%
A49 Section 5 NB	141	91	-49	-35%	141	114	-27	-19%
A49 Section 4 NB	104	105	2	1%	104	105	1	1%
A49 Section 3 NB	207	243	36	17%	207	165	-42	-20%
A49 Section 2 NB	74	77	3	5%	74	75	1	1%
A49 Section 1 NB	59	60	1	2%	59	58	-1	-1%
M62 Section 1 EB	70	71	1	1%	70	71	0	1%
M62 Section 2 EB	50	77	27	55%	50	39	-11	-22%
M62 Section 3 EB	59	69	10	18%	59	64	5	9%
M62 Section 4 EB	45	54	10	22%	45	65	21	47%
M62 Section 5 EB	679	682	3	0%	679	689	9	1%
M62 Section 5 WB	93	91	-2	-2%	93	86	-7	-7%
M62 Section 4 WB	162	169	7	4%	162	90	-73	-45%
M62 Section 3 WB	36	36	0	-1%	36	36	0	-1%
M62 Section 2 WB	22	22	0	0%	22	22	0	-2%
M62 Section 1 WB	72	72	0	0%	72	72	0	0%
Cromwell Ave EB	186	193	7	4%	186	280	94	50%
Cromwell Ave WB	76	76	0	0%	76	75	-1	-1%
Sandy Lane EB	43	44	1	1%	43	43	-1	-1%
Sandy Lane WB	167	204	37	22%	167	179	12	7%
Northway SWB	489	710	222	45%	489	691	202	41%
A50 Section 1 EB	110	113	3	3%	110	113	3	3%
A50 Section 2 EB	92	93	1	1%	92	91	-1	-1%
A50 Section 2 WB	124	183	59	48%	124	162	38	30%
A50 Section 1 WB	303	372	69	23%	303	345	42	14%
Hawley's Lane EB	62	130	67	108%	62	50	-12	-19%

FIGURE 3.4: AM PEAK 2027 JOURNEY TIME COMPARISON

- 3.3.17 In Table 3.5, the journey time comparison for the 2032 morning scenarios is shown. In 2032, the southbound A49 detriment when compared against the Reference Case data is less than previous AM future years (+88 seconds/+9%). In comparison, the northbound improvement is considerably more than the other AM future year comparisons (-139 seconds/-19% over the entire length of the route).
- 3.3.18 The journey time improvement for the eastbound offslip at M62 Junction 9 is also much more significant (-34 seconds/-41%), when compared against the Reference Case model. A similar level of improvement to that achieved in the Reference Case model has been maintained for the westbound offslip (+5 seconds/+4%).
- 3.3.19 The effect of the mitigation measures at the A49/Sandy Lane West/Cromwell Avenue junction are also more apparent in 2032. Cromwell Avenue experiences a relatively small increase in delay (+42 seconds/+13%), as does the A49 southbound approach (+24 seconds/+9%). The A49 northbound approach and Sandy Lane West approach have similar levels of performance with the development traffic added to that found in the Reference Case model.
- 3.3.20 As with the other AM future year comparisons, the main area to experience detriment is the area covering both the A50 Long Lane approach to the junction with A49 Winwick Road and the Northway approach to A50 Long Lane located around 70m to the east of this.
- 3.3.21 There is clearly an issue with any substantial volume of traffic successfully exiting from Northway onto A50 Long Lane during the peak, as can be seen from the high journey times in the Reference Case models. This is exacerbated by a high volume of left-turners onto the A49 Winwick Road in the morning peak, which become increasingly delayed by the congestion on the southern A49 exit link from the modelled area, as can be seen in the example image to the right.



3.3.22 In reality, it is likely that signals further to the south could be optimised further to help with this delay in the future. This is beyond the current remit of this model and the agreed scope of this study.

Section	AM 2032 - 08:00 - 09:00							
	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Section 1 SB	120	136	16	13%	120	149	29	24%
A49 Section 2 SB	209	206	-4	-2%	209	236	26	12%
A49 Section 3 SB	266	251	-15	-6%	266	290	24	9%
A49 Section 4 SB	225	224	-2	-1%	225	245	20	9%
A49 Section 5 SB	194	204	10	5%	194	183	-11	-6%
A49 Section 5 NB	180	113	-67	-37%	180	167	-13	-7%
A49 Section 4 NB	116	119	3	3%	116	113	-3	-3%
A49 Section 3 NB	279	285	7	2%	279	180	-99	-35%
A49 Section 2 NB	95	84	-12	-12%	95	79	-16	-17%
A49 Section 1 NB	69	65	-4	-5%	69	61	-8	-11%
M62 Section 1 EB	70	76	6	8%	70	71	1	1%
M62 Section 2 EB	84	155	71	85%	84	50	-34	-41%
M62 Section 3 EB	41	42	1	1%	41	41	0	1%
M62 Section 4 EB	30	32	2	5%	30	39	8	28%
M62 Section 5 EB	495	538	43	9%	495	542	47	10%
M62 Section 5 WB	88	90	1	2%	88	91	2	3%
M62 Section 4 WB	123	113	-10	-8%	123	128	5	4%
M62 Section 3 WB	36	36	0	0%	36	36	0	0%
M62 Section 2 WB	22	22	0	1%	22	22	0	-1%
M62 Section 1 WB	72	72	0	0%	72	72	0	0%
Cromwell Ave EB	317	344	28	9%	317	359	42	13%
Cromwell Ave WB	75	77	2	3%	75	77	2	3%
Sandy Lane EB	44	44	0	1%	44	45	0	1%
Sandy Lane WB	200	188	-12	-6%	200	204	3	2%
Northway SWB	667	933	266	40%	667	921	254	38%
A50 Section 1 EB	111	104	-7	-6%	111	107	-4	-3%
A50 Section 2 EB	98	89	-9	-9%	98	88	-10	-10%
A50 Section 2 WB	206	283	78	38%	206	241	36	17%
A50 Section 1 WB	381	426	45	12%	381	392	11	3%
Hawley's Lane EB	83	138	54	65%	83	77	-6	-8%

FIGURE 3.5: AM PEAK 2032 JOURNEY TIME COMPARISON

- 3.3.23 When the PM 2022 journey time data is analysed (Table 3.6), it is clear that with all mitigation measures in place, performance can be maintained or improved through most sections of the northbound and southbound A49 corridor, as well as for eastbound and westbound traffic on the M62 with the full Peel Hall development in place.
- 3.3.24 On the A49 corridor, journey times for northbound traffic are mostly maintained with very little detriment (+27 seconds/+4%), whilst it has been possible to create an overall improvement for southbound traffic along the total length of the route (-14 seconds/-3%).
- 3.3.25 At the A49/Sandy Lane West/Cromwell Avenue junction, there is a small increase to journey times on Cromwell Avenue (+5 seconds/+3%), however the Sandy Lane West westbound approach experiences a significant improvement (-53 seconds/-29%) to journey times compared against the optimised Reference Case model. Performance on the A49 northbound (-3 seconds/-2%) and southbound (-9 seconds/-6%) approaches are also improved upon.
- 3.3.26 There are impacts for traffic approaching the A49 junction along A50 Long Lane and Northway. In 2022, this equates to a total of +108 seconds/+18% for westbound traffic along the whole length of A50 Long Lane, and +13 seconds/18% for traffic on Northway. There is also an impact to journey times on the Hawley's Lane eastbound approach (+45 seconds/+15%).
- 3.3.27 The proposed mitigation measures at M62 Junction 9, and the resultant signal optimisation, allow performance to be approximately the same on three of the approaches, with journey time differences of +7 seconds/7% on the southbound A49 approach, +2 seconds/+2% on the northbound A49 approach, and +4 seconds/+6% on the M62 westbound off-slip. However, traffic on the busy M62 eastbound off-slip experience a significant improvement of almost 1 minute (-54 seconds/-45%) to journey times.
- 3.3.28 As with other future year models, the impacts experienced by eastbound M62 traffic are as a result of the fixed constraint at the eastern exit point from the model. This relatively small additional delay does not affect the rest of the model.

Section	PM 2022 - 17:00 - 18:00							
	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Section 1 SB	58	58	0	1%	58	58	0	1%
A49 Section 2 SB	108	110	2	2%	108	115	7	7%
A49 Section 3 SB	141	207	65	46%	141	132	-9	-6%
A49 Section 4 SB	145	102	-43	-29%	145	133	-12	-8%
A49 Section 5 SB	72	72	-1	-1%	72	72	0	-1%
A49 Section 5 NB	250	265	15	6%	250	281	31	13%
A49 Section 4 NB	123	116	-7	-6%	123	120	-3	-2%
A49 Section 3 NB	121	124	3	3%	121	123	2	2%
A49 Section 2 NB	75	72	-3	-5%	75	73	-2	-3%
A49 Section 1 NB	58	55	-2	-4%	58	57	-1	-1%
M62 Section 1 EB	71	93	22	32%	71	71	0	1%
M62 Section 2 EB	120	240	120	100%	120	66	-54	-45%
M62 Section 3 EB	37	37	0	0%	37	37	0	0%
M62 Section 4 EB	30	29	0	0%	30	37	7	25%
M62 Section 5 EB	114	115	0	0%	114	134	20	17%
M62 Section 5 WB	87	88	0	1%	87	88	0	1%
M62 Section 4 WB	59	63	4	8%	59	62	4	6%
M62 Section 3 WB	38	38	0	0%	38	38	0	0%
M62 Section 2 WB	21	21	0	0%	21	21	0	0%
M62 Section 1 WB	76	76	0	0%	76	76	0	0%
Cromwell Ave EB	146	147	1	1%	146	151	5	3%
Cromwell Ave WB	73	73	0	0%	73	75	2	3%
Sandy Lane EB	49	51	2	5%	49	47	-2	-4%
Sandy Lane WB	185	195	11	6%	185	132	-53	-29%
Northway SWB	76	77	1	1%	76	90	13	18%
A50 Section 1 EB	102	99	-3	-3%	102	101	-1	-1%
A50 Section 2 EB	80	79	-1	-1%	80	79	-1	-1%
A50 Section 2 WB	170	205	34	20%	170	252	81	48%
A50 Section 1 WB	422	409	-13	-3%	422	449	27	6%
Hawley's Lane EB	298	305	7	2%	298	342	45	15%

FIGURE 3.6: PM PEAK 2022 JOURNEY TIME COMPARISON

- 3.3.29 Table 3.7 shows comparative journey time performance in the evening peak for the 2027 scenarios. On the A49 corridor, journey times for northbound traffic are mostly maintained with very little detriment (+16 seconds/+2%), whilst it has been possible to create a substantial overall improvement for southbound traffic along the total length of the route (-110 seconds/-18%).
- 3.3.30 Through signal green time optimisation, as a direct result of the proposed mitigation measure at M62 Junction 9, it has been possible to maintain 2022 Reference Case levels of performance for the busy eastbound offslip. This equates to an improvement of -67 seconds/-36% when compared against the optimised 2027 Reference Case model.
- 3.3.31 As a result of the proposed mitigation measure at the A49/Sandy Lane West/Cromwell Avenue junction, it has been possible to optimise the signal green times so that levels of performance are maintained or improved on for the Sandy Lane West (+1 second/+0%) and Cromwell Avenue (-18 seconds/-11%) approaches, whilst delivering journey time improvements for both the northbound (-16 seconds/-12%) and southbound (-5 seconds/-3%) approaches on the A49 Winwick Road.
- 3.3.32 There are impacts for traffic approaching the A49 junction along A50 Long Lane and Northway. In 2027, this equates to a total of +50 seconds/+8% for westbound traffic along the whole length of A50 Long Lane, and +12 seconds/16% for traffic on Northway.
- 3.3.33 As with other future year models, the impacts experienced by eastbound M62 traffic are as a result of the fixed constraint at the eastern exit point from the model. This relatively small additional delay does not affect the rest of the model.

Section	PM 2027 - 17:00 - 18:00							
	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Section 1 SB	65	66	1	2%	65	65	1	1%
A49 Section 2 SB	137	141	3	2%	137	99	-38	-28%
A49 Section 3 SB	159	177	18	11%	159	155	-5	-3%
A49 Section 4 SB	191	107	-85	-44%	191	124	-67	-35%
A49 Section 5 SB	73	71	-1	-2%	73	72	-1	-1%
A49 Section 5 NB	258	270	12	5%	258	279	21	8%
A49 Section 4 NB	137	120	-17	-12%	137	121	-16	-12%
A49 Section 3 NB	125	126	1	1%	125	126	0	0%
A49 Section 2 NB	86	84	-2	-2%	86	91	5	6%
A49 Section 1 NB	63	62	-1	-1%	63	63	1	1%
M62 Section 1 EB	71	75	4	6%	71	71	0	0%
M62 Section 2 EB	188	209	21	11%	188	121	-67	-36%
M62 Section 3 EB	37	37	0	0%	37	37	0	0%
M62 Section 4 EB	30	30	0	-1%	30	37	7	25%
M62 Section 5 EB	120	119	-1	-1%	120	141	21	17%
M62 Section 5 WB	90	90	0	0%	90	90	0	0%
M62 Section 4 WB	68	70	3	4%	68	68	0	0%
M62 Section 3 WB	38	38	0	0%	38	38	0	0%
M62 Section 2 WB	22	22	0	0%	22	22	0	0%
M62 Section 1 WB	78	78	0	1%	78	78	0	1%
Cromwell Ave EB	168	155	-13	-8%	168	150	-18	-11%
Cromwell Ave WB	74	74	0	0%	74	75	1	2%
Sandy Lane EB	48	49	2	3%	48	44	-3	-7%
Sandy Lane WB	124	154	29	24%	124	125	1	0%
Northway SWB	78	77	-1	-1%	78	90	12	16%
A50 Section 1 EB	102	101	-1	-1%	102	102	1	1%
A50 Section 2 EB	81	79	-2	-2%	81	79	-2	-2%
A50 Section 2 WB	211	231	20	9%	211	254	43	20%
A50 Section 1 WB	430	417	-13	-3%	430	437	7	2%
Hawley's Lane EB	293	303	10	3%	293	328	35	12%

FIGURE 3.7: PM PEAK 2027 JOURNEY TIME COMPARISON

- 3.3.34 The final PM journey times table (Table 3.8) shows that by 2032, much as in the other future years, it is possible to maintain the performance for the majority of the network with the addition of the full Peel Hall development and create some significant improvements.
- 3.3.35 The improved responsiveness of the proposed controller upgrades at the A49/A50 Long Lane/Hawley's Lane junction creates improvements for the entire westbound A50 Long Lane approach (-68 seconds/-9%), and the southbound A49 Winwick Road approach (-82 seconds/-40%), whilst the northbound A49 Winwick Road approach (-1 second/-0%) and the Hawleys Lane eastbound approach (+18 seconds/+6%) maintain similar performance to the Reference Case model.
- 3.3.36 The proposed mitigation measures also allow for improved performance at the A49/Sandy Lane West/Cromwell Avenue junction, for all approaches. The tidal northbound flow on the A49 Winwick Road approach experiences a journey time improvement (-28 seconds/-17%) compared against the Reference Case model, as does the Sandy Lane West (-9 seconds/-6%), Cromwell Avenue (-28 seconds/-14%) and A49 Winwick Road southbound approaches (-42 seconds/-20%).
- 3.3.37 At the M62 Junction 9, most data shows very comparable journey times. There are small increases on two of the approaches - +20 seconds/15% on the A49 Winwick Road northbound approach, and +13 seconds/+14% for traffic on the M62 eastbound offslip. However, traffic on the A49 Winwick Road southbound approach experience a reduction of -6 seconds/+5%, and on the westbound offslip, which experiences a significant beneficial decrease to journey times of -33 seconds/-36%.
- 3.3.38 The overall journey time for the entirety of the northbound route along the A49 receives an improvement (-30 seconds/-4%). For traffic travelling the entirety of the southbound A49 corridor route, a significant improvement to journey times is achieved (-122 seconds/-17%).
- 3.3.39 As with other future year models, the impacts experienced by eastbound M62 traffic are as a result of the fixed constraint at the eastern exit point from the model. This relatively small additional delay does not affect the rest of the model.
- 3.3.40 The rest of the network demonstrates that even with 2032 levels of traffic growth as well as the full Peel Hall development traffic, the overall effect on the network can be minimised and improved upon.

Section	PM 2032 - 17:00 - 18:00							
	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Section 1 SB	68	86	17	25%	68	78	9	14%
A49 Section 2 SB	123	167	44	36%	123	117	-6	-5%
A49 Section 3 SB	214	298	84	40%	214	171	-42	-20%
A49 Section 4 SB	208	118	-90	-43%	208	126	-82	-40%
A49 Section 5 SB	73	71	-1	-2%	73	72	-1	-1%
A49 Section 5 NB	291	303	13	4%	291	289	-1	0%
A49 Section 4 NB	164	157	-7	-4%	164	136	-28	-17%
A49 Section 3 NB	133	167	35	26%	133	153	20	15%
A49 Section 2 NB	103	91	-12	-11%	103	85	-18	-18%
A49 Section 1 NB	66	63	-3	-4%	66	63	-3	-5%
M62 Section 1 EB	71	75	4	6%	71	71	0	1%
M62 Section 2 EB	92	175	83	89%	92	106	13	14%
M62 Section 3 EB	37	37	0	0%	37	37	0	0%
M62 Section 4 EB	30	30	0	-1%	30	37	7	24%
M62 Section 5 EB	164	166	2	1%	164	179	15	9%
M62 Section 5 WB	93	96	3	3%	93	93	0	0%
M62 Section 4 WB	91	164	73	80%	91	58	-33	-36%
M62 Section 3 WB	39	39	0	0%	39	39	0	0%
M62 Section 2 WB	22	22	0	-1%	22	22	0	-1%
M62 Section 1 WB	80	79	0	-1%	80	79	0	-1%
Cromwell Ave EB	206	163	-43	-21%	206	178	-28	-14%
Cromwell Ave WB	73	74	1	2%	73	76	3	4%
Sandy Lane EB	49	49	0	-1%	49	47	-2	-4%
Sandy Lane WB	140	141	1	0%	140	132	-9	-6%
Northway SWB	80	80	0	0%	80	85	5	6%
A50 Section 1 EB	101	99	-2	-2%	101	102	1	1%
A50 Section 2 EB	79	79	1	1%	79	79	0	1%
A50 Section 2 WB	287	235	-52	-18%	287	263	-24	-9%
A50 Section 1 WB	482	414	-69	-14%	482	438	-44	-9%
Hawley's Lane EB	314	303	-11	-4%	314	332	18	6%

FIGURE 3.8: PM PEAK 2032 JOURNEY TIME COMPARISON

3.4 Queue Length Analysis

- 3.4.1 Queue length data has been extracted at key locations to provide an indicative comparison of the visual difference between relevant scenarios. The following charts will focus on the direction of tidal flow per peak - full queue length comparisons can be found in Appendix C.
- 3.4.2 It is worth noting that maximum queue lengths (QLENMAX) in each model run may only occur once in each time period. Although these values are then averaged over all model runs, the alternative measure displayed (QLEN), representing the average of queue lengths from each time period, averaged over all model runs, is therefore more representative of likely conditions.
- 3.4.3 Charts 3.1 – 3.3 show the comparative queue length data for the eastbound M62 off-slip in the morning peak.
- 3.4.4 In all three charts it is clear that average and maximum queue lengths are either maintained, or experience small improvements, when compared against the Reference Case models.

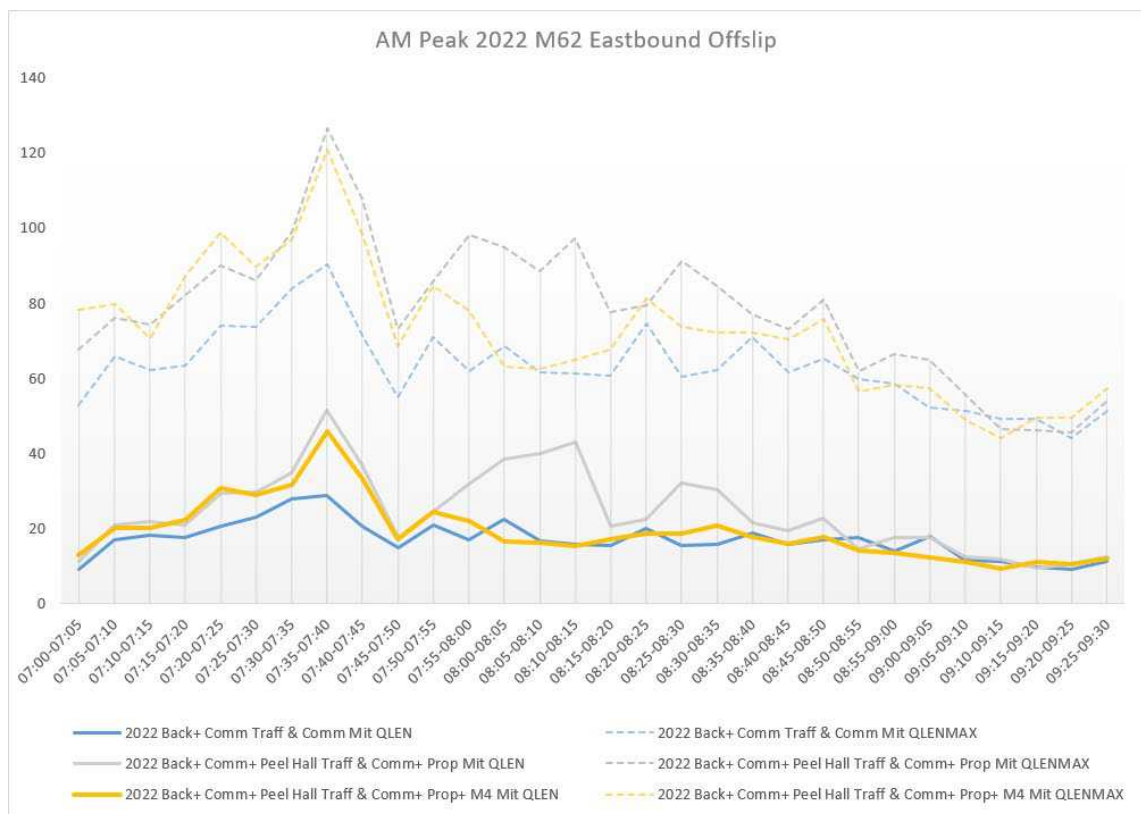


CHART 3.1 – AM PEAK 2022 M62 EASTBOUND OFFSLIP

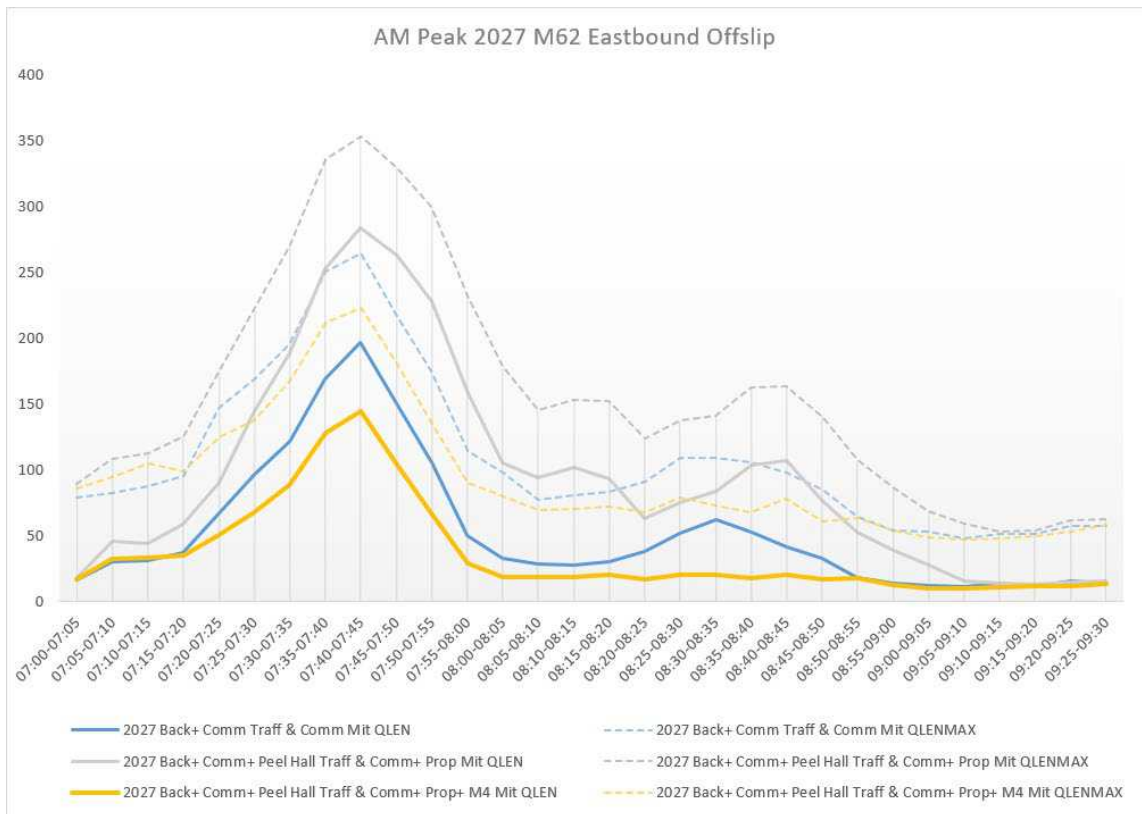


CHART 3.2 – AM PEAK 2027 M62 EASTBOUND OFFSLIP

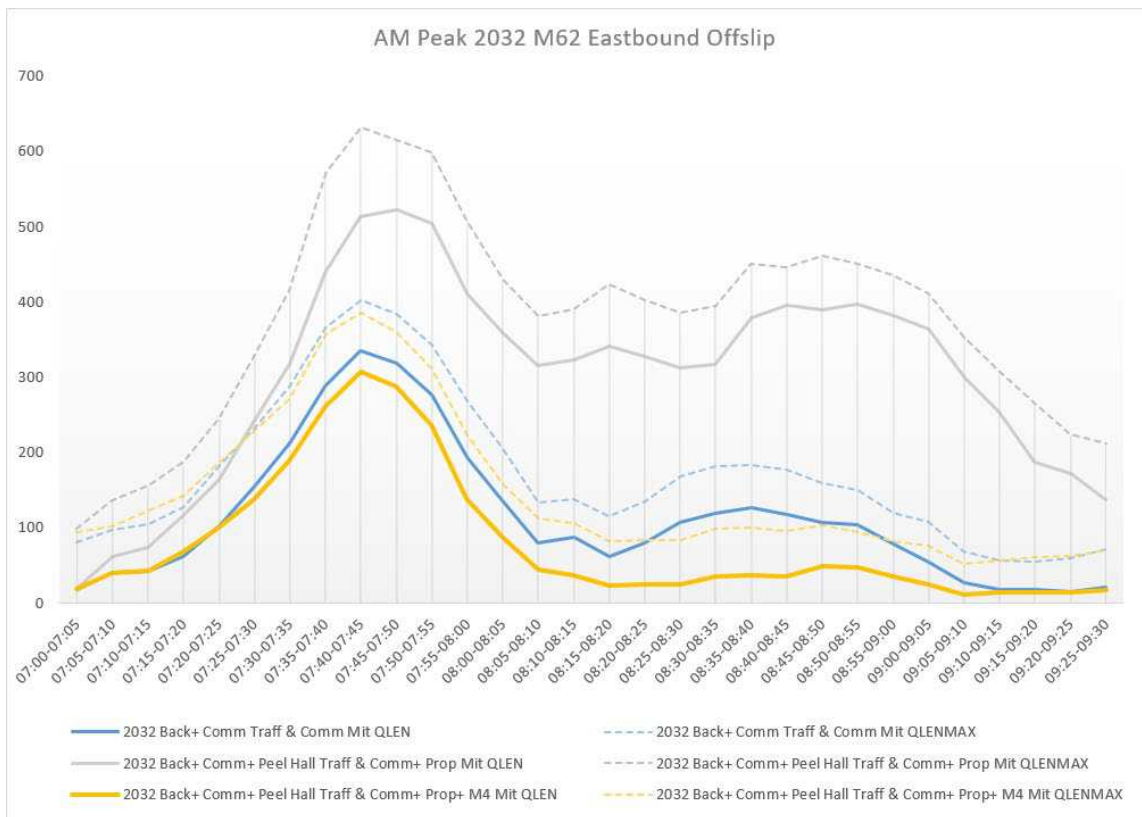


CHART 3.3 – AM PEAK 2032 M62 EASTBOUND OFFSLIP

- 3.4.5 Charts 3.4 – 3.6 show the comparative queue lengths for the westbound M62 off-slip in the morning peak.
- 3.4.6 The 2022 and 2027 data (Charts 3.4 & 3.5) show that, through improved signal optimisation and the management of exit arm blocking on the southbound A49, it is possible to significantly reduce both average and maximum queue lengths.
- 3.4.7 In 2032 (Chart 3.6), performance is comparable throughout the majority of the peak period, however there is a noticeable 'spike' between 08:50-09:05 where queue lengths are longer. This then leads to a slight spreading of the peak in this location, resulting in slower queue length recovery.

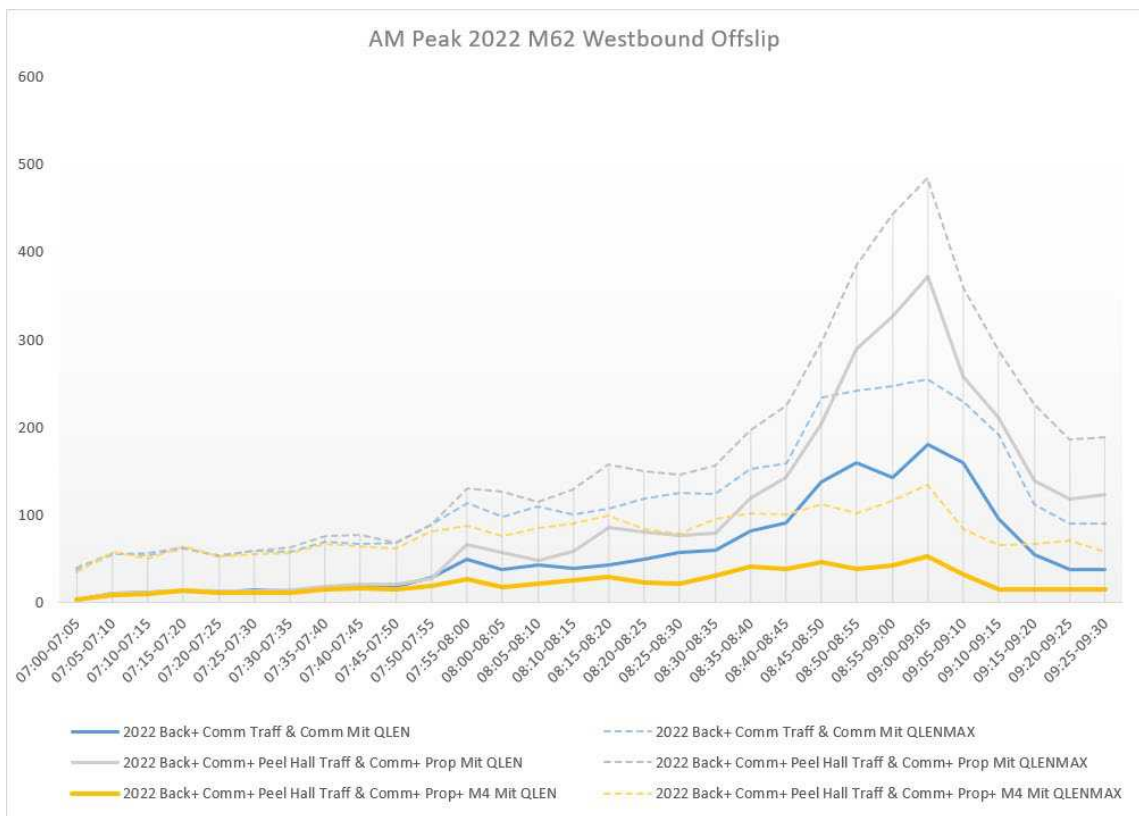


CHART 3.4 – AM PEAK 2022 M62 WESTBOUND OFFSLIP

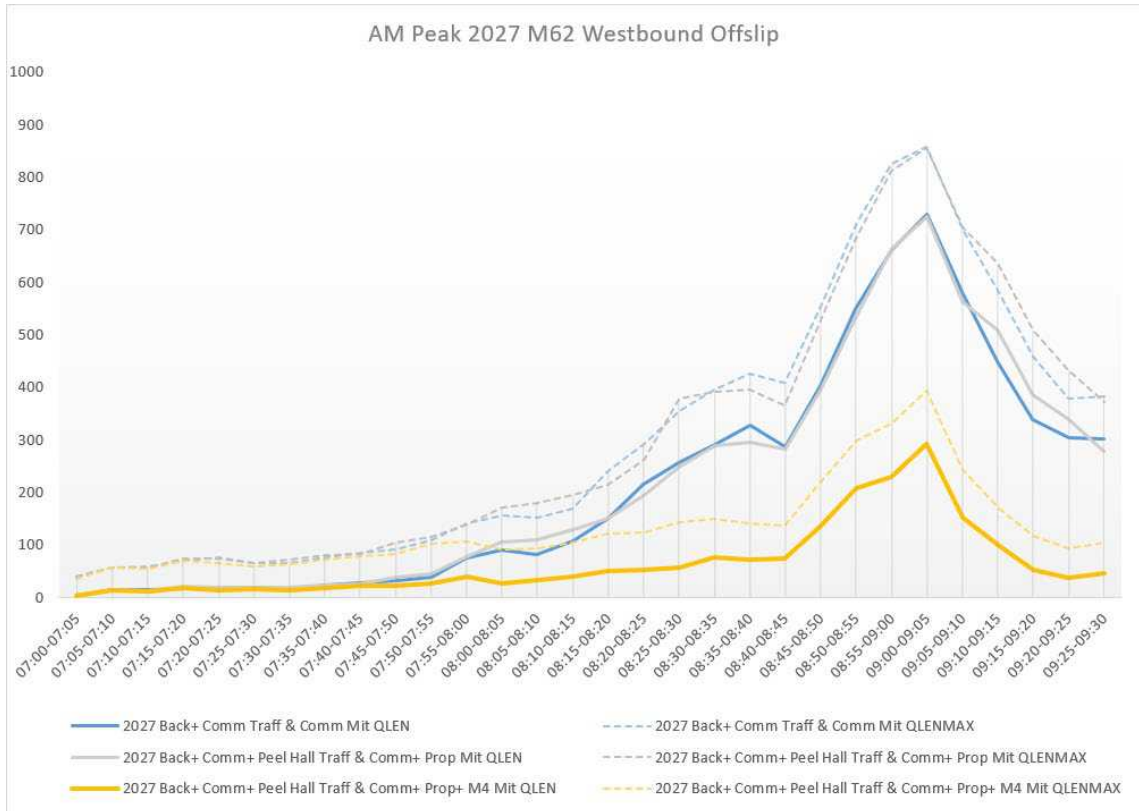


CHART 3.5 – AM PEAK 2027 M62 WESTBOUND OFFSLIP

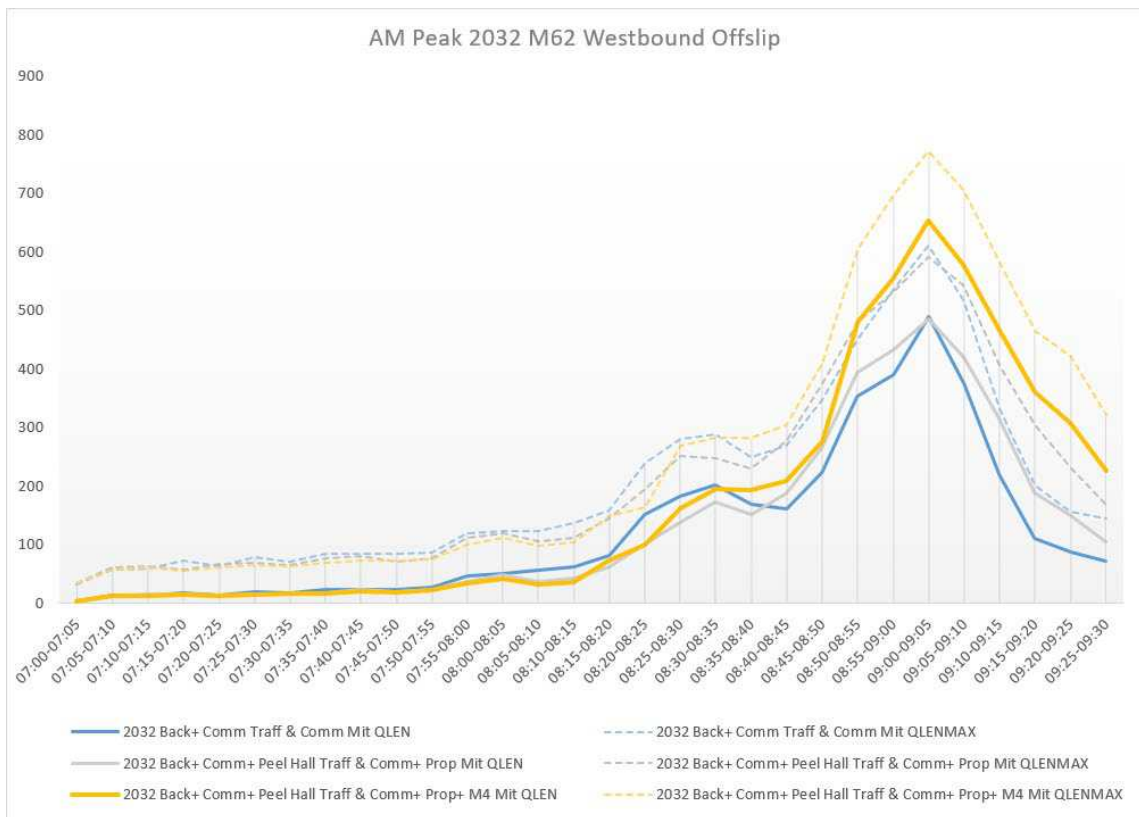


CHART 3.6 – AM PEAK 2032 M62 WESTBOUND OFFSLIP

- 3.4.8 Charts 3.7 – 3.9 show the comparative queue length performance on Sandy Lane West in the morning peak.
- 3.4.9 The charts show a similar effect in each of the three future years – queue lengths are similar in the M4 mitigated Peel Hall development scenarios; however, the peak tends to be somewhat larger and the peak period tends to be somewhat longer.
- 3.4.10 This effect is, at least in part, due to the fixed constraint used to validate the base model – although there is an increased traffic volume, it is not possible to do much to mitigate the delays with the signal green time at the junction with the A49, as the constraint is further to the east, slowing vehicles before they get to the signalised junction.

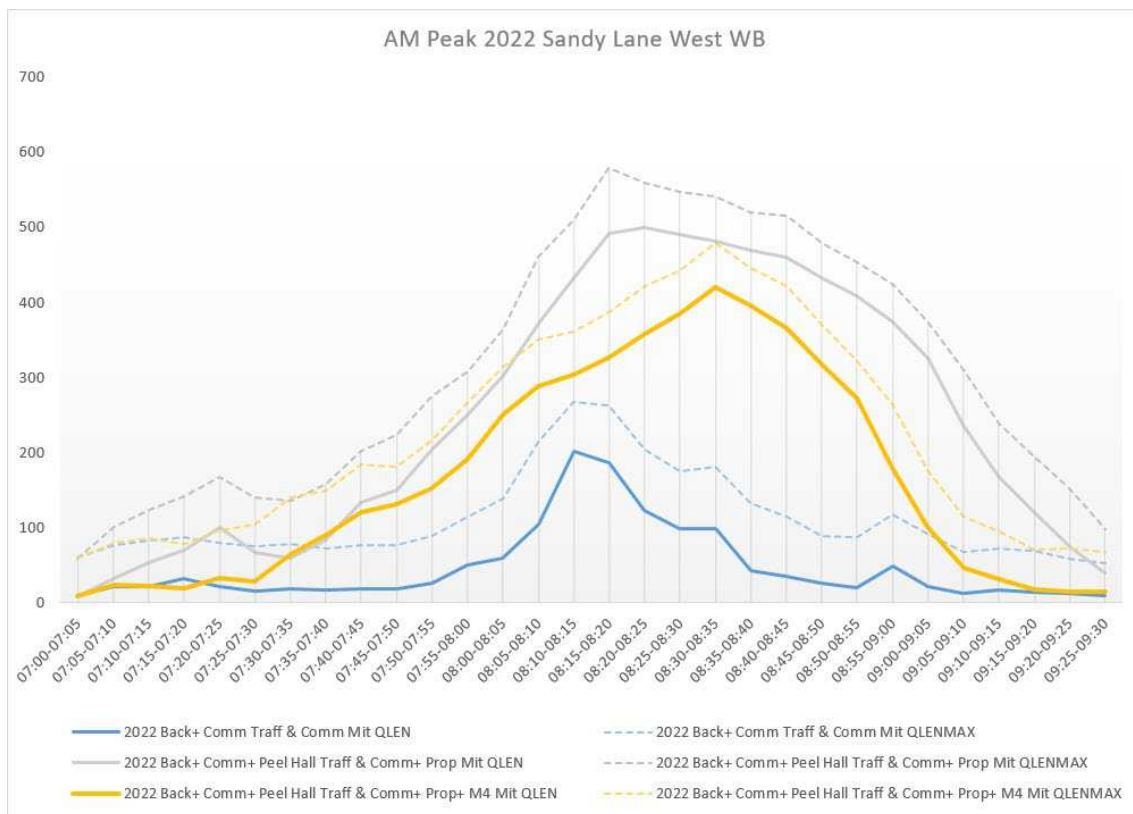


CHART 3.7 – AM PEAK 2022 SANDY LANE WEST

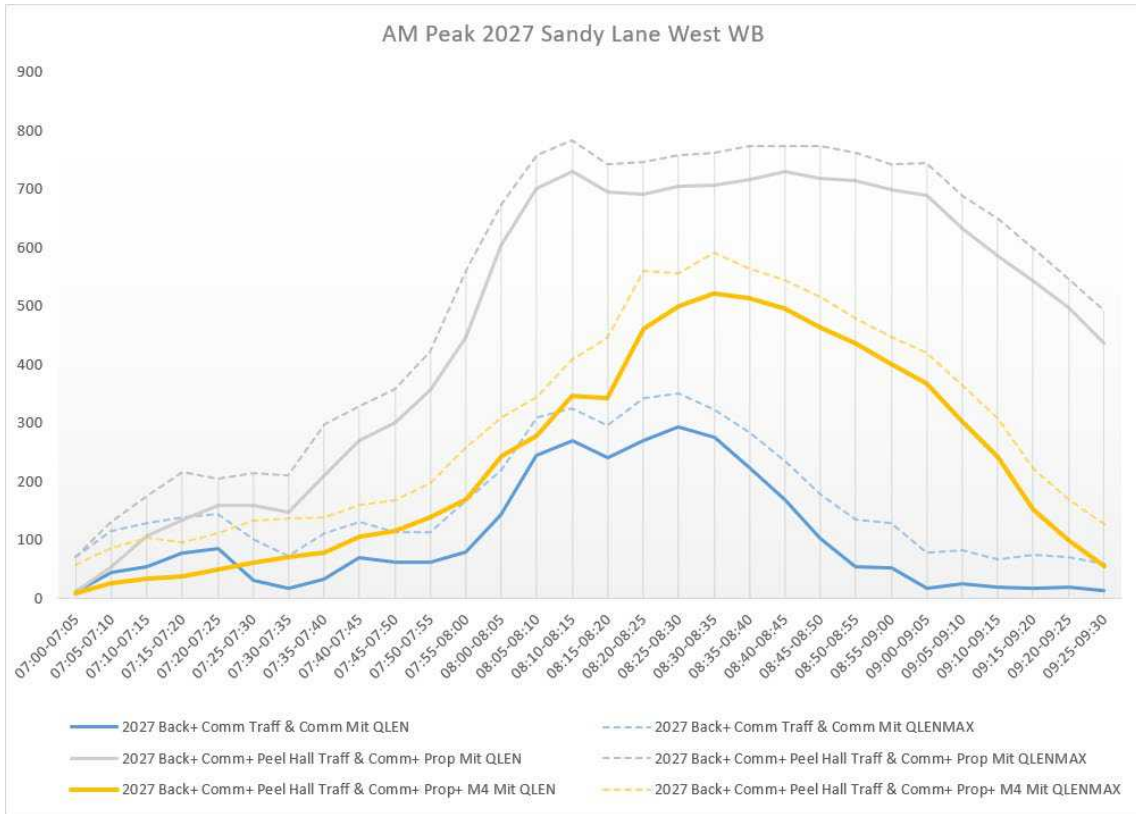


CHART 3.8 – AM PEAK 2027 SANDY LANE WEST

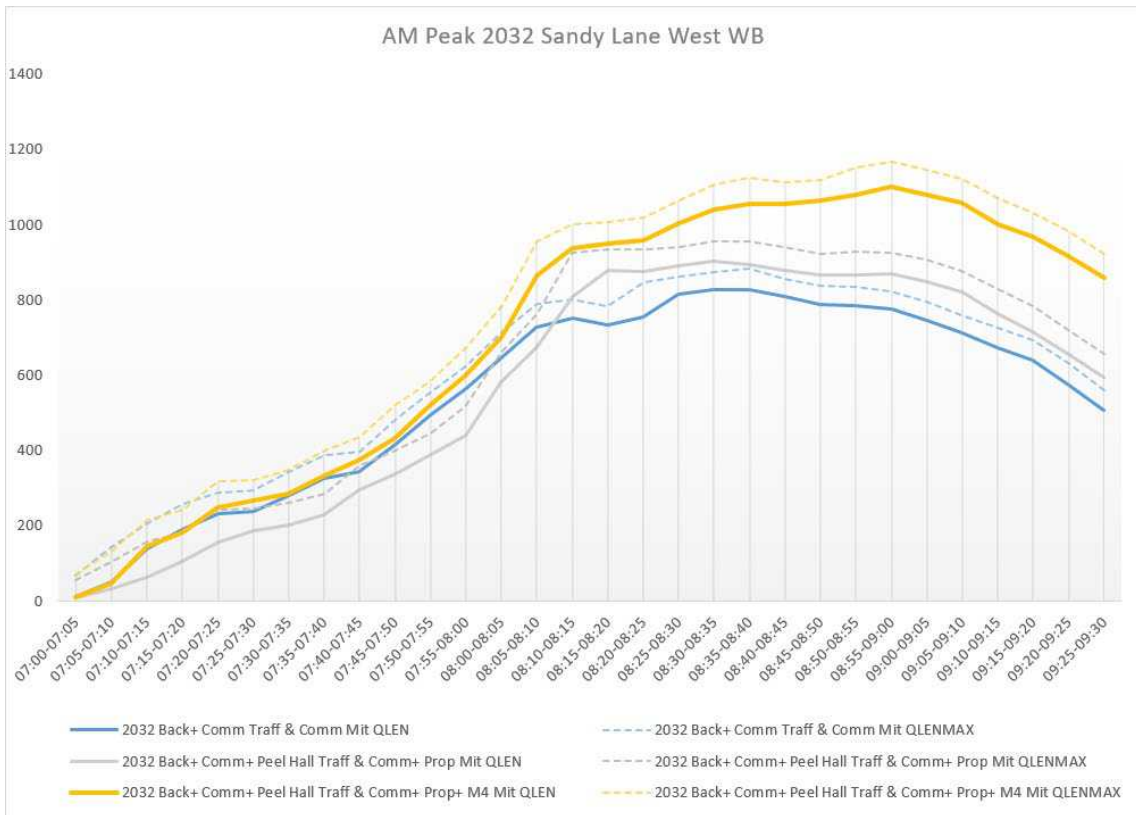


CHART 3.9 – AM PEAK 2032 SANDY LANE WEST

- 3.4.11 Charts 3.10 – 3.12 show the comparative queue length performance on A50 Long Lane in the morning peak.
- 3.4.12 It is clear that in all future year scenarios, there is an increased impact to the speed that queue lengths build up, and the length that they build up to. Although this is partially as a result of increased flow on this link, there is also an impact due to exit arm blocking for vehicles turning left onto the A49.
- 3.4.13 Additionally, on occasion there are complications caused by traffic from Northway blocking the approach for traffic from A50 Long Lane. This can constrict the final 70m of the approach to the signalised A49 junction, leading to a lowered saturation flow here.

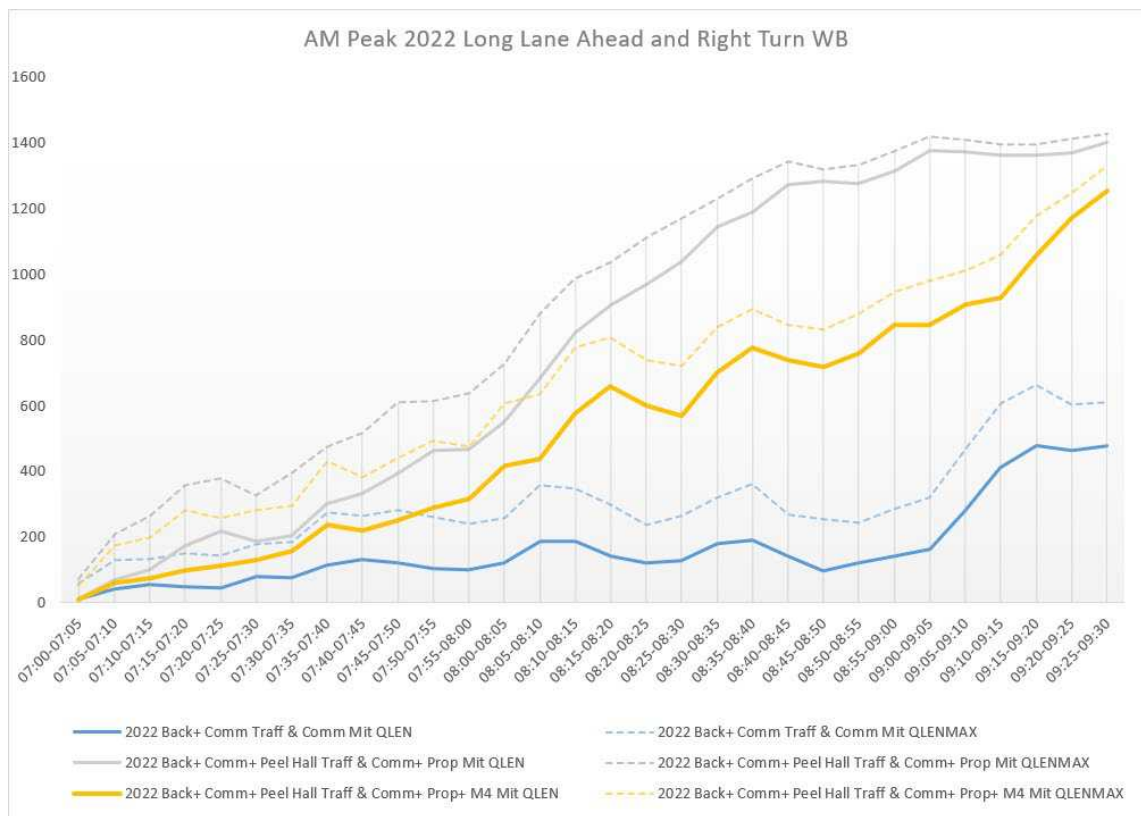


CHART 3.10 – AM PEAK 2022 A50 LONG LANE

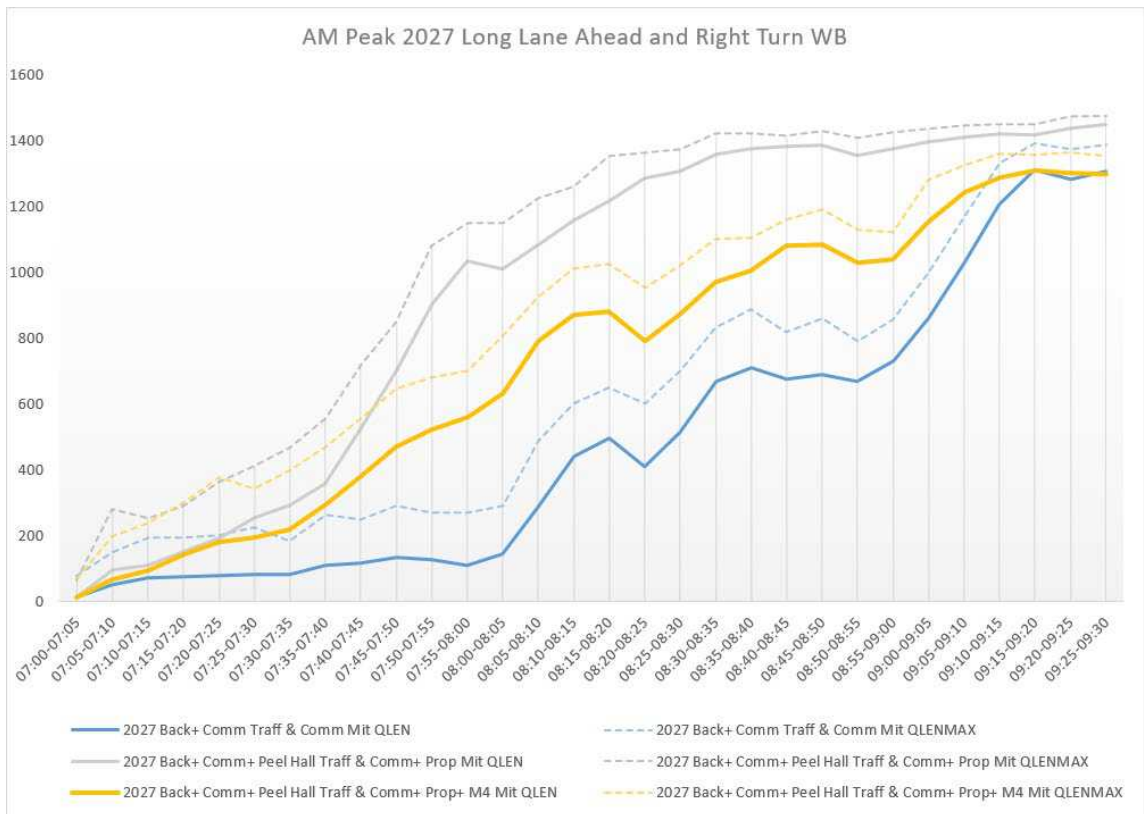


CHART 3.11 – AM PEAK 2027 A50 LONG LANE

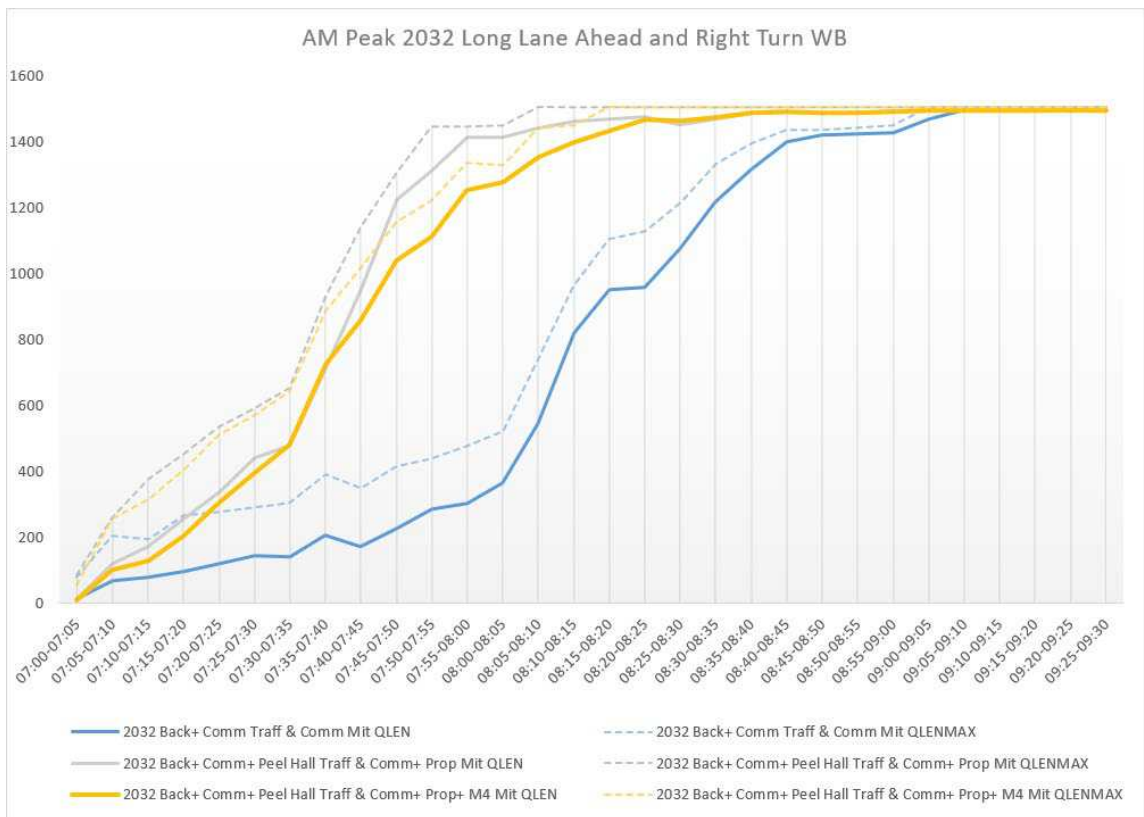


CHART 3.12 – AM PEAK 2032 A50 LONG LANE

3.4.14 Charts 3.13 – 3.15 show the comparative queue length performance for the southbound A49 approach to the Delph Lane junction.

3.4.15 These charts show the effect, which decreases over each subsequent future year, of the signal green time gating necessary in order to keep the rest of the southbound A49 flowing without causing additional blockages to either the local roads, or the M62 mainline.

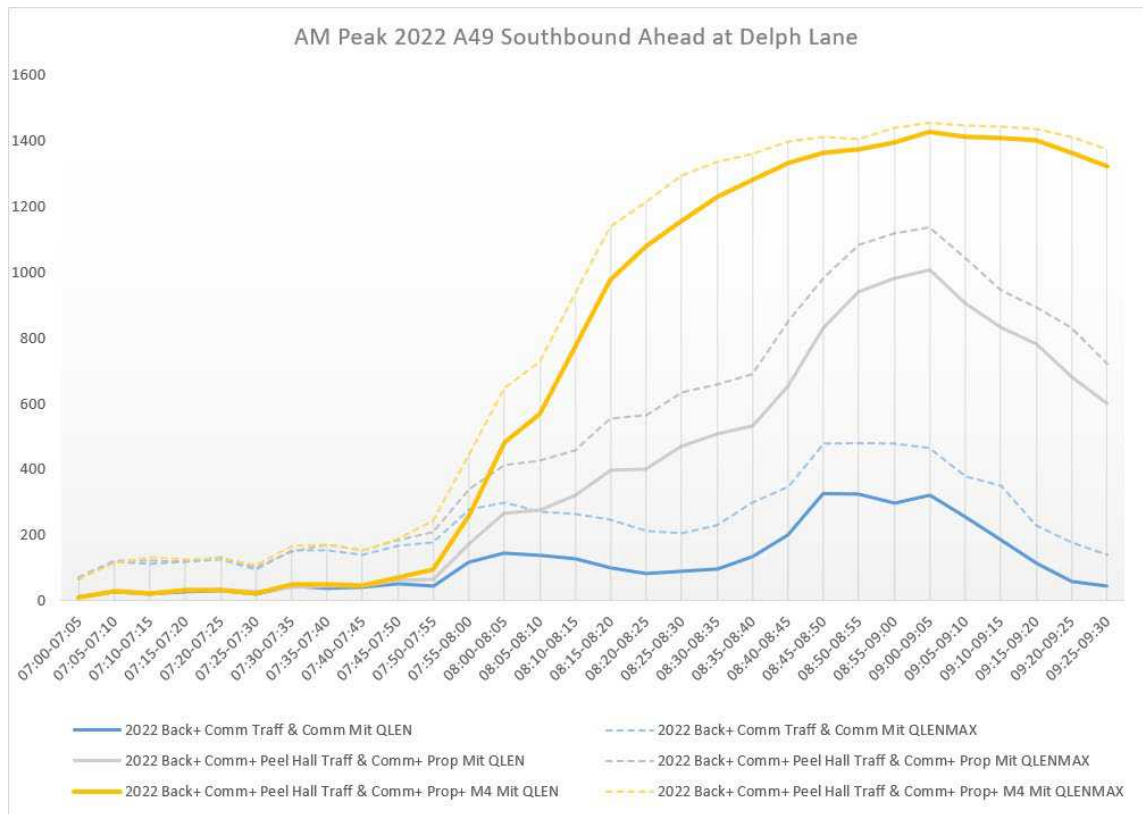


CHART 3.13 – AM PEAK 2022 A49 SOUTHBOUND AT DELPH LANE

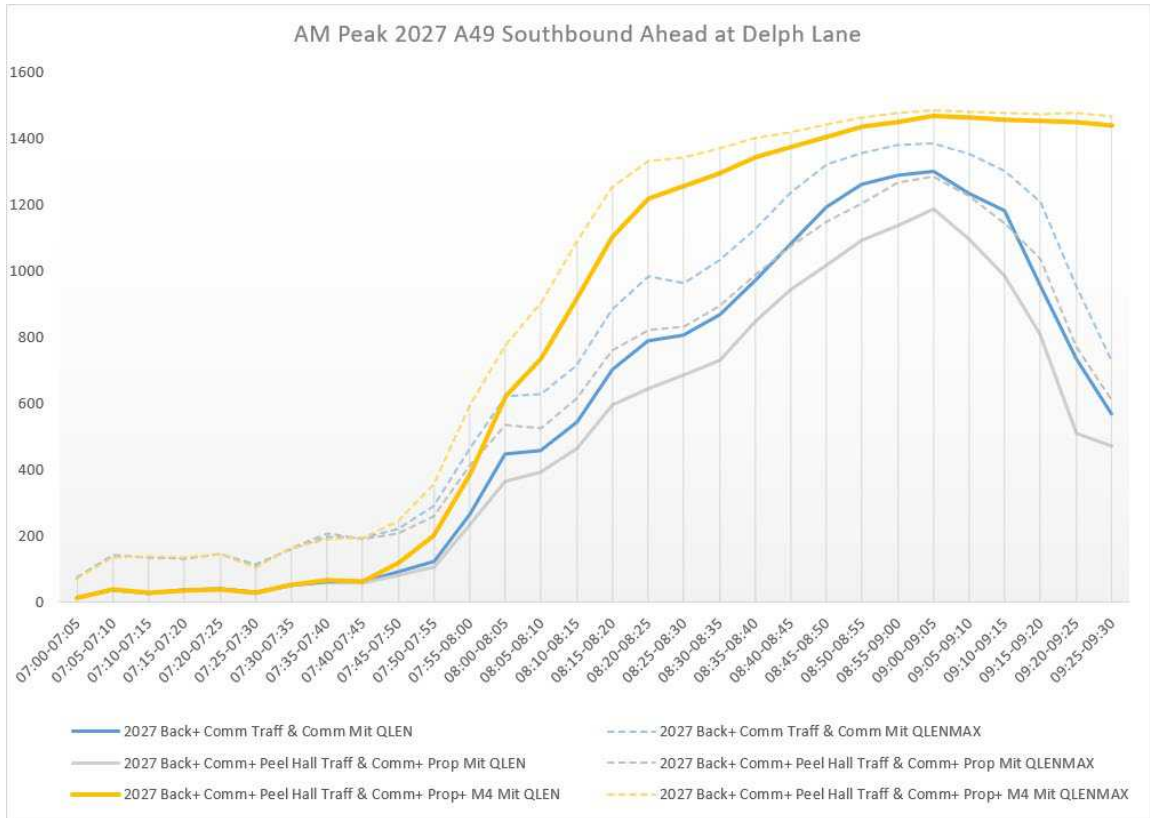


CHART 3.14 – AM PEAK 2027 A49 SOUTHBOUND AT DELPH LANE

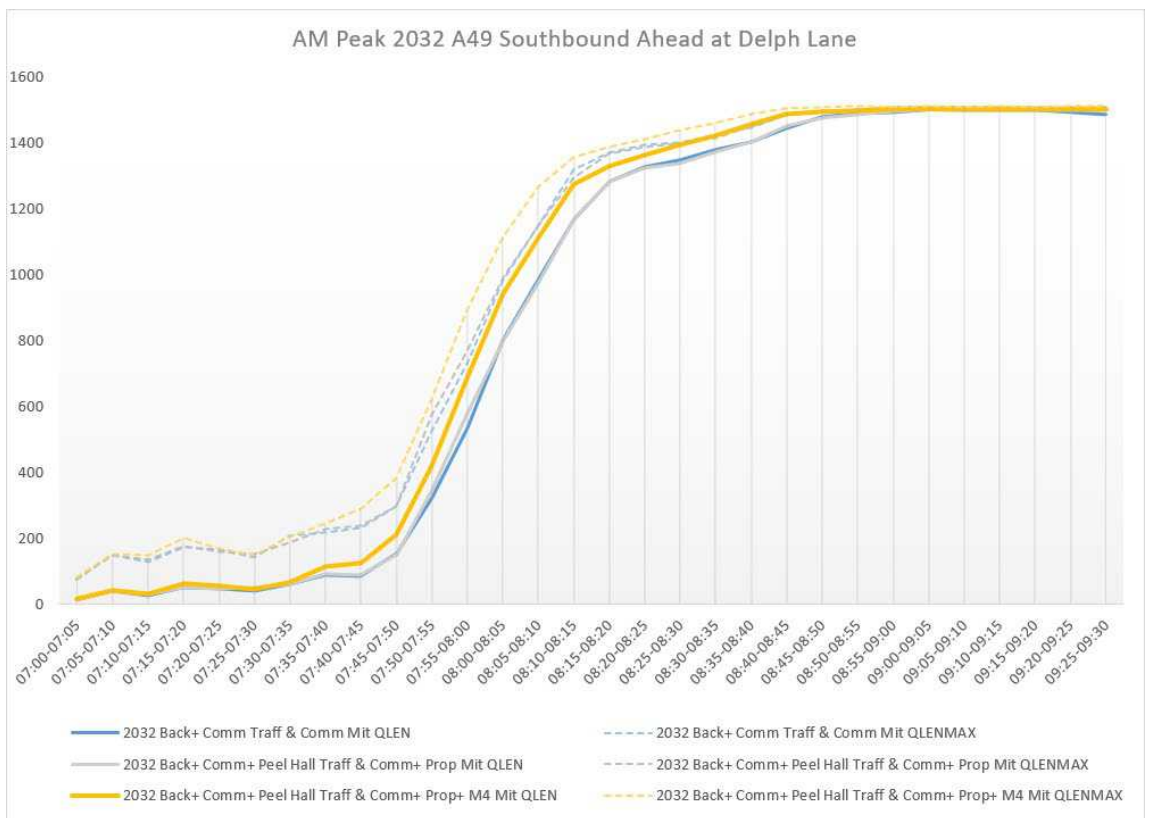


CHART 3.15 – AM PEAK 2032 A49 SOUTHBOUND AT DELPH LANE

3.4.16 Charts 3.16 – 3.18 show the comparative queue length performance for the southbound A49 approach to the Sandy Lane West junction.

3.4.17 These charts show that in all future year scenarios, it is possible to maintain a similar level of performance as that experienced in the relevant Reference Case models. This is of key importance in order to keep the queues from blocking the southbound exit link from M62 Junction 9.

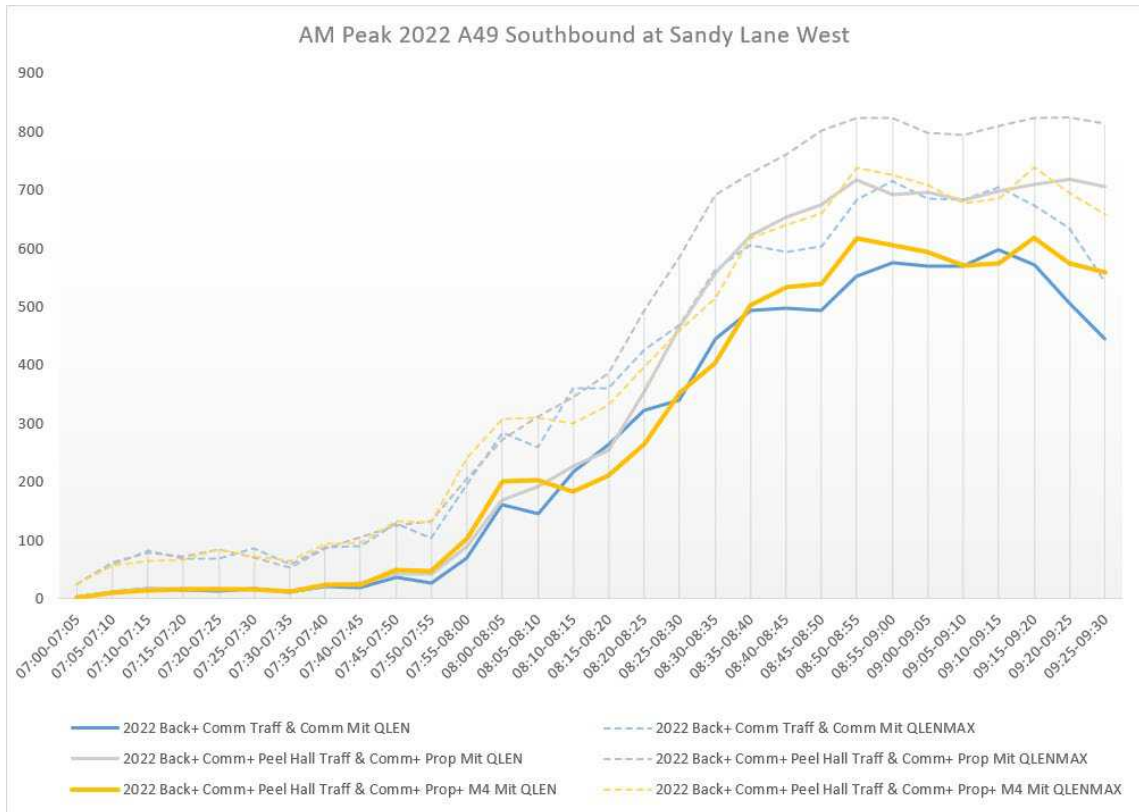


CHART 3.16 – AM PEAK 2022 A49 SOUTHBOUND AT SANDY LANE WEST

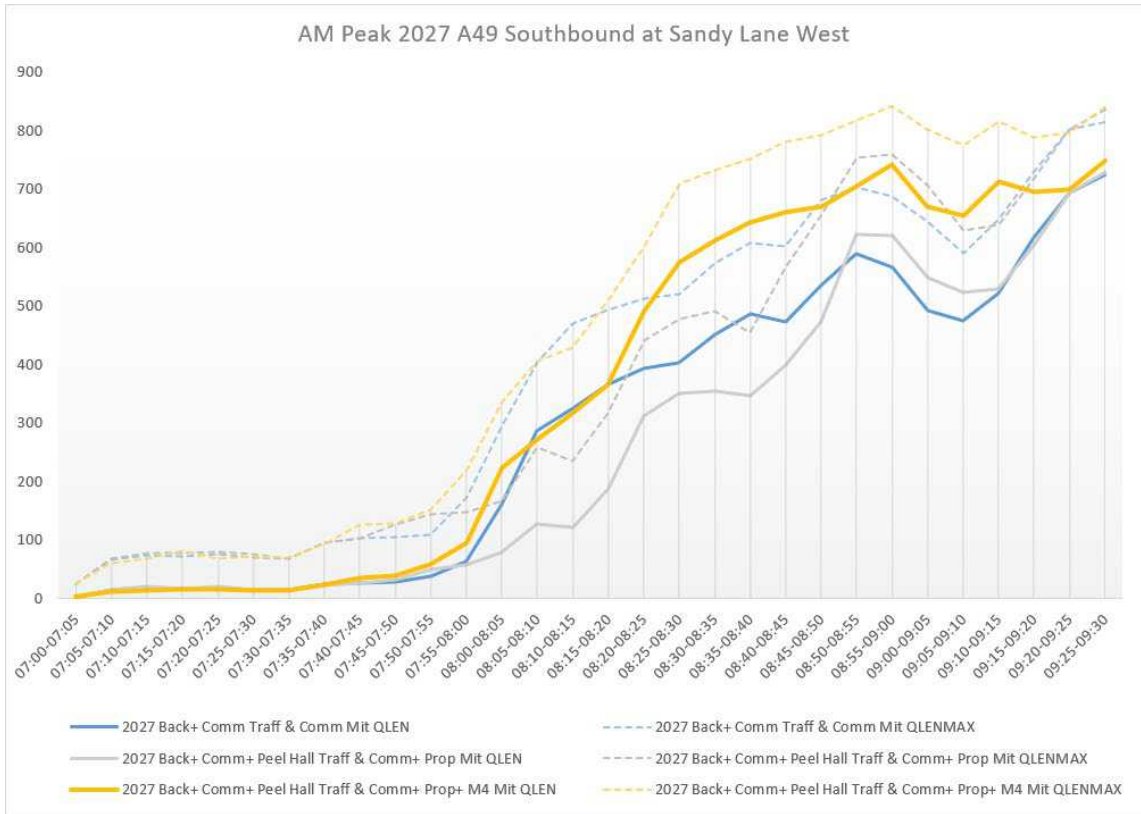


CHART 3.17 – AM PEAK 2027 A49 SOUTHBOUND AT SANDY LANE WEST

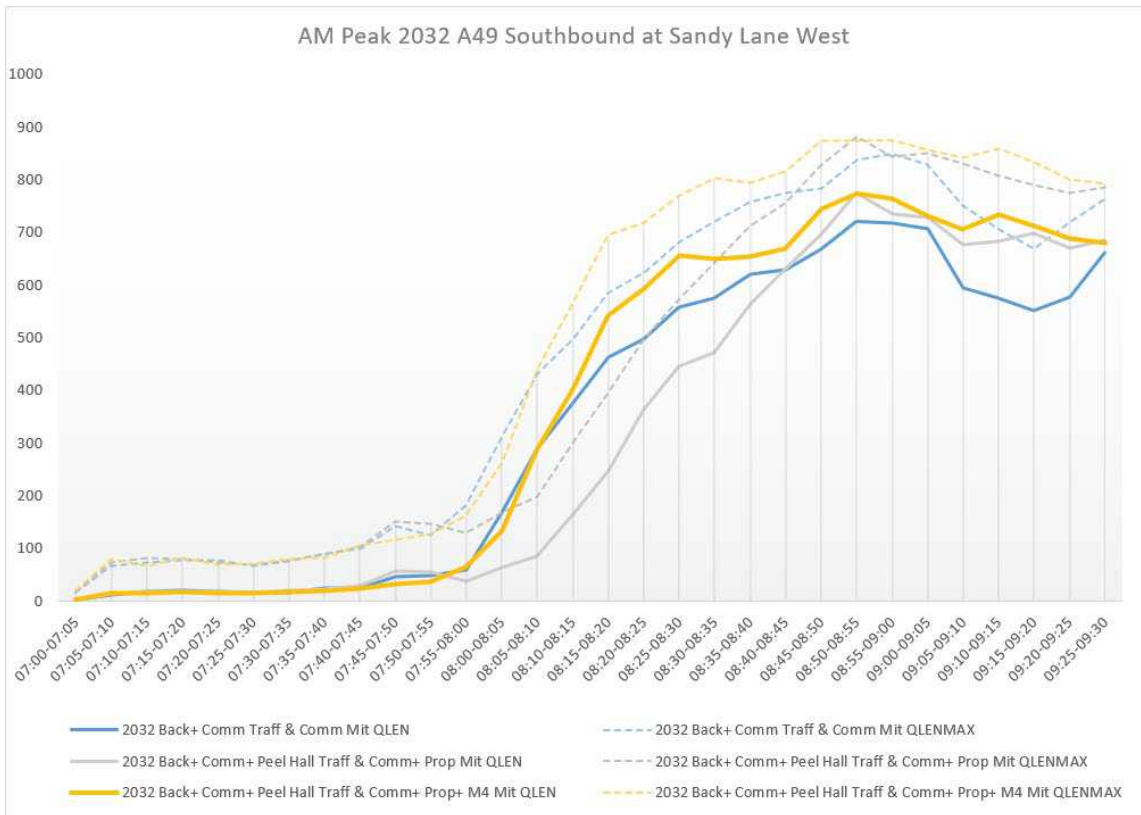


CHART 3.18 – AM PEAK 2032 A49 SOUTHBOUND AT SANDY LANE WEST

3.4.18 Charts 3.19 – 3.21 show the comparative queue length performance for the southbound A49 approach to the A50 Long Lane junction.

3.4.19 These charts show that in all future year scenarios, it is possible to maintain a similar level of performance as that experienced in the relevant Reference Case models. This is of key importance in order to keep the queues from blocking the Cromwell Avenue/Sandy Lane West junction, then blocking all the way to the southbound exit link from M62 Junction 9.

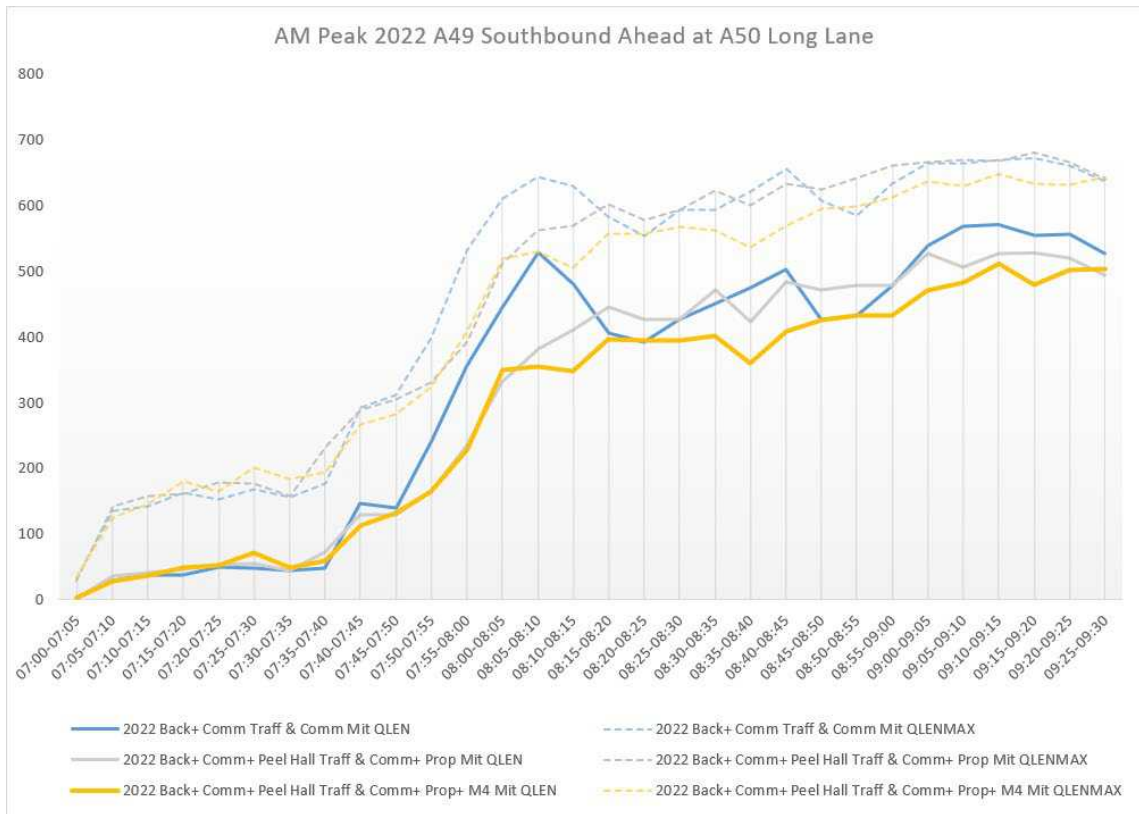


CHART 3.19 – AM PEAK 2022 A49 SOUTHBOUND AT A50 LONG LANE

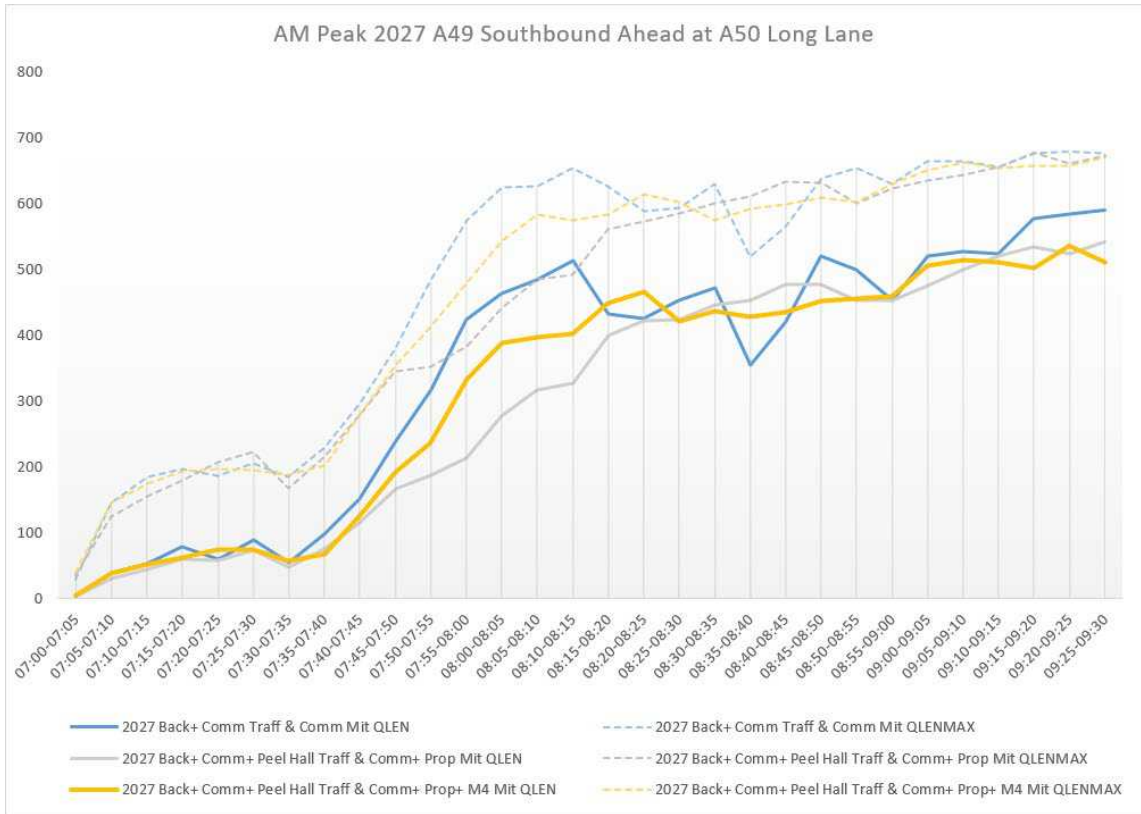


CHART 3.20 – AM PEAK 2027 A49 SOUTHBOUND AT A50 LONG LANE



CHART 3.21 – AM PEAK 2032 A49 SOUTHBOUND AT A50 LONG LANE

3.4.20 Charts 3.22 – 3.24 show the comparative queue length data for the eastbound M62 off-slip in the evening peak.

3.4.21 In all three charts it is clear that average and maximum queue lengths are either maintained, or experience small improvements, when compared against the Reference Case models.

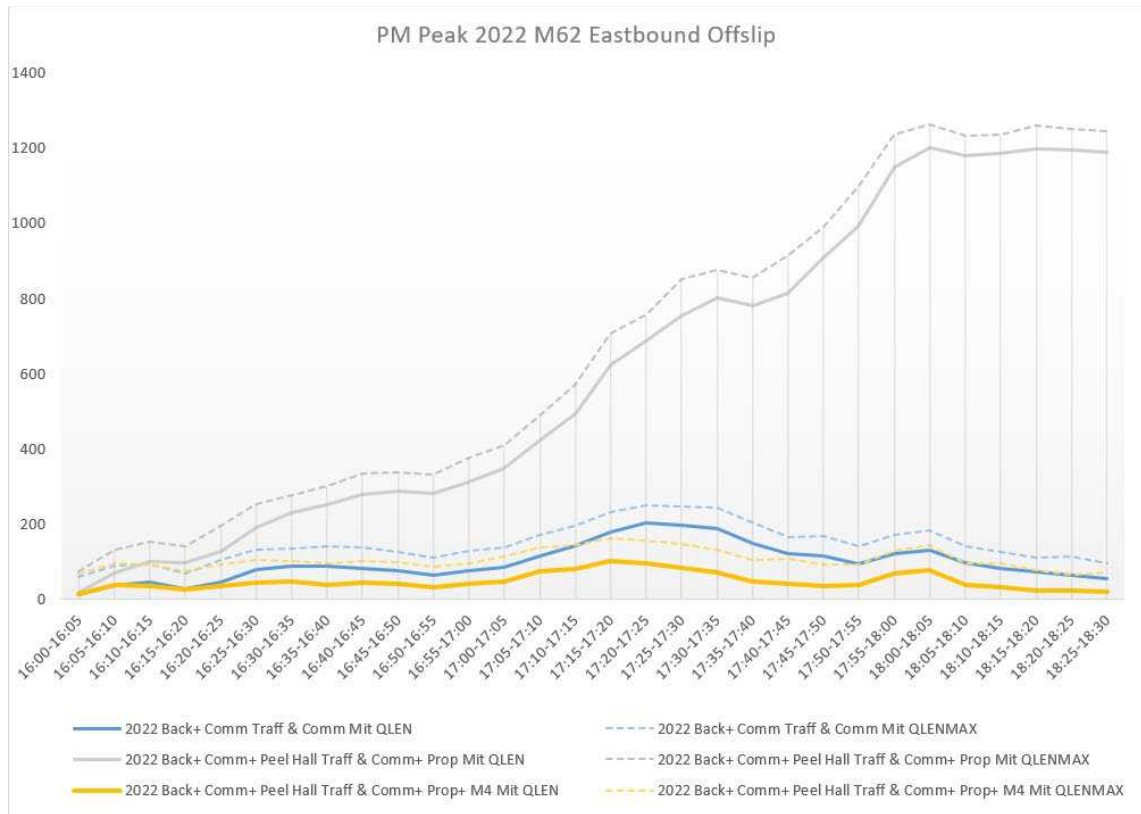


CHART 3.22 – PM PEAK 2022 M62 EASTBOUND OFFSLIP

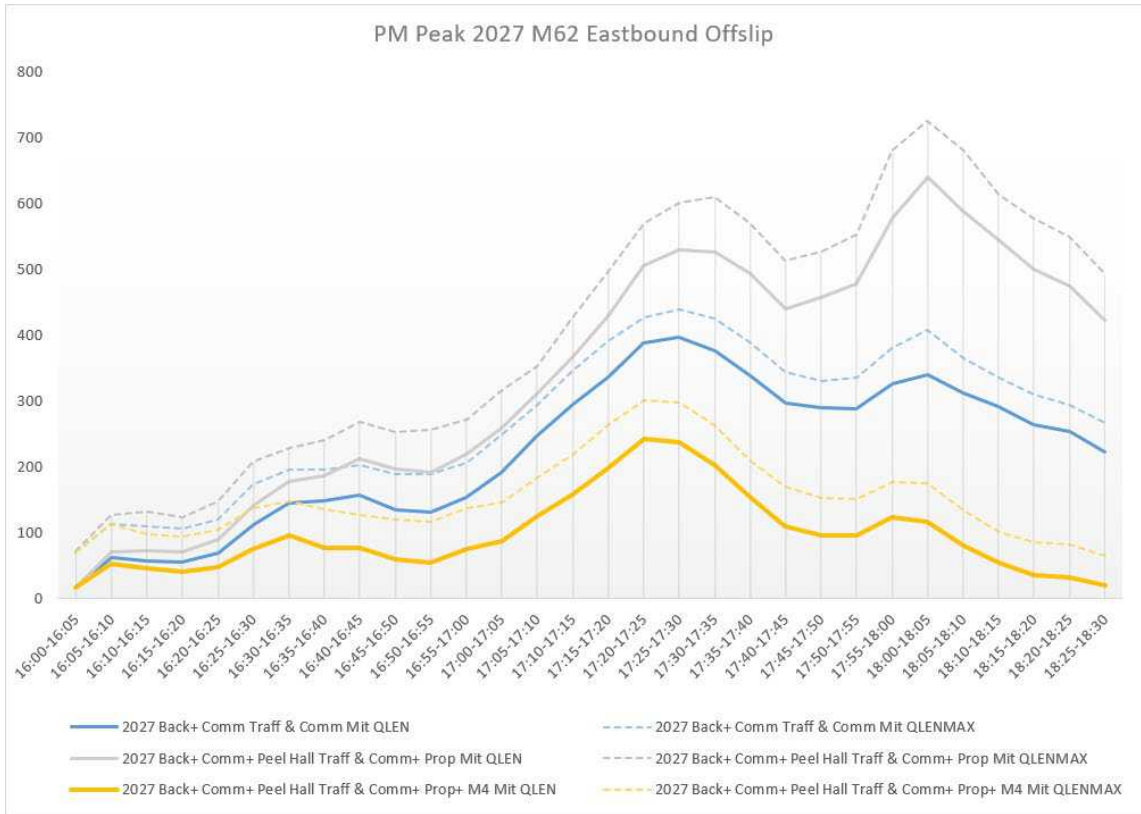


CHART 3.23 – PM PEAK 2027 M62 EASTBOUND OFFSLIP

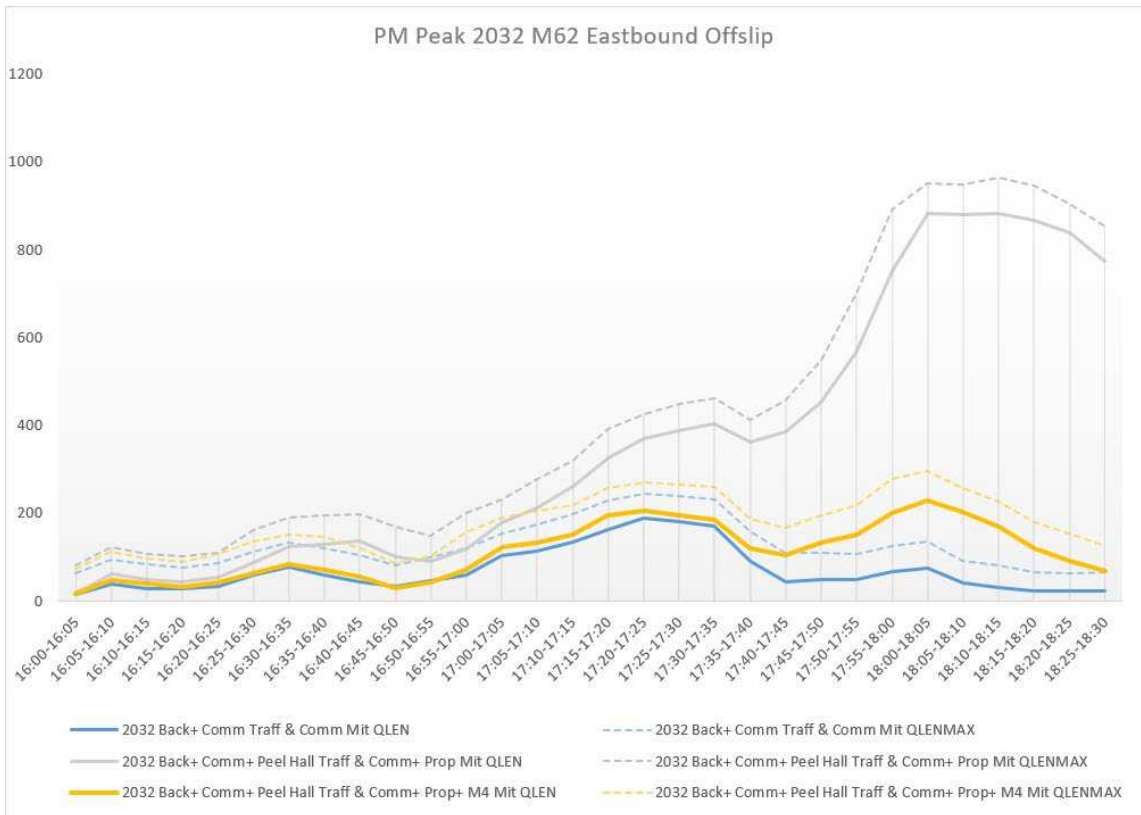


CHART 3.24 – PM PEAK 2032 M62 EASTBOUND OFFSLIP

3.4.22 Charts 3.25 – 3.27 show the comparative queue length data for the westbound M62 offslip in the evening peak.

3.4.23 In all three charts it is clear that average and maximum queue lengths are either maintained, or experience small improvements, when compared against the Reference Case models.

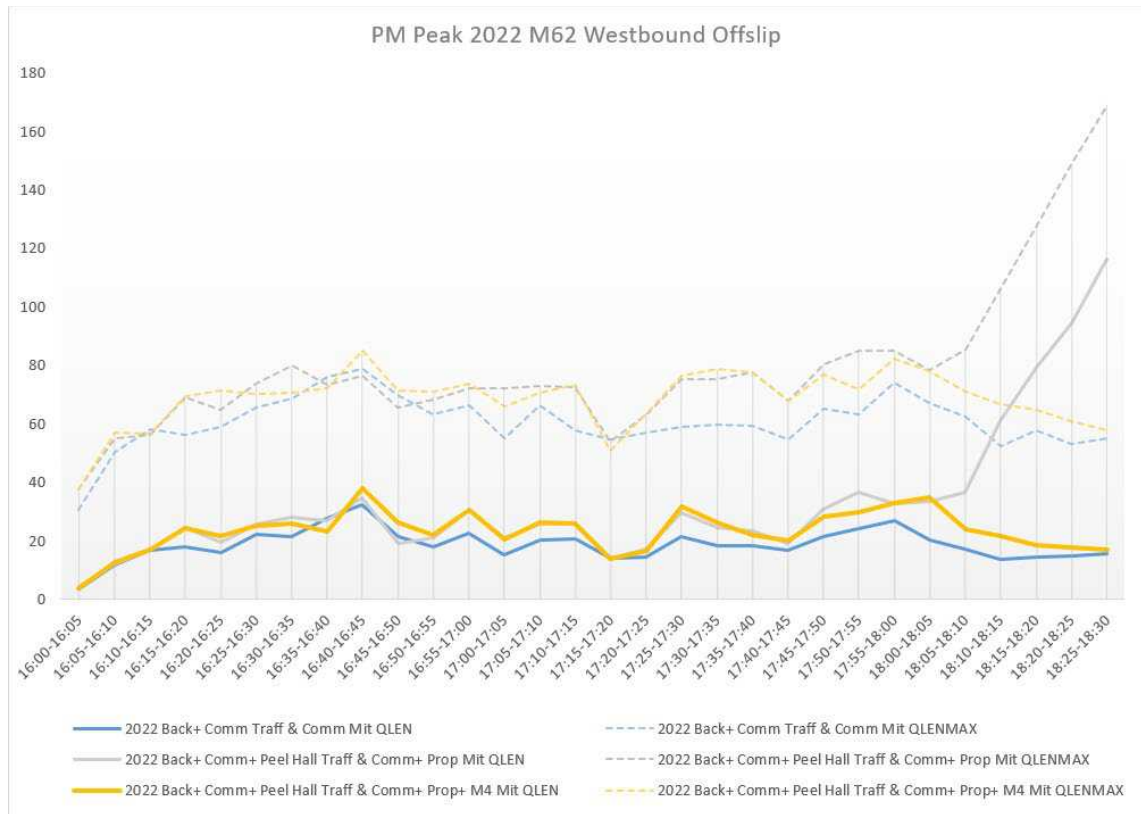


CHART 3.25 – PM PEAK 2022 M62 WESTBOUND OFFSLIP

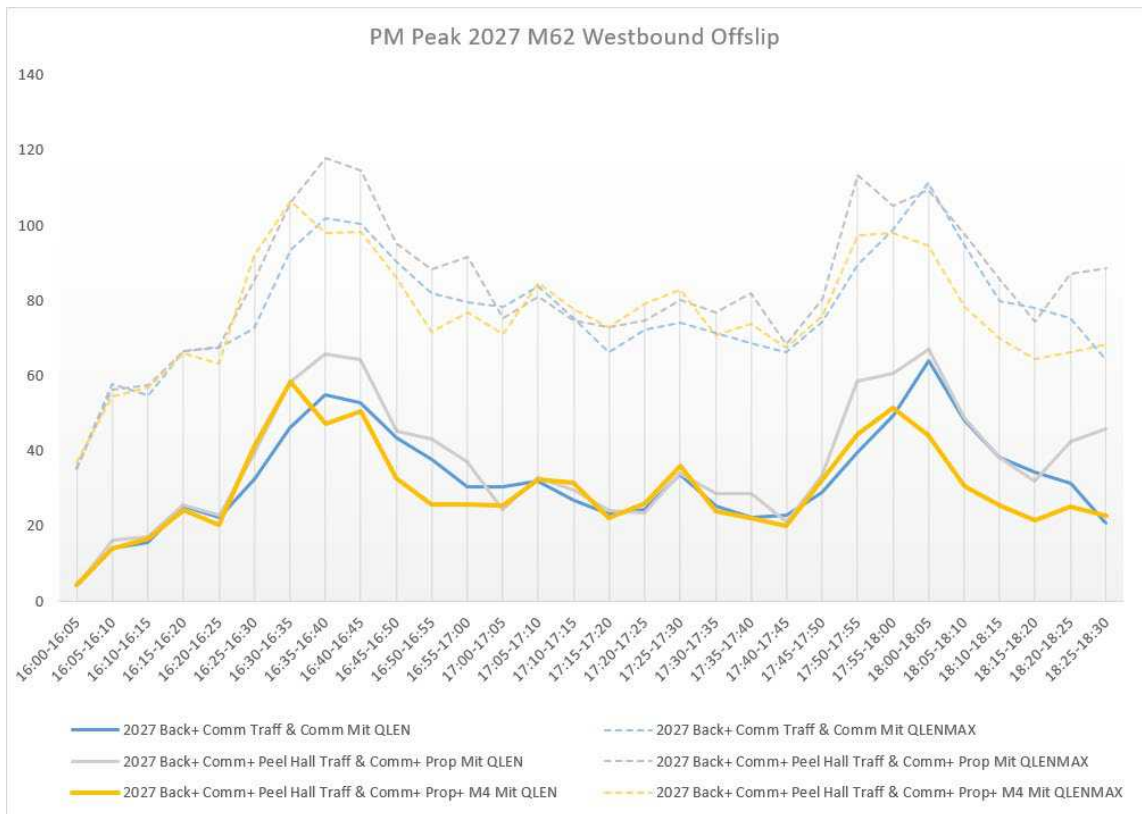


CHART 3.26 – PM PEAK 2027 M62 WESTBOUND OFFSLIP

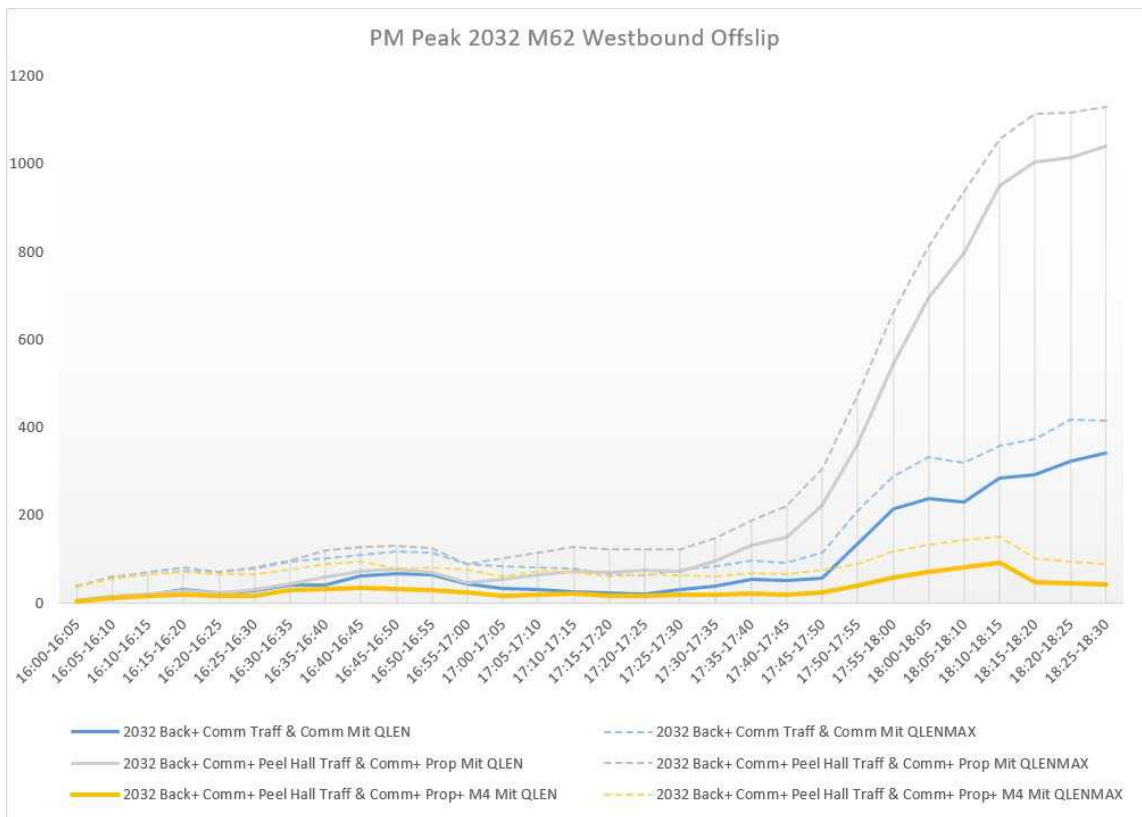


CHART 3.27 – PM PEAK 2032 M62 WESTBOUND OFFSLIP

- 3.4.24 Charts 3.28 – 3.30 show the comparative queue length performance on Sandy Lane West in the evening peak.
- 3.4.25 Although the 2022 data shows a similar level of performance, the 2027 and 2032 data (Charts 3.28 & 3.29) show a similar effect to that found in the morning peak – queue lengths grow longer more quickly, the peak tends to be somewhat larger and the peak period tends to be somewhat longer.
- 3.4.26 As with the morning peak models, this effect is, at least in part, due to the fixed constraint used to validate the base model – although there is an increased traffic volume, it is not possible to fully mitigate the delays with the signal green time at the junction with the A49, as the constraint is further to the east, slowing vehicles before they get to the signalised junction.

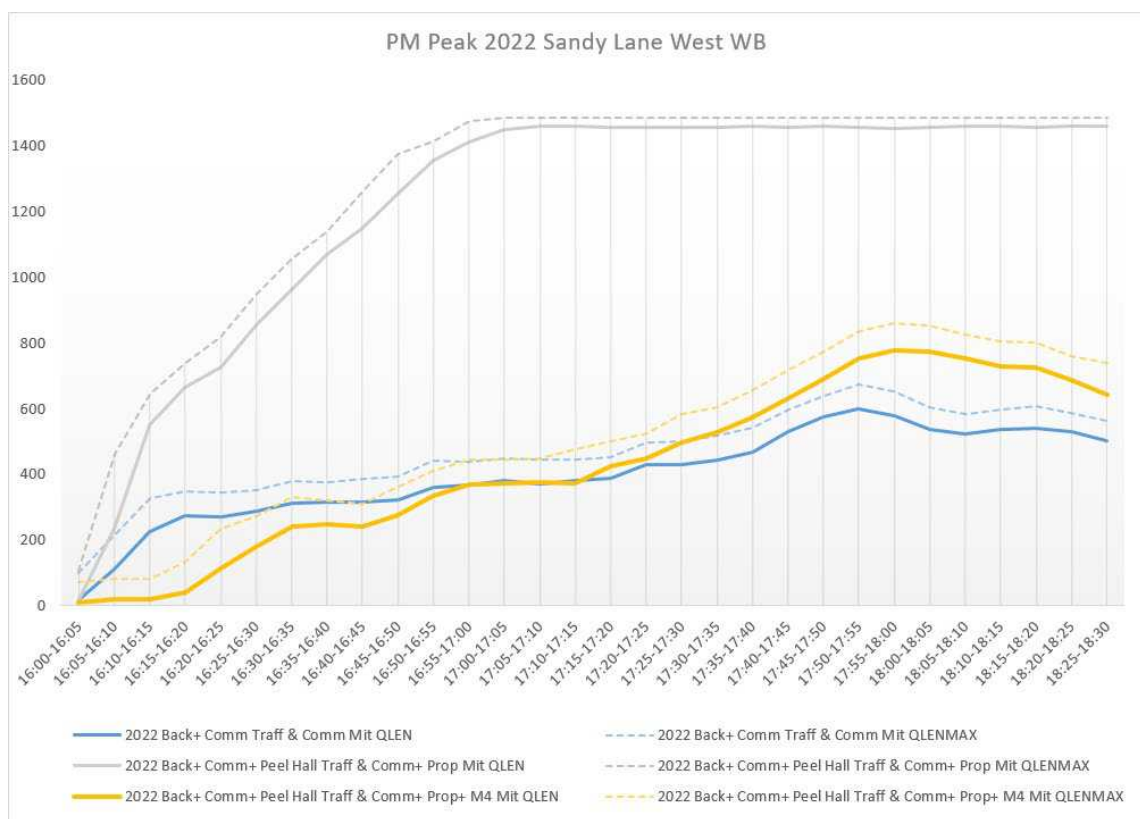


CHART 3.28 – PM PEAK 2022 SANDY LANE WEST

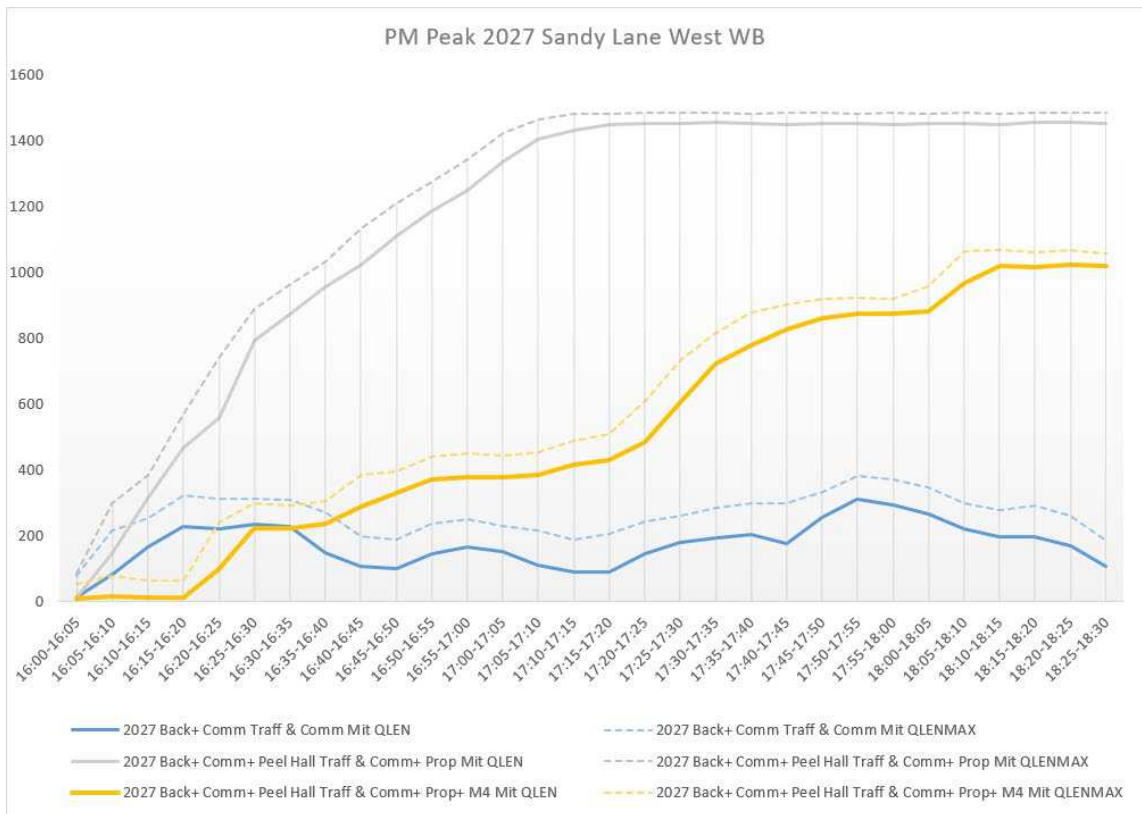


CHART 3.29 – PM PEAK 2027 SANDY LANE WEST

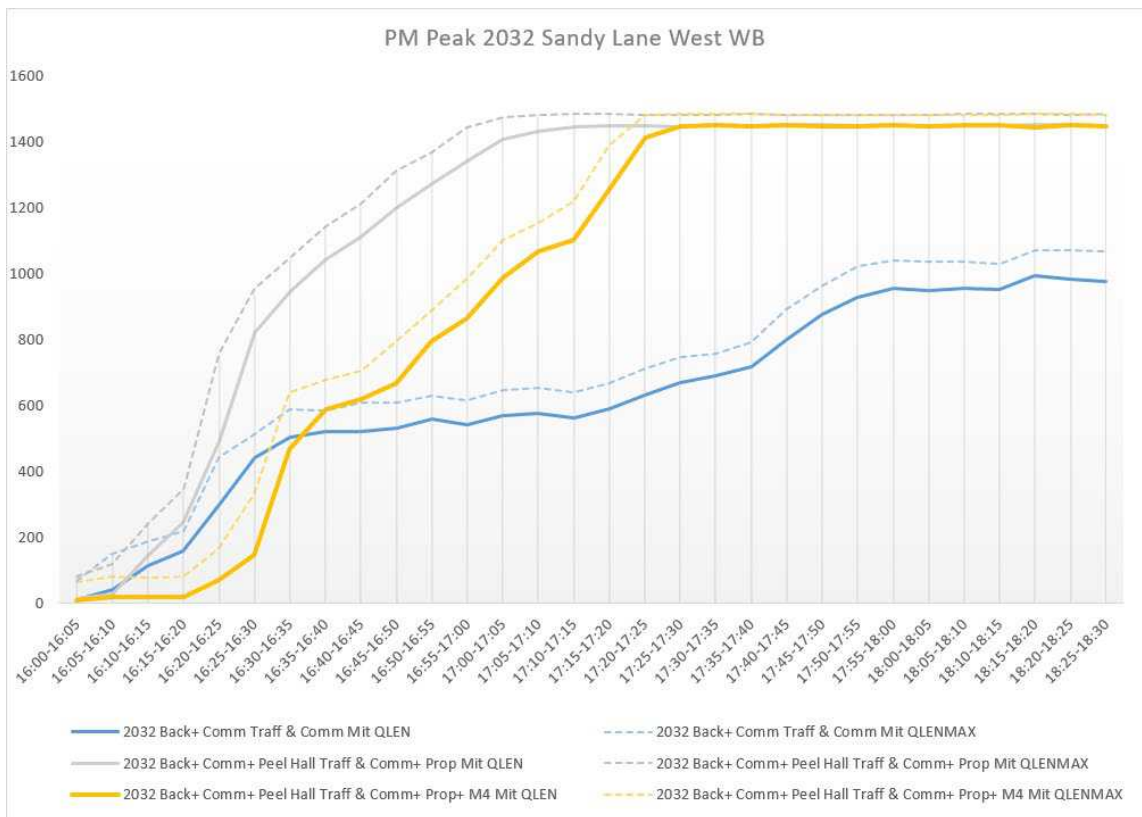


CHART 3.30 – PM PEAK 2032 SANDY LANE WEST

3.4.27 Charts 3.31 – 3.33 show the comparative queue length performance on A50 Long Lane in the evening peak.

3.4.28 Other than 2032, it is clear in the 2022 and 2027 future year scenarios that there is an increased impact to the speed that queue lengths build up, and the length that they build up to. As with the morning peak models, this is partially as a result of increased flow on this link.

3.4.29 Additionally, on occasion there are complications caused by traffic from Northway blocking the approach for traffic from A50 Long Lane. This can constrict the final 70m of the approach to the signalised A49 junction, leading to a lowered saturation flow here.

3.4.30

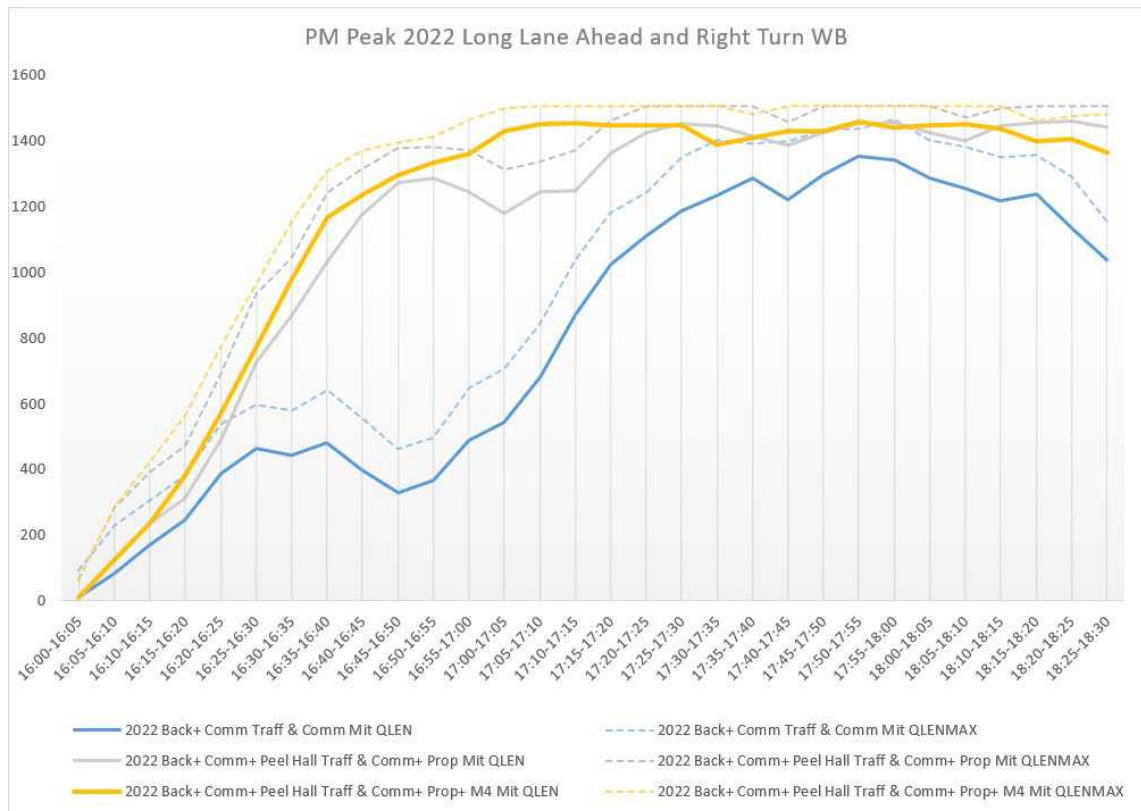


CHART 3.31 – PM PEAK 2022 A50 LONG LANE



CHART 3.32 – PM PEAK 2027 A50 LONG LANE

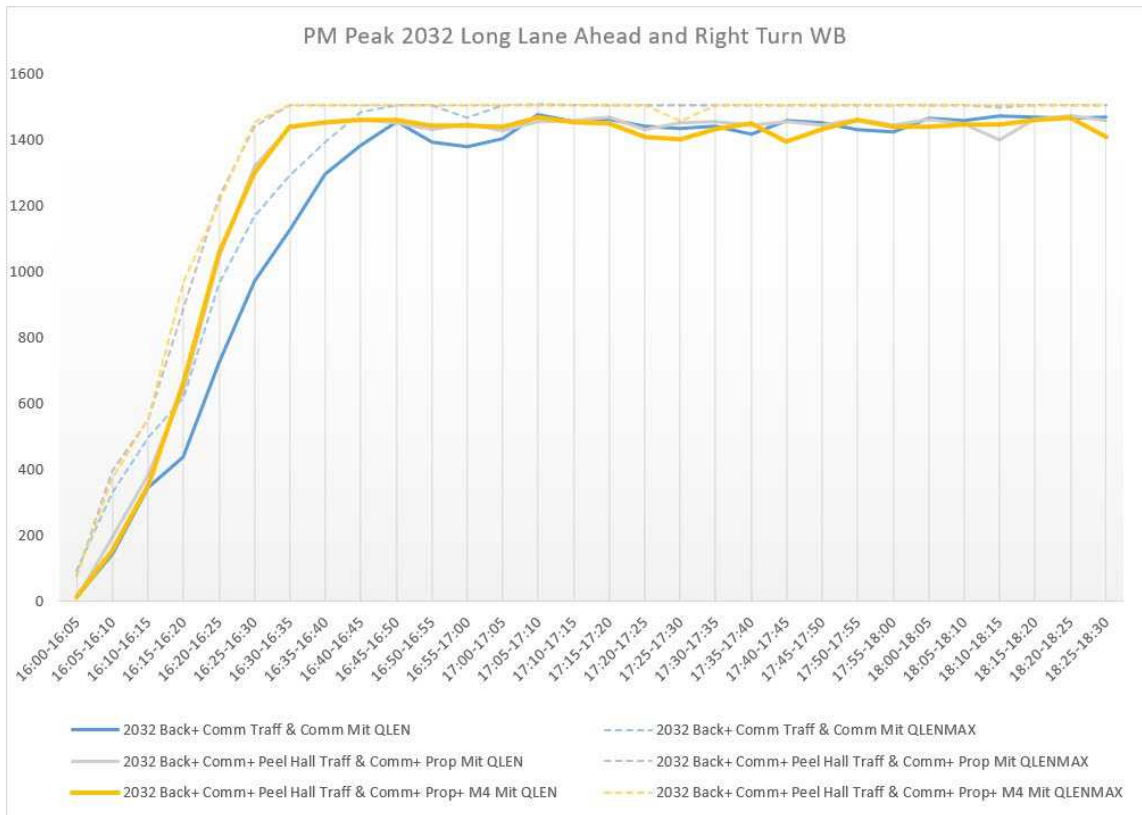


CHART 3.33 – PM PEAK 2032 A50 LONG LANE

- 3.4.31 Charts 3.34 – 3.36 show the comparative queue length performance on the northbound A49 approaching M62 Junction 9 in the evening peak.
- 3.4.32 The 2022 and 2027 (Charts 3.34 & 3.35) show that it is possible to maintain the same levels of queuing experienced in the Reference Case models. However, in 2032 there is a ‘spike’ in queue levels experienced during the cool-down period (18:00-18:30). This is as a result of constraining the additional traffic released through smoother operation in the south from arriving at the northern exit from the model at once.
- 3.4.33 As there is a fixed constraint at the northern end of A49 Newton Road (to simulate the stated capacity of the Hollins Lane junction), if too much traffic arrives at the northern end of the model, queue lengths can quickly reach back to M62 Junction 9, creating the potential of queuing on the M62 mainline.
- 3.4.34 As there is space on the A49 northbound approach (approximately 800m back to Cromwell Avenue) and as the queue build-up is temporary (the spike is already reducing at the end of the modelled period) it was felt to be an acceptable compromise in order to keep M62 Junction 9 running smoothly.

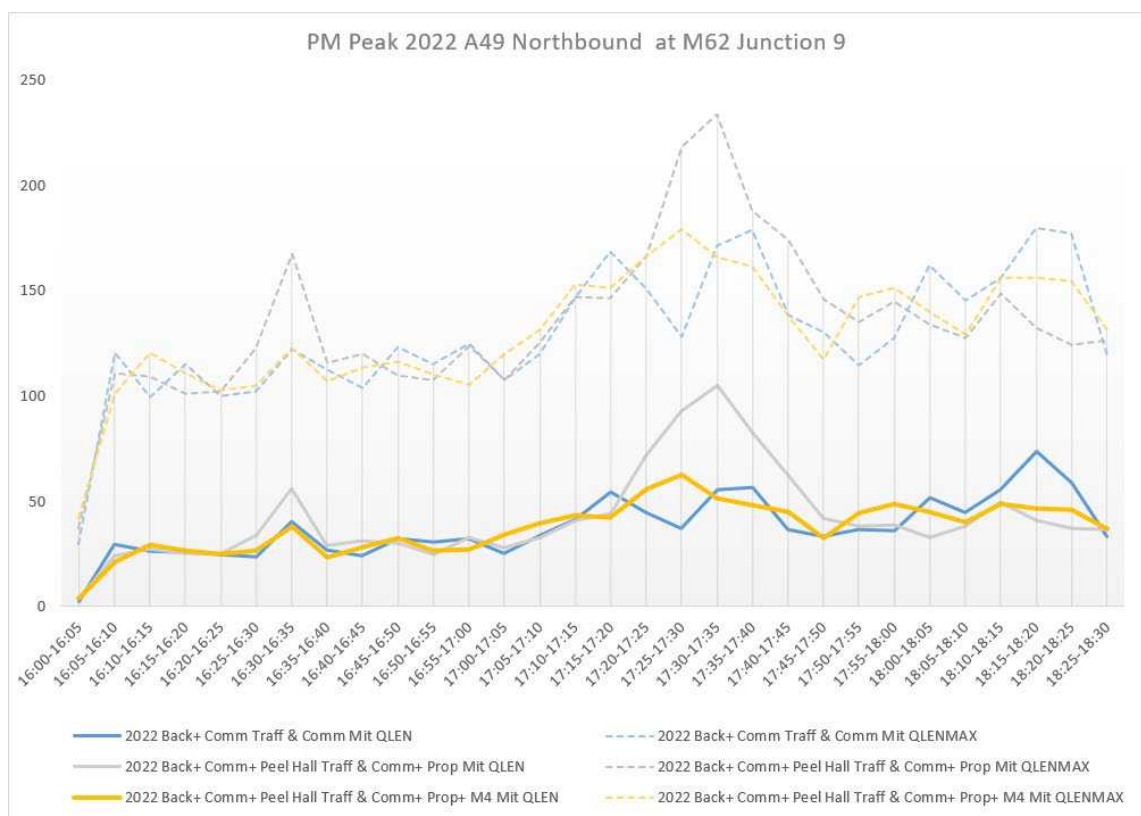


CHART 3.34 – PM PEAK 2022 A49 NORTHBOUND AT M62 JUNCTION 9

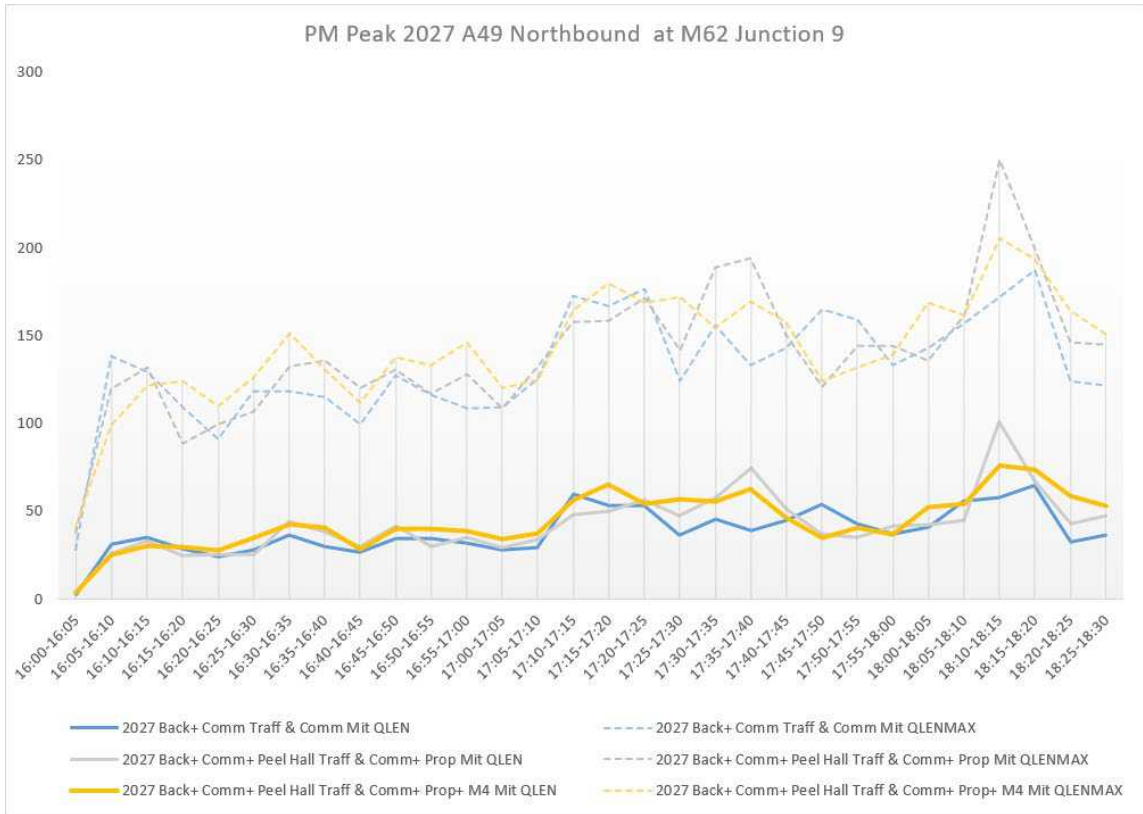


CHART 3.35 – PM PEAK 2027 A49 NORTHBOUND AT M62 JUNCTION 9

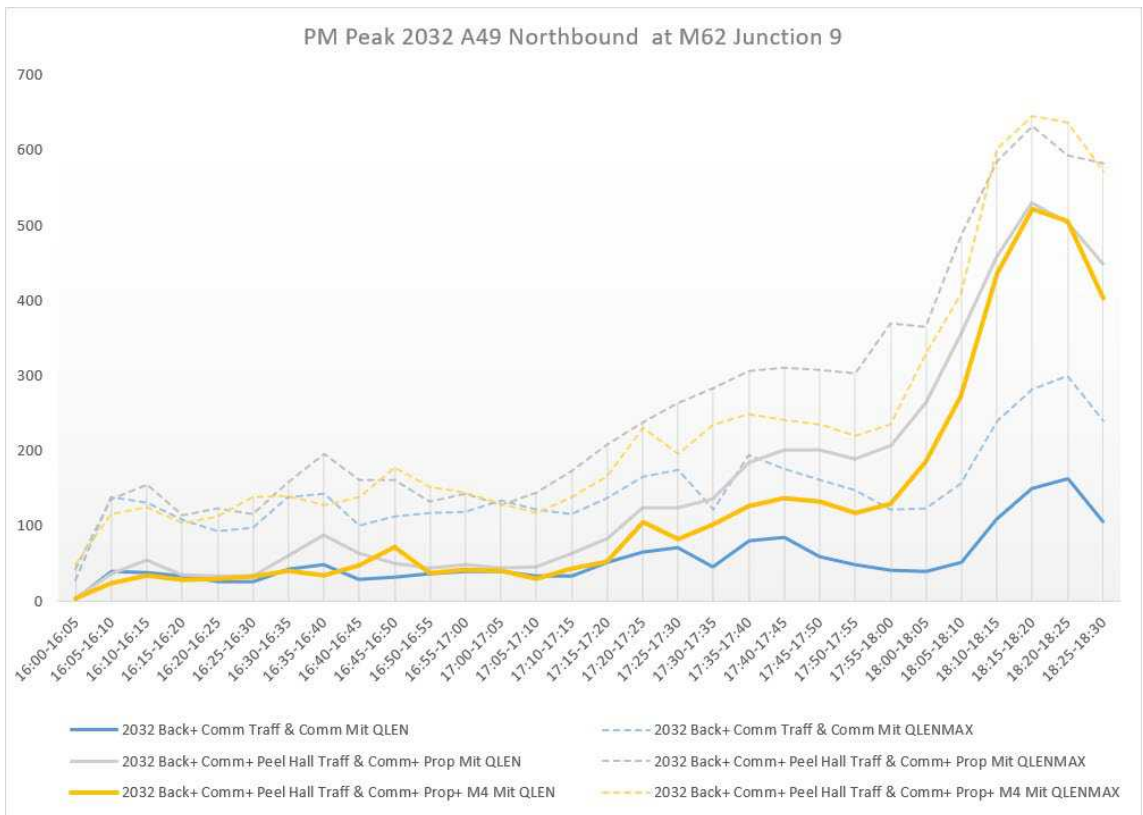


CHART 3.36 – PM PEAK A49 NORTHBOUND AT M62 JUNCTION 9

3.4.35 Charts 3.37 – 3.39 show the comparative queue length performance on the northbound A49 approaching Cromwell Avenue in the evening peak.

3.4.36 All charts clearly show that, as a direct consequence of the mitigation measures in this location, queue lengths have been substantially reduced for the tidal northbound flow. The same is also true for the ahead and right turning movements.

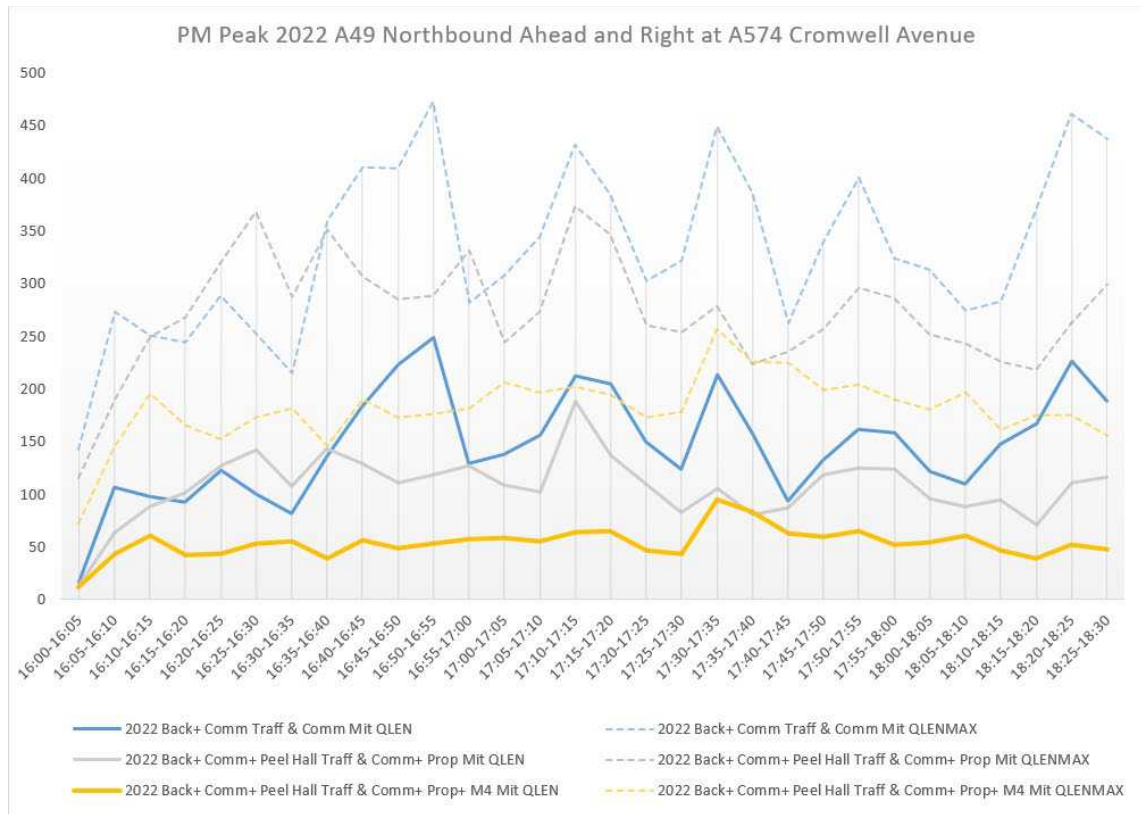


CHART 3.37 – PM PEAK 2022 A49 NORTHBOUND AT CROMWELL AVENUE

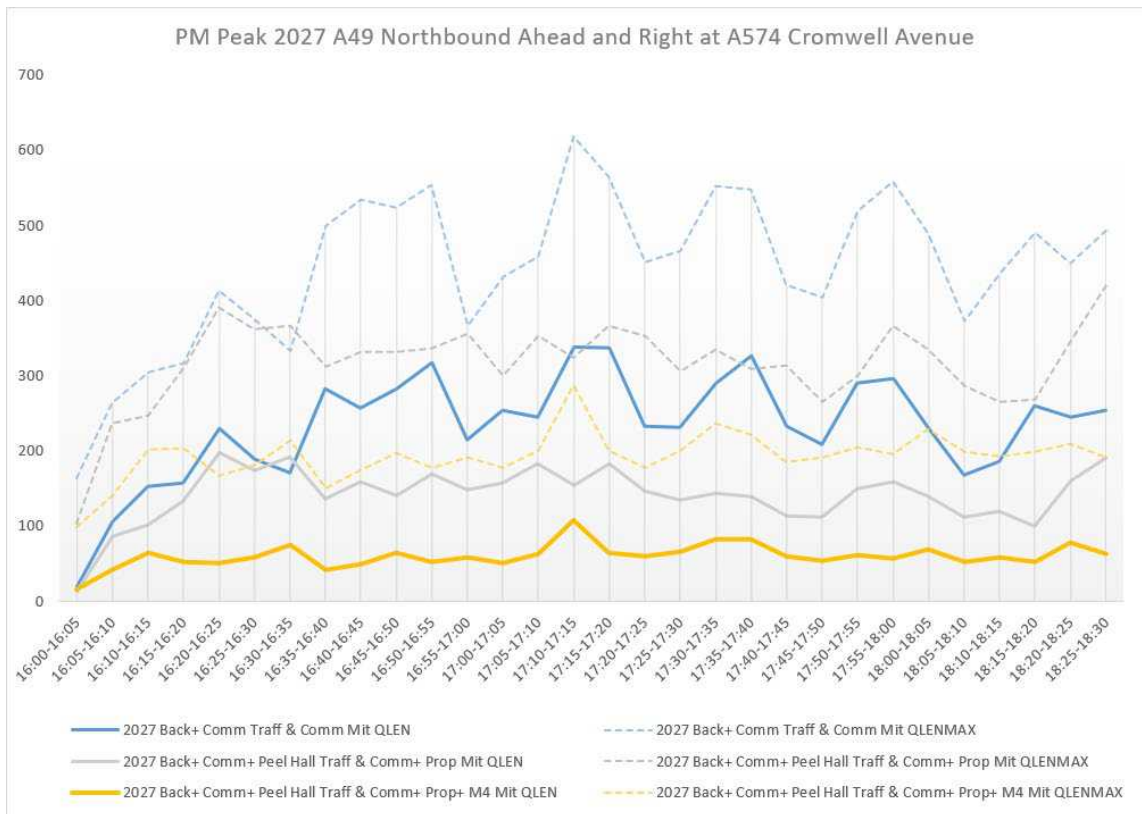


CHART 3.38 – PM PEAK 2027 A49 NORTHBOUND AT CROMWELL AVENUE

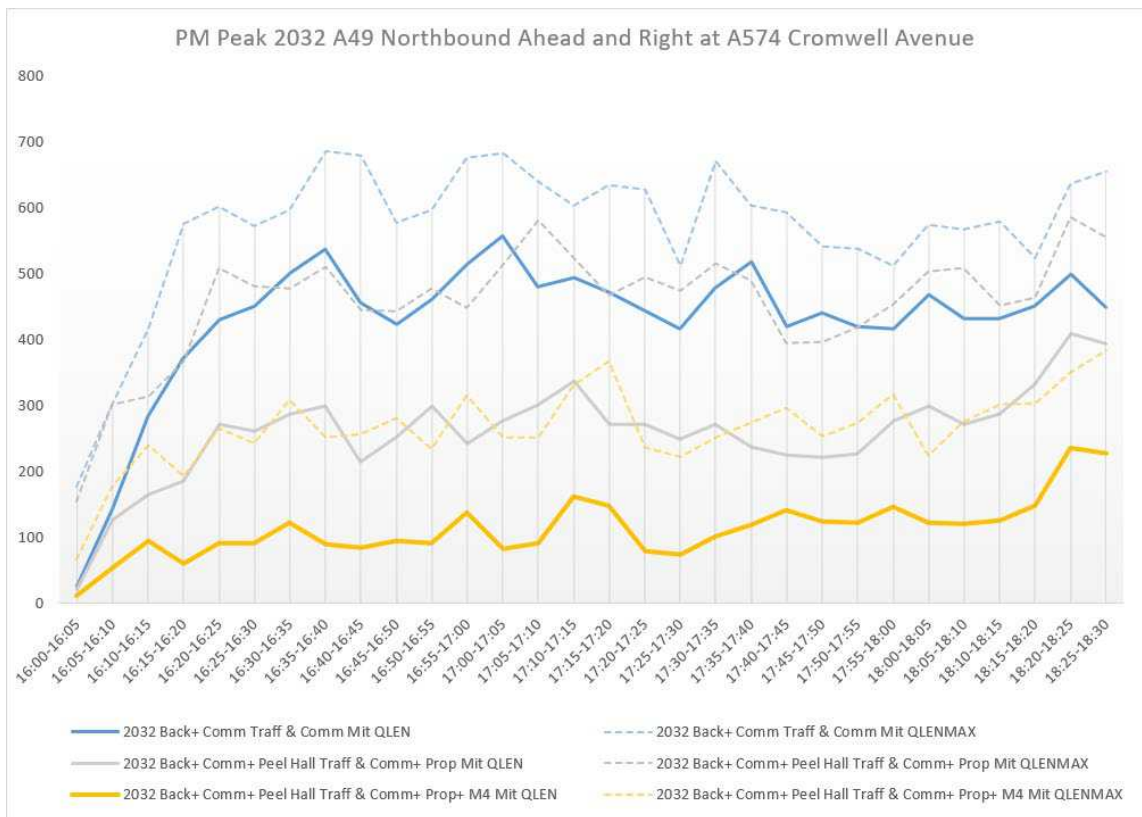


CHART 3.39 – PM PEAK 2032 A49 NORTHBOUND AT CROMWELL AVENUE

3.4.37 Charts 3.40 – 3.42 show the comparative queue length performance on the northbound A49 approaching Hawley’s Lane in the evening peak.

3.4.38 Although queues tend to build up slightly faster in all future years, the overall impact of the development traffic can be considered to be minimal in this location.



CHART 3.40 – PM PEAK 2022 A49 NORTHBOUND AT HAWLEYS LANE

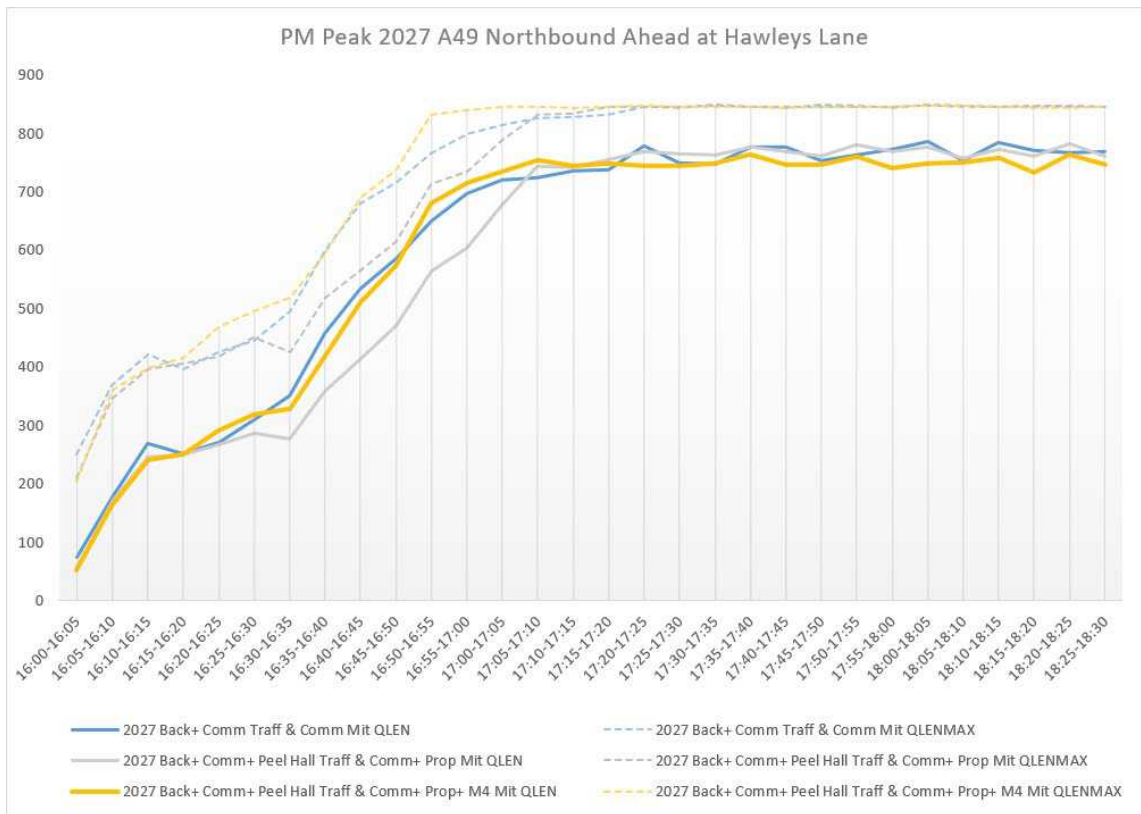


CHART 3.41 – PM PEAK 2027 A49 NORTHBOUND AT HAWLEYS LANE

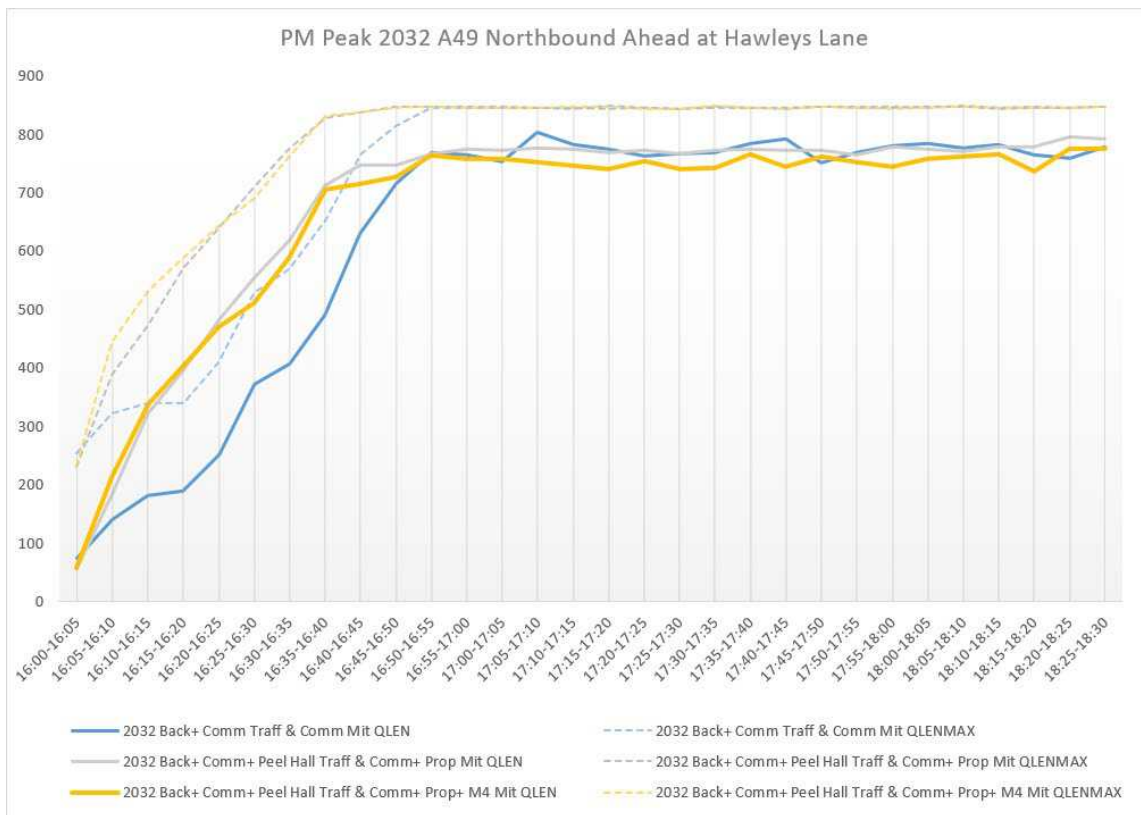


CHART 3.42 – PM PEAK 2032 A49 NORTHBOUND AT HAWLEYS LANE

4 SUMMARY AND CONCLUSIONS

4.1 Summary of Modelling Outcomes

4.1.1 Building on the 2019 Base Year Model, forecast 2022, 2027 and 2032 model scenarios have been produced to act as reference case models for the purposes of comparison, with the aim of assessing the impact of traffic flow changes associated with the proposed Peel Hall development. These models contain background traffic growth and traffic growth associated with known committed development schemes in the area, along with all highway mitigation associated with those committed development schemes.

4.1.2 The following scenarios, with additional traffic associated with the Peel Hall development, were then compared against their associated reference cases:

- 2022 (Full Development Scenario) with committed mitigation measures and additional proposed mitigation measures.
- 2027 (Part Development Scenario) with committed mitigation measures and additional proposed mitigation measures.
- 2032 (Full Development Scenario) with committed mitigation measures and additional proposed mitigation measures.
- 2022 (Full Development Scenario) with committed mitigation measures and additional proposed mitigation measures plus M4 Mitigation measure package.
- 2027 (Part Development Scenario) with committed mitigation measures and additional proposed mitigation measures plus M4 Mitigation measure package.
- 2032 (Full Development Scenario) with committed mitigation measures and additional proposed mitigation measures plus M4 Mitigation measure package.

4.1.3 There are some relatively minor, steady increases to delay, queue lengths etc. as a result of the growth in both background traffic and specific development related traffic. However, there is one notable area where higher levels of delay are apparent:

- A49 Winwick Road/Hawleys Lane/A50 Long Lane – this junction is modelled with simple, varying signal plans, as in the base, then with a more responsive, vehicle actuated controller in the Proposed Mitigation scenarios, to assess the possible impact of upgrading and re-optimising this junction controller. The results do show that improvements are made, particularly in the evening peak. However, the heavy westbound flow on A50 Long Lane combined with the proximity of Northway to the main junction, make it very likely that traffic will either find it difficult to exit Northway onto Long Lane, or that traffic exiting Northway will cause blockages for westbound traffic on A50 Long Lane, restricting the flow to the stop line and reducing the potential saturation flow there. This is an existing issue, but is clearly exacerbated by the increased future traffic volumes.

4.2 Summary of Modelling Conclusions

- 4.2.1 For the majority of the network, the combined effect of committed and proposed mitigation measures either allow maintained levels of performance or produce significant improvements when compared against the Reference Case models.
- 4.2.2 The committed mitigation measures, along with the associated signal timing optimisation carried out to rebalance each future year scenario, contribute towards the Reference Case scenarios working well in all future years. Speeds are relatively high, considering the number of signalised junctions along most journeys and levels of peak hour latent demand (vehicles unable to access the network due to congestion/queuing) are relatively low. These results do show impact from the addition of background and committed traffic growth associated with each subsequent future year period but suggest a network which is coping well with the required level of demand in each Reference Case future year scenario.
- 4.2.3 When Peel Hall development traffic is added to the network, there is an impact on levels of congestion, however, the addition of the full M4 mitigation package clearly improves upon or resolves many of the congestions contributing factors. Added to this, the mitigation measures contribute towards the creation of a network with the ability to produce comparatively improved and consistent network performance in each sequential future year scenario, particularly in the evening peak.
- 4.2.4 Where delay is not fully mitigated against, effects are able to be kept localised and controlled through a networkwide optimisation strategy. The focus of this strategy has been to ensure the smooth running of the primary A49 corridor, in both peaks, whilst also guaranteeing minimum impact for traffic on, as well as entering and exiting, the strategic M62 mainline route. Once these goals were achieved, the determination has then been to minimise any impacts experienced on the local road network.
- 4.2.5 As a result, it is considered that the data in this report demonstrates that any impacts resultant of the proposed development can be effectively mitigated against, as well as improvement gains to many journey times and experienced queue lengths across the whole corridor.

APPENDIX A:

TURNING VOLUME COMPARISONS



AM 2022 VOLUME COMPARISON – 07:00-08:00 (WARM-UP PERIOD)

		07:00-08:00							
		2022							
Junction/ Movement		Vehicle Flow		Difference		Vehicle Flow		Difference	
Junction	Approach	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Newton Road/ A49 Winwick Link Road/ Winwick Park Avenue	A49 NB to Winwick Park Ave	5	7	2	40%	5	7	2	40%
	A49 NB	945	970	25	3%	945	971	26	3%
	A49 NB to Winwick Link Rd	598	605	7	1%	598	607	9	2%
	Winwick Park Ave to A49 NB	126	126	0	0%	126	126	0	0%
	Winwick Park Ave to Winwick Link Rd	49	49	0	0%	49	49	0	0%
	Winwick Park Ave to A49 SB	71	73	2	3%	71	73	2	3%
	A49 SB to Winwick Link Rd	74	81	7	9%	74	81	7	9%
	A49 SB	682	720	38	6%	682	722	40	6%
	A49 SB to Winwick Park Ave	15	16	1	7%	15	16	1	7%
	Winwick Link Rd to A49 SB	894	897	3	0%	894	899	5	1%
Winwick Link Rd to Winwick Park Ave	1	0	-1	-100%	1	0	-1	-100%	
Winwick Link Rd to A49 NB	54	54	0	0%	54	54	0	0%	
A49 Newton Road/ Delph Lane	A49 NB	1469	1505	36	2%	1469	1507	38	3%
	A49 NB to Delph Ln	217	244	27	12%	217	244	27	12%
	A49 SB	1567	1608	41	3%	1567	1614	47	3%
	A49 SB to Delph Ln	52	52	0	0%	52	52	0	0%
	Delph Ln to A49 NB	100	101	1	1%	100	101	1	1%
M62 Junction 9	Delph Ln to A49 SB	174	185	11	6%	174	185	11	6%
	A49 NB to M62 WB	326	336	10	3%	326	336	10	3%
	A49 NB	599	609	10	2%	599	612	13	2%
	A49 NB to M62 EB	252	258	6	2%	252	260	8	3%
	A49 NB to A49 SB (U-Turn)	5	9	4	80%	5	9	4	80%
	M62 EB to A49 NB	840	885	45	5%	840	885	45	5%
	M62 EB Mainline	3857	3854	-3	0%	3857	3854	-3	0%
	M62 EB to A49 SB	248	258	10	4%	248	258	10	4%
	A49 SB to M62 EB	261	293	32	12%	261	295	34	13%
	A49 SB	629	636	7	1%	629	639	10	2%
	A49 SB to M62 WB	784	799	15	2%	784	802	18	2%
	M62 WB to A49 SB	500	510	10	2%	500	513	13	3%
M62 WB Mainline	3427	3428	1	0%	3427	3428	1	0%	
M62 WB to A49 NB	257	264	7	3%	257	265	8	3%	
A49 Winwick Rd/ Birch Ave	A49 SB to Birch Ave	8	13	5	63%	8	13	5	63%
	Birch Rd to A49 SB	48	70	22	46%	48	70	22	46%
A49 Winwick Road @ Poplars Avenue	A49 NB to Woburn Rd	17	16	-1	-6%	17	16	-1	-6%
	A49 NB	1231	1261	30	2%	1231	1263	32	3%
	A49 SB	1414	1462	48	3%	1414	1469	55	4%
A49 Winwick Road/ A574 Cromwell Avenue/ Sandy Lane West	A49 SB to Sandy Ln West	152	173	21	14%	152	173	21	14%
	A49 SB	980	993	13	1%	980	993	13	1%
	A49 SB to Cromwell Ave	205	218	13	6%	205	218	13	6%
	Cromwell Ave to A49 NB	255	253	-2	-1%	255	253	-2	-1%
	Cromwell Ave to Sandy Ln West	363	365	2	1%	363	363	0	0%
	Cromwell Ave to A49 SB	481	492	11	2%	481	493	12	2%
	Cromwell Ave to Cromwell Ave (U-turn)	43	42	-1	-2%	43	42	-1	-2%
	A49 NB	728	726	-2	0%	728	724	-4	-1%
	A49 NB to Sandy Ln West	44	48	4	9%	44	48	4	9%
	A49 NB to Cromwell Ave	398	407	9	2%	398	408	10	3%
	Sandy Ln West to A49 NB	283	317	34	12%	283	317	34	12%
	Sandy Ln West to Sandy Ln (U-turn)	0	0	0	-	0	0	0	-
Sandy Ln West to A49 SB	105	87	-18	-17%	105	87	-18	-17%	
Sandy Ln West to Cromwell Ave	215	256	41	19%	215	256	41	19%	
A49 Winwick Road @ Junction NINE Retail Park	A49 NB	1094	1110	16	1%	1094	1112	18	2%
	A49 NB to Junction NINE Retail	4	7	3	75%	4	7	3	75%
	Junction NINE Retail to A49 SB	18	21	3	17%	18	21	3	17%
	Junction NINE Retail to A49 NB	89	87	-2	-2%	89	87	-2	-2%
	A49 SB	1426	1437	11	1%	1426	1434	8	1%
A49 SB to Junction NINE Retail	111	113	2	2%	111	113	2	2%	
A49 Winwick Road/ Hawleys Lane/ A50 Long Lane	A49 SB to Hawleys Lane	138	140	2	1%	138	139	1	1%
	A49 SB to Long Lane	134	146	12	9%	134	146	12	9%
	A49 SB	1090	1112	22	2%	1090	1114	24	2%
	A49 NB to Hawleys Lane	83	86	3	4%	83	87	4	5%
	A49 NB to Long Lane	179	180	1	1%	179	179	0	0%
	A49 NB	666	674	8	1%	666	677	11	2%
	Long Lane to A49 SB	456	491	35	8%	0	0	0	-
	Long Lane to Hawleys Lane	142	125	-17	-12%	142	125	-17	-12%
	Long Lane to A49 NB	271	270	-1	0%	271	271	0	0%
	Hawleys Lane to Long Lane	58	59	1	2%	58	59	1	2%
Hawleys Lane to A49 SB	64	63	-1	-2%	64	62	-2	-3%	
Hawleys Lane to A49 NB	193	196	3	2%	193	196	3	2%	

AM 2027 VOLUME COMPARISON – 07:00-08:00 (WARM-UP PERIOD)

		07:00-08:00							
Junction/ Movement		Vehicle Flow		Difference		Vehicle Flow		Difference	
Junction	Approach	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Newton Road/ A49 Winwick Link Road/ Winwick Park Avenue	A49 NB to Winwick Park Ave	6	6	0	0%	6	7	1	17%
	A49 NB	1073	1079	6	1%	1073	1090	17	2%
	A49 NB to Winwick Link Rd	637	635	-2	0%	637	643	6	1%
	Winwick Park Ave to A49 NB	161	161	0	0%	161	158	-3	-2%
	Winwick Park Ave to Winwick Link Rd	53	54	1	2%	53	53	0	0%
	Winwick Park Ave to A49 SB	73	72	-1	-1%	73	71	-2	-3%
	A49 SB to Winwick Link Rd	95	98	3	3%	95	99	4	4%
	A49 SB	736	764	28	4%	736	764	28	4%
	A49 SB to Winwick Park Ave	16	16	0	0%	16	16	0	0%
	Winwick Link Rd to A49 SB	943	930	-13	-1%	943	922	-21	-2%
Winwick Link Rd to Winwick Park Ave	0	0	0	-	0	0	0	-	
Winwick Link Rd to A49 NB	107	106	-1	-1%	107	106	-1	-1%	
A49 Newton Road/ Delph Lane	A49 NB	1650	1656	6	0%	1650	1670	20	1%
	A49 NB to Delph Ln	294	312	18	6%	294	316	22	7%
	A49 SB	1675	1688	13	1%	1675	1680	5	0%
	A49 SB to Delph Ln	51	52	1	2%	51	51	0	0%
	Delph Ln to A49 NB	98	97	-1	-1%	98	97	-1	-1%
	Delph Ln to A49 SB	190	196	6	3%	190	196	6	3%
M62 Junction 9	A49 NB to M62 WB	349	345	-4	-1%	349	348	-1	0%
	A49 NB	656	659	3	0%	656	665	9	1%
	A49 NB to M62 EB	260	264	4	2%	260	267	7	3%
	A49 NB to A49 SB (U-Turn)	5	8	3	60%	5	8	3	60%
	M62 EB to A49 NB	1021	1047	26	3%	1021	1057	36	4%
	M62 EB Mainline	3852	3856	4	0%	3852	3856	4	0%
	M62 EB to A49 SB	228	228	0	0%	228	235	7	3%
	A49 SB to M62 EB	272	291	19	7%	272	290	18	7%
	A49 SB	657	653	-4	-1%	657	650	-7	-1%
	A49 SB to M62 WB	872	874	2	0%	872	870	-2	0%
	M62 WB to A49 SB	547	545	-2	0%	547	550	3	1%
	M62 WB Mainline	3430	3426	-4	0%	3430	3426	-4	0%
M62 WB to A49 NB	278	276	-2	-1%	278	277	-1	0%	
A49 Winwick Rd/ Birch Ave	A49 SB to Birch Ave	8	11	3	38%	8	11	3	38%
	Birch Rd to A49 SB	48	78	30	63%	48	78	30	63%
A49 Winwick Road @ Poplars Avenue	A49 NB to Woburn Rd	15	14	-1	-7%	15	15	0	0%
	A49 NB	1325	1330	5	0%	1325	1340	15	1%
	A49 SB	1472	1493	21	1%	1472	1502	30	2%
A49 Winwick Road/ A574 Cromwell Avenue/ Sandy Lane West	A49 SB to Sandy Ln West	199	233	34	17%	199	231	32	16%
	A49 SB	975	976	1	0%	975	977	2	0%
	A49 SB to Cromwell Ave	217	216	-1	0%	217	216	-1	0%
	Cromwell Ave to A49 NB	258	253	-5	-2%	258	257	-1	0%
	Cromwell Ave to Sandy Ln West	374	374	0	0%	374	373	-1	0%
	Cromwell Ave to A49 SB	504	520	16	3%	504	538	34	7%
	Cromwell Ave to Cromwell Ave (U-turn)	43	42	-1	-2%	43	45	2	5%
	A49 NB	783	787	4	1%	783	782	-1	0%
	A49 NB to Sandy Ln West	54	63	9	17%	54	62	8	15%
	A49 NB to Cromwell Ave	434	447	13	3%	434	448	14	3%
	Sandy Ln West to A49 NB	323	336	13	4%	323	338	15	5%
	Sandy Ln West to Sandy Ln (U-turn)	0	0	0	-	0	0	0	-
	Sandy Ln West to A49 SB	81	84	3	4%	81	84	3	4%
Sandy Ln West to Cromwell Ave	233	251	18	8%	233	252	19	8%	
A49 Winwick Road @ Junction NINE Retail Park	A49 NB	1189	1212	23	2%	1189	1213	24	2%
	A49 NB to Junction NINE Retail	3	5	2	67%	3	5	2	67%
	Junction NINE Retail to A49 SB	18	15	-3	-17%	18	15	-3	-17%
	Junction NINE Retail to A49 NB	102	104	2	2%	102	103	1	1%
	A49 SB	1407	1440	33	2%	1407	1458	51	4%
A49 SB to Junction NINE Retail	113	115	2	2%	113	115	2	2%	
A49 Winwick Road/ Hawleys Lane/ A50 Long Lane	A49 SB to Hawleys Lane	135	131	-4	-3%	135	131	-4	-3%
	A49 SB to Long Lane	123	119	-4	-3%	123	118	-5	-4%
	A49 SB	1102	1152	50	5%	1102	1156	54	5%
	A49 NB to Hawleys Lane	93	97	4	4%	93	97	4	4%
	A49 NB to Long Lane	177	184	7	4%	177	185	8	5%
	A49 NB	705	741	36	5%	705	738	33	5%
	Long Lane to A49 SB	496	486	-10	-2%	0	0	0	-
	Long Lane to Hawleys Lane	140	128	-12	-9%	140	127	-13	-9%
	Long Lane to A49 NB	273	274	1	0%	273	274	1	0%
	Hawleys Lane to Long Lane	48	48	0	0%	48	48	0	0%
	Hawleys Lane to A49 SB	71	67	-4	-6%	71	67	-4	-6%
Hawleys Lane to A49 NB	228	229	1	0%	228	230	2	1%	

AM 2032 VOLUME COMPARISON – 07:00-08:00 (WARM-UP PERIOD)

		07:00-08:00							
		2032							
Junction/ Movement		Vehicle Flow		Difference		Vehicle Flow		Difference	
Junction	Approach	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Newton Road/ A49 Winwick Link Road/ Winwick Park Avenue	A49 NB to Winwick Park Ave	5	6	1	20%	5	6	1	20%
	A49 NB	1081	1074	-7	-1%	1081	1097	16	1%
	A49 NB to Winwick Link Rd	654	648	-6	-1%	654	662	8	1%
	Winwick Park Ave to A49 NB	184	173	-11	-6%	184	167	-17	-9%
	Winwick Park Ave to Winwick Link Rd	51	55	4	8%	51	53	2	4%
	Winwick Park Ave to A49 SB	74	80	6	8%	74	78	4	5%
	A49 SB to Winwick Link Rd	94	102	8	9%	94	102	8	9%
	A49 SB	767	783	16	2%	767	776	9	1%
	A49 SB to Winwick Park Ave	16	16	0	0%	16	16	0	0%
	Winwick Link Rd to A49 SB	958	957	-1	0%	958	934	-24	-3%
Winwick Link Rd to Winwick Park Ave	0	0	0	-	0	0	0	-	
Winwick Link Rd to A49 NB	105	105	0	0%	105	103	-2	-2%	
A49 Newton Road/ Delph Lane	A49 NB	1686	1659	-27	-2%	1686	1695	9	1%
	A49 NB to Delp Ln	307	292	-15	-5%	307	300	-7	-2%
	A49 SB	1720	1738	18	1%	1720	1703	-17	-1%
	A49 SB to Delph Ln	51	55	4	8%	51	54	3	6%
	Delph Ln to A49 NB	99	99	0	0%	99	99	0	0%
	Delph Ln to A49 SB	197	200	3	2%	197	201	4	2%
M62 Junction 9	A49 NB to M62 WB	389	351	-38	-10%	389	353	-36	-9%
	A49 NB	691	682	-9	-1%	691	695	4	1%
	A49 NB to M62 EB	260	268	8	3%	260	270	10	4%
	A49 NB to A49 SB (U-Turn)	5	7	2	40%	5	6	1	20%
	M62 EB to A49 NB	1065	1066	1	0%	1065	1100	35	3%
	M62 EB Mainline	3857	3857	0	0%	3857	3857	0	0%
	M62 EB to A49 SB	236	241	5	2%	236	263	27	11%
	A49 SB to M62 EB	297	327	30	10%	297	322	25	8%
	A49 SB	652	661	9	1%	652	650	-2	0%
	A49 SB to M62 WB	899	881	-18	-2%	899	866	-33	-4%
M62 WB to A49 SB	597	614	17	3%	597	615	18	3%	
M62 WB Mainline	3433	3434	1	0%	3433	3434	1	0%	
M62 WB to A49 NB	249	214	-35	-14%	249	213	-36	-14%	
A49 Winwick Rd/ Birch Ave	A49 SB to Birch Ave	7	11	4	57%	7	11	4	57%
	Birch Rd to A49 SB	48	41	-7	-15%	48	41	-7	-15%
A49 Winwick Road @ Poplars Avenue	A49 NB to Woburn Rd	12	11	-1	-8%	12	11	-1	-8%
	A49 NB	1397	1359	-38	-3%	1397	1372	-25	-2%
	A49 SB	1523	1546	23	2%	1523	1557	34	2%
A49 Winwick Road/ A574 Cromwell Avenue/ Sandy Lane West	A49 SB to Sandy Ln West	242	251	9	4%	242	249	7	3%
	A49 SB	966	965	-1	0%	966	964	-2	0%
	A49 SB to Cromwell Ave	243	263	20	8%	243	266	23	9%
	Cromwell Ave to A49 NB	268	266	-2	-1%	268	268	0	0%
	Cromwell Ave to Sandy Ln West	368	376	8	2%	368	373	5	1%
	Cromwell Ave to A49 SB	533	531	-2	0%	533	540	7	1%
	Cromwell Ave to Cromwell Ave (U-turn)	43	39	-4	-9%	43	40	-3	-7%
	A49 NB	810	824	14	2%	810	817	7	1%
	A49 NB to Sandy Ln West	64	74	10	16%	64	74	10	16%
	A49 NB to Cromwell Ave	464	475	11	2%	464	473	9	2%
	Sandy Ln West to A49 NB	362	320	-42	-12%	362	324	-38	-10%
	Sandy Ln West to Sandy Ln (U-turn)	0	0	0	-	0	0	0	-
Sandy Ln West to A49 SB	75	85	10	13%	75	86	11	15%	
Sandy Ln West to Cromwell Ave	237	265	28	12%	237	268	31	13%	
A49 Winwick Road @ Junction NINE Retail Park	A49 NB	1243	1277	34	3%	1243	1275	32	3%
	A49 NB to Junction NINE Retail	4	9	5	125%	4	9	5	125%
	Junction NINE Retail to A49 SB	14	15	1	7%	14	15	1	7%
	Junction NINE Retail to A49 NB	114	115	1	1%	114	115	1	1%
	A49 SB	1417	1440	23	2%	1417	1453	36	3%
	A49 SB to Junction NINE Retail	113	117	4	4%	113	117	4	4%
A49 Winwick Road/ Hawleys Lane/ A50 Long Lane	A49 SB to Hawleys Lane	132	131	-1	-1%	132	135	3	2%
	A49 SB to Long Lane	108	102	-6	-6%	108	102	-6	-6%
	A49 SB	1126	1164	38	3%	1126	1170	44	4%
	A49 NB to Hawleys Lane	103	107	4	4%	103	106	3	3%
	A49 NB to Long Lane	176	185	9	5%	176	183	7	4%
	A49 NB	733	788	55	8%	733	784	51	7%
	Long Lane to A49 SB	545	522	-23	-4%	0	0	0	-
	Long Lane to Hawleys Lane	132	112	-20	-15%	132	111	-21	-16%
	Long Lane to A49 NB	278	272	-6	-2%	278	271	-7	-3%
	Hawleys Lane to Long Lane	41	41	0	0%	41	41	0	0%
Hawleys Lane to A49 SB	70	64	-6	-9%	70	64	-6	-9%	
Hawleys Lane to A49 NB	252	257	5	2%	252	258	6	2%	

AM 2022 VOLUME COMPARISON – 08:00-09:00 (PEAK PERIOD)

		08:00-09:00							
		2022							
Junction/ Movement		Vehicle Flow		Difference		Vehicle Flow		Difference	
Junction	Approach	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Newton Road/ A49 Winwick Link Road/ Winwick Park Avenue	A49 NB to Winwick Park Ave	8	9	1	13%	8	9	1	13%
	A49 NB	927	938	11	1%	927	939	12	1%
	A49 NB to Winwick Link Rd	595	593	-2	0%	595	590	-5	-1%
	Winwick Park Ave to A49 NB	184	184	0	0%	184	186	2	1%
	Winwick Park Ave to Winwick Link Rd	62	62	0	0%	62	62	0	0%
	Winwick Park Ave to A49 SB	88	90	2	2%	88	92	4	5%
	A49 SB to Winwick Link Rd	81	87	6	7%	81	87	6	7%
	A49 SB	848	911	63	7%	848	907	59	7%
	A49 SB to Winwick Park Ave	26	25	-1	-4%	26	25	-1	-4%
	Winwick Link Rd to A49 SB	961	934	-27	-3%	961	921	-40	-4%
Winwick Link Rd to Winwick Park Ave	0	0	0	-	0	0	0	-	
Winwick Link Rd to A49 NB	78	75	-3	-4%	78	75	-3	-4%	
A49 Newton Road/ Delph Lane	A49 NB	1418	1430	12	1%	1418	1430	12	1%
	A49 NB to Delp Ln	204	231	27	13%	204	230	26	13%
	A49 SB	1817	1850	33	2%	1817	1829	12	1%
	A49 SB to Delph Ln	64	67	3	5%	64	67	3	5%
	Delph Ln to A49 NB	102	101	-1	-1%	102	101	-1	-1%
	Delph Ln to A49 SB	204	219	15	7%	204	219	15	7%
M62 Junction 9	A49 NB to M62 WB	399	413	14	4%	399	411	12	3%
	A49 NB	746	745	-1	0%	746	744	-2	0%
	A49 NB to M62 EB	358	368	10	3%	358	365	7	2%
	A49 NB to A49 SB (U-Turn)	5	9	4	80%	5	9	4	80%
	M62 EB to A49 NB	590	625	35	6%	590	625	35	6%
	M62 EB Mainline	3276	3273	-3	0%	3276	3273	-3	0%
	M62 EB to A49 SB	380	390	10	3%	380	389	9	2%
	A49 SB to M62 EB	398	437	39	10%	398	435	37	9%
	A49 SB	702	698	-4	-1%	702	691	-11	-2%
	A49 SB to M62 WB	937	943	6	1%	937	934	-3	0%
	M62 WB to A49 SB	709	715	6	1%	709	716	7	1%
	M62 WB Mainline	3145	3146	1	0%	3145	3146	1	0%
M62 WB to A49 NB	299	303	4	1%	299	303	4	1%	
A49 Winwick Rd/ Birch Ave	A49 SB to Birch Ave	8	13	5	63%	8	13	5	63%
	Birch Rd to A49 SB	51	70	19	37%	51	66	15	29%
A49 Winwick Road @ Poplars Avenue	A49 NB to Woburn Rd	23	22	-1	-4%	23	22	-1	-4%
	A49 NB	1502	1535	33	2%	1502	1527	25	2%
	A49 SB	1822	1851	29	2%	1822	1841	19	1%
A49 Winwick Road/ A574 Cromwell Avenue/ Sandy Lane West	A49 SB to Sandy Ln West	194	211	17	9%	194	210	16	8%
	A49 SB	1291	1296	5	0%	1291	1301	10	1%
	A49 SB to Cromwell Ave	271	282	11	4%	271	283	12	4%
	Cromwell Ave to A49 NB	291	293	2	1%	291	286	-5	-2%
	Cromwell Ave to Sandy Ln West	425	427	2	0%	425	418	-7	-2%
	Cromwell Ave to A49 SB	520	521	1	0%	520	508	-12	-2%
	Cromwell Ave to Cromwell Ave (U-turn)	54	49	-5	-9%	54	48	-6	-11%
	A49 NB	923	924	1	0%	923	917	-6	-1%
	A49 NB to Sandy Ln West	93	107	14	15%	93	106	13	14%
	A49 NB to Cromwell Ave	449	470	21	5%	449	471	22	5%
	Sandy Ln West to A49 NB	286	319	33	12%	286	325	39	14%
	Sandy Ln West to Sandy Ln (U-turn)	0	0	0	-	0	0	0	-
	Sandy Ln West to A49 SB	101	73	-28	-28%	101	74	-27	-27%
Sandy Ln West to Cromwell Ave	273	325	52	19%	273	329	56	21%	
A49 Winwick Road @ Junction NINE Retail Park	A49 NB	1384	1422	38	3%	1384	1418	34	2%
	A49 NB to Junction NINE Retail	5	10	5	100%	5	10	5	100%
	Junction NINE Retail to A49 SB	15	17	2	13%	15	17	2	13%
	Junction NINE Retail to A49 NB	86	85	-1	-1%	86	85	-1	-1%
	A49 SB	1786	1754	-32	-2%	1786	1749	-37	-2%
	A49 SB to Junction NINE Retail	116	116	0	0%	116	114	-2	-2%
A49 Winwick Road/ Hawleys Lane/ A50 Long Lane	A49 SB to Hawleys Lane	209	207	-2	-1%	209	208	-1	0%
	A49 SB to Long Lane	186	185	-1	-1%	186	185	-1	-1%
	A49 SB	1410	1378	-32	-2%	1410	1366	-44	-3%
	A49 NB to Hawleys Lane	96	102	6	6%	96	101	5	5%
	A49 NB to Long Lane	211	215	4	2%	211	214	3	1%
	A49 NB	887	897	10	1%	887	893	6	1%
	Long Lane to A49 SB	470	490	20	4%	0	0	0	-
	Long Lane to Hawleys Lane	151	142	-9	-6%	151	141	-10	-7%
	Long Lane to A49 NB	289	315	26	9%	289	313	24	8%
	Hawleys Lane to Long Lane	77	80	3	4%	77	79	2	3%
	Hawleys Lane to A49 SB	67	68	1	1%	67	67	0	0%
Hawleys Lane to A49 NB	216	227	11	5%	216	220	4	2%	

AM 2027 VOLUME COMPARISON – 08:00-09:00 (PEAK PERIOD)

		08:00-09:00							
		2027							
Junction/ Movement		Vehicle Flow		Difference		Vehicle Flow		Difference	
Junction	Approach	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Newton Road/ A49 Winwick Link Road/ Winwick Park Avenue	A49 NB to Winwick Park Ave	8	9	1	13%	8	9	1	13%
	A49 NB	1030	1041	11	1%	1030	1036	6	1%
	A49 NB to Winwick Link Rd	616	616	0	0%	616	618	2	0%
	Winwick Park Ave to A49 NB	227	229	2	1%	227	201	-26	-11%
	Winwick Park Ave to Winwick Link Rd	66	65	-1	-2%	66	58	-8	-12%
	Winwick Park Ave to A49 SB	87	87	0	0%	87	74	-13	-15%
	A49 SB to Winwick Link Rd	99	103	4	4%	99	103	4	4%
	A49 SB	936	953	17	2%	936	959	23	2%
	A49 SB to Winwick Park Ave	26	27	1	4%	26	27	1	4%
	Winwick Link Rd to A49 SB	962	962	0	0%	962	916	-46	-5%
Winwick Link Rd to Winwick Park Ave	0	0	0	-	0	0	0	-	
Winwick Link Rd to A49 NB	120	123	3	3%	120	119	-1	-1%	
A49 Newton Road/ Delph Lane	A49 NB	1543	1554	11	1%	1543	1558	15	1%
	A49 NB to Delp Ln	262	286	24	9%	262	282	20	8%
	A49 SB	1899	1918	19	1%	1899	1869	-30	-2%
	A49 SB to Delph Ln	62	62	0	0%	62	58	-4	-6%
	Delph Ln to A49 NB	99	100	1	1%	99	100	1	1%
	Delph Ln to A49 SB	225	227	2	1%	225	227	2	1%
M62 Junction 9	A49 NB to M62 WB	420	399	-21	-5%	420	401	-19	-5%
	A49 NB	810	807	-3	0%	810	814	4	0%
	A49 NB to M62 EB	371	386	15	4%	371	384	13	4%
	A49 NB to A49 SB (U-Turn)	4	6	2	50%	4	6	2	50%
	M62 EB to A49 NB	703	735	32	5%	703	727	24	3%
	M62 EB Mainline	3274	3274	0	0%	3274	3274	0	0%
	M62 EB to A49 SB	354	360	6	2%	354	354	0	0%
	A49 SB to M62 EB	422	440	18	4%	422	434	12	3%
	A49 SB	707	704	-3	0%	707	684	-23	-3%
	A49 SB to M62 WB	1008	1015	7	1%	1008	990	-18	-2%
	M62 WB to A49 SB	751	758	7	1%	751	757	6	1%
M62 WB Mainline	3150	3151	1	0%	3150	3150	0	0%	
M62 WB to A49 NB	307	306	-1	0%	307	308	1	0%	
A49 Winwick Rd/ Birch Ave	A49 SB to Birch Ave	6	11	5	83%	6	11	5	83%
	Birch Rd to A49 SB	55	88	33	60%	55	78	23	42%
A49 Winwick Road @ Poplars Avenue	A49 NB to Woburn Rd	15	16	1	7%	15	16	1	7%
	A49 NB	1606	1598	-8	0%	1606	1603	-3	0%
	A49 SB	1850	1891	41	2%	1850	1852	2	0%
A49 Winwick Road/ A574 Cromwell Avenue/ Sandy Lane West	A49 SB to Sandy Ln West	254	286	32	13%	254	285	31	12%
	A49 SB	1268	1271	3	0%	1268	1243	-25	-2%
	A49 SB to Cromwell Ave	278	276	-2	-1%	278	273	-5	-2%
	Cromwell Ave to A49 NB	288	281	-7	-2%	288	281	-7	-2%
	Cromwell Ave to Sandy Ln West	447	437	-10	-2%	447	423	-24	-5%
	Cromwell Ave to A49 SB	506	504	-2	0%	506	513	7	1%
	Cromwell Ave to Cromwell Ave (U-turn)	47	43	-4	-9%	47	48	1	2%
	A49 NB	992	983	-9	-1%	992	981	-11	-1%
	A49 NB to Sandy Ln West	118	133	15	13%	118	134	16	14%
	A49 NB to Cromwell Ave	486	511	25	5%	486	520	34	7%
	Sandy Ln West to A49 NB	327	335	8	2%	327	344	17	5%
	Sandy Ln West to Sandy Ln (U-turn)	0	0	0	-	0	0	0	-
	Sandy Ln West to A49 SB	69	72	3	4%	69	73	4	6%
Sandy Ln West to Cromwell Ave	301	316	15	5%	301	321	20	7%	
A49 Winwick Road @ Junction NINE Retail Park	A49 NB	1505	1538	33	2%	1505	1541	36	2%
	A49 NB to Junction NINE Retail	5	8	3	60%	5	8	3	60%
	Junction NINE Retail to A49 SB	15	13	-2	-13%	15	13	-2	-13%
	Junction NINE Retail to A49 NB	98	100	2	2%	98	100	2	2%
	A49 SB	1710	1705	-5	0%	1710	1685	-25	-1%
	A49 SB to Junction NINE Retail	125	124	-1	-1%	125	122	-3	-2%
A49 Winwick Road/ Hawleys Lane/ A50 Long Lane	A49 SB to Hawleys Lane	194	186	-8	-4%	194	187	-7	-4%
	A49 SB to Long Lane	158	148	-10	-6%	158	147	-11	-7%
	A49 SB	1385	1365	-20	-1%	1385	1366	-19	-1%
	A49 NB to Hawleys Lane	115	115	0	0%	115	116	1	1%
	A49 NB to Long Lane	219	213	-6	-3%	219	213	-6	-3%
	A49 NB	967	965	-2	0%	967	969	2	0%
	Long Lane to A49 SB	477	492	15	3%	0	0	0	-
	Long Lane to Hawleys Lane	140	141	1	1%	140	141	1	1%
	Long Lane to A49 NB	292	315	23	8%	292	313	21	7%
	Hawleys Lane to Long Lane	62	62	0	0%	62	61	-1	-2%
	Hawleys Lane to A49 SB	78	75	-3	-4%	78	74	-4	-5%
Hawleys Lane to A49 NB	265	274	9	3%	265	272	7	3%	

AM 2032 VOLUME COMPARISON – 08:00-09:00 (PEAK PERIOD)

		08:00-09:00							
		2032							
Junction/ Movement		Vehicle Flow		Difference		Vehicle Flow		Difference	
Junction	Approach	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Newton Road/ A49 Winwick Link Road/ Winwick Park Avenue	A49 NB to Winwick Park Ave	8	9	1	13%	8	9	1	13%
	A49 NB	1027	1009	-18	-2%	1027	1037	10	1%
	A49 NB to Winwick Link Rd	617	608	-9	-1%	617	631	14	2%
	Winwick Park Ave to A49 NB	230	226	-4	-2%	230	197	-33	-14%
	Winwick Park Ave to Winwick Link Rd	58	63	5	9%	58	55	-3	-5%
	Winwick Park Ave to A49 SB	81	93	12	15%	81	78	-3	-4%
	A49 SB to Winwick Link Rd	99	106	7	7%	99	106	7	7%
	A49 SB	924	926	2	0%	924	919	-5	-1%
	A49 SB to Winwick Park Ave	23	23	0	0%	23	23	0	0%
	Winwick Link Rd to A49 SB	874	881	7	1%	874	847	-27	-3%
Winwick Link Rd to Winwick Park Ave	0	0	0	-	0	0	0	-	
Winwick Link Rd to A49 NB	109	108	-1	-1%	109	104	-5	-5%	
A49 Newton Road/ Delph Lane	A49 NB	1539	1524	-15	-1%	1539	1569	30	2%
	A49 NB to Delph Ln	279	258	-21	-8%	279	274	-5	-2%
	A49 SB	1802	1814	12	1%	1802	1766	-36	-2%
	A49 SB to Delph Ln	56	62	6	11%	56	56	0	0%
	Delph Ln to A49 NB	103	103	0	0%	103	104	1	1%
	Delph Ln to A49 SB	227	231	4	2%	227	231	4	2%
M62 Junction 9	A49 NB to M62 WB	443	412	-31	-7%	443	418	-25	-6%
	A49 NB	823	813	-10	-1%	823	831	8	1%
	A49 NB to M62 EB	368	374	6	2%	368	377	9	2%
	A49 NB to A49 SB (U-Turn)	5	7	2	40%	5	7	2	40%
	M62 EB to A49 NB	735	741	6	1%	735	778	43	6%
	M62 EB Mainline	3270	3268	-2	0%	3270	3269	-1	0%
	M62 EB to A49 SB	370	389	19	5%	370	411	41	11%
	A49 SB to M62 EB	424	462	38	9%	424	450	26	6%
	A49 SB	649	659	10	2%	649	639	-10	-2%
	A49 SB to M62 WB	968	935	-33	-3%	968	919	-49	-5%
	M62 WB to A49 SB	838	868	30	4%	838	871	33	4%
M62 WB Mainline	3152	3155	3	0%	3152	3155	3	0%	
M62 WB to A49 NB	273	238	-35	-13%	273	240	-33	-12%	
A49 Winwick Rd/ Birch Ave	A49 SB to Birch Ave	7	10	3	43%	7	10	3	43%
	Birch Rd to A49 SB	50	47	-3	-6%	50	46	-4	-8%
A49 Winwick Road @ Poplars Avenue	A49 NB to Woburn Rd	16	13	-3	-19%	16	12	-4	-25%
	A49 NB	1643	1605	-38	-2%	1643	1634	-9	-1%
	A49 SB	1884	1942	58	3%	1884	1943	59	3%
A49 Winwick Road/ A574 Cromwell Avenue/ Sandy Lane West	A49 SB to Sandy Ln West	297	301	4	1%	297	298	1	0%
	A49 SB	1229	1246	17	1%	1229	1246	17	1%
	A49 SB to Cromwell Ave	309	341	32	10%	309	351	42	14%
	Cromwell Ave to A49 NB	285	264	-21	-7%	285	268	-17	-6%
	Cromwell Ave to Sandy Ln West	417	413	-4	-1%	417	411	-6	-1%
	Cromwell Ave to A49 SB	486	448	-38	-8%	486	464	-22	-5%
	Cromwell Ave to Cromwell Ave (U-turn)	44	41	-3	-7%	44	42	-2	-5%
	A49 NB	1032	1032	0	0%	1032	1036	4	0%
	A49 NB to Sandy Ln West	141	162	21	15%	141	164	23	16%
	A49 NB to Cromwell Ave	534	530	-4	-1%	534	541	7	1%
	Sandy Ln West to A49 NB	342	299	-43	-13%	342	325	-17	-5%
	Sandy Ln West to Sandy Ln (U-turn)	0	0	0	-	0	0	0	-
	Sandy Ln West to A49 SB	61	72	11	18%	61	75	14	23%
Sandy Ln West to Cromwell Ave	292	325	33	11%	292	342	50	17%	
A49 Winwick Road @ Junction NINE Retail Park	A49 NB	1610	1627	17	1%	1610	1644	34	2%
	A49 NB to Junction NINE Retail	4	9	5	125%	4	10	6	150%
	Junction NINE Retail to A49 SB	13	12	-1	-8%	13	12	-1	-8%
	Junction NINE Retail to A49 NB	107	109	2	2%	107	109	2	2%
	A49 SB	1650	1638	-12	-1%	1650	1639	-11	-1%
A49 SB to Junction NINE Retail	119	118	-1	-1%	119	119	0	0%	
A49 Winwick Road/ Hawleys Lane/ A50 Long Lane	A49 SB to Hawleys Lane	192	190	-2	-1%	192	197	5	3%
	A49 SB to Long Lane	127	115	-12	-9%	127	115	-12	-9%
	A49 SB	1355	1339	-16	-1%	1355	1337	-18	-1%
	A49 NB to Hawleys Lane	129	129	0	0%	129	130	1	1%
	A49 NB to Long Lane	216	218	2	1%	216	218	2	1%
	A49 NB	1036	1044	8	1%	1036	1052	16	2%
	Long Lane to A49 SB	486	500	14	3%	0	0	0	-
	Long Lane to Hawleys Lane	137	128	-9	-7%	137	127	-10	-7%
	Long Lane to A49 NB	300	301	1	0%	300	294	-6	-2%
	Hawleys Lane to Long Lane	47	49	2	4%	47	48	1	2%
	Hawleys Lane to A49 SB	78	74	-4	-5%	78	74	-4	-5%
Hawleys Lane to A49 NB	300	313	13	4%	300	314	14	5%	

AM 2022 VOLUME COMPARISON – 09:00-09:30 (COOL-DOWN PERIOD)

		09:00-09:30							
		2022							
Junction/ Movement		Vehicle Flow		Difference		Vehicle Flow		Difference	
Junction	Approach	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Newton Road/ A49 Winwick Link Road/ Winwick Park Avenue	A49 NB to Winwick Park Ave	5	4	-1	-20%	5	4	-1	-20%
	A49 NB	400	412	12	3%	400	410	10	3%
	A49 NB to Winwick Link Rd	282	287	5	2%	282	287	5	2%
	Winwick Park Ave to A49 NB	84	85	1	1%	84	83	-1	-1%
	Winwick Park Ave to Winwick Link Rd	31	30	-1	-3%	31	29	-2	-6%
	Winwick Park Ave to A49 SB	43	48	5	12%	43	46	3	7%
	A49 SB to Winwick Link Rd	35	37	2	6%	35	37	2	6%
	A49 SB	328	363	35	11%	328	366	38	12%
	A49 SB to Winwick Park Ave	13	14	1	8%	13	14	1	8%
	Winwick Link Rd to A49 SB	478	500	22	5%	478	501	23	5%
Winwick Link Rd to Winwick Park Ave	0	0	0	-	0	0	0	-	
Winwick Link Rd to A49 NB	34	36	2	6%	34	36	2	6%	
A49 Newton Road/ Delph Lane	A49 NB	655	672	17	3%	655	668	13	2%
	A49 NB to Delp Ln	91	107	16	18%	91	107	16	18%
	A49 SB	845	895	50	6%	845	901	56	7%
	A49 SB to Delph Ln	33	37	4	12%	33	35	2	6%
	Delph Ln to A49 NB	45	42	-3	-7%	45	42	-3	-7%
Delph Ln to A49 SB	100	110	10	10%	100	110	10	10%	
M62 Junction 9	A49 NB to M62 WB	191	199	8	4%	191	201	10	5%
	A49 NB	343	353	10	3%	343	351	8	2%
	A49 NB to M62 EB	160	164	4	3%	160	163	3	2%
	A49 NB to A49 SB (U-Turn)	3	4	1	33%	3	4	1	33%
	M62 EB to A49 NB	234	248	14	6%	234	249	15	6%
	M62 EB Mainline	1585	1587	2	0%	1585	1587	2	0%
	M62 EB to A49 SB	154	159	5	3%	154	159	5	3%
	A49 SB to M62 EB	154	178	24	16%	154	179	25	16%
	A49 SB	345	361	16	5%	345	361	16	5%
	A49 SB to M62 WB	444	464	20	5%	444	466	22	5%
	M62 WB to A49 SB	287	304	17	6%	287	293	6	2%
M62 WB Mainline	1580	1584	4	0%	1580	1584	4	0%	
M62 WB to A49 NB	154	164	10	6%	154	160	6	4%	
A49 Winwick Rd/ Birch Ave	A49 SB to Birch Ave	4	6	2	50%	4	5	1	25%
	Birch Rd to A49 SB	34	45	11	32%	34	45	11	32%
A49 Winwick Road @ Poplars Avenue	A49 NB to Woburn Rd	9	9	0	0%	9	9	0	0%
	A49 NB	690	700	10	1%	690	705	15	2%
	A49 SB	828	872	44	5%	828	858	30	4%
A49 Winwick Road/ A574 Cromwell Avenue/ Sandy Lane West	A49 SB to Sandy Ln West	72	84	12	17%	72	85	13	18%
	A49 SB	605	613	8	1%	605	600	-5	-1%
	A49 SB to Cromwell Ave	146	160	14	10%	146	154	8	5%
	Cromwell Ave to A49 NB	173	171	-2	-1%	173	176	3	2%
	Cromwell Ave to Sandy Ln West	182	182	0	0%	182	192	10	5%
	Cromwell Ave to A49 SB	254	268	14	6%	254	279	25	10%
	Cromwell Ave to Cromwell Ave (U-turn)	26	25	-1	-4%	26	26	0	0%
	A49 NB	400	388	-12	-3%	400	390	-10	-3%
	A49 NB to Sandy Ln West	22	23	1	5%	22	24	2	9%
	A49 NB to Cromwell Ave	226	231	5	2%	226	229	3	1%
	Sandy Ln West to A49 NB	120	142	22	18%	120	137	17	14%
	Sandy Ln West to Sandy Ln (U-turn)	0	0	0	-	0	0	0	-
Sandy Ln West to A49 SB	41	36	-5	-12%	41	35	-6	-15%	
Sandy Ln West to Cromwell Ave	117	146	29	25%	117	142	25	21%	
A49 Winwick Road @ Junction NINE Retail Park	A49 NB	588	583	-5	-1%	588	582	-6	-1%
	A49 NB to Junction NINE Retail	2	4	2	100%	2	4	2	100%
	Junction NINE Retail to A49 SB	7	9	2	29%	7	9	2	29%
	Junction NINE Retail to A49 NB	46	44	-2	-4%	46	44	-2	-4%
	A49 SB	840	849	9	1%	840	851	11	1%
A49 SB to Junction NINE Retail	61	61	0	0%	61	61	0	0%	
A49 Winwick Road/ Hawleys Lane/ A50 Long Lane	A49 SB to Hawleys Lane	80	81	1	1%	80	83	3	4%
	A49 SB to Long Lane	88	90	2	2%	88	91	3	3%
	A49 SB	678	671	-7	-1%	678	674	-4	-1%
	A49 NB to Hawleys Lane	29	31	2	7%	29	31	2	7%
	A49 NB to Long Lane	90	95	5	6%	90	96	6	7%
	A49 NB	332	330	-2	-1%	332	332	0	0%
	Long Lane to A49 SB	246	264	18	7%	0	0	0	-
	Long Lane to Hawleys Lane	89	62	-27	-30%	89	60	-29	-33%
	Long Lane to A49 NB	122	126	4	3%	122	126	4	3%
	Hawleys Lane to Long Lane	39	36	-3	-8%	39	37	-2	-5%
	Hawleys Lane to A49 SB	49	44	-5	-10%	49	43	-6	-12%
Hawleys Lane to A49 NB	121	115	-6	-5%	121	120	-1	-1%	

AM 2027 VOLUME COMPARISON – 09:00-09:30 (COOL-DOWN PERIOD)

		09:00-09:30							
		2027							
Junction/ Movement		Vehicle Flow		Difference		Vehicle Flow		Difference	
Junction	Approach	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Newton Road/ A49 Winwick Link Road/ Winwick Park Avenue	A49 NB to Winwick Park Ave	4	3	-1	-25%	4	3	-1	-25%
	A49 NB	446	460	14	3%	446	458	12	3%
	A49 NB to Winwick Link Rd	298	297	-1	0%	298	298	0	0%
	Winwick Park Ave to A49 NB	116	114	-2	-2%	116	107	-9	-8%
	Winwick Park Ave to Winwick Link Rd	33	32	-1	-3%	33	27	-6	-18%
	Winwick Park Ave to A49 SB	45	44	-1	-2%	45	44	-1	-2%
	A49 SB to Winwick Link Rd	48	48	0	0%	48	48	0	0%
	A49 SB	357	381	24	7%	357	371	14	4%
	A49 SB to Winwick Park Ave	13	14	1	8%	13	13	0	0%
	Winwick Link Rd to A49 SB	541	517	-24	-4%	541	503	-38	-7%
Winwick Link Rd to Winwick Park Ave	0	0	0	-	0	0	0	-	
Winwick Link Rd to A49 NB	64	62	-2	-3%	64	62	-2	-3%	
A49 Newton Road/ Delph Lane	A49 NB	715	725	10	1%	715	725	10	1%
	A49 NB to Delp Ln	129	134	5	4%	129	135	6	5%
	A49 SB	923	918	-5	-1%	923	893	-30	-3%
	A49 SB to Delph Ln	37	35	-2	-5%	37	36	-1	-3%
	Delph Ln to A49 NB	41	41	0	0%	41	42	1	2%
	Delph Ln to A49 SB	112	115	3	3%	112	115	3	3%
M62 Junction 9	A49 NB to M62 WB	206	209	3	1%	206	215	9	4%
	A49 NB	380	392	12	3%	380	393	13	3%
	A49 NB to M62 EB	179	175	-4	-2%	179	171	-8	-4%
	A49 NB to A49 SB (U-Turn)	3	5	2	67%	3	5	2	67%
	M62 EB to A49 NB	279	293	14	5%	279	291	12	4%
	M62 EB Mainline	1586	1586	0	0%	1586	1586	0	0%
	M62 EB to A49 SB	144	138	-6	-4%	144	134	-10	-7%
	A49 SB to M62 EB	170	185	15	9%	170	181	11	6%
	A49 SB	364	356	-8	-2%	364	343	-21	-6%
	A49 SB to M62 WB	493	482	-11	-2%	493	470	-23	-5%
	M62 WB to A49 SB	318	304	-14	-4%	318	303	-15	-5%
M62 WB Mainline	1577	1574	-3	0%	1577	1575	-2	0%	
M62 WB to A49 NB	169	164	-5	-3%	169	163	-6	-4%	
A49 Winwick Rd/ Birch Ave	A49 SB to Birch Ave	4	6	2	50%	4	6	2	50%
	Birch Rd to A49 SB	39	41	2	5%	39	41	2	5%
A49 Winwick Road @ Poplars Avenue	A49 NB to Woburn Rd	8	7	-1	-13%	8	8	0	0%
	A49 NB	743	761	18	2%	743	772	29	4%
	A49 SB	850	829	-21	-2%	850	810	-40	-5%
A49 Winwick Road/ A574 Cromwell Avenue/ Sandy Lane West	A49 SB to Sandy Ln West	94	101	7	7%	94	97	3	3%
	A49 SB	585	556	-29	-5%	585	532	-53	-9%
	A49 SB to Cromwell Ave	151	143	-8	-5%	151	141	-10	-7%
	Cromwell Ave to A49 NB	178	171	-7	-4%	178	184	6	3%
	Cromwell Ave to Sandy Ln West	193	193	0	0%	193	208	15	8%
	Cromwell Ave to A49 SB	263	264	1	0%	263	289	26	10%
	Cromwell Ave to Cromwell Ave (U-turn)	23	23	0	0%	23	23	0	0%
	A49 NB	421	422	1	0%	421	423	2	0%
	A49 NB to Sandy Ln West	28	31	3	11%	28	31	3	11%
	A49 NB to Cromwell Ave	240	251	11	5%	240	242	2	1%
	Sandy Ln West to A49 NB	136	159	23	17%	136	158	22	16%
	Sandy Ln West to Sandy Ln (U-turn)	0	0	0	-	0	0	0	-
Sandy Ln West to A49 SB	31	37	6	19%	31	38	7	23%	
Sandy Ln West to Cromwell Ave	128	153	25	20%	128	149	21	16%	
A49 Winwick Road @ Junction NINE Retail Park	A49 NB	627	629	2	0%	627	626	-1	0%
	A49 NB to Junction NINE Retail	3	4	1	33%	3	4	1	33%
	Junction NINE Retail to A49 SB	6	6	0	0%	6	6	0	0%
	Junction NINE Retail to A49 NB	51	53	2	4%	51	53	2	4%
	A49 SB	816	785	-31	-4%	816	796	-20	-2%
	A49 SB to Junction NINE Retail	58	59	1	2%	58	60	2	3%
A49 Winwick Road/ Hawleys Lane/ A50 Long Lane	A49 SB to Hawleys Lane	76	70	-6	-8%	76	71	-5	-7%
	A49 SB to Long Lane	74	74	0	0%	74	77	3	4%
	A49 SB	646	649	3	0%	646	654	8	1%
	A49 NB to Hawleys Lane	31	31	0	0%	31	31	0	0%
	A49 NB to Long Lane	93	104	11	12%	93	104	11	12%
	A49 NB	348	354	6	2%	348	356	8	2%
	Long Lane to A49 SB	262	267	5	2%	0	0	0	-
	Long Lane to Hawleys Lane	69	57	-12	-17%	69	56	-13	-19%
	Long Lane to A49 NB	125	126	1	1%	125	128	3	2%
	Hawleys Lane to Long Lane	32	29	-3	-9%	32	30	-2	-6%
	Hawleys Lane to A49 SB	48	44	-4	-8%	48	45	-3	-6%
Hawleys Lane to A49 NB	134	133	-1	-1%	134	133	-1	-1%	

AM 2032 VOLUME COMPARISON – 09:00-09:30 (COOL-DOWN PERIOD)

		09:00-09:30							
		2032							
Junction/ Movement		Vehicle Flow		Difference		Vehicle Flow		Difference	
Junction	Approach	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Newton Road/ A49 Winwick Link Road/ Winwick Park Avenue	A49 NB to Winwick Park Ave	3	3	0	0%	3	3	0	0%
	A49 NB	480	484	4	1%	480	460	-20	-4%
	A49 NB to Winwick Link Rd	326	330	4	1%	326	307	-19	-6%
	Winwick Park Ave to A49 NB	117	114	-3	-3%	117	101	-16	-14%
	Winwick Park Ave to Winwick Link Rd	31	32	1	3%	31	25	-6	-19%
	Winwick Park Ave to A49 SB	43	45	2	5%	43	46	3	7%
	A49 SB to Winwick Link Rd	50	56	6	12%	50	60	10	20%
	A49 SB	419	447	28	7%	419	447	28	7%
	A49 SB to Winwick Park Ave	14	16	2	14%	14	16	2	14%
	Winwick Link Rd to A49 SB	458	443	-15	-3%	458	432	-26	-6%
Winwick Link Rd to Winwick Park Ave	0	0	0	-	0	0	0	-	
Winwick Link Rd to A49 NB	53	49	-4	-8%	53	48	-5	-9%	
A49 Newton Road/ Delph Lane	A49 NB	767	774	7	1%	767	734	-33	-4%
	A49 NB to Delp Ln	139	146	7	5%	139	127	-12	-9%
	A49 SB	898	916	18	2%	898	909	11	1%
	A49 SB to Delph Ln	31	31	0	0%	31	32	1	3%
	Delph Ln to A49 NB	43	43	0	0%	43	43	0	0%
M62 Junction 9	Delph Ln to A49 SB	113	117	4	4%	113	117	4	4%
	A49 NB to M62 WB	231	210	-21	-9%	231	214	-17	-7%
	A49 NB	413	411	-2	0%	413	411	-2	0%
	A49 NB to M62 EB	184	179	-5	-3%	184	179	-5	-3%
	A49 NB to A49 SB (U-Turn)	3	4	1	33%	3	4	1	33%
	M62 EB to A49 NB	321	362	41	13%	321	304	-17	-5%
	M62 EB Mainline	1591	1591	0	0%	1591	1590	-1	0%
	M62 EB to A49 SB	166	199	33	20%	166	164	-2	-1%
	A49 SB to M62 EB	198	219	21	11%	198	219	21	11%
	A49 SB	327	335	8	2%	327	332	5	2%
	A49 SB to M62 WB	482	476	-6	-1%	482	471	-11	-2%
	M62 WB to A49 SB	355	368	13	4%	355	364	9	3%
M62 WB Mainline	1579	1573	-6	0%	1579	1572	-7	0%	
M62 WB to A49 NB	157	135	-22	-14%	157	133	-24	-15%	
A49 Winwick Rd/ Birch Ave	A49 SB to Birch Ave	4	5	1	25%	4	6	2	50%
	Birch Rd to A49 SB	32	44	12	38%	32	37	5	16%
A49 Winwick Road @ Poplars Avenue	A49 NB to Woburn Rd	8	7	-1	-13%	8	6	-2	-25%
	A49 NB	833	801	-32	-4%	833	796	-37	-4%
	A49 SB	883	954	71	8%	883	901	18	2%
A49 Winwick Road/ A574 Cromwell Avenue/ Sandy Lane West	A49 SB to Sandy Ln West	112	127	15	13%	112	122	10	9%
	A49 SB	581	607	26	4%	581	575	-6	-1%
	A49 SB to Cromwell Ave	181	215	34	19%	181	198	17	9%
	Cromwell Ave to A49 NB	195	186	-9	-5%	195	183	-12	-6%
	Cromwell Ave to Sandy Ln West	225	226	1	0%	225	221	-4	-2%
	Cromwell Ave to A49 SB	266	254	-12	-5%	266	256	-10	-4%
	Cromwell Ave to Cromwell Ave (U-turn)	19	18	-1	-5%	19	18	-1	-5%
	A49 NB	458	451	-7	-2%	458	447	-11	-2%
	A49 NB to Sandy Ln West	33	35	2	6%	33	34	1	3%
	A49 NB to Cromwell Ave	273	290	17	6%	273	272	-1	0%
	Sandy Ln West to A49 NB	170	154	-16	-9%	170	158	-12	-7%
	Sandy Ln West to Sandy Ln (U-turn)	0	0	0	-	0	0	0	-
Sandy Ln West to A49 SB	35	38	3	9%	35	40	5	14%	
Sandy Ln West to Cromwell Ave	136	151	15	11%	136	159	23	17%	
A49 Winwick Road @ Junction NINE Retail Park	A49 NB	695	698	3	0%	695	672	-23	-3%
	A49 NB to Junction NINE Retail	2	6	4	200%	2	5	3	150%
	Junction NINE Retail to A49 SB	5	6	1	20%	5	6	1	20%
	Junction NINE Retail to A49 NB	58	58	0	0%	58	58	0	0%
	A49 SB	807	814	7	1%	807	804	-3	0%
A49 SB to Junction NINE Retail	69	72	3	4%	69	69	0	0%	
A49 Winwick Road/ Hawleys Lane/ A50 Long Lane	A49 SB to Hawleys Lane	85	86	1	1%	85	80	-5	-6%
	A49 SB to Long Lane	64	62	-2	-3%	64	62	-2	-3%
	A49 SB	641	661	20	3%	641	654	13	2%
	A49 NB to Hawleys Lane	32	30	-2	-6%	32	30	-2	-6%
	A49 NB to Long Lane	94	106	12	13%	94	107	13	14%
	A49 NB	384	384	0	0%	384	379	-5	-1%
	Long Lane to A49 SB	274	266	-8	-3%	0	0	0	-
	Long Lane to Hawleys Lane	53	51	-2	-4%	53	47	-6	-11%
	Long Lane to A49 NB	130	126	-4	-3%	130	121	-9	-7%
	Hawleys Lane to Long Lane	24	26	2	8%	24	26	2	8%
Hawleys Lane to A49 SB	46	40	-6	-13%	46	39	-7	-15%	
Hawleys Lane to A49 NB	153	159	6	4%	153	159	6	4%	

PM 2022 VOLUME COMPARISON – 16:00-17:00 (WARM-UP PERIOD)

		16:00-17:00							
		2022							
Junction/ Movement		Vehicle Flow		Difference		Vehicle Flow		Difference	
Junction	Approach	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Newton Road/ A49 Winwick Link Road/ Winwick Park Avenue	A49 NB to Winwick Park Ave	92	94	2	2%	92	94	2	2%
	A49 NB	1044	1024	-20	-2%	1044	1047	3	0%
	A49 NB to Winwick Link Rd	698	683	-15	-2%	698	689	-9	-1%
	Winwick Park Ave to A49 NB	71	102	31	44%	71	102	31	44%
	Winwick Park Ave to Winwick Link Rd	4	5	1	25%	4	5	1	25%
	Winwick Park Ave to A49 SB	63	114	51	81%	63	114	51	81%
	A49 SB to Winwick Link Rd	50	74	24	48%	50	74	24	48%
	A49 SB	606	594	-12	-2%	606	593	-13	-2%
	A49 SB to Winwick Park Ave	45	47	2	4%	45	47	2	4%
	Winwick Link Rd to A49 SB	747	717	-30	-4%	747	717	-30	-4%
Winwick Link Rd to Winwick Park Ave	1	0	-1	-100%	1	0	-1	-100%	
Winwick Link Rd to A49 NB	143	145	2	1%	143	145	2	1%	
A49 Newton Road/ Delph Lane	A49 NB	1645	1600	-45	-3%	1645	1638	-7	0%
	A49 NB to Delp Ln	207	215	8	4%	207	224	17	8%
	A49 SB	1286	1294	8	1%	1286	1294	8	1%
	A49 SB to Delph Ln	118	116	-2	-2%	118	117	-1	-1%
	Delph Ln to A49 NB	226	233	7	3%	226	233	7	3%
	Delph Ln to A49 SB	194	187	-7	-4%	194	187	-7	-4%
M62 Junction 9	A49 NB to M62 WB	455	465	10	2%	455	470	15	3%
	A49 NB	979	965	-14	-1%	979	982	3	0%
	A49 NB to M62 EB	390	389	-1	0%	390	392	2	1%
	A49 NB to A49 SB (U-Turn)	4	45	41	1025%	4	46	42	1050%
	M62 EB to A49 NB	640	620	-20	-3%	640	647	7	1%
	M62 EB Mainline	4523	4518	-5	0%	4523	4518	-5	0%
	M62 EB to A49 SB	255	325	70	27%	255	341	86	34%
	A49 SB to M62 EB	197	184	-13	-7%	197	184	-13	-7%
	A49 SB	493	525	32	6%	493	524	31	6%
	A49 SB to M62 WB	743	725	-18	-2%	743	725	-18	-2%
	M62 WB to A49 SB	431	474	43	10%	431	474	43	10%
M62 WB Mainline	4622	4636	14	0%	4622	4636	14	0%	
M62 WB to A49 NB	248	243	-5	-2%	248	243	-5	-2%	
A49 Winwick Rd/ Birch Ave	A49 SB to Birch Ave	7	49	42	600%	7	49	42	600%
	Birch Rd to A49 SB	16	22	6	38%	16	22	6	38%
A49 Winwick Road @ Poplars Avenue	A49 NB to Woburn Rd	10	11	1	10%	10	11	1	10%
	A49 NB	1864	1906	42	2%	1864	1931	67	4%
	A49 SB	1188	1338	150	13%	1188	1353	165	14%
A49 Winwick Road/ A574 Cromwell Avenue/ Sandy Lane West	A49 SB to Sandy Ln West	217	315	98	45%	217	322	105	48%
	A49 SB	641	682	41	6%	641	691	50	8%
	A49 SB to Cromwell Ave	285	286	1	0%	285	292	7	2%
	Cromwell Ave to A49 NB	272	290	18	7%	272	291	19	7%
	Cromwell Ave to Sandy Ln West	319	334	15	5%	319	333	14	4%
	Cromwell Ave to A49 SB	466	448	-18	-4%	466	447	-19	-4%
	Cromwell Ave to Cromwell Ave (U-turn)	75	68	-7	-9%	75	68	-7	-9%
	A49 NB	1438	1451	13	1%	1438	1447	9	1%
	A49 NB to Sandy Ln West	94	50	-44	-47%	94	48	-46	-49%
	A49 NB to Cromwell Ave	659	656	-3	0%	659	645	-14	-2%
	Sandy Ln West to A49 NB	191	198	7	4%	191	225	34	18%
	Sandy Ln West to Sandy Ln (U-turn)	0	0	0	-	0	0	0	-
	Sandy Ln West to A49 SB	123	126	3	2%	123	145	22	18%
Sandy Ln West to Cromwell Ave	249	253	4	2%	249	291	42	17%	
A49 Winwick Road @ Junction NINE Retail Park	A49 NB	1935	1909	-26	-1%	1935	1898	-37	-2%
	A49 NB to Junction NINE Retail	140	139	-1	-1%	140	137	-3	-2%
	Junction NINE Retail to A49 SB	103	74	-29	-28%	103	74	-29	-28%
	Junction NINE Retail to A49 NB	288	282	-6	-2%	288	282	-6	-2%
	A49 SB	1098	1125	27	2%	1098	1147	49	4%
	A49 SB to Junction NINE Retail	118	117	-1	-1%	118	120	2	2%
A49 Winwick Road/ Hawleys Lane/ A50 Long Lane	A49 SB to Hawleys Lane	175	181	6	3%	175	187	12	7%
	A49 SB to Long Lane	295	266	-29	-10%	295	270	-25	-8%
	A49 SB	706	725	19	3%	706	731	25	4%
	A49 NB to Hawleys Lane	54	55	1	2%	54	56	2	4%
	A49 NB to Long Lane	184	187	3	2%	184	189	5	3%
	A49 NB	1407	1413	6	0%	1407	1428	21	1%
	Long Lane to A49 SB	288	340	52	18%	0	0	0	-
	Long Lane to Hawleys Lane	173	171	-2	-1%	173	167	-6	-3%
	Long Lane to A49 NB	317	308	-9	-3%	317	302	-15	-5%
	Hawleys Lane to Long Lane	116	108	-8	-7%	116	102	-14	-12%
	Hawleys Lane to A49 SB	86	84	-2	-2%	86	79	-7	-8%
	Hawleys Lane to A49 NB	384	354	-30	-8%	384	333	-51	-13%

PM 2027 VOLUME COMPARISON – 16:00-17:00 (WARM-UP PERIOD)

		16:00-17:00							
		2027							
Junction/ Movement		Vehicle Flow		Difference		Vehicle Flow		Difference	
Junction	Approach	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Newton Road/ A49 Winwick Link Road/ Winwick Park Avenue	A49 NB to Winwick Park Ave	88	90	2	2%	88	93	5	6%
	A49 NB	1102	1124	22	2%	1102	1145	43	4%
	A49 NB to Winwick Link Rd	711	732	21	3%	711	721	10	1%
	Winwick Park Ave to A49 NB	71	106	35	49%	71	71	0	0%
	Winwick Park Ave to Winwick Link Rd	4	5	1	25%	4	4	0	0%
	Winwick Park Ave to A49 SB	63	126	63	100%	63	63	0	0%
	A49 SB to Winwick Link Rd	190	173	-17	-9%	190	191	1	1%
	A49 SB	670	702	32	5%	670	680	10	1%
	A49 SB to Winwick Park Ave	57	58	1	2%	57	58	1	2%
	Winwick Link Rd to A49 SB	787	801	14	2%	787	777	-10	-1%
Winwick Link Rd to Winwick Park Ave	0	0	0	-	0	0	0	-	
Winwick Link Rd to A49 NB	179	173	-6	-3%	179	174	-5	-3%	
A49 Newton Road/ Delph Lane	A49 NB	1690	1720	30	2%	1690	1745	55	3%
	A49 NB to Delp Ln	229	266	37	16%	229	237	8	3%
	A49 SB	1377	1482	105	8%	1377	1382	5	0%
	A49 SB to Delph Ln	126	127	1	1%	126	128	2	2%
	Delph Ln to A49 NB	260	277	17	7%	260	260	0	0%
	Delph Ln to A49 SB	212	215	3	1%	212	207	-5	-2%
M62 Junction 9	A49 NB to M62 WB	475	482	7	1%	475	471	-4	-1%
	A49 NB	974	1030	56	6%	974	1012	38	4%
	A49 NB to M62 EB	404	393	-11	-3%	404	393	-11	-3%
	A49 NB to A49 SB (U-Turn)	3	45	42	1400%	3	41	38	1267%
	M62 EB to A49 NB	680	693	13	2%	680	697	17	3%
	M62 EB Mainline	4518	4523	5	0%	4518	4514	-4	0%
	M62 EB to A49 SB	265	392	127	48%	265	288	23	9%
	A49 SB to M62 EB	205	203	-2	-1%	205	205	0	0%
	A49 SB	503	577	74	15%	503	501	-2	0%
	A49 SB to M62 WB	828	861	33	4%	828	832	4	0%
	M62 WB to A49 SB	452	511	59	13%	452	465	13	3%
M62 WB Mainline	4630	4639	9	0%	4630	4620	-10	0%	
M62 WB to A49 NB	277	277	0	0%	277	284	7	3%	
A49 Winwick Rd/ Birch Ave	A49 SB to Birch Ave	6	48	42	700%	6	44	38	633%
	Birch Rd to A49 SB	16	22	6	38%	16	22	6	38%
A49 Winwick Road @ Poplars Avenue	A49 NB to Woburn Rd	10	11	1	10%	10	11	1	10%
	A49 NB	1898	1996	98	5%	1898	1964	66	3%
	A49 SB	1229	1493	264	21%	1229	1268	39	3%
A49 Winwick Road/ A574 Cromwell Avenue/ Sandy Lane West	A49 SB to Sandy Ln West	241	380	139	58%	241	247	6	2%
	A49 SB	653	723	70	11%	653	668	15	2%
	A49 SB to Cromwell Ave	287	316	29	10%	287	295	8	3%
	Cromwell Ave to A49 NB	252	272	20	8%	252	264	12	5%
	Cromwell Ave to Sandy Ln West	353	399	46	13%	353	348	-5	-1%
	Cromwell Ave to A49 SB	472	476	4	1%	472	477	5	1%
	Cromwell Ave to Cromwell Ave (U-turn)	80	79	-1	-1%	80	80	0	0%
	A49 NB	1458	1505	47	3%	1458	1462	4	0%
	A49 NB to Sandy Ln West	182	63	-119	-65%	182	59	-123	-68%
	A49 NB to Cromwell Ave	686	693	7	1%	686	656	-30	-4%
	Sandy Ln West to A49 NB	226	255	29	13%	226	265	39	17%
	Sandy Ln West to Sandy Ln (U-turn)	0	0	0	-	0	0	0	-
	Sandy Ln West to A49 SB	114	112	-2	-2%	114	110	-4	-4%
Sandy Ln West to Cromwell Ave	272	296	24	9%	272	296	24	9%	
A49 Winwick Road @ Junction NINE Retail Park	A49 NB	1978	1926	-52	-3%	1978	1907	-71	-4%
	A49 NB to Junction NINE Retail	143	148	5	3%	143	155	12	8%
	Junction NINE Retail to A49 SB	84	102	18	21%	84	101	17	20%
	Junction NINE Retail to A49 NB	384	376	-8	-2%	384	305	-79	-21%
	A49 SB	1100	1168	68	6%	1100	1114	14	1%
	A49 SB to Junction NINE Retail	123	127	4	3%	123	127	4	3%
A49 Winwick Road/ Hawleys Lane/ A50 Long Lane	A49 SB to Hawleys Lane	169	179	10	6%	169	174	5	3%
	A49 SB to Long Lane	268	273	5	2%	268	298	30	11%
	A49 SB	723	785	62	9%	723	709	-14	-2%
	A49 NB to Hawleys Lane	56	58	2	4%	56	57	1	2%
	A49 NB to Long Lane	189	199	10	5%	189	194	5	3%
	A49 NB	1412	1413	1	0%	1412	1434	22	2%
	Long Lane to A49 SB	316	368	52	16%	0	0	0	-
	Long Lane to Hawleys Lane	174	163	-11	-6%	174	162	-12	-7%
	Long Lane to A49 NB	312	298	-14	-4%	312	312	0	0%
	Hawleys Lane to Long Lane	112	108	-4	-4%	112	102	-10	-9%
	Hawleys Lane to A49 SB	84	81	-3	-4%	84	79	-5	-6%
Hawleys Lane to A49 NB	428	399	-29	-7%	428	346	-82	-19%	

PM 2032 VOLUME COMPARISON – 16:00-17:00 (WARM-UP PERIOD)

		16:00-17:00							
		2032							
Junction/ Movement		Vehicle Flow		Difference		Vehicle Flow		Difference	
Junction	Approach	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Newton Road/ A49 Winwick Link Road/ Winwick Park Avenue	A49 NB to Winwick Park Ave	86	92	6	7%	86	93	7	8%
	A49 NB	1129	1121	-8	-1%	1129	1150	21	2%
	A49 NB to Winwick Link Rd	742	708	-34	-5%	742	751	9	1%
	Winwick Park Ave to A49 NB	95	71	-24	-25%	95	87	-8	-8%
	Winwick Park Ave to Winwick Link Rd	4	4	0	0%	4	4	0	0%
	Winwick Park Ave to A49 SB	61	64	3	5%	61	107	46	75%
	A49 SB to Winwick Link Rd	190	191	1	1%	190	170	-20	-11%
	A49 SB	707	684	-23	-3%	707	703	-4	-1%
	A49 SB to Winwick Park Ave	63	58	-5	-8%	63	59	-4	-6%
	Winwick Link Rd to A49 SB	827	775	-52	-6%	827	801	-26	-3%
Winwick Link Rd to Winwick Park Ave	0	0	0	-	0	0	0	-	
Winwick Link Rd to A49 NB	176	177	1	1%	176	175	-1	-1%	
A49 Newton Road/ Delph Lane	A49 NB	1726	1705	-21	-1%	1726	1747	21	1%
	A49 NB to Delp Ln	263	232	-31	-12%	263	267	4	2%
	A49 SB	1452	1379	-73	-5%	1452	1446	-6	0%
	A49 SB to Delph Ln	128	127	-1	-1%	128	128	0	0%
	Delph Ln to A49 NB	281	260	-21	-7%	281	285	4	1%
	Delph Ln to A49 SB	222	207	-15	-7%	222	214	-8	-4%
M62 Junction 9	A49 NB to M62 WB	482	471	-11	-2%	482	480	-2	0%
	A49 NB	990	999	9	1%	990	1054	64	6%
	A49 NB to M62 EB	399	397	-2	-1%	399	401	2	1%
	A49 NB to A49 SB (U-Turn)	3	41	38	1267%	3	45	42	1400%
	M62 EB to A49 NB	729	673	-56	-8%	729	700	-29	-4%
	M62 EB Mainline	4530	4518	-12	0%	4530	4526	-4	0%
	M62 EB to A49 SB	298	278	-20	-7%	298	393	95	32%
	A49 SB to M62 EB	208	205	-3	-1%	208	202	-6	-3%
	A49 SB	526	500	-26	-5%	526	557	31	6%
	A49 SB to M62 WB	884	829	-55	-6%	884	857	-27	-3%
	M62 WB to A49 SB	476	458	-18	-4%	476	523	47	10%
M62 WB Mainline	4631	4632	1	0%	4631	4634	3	0%	
M62 WB to A49 NB	286	279	-7	-2%	286	289	3	1%	
A49 Winwick Rd/ Birch Ave	A49 SB to Birch Ave	6	44	38	633%	6	48	42	700%
	Birch Rd to A49 SB	16	22	6	38%	16	22	6	38%
A49 Winwick Road @ Poplars Avenue	A49 NB to Woburn Rd	11	11	0	0%	11	11	0	0%
	A49 NB	1920	1955	35	2%	1920	2027	107	6%
	A49 SB	1309	1251	-58	-4%	1309	1486	177	14%
A49 Winwick Road/ A574 Cromwell Avenue/ Sandy Lane West	A49 SB to Sandy Ln West	282	241	-41	-15%	282	393	111	39%
	A49 SB	679	661	-18	-3%	679	712	33	5%
	A49 SB to Cromwell Ave	301	296	-5	-2%	301	325	24	8%
	Cromwell Ave to A49 NB	257	263	6	2%	257	271	14	5%
	Cromwell Ave to Sandy Ln West	372	351	-21	-6%	372	395	23	6%
	Cromwell Ave to A49 SB	480	475	-5	-1%	480	475	-5	-1%
	Cromwell Ave to Cromwell Ave (U-turn)	80	79	-1	-1%	80	81	1	1%
	A49 NB	1451	1470	19	1%	1451	1528	77	5%
	A49 NB to Sandy Ln West	242	65	-177	-73%	242	60	-182	-75%
	A49 NB to Cromwell Ave	670	672	2	0%	670	686	16	2%
	Sandy Ln West to A49 NB	254	251	-3	-1%	254	260	6	2%
	Sandy Ln West to Sandy Ln (U-turn)	0	0	0	-	0	0	0	-
	Sandy Ln West to A49 SB	117	104	-13	-11%	117	111	-6	-5%
Sandy Ln West to Cromwell Ave	281	276	-5	-2%	281	303	22	8%	
A49 Winwick Road @ Junction NINE Retail Park	A49 NB	1942	1935	-7	0%	1942	1941	-1	0%
	A49 NB to Junction NINE Retail	126	155	29	23%	126	151	25	20%
	Junction NINE Retail to A49 SB	72	101	29	40%	72	101	29	40%
	Junction NINE Retail to A49 NB	462	305	-157	-34%	462	378	-84	-18%
	A49 SB	1129	1102	-27	-2%	1129	1152	23	2%
	A49 SB to Junction NINE Retail	129	124	-5	-4%	129	131	2	2%
A49 Winwick Road/ Hawleys Lane/ A50 Long Lane	A49 SB to Hawleys Lane	167	173	6	4%	167	176	9	5%
	A49 SB to Long Lane	236	295	59	25%	236	270	34	14%
	A49 SB	740	704	-36	-5%	740	762	22	3%
	A49 NB to Hawleys Lane	58	56	-2	-3%	58	60	2	3%
	A49 NB to Long Lane	199	190	-9	-5%	199	202	3	2%
	A49 NB	1423	1422	-1	0%	1423	1452	29	2%
	Long Lane to A49 SB	350	352	2	1%	0	0	0	-
	Long Lane to Hawleys Lane	169	164	-5	-3%	169	165	-4	-2%
	Long Lane to A49 NB	281	313	32	11%	281	305	24	9%
	Hawleys Lane to Long Lane	100	109	9	9%	100	99	-1	-1%
	Hawleys Lane to A49 SB	76	84	8	11%	76	78	2	3%
Hawleys Lane to A49 NB	405	386	-19	-5%	405	364	-41	-10%	

PM 2022 VOLUME COMPARISON – 17:00-18:00 (PEAK PERIOD)

		17:00-18:00							
		2022							
Junction/ Movement		Vehicle Flow		Difference		Vehicle Flow		Difference	
Junction	Approach	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Newton Road/ A49 Winwick Link Road/ Winwick Park Avenue	A49 NB to Winwick Park Ave	95	90	-5	-5%	95	93	-2	-2%
	A49 NB	1164	1104	-60	-5%	1164	1154	-10	-1%
	A49 NB to Winwick Link Rd	783	763	-20	-3%	783	785	2	0%
	Winwick Park Ave to A49 NB	89	109	20	22%	89	107	18	20%
	Winwick Park Ave to Winwick Link Rd	3	3	0	0%	3	3	0	0%
	Winwick Park Ave to A49 SB	87	137	50	57%	87	135	48	55%
	A49 SB to Winwick Link Rd	55	79	24	44%	55	79	24	44%
	A49 SB	709	698	-11	-2%	709	699	-10	-1%
	A49 SB to Winwick Park Ave	50	49	-1	-2%	50	50	0	0%
	Winwick Link Rd to A49 SB	741	706	-35	-5%	741	705	-36	-5%
Winwick Link Rd to Winwick Park Ave	0	0	0	-	0	0	0	-	
Winwick Link Rd to A49 NB	190	189	-1	-1%	190	189	-1	-1%	
A49 Newton Road/ Delph Lane	A49 NB	1795	1708	-87	-5%	1795	1777	-18	-1%
	A49 NB to Delp Ln	226	226	0	0%	226	250	24	11%
	A49 SB	1408	1415	7	0%	1408	1406	-2	0%
	A49 SB to Delph Ln	126	127	1	1%	126	127	1	1%
	Delph Ln to A49 NB	243	250	7	3%	243	250	7	3%
	Delph Ln to A49 SB	224	221	-3	-1%	224	221	-3	-1%
M62 Junction 9	A49 NB to M62 WB	469	467	-2	0%	469	479	10	2%
	A49 NB	1178	1147	-31	-3%	1178	1184	6	1%
	A49 NB to M62 EB	459	451	-8	-2%	459	457	-2	0%
	A49 NB to A49 SB (U-Turn)	3	52	49	1633%	3	53	50	1667%
	M62 EB to A49 NB	608	556	-52	-9%	608	615	7	1%
	M62 EB Mainline	3997	3995	-2	0%	3997	3997	0	0%
	M62 EB to A49 SB	331	372	41	12%	331	438	107	32%
	A49 SB to M62 EB	219	208	-11	-5%	219	207	-12	-5%
	A49 SB	572	601	29	5%	572	596	24	4%
	A49 SB to M62 WB	845	828	-17	-2%	845	825	-20	-2%
	M62 WB to A49 SB	529	586	57	11%	529	587	58	11%
M62 WB Mainline	4788	4790	2	0%	4788	4790	2	0%	
M62 WB to A49 NB	233	227	-6	-3%	233	227	-6	-3%	
A49 Winwick Rd/ Birch Ave	A49 SB to Birch Ave	4	55	51	1275%	4	56	52	1300%
	Birch Rd to A49 SB	13	18	5	38%	13	18	5	38%
A49 Winwick Road @ Poplars Avenue	A49 NB to Woburn Rd	16	15	-1	-6%	16	15	-1	-6%
	A49 NB	2118	2123	5	0%	2118	2175	57	3%
	A49 SB	1440	1570	130	9%	1440	1633	193	13%
A49 Winwick Road/ A574 Cromwell Avenue/ Sandy Lane West	A49 SB to Sandy Ln West	311	405	94	30%	311	452	141	45%
	A49 SB	801	821	20	2%	801	841	40	5%
	A49 SB to Cromwell Ave	311	301	-10	-3%	311	316	5	2%
	Cromwell Ave to A49 NB	316	341	25	8%	316	342	26	8%
	Cromwell Ave to Sandy Ln West	371	383	12	3%	371	385	14	4%
	Cromwell Ave to A49 SB	524	503	-21	-4%	524	505	-19	-4%
	Cromwell Ave to Cromwell Ave (U-turn)	87	84	-3	-3%	87	84	-3	-3%
	A49 NB	1591	1575	-16	-1%	1591	1594	3	0%
	A49 NB to Sandy Ln West	97	56	-41	-42%	97	55	-42	-43%
	A49 NB to Cromwell Ave	689	690	1	0%	689	673	-16	-2%
	Sandy Ln West to A49 NB	228	223	-5	-2%	228	254	26	11%
	Sandy Ln West to Sandy Ln (U-turn)	0	0	0	-	0	0	0	-
	Sandy Ln West to A49 SB	116	123	7	6%	116	134	18	16%
Sandy Ln West to Cromwell Ave	253	261	8	3%	253	296	43	17%	
A49 Winwick Road @ Junction NINE Retail Park	A49 NB	2095	2041	-54	-3%	2095	2036	-59	-3%
	A49 NB to Junction NINE Retail	154	154	0	0%	154	155	1	1%
	Junction NINE Retail to A49 SB	101	73	-28	-28%	101	73	-28	-28%
	Junction NINE Retail to A49 NB	283	274	-9	-3%	283	274	-9	-3%
	A49 SB	1274	1296	22	2%	1274	1322	48	4%
	A49 SB to Junction NINE Retail	141	147	6	4%	141	153	12	9%
A49 Winwick Road/ Hawleys Lane/ A50 Long Lane	A49 SB to Hawleys Lane	197	207	10	5%	197	210	13	7%
	A49 SB to Long Lane	314	286	-28	-9%	314	293	-21	-7%
	A49 SB	847	874	27	3%	847	889	42	5%
	A49 NB to Hawleys Lane	55	53	-2	-4%	55	55	0	0%
	A49 NB to Long Lane	172	178	6	3%	172	180	8	5%
	A49 NB	1518	1481	-37	-2%	1518	1506	-12	-1%
	Long Lane to A49 SB	312	372	60	19%	0	0	0	-
	Long Lane to Hawleys Lane	170	171	1	1%	170	170	0	0%
	Long Lane to A49 NB	340	336	-4	-1%	340	336	-4	-1%
	Hawleys Lane to Long Lane	116	116	0	0%	116	112	-4	-3%
	Hawleys Lane to A49 SB	78	79	1	1%	78	74	-4	-5%
Hawleys Lane to A49 NB	398	385	-13	-3%	398	347	-51	-13%	

PM 2027 VOLUME COMPARISON – 17:00-18:00 (PEAK PERIOD)

		17:00-18:00							
		2027							
Junction/ Movement		Vehicle Flow		Difference		Vehicle Flow		Difference	
Junction	Approach	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Newton Road/ A49 Winwick Link Road/ Winwick Park Avenue	A49 NB to Winwick Park Ave	92	90	-2	-2%	92	91	-1	-1%
	A49 NB	1224	1195	-29	-2%	1224	1250	26	2%
	A49 NB to Winwick Link Rd	811	771	-40	-5%	811	811	0	0%
	Winwick Park Ave to A49 NB	88	119	31	35%	88	88	0	0%
	Winwick Park Ave to Winwick Link Rd	3	3	0	0%	3	3	0	0%
	Winwick Park Ave to A49 SB	87	164	77	89%	87	87	0	0%
	A49 SB to Winwick Link Rd	195	176	-19	-10%	195	196	1	1%
	A49 SB	779	792	13	2%	779	795	16	2%
	A49 SB to Winwick Park Ave	62	59	-3	-5%	62	62	0	0%
	Winwick Link Rd to A49 SB	782	777	-5	-1%	782	771	-11	-1%
Winwick Link Rd to Winwick Park Ave	0	0	0	-	0	0	0	-	
Winwick Link Rd to A49 NB	226	218	-8	-4%	226	223	-3	-1%	
A49 Newton Road/ Delph Lane	A49 NB	1831	1763	-68	-4%	1831	1866	35	2%
	A49 NB to Delp Ln	246	257	11	4%	246	254	8	3%
	A49 SB	1506	1592	86	6%	1506	1522	16	1%
	A49 SB to Delph Ln	131	125	-6	-5%	131	128	-3	-2%
	Delph Ln to A49 NB	281	292	11	4%	281	283	2	1%
	Delph Ln to A49 SB	248	250	2	1%	248	240	-8	-3%
M62 Junction 9	A49 NB to M62 WB	485	490	5	1%	485	489	4	1%
	A49 NB	1185	1185	0	0%	1185	1201	16	1%
	A49 NB to M62 EB	478	441	-37	-8%	478	463	-15	-3%
	A49 NB to A49 SB (U-Turn)	4	50	46	1150%	4	49	45	1125%
	M62 EB to A49 NB	643	618	-25	-4%	643	668	25	4%
	M62 EB Mainline	3999	3990	-9	0%	3999	3992	-7	0%
	M62 EB to A49 SB	336	456	120	36%	336	366	30	9%
	A49 SB to M62 EB	233	240	7	3%	233	234	1	0%
	A49 SB	575	641	66	11%	575	573	-2	0%
	A49 SB to M62 WB	947	947	0	0%	947	958	11	1%
	M62 WB to A49 SB	557	546	-11	-2%	557	569	12	2%
M62 WB Mainline	4787	4820	33	1%	4787	4793	6	0%	
M62 WB to A49 NB	250	226	-24	-10%	250	254	4	2%	
A49 Winwick Rd/ Birch Ave	A49 SB to Birch Ave	6	52	46	767%	6	52	46	767%
	Birch Rd to A49 SB	13	18	5	38%	13	18	5	38%
A49 Winwick Road @ Poplars Avenue	A49 NB to Woburn Rd	12	13	1	8%	12	14	2	17%
	A49 NB	2159	2191	32	1%	2159	2200	41	2%
	A49 SB	1473	1646	173	12%	1473	1525	52	4%
A49 Winwick Road/ A574 Cromwell Avenue/ Sandy Lane West	A49 SB to Sandy Ln West	316	458	142	45%	316	330	14	4%
	A49 SB	808	818	10	1%	808	835	27	3%
	A49 SB to Cromwell Ave	311	317	6	2%	311	334	23	7%
	Cromwell Ave to A49 NB	302	329	27	9%	302	315	13	4%
	Cromwell Ave to Sandy Ln West	411	461	50	12%	411	406	-5	-1%
	Cromwell Ave to A49 SB	532	550	18	3%	532	535	3	1%
	Cromwell Ave to Cromwell Ave (U-turn)	96	95	-1	-1%	96	97	1	1%
	A49 NB	1608	1639	31	2%	1608	1608	0	0%
	A49 NB to Sandy Ln West	184	71	-113	-61%	184	76	-108	-59%
	A49 NB to Cromwell Ave	689	702	13	2%	689	677	-12	-2%
	Sandy Ln West to A49 NB	264	282	18	7%	264	296	32	12%
	Sandy Ln West to Sandy Ln (U-turn)	0	0	0	-	0	0	0	-
	Sandy Ln West to A49 SB	102	100	-2	-2%	102	98	-4	-4%
Sandy Ln West to Cromwell Ave	277	307	30	11%	277	304	27	10%	
A49 Winwick Road @ Junction NINE Retail Park	A49 NB	2102	2039	-63	-3%	2102	2060	-42	-2%
	A49 NB to Junction NINE Retail	147	153	6	4%	147	168	21	14%
	Junction NINE Retail to A49 SB	86	104	18	21%	86	101	15	17%
	Junction NINE Retail to A49 NB	378	367	-11	-3%	378	296	-82	-22%
	A49 SB	1259	1320	61	5%	1259	1306	47	4%
	A49 SB to Junction NINE Retail	142	147	5	4%	142	152	10	7%
A49 Winwick Road/ Hawleys Lane/ A50 Long Lane	A49 SB to Hawleys Lane	188	193	5	3%	188	205	17	9%
	A49 SB to Long Lane	280	303	23	8%	280	320	40	14%
	A49 SB	848	934	86	10%	848	881	33	4%
	A49 NB to Hawleys Lane	57	58	1	2%	57	57	0	0%
	A49 NB to Long Lane	176	182	6	3%	176	183	7	4%
	A49 NB	1530	1460	-70	-5%	1530	1509	-21	-1%
	Long Lane to A49 SB	338	406	68	20%	0	0	0	-
	Long Lane to Hawleys Lane	175	166	-9	-5%	175	163	-12	-7%
	Long Lane to A49 NB	327	323	-4	-1%	327	337	10	3%
	Hawleys Lane to Long Lane	112	111	-1	-1%	112	106	-6	-5%
	Hawleys Lane to A49 SB	77	81	4	5%	77	70	-7	-9%
Hawleys Lane to A49 NB	399	411	12	3%	399	383	-16	-4%	

PM 2032 VOLUME COMPARISON – 17:00-18:00 (PEAK PERIOD)

		17:00-18:00							
		2032							
Junction/ Movement		Vehicle Flow		Difference		Vehicle Flow		Difference	
Junction	Approach	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Newton Road/ A49 Winwick Link Road/ Winwick Park Avenue	A49 NB to Winwick Park Ave	86	91	5	6%	86	90	4	5%
	A49 NB	1252	1228	-24	-2%	1252	1268	16	1%
	A49 NB to Winwick Link Rd	815	793	-22	-3%	815	812	-3	0%
	Winwick Park Ave to A49 NB	118	87	-31	-26%	118	78	-40	-34%
	Winwick Park Ave to Winwick Link Rd	3	3	0	0%	3	4	1	33%
	Winwick Park Ave to A49 SB	87	88	1	1%	87	108	21	24%
	A49 SB to Winwick Link Rd	198	197	-1	-1%	198	179	-19	-10%
	A49 SB	829	791	-38	-5%	829	822	-7	-1%
	A49 SB to Winwick Park Ave	67	61	-6	-9%	67	61	-6	-9%
	Winwick Link Rd to A49 SB	826	767	-59	-7%	826	788	-38	-5%
Winwick Link Rd to Winwick Park Ave	0	0	0	-	0	0	0	-	
Winwick Link Rd to A49 NB	223	226	3	1%	223	219	-4	-2%	
A49 Newton Road/ Delph Lane	A49 NB	1851	1819	-32	-2%	1851	1878	27	1%
	A49 NB to Delp Ln	273	243	-30	-11%	273	280	7	3%
	A49 SB	1605	1508	-97	-6%	1605	1601	-4	0%
	A49 SB to Delph Ln	133	128	-5	-4%	133	126	-7	-5%
	Delph Ln to A49 NB	301	283	-18	-6%	301	294	-7	-2%
M62 Junction 9	Delph Ln to A49 SB	257	241	-16	-6%	257	249	-8	-3%
	A49 NB to M62 WB	496	482	-14	-3%	496	485	-11	-2%
	A49 NB	1176	1175	-1	0%	1176	1215	39	3%
	A49 NB to M62 EB	461	464	3	1%	461	464	3	1%
	A49 NB to A49 SB (U-Turn)	3	47	44	1467%	3	51	48	1600%
	M62 EB to A49 NB	690	633	-57	-8%	690	675	-15	-2%
	M62 EB Mainline	3991	3999	8	0%	3991	3988	-3	0%
	M62 EB to A49 SB	389	348	-41	-11%	389	504	115	30%
	A49 SB to M62 EB	252	230	-22	-9%	252	245	-7	-3%
	A49 SB	597	566	-31	-5%	597	608	11	2%
A49 SB to M62 WB	1017	952	-65	-6%	1017	979	-38	-4%	
M62 WB to A49 SB	580	561	-19	-3%	580	639	59	10%	
M62 WB Mainline	4811	4794	-17	0%	4811	4821	10	0%	
M62 WB to A49 NB	256	251	-5	-2%	256	253	-3	-1%	
A49 Winwick Rd/ Birch Ave	A49 SB to Birch Ave	5	49	44	880%	5	53	48	960%
	Birch Rd to A49 SB	13	18	5	38%	13	18	5	38%
A49 Winwick Road @ Poplars Avenue	A49 NB to Woburn Rd	14	13	-1	-7%	14	13	-1	-7%
	A49 NB	2144	2167	23	1%	2144	2222	78	4%
A49 SB	1562	1486	-76	-5%	1562	1757	195	12%	
A49 Winwick Road/ A574 Cromwell Avenue/ Sandy Lane West	A49 SB to Sandy Ln West	362	315	-47	-13%	362	511	149	41%
	A49 SB	801	816	15	2%	801	837	36	4%
	A49 SB to Cromwell Ave	321	323	2	1%	321	348	27	8%
	Cromwell Ave to A49 NB	290	316	26	9%	290	305	15	5%
	Cromwell Ave to Sandy Ln West	423	408	-15	-4%	423	457	34	8%
	Cromwell Ave to A49 SB	544	538	-6	-1%	544	536	-8	-1%
	Cromwell Ave to Cromwell Ave (U-turn)	87	96	9	10%	87	87	0	0%
	A49 NB	1572	1590	18	1%	1572	1655	83	5%
	A49 NB to Sandy Ln West	264	75	-189	-72%	264	71	-193	-73%
	A49 NB to Cromwell Ave	682	693	11	2%	682	716	34	5%
	Sandy Ln West to A49 NB	289	278	-11	-4%	289	289	0	0%
	Sandy Ln West to Sandy Ln (U-turn)	0	0	0	-	0	0	0	-
	Sandy Ln West to A49 SB	99	96	-3	-3%	99	102	3	3%
Sandy Ln West to Cromwell Ave	290	288	-2	-1%	290	308	18	6%	
A49 Winwick Road @ Junction NINE Retail Park	A49 NB	2036	2057	21	1%	2036	2064	28	1%
	A49 NB to Junction NINE Retail	131	170	39	30%	131	164	33	25%
	Junction NINE Retail to A49 SB	73	100	27	37%	73	105	32	44%
	Junction NINE Retail to A49 NB	479	297	-182	-38%	479	366	-113	-24%
	A49 SB	1266	1292	26	2%	1266	1307	41	3%
A49 SB to Junction NINE Retail	147	151	4	3%	147	155	8	5%	
A49 Winwick Road/ Hawleys Lane/ A50 Long Lane	A49 SB to Hawleys Lane	199	201	2	1%	199	204	5	3%
	A49 SB to Long Lane	260	323	63	24%	260	306	46	18%
	A49 SB	883	869	-14	-2%	883	913	30	3%
	A49 NB to Hawleys Lane	55	54	-1	-2%	55	57	2	4%
	A49 NB to Long Lane	172	181	9	5%	172	186	14	8%
	A49 NB	1440	1480	40	3%	1440	1512	72	5%
	Long Lane to A49 SB	359	395	36	10%	0	0	0	-
	Long Lane to Hawleys Lane	161	167	6	4%	161	169	8	5%
	Long Lane to A49 NB	304	340	36	12%	304	329	25	8%
	Hawleys Lane to Long Lane	104	116	12	12%	104	105	1	1%
	Hawleys Lane to A49 SB	74	76	2	3%	74	72	-2	-3%
Hawleys Lane to A49 NB	427	413	-14	-3%	427	388	-39	-9%	

PM 2022 VOLUME COMPARISON – 18:00-18:30 (COOL-DOWN PERIOD)

		18:00-18:30							
Junction/ Movement		Vehicle Flow		Difference		Vehicle Flow		Difference	
Junction	Approach	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Newton Road/ A49 Winwick Link Road/ Winwick Park Avenue	A49 NB to Winwick Park Ave	43	44	1	2%	43	43	0	0%
	A49 NB	526	492	-34	-6%	526	524	-2	0%
	A49 NB to Winwick Link Rd	391	377	-14	-4%	391	382	-9	-2%
	Winwick Park Ave to A49 NB	53	64	11	21%	53	62	9	17%
	Winwick Park Ave to Winwick Link Rd	2	2	0	0%	2	2	0	0%
	Winwick Park Ave to A49 SB	42	69	27	64%	42	67	25	60%
	A49 SB to Winwick Link Rd	25	35	10	40%	25	35	10	40%
	A49 SB	362	358	-4	-1%	362	358	-4	-1%
	A49 SB to Winwick Park Ave	26	26	0	0%	26	26	0	0%
	Winwick Link Rd to A49 SB	315	298	-17	-5%	315	299	-16	-5%
Winwick Link Rd to Winwick Park Ave	0	0	0	-	0	0	0	-	
Winwick Link Rd to A49 NB	59	63	4	7%	59	64	5	8%	
A49 Newton Road/ Delph Lane	A49 NB	858	802	-56	-7%	858	837	-21	-2%
	A49 NB to Delp Ln	116	114	-2	-2%	116	127	11	9%
	A49 SB	666	671	5	1%	666	674	8	1%
	A49 SB to Delph Ln	56	56	0	0%	56	56	0	0%
	Delph Ln to A49 NB	107	112	5	5%	107	111	4	4%
	Delph Ln to A49 SB	118	115	-3	-3%	118	114	-4	-3%
M62 Junction 9	A49 NB to M62 WB	217	226	9	4%	217	223	6	3%
	A49 NB	606	576	-30	-5%	606	588	-18	-3%
	A49 NB to M62 EB	249	248	-1	0%	249	243	-6	-2%
	A49 NB to A49 SB (U-Turn)	2	23	21	1050%	2	23	21	1050%
	M62 EB to A49 NB	273	247	-26	-10%	273	283	10	4%
	M62 EB Mainline	1758	1754	-4	0%	1758	1758	0	0%
	M62 EB to A49 SB	158	202	44	28%	158	209	51	32%
	A49 SB to M62 EB	82	76	-6	-7%	82	76	-6	-7%
	A49 SB	298	319	21	7%	298	320	22	7%
	A49 SB to M62 WB	399	388	-11	-3%	399	391	-8	-2%
	M62 WB to A49 SB	282	309	27	10%	282	311	29	10%
	M62 WB Mainline	2160	2160	0	0%	2160	2160	0	0%
M62 WB to A49 NB	97	95	-2	-2%	97	96	-1	-1%	
A49 Winwick Rd/ Birch Ave	A49 SB to Birch Ave	4	25	21	525%	4	25	21	525%
	Birch Rd to A49 SB	8	11	3	38%	8	11	3	38%
A49 Winwick Road @ Poplars Avenue	A49 NB to Woburn Rd	8	8	0	0%	8	7	-1	-13%
	A49 NB	1062	1063	1	0%	1062	1078	16	2%
	A49 SB	748	832	84	11%	748	852	104	14%
A49 Winwick Road/ A574 Cromwell Avenue/ Sandy Lane West	A49 SB to Sandy Ln West	141	207	66	47%	141	208	67	48%
	A49 SB	443	440	-3	-1%	443	469	26	6%
	A49 SB to Cromwell Ave	164	158	-6	-4%	164	166	2	1%
	Cromwell Ave to A49 NB	168	180	12	7%	168	184	16	10%
	Cromwell Ave to Sandy Ln West	172	185	13	8%	172	184	12	7%
	Cromwell Ave to A49 SB	229	225	-4	-2%	229	228	-1	0%
	Cromwell Ave to Cromwell Ave (U-turn)	45	41	-4	-9%	45	43	-2	-4%
	A49 NB	777	757	-20	-3%	777	745	-32	-4%
	A49 NB to Sandy Ln West	43	28	-15	-35%	43	27	-16	-37%
	A49 NB to Cromwell Ave	340	342	2	1%	340	336	-4	-1%
	Sandy Ln West to A49 NB	118	118	0	0%	118	140	22	19%
	Sandy Ln West to Sandy Ln (U-turn)	0	0	0	-	0	0	0	-
	Sandy Ln West to A49 SB	55	57	2	4%	55	65	10	18%
Sandy Ln West to Cromwell Ave	120	128	8	7%	120	155	35	29%	
A49 Winwick Road @ Junction NINE Retail Park	A49 NB	1057	1035	-22	-2%	1057	1022	-35	-3%
	A49 NB to Junction NINE Retail	52	53	1	2%	52	53	1	2%
	Junction NINE Retail to A49 SB	37	28	-9	-24%	37	27	-10	-27%
	Junction NINE Retail to A49 NB	109	105	-4	-4%	109	105	-4	-4%
	A49 SB	667	654	-13	-2%	667	687	20	3%
	A49 SB to Junction NINE Retail	73	73	0	0%	73	78	5	7%
A49 Winwick Road/ Hawleys Lane/ A50 Long Lane	A49 SB to Hawleys Lane	103	104	1	1%	103	108	5	5%
	A49 SB to Long Lane	159	142	-17	-11%	159	150	-9	-6%
	A49 SB	437	435	-2	0%	437	443	6	1%
	A49 NB to Hawleys Lane	31	30	-1	-3%	31	30	-1	-3%
	A49 NB to Long Lane	100	95	-5	-5%	100	96	-4	-4%
	A49 NB	764	721	-43	-6%	764	733	-31	-4%
	Long Lane to A49 SB	154	176	22	14%	0	0	0	-
	Long Lane to Hawleys Lane	88	91	3	3%	88	93	5	6%
	Long Lane to A49 NB	161	165	4	2%	161	164	3	2%
	Hawleys Lane to Long Lane	54	55	1	2%	54	48	-6	-11%
	Hawleys Lane to A49 SB	44	46	2	5%	44	43	-1	-2%
Hawleys Lane to A49 NB	179	184	5	3%	179	173	-6	-3%	

PM 2027 VOLUME COMPARISON – 18:00-18:30 (COOL-DOWN PERIOD)

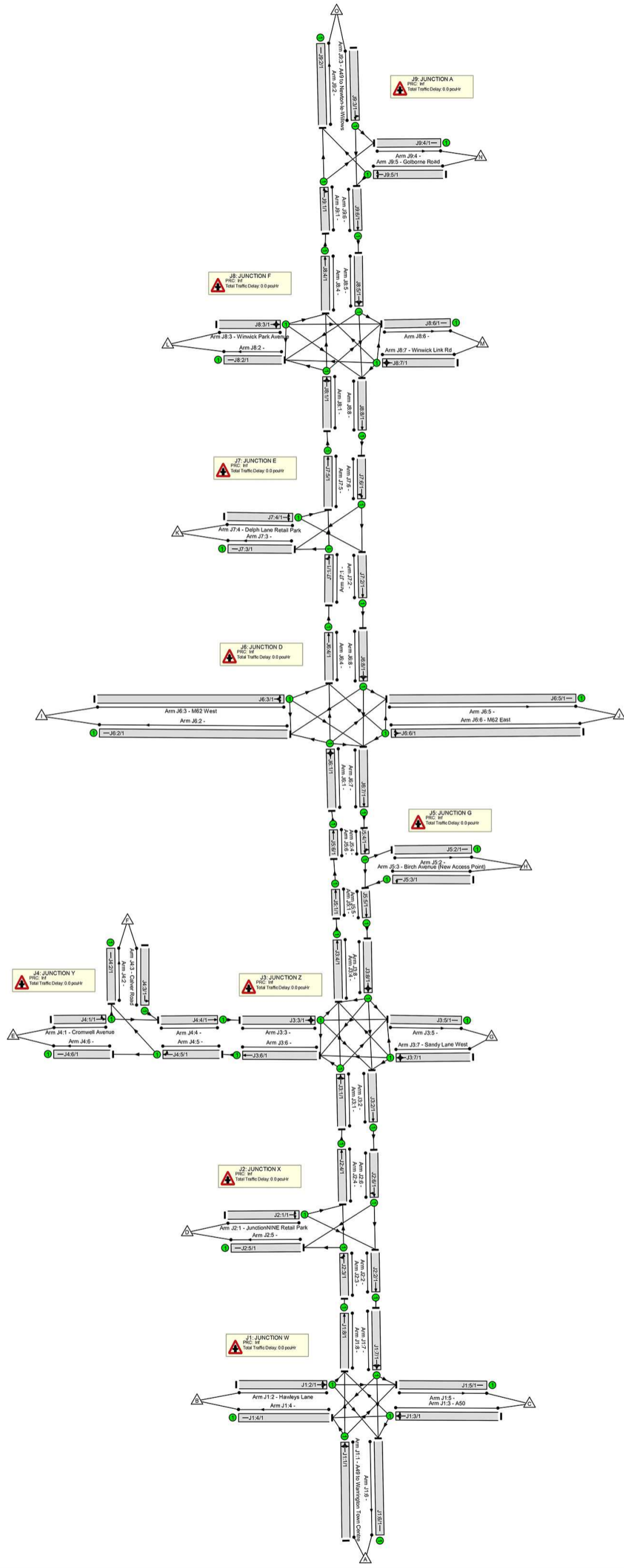
		18:00-18:30							
		2027							
Junction/ Movement		Vehicle Flow		Difference		Vehicle Flow		Difference	
Junction	Approach	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Newton Road/ A49 Winwick Link Road/ Winwick Park Avenue	A49 NB to Winwick Park Ave	44	32	-12	-27%	44	43	-1	-2%
	A49 NB	556	400	-156	-28%	556	572	16	3%
	A49 NB to Winwick Link Rd	394	269	-125	-32%	394	387	-7	-2%
	Winwick Park Ave to A49 NB	53	45	-8	-15%	53	53	0	0%
	Winwick Park Ave to Winwick Link Rd	2	1	-1	-50%	2	2	0	0%
	Winwick Park Ave to A49 SB	42	60	18	43%	42	43	1	2%
	A49 SB to Winwick Link Rd	77	56	-21	-27%	77	78	1	1%
	A49 SB	410	312	-98	-24%	410	417	7	2%
	A49 SB to Winwick Park Ave	34	25	-9	-26%	34	35	1	3%
	Winwick Link Rd to A49 SB	326	322	-4	-1%	326	319	-7	-2%
Winwick Link Rd to Winwick Park Ave	0	0	0	-	0	0	0	-	
Winwick Link Rd to A49 NB	82	65	-17	-21%	82	83	1	1%	
A49 Newton Road/ Delph Lane	A49 NB	879	621	-258	-29%	879	880	1	0%
	A49 NB to Delp Ln	129	104	-25	-19%	129	133	4	3%
	A49 SB	721	637	-84	-12%	721	720	-1	0%
	A49 SB to Delph Ln	64	51	-13	-20%	64	61	-3	-5%
	Delph Ln to A49 NB	123	105	-18	-15%	123	120	-3	-2%
	Delph Ln to A49 SB	131	114	-17	-13%	131	131	0	0%
M62 Junction 9	A49 NB to M62 WB	231	192	-39	-17%	231	230	-1	0%
	A49 NB	602	446	-156	-26%	602	606	4	1%
	A49 NB to M62 EB	253	189	-64	-25%	253	248	-5	-2%
	A49 NB to A49 SB (U-Turn)	3	19	16	533%	3	20	17	567%
	M62 EB to A49 NB	301	221	-80	-27%	301	300	-1	0%
	M62 EB Mainline	1758	1754	-4	0%	1758	1758	0	0%
	M62 EB to A49 SB	174	194	20	11%	174	174	0	0%
	A49 SB to M62 EB	87	72	-15	-17%	87	86	-1	-1%
	A49 SB	299	305	6	2%	299	299	0	0%
	A49 SB to M62 WB	462	383	-79	-17%	462	465	3	1%
	M62 WB to A49 SB	294	245	-49	-17%	294	304	10	3%
M62 WB Mainline	2160	2132	-28	-1%	2160	2153	-7	0%	
M62 WB to A49 NB	106	74	-32	-30%	106	108	2	2%	
A49 Winwick Rd/ Birch Ave	A49 SB to Birch Ave	5	20	15	300%	5	22	17	340%
	Birch Rd to A49 SB	8	11	3	38%	8	11	3	38%
A49 Winwick Road @ Poplars Avenue	A49 NB to Woburn Rd	7	6	-1	-14%	7	6	-1	-14%
	A49 NB	1079	849	-230	-21%	1079	1105	26	2%
	A49 SB	769	767	-2	0%	769	784	15	2%
A49 Winwick Road/ A574 Cromwell Avenue/ Sandy Lane West	A49 SB to Sandy Ln West	156	217	61	39%	156	146	-10	-6%
	A49 SB	442	431	-11	-2%	442	445	3	1%
	A49 SB to Cromwell Ave	169	150	-19	-11%	169	176	7	4%
	Cromwell Ave to A49 NB	162	157	-5	-3%	162	167	5	3%
	Cromwell Ave to Sandy Ln West	195	207	12	6%	195	193	-2	-1%
	Cromwell Ave to A49 SB	237	226	-11	-5%	237	238	1	0%
	Cromwell Ave to Cromwell Ave (U-turn)	48	45	-3	-6%	48	47	-1	-2%
	A49 NB	777	600	-177	-23%	777	766	-11	-1%
	A49 NB to Sandy Ln West	85	31	-54	-64%	85	37	-48	-56%
	A49 NB to Cromwell Ave	347	264	-83	-24%	347	333	-14	-4%
	Sandy Ln West to A49 NB	137	132	-5	-4%	137	162	25	18%
	Sandy Ln West to Sandy Ln (U-turn)	0	0	0	-	0	0	0	-
	Sandy Ln West to A49 SB	49	48	-1	-2%	49	50	1	2%
Sandy Ln West to Cromwell Ave	136	143	7	5%	136	149	13	10%	
A49 Winwick Road @ Junction NINE Retail Park	A49 NB	1071	795	-276	-26%	1071	1041	-30	-3%
	A49 NB to Junction NINE Retail	53	53	0	0%	53	60	7	13%
	Junction NINE Retail to A49 SB	31	32	1	3%	31	38	7	23%
	Junction NINE Retail to A49 NB	147	121	-26	-18%	147	114	-33	-22%
	A49 SB	672	640	-32	-5%	672	652	-20	-3%
	A49 SB to Junction NINE Retail	77	69	-8	-10%	77	79	2	3%
A49 Winwick Road/ Hawleys Lane/ A50 Long Lane	A49 SB to Hawleys Lane	101	85	-16	-16%	101	104	3	3%
	A49 SB to Long Lane	146	127	-19	-13%	146	148	2	1%
	A49 SB	462	444	-18	-4%	462	423	-39	-8%
	A49 NB to Hawleys Lane	31	27	-4	-13%	31	30	-1	-3%
	A49 NB to Long Lane	100	77	-23	-23%	100	96	-4	-4%
	A49 NB	750	556	-194	-26%	750	733	-17	-2%
	Long Lane to A49 SB	164	187	23	14%	0	0	0	-
	Long Lane to Hawleys Lane	92	80	-12	-13%	92	91	-1	-1%
	Long Lane to A49 NB	159	141	-18	-11%	159	166	7	4%
	Hawleys Lane to Long Lane	52	47	-5	-10%	52	50	-2	-4%
	Hawleys Lane to A49 SB	44	38	-6	-14%	44	43	-1	-2%
Hawleys Lane to A49 NB	204	167	-37	-18%	204	186	-18	-9%	

PM 2032 VOLUME COMPARISON – 18:00-18:30 (COOL-DOWN PERIOD)

		18:00-18:30							
		2032							
Junction/ Movement		Vehicle Flow		Difference		Vehicle Flow		Difference	
Junction	Approach	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Newton Road/ A49 Winwick Link Road/ Winwick Park Avenue	A49 NB to Winwick Park Ave	43	44	1	2%	43	42	-1	-2%
	A49 NB	569	553	-16	-3%	569	558	-11	-2%
	A49 NB to Winwick Link Rd	381	386	5	1%	381	379	-2	-1%
	Winwick Park Ave to A49 NB	69	53	-16	-23%	69	45	-24	-35%
	Winwick Park Ave to Winwick Link Rd	2	2	0	0%	2	1	-1	-50%
	Winwick Park Ave to A49 SB	41	43	2	5%	41	58	17	41%
	A49 SB to Winwick Link Rd	75	77	2	3%	75	68	-7	-9%
	A49 SB	418	421	3	1%	418	400	-18	-4%
	A49 SB to Winwick Park Ave	32	34	2	6%	32	33	1	3%
	Winwick Link Rd to A49 SB	336	323	-13	-4%	336	330	-6	-2%
Winwick Link Rd to Winwick Park Ave	0	0	0	-	0	0	0	-	
Winwick Link Rd to A49 NB	82	80	-2	-2%	82	81	-1	-1%	
A49 Newton Road/ Delph Lane	A49 NB	861	870	9	1%	861	835	-26	-3%
	A49 NB to Delp Ln	141	134	-7	-5%	141	141	0	0%
	A49 SB	725	725	0	0%	725	718	-7	-1%
	A49 SB to Delph Ln	67	64	-3	-4%	67	62	-5	-7%
	Delph Ln to A49 NB	133	122	-11	-8%	133	134	1	1%
	Delph Ln to A49 SB	136	129	-7	-5%	136	138	2	1%
M62 Junction 9	A49 NB to M62 WB	228	230	2	1%	228	215	-13	-6%
	A49 NB	588	595	7	1%	588	563	-25	-4%
	A49 NB to M62 EB	245	252	7	3%	245	239	-6	-2%
	A49 NB to A49 SB (U-Turn)	3	20	17	567%	3	23	20	667%
	M62 EB to A49 NB	309	301	-8	-3%	309	304	-5	-2%
	M62 EB Mainline	1761	1758	-3	0%	1761	1760	-1	0%
	M62 EB to A49 SB	179	184	5	3%	179	242	63	35%
	A49 SB to M62 EB	86	88	2	2%	86	87	1	1%
	A49 SB	307	302	-5	-2%	307	312	5	2%
	A49 SB to M62 WB	461	465	4	1%	461	463	2	0%
	M62 WB to A49 SB	293	307	14	5%	293	344	51	17%
	M62 WB Mainline	2146	2154	8	0%	2146	2161	15	1%
M62 WB to A49 NB	108	108	0	0%	108	113	5	5%	
A49 Winwick Rd/ Birch Ave	A49 SB to Birch Ave	4	22	18	450%	4	24	20	500%
	Birch Rd to A49 SB	8	11	3	38%	8	11	3	38%
A49 Winwick Road @ Poplars Avenue	A49 NB to Woburn Rd	6	7	1	17%	6	7	1	17%
	A49 NB	1062	1095	33	3%	1062	1049	-13	-1%
	A49 SB	794	802	8	1%	794	909	115	14%
A49 Winwick Road/ A574 Cromwell Avenue/ Sandy Lane West	A49 SB to Sandy Ln West	178	158	-20	-11%	178	246	68	38%
	A49 SB	469	457	-12	-3%	469	457	-12	-3%
	A49 SB to Cromwell Ave	171	180	9	5%	171	180	9	5%
	Cromwell Ave to A49 NB	160	171	11	7%	160	164	4	3%
	Cromwell Ave to Sandy Ln West	206	195	-11	-5%	206	214	8	4%
	Cromwell Ave to A49 SB	242	242	0	0%	242	230	-12	-5%
	Cromwell Ave to Cromwell Ave (U-turn)	47	49	2	4%	47	45	-2	-4%
	A49 NB	770	772	2	0%	770	734	-36	-5%
	A49 NB to Sandy Ln West	111	35	-76	-68%	111	36	-75	-68%
	A49 NB to Cromwell Ave	341	338	-3	-1%	341	324	-17	-5%
	Sandy Ln West to A49 NB	150	149	-1	-1%	150	162	12	8%
	Sandy Ln West to Sandy Ln (U-turn)	0	0	0	-	0	0	0	-
	Sandy Ln West to A49 SB	53	46	-7	-13%	53	49	-4	-8%
Sandy Ln West to Cromwell Ave	139	134	-5	-4%	139	155	16	12%	
A49 Winwick Road @ Junction NINE Retail Park	A49 NB	1043	1040	-3	0%	1043	978	-65	-6%
	A49 NB to Junction NINE Retail	47	63	16	34%	47	59	12	26%
	Junction NINE Retail to A49 SB	28	38	10	36%	28	37	9	32%
	Junction NINE Retail to A49 NB	187	114	-73	-39%	187	139	-48	-26%
	A49 SB	675	667	-8	-1%	675	644	-31	-5%
	A49 SB to Junction NINE Retail	81	78	-3	-4%	81	77	-4	-5%
A49 Winwick Road/ Hawleys Lane/ A50 Long Lane	A49 SB to Hawleys Lane	98	101	3	3%	98	98	0	0%
	A49 SB to Long Lane	136	150	14	10%	136	144	8	6%
	A49 SB	475	440	-35	-7%	475	438	-37	-8%
	A49 NB to Hawleys Lane	33	31	-2	-6%	33	31	-2	-6%
	A49 NB to Long Lane	97	94	-3	-3%	97	94	-3	-3%
	A49 NB	728	723	-5	-1%	728	675	-53	-7%
	Long Lane to A49 SB	160	182	22	14%	0	0	0	-
	Long Lane to Hawleys Lane	86	90	4	5%	86	88	2	2%
	Long Lane to A49 NB	138	165	27	20%	138	160	22	16%
	Hawleys Lane to Long Lane	49	52	3	6%	49	49	0	0%
	Hawleys Lane to A49 SB	38	46	8	21%	38	41	3	8%
	Hawleys Lane to A49 NB	203	199	-4	-2%	203	197	-6	-3%

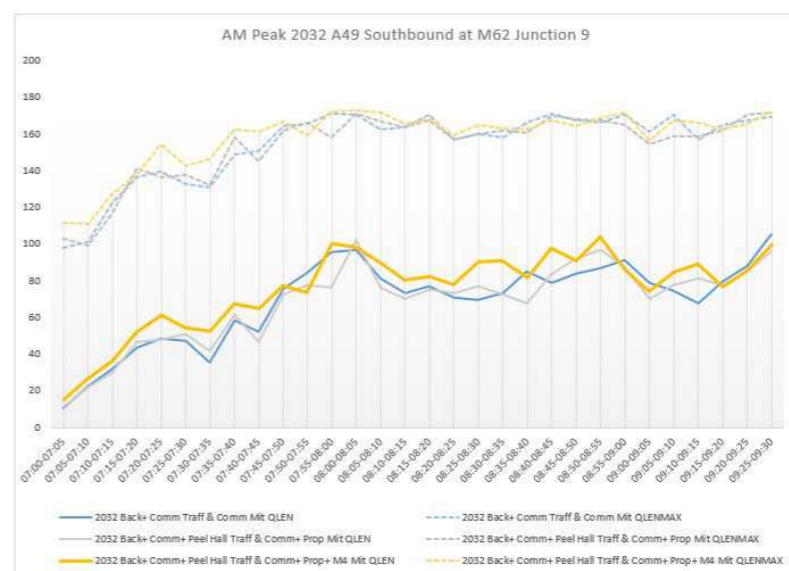
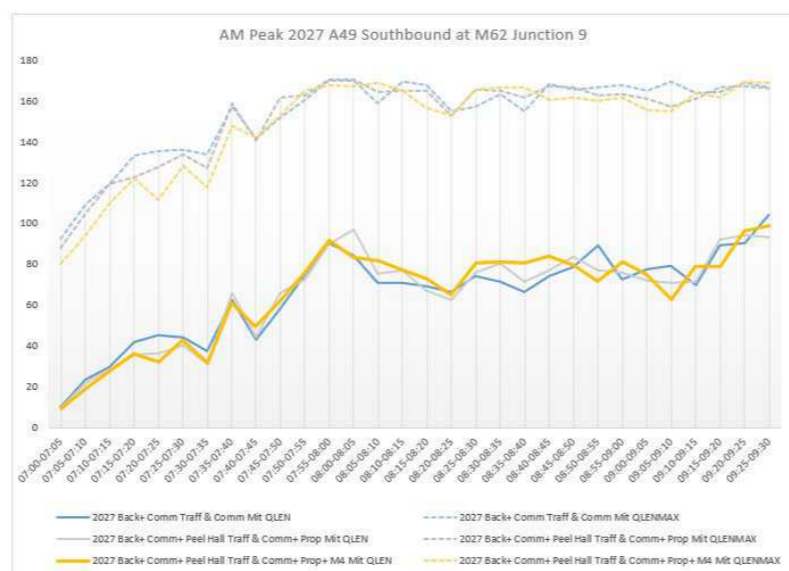
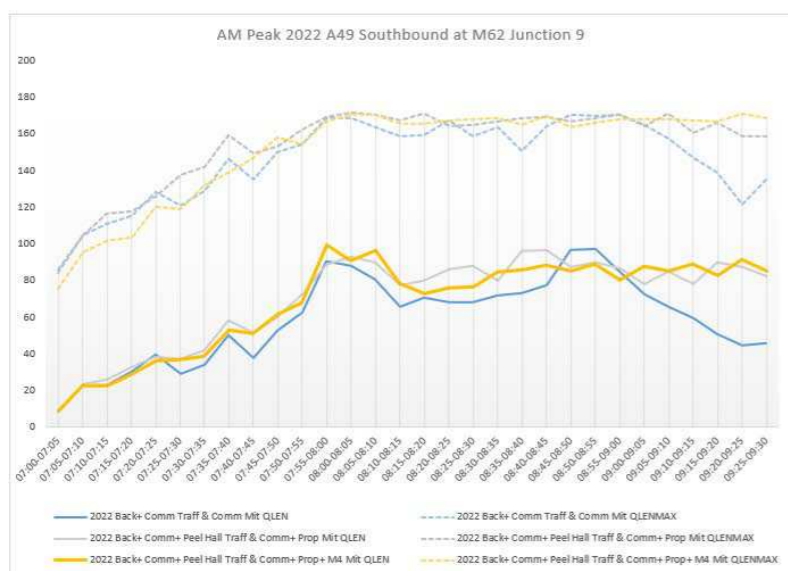
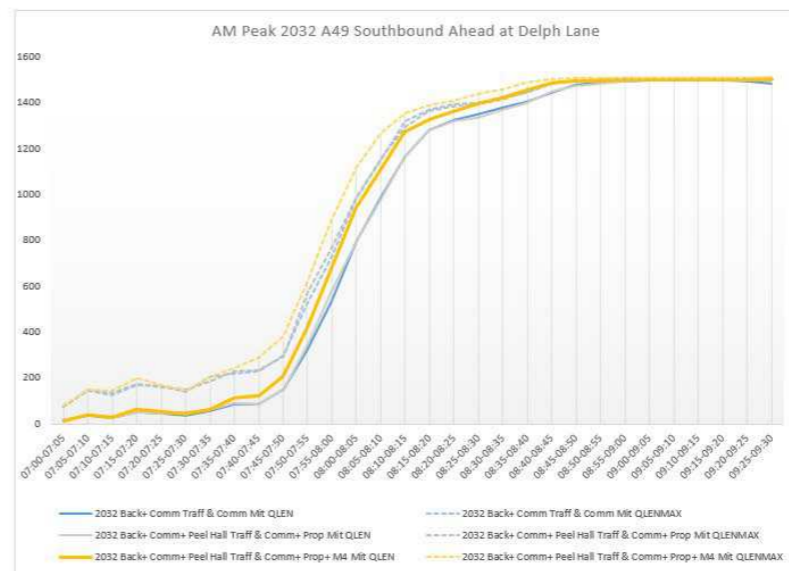
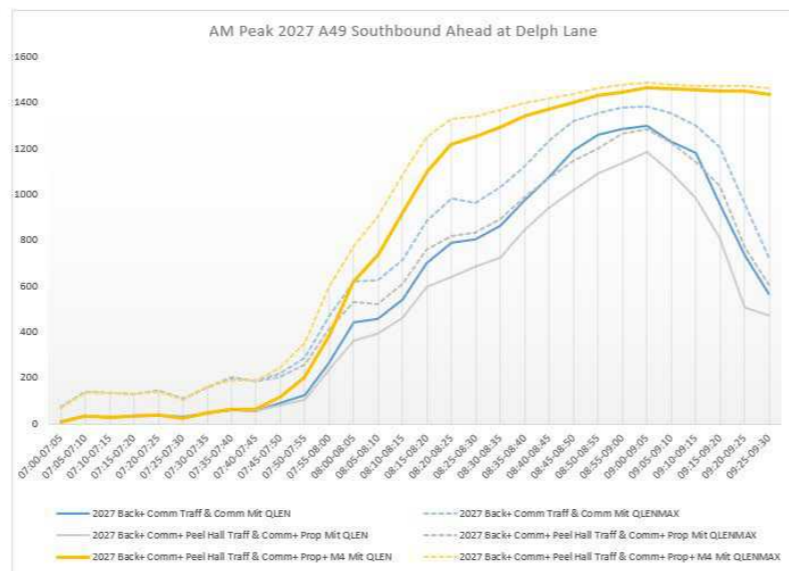
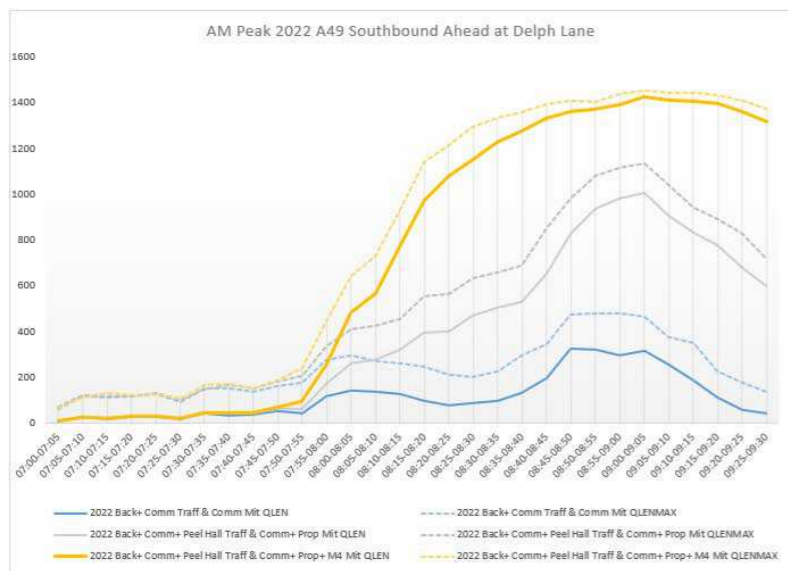
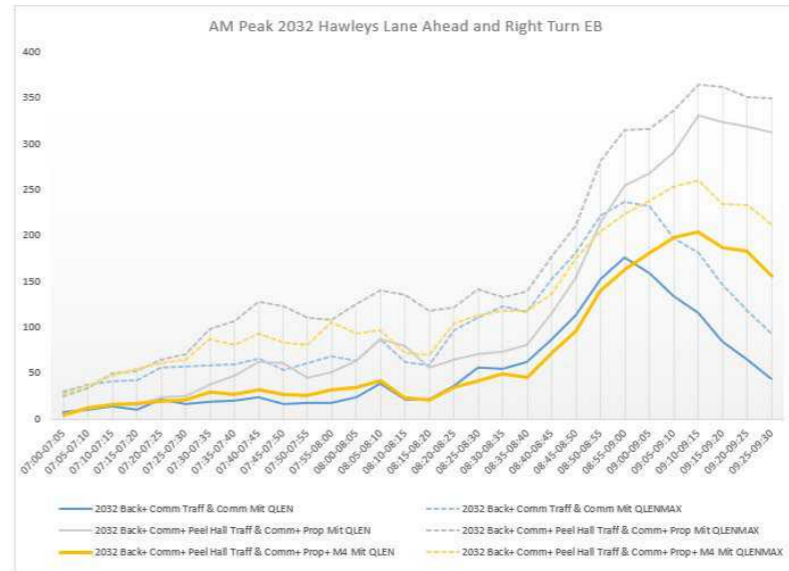
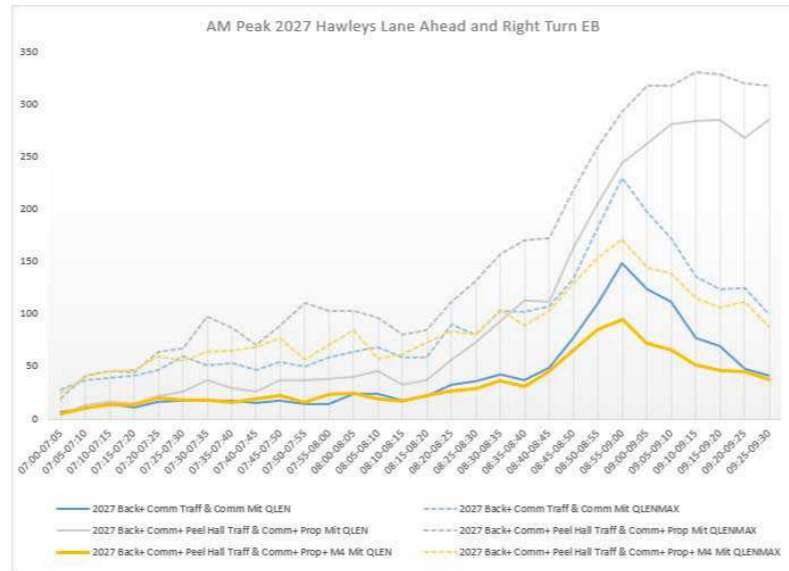
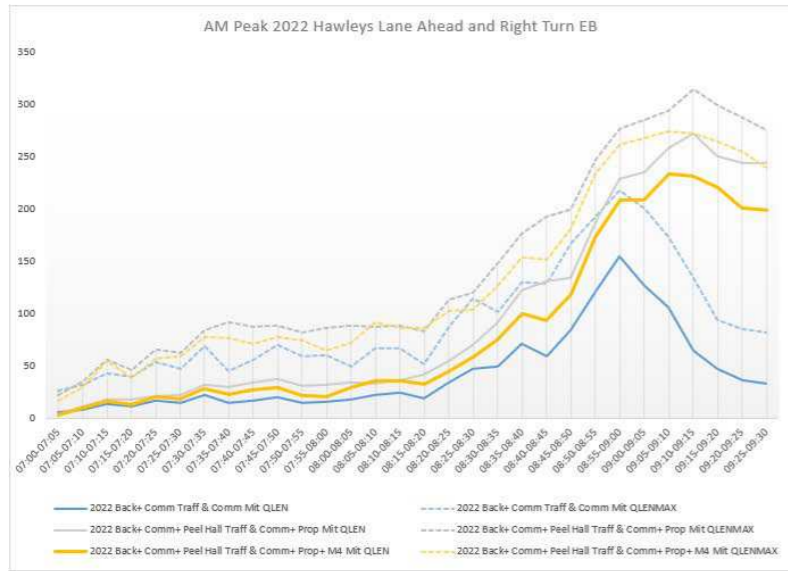
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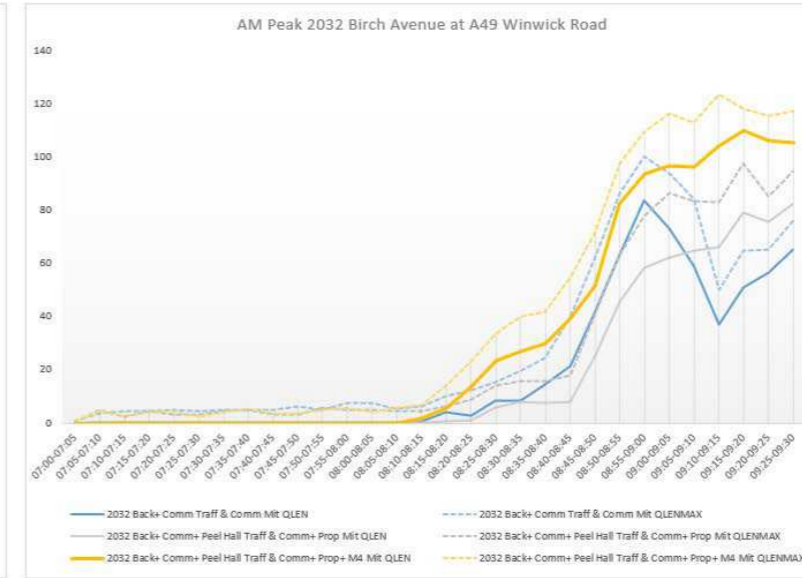
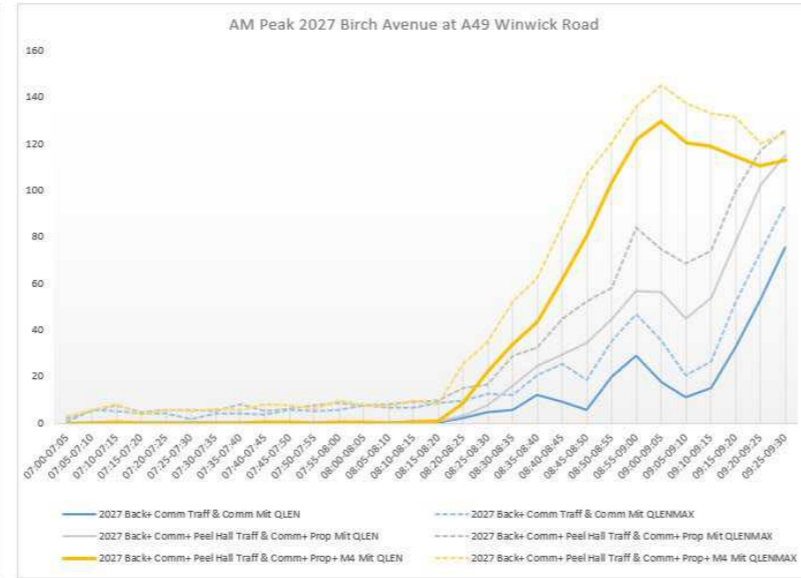
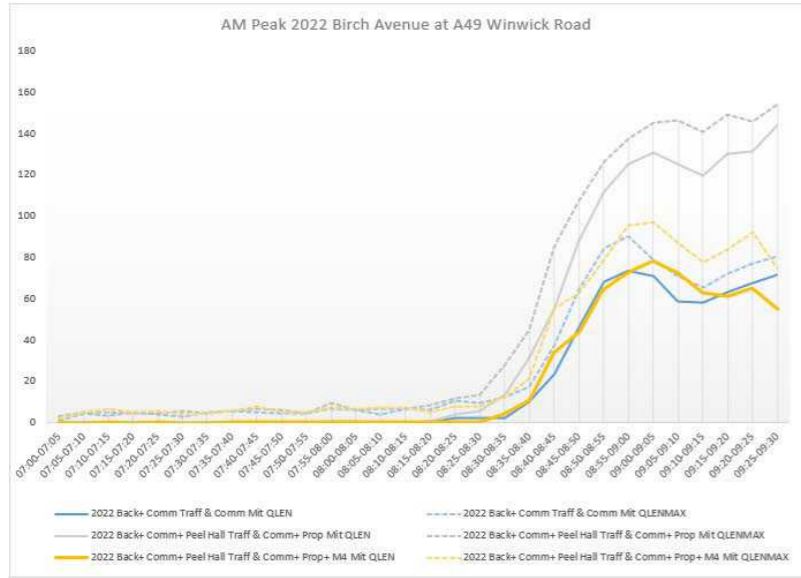
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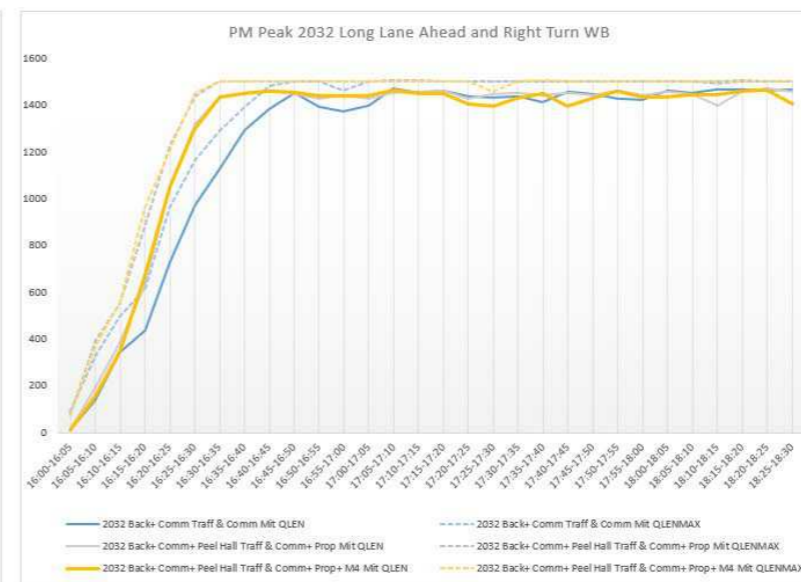
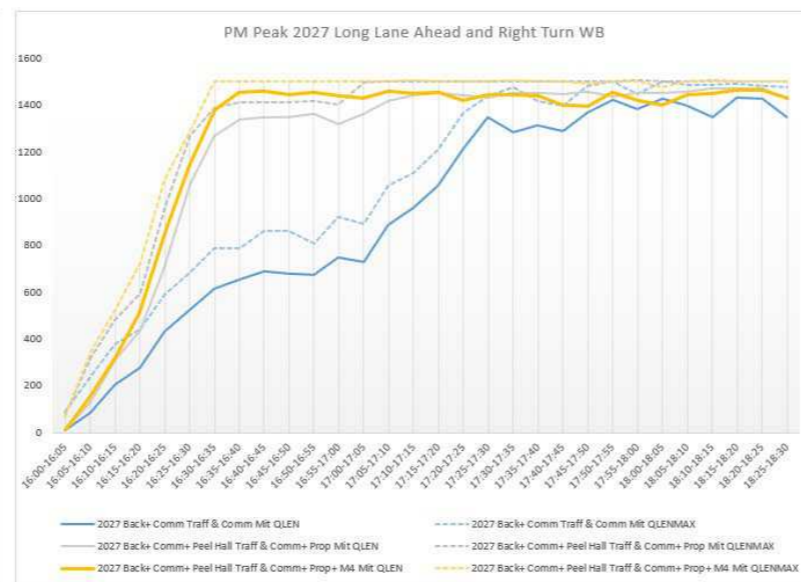
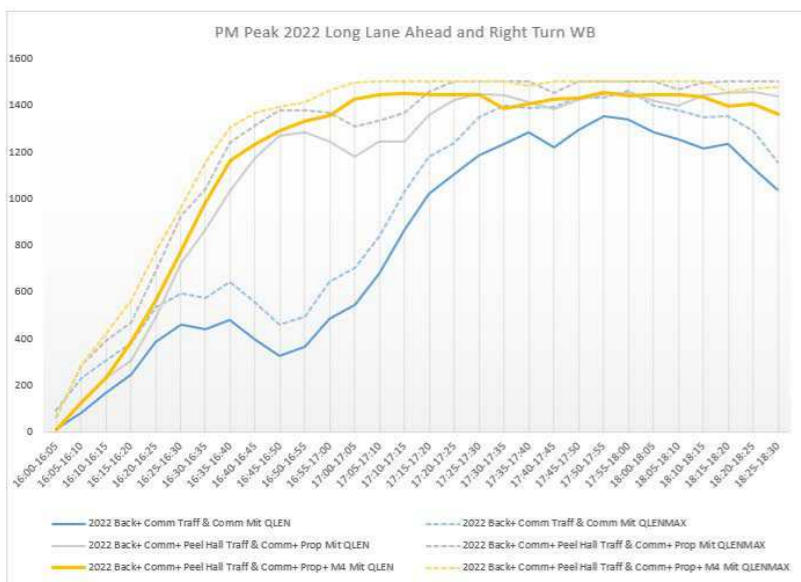
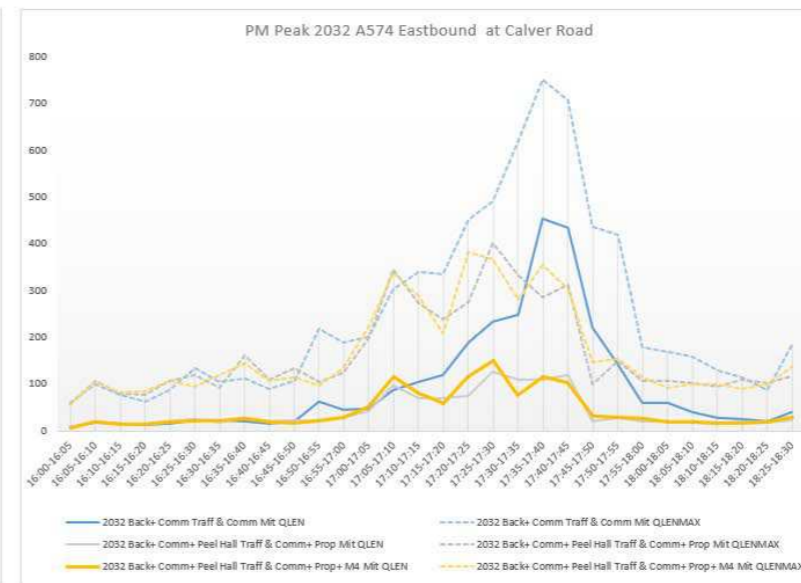
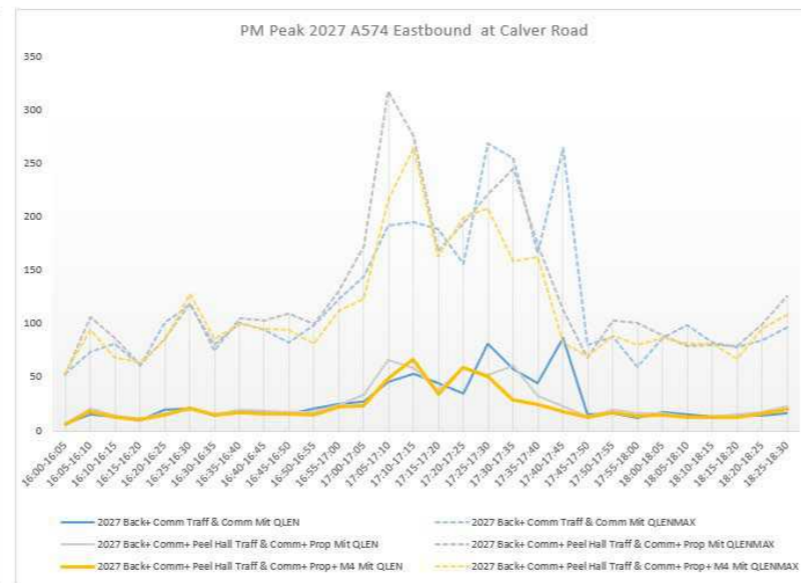
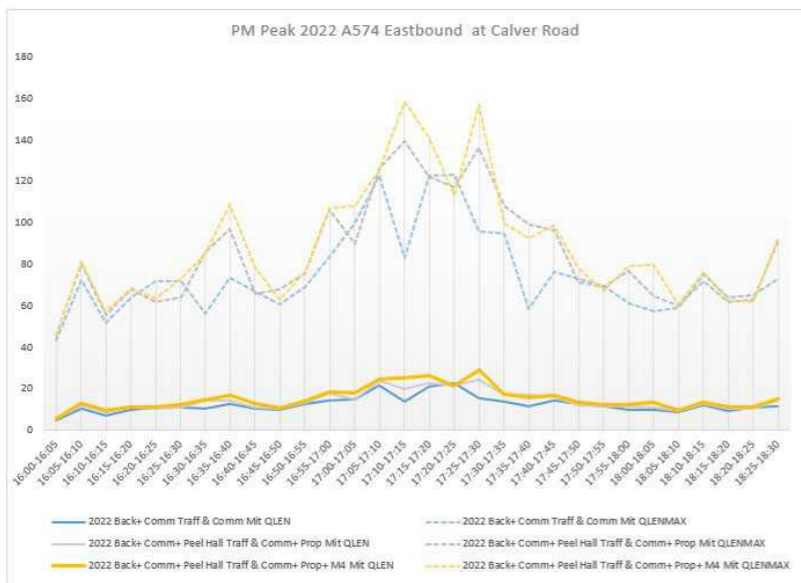
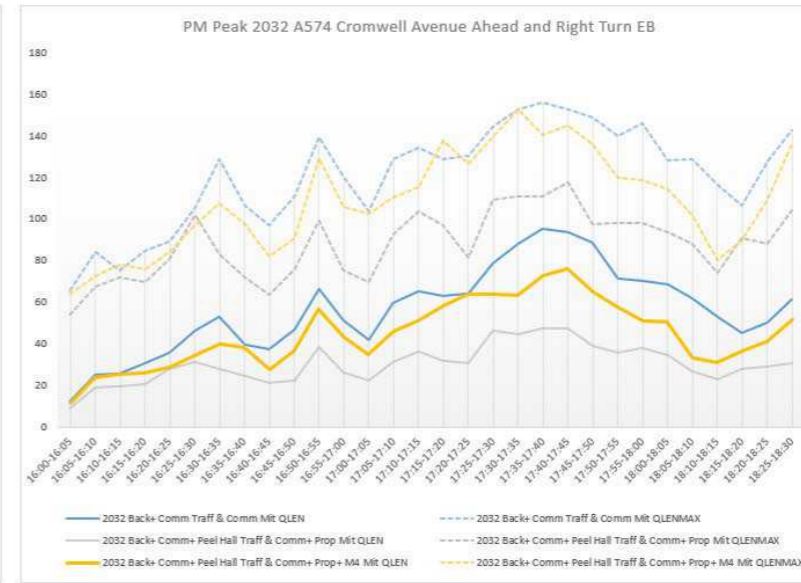
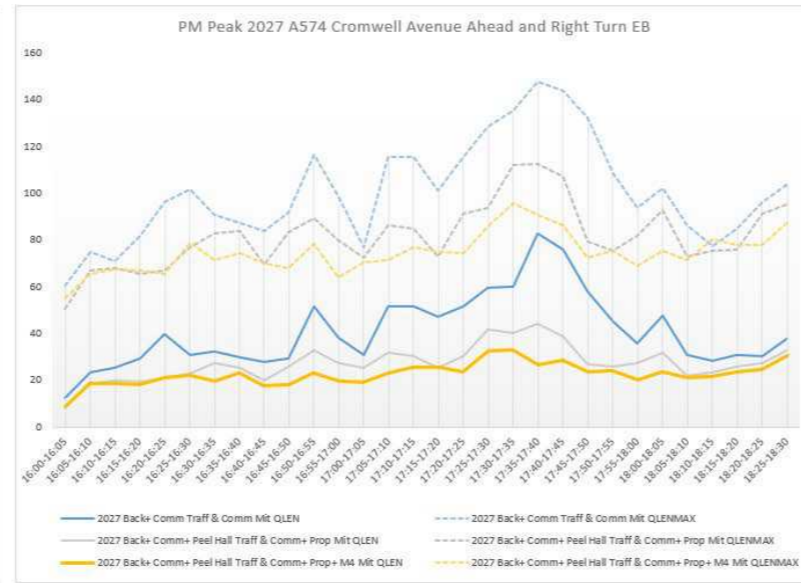


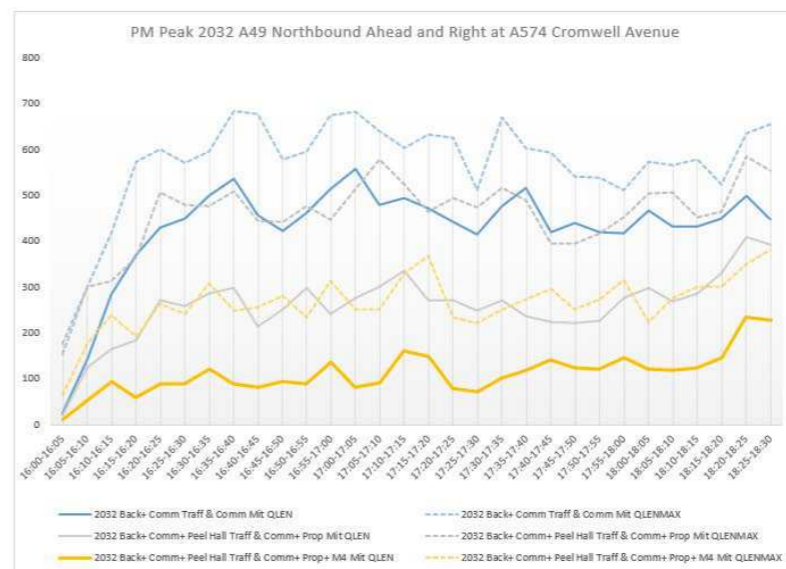
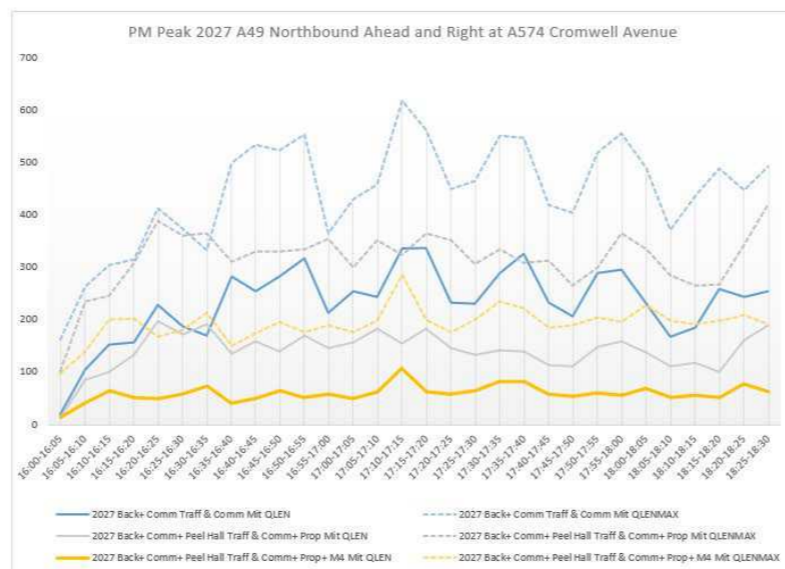
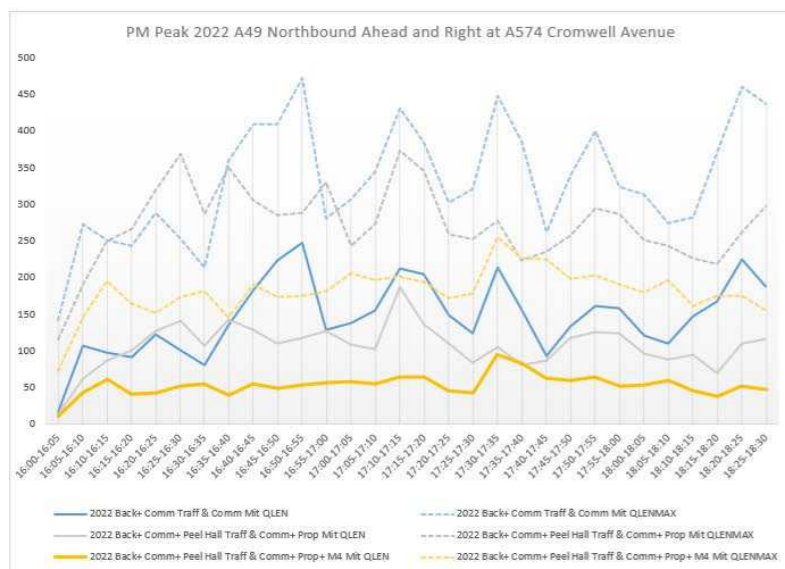
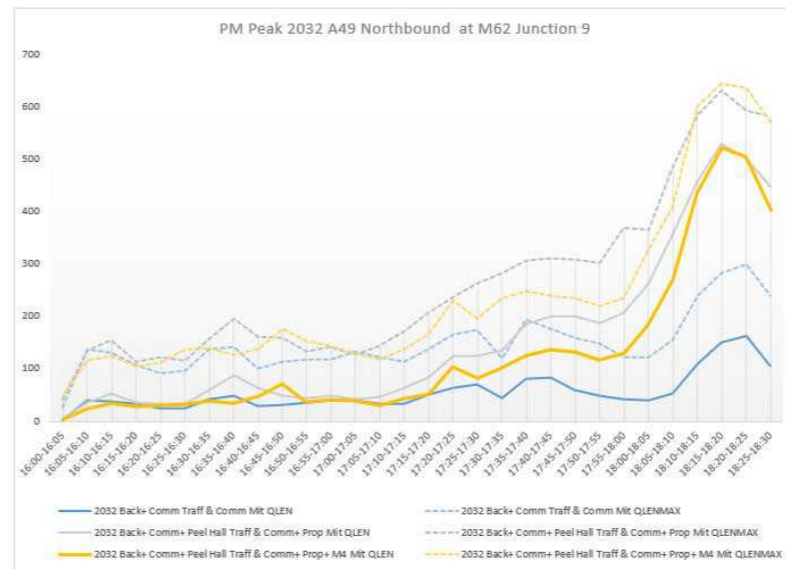
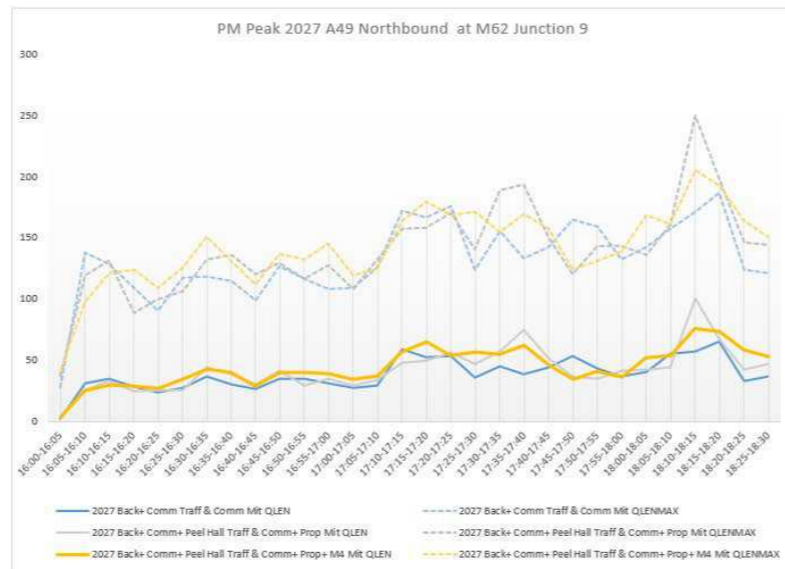
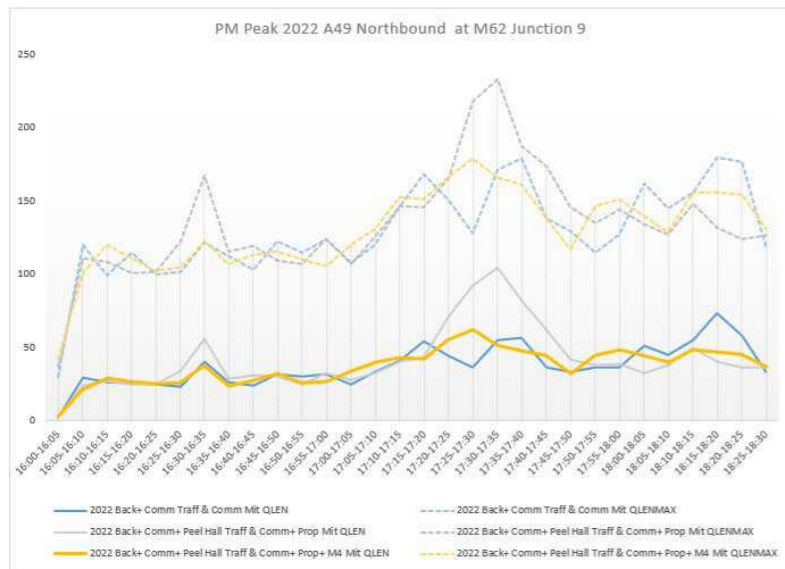
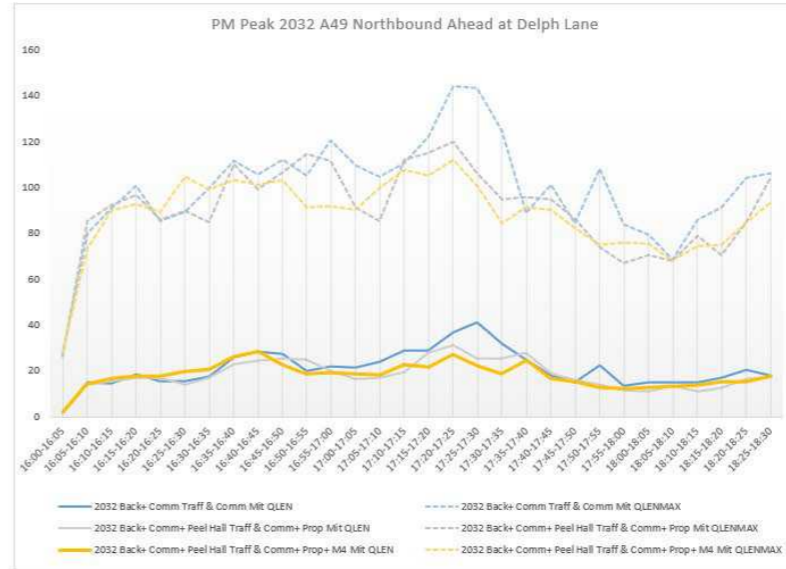
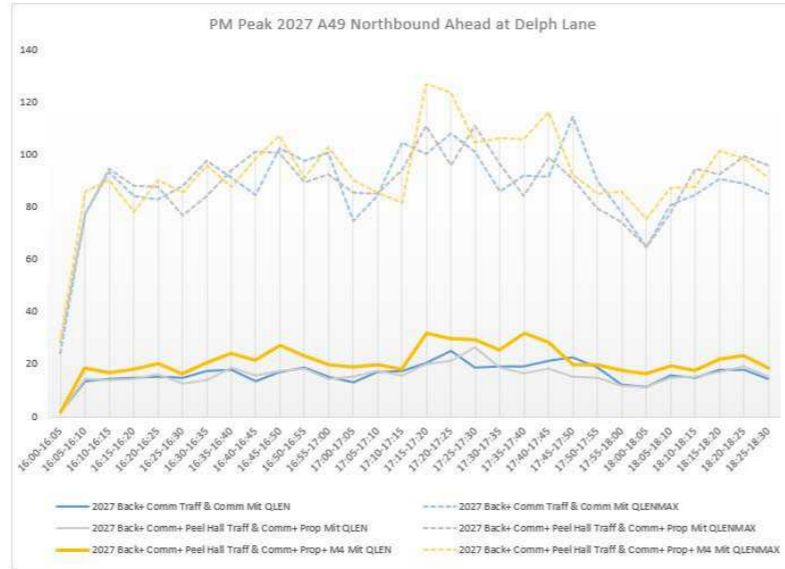
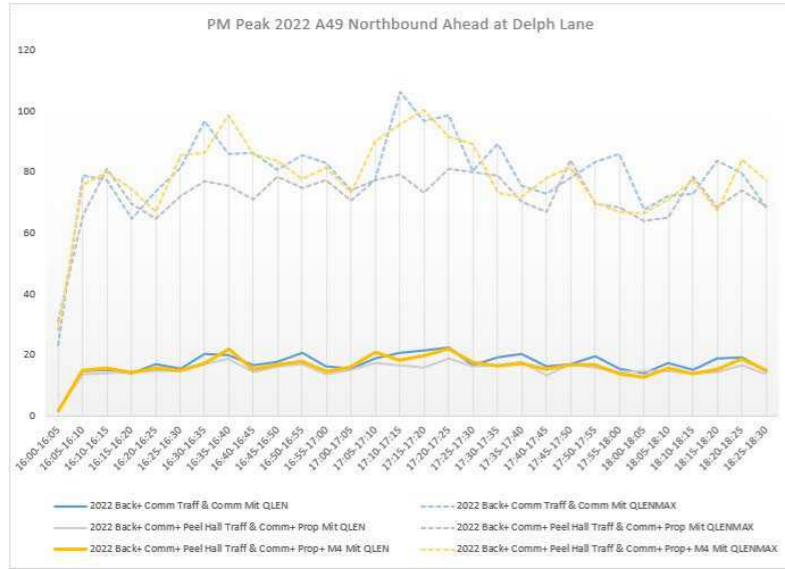
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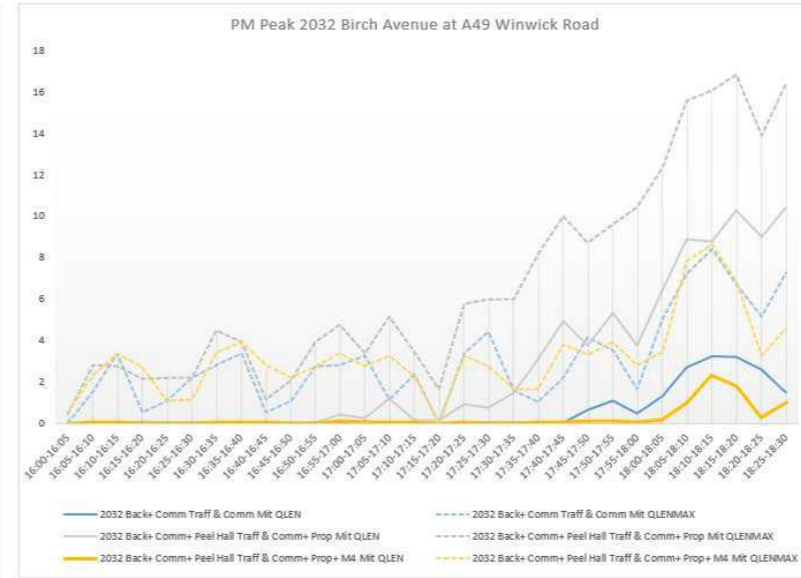
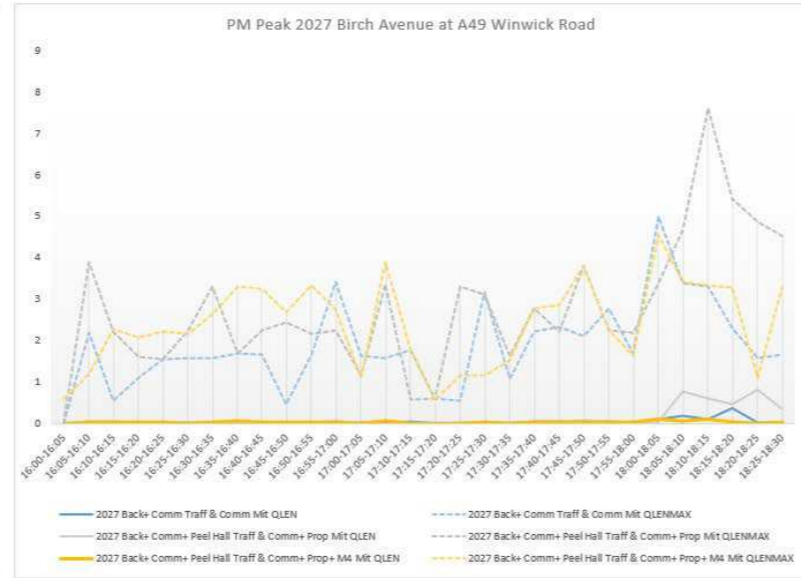
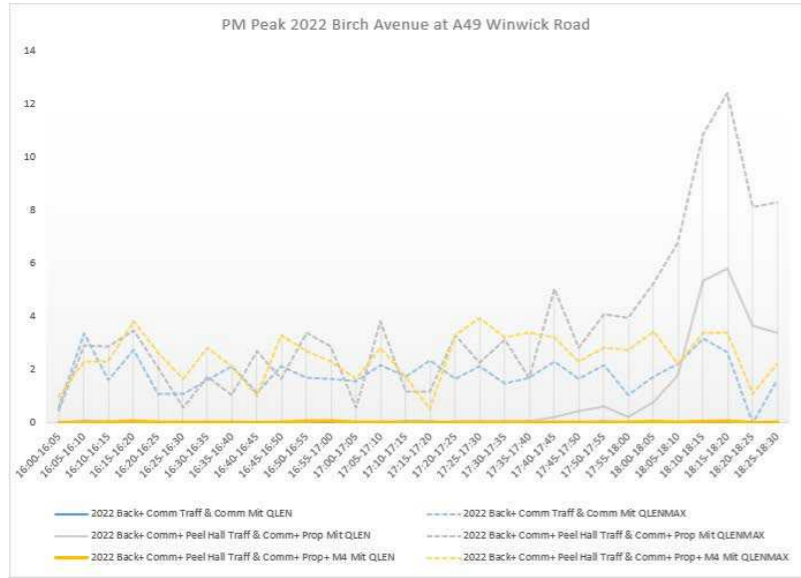
QUEUE LENGTH ANALYSIS COMPARISONS





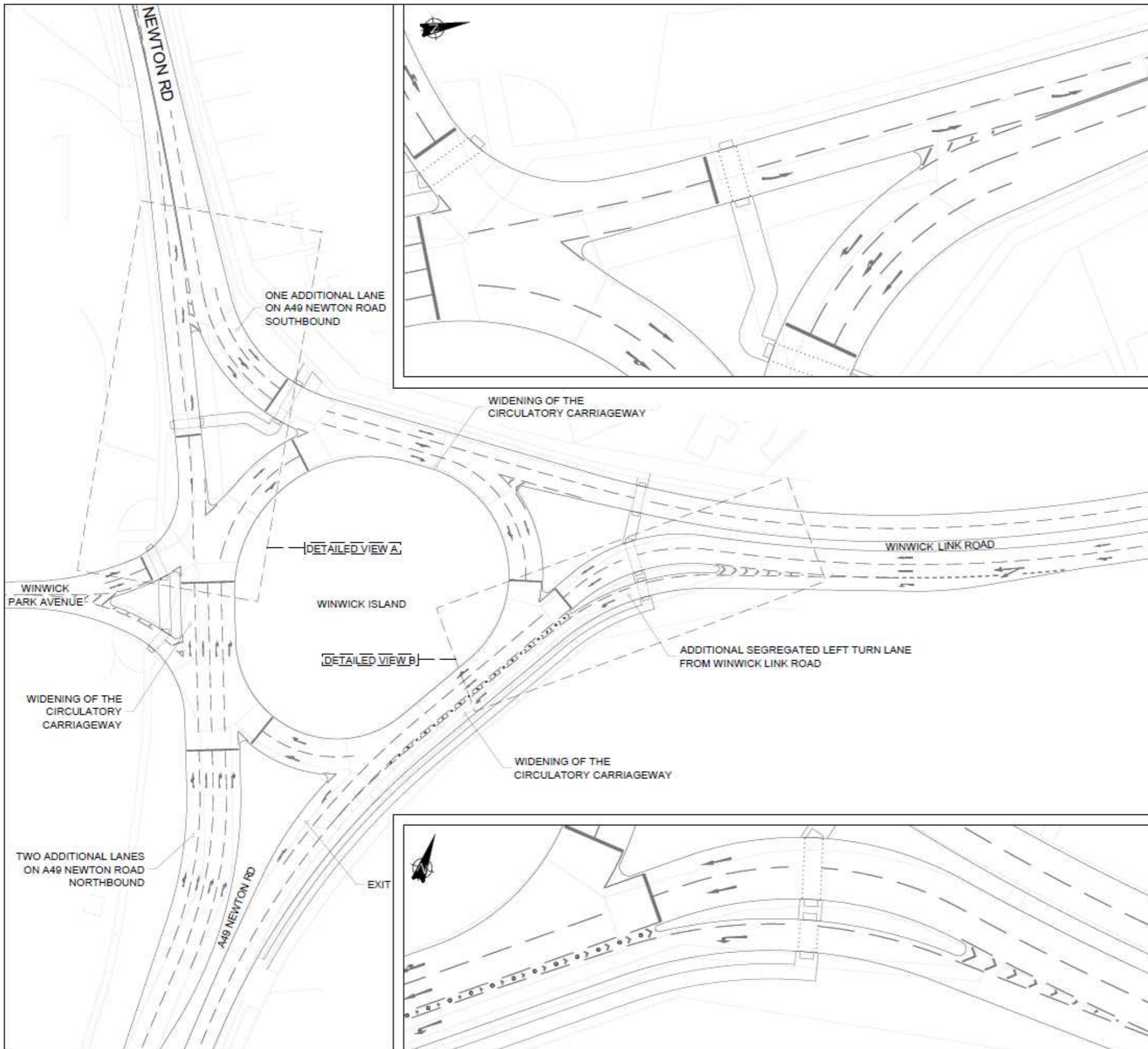






APPENDIX D1:

MITIGATION DESIGNS – Committed Mitigation



NOTES:

A	Existing lines rendered under proposed	29/02/16	DD	KY
Rev:	Description:	Date:	By:	Chkd:



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 Merchant Exchange, 17-19 Whitworth St West, Manchester, M1 5WG
 t: 0161 236 2394
 e: manchester@curtins.com
 www.curtins.com

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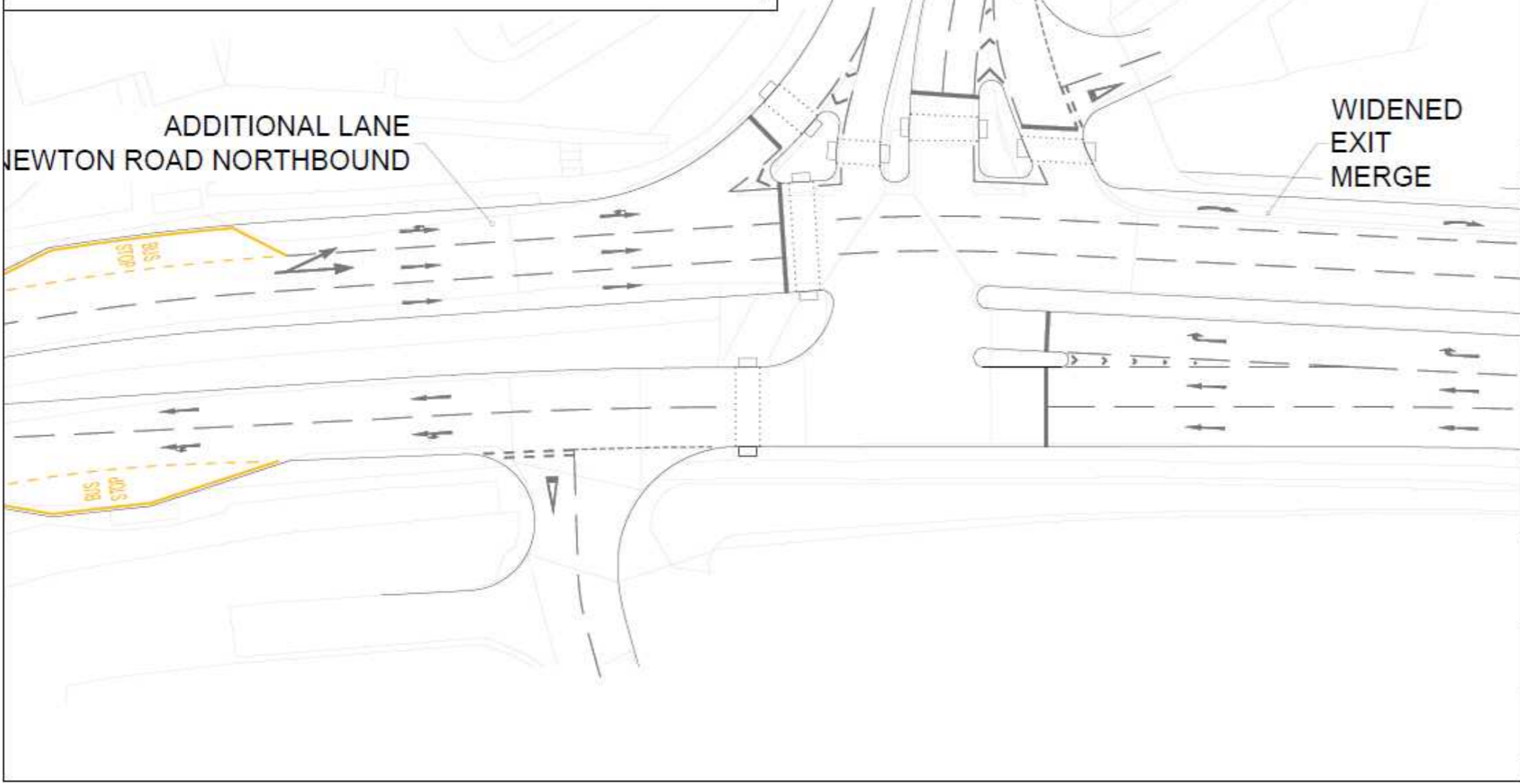
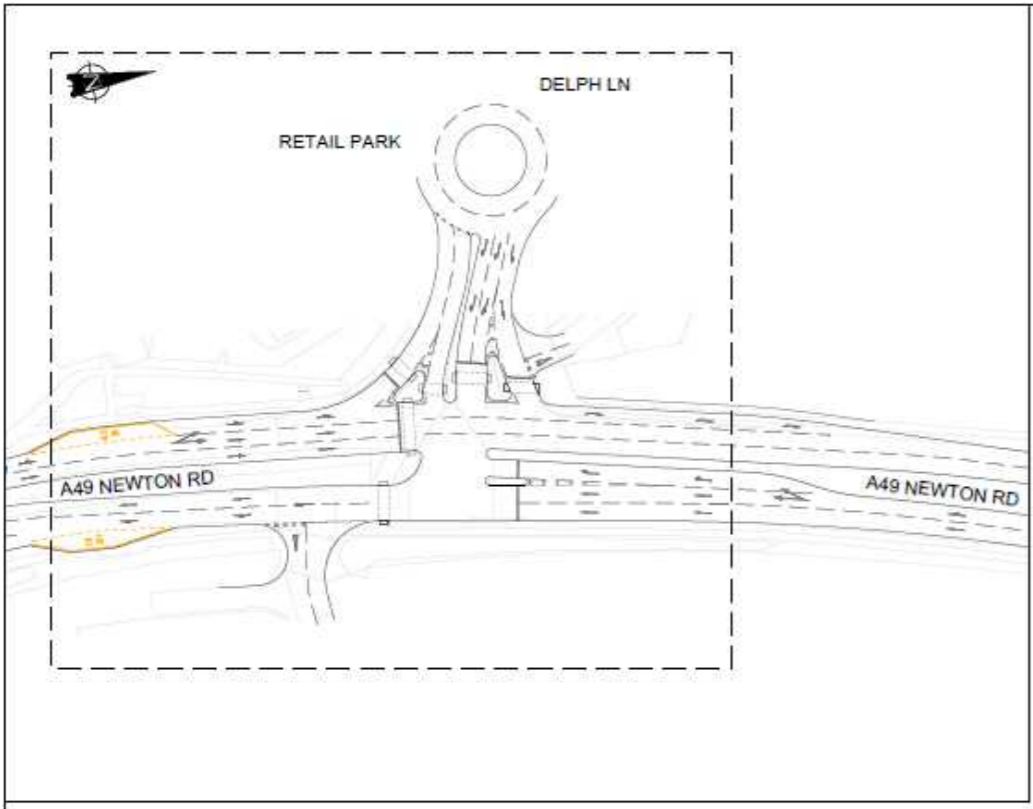
Status: **PRELIMINARY**

Project: **PARKSIDE
 PHASE I**

Org Title: **JUNCTION IMPROVEMENT PROPOSAL
 JUNCTION 3 - WINWICK ISLAND**

Scale:	Size:	First Issue:	Drawn:	Checked:
1:1000	A3	16/02/16	DD	JG

Org No:	Rev:
TPMA1389-103	A



NOTES:

Empty box for notes.

A	Existing lines rendered under proposed	29/02/16	DD	KY
Rev:	Description:	Date:	By:	Chkd:



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e: manchester@curtins.com
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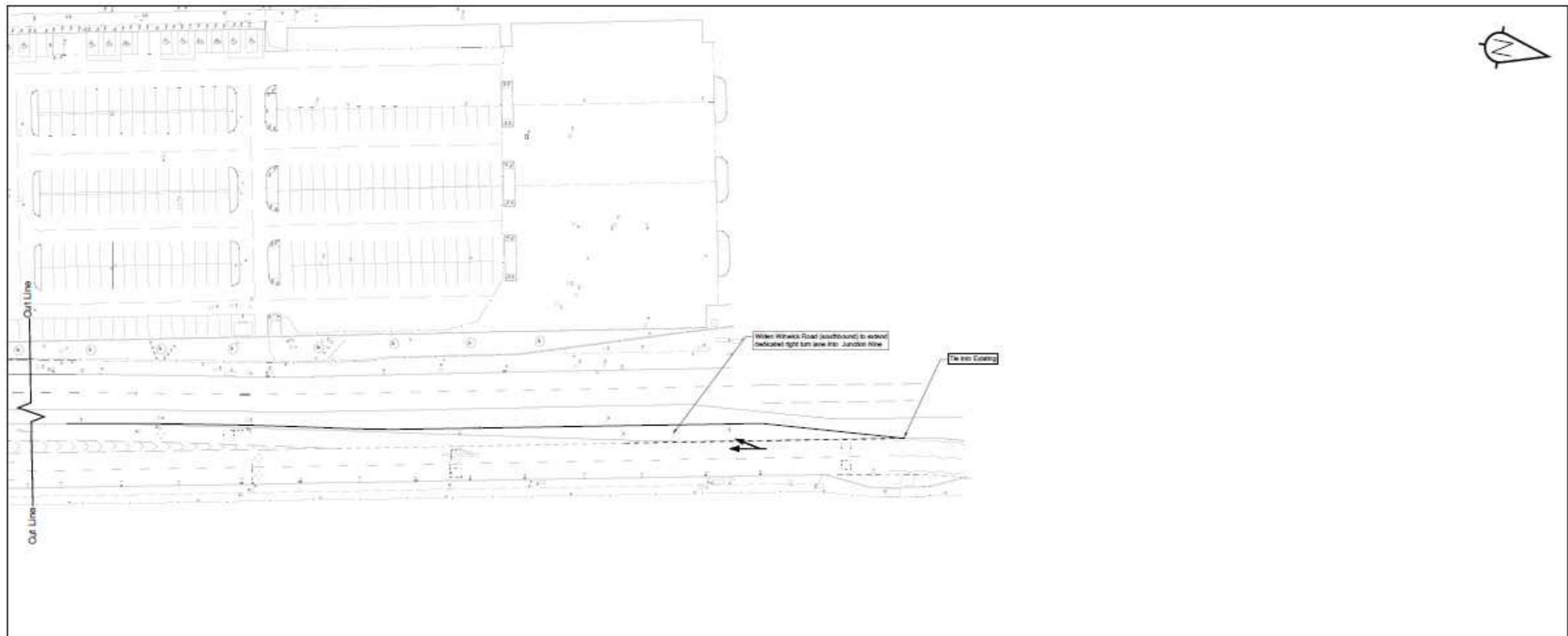
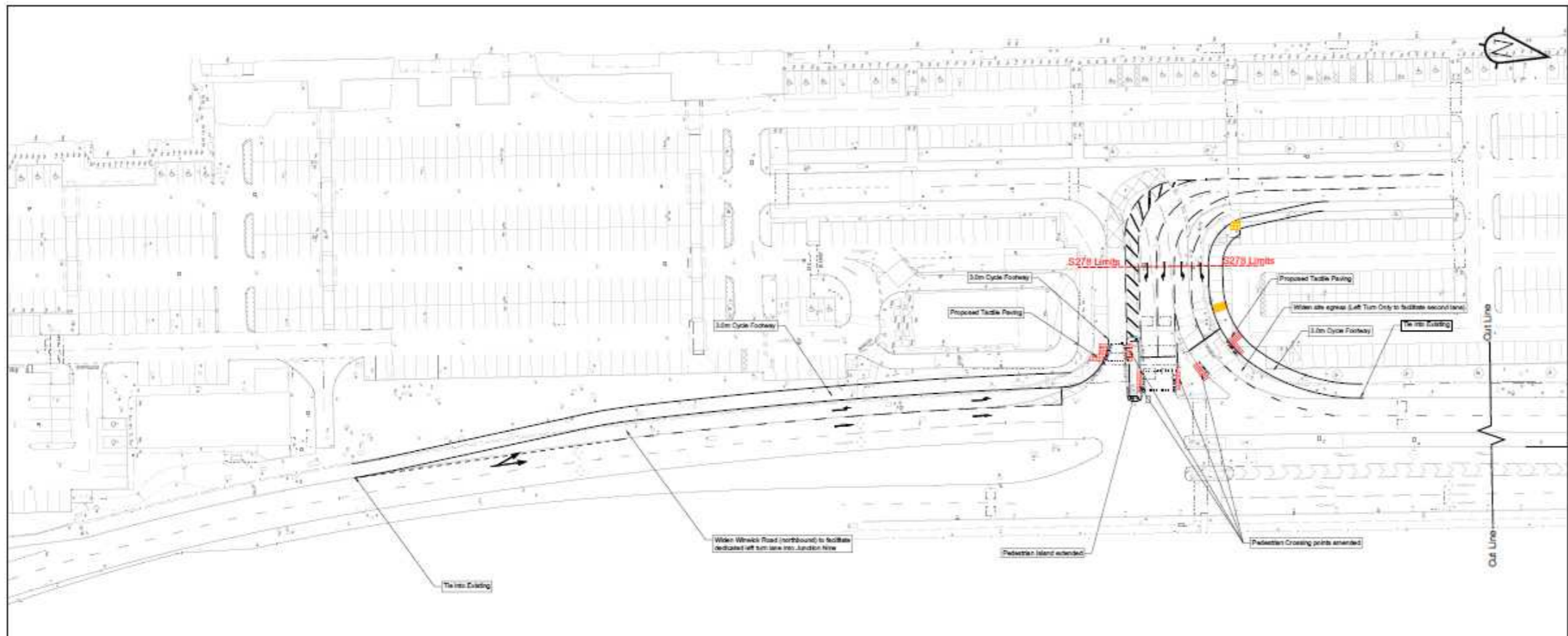
Status: **PRELIMINARY**

Project: **PARKSIDE
PHASE I**

Drg Title: **JUNCTION IMPROVEMENT PROPOSAL
JUNCTION 2 - DELPH LANE**

Scale:	Size:	First Issue:	Drawn:	Checked:
1:500	A3	16/02/16	DD	JG

Drg No: **TPMA1389-102** Rev: **A**



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• The locations of utility accessories, if shown, is reproduced from plans supplied to the consultant, although care has been taken when duplicating this information. These locations are approximate only and no guarantee can be given for their accuracy. It is the client's or its appointed agent/contractors responsibility to verify the exact locations on site by hand digging test holes or other appropriate means prior to mechanical excavation.

• Service connections are not shown but their presence should be anticipated.

• Reference to any third party equipment shown on this drawing was only relevant at the time the drawing was prepared.

• It is the client's responsibility to ensure that any equipment ordered meets the design.

Rev	Amendment	Drawn	Date	Checked



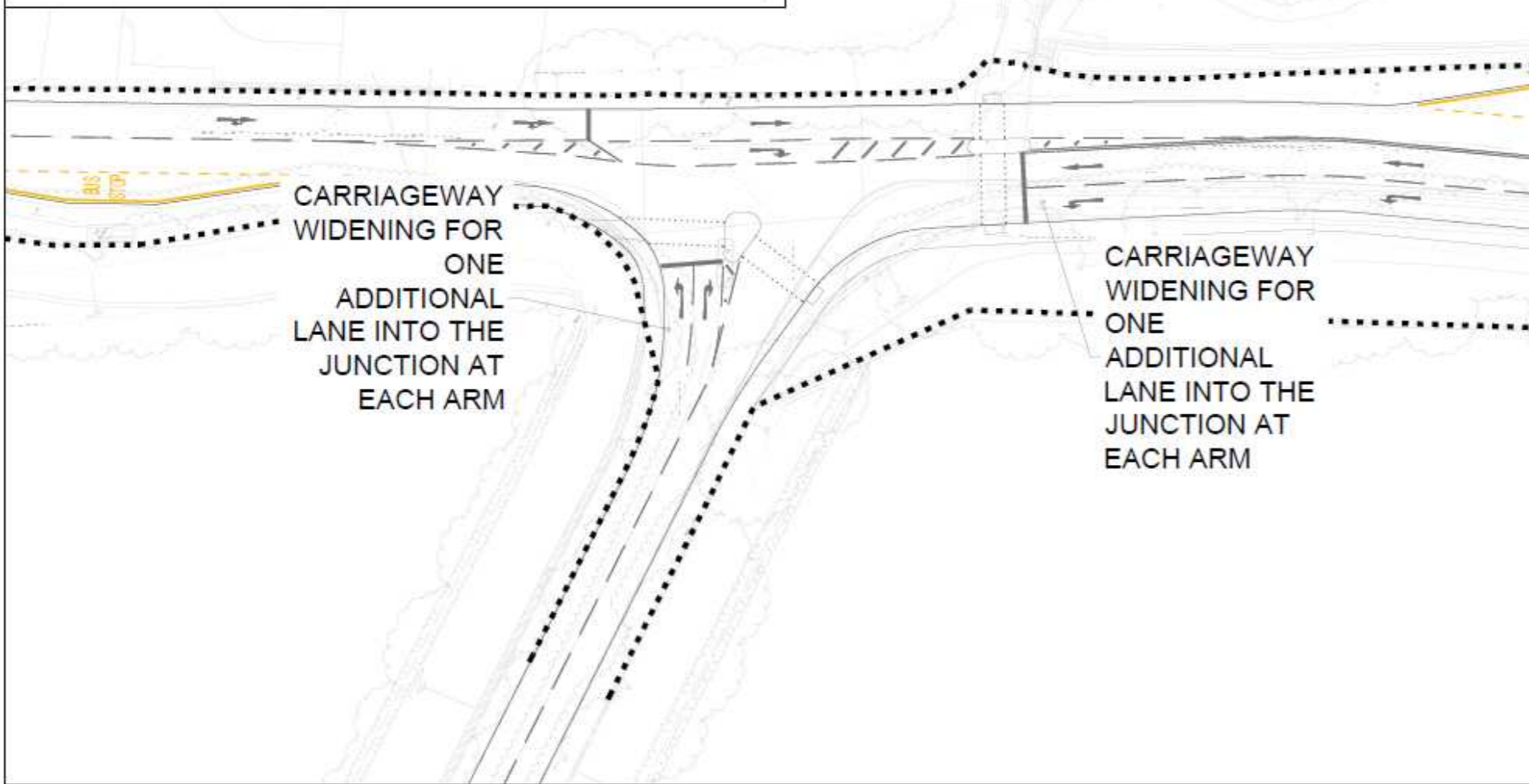
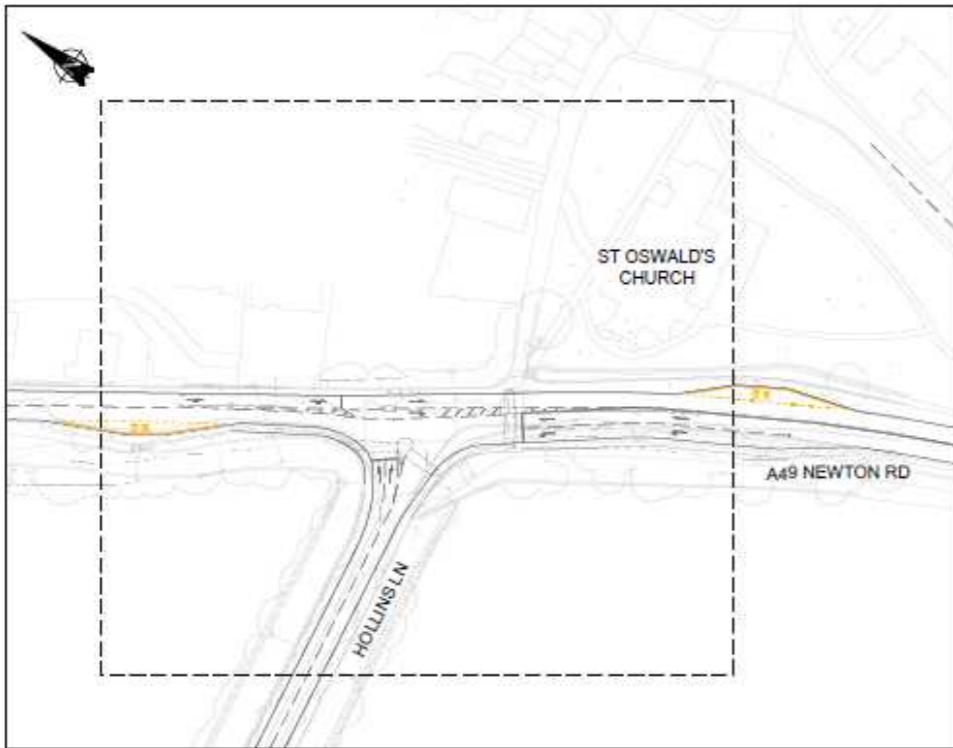
Client: DERWENT CONSTRUCTION LIMITED

Project Title: JUNCTION NINE RETAIL PARK WARRINGTON

Drawing Title: WINWICK ROAD S278 WORKS GENERAL ARRANGEMENT

Scale: 1:500	Drawn By: DH
Drawing Size: A1	Checked By: P.J.M
Date: 19.02.19	Approved By: P.J.M

Drawing Number: 10753-100-001	Rev
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NOTES:

Rev:	Description:	Date:	By:	Chkd:
B	Existing lines rendered under proposed	19/02/16	DD	KY
A	Changes in layout	19/02/16	DD	KY



Curtins Consulting Ltd,
 Merchant Exchange, 17-19 Whitworth St West, Manchester, M1 5WG
 t: 0161 236 2394
 e: manchester@curtins.com
 www.curtins.com

Structure - Civils - Environmental - Infrastructure - Transport Planning - Sustainability - Expert Advisory Services
 Birmingham - Bristol - Cardiff - Douglas - Edinburgh - Farnham - Leeds - Liverpool - London - Manchester - Nottingham

Status: **PRELIMINARY**

Project: **PARKSIDE PHASE I**

Orig Title: **JUNCTION IMPROVEMENT PROPOSAL
 JUNCTION 5 - HOLLINS LANE**

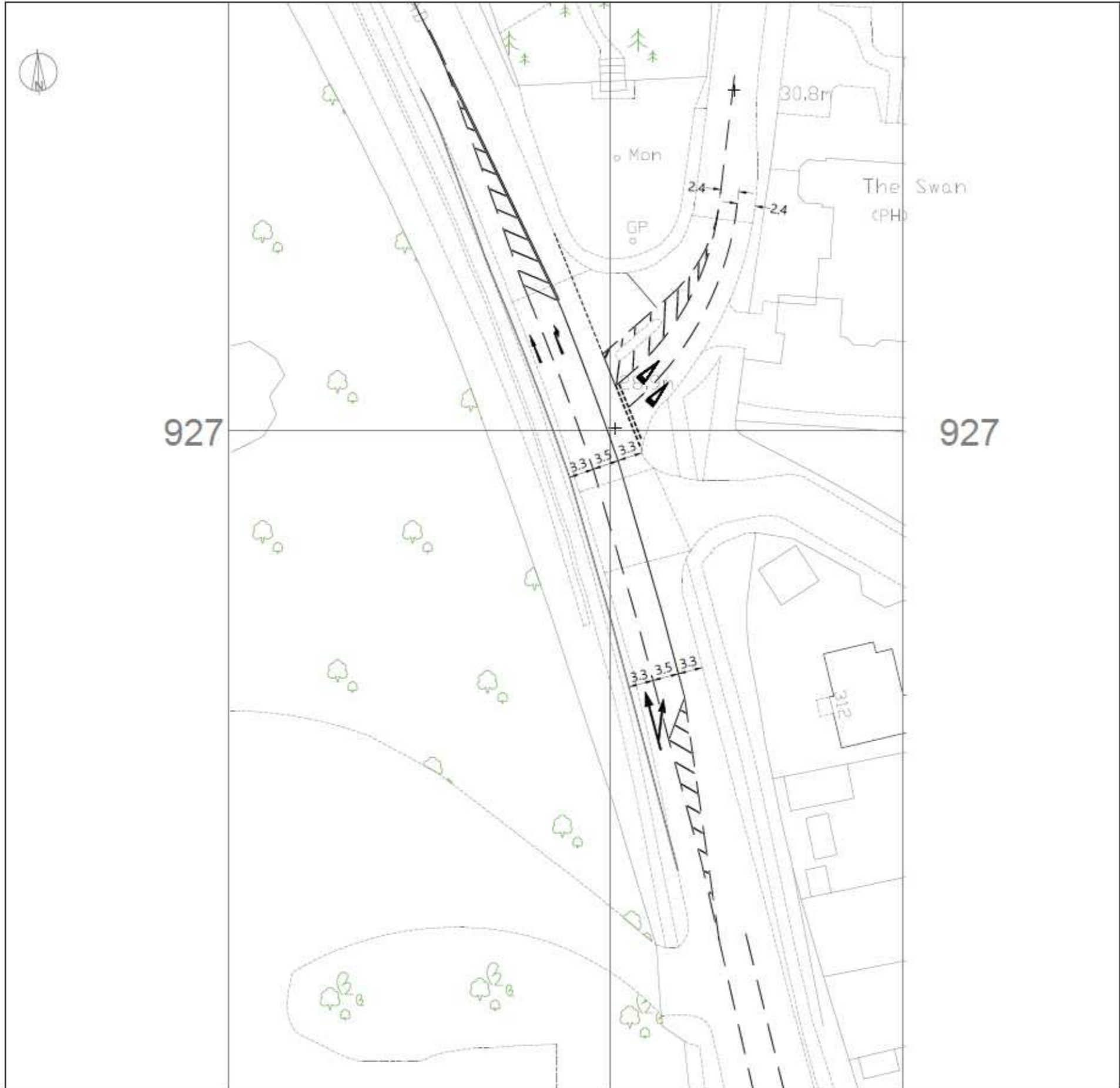
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Orig No: **TPMA1389-105** Rev: **B**

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APPENDIX D2:

**MITIGATION DESIGNS – Proposed M4
Mitigation Package**



NOTES:
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 North arrow indicative.

PRELIMINARY

ISSUE	REASON FOR REVISION	DATE

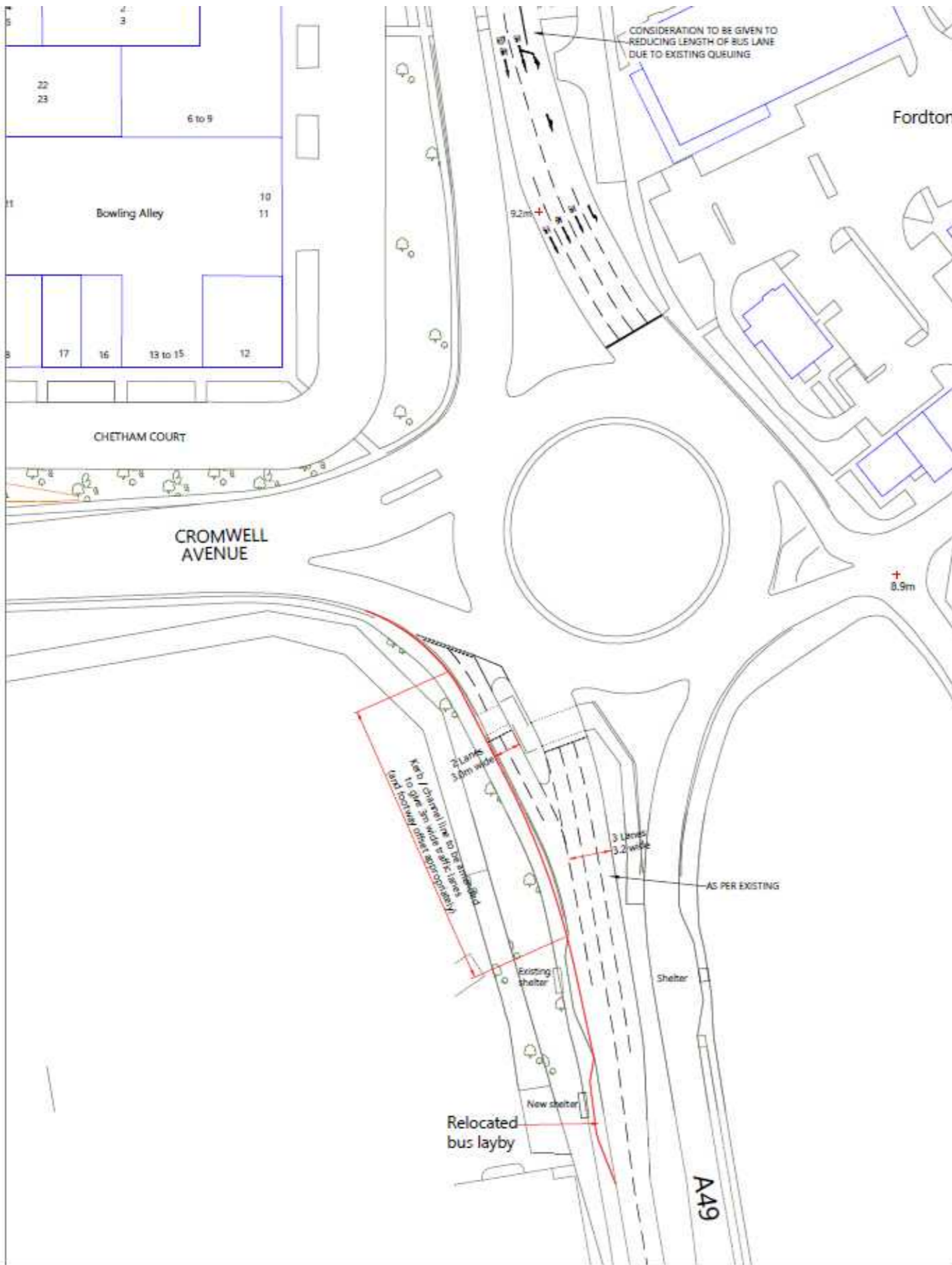
PROJECT:	PEEL HALL WARRINGTON
CLIENT:	SATNAM MILLENNIUM LTD
PROJECT REFERENCE:	1901
DRAWING NUMBER:	08
SCALE:	1:500 @ A3

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 First Floor, 43-45 Park Street
 Bristol BS1 5NL
 07973 375 937 / 07595 892 217
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TITLE:
 PROPOSED A49 / GOLBOURNE ROAD
 JUNCTION IMPROVEMENTS

DATE:	DRAWN BY:	CHECKED:
04/03/20	BGS	FB



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PRELIMINARY FOR COMMENT



ISSUE	REASON FOR REVISION	DATE

PROJECT:
**PEEL HALL,
 WARRINGTON**

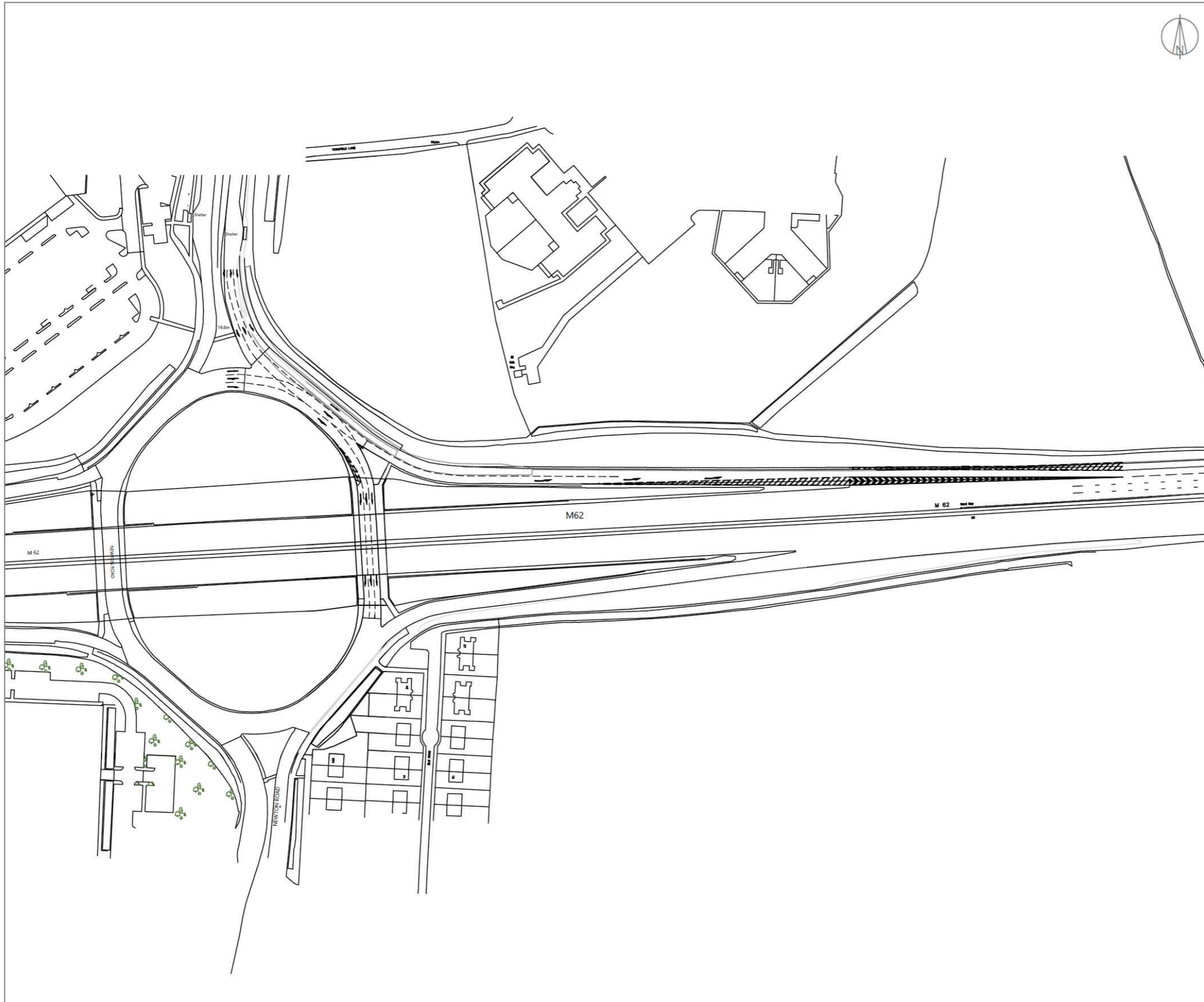
CLIENT:
**SATNAM MILLENNIUM
 LTD**

PROJECT REFERENCE:	DRAWING NUMBER:	SCALE:
1901	27	1:1,000 @ A3

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TITLE:
**Preliminary Sketch for Mitigation at A49/
 Cromwell Avenue/Sandy Lane West Junction**

DATE:	DRAWN BY:	CHECKED:
06-08-2020	BGS	FB



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PRELIMINARY

Note: Lane markings and arrows revised
 where necessary

ISSUE	REASON FOR REVISION	DATE

PROJECT:
**PEEL HALL,
 WARRINGTON**

CLIENT:
**SATNAM MILLENNIUM
 LTD**

PROJECT REFERENCE:	DRAWING NUMBER:	SCALE:
1901	28	1:2,000 @ A3

SHEET:
SHEET 1 OF 3

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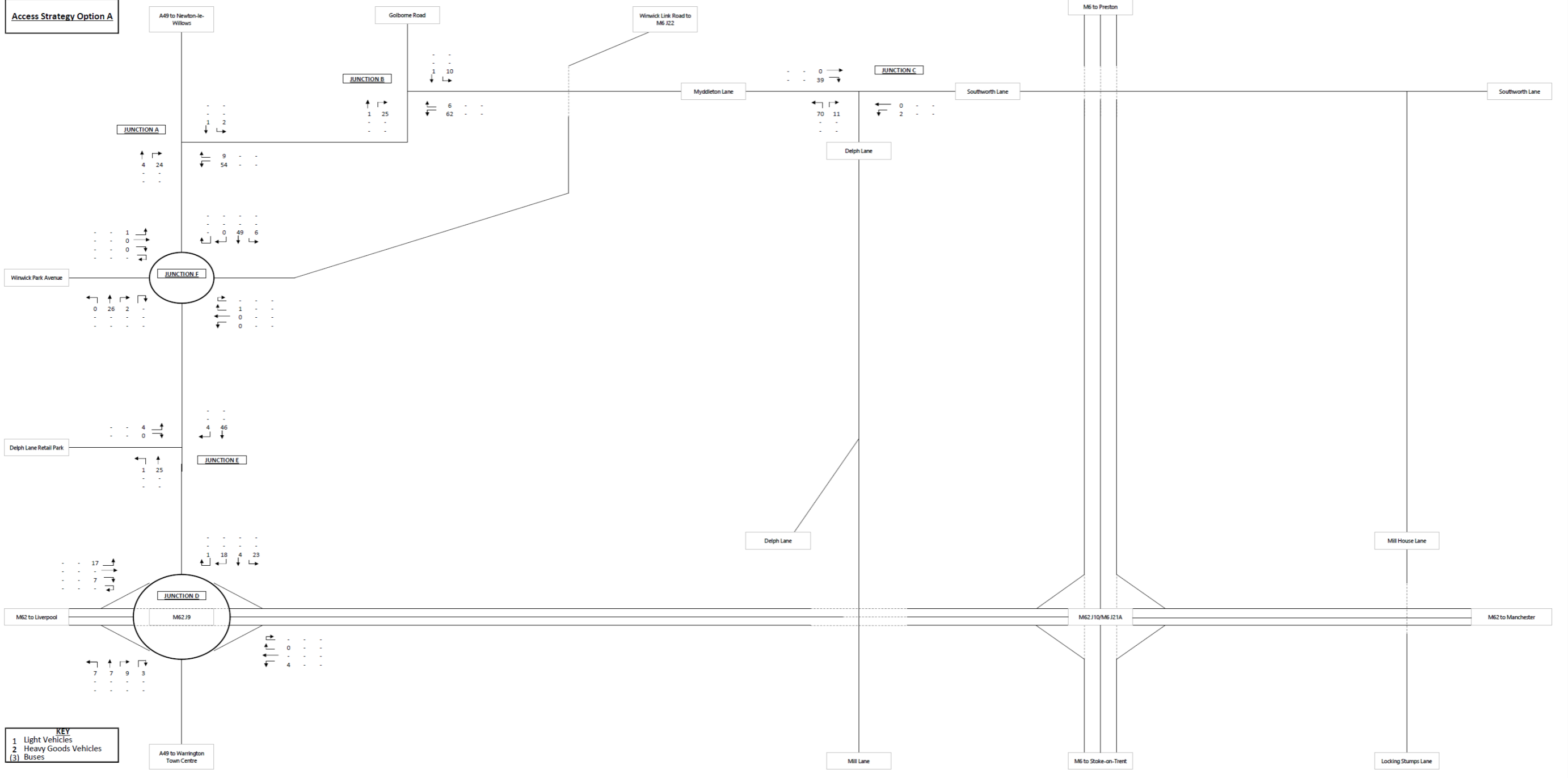
TITLE:
**M62 J9 POTENTIAL E/BOUND ON-SLIP
 IMPROVEMENTS - OVERVIEW**

DATE:	DRAWN BY:	CHECKED:
08/09/20	AH	FB

APPENDIX E:

PEEL HALL DEVELOPMENT TRIPS

Access Strategy Option A

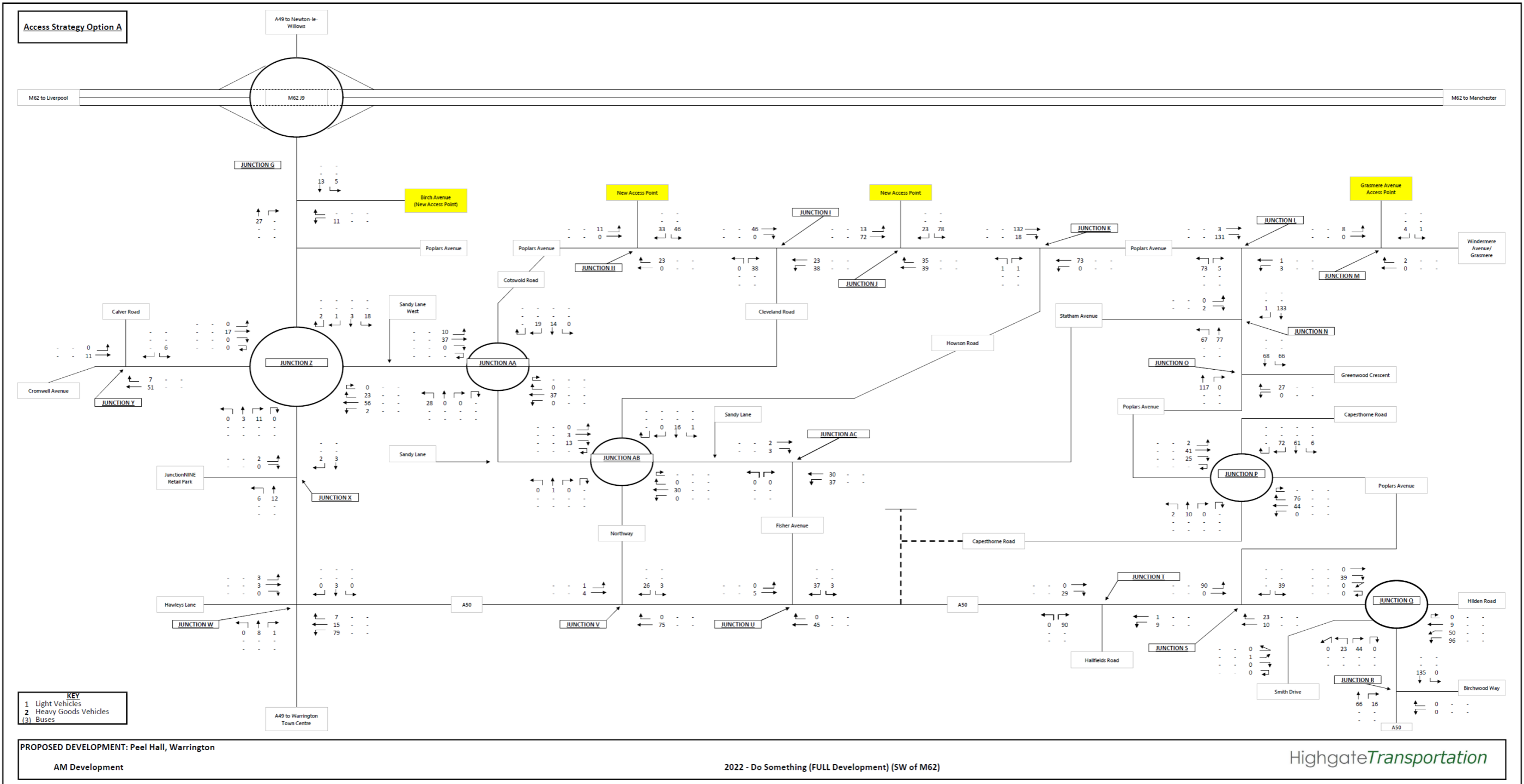


KEY
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 2 Heavy Goods Vehicles
 (3) Buses

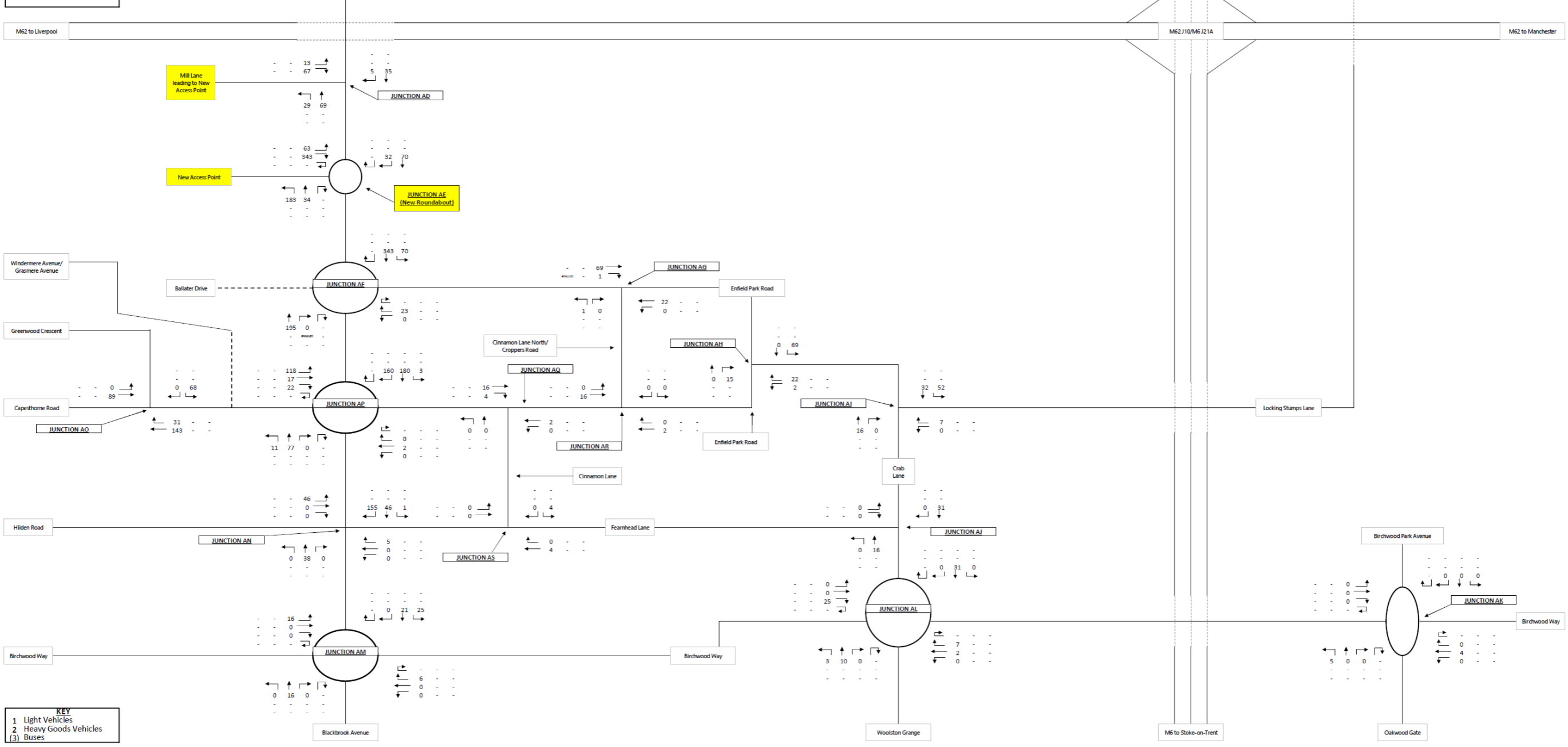
PROPOSED DEVELOPMENT: Peel Hall, Warrington
 AM Development

2022 - Do Something (FULL Development) (N of M62)

HighgateTransportation

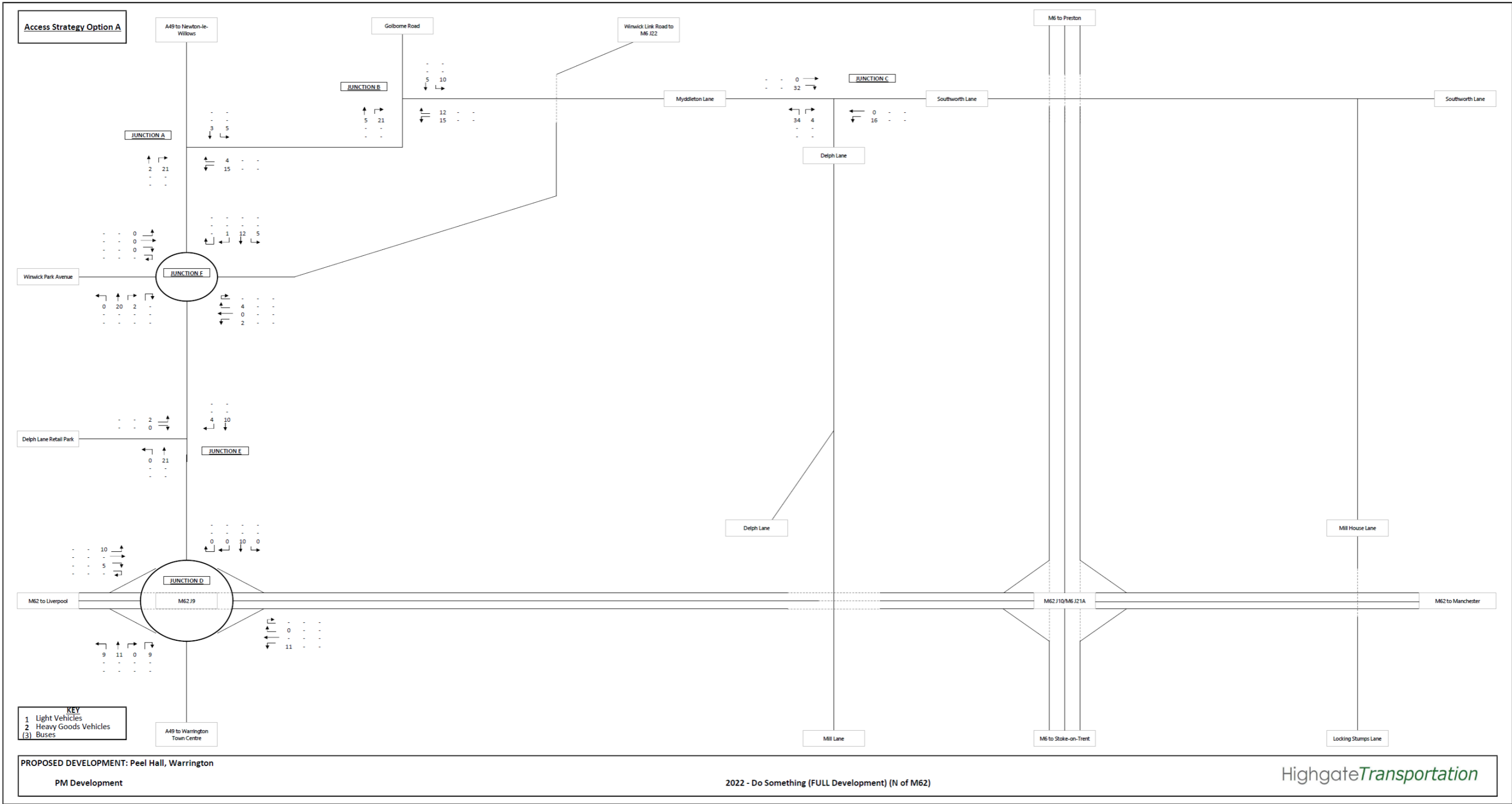


Access Strategy Option A

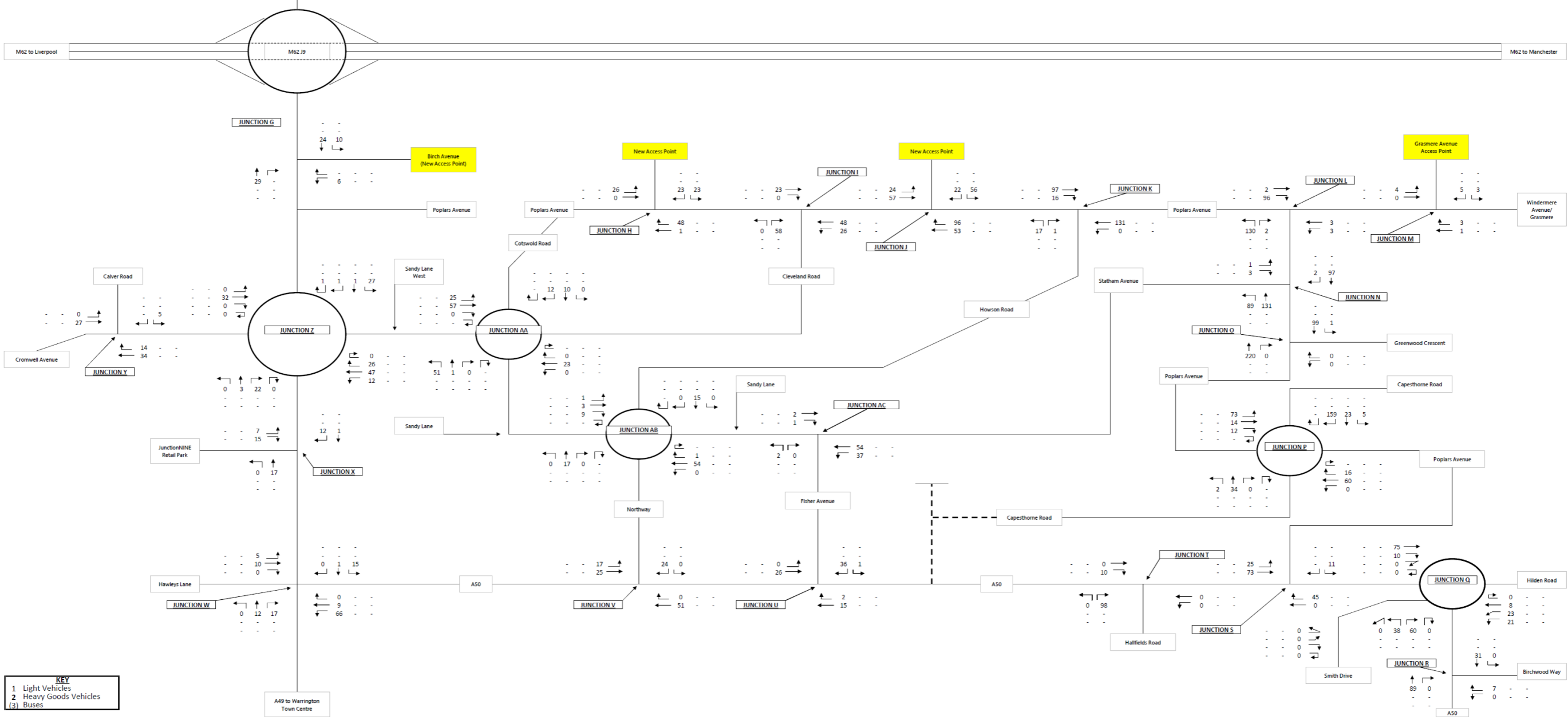


PROPOSED DEVELOPMENT: Peel Hall, Warrington
AM Development

2022 - Do Something (FULL Development) (SE of M62)

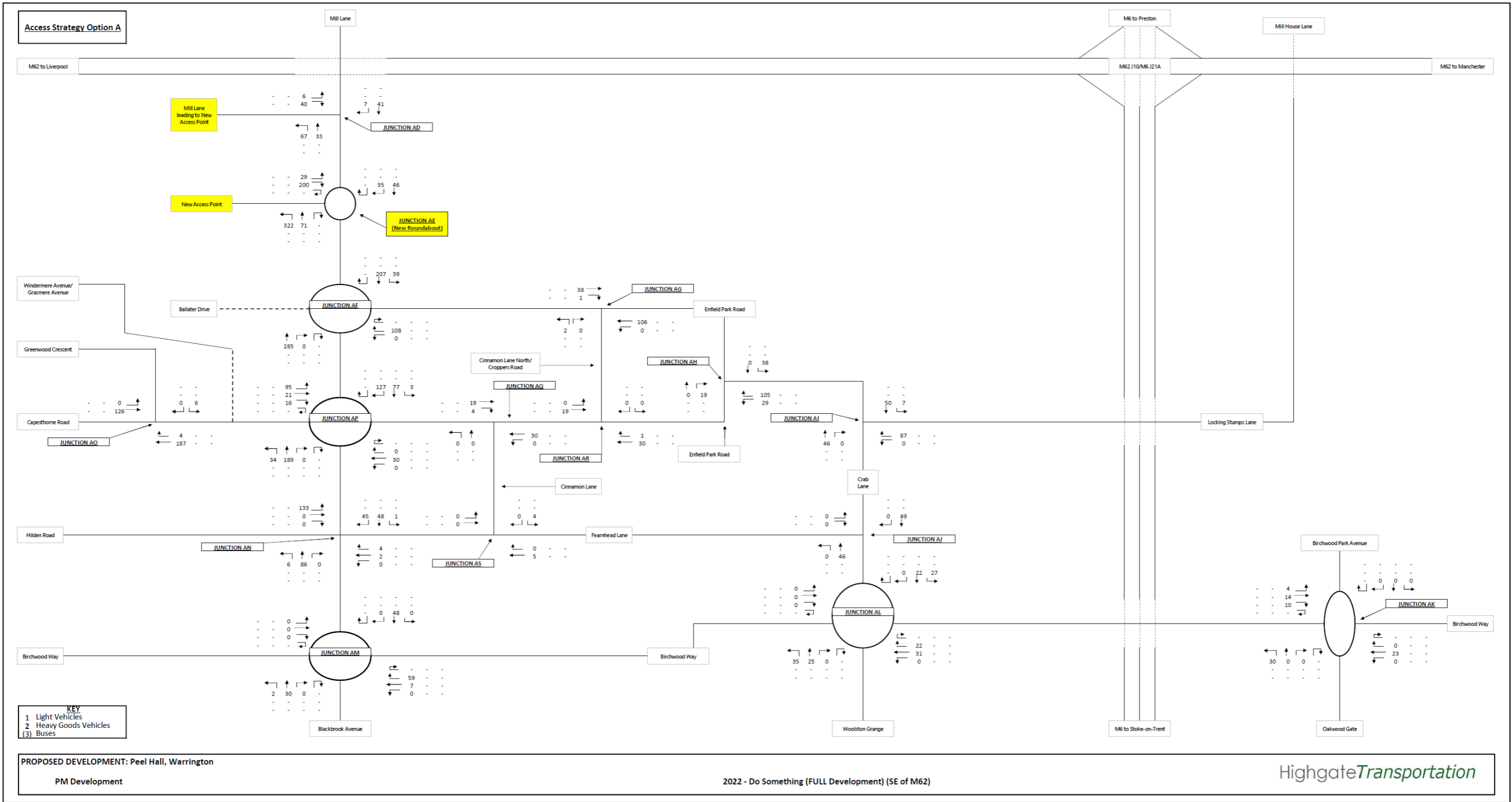


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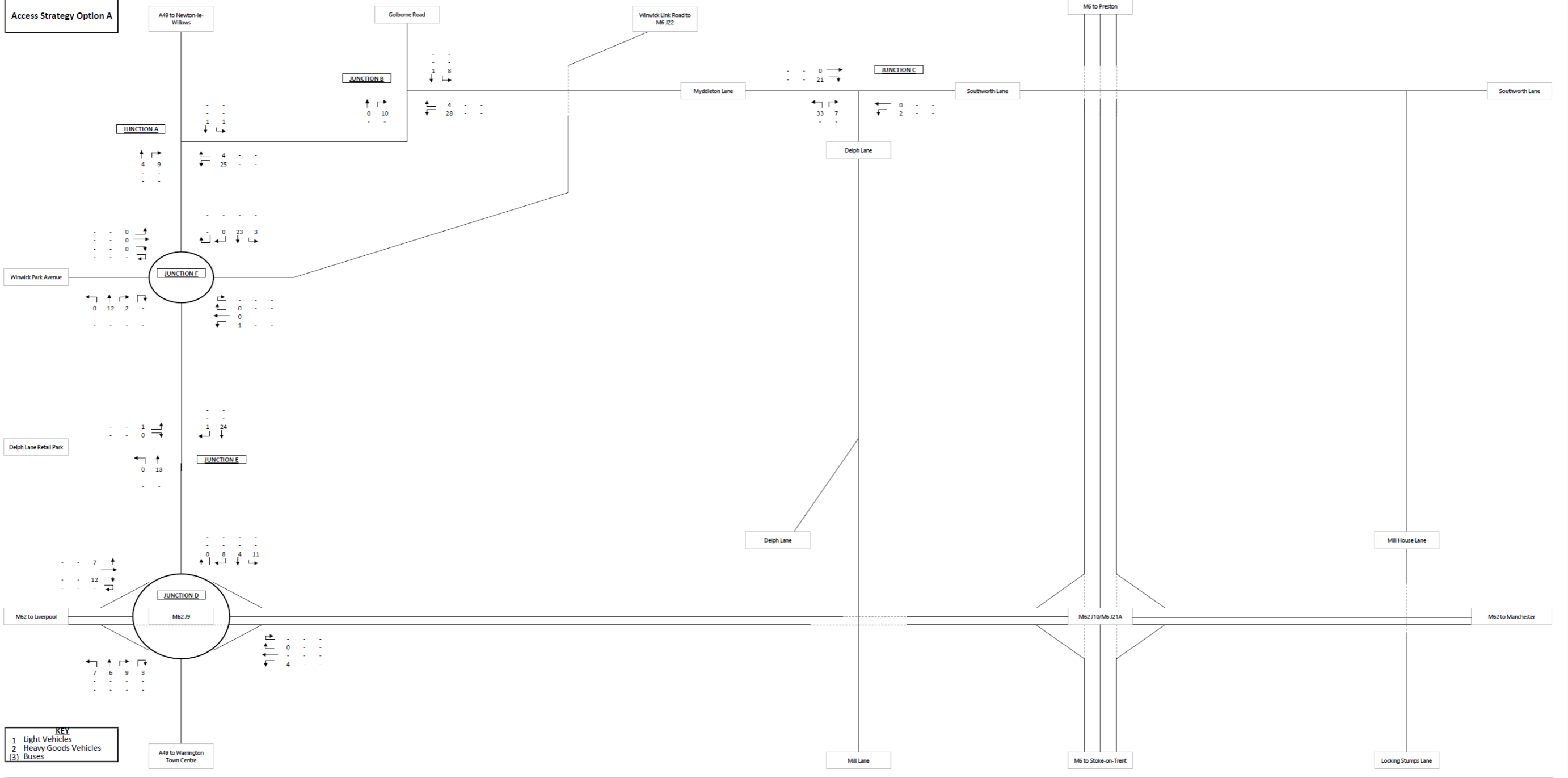


PROPOSED DEVELOPMENT: Peel Hall, Warrington
PM Development

2022 - Do Something (FULL Development) (SW of M62)

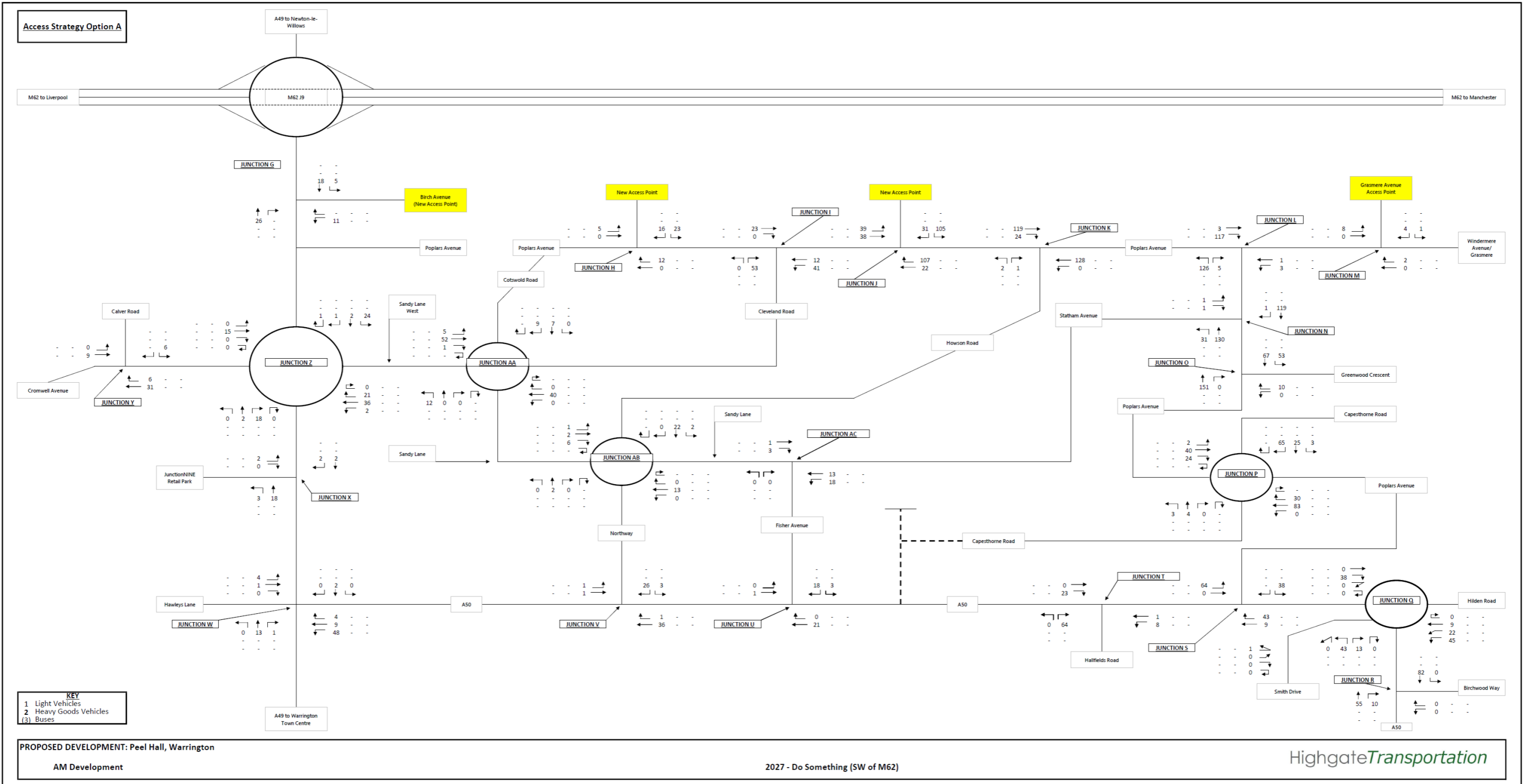


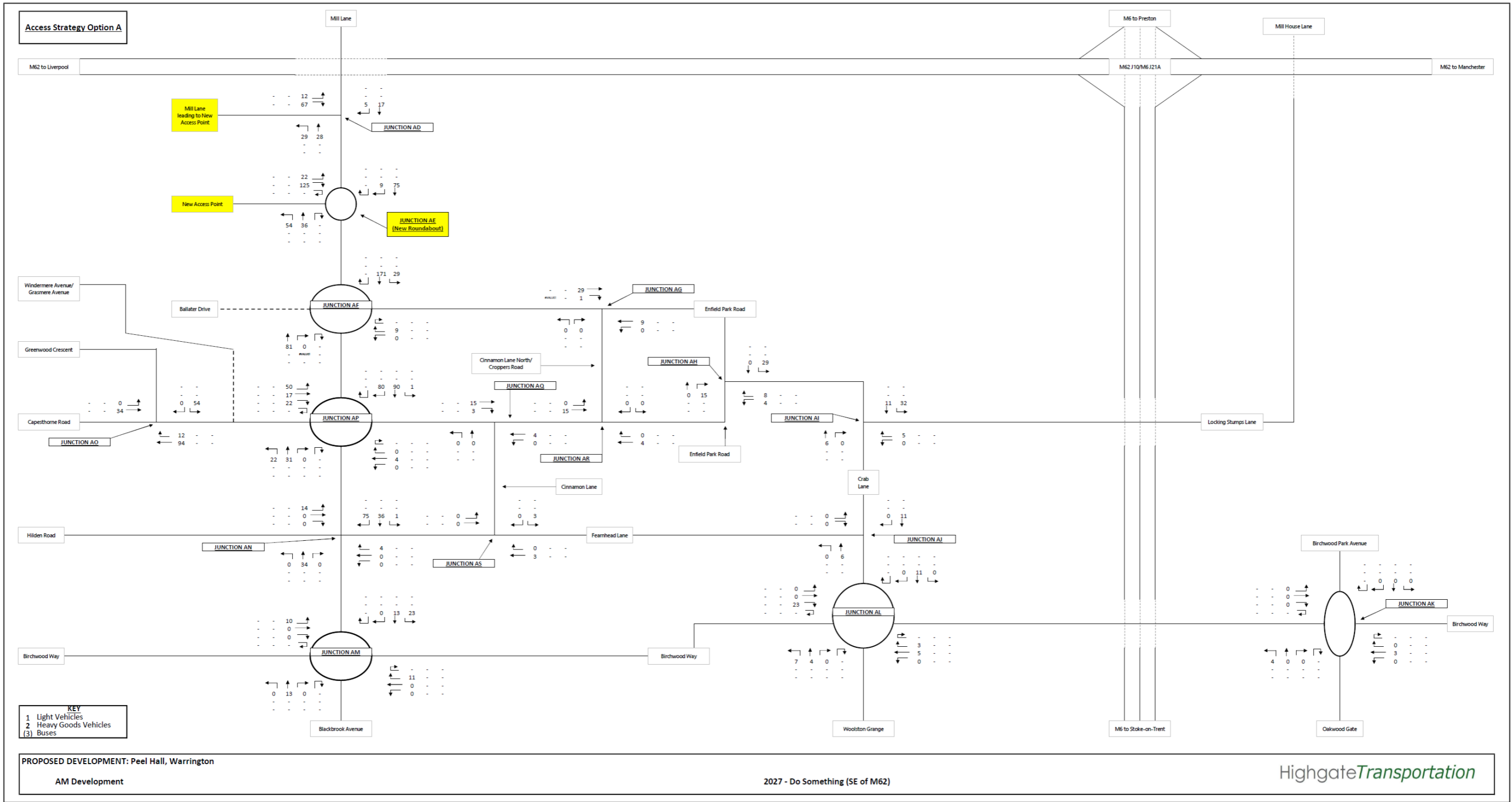
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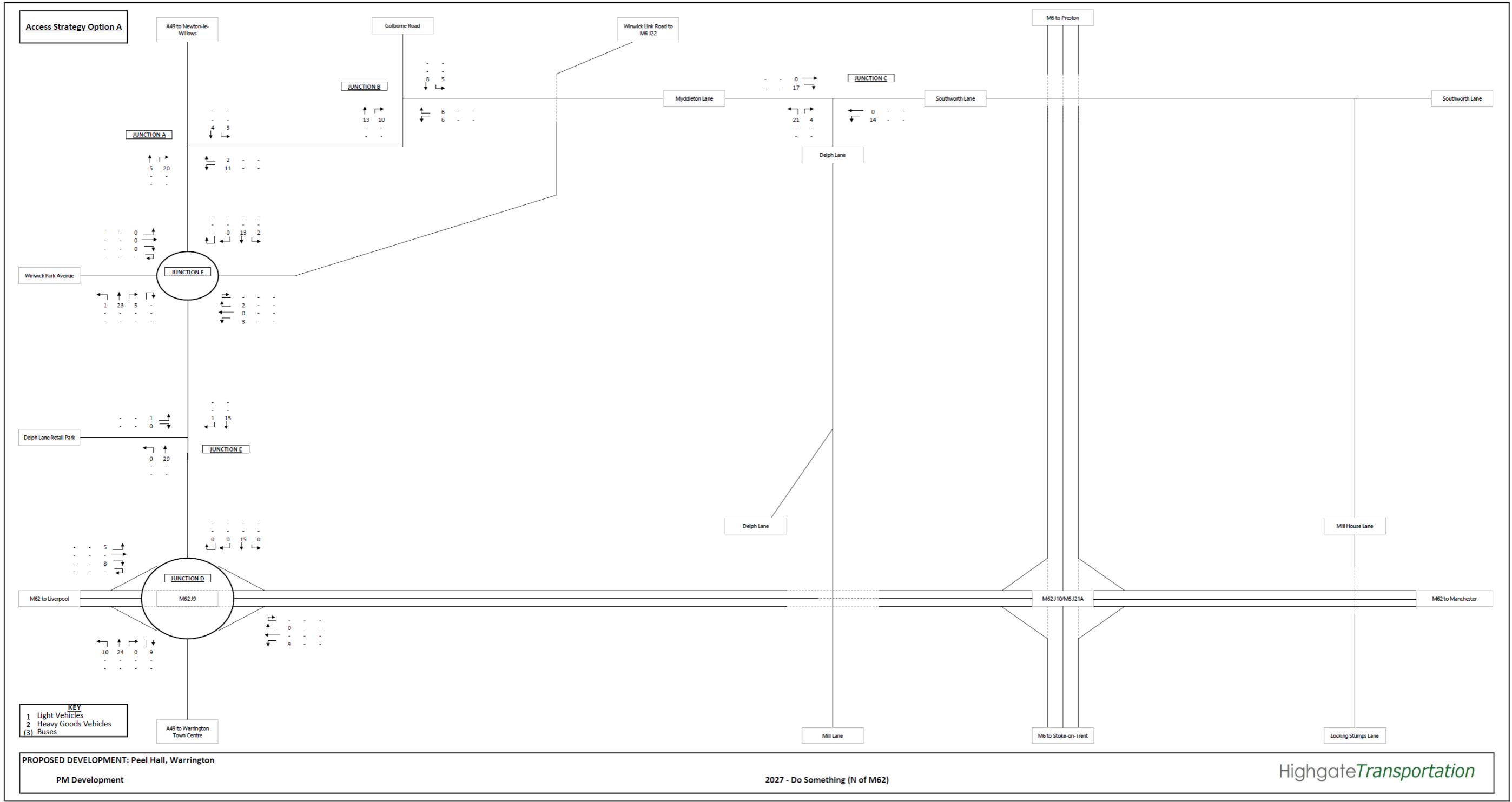


PROPOSED DEVELOPMENT: Peel Hall, Warrington
 AM Development

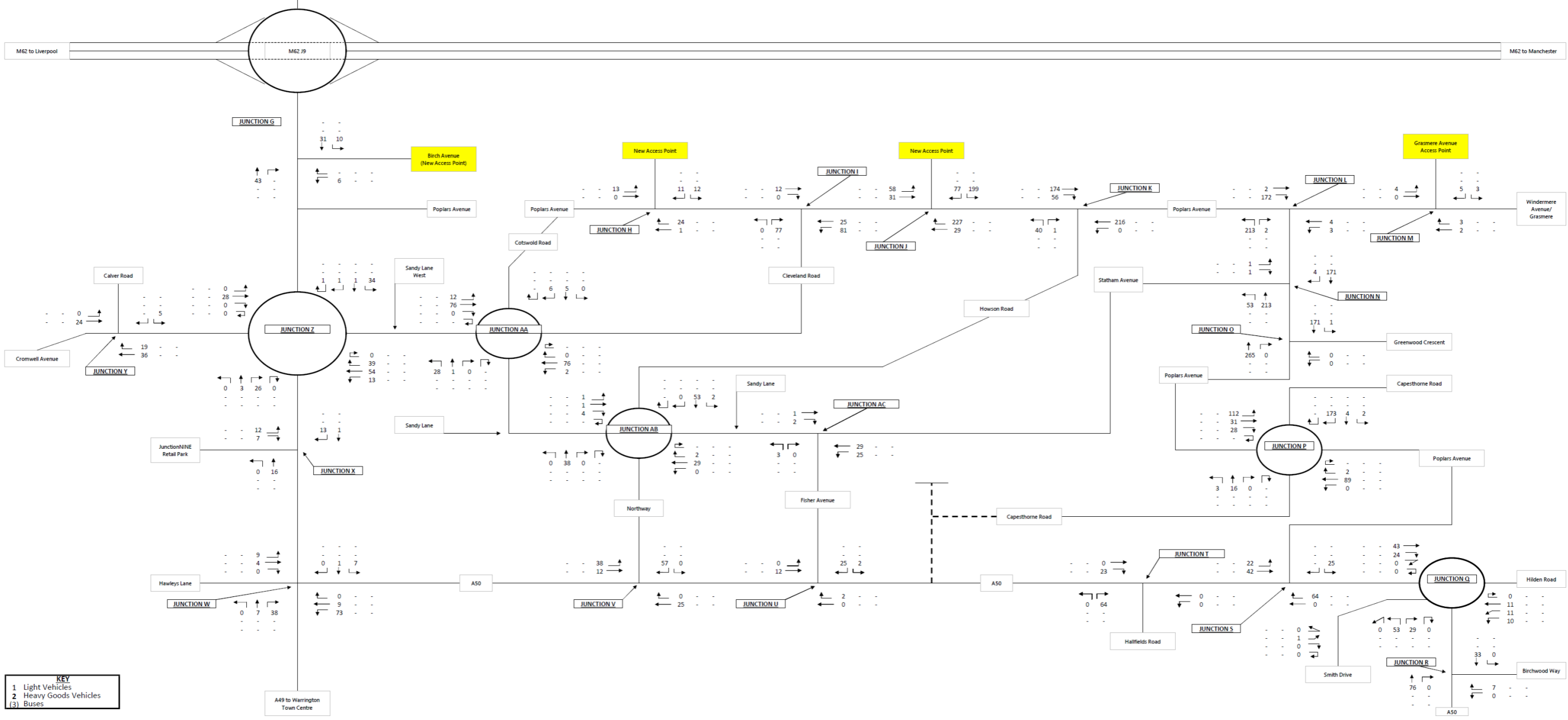
2027 - Do Something (N of M62)





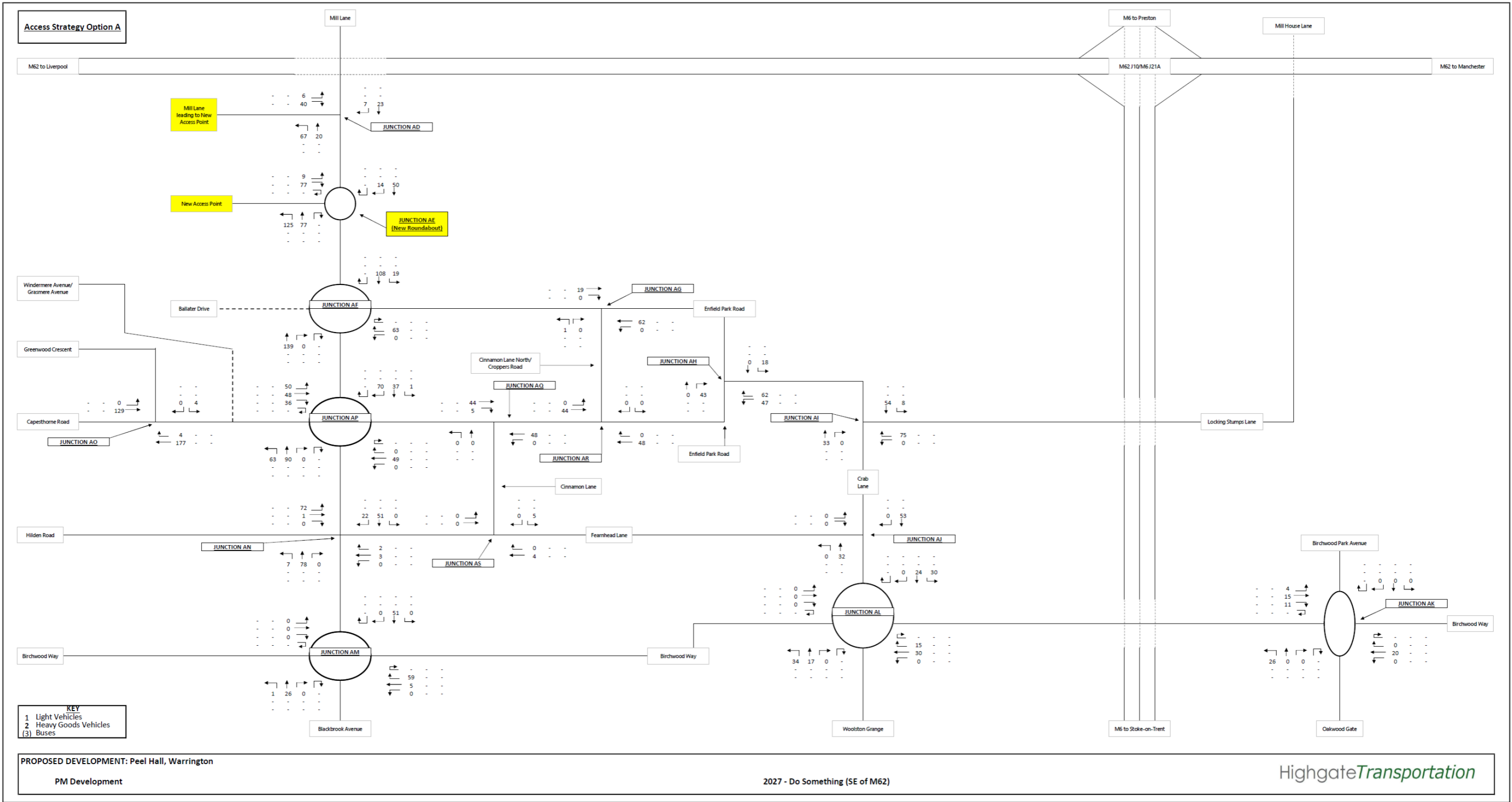


Access Strategy Option A

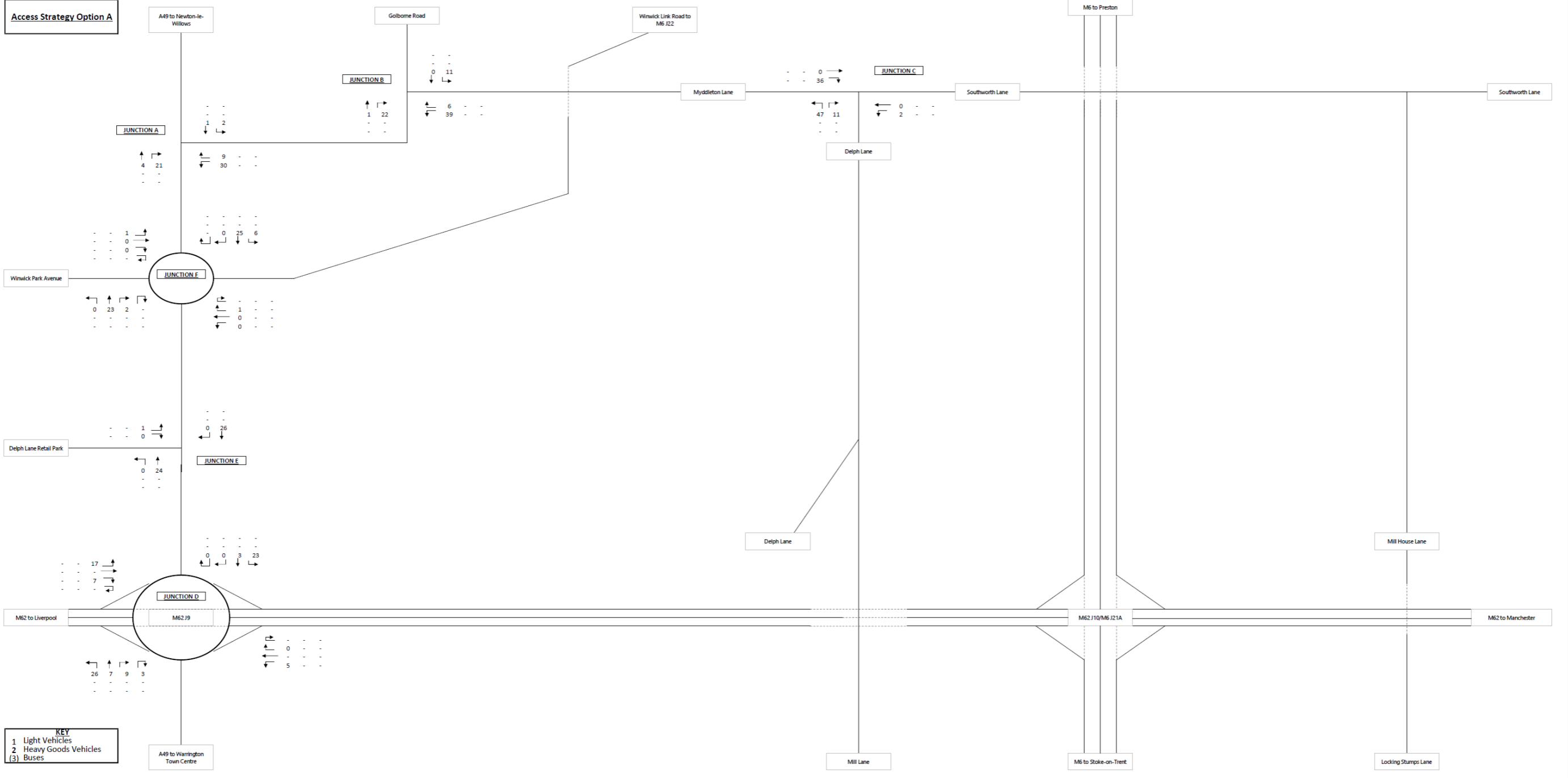


PROPOSED DEVELOPMENT: Peel Hall, Warrington
PM Development

2027 - Do Something (SW of M62)



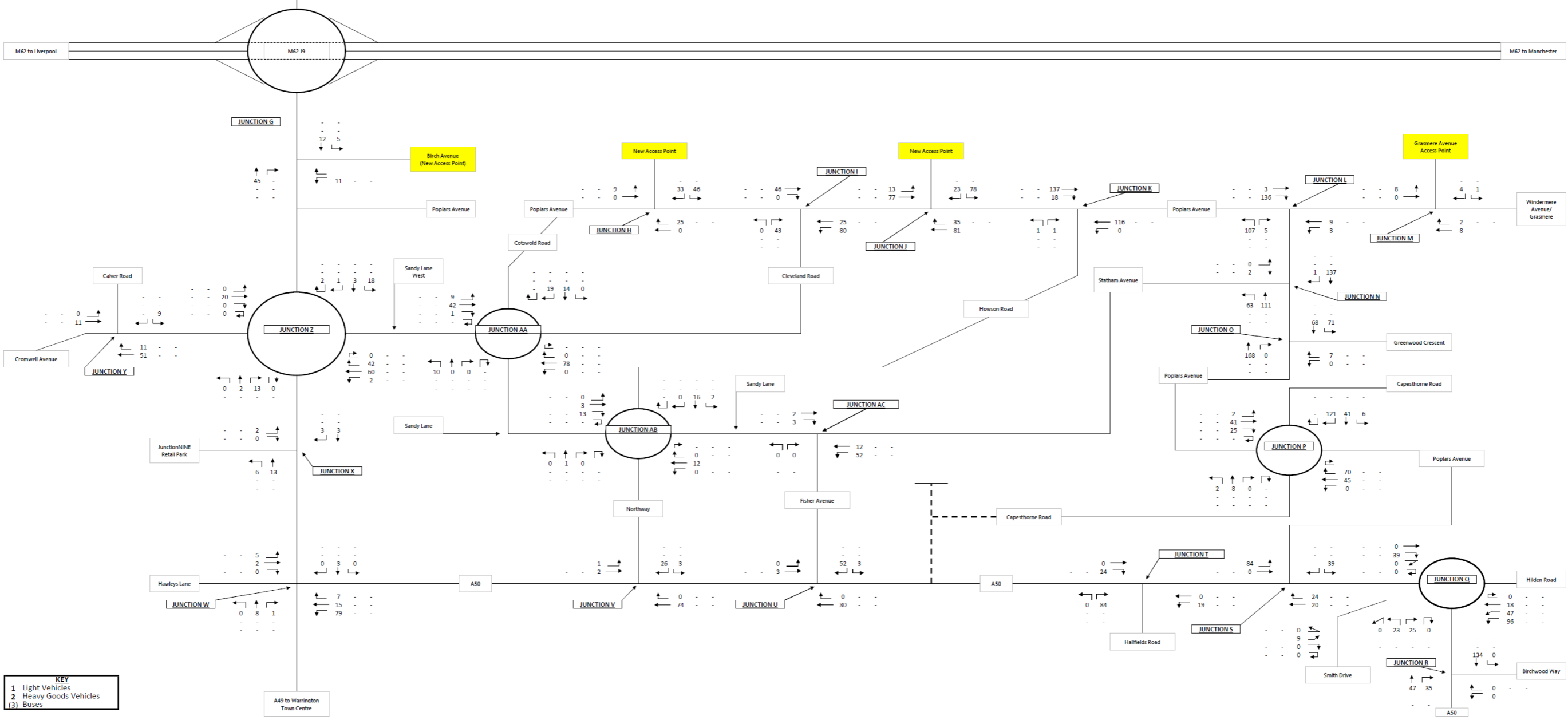
Access Strategy Option A



PROPOSED DEVELOPMENT: Peel Hall, Warrington
 AM Development

2032 - Do Something (FULL Development) (N of M62)

Access Strategy Option A

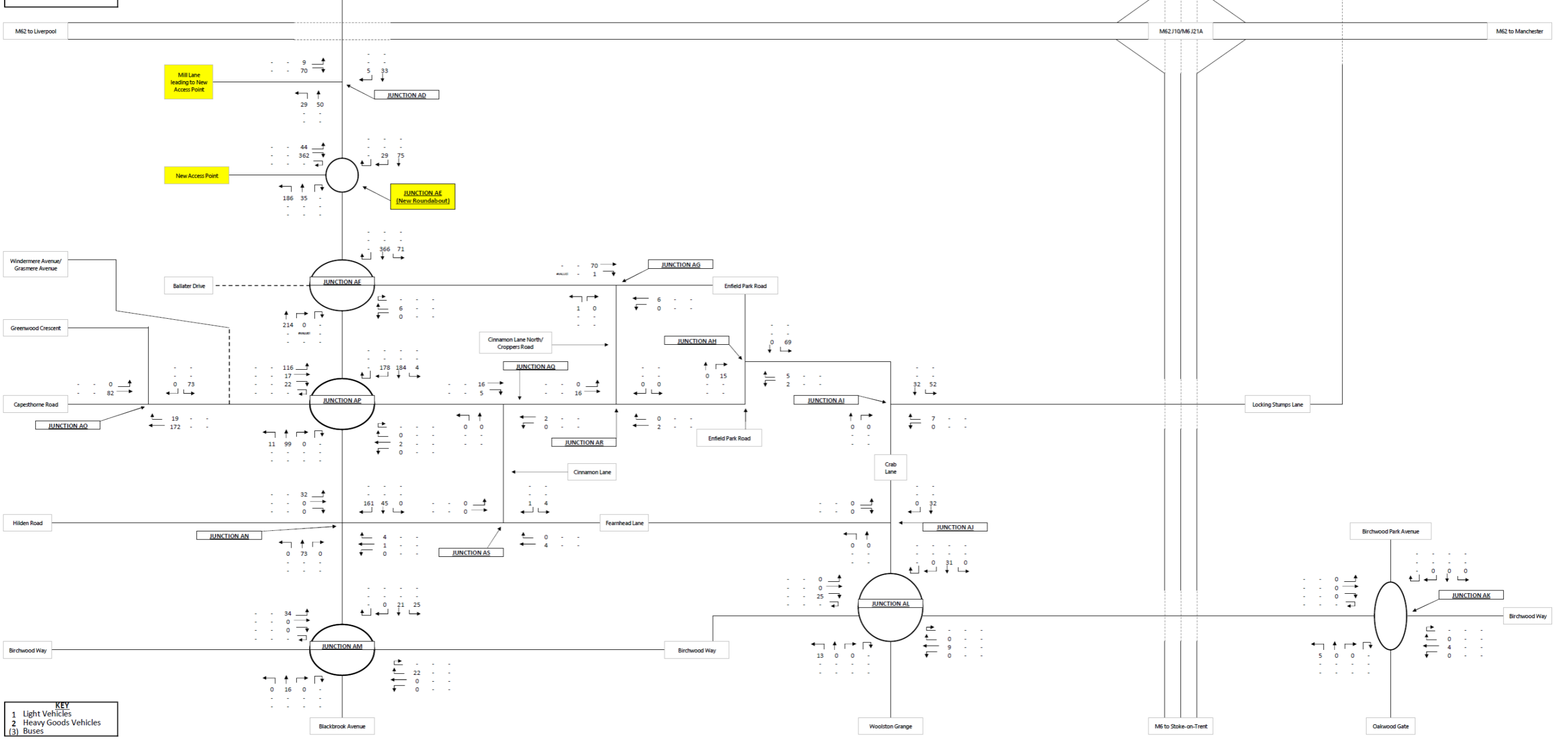


PROPOSED DEVELOPMENT: Peel Hall, Warrington
AM Development

2032 - Do Something (FULL Development) (SW of M62)

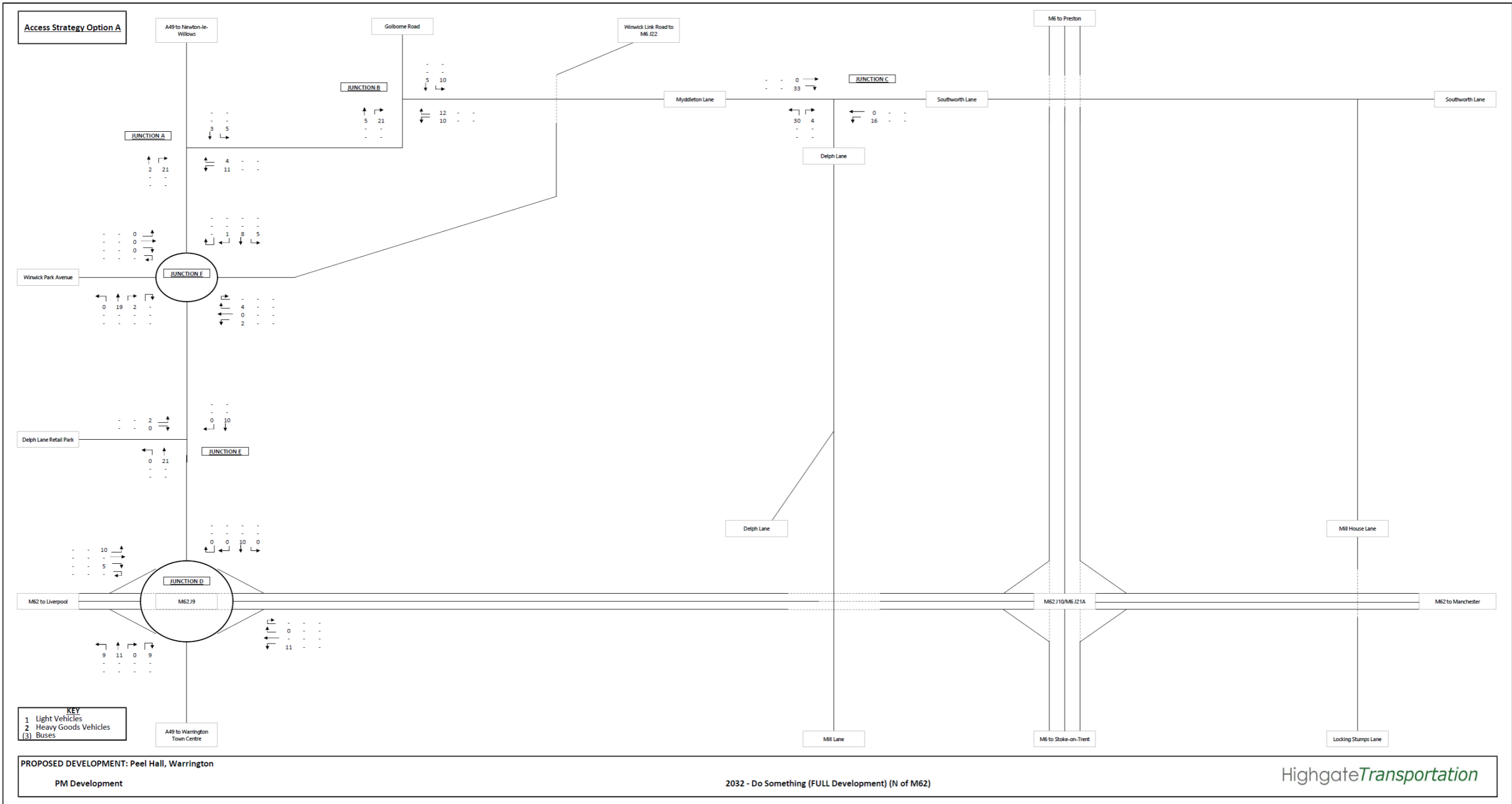
HighgateTransportation

Access Strategy Option A

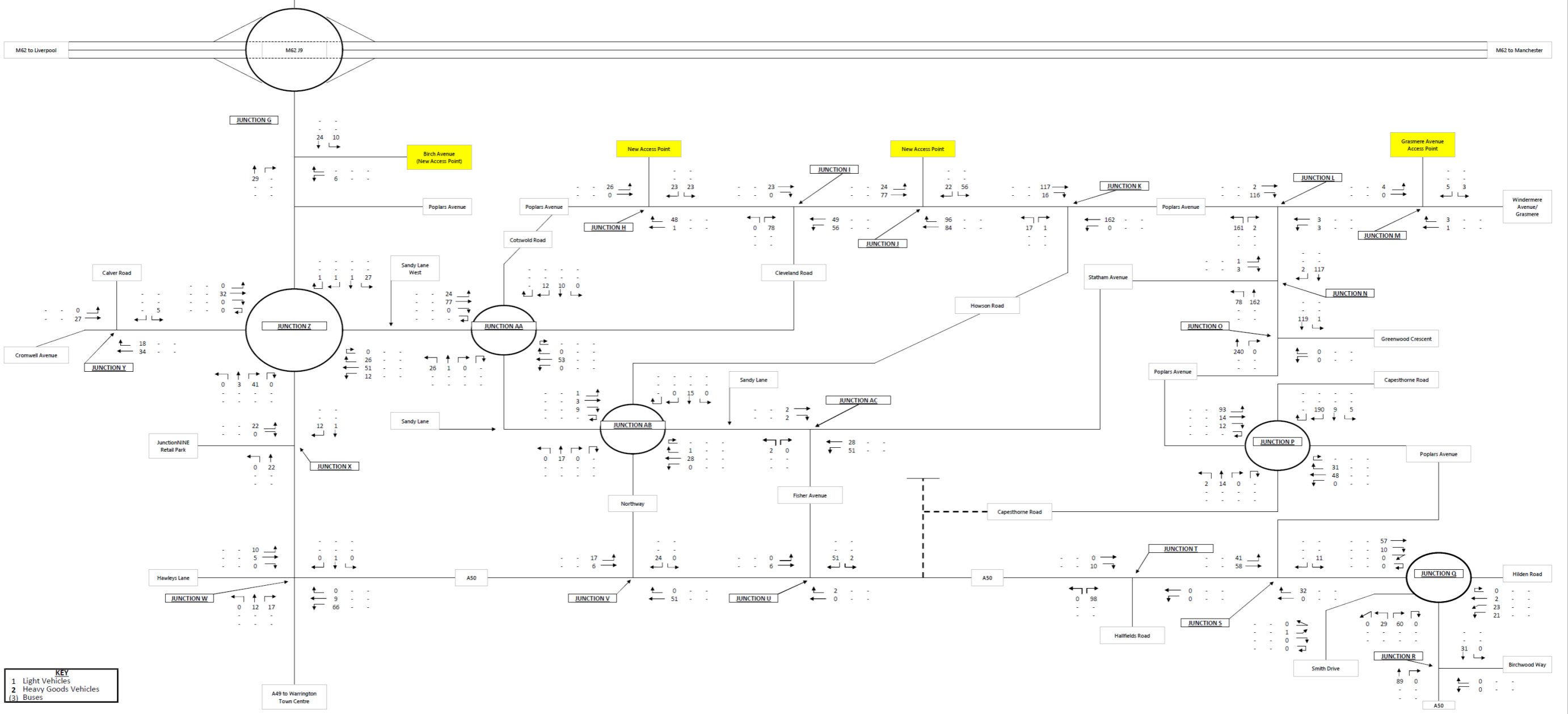


PROPOSED DEVELOPMENT: Peel Hall, Warrington
AM Development

2032 - Do Something (FULL Development) (SE of M62)



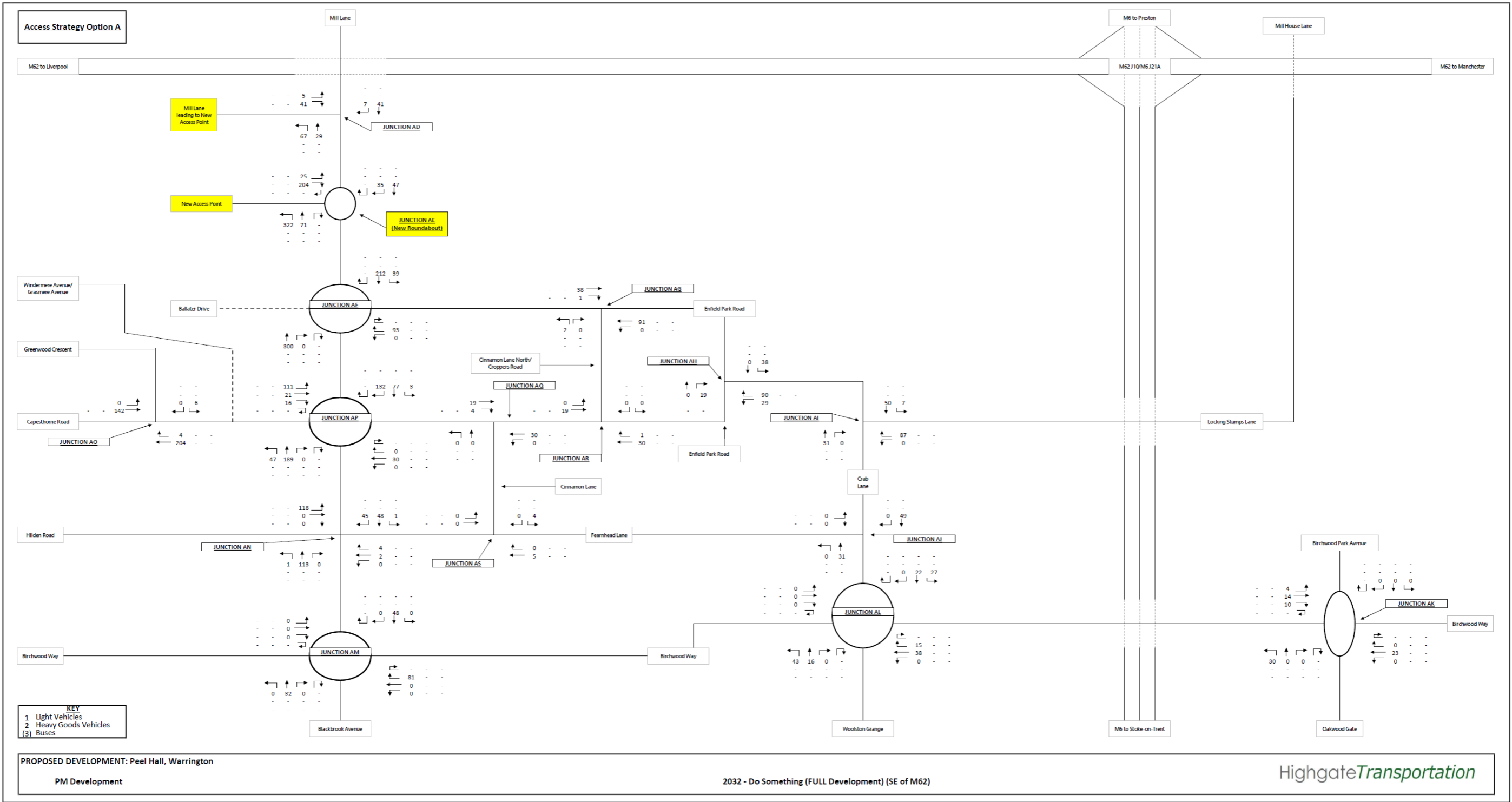
Access Strategy Option A



KEY
 1 Light Vehicles
 2 Heavy Goods Vehicles
 3 Buses

PROPOSED DEVELOPMENT: Peel Hall, Warrington
 PM Development

2032 - Do Something (FULL Development) (SW of M62)



APP34 -

Peel *Hall* HE-Atkins Future Years VISSIM *Review*

Subject: RE: Peel Hall, Warrington.
Date: Tuesday, 12 January 2021 at 08:21:35 Greenwich Mean Time
From: Heywood, Robert
To: Colin Griffiths, 'fiona.bennett@highgatetransportation.co.uk'
CC: 'jim.sullivan@hotmail.co.uk', 'Spencer Tewis-Allen', 'Carney, Matthew', 'dave.tighe@highgatetransportation.co.uk', 'Taylor, Mike', 'Gallagher, Niki', 'Skinner, Helen', 'Hughes, Martha', 'Clisby, Paul'
Attachments: image001.png, image002.png, image003.jpg, 5188540.078 Review of Proposed Mitigation.pdf, 5188540.078 Peel Hall Vissim Review.pdf

Fiona/Colin,

Based on the latest submission to date, the Base Vissim model has been found to be of a reasonable standard along the main study corridor in the area of interest to Highways England. The base model is recommended as fit-for-purpose in the area of interest to Highways England whilst caution will have to be applied to the interpretation of any modelling results along the M62 mainline and slip roads, particularly in the evening peak period.

The Proposed Vissim model coding and data input is deemed reasonable, however, concerns have been raised with respect to the proposed traffic signal optimisation strategy at the M62 junction 9 motorway junction, and also the stated Hollins Lane junction capacity as part of the committed development scheme.

Given that WBC have confirmed that they are unable to accept the proposed signal optimisations at M62 J9 with the information supplied we would need to wait until such information is provided to WBC to allow them to reach a conclusion that they are in a position to accept the proposed traffic signal optimisation strategy. Or an alternative mitigation measure to M62 J9 will need to be proposed and accepted by all parties before we are able to confirm the appropriateness of any such mitigation to the SRN.

In the mean time I attach the Vissim review and technical note produced by Atkins on our behalf.

Kind regards,

Rob

Robert Heywood, Route Manager
Network Development & Planning Team
Highways England | Atlantic House | Birchwood Boulevard | Warrington | WA3 7WE
Mobile: + 44 (0) 7785 925 993
Web: www.highwaysengland.co.uk

From: Colin Griffiths [mailto:colin@satnam.co.uk]
Sent: 11 January 2021 11:01
To: 'Taylor, Mike' <mike.taylor@warrington.gov.uk>; 'Gallagher, Niki' <Niki.Gallagher@warrington.gov.uk>; 'Skinner, Helen' <HELEN.SKINNER@planninginspectorate.gov.uk>; 'Hughes, Martha' <Martha.Hughes@warrington.gov.uk>; 'Clisby, Paul' <pclisby@warrington.gov.uk>
Cc: 'jim.sullivan@hotmail.co.uk' <jim.sullivan@hotmail.co.uk>; 'Spencer Tewis-Allen' <spencer.tewis-allen@townlegal.com>; 'Carney, Matthew' <Matthew.Carney@warrington.gov.uk>; 'fiona.bennett@highgatetransportation.co.uk' <fiona.bennett@highgatetransportation.co.uk>;

Our reference: 5188540.078

Your reference: NW086 20/21

Robert Heywood
Highways England
Piccadilly Gate
Store Street
Manchester
M1 2WD

atkinsglobal.com
[snclavalin.com](https://www.snclavalin.com)

14 December 2020

Dear Rob

Re: Review of Peel Hall Modelling Information

Atkins has been commissioned by Highways England to audit a Vissim model with supporting Local Model Validation Report (LMVR) and a range of technical notes, which have been produced by The Modelling Group (TMG). TMG are working on behalf of Highgate Transportation (HT) who has been commissioned by Satnam Millennium Ltd (Satnam) in support of a proposed development of land at Peel Hall in Warrington. The relevant Planning Authority for this submission is Warrington Borough Council (WBC)

Background

There is a long planning history to this project and Atkins have provided several reviews in the past as well as providing supporting information to the 2018 Public Inquiry (LPA reference: 2016/28492, PINS reference: APP/M0655/W/17/3178530). Since the previous Public Inquiry, a number of submissions have been issued to Highways England and the latest document reviews include:

- A review of a submitted Addendum to the previously submitted Transport Assessment (HTp/1107/01/A dated January 2018), in support of the proposals for a new residential neighbourhood on land at Peel Hall to be considered at a forthcoming reopened Public Inquiry. This review was issued on 15th April 2020 and included a further review of the Vissim modelling.
- A review of a submitted documents that make up part of a second Addendum to the Environmental Statement (ES Addendum 2). The following documents (in PDF) were reviewed in a letter issued on 5th June 2020:
 - 1820_Peel Hall- ES Non-Technical Summary- Volume 7;
 - 1820_Peel Hall- Environmental Statement ADDENDUM 2 - Volume 8- 2020; and
 - 1820_Peel Hall- ES Documents and Figures- Volume 9- Part 1 and 2- 02.04.20.
- A review of a submitted base Vissim model and supporting LMVR. This review was issued on 5th June 2020.
- A review of a revised base Vissim model, supporting LMVR and the spreadsheets relating to the conversion of future year flows from a SATURN model for use in the Vissim model for scenarios creation. This review was issued on 31st July 2020.
- A review of the revised base Vissim model, proposed Vissim model, supporting documents and technical notes produced. This review was issued on 7th September 2020.
- A review of the revised base Vissim model and supporting LMVR. This review was issued on the 30th October 2020, following which the base Vissim was accepted by both Highways England and WBC.

Submitted Documentation

HT submitted the following documentation and model files on the 2nd December 2020:

Vissim Model

- Vissim model '2019AuditedBase_v6Final' which includes the base models and 18 different modelled future scenarios which cover both morning and evening peak periods;

Other documents

- Technical Note 'MG0123_A49WarringtonCorridor_OptionA_ModellingReport_v6.3';
- Spreadsheet 'MG0123_A7*Warrington_VISSIM_CalVal_v6';
- Spreadsheet 'MG0123_A49Warrington_PeelHallOptA_Results_v6.2';
- Spreadsheet 'BaseModelRatioBalances';
- Spreadsheet 'Link Flow Summary Strategy A_HTp_M62 Summary';
- Spreadsheet 'MG0123_A49Warrington_PeelHall_DevFlowInputs_v1';
- Spreadsheet 'MG0123_Lin2VIS_MtxConv_SATVISSIM_FY_v10'; and
- Spreadsheet 'MG0123_Lin2VIS_MtxConv_SATVISSIM_FY_v10_ODmatrix_Result'.

The above documents have been reviewed under the following sub-headings.

Peel Hall Vissim Model – Base Model Review

It should be noted at the outset that, as with previous reviews, this review focuses on the parts of the network that are of primary interest to Highways England. As such, it cannot be said that Highways England agrees or disagrees with any part of the work that does not fall under that heading. Overall, the Vissim base model looks to be of a reasonable standard along the main study corridor. A number of issues which have been noted in the previous reviews have now been addressed in the previous submission dated 16th October 2020.

In the latest submission, it has been noticed that the vehicle input zone names have been amended to reflect the LinSig Zone names, rather than Parking Lot reference. This is a welcome refinement and this naming convention provides the same reference point and avoid any confusion for future reference. Such zoning label amendments do not have any adverse impact on the calibration and validation of the previous accepted base model and hence the base model is recommended to be fit for purpose for this scheme evaluation in the area of interest to Highways England.

Traffic flow Conversion Process

Following discussions with TMG and subsequent reviews on the additional evidence provided previously, the latest version of the excel spreadsheets have been amended with relevant naming conventions to improve data reference clarity. The 'Vehicle Input' flows have been examined and traffic flow irregularities have been highlighted as follows:

- Between the base and future year model periods, a relatively steady increase in traffic volume would be expected to reflect the background traffic growth across all Vehicle Inputs. However, between the future years of 2022, 2027 and 2032, various traffic growth rates have applied ranging from 2% to 31% for each of the traffic entry point notwithstanding the following further anomalies.
- The 'Vehicle input' has been reduced in volume by 50% for Birch Avenue (Zone H) in the morning peak period between 2027 DS and 2032 DS scenarios, with an absolute difference in a region of 50 cars, whilst no changes in traffic volume in the evening peak period between the two future year scenarios.
- The 'Vehicle input' from Winwick Park Avenue (Zone L) experiences a constant year-on-year increase, with an exception between 2022 DS and 2027 DS evening peak scenarios where a 40% reduction of traffic volume is predicted, with a net difference in the region of 80 cars.
- The total number development trips in future year 2027 is significantly less than those values applied to years 2022 and 2032 to reflect the Part Development scenario.

With relation to above, following closer investigation, it is agreed that the traffic irregularities were a direct reflection of the traffic flow distribution impact taken directly from the WMMTM16 SATURN model without adjustment. Albeit the flow discrepancies outlined above, the overall model traffic flow inputs are deemed acceptable on this occasion for this transport assessment scheme evaluation.

Peel Hall Vissim Model – Proposed Model Review

In the latest model submission, a total of 18 different future year scenarios have been provided to cover both the morning and evening peak periods:

- 2022 Background & Committed Traffic Growth + Committed Mitigation Measures (Reference Case)
- 2022 Background & Committed Traffic Growth + Peel Hall Development Traffic (Full Development Scenario) + Committed & Proposed Mitigation Measures (Proposed Test)
- 2022 Background & Committed Traffic Growth + Peel Hall Development Traffic (Full Development Scenario) + Committed & Proposed Mitigation Measures + M4 Mitigation Package (Mitigation Test)
- 2027 Background & Committed Traffic Growth + Committed Mitigation Measures (Reference Case)
- 2027 Background & Committed Traffic Growth + Peel Hall Development Traffic (Part-Build Out with no Internal Link Development Scenario) + Committed & Proposed Mitigation Measures (Proposed Test)
- 2027 Background & Committed Traffic Growth + Peel Hall Development Traffic (Part-Build Out with no Internal Link Development Scenario) + Committed & Proposed Mitigation Measures + M4 Mitigation Package (Mitigation Test)
- 2032 Background & Committed Traffic Growth + Committed Mitigation Measures (Reference Case)
- 2032 Background & Committed Traffic Growth + Peel Hall Development Traffic (Full Development Scenario) + Committed & Proposed Mitigation Measures (Proposed Test)
- 2032 Background & Committed Traffic Growth + Peel Hall Development Traffic (Full Development Scenario) + Committed & Proposed Mitigation Measures + M4 Mitigation Package (Mitigation Test)

It should be again noted that this review focuses on the parts of the network that are of primary interest to Highways England, including the immediate junctions north and south of the M62 junction 9. As such, it cannot be said that Highways England agrees or disagrees with any part of the work that does not fall under that heading.

Traffic Flows / Method of Assignment

In summary, the overall principle of using the SATURN modelled future year scenarios to derive Vissim inputs is deemed appropriate, albeit the complex process could have been significantly simplified if TMG had retained the dynamic assignment from the original Vissim model as it would have been significantly easier for the matrices to be directly matched to SATURN cordon matrices. As discussed under **Traffic flow Conversion Process**, a number of traffic flow entry irregularities have been outlined in the above section. The traffic flows applied in the Vissim model largely follow the predicted traffic flow pattern for each of the SATURN modelled future year scenarios, therefore the traffic flows are considered representative for this transport assessment.

Use of Modifications

As suggested in our previous review(s), the number of modifications has been significantly reduced and appropriate file names have now been given. This makes the model easier to follow for both the model builder and auditor(s). Each modification has been reviewed and the model set up seems appropriate.

Network Layout Coding – Committed Development Schemes

According to the Technical Note 'MG0123_A49WarringtonCorridor_OptionA_ModellingReport_v6.3', the Committed Mitigation Measures scenarios incorporate the following schemes:

- **A49 Newton Road / Hollins Lane Junction** – although this junction is outside of the modelled network extents, the effects of delays at this location form part of the base model validation (through the use of reduced speed areas on the exiting link to replicate vehicle speeds/delays). As a result of committed future mitigation measures in this location, modelling results from the document 'Former Parkside Colliery, Newton-le-Willows WPC Post Submission Highway Response 1' were used to alter the reduced speed area profiles, in order to match the stated improvement to northbound capacity through the junction as a result of a left-turn filter lane being added and the junction being optimised.
- **A49 Newton Road / Winwick Link Road Junction (Winwick Island)** – Widening of northbound and southbound approaches on Newton Road, widening of westbound approach from Winwick Link Road including a segregated left turn lane. Also included, is widening of the circulatory carriageway.
- **A49 Newton Road / Delph Lane Junction** – Additional lane for Newton Road northbound, including widened exit merge.
- **Nine Retail Park Junction** – Widening of Winwick Road northbound to facilitate a dedicated left turn lane into the retail park, Widening of Winwick Road southbound to extend the existing dedicated right turn lane into the retail park.

The modelling of each of the above schemes is discussed under the following sub-headings.

A49 Newton Road / Hollins Lane Junction

As explained in Technical Note 'MG0123_A49WarringtonCorridor_OptionA_ModellingReport_v6.3', reduced speed area no. 1458 has now been amended to reflect the stated improvement to northbound capacity through the modified junction as a result of a left-turn filter lane being added and the junction timings being optimised. The reduced speed area has been adjusted from 6 – 13.25 mph in the base model to 12 – 15 mph under the committed development scheme improvement. This has effectively increased the traffic throughput capacity, allowing more traffic to leave the network to the north, relieve traffic pressure within the Vissim network and subsequently reduce the A49 Section 1 NB journey time.

Based on the information provided in the 'Former Parkside Colliery, Newton-le-Willows WPC Post Submission Highway Response 1', there is limited evidence that the northbound capacity has been increased as stated compared to the baseline situation, therefore it is possible that the journey time analysis may have been over-estimated in the future year scenarios. The result of such should be treated with caution.

A49 Newton Road / Delph Lane Junction

At the A49 Newton Road / Delph Lane Junction, an additional lane for Newton Road northbound, including widened exit merge has been coded in the scenario management modification accordingly and accurately.

A49 Newton Road / Winwick Link Road Junction (Winwick Island)

At the A49 Newton Road / Winwick Link Road Junction (Winwick Island), changes have been made to reflect the proposed scheme which includes widening and a segregated left turn for traffic entering Delph Lane from the Winwick Link Road. Our previous observation with respect to the lack of reduced speed areas on the approaches to the roundabout have been addressed and deemed appropriate.

Nine Retail Park Junction

At the Nine Retail Park Junction, an additional northbound left turn lane along Winwick Road and the new four-lane stop line approach from the retail park have been coded in the scenario management modification accordingly.

Network Layout Coding – Proposed Mitigation Schemes

Two mitigation proposals are tested in all Proposed Mitigation Measures models. Although the proposed mitigation is more extensive, these two sites are the only ones covered by the physical extents of the model. These are as follows:

- **A49 Newton Road / Golborne Road Junction** – Improvements were made to the existing road widths and layout at this junction in order to increase queueing capacity, particularly for right turning vehicles which contribute heavily to the wider impact on the surrounding network.
- **A49 Winwick Road / A50 Long Lane / Hawley’s Lane Junction** – A much more detailed and responsive signal controller was created at this location, in order to allow a more accurate understanding of the potential impacts of planned physical upgrades and improvements to the current vehicle actuated signal control setup.

The modelling of the above schemes is discussed under the following sub-headings.

A49 Newton Road / Golborne Road Junction

At the Golborne Road Junction, an additional northbound right turn pocket along Winwick Road has been coded in the scenario management modification accordingly.

A49 Winwick Road / A50 Long Lane / Hawley’s Lane Junction

At the A49 Winwick Road / A50 Long Lane / Hawley’s Lane Junction, traffic signal infrastructure improvement and upgrade to MOVA operation at the junction is proposed. With regards to the proposed changes to the traffic signal control strategy, a bespoke VAP logic to mimic the vehicle actuated signal control has been prepared and incorporated in different model scenarios accordingly.

Network Layout Coding – Additional M4 Proposed Mitigation Schemes

Two further mitigation proposals have been tested in mitigation model scenarios. The details for the intervention are as follows:

- **A49 Winwick Road / Sandy Lane West / A574 Cromwell Avenue Junction** – The northbound left-turn filter lane from the A49 Winwick Road to Cromwell Avenue was widened to two lanes and extended further south. This was in order to allow more storage space for the heavily used left-turn. An additional benefit to this arrangement is the allowance of a rebalancing of signal green time, providing additional capacity for other approaches.
- **M62 Junction 9** – The eastbound on-slip was widened to a two-lane section exiting the junction. There is also some realignment of the A49 Newton Road southbound approach and circulating carriageway in between to accommodate the additional exit lane. This allowed better lane usage on the northern section of the circulatory carriageway for traffic exiting eastbound onto the M62, with an additional knock-on benefit of allowing a rebalancing of stage green-time.

The modelling of the scheme is discussed below.

A49 Winwick Road / Sandy Lane West / A574 Cromwell Avenue Junction

The new left turn lane widening has been coded in the Vissim network. The Vissim model assumes vehicles travelling along the A574 Cromwell Avenue towards Westbrook and Old Hall will be using both lanes. The intended destination road markings should be clearly shown in the scheme layout, and any feedback from Stage 1 Road Safety Audit would be welcome.

M62 Junction 9

Lane widening on the M62 junction 9 eastbound exit has been coded in the Vissim network. Lane destination markings have been adjusted to allow vehicles to use two lanes within the northern circulatory carriageway to travel eastbound onto the M62 motorway. Stage 1 Road Safety Audit for a previous version of the layout has been undertaken in 2018. The previous layout contains a lane gain on the M62 (east) off slip which has now been removed in the latest version, and the corresponding designer response is deemed acceptable for the new exit lane widening element.

Proposed Mitigation Measures and Development Impact Assessment

As outlined in the previous sections, the model traffic and network coding are deemed acceptable. This section outlines the proposed mitigation measures and the development impact on the key junctions, which focuses on the network operation which is close to the area of interest to Highways England.

A49 Newton Road / Hollins Lane Junction

As raised in the previous model review, the reduced speed area no. 1458 has now been updated to reflect the stated improvement to northbound capacity through the modified junction as a result of a left-turn filter lane being added and the junction timings being optimised. However, no detail analysis has been provided to quantify the stated speed adjustment methodology.

Based on the information provided in the 'Former Parkside Colliery, Newton-le-Willows WPC Post Submission Highway Response 1', there is limited information to demonstrate the stated northbound capacity improvement compared with the baseline situation, therefore it is possible that the journey time analysis may have been over-estimated. The potential for queueing traffic to block back onto the M62 junction 9 roundabout should be carefully assessed and evaluated for Highways England's reference.

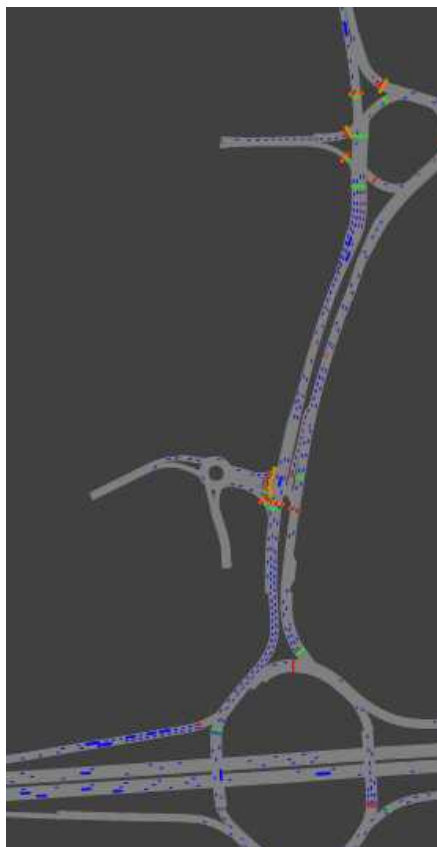
As a sensitivity test, if the Hollins Lane junction mitigation measure provided nil-detriment solution to accommodate the committed development traffic, the traffic would be travelling at the same cruise speed as in the existing situation. As illustrated below in Figure 1, the predicted traffic queue would be likely to be stretch back to the motorway junction and increase the risk of interaction with the M62 mainline on the Strategic Road Network.

Whilst it is acknowledged that the Hollins Lane junction forms part of the committed development scheme which is not the focus of this Peel Hall development, however, the impact of such committed development scheme capacity assumption on the Strategic Road Network is fundamental to Highways England as it is important to provide a robust Reference Case benchmark for this scheme evaluation. It is therefore recommended that the anticipated local junction capacity improvement at the Hollins Lane junction should be confirmed with WBC, and the Hollins Lane junction improvement should be replicated accordingly for Highways England's reference.

Figure 1 2022 PM Do Something + Committed + Proposed + M4 Mitigation @17:53 (Seed 5)

With Hollins Lane Capacity Improvement

Without Hollins Lane Capacity Improvement



A49 Newton Road / Golborne Road Junction

A mitigation measure has been provided to increase the right turn storage capacity. Limited information and narrative has been provided in the technical note to ascertain the effectiveness of such an intervention to alleviate the pressure of the development traffic. The impact on journey times of the scheme combined with the additional development traffic can be seen by reviewing Journey Time A49 Section 1 NB. Tables from TMG TN are reproduced here in order to illustrate the impact.

Table 1 Journey time comparison provided for A49 Section 1 for future year 2022

Section	AM 2022 - 08:00 - 09:00							
	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Section 1 NB	50	49	-1	-2%	50	50	0	-1%

Section	PM 2022 - 17:00 - 18:00							
	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Section 1 NB	58	55	-2	-4%	58	57	-1	-1%

From a review of the above, it can be seen that there are predicted journey time savings following the introduction of a right turn pocket to accommodate the development traffic.

A49 Newton Road / Winwick Link Road Junction (Winwick Island)

No mitigation measure has been proposed at the Winwick Island junction for the development traffic. As part of the committed mitigation measure, the junction capacity has been improved which increases the traffic throughput level across all modelled years. However, as illustrated in Table 2, the total traffic throughput has experienced an overall reduction which implies that lower levels of traffic can enter the junction with the committed measures in place for the same time period. The underlying reason for such model results are due to the downstream blocking which occurs when the network is saturated with no spare capacity.

Table 2: Traffic flow comparison at Winwick Island for future year 2022 AM Peak

		08:00-09:00							
		2022							
Junction/ Movement		Vehicle Flow				Difference			
Junction	Approach	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Newton Road/ A49 Winwick Link Road/ Winwick Park Avenue	A49 NB to Winwick Park Ave	8	9	1	13%	8	10	2	25%
	A49 NB	942	945	3	0%	942	956	14	1%
	A49 NB to Winwick Link Rd	601	596	-5	-1%	601	600	-1	0%
	Winwick Park Ave to A49 NB	185	185	0	0%	185	186	1	1%
	Winwick Park Ave to Winwick Link Rd	63	63	0	0%	63	62	-1	-2%
	Winwick Park Ave to A49 SB	88	92	4	5%	88	92	4	5%
	A49 SB to Winwick Link Rd	79	85	6	8%	79	85	6	8%
	A49 SB	845	912	67	8%	845	902	57	7%
	A49 SB to Winwick Park Ave	25	26	1	4%	25	26	1	4%
	Winwick Link Rd to A49 SB	964	915	-49	-5%	964	822	-142	-15%
	Winwick Link Rd to Winwick Park Ave	0	0	0	-	0	0	0	-
Winwick Link Rd to A49 NB	79	76	-3	-4%	79	70	-9	-11%	

As can be seen from the Vissim model, this junction is predicted to operate over capacity in all future years with a heavy tidal traffic flow pattern. There is a heavy southbound movement in the morning peak and a heavy northbound movement in the evening peak. The potential for queueing traffic to block back onto the M62 junction 9 roundabout has been carefully assessed and it is deemed that the two full ahead northbound lanes and the two full right turn lanes provided at the Winwick Island junction would provide sufficient capacity to minimise the risk of queueing back on to the M62 junction 9.

Albeit the above, as expressed in the previous section, it is unclear whether the Hollins Lane junction improvement would provide the stated capacity and any downstream blocking would have a ripple knock on impact on the operation of the M62 junction 9.

M62 junction 9 motorway roundabout

The new exit lane widening on the M62 junction 9 eastbound exit has been proposed at the motorway roundabout to mitigate the highway impact of the predicted development traffic. As noted in the Technical Note ‘MG0123_A49WarringtonCorridor_OptionA_ModellingReport_v6.3’ that the traffic signal timings could be optimised to relieve the pressure on the M62 junction 9 slip roads. Limited information has been provided in the report to substantiate the traffic signal optimisation process or methodology. For the primary area of interests, traffic signal green time analysis at the M62 junction 9 has been presented in Table 3 for Highways England’s reference.

Table 3: Traffic signal green time comparison at M62 junction 9 between base and 2022 M4 Models

	AM		PM	
	Base	2022 DS M4	Base	2022 DS M4
A (Roundabout at M62 East Off Slip)	23	17	22	20
B (M62 East Off Slip)	13	19	12	14
C (Roundabout at M62 West Off Slip)	22	17	22	22
D (M62 West Off Slip)	14	19	12	12
E (Roundabout at A49 Newton Road South)	14	20	12	14
F (A49 Newton Road South)	22	16	23	21
G (Roundabout at A49 Newton Road North)	13	12	21	17
H (A49 Newton Road North)	23	24	14	18

As can be seen in Table 3, the traffic green time allocations have been adjusted to allow more traffic to enter the roundabout from the approaches, subsequently, the traffic signal green time allowance for internal circulatory lanes have been reduced accordingly. As one of the key traffic signal optimisation principles for signalised roundabout, it is important to consider green wave progression and internal circulatory lane storage capacity. In the base model scenarios, the traffic signal timing offset strategy follows the above underlying traffic engineering principle which allow the roundabout approaching traffic to pass the first set of circulatory lane stop line without stopping when unhindered.

In the 2022 DS M4 scenarios, with the new proposed signal timing strategy, the traffic approaching from the M62 off slips would be stopped by the first set of circulatory lane stop line hence created an internal exit blocking situation within the motorway roundabout, resulting in vehicle start-stop movements and compromise operational safety and efficiency. Figures 2 has been provided to illustrate the internal circulatory lane queueing situation in 2022, and the internal circulatory lane queueing issue will be exacerbated in the future year of 2032 as shown in Figure 3.

Further input from WBC would be required to ascertain the appropriateness of the proposed traffic signal timing strategy. If the traffic signal is deemed not acceptable from an operational perspective, the traffic queueing impact on the slip roads should be thoroughly reviewed and presented for Highways England’s reference.

Figure 2 2022 PM Do Something + Committed + Proposed + M4 Mitigation @17:41 (Seed 5)

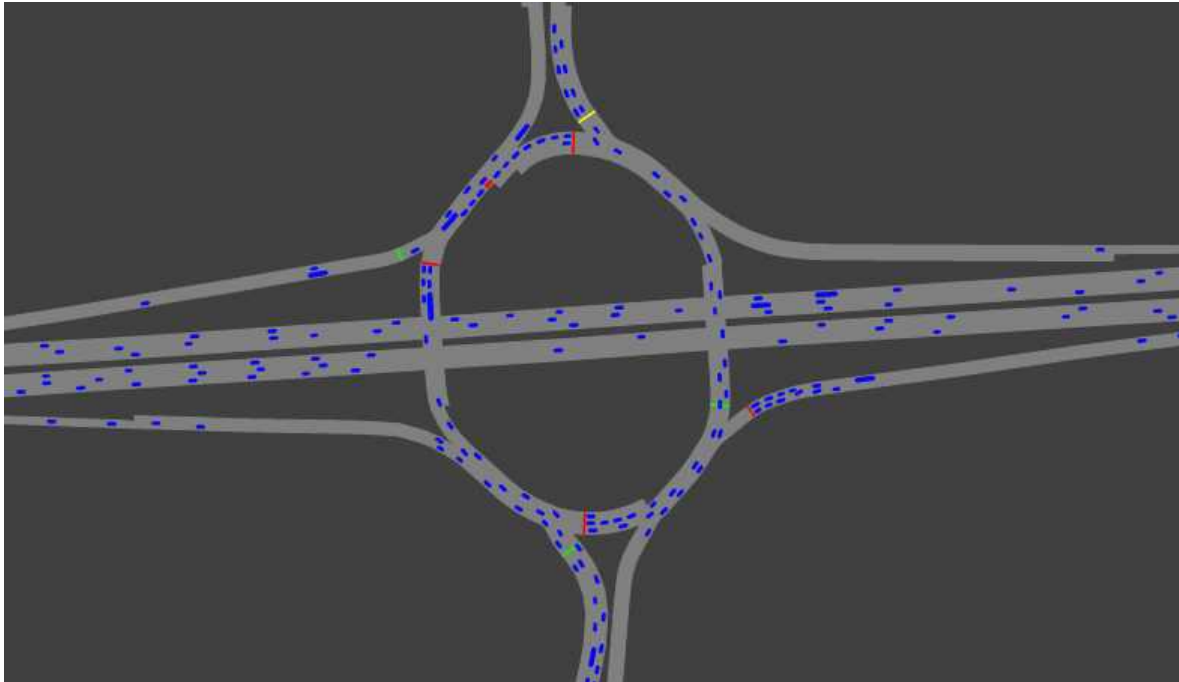
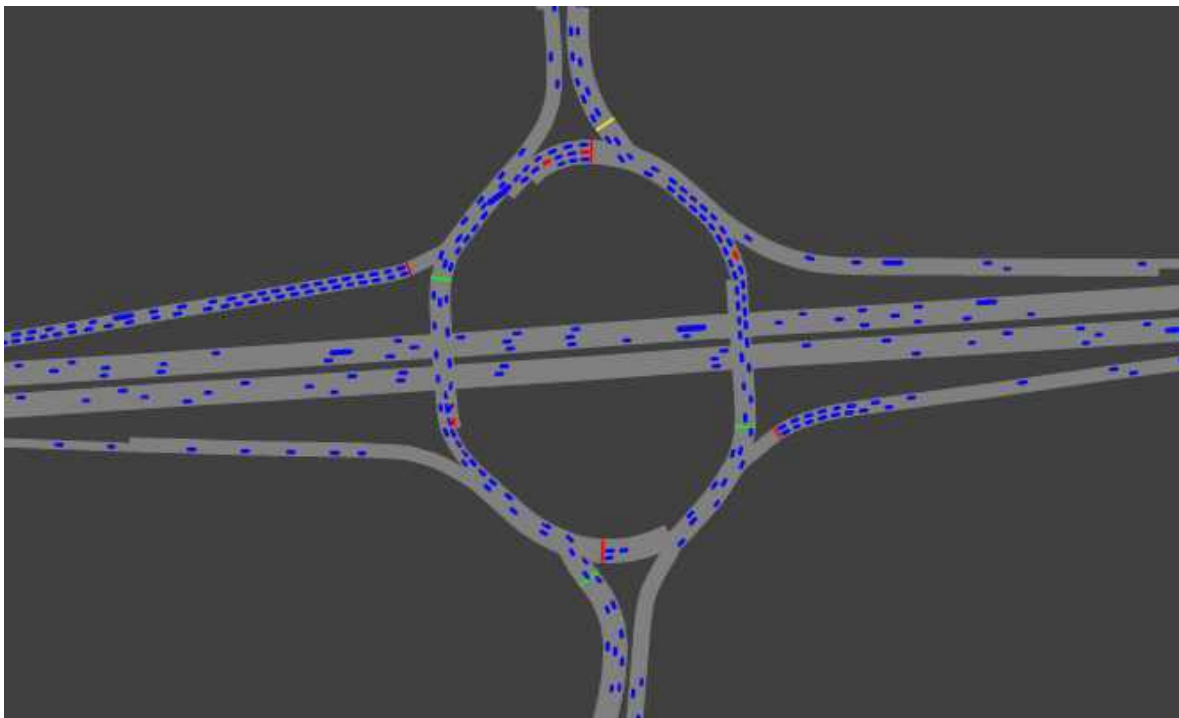


Figure 3 2032 PM Do Something + Committed + Proposed + M4 Mitigation @18:08 (Seed 5)



A49 Winwick Road / Sandy Lane West / A574 Cromwell Avenue Junction

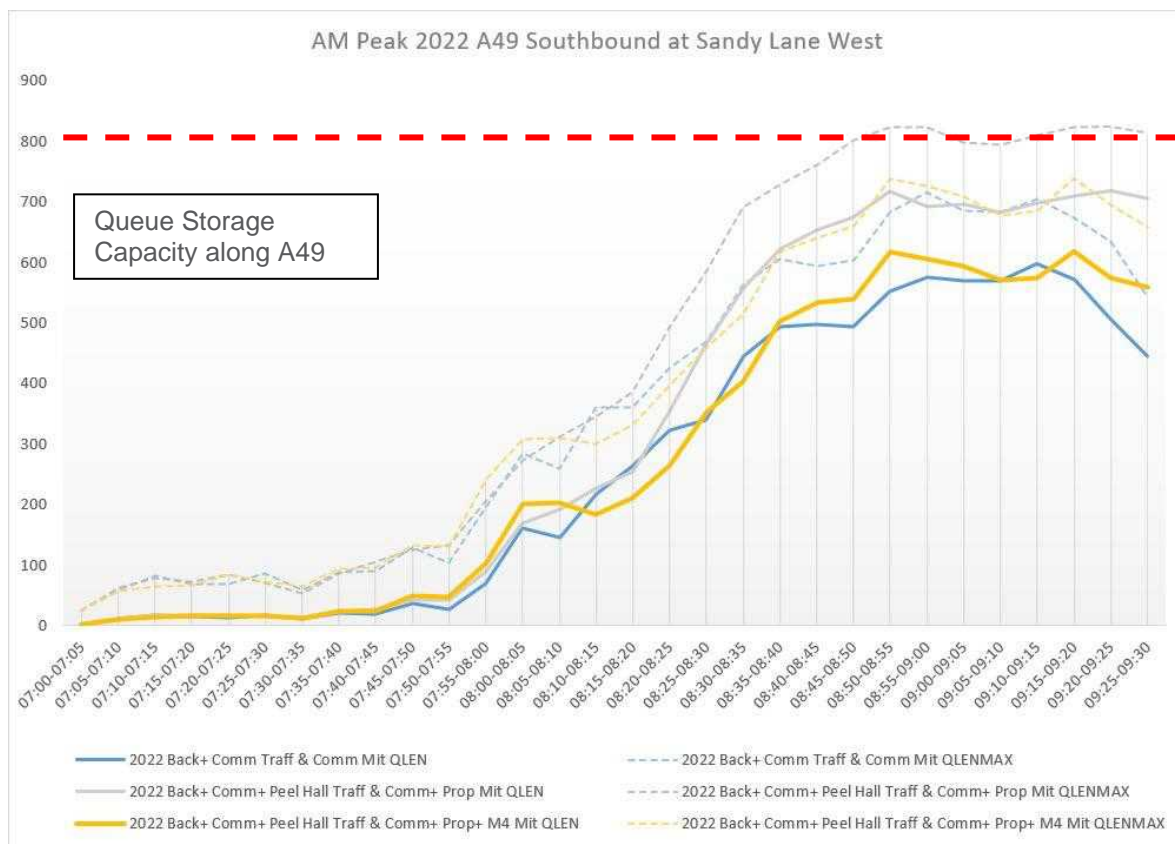
A new northbound left turn lane widening has been provided to allow two traffic lanes travelling towards the A574 Cromwell Avenue. The traffic signal timings have also been optimised to balance the green time allocation on different approaches. The 2022 journey time comparison tables as reproduced below in Table 4 generally shows a + / - 9 seconds difference for the A49 southbound Section 3, where the wider impact on the M62 junction 9 is predicted to be limited. As demonstrated in the Figure 4, the queue length is likely to be retained within the available traffic queue storage capacity along the A49 between Sandy Lane West roundabout and the M62 motorway junction.

Table 4 Journey time comparison provided for A49 for future year 2022

Section	AM 2022 - 08:00 - 09:00							
	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Section 3 SB	232	256	24	10%	232	241	9	4%

Section	PM 2022 - 17:00 - 18:00							
	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop Mit	Diff	%	Back+ Comm Traff & Comm Mit	Back+ Comm+ Peel Hall Traff & Comm+ Prop+ M4 Mit	Diff	%
A49 Section 3 SB	141	207	65	46%	141	132	-9	-6%

Figure 4 2022 AM Do Something + Committed + Proposed + M4 Mitigation for the A49 SB at Sandy Lane West Signalised roundabout



In the 2032 AM peak, as illustrated in Figure 5, the queue length is likely to impact on the junction exit of the M62 junction 9 motorway roundabout. The potential queue blocking back onto the M62 junction 9 roundabout have been evaluated by the applicant and been reproduced as Figures 6 and 7 below, with the queue storage capacity indicated with a red dotted line. The queue length is predicted to stretch back very close to the M62 junction 9 roundabout exit in the with development scenario even with the mitigation measure.

Figure 5 2032 AM Do Something + Committed + Proposed + M4 Mitigation @09:07 (Seed 5)

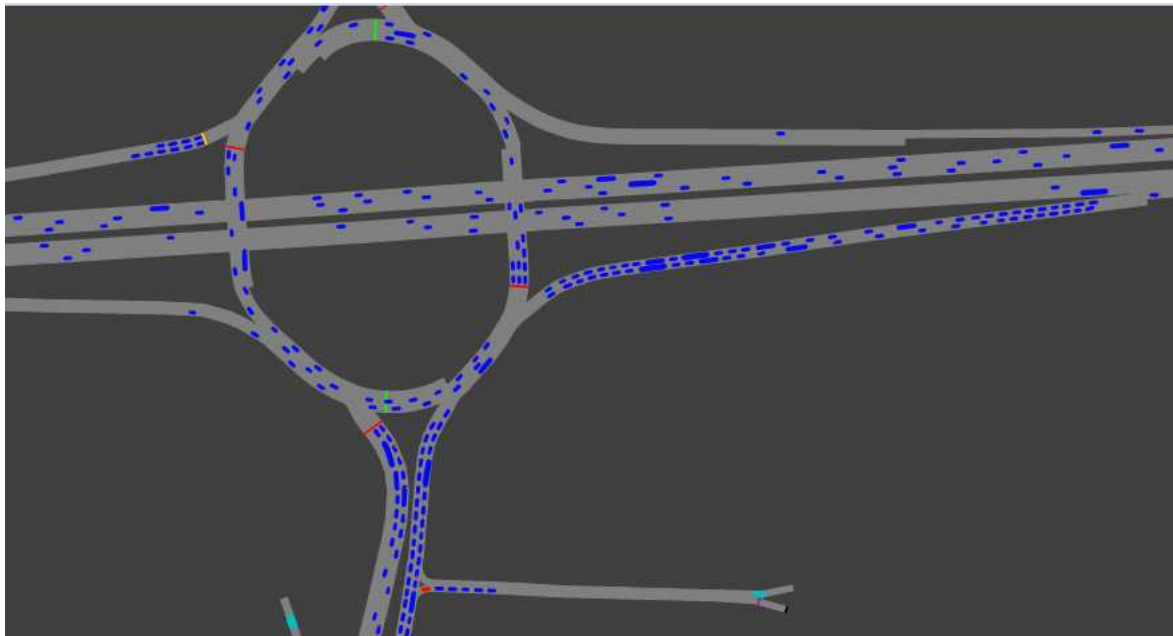
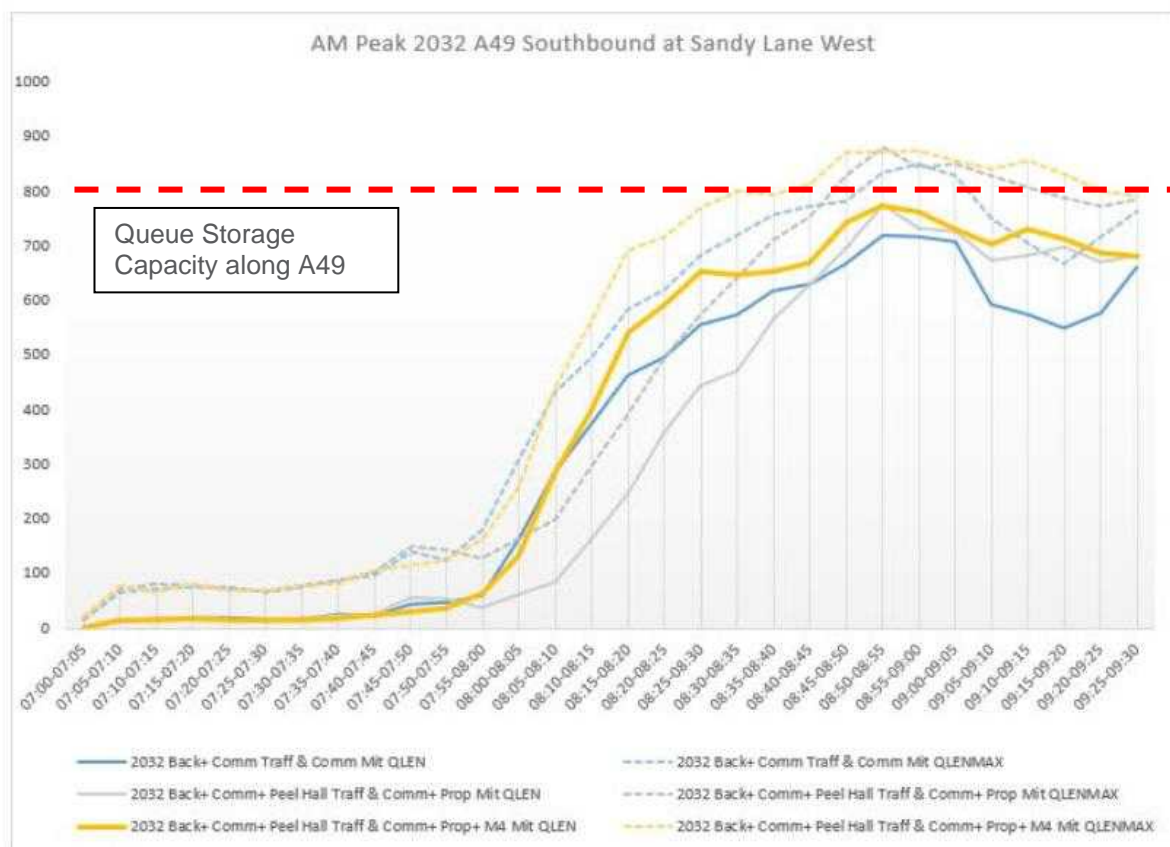


Figure 6 2032 AM Do Something + Committed + Proposed + M4 Mitigation for the A49 SB at Sandy Lane West Signalised roundabout



Summary

Atkins has been commissioned by Highways England to audit a base Vissim model, proposed Vissim model and supporting documents produced by TMG on behalf of HT who has been commissioned by Satnam in support of proposed development of land at Peel Hall in Warrington.

The base Vissim model has been found to be of a reasonable standard along the main study corridor in the area of interest to Highways England. The proposed Vissim model network coding and set up has been reviewed and it is recommended that the model is fit-for-purpose for this scheme appraisal.

This review focuses on the parts of the network that are of primary interest to Highways England. As outlined in the review, concerns have been raised about the appropriateness of the traffic signal timing optimisation strategy applied at the M62 junction 9 motorway roundabout in the forecast scenarios. The traffic approach from the M62 off slips would be stopped by the first set of circulatory lane stop line thus creating an internal exit blocking situation within the motorway roundabout, resulting in vehicle start-stop movements which compromise operational safety and efficiency.

The 2032 model with development scenario and with the proposed mitigation measures predicts that the A49 southbound traffic queue from the Sandy Lane signalised roundabout is likely to stretch back very close to the M62 junction 9 roundabout exit. Thus there is limited capacity and resilience to cope with any daily traffic fluctuation to the Strategic Road Network.

In addition to the above, with regards to the Hollins Lane junction capacity improvement, there is limited information to quantify the additional northbound capacity compared to the baseline situation, therefore it is possible that the journey time analysis may have been over-estimated in the Reference Case scenario. The potential for queueing traffic to block back onto the M62 junction 9 roundabout should be promptly addressed to minimise risk of interaction with the M62 mainline within the Strategic Road Network.

It is recommended that WBC is to be consulted to confirm the acceptance of the proposed traffic signal time settings at the M62 junction 9, and also advise whether the Hollins Lane junction would provide the stated northbound capacity improvement as these are critical aspects to evaluate the appropriateness and effectiveness of the mitigation measures and to provide assurance of the development impact on the Strategic Road Network.

Yours faithfully

Lun Wong

Technical Note

Project:	Peel Hall		
Subject:	Proposed Mitigation		
Author:	Lun Wong		
Date:	14/12/2020	Project No.:	5188540.078
Atkins No.:		Icepac No.:	
Distribution:	Rob Heywood Ben Laverick	Representing:	Highways England Highways England

Document history

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
Rev 1.0	Background Information	LW	KK	PW	LW	14/12/2020

Client signoff

Client	Highways England
Project	Peel Hall
Project No.	5188540.078
Client signature / date	

1. Introduction

This Technical Note has been written to provide details on the mitigation proposals associated with the proposed Peel Hall development, Warrington. It is intended as a guide only and the information within should be cross-checked with the relevant documents which are referenced throughout.

For completeness, this note will include details of Highway Mitigation schemes associated with committed development in the area of interest as well as those associated with the latest Peel Hall development. The remainder of this note is therefore broken down as follows:

- Section 2 – Committed Development Scheme;
- Section 3 – Current Proposed Mitigation; and
- Section 4 – Summary.

2. Committed Development Schemes

The committed developments taken into account of as part of the Peel Hall assessments are as follows:

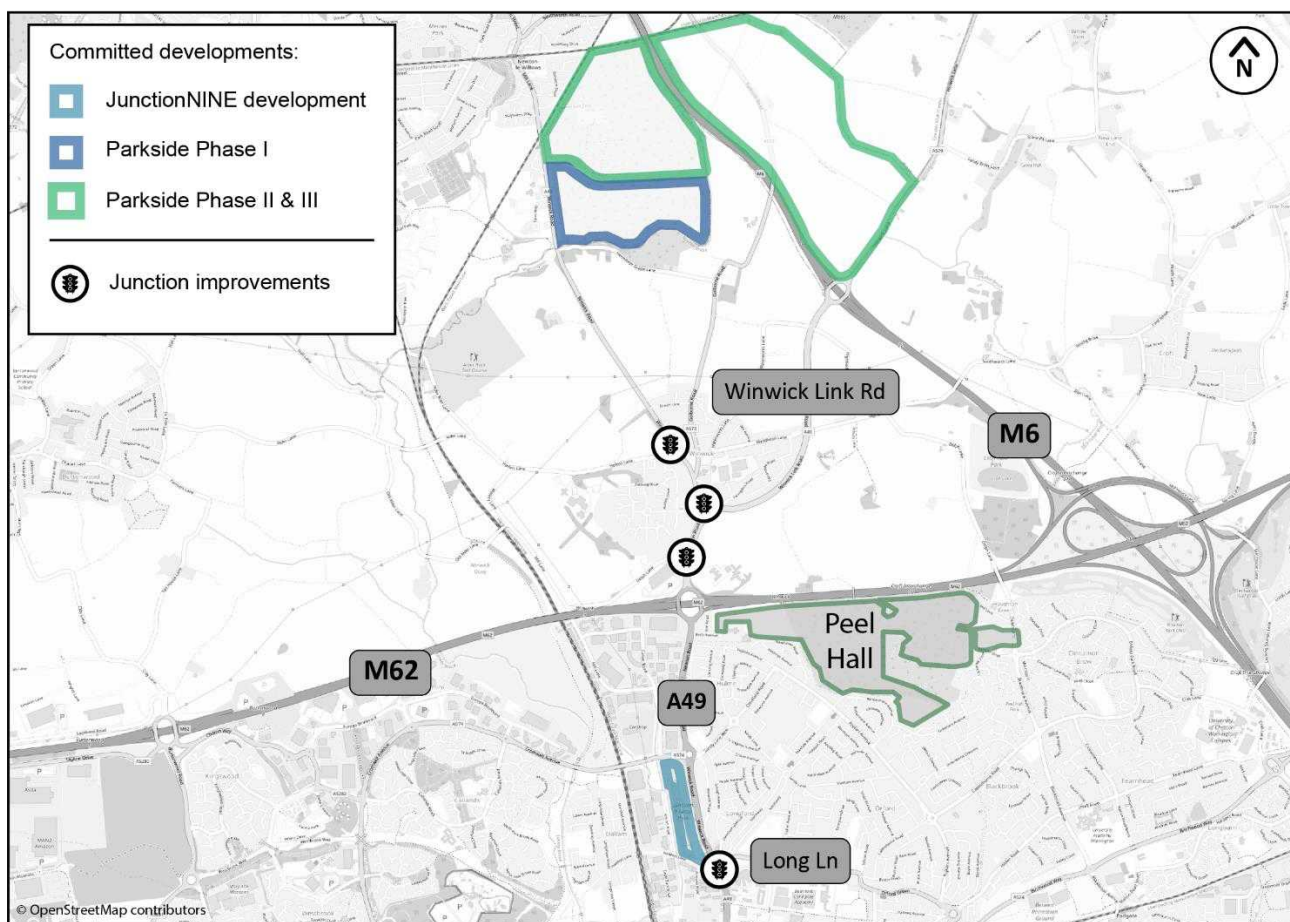
- J9 Retail Park(2016/29425);
- Parkside Phase 1 (2018/32247); and
- Birchwood Park (2015/26044).

The above list appears in various documents including the Transport Assessment Addendum (Pins Ref: APP/M0655/W/17/3178530) and it is noted that the list is agreed by all parties. The developments propose the following mitigations:

- J9 Retail Park;
 - A49/Retail Park (10733-100-001)
- Parkside Phase 1;
 - A49/Delph Lane (TPMA1389-102)
 - Winwick Island (TPMA1389-103)
 - A49/Hollins Lane (TPMA1389-105)
- Birchwood Park – no proposed mitigation in study area.

Drawings illustrating the mitigation proposals associated with each of the three developments are provided at Appendix A of this Technical Note. The location of the mitigation proposals are illustrated in the figure below:

Committed Development Schemes – Mitigation



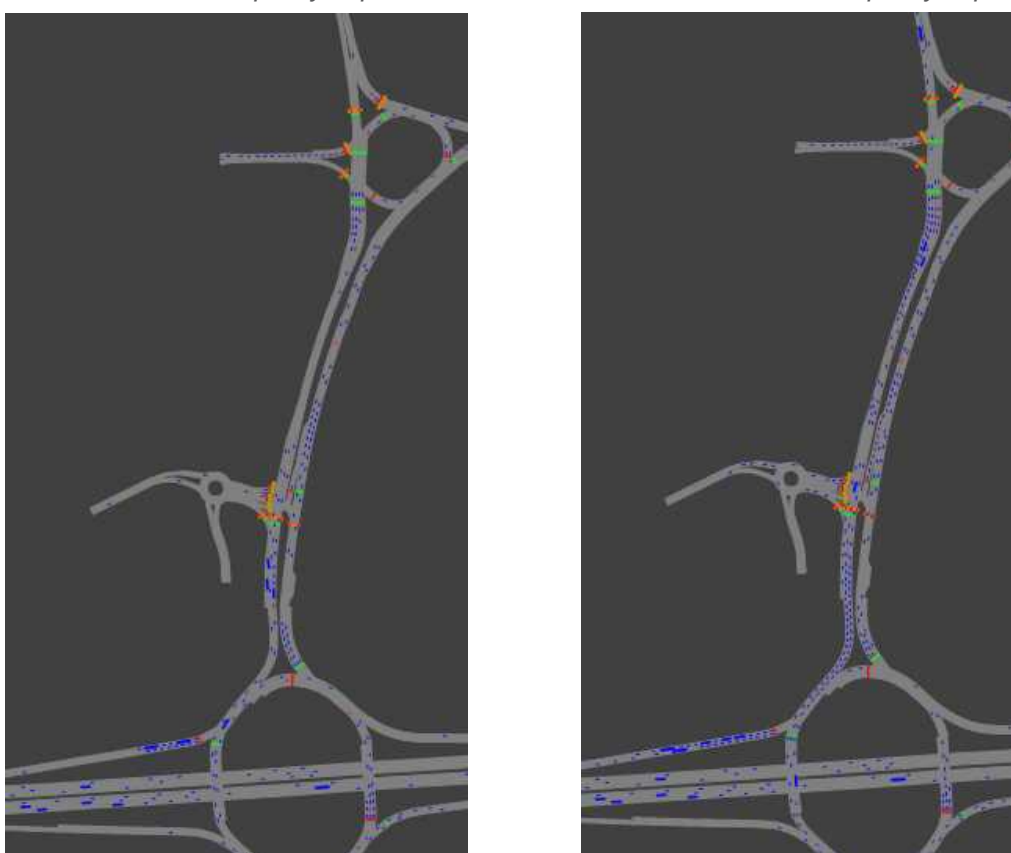
A49/ Hollins Lane

In relation to A49/ Hollins Lane junction, based on the information provided in the 'Former Parkside Colliery, Newton-le-Willows WPC Post Submission Highway Response 1', there is limited information to demonstrate the stated northbound capacity improvement compared with the baseline situation, therefore it is possible that the journey time analysis could have been over-estimated. The potential for queueing traffic to block back onto the M62 junction 9 roundabout should be carefully assessed and evaluated for Highways England's reference.

As a sensitive test, if the Hollins Lane junction mitigation measure provided nil-detriment solution to accommodate the committed development traffic, the traffic would be travelling at the same cruise speed as the existing situation. As illustrated below in Figure 1, the predicted traffic queue would be likely to be stretched back to the motorway junction and hence increases the risk of interaction with the M62 mainline on the Strategic Road Network.

Whilst it is understood that the Hollins Lane junction forms part of the committed development scheme which is not the focus of this Peel Hall development, the impact of such committed development scheme capacity assumption on the Strategic Road Network is fundamental to Highways England and hence it is important to provide a robust Reference Case benchmark for this scheme evaluation.

*Figure 1 2022 PM Do Something + Committed + Proposed + M4 Mitigation @17:53 (Seed 5)
With Hollins Lane Capacity Improvement Without Hollins Lane Capacity Improvement*



Furthermore, Highways England have also been requested for comment on the additional information in relation to a former Parkside Colliery Site and its associated link road (Warrington – 2018/32514 / St Helens – P/20180249/FUL), which is in close proximity of the Peel Hall development on a separate Task Order NW083 20/21. The link road for the proposed development is currently subject to public inquiry and the impact of the scheme on the local and strategic road networks has been listed by the Inspector as one of the main issues to be considered at the inquiry.

Within the Updated Transport Evidence as part of the Parkside Link Road submission, there is no reference of the Hollins Lane capacity improvement scheme. The document suggests that the new link road will effectively divert traffic away from the A49 and the Hollins Lane junction will be predicted to operate within capacity and relieve the traffic pressure at this location.

It is therefore recommended that the anticipated local junction capacity improvement at the Hollins Lane junction to be confirmed with WBC and the wider scheme context to be considered to minimise risk of interaction with the M62 mainline within the Strategic Road Network.

3. Current Proposed Mitigation

The proposed mitigation, as it currently stands, is described in Development Profile section of the Transport Assessment Addendum dated March 2020 (Pins Ref: APP/M0655/W/17/3178530) and also highlighted in the latest technical note dated November 2020 'MG0123_A49WarringtonCorridor_OptionA_ModellingReport_v6.3'. The full list of mitigation is reproduced below. The mitigation 'types' have been added for ease of reading:

Non-Physical Measures

- A full and comprehensive Travel Plan supported by extensive travel plan measures, to enhance and support sustainable travel of future residents
- An effective bus mitigation strategy based on extending two existing bus services into the site, in the east and south

Physical Measures (Local Network)

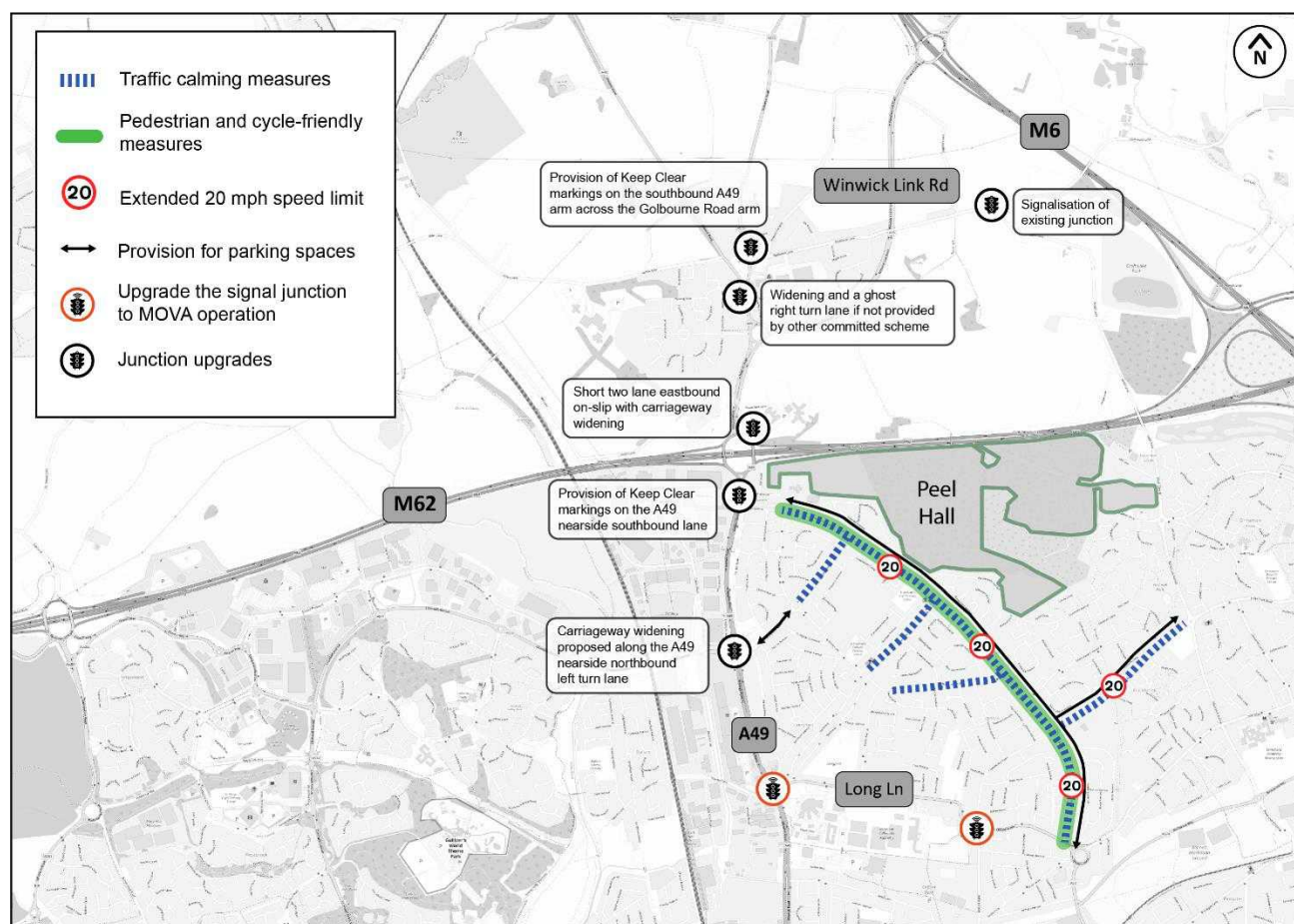
- A50 Orford Green/Poplars Avenue – development impact at this junction was previously addressed through proposed engineering measures to increase the circulatory to two lanes (as built). However, this capacity restriction was part of a highway safety scheme and as such, instead of mitigation measures at the junction it is proposed to provide a contribution towards traffic calming measures within the area to the immediate south of the development site
- Provision of funding for traffic calming measures on the area to the immediate south of the Peel Hall development such as Poplars Avenue, Cleveland Road, Statham Avenue, Howson Road and Capesthorpe Road. This is likely to involve, for example, replacement of measures along Capesthorpe Road with more appropriate traffic calming and additional traffic calming and traffic management measures in the wider area
- Provide funding for an extended 20mph speed limit through Poplars Avenue and Capesthorpe Road
- Provision of uncontrolled dropped kerb pedestrian crossing points with tactile paving across arms of all roads intersecting with Poplars Avenue and upgrade existing locations for pedestrians to cross Poplars Avenue to promote attractive pedestrian routes, enhance highway safety and assist pedestrians with crossing movements
- Provision of cycle-friendly measures on Poplars Avenue such as painting cycle markings on carriageway near junctions to warn motorists of cycles. Also, the provision of cycle warning signing where suitable poles for doing so at key areas such as the approaches to the Poplars Avenue/Capesthorpe Road roundabout
- Provision of funding for parking spaces to be created within the highway verges at locations along Poplars Avenue and Capesthorpe Road

Physical Measures (Primary Network)

- M62 junction 9 – provide a short two lane eastbound on-slip with carriageway widening to allow two-lane section exiting the junction.
- A49/A50/Hawleys Lane signal junction – provide a contribution to upgrade the signal junction to MOVA operation (to cover controller, additional loops and testing).
- A50/Hallfields Road signal junction – provide a contribution to upgrade the signal junction to MOVA operation (to cover controller, additional loops and testing).
- A49 Winwick Road/Sandy Lane West/A574 Cromwell Avenue Junction – The northbound left-turn filter lane from the A49 Winwick Road to Cromwell Avenue has been widened to two lanes and extended further south. This is to allow more storage space for the heavily used left-turn here in both peaks. An additional benefit to this arrangement, is the allowance of a rebalancing of signal green time, providing additional capacity for other approaches.
- A49 Newton Road/Golbourne Road – provide a scheme of widening and a ghost right turn lane if not provided by other committed schemes.
- Golbourne Road/Myddleton Lane - proposed provision of Keep Clear markings on the southbound A49 arm across the Golbourne Road arm to improve junction performance by removing obstructions to the A46 right-turning movement.
- Myddleton Lane/Delph Lane – proposed signalised junction.
- Birch Avenue/A49 – proposed provision of Keep Clear markings on the A49 nearside southbound lane across the Birch Avenue junction.

Drawings illustrating the mitigation proposals detailed above are supplied as **Appendix B** of this Technical Note. The location of the mitigation proposals are illustrated below:

M4 Mitigation – Current Proposal



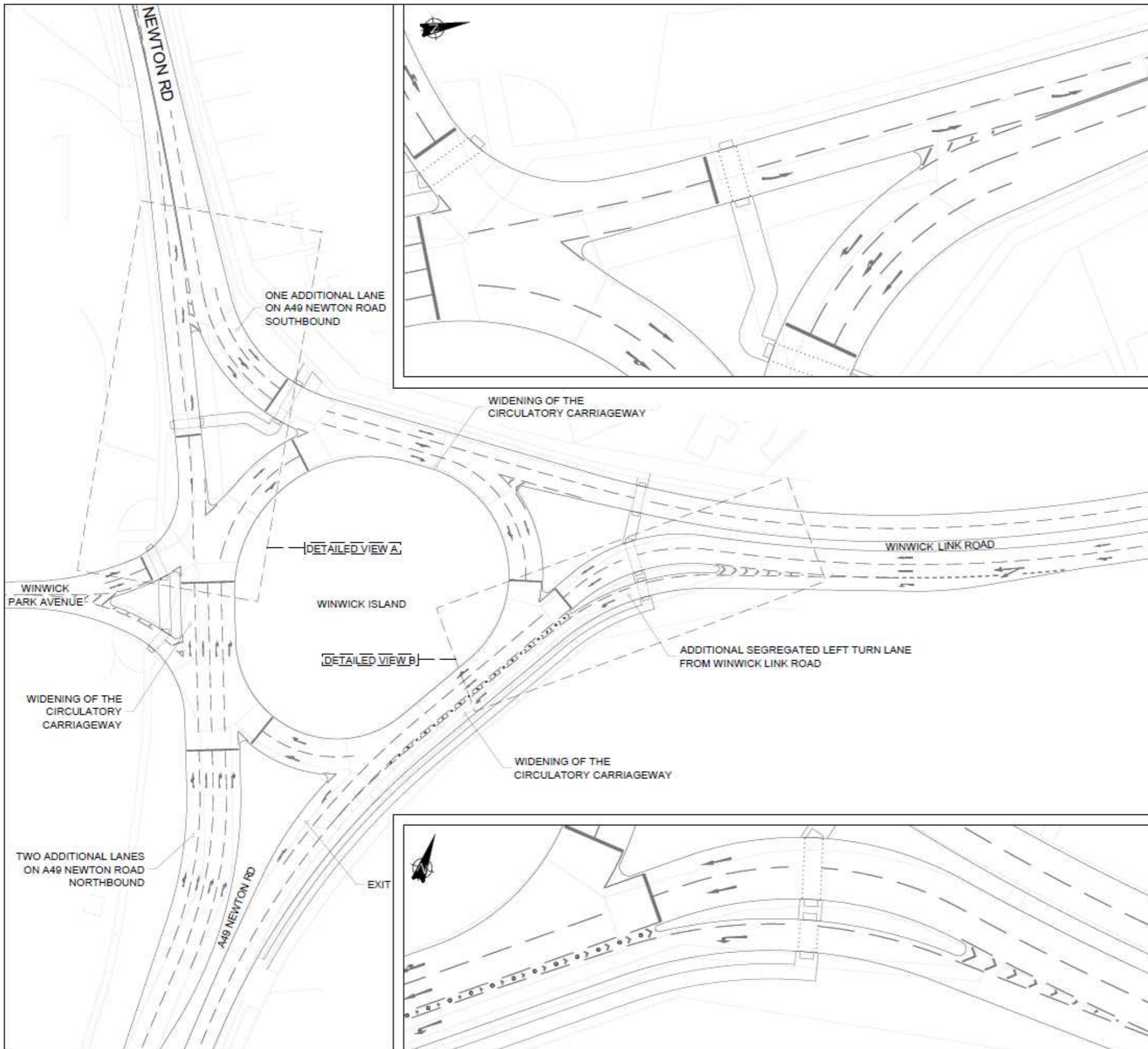
4. Summary

It can be seen throughout this Technical Note that a significant number of changes are proposed for the A49 corridor associated with both committed developments and the proposed Peel Hall development.

As part of a proposed mitigation measures presented at the first Public Inquiry, mitigation works proposed at the M62 Junction 9 has been discussed with Highways England which comprises of the widening of the A49 southbound entry radius and the circulatory carriageway adjacent to the eastbound on-slip, creating a two-lane slip road (mirroring the existing westbound on-slip), and widening of the westbound off-slip entry to the roundabout to form three lanes. In the latest submission, lane widening on the M62 junction 9 eastbound exit has been retained and lane gain on the M62 (east) off slip which has now been removed. Lane destination markings have been adjusted to allow vehicles to use two lanes within the northern circulatory carriageway to travel eastbound onto the M62 motorway.

Whilst it is understood that the Hollins Lane junction forms part of the committed development scheme which is not the focus of this Peel Hall development, the impact of such committed development scheme capacity assumption on the Strategic Road Network is fundamental to Highways England as it is important to provide a robust Reference Case benchmark for this scheme evaluation. It is therefore recommended that the anticipated local junction capacity improvement at the Hollins Lane junction should be confirmed with WBC, and the Hollins Lane junction improvement should be replicated accordingly for Highways England's reference. As such, care needs to be taken when reviewing and drawing conclusions from associated modelling given the level of interventions and changes in traffic flows.

Appendix A. Committed Development Mitigation Drawings



NOTES:

A	Existing lines rendered under proposed	29/02/16	DD	KY
Rev:	Description:	Date:	By:	Chkd:



Curtins Consulting Ltd,
 Merchant Exchange, 17-19 Whitworth St West, Manchester, M1 5WG
 t: 0161 236 2394
 e: manchester@curtins.com
 www.curtins.com

Structures - Civils - Environmental - Infrastructure - Transport Planning - Sustainability - Expert Advisory Services
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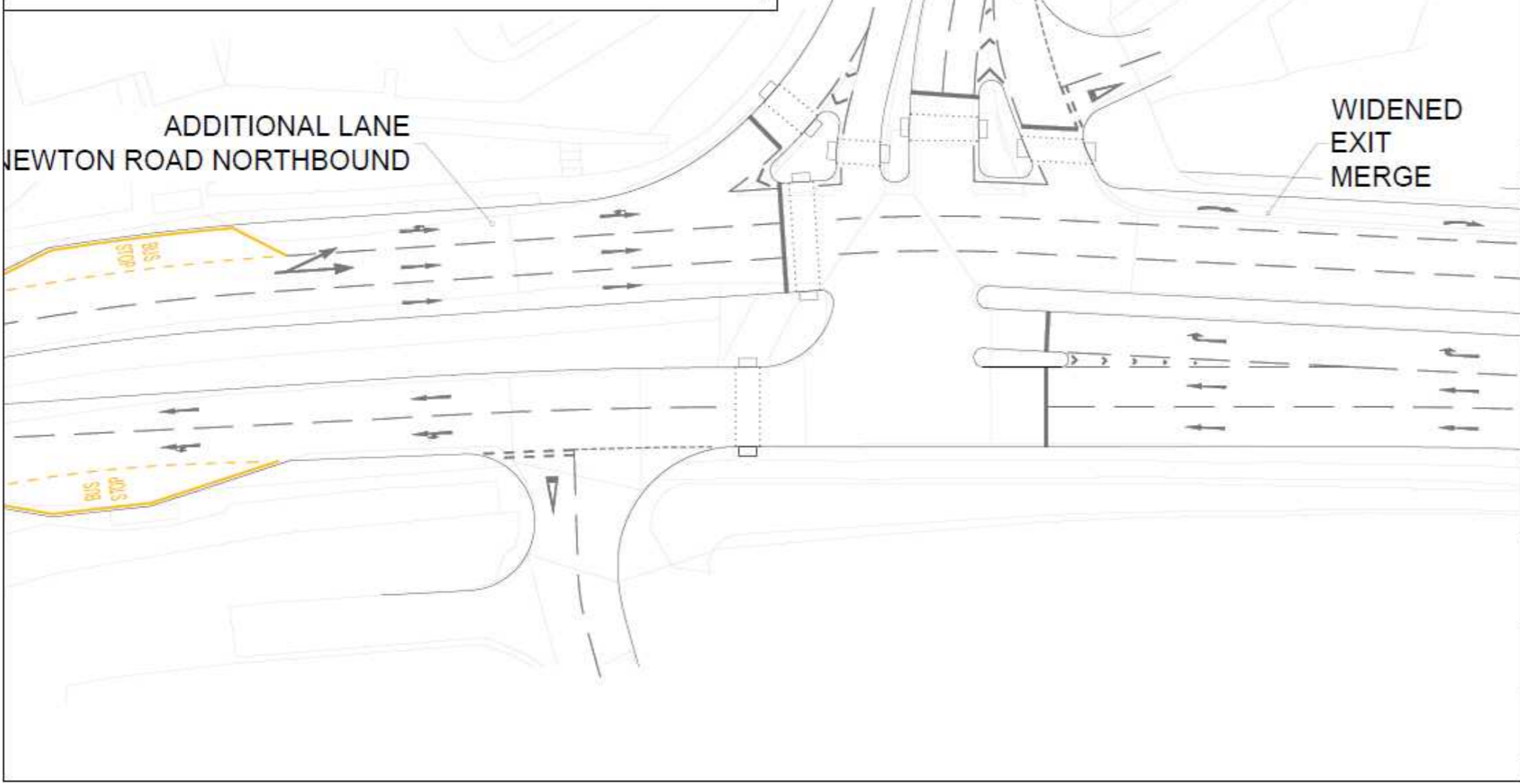
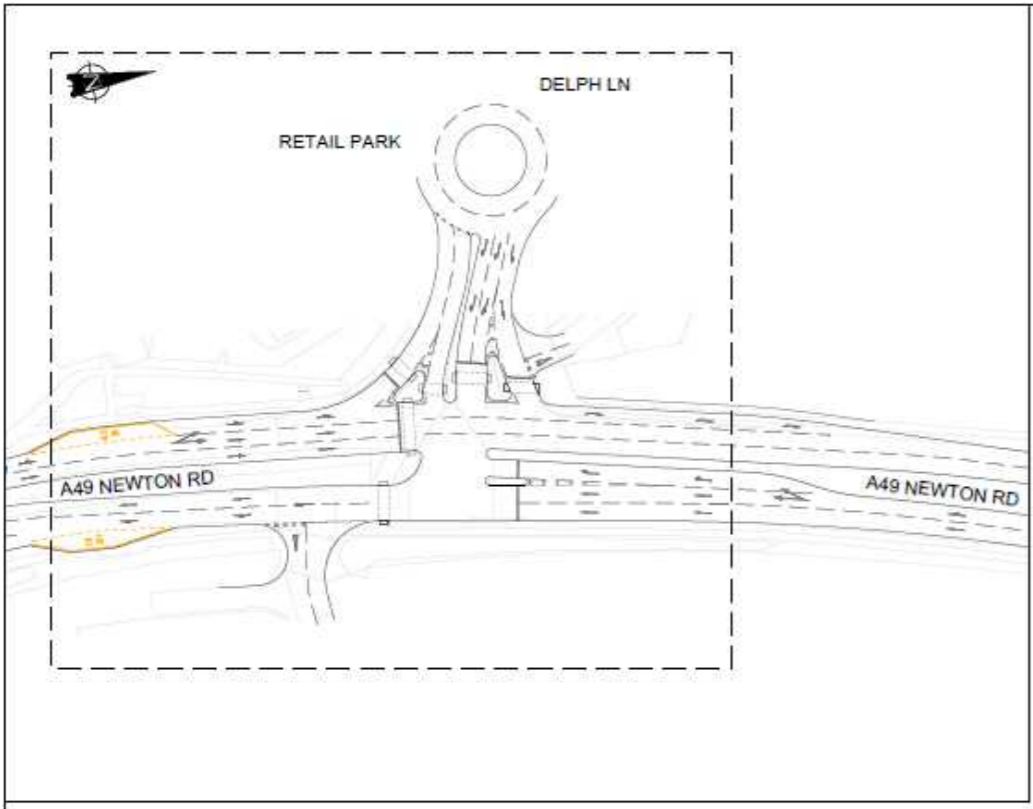
Status: **PRELIMINARY**

Project: **PARKSIDE
 PHASE I**

Org Title: **JUNCTION IMPROVEMENT PROPOSAL
 JUNCTION 3 - WINWICK ISLAND**

Scale:	Size:	First Issue:	Drawn:	Checked:
1:1000	A3	16/02/16	DD	JG

Org No:	Rev:
TPMA1389-103	A



NOTES:

A	Existing lines rendered under proposed	29/02/16	DD	KY
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 Merchant Exchange, 17-19 Whitworth St West, Manchester, M1 5WG
 t: 0161 236 2394
 e: manchester@curtins.com
 www.curtins.com

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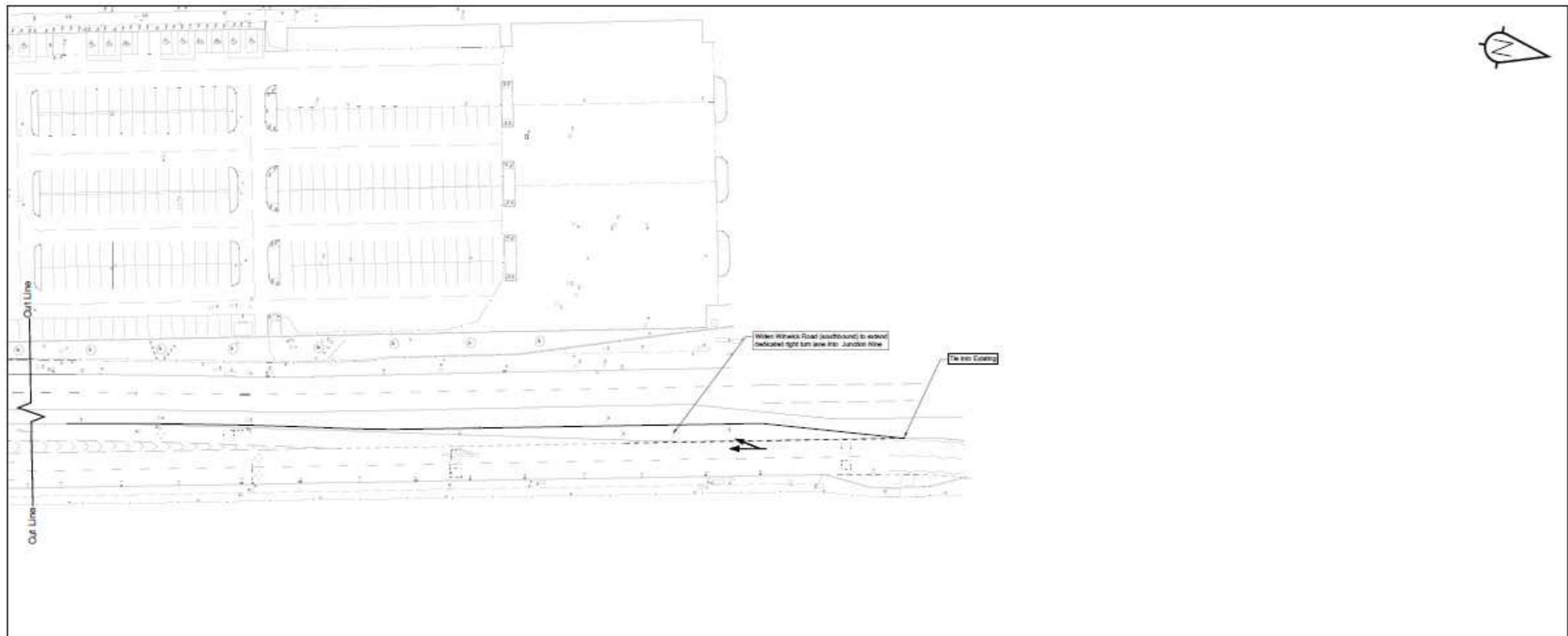
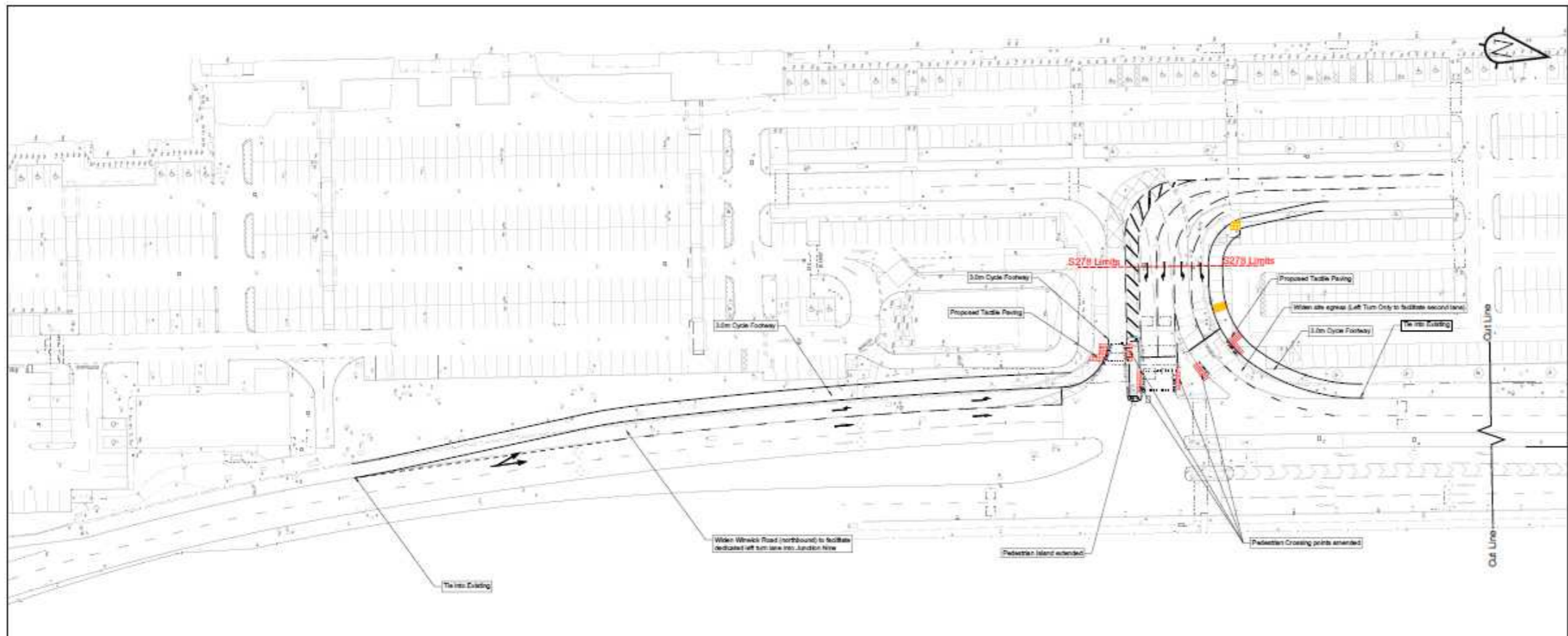
Status: **PRELIMINARY**

Project: **PARKSIDE
 PHASE I**

Drg Title: **JUNCTION IMPROVEMENT PROPOSAL
 JUNCTION 2 - DELPH LANE**

Scale:	Size:	First Issue:	Drawn:	Checked:
1:500	A3	16/02/16	DD	JG

Drg No: **TPMA1389-102** Rev: **A**



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• The consultant shall not be liable for the use by any person of any document for any purpose other than that for which the same were provided by the consultant.

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• The locations of utility accessories, if shown, is reproduced from plans supplied to the consultant, although care has been taken when duplicating this information. These locations are approximate only and no guarantee can be given for their accuracy. It is the client's or its appointed agent/contractors responsibility to verify the exact locations on site by hand digging holes or other appropriate means prior to mechanical excavation.

• Service connections are not shown but their presence should be anticipated.

• Reference to any third party equipment shown on this drawing was only relevant at the time the drawing was prepared.

• It is the client's responsibility to ensure that any equipment ordered meets the design.

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Rev	Amendment	Drawn	Date	Checked



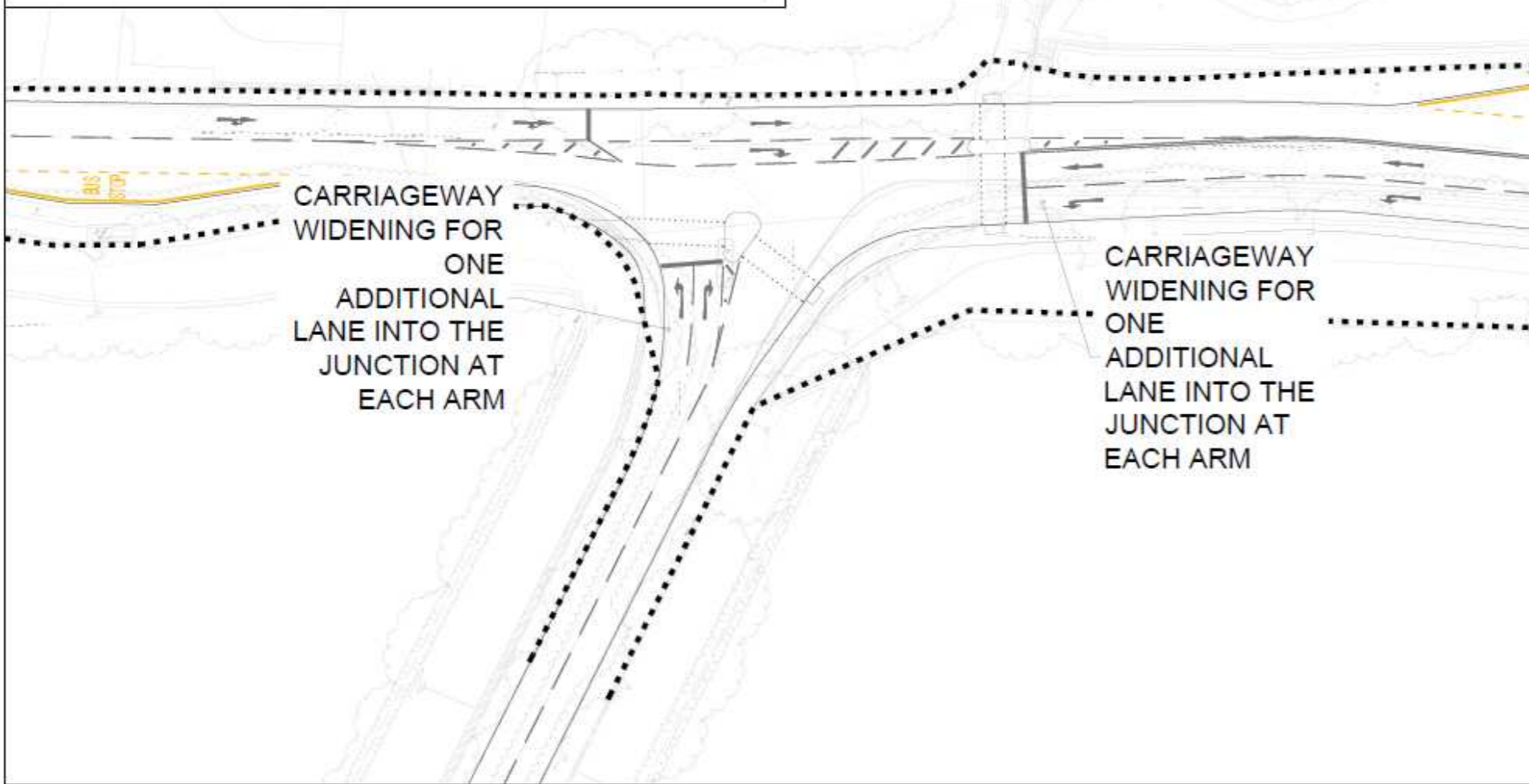
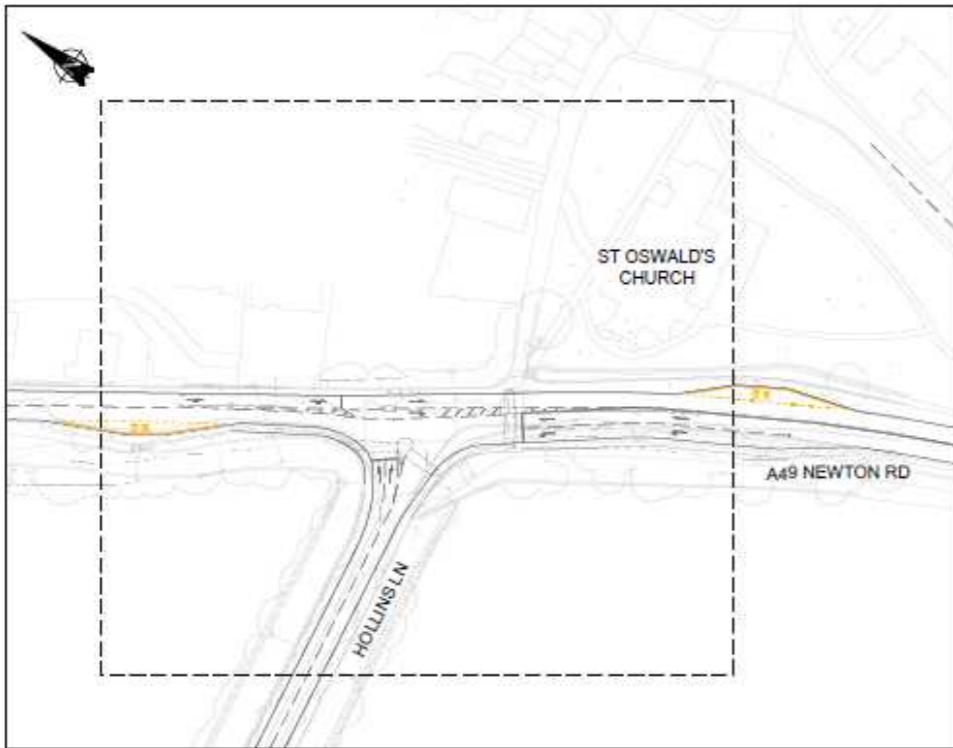
Client: **DERWENT CONSTRUCTION LIMITED**

Project Title: **JUNCTION NINE RETAIL PARK WARRINGTON**

Drawing Title: **WINWICK ROAD S278 WORKS GENERAL ARRANGEMENT**

Scale: 1:500	Drawn By: DH
Drawing Size: A1	Checked By: P.J.M
Date: 19.02.19	Approved By: P.J.M

Drawing Number: 10753-100-001	Rev:
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NOTES:

Rev:	Description:	Date:	By:	Chkd:
B	Existing lines rendered under proposed	19/02/16	DD	KY
A	Changes in layout	19/02/16	DD	KY



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Merchant Exchange, 17-19 Whitworth St West, Manchester, M1 5WG
t: 0161 236 2394
e: manchester@curtins.com
www.curtins.com

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Status: **PRELIMINARY**

Project: **PARKSIDE PHASE I**

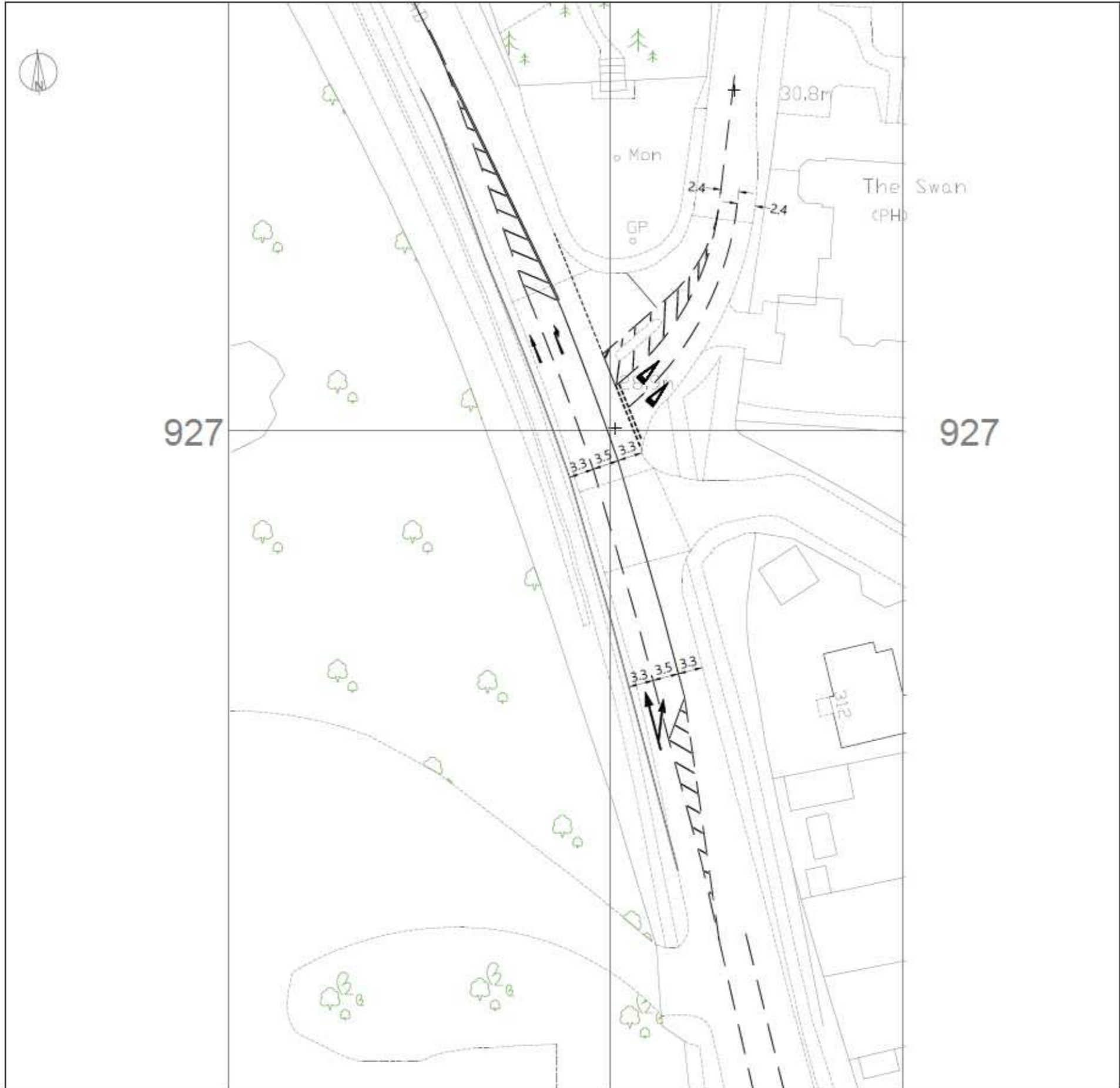
Orig Title: **JUNCTION IMPROVEMENT PROPOSAL
JUNCTION 5 - HOLLINS LANE**

Scale:	Size:	First Issue:	Drawn:	Checked:
1:500	A3	18/02/16	DD	JG

Orig No: **TPMA1389-105** Rev: **B**

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Appendix B. Proposed Mitigation Drawings



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 North arrow indicative.

PRELIMINARY

ISSUE	REASON FOR REVISION	DATE

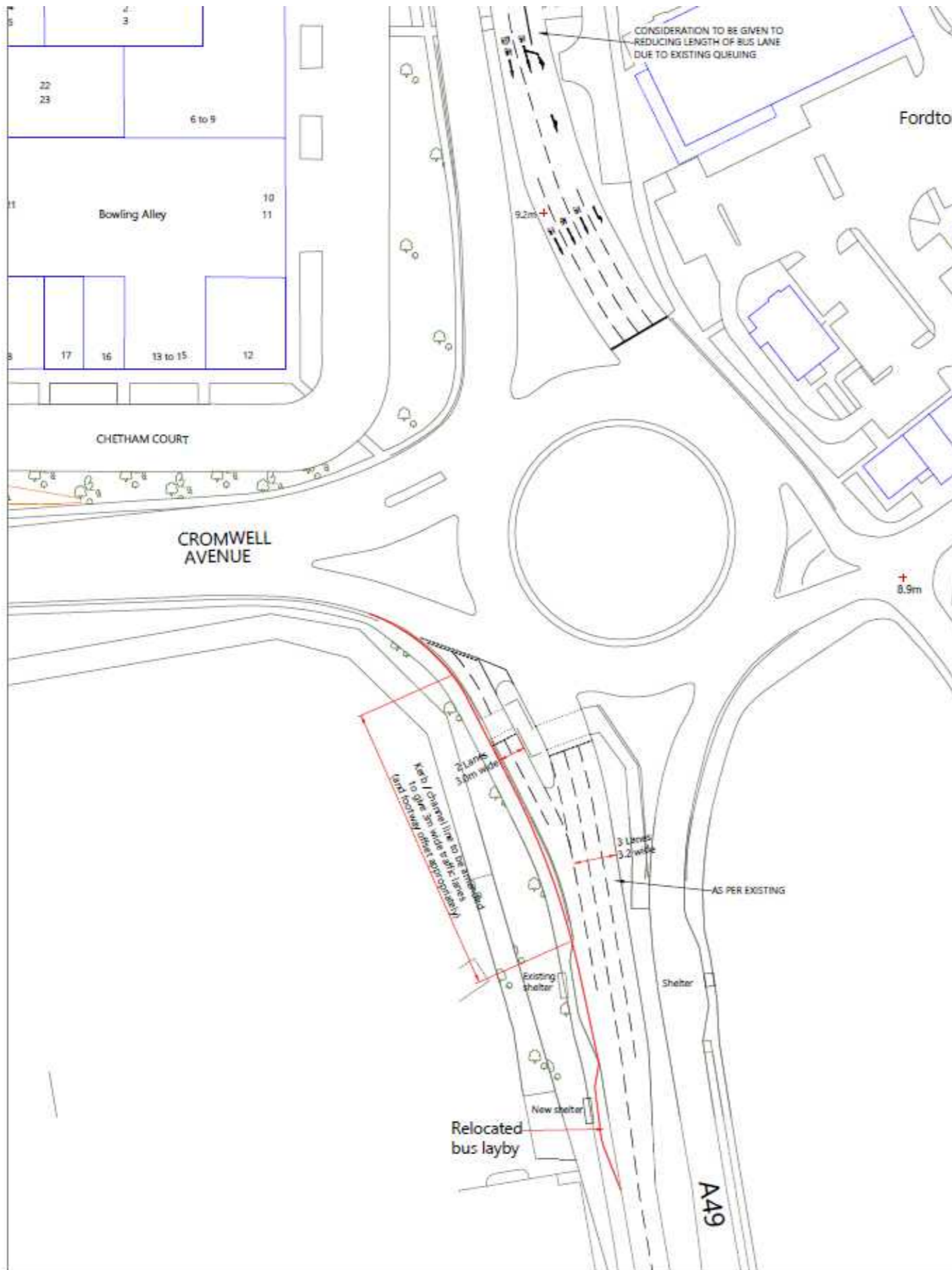
PROJECT:	PEEL HALL WARRINGTON	
CLIENT:	SATNAM MILLENNIUM LTD	
PROJECT REFERENCE:	DRAWING NUMBER:	SCALE:
1901	08	1:500 @ A3

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**PROPOSED A49 / GOLBOURNE ROAD
 JUNCTION IMPROVEMENTS**

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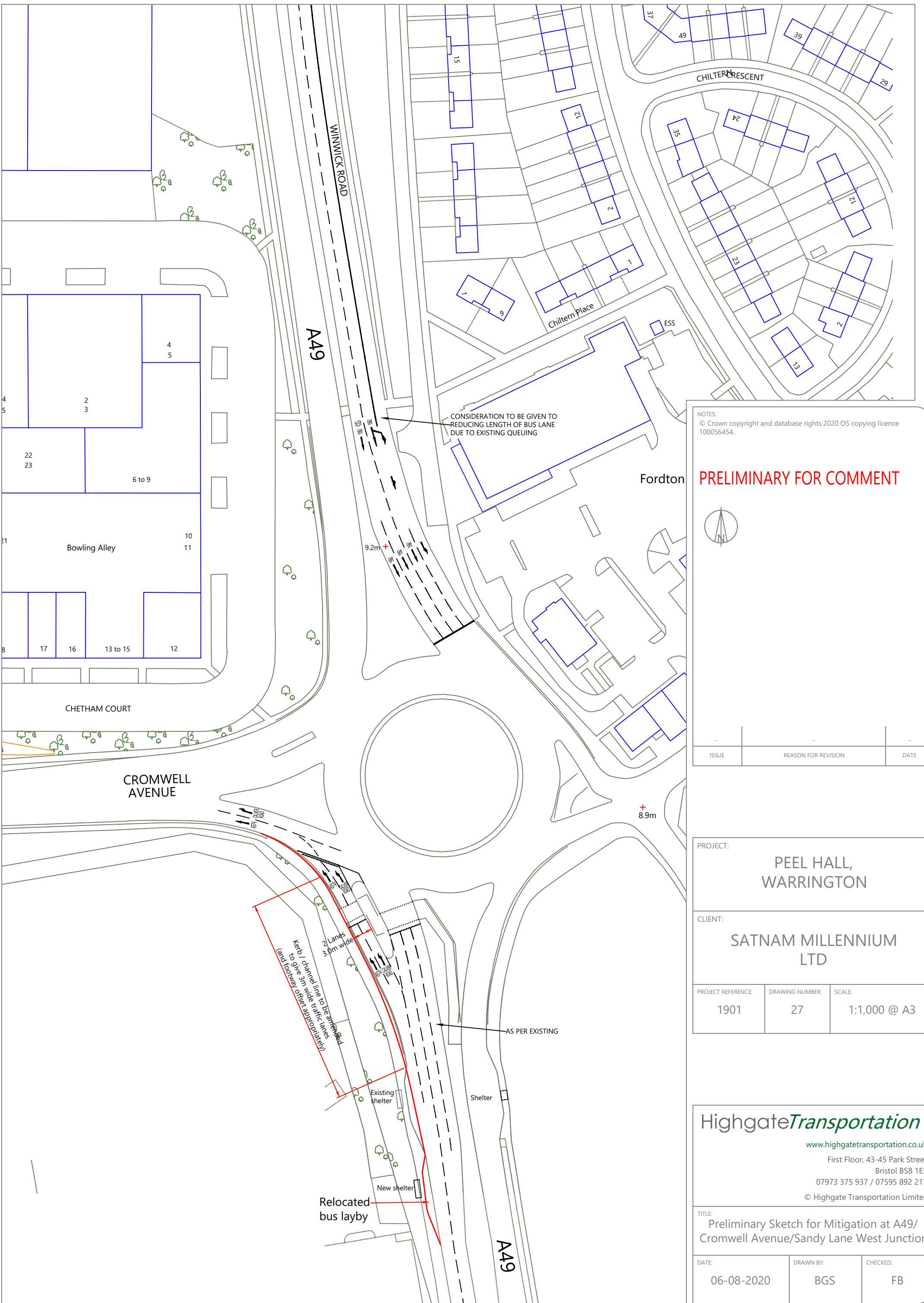
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TITLE:
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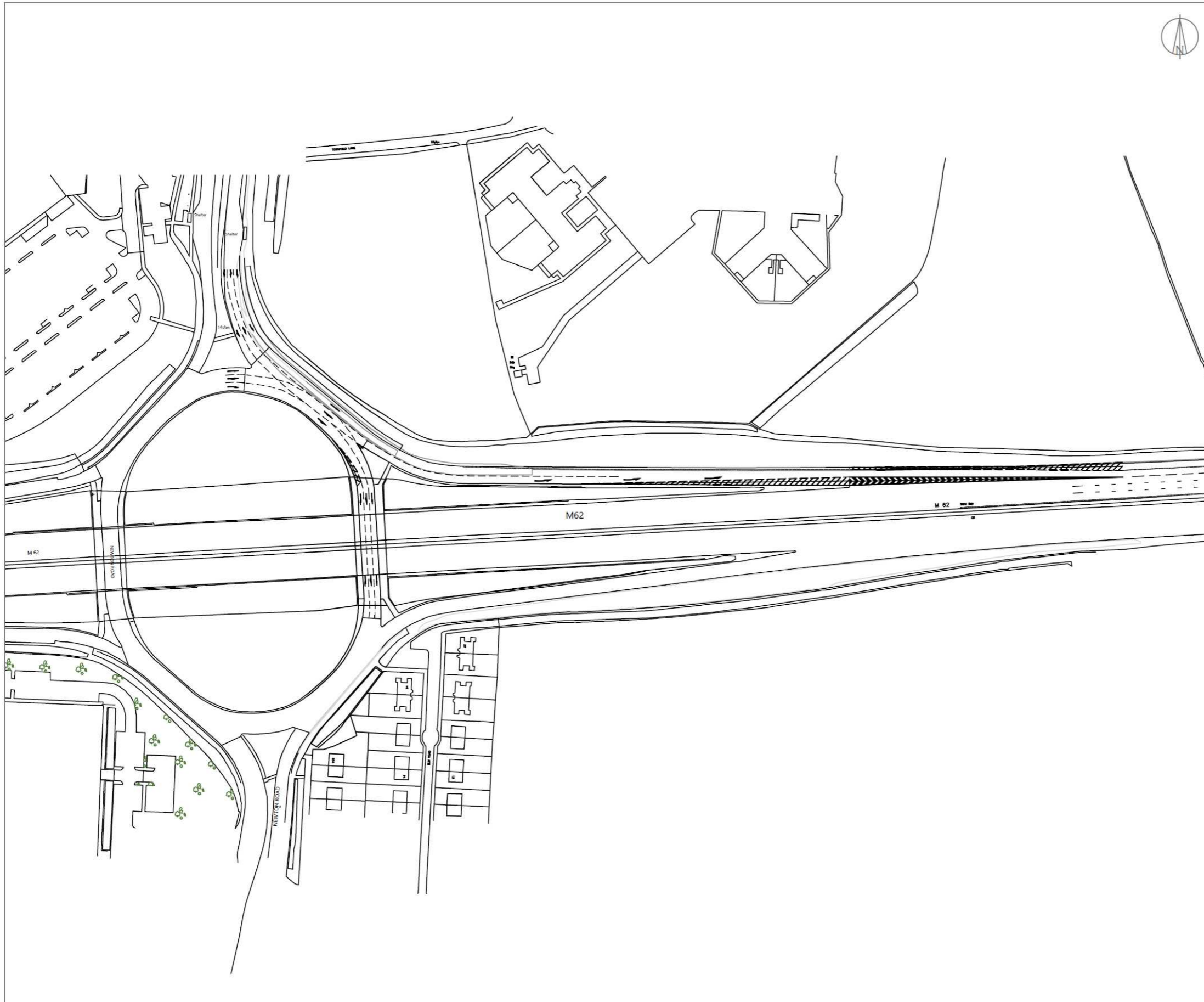
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PRELIMINARY

Note: Lane markings and arrows revised
 where necessary

ISSUE	REASON FOR REVISION	DATE

PROJECT:
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CLIENT:
**SATNAM MILLENNIUM
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PROJECT REFERENCE:	DRAWING NUMBER:	SCALE:
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SHEET:
SHEET 1 OF 3

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TITLE:
**M62 J9 POTENTIAL E/BOUND ON-SLIP
 IMPROVEMENTS - OVERVIEW**

DATE:	DRAWN BY:	CHECKED:
08/09/20	AH	FB

Subject: Re: Peel Hall, Warrington - VISSIM Review Meeting Monday 18th January 10.30
Date: Tuesday, 19 January 2021 at 18:20:39 Greenwich Mean Time
From: Fiona Bennett
To: Heywood, Robert
CC: 'Wright, Colin', 'Rowland, Gary', jim.sullivan@hotmail.co.uk, colin@satnam.co.uk, 'Skinner, Helen', Gallagher, Niki, Hughes, Martha, dave.tighe@highgatetransportation.co.uk, Luke, Wong, Lun, Jon Parr, Taylor, Mike
BCC: 'Christopher Lockhart-Mummery QC'
Attachments: image001.png, image002.png, image003.jpg

Dear Robert,

Further to Mike Taylor's email of this morning, we trust that Mike's email is what you require to confirm your position to the inquiry and that this does not affect the agreement made yesterday that you will now supply your confirmation of no objection with condition(s).

From our discussion yesterday the issues raised in Mike's email were discussed, the response to which was that Highways England are happy with and can accept the VISSIM model, that the proposed mitigation is proportionate for nil detriment and that the MOVA operation installed at the A49/M62 Junction 9 roundabout is capable of adjusting cycle to cycle to accommodate demand now and in the future in any event.

You will appreciate that we need to have clarity on Highways England's position well in advance of the Case Management Call with the Inspector to be held on Monday 25th January 2021.

You will appreciate that if an objection from Highways England does in fact remain, we will need to know the witnesses to be called and who will act as advocate, so that time estimates (including for cross-examination) can be made.

Happy to discuss.

Kind regards,
Fiona

Fiona Bennett
Highgate Transportation
Tel: 0117 934 9121
Mob: 07595 892 217

*Highgate Transportation Ltd
First Floor, 43-45 Park Street
BRISTOL BS1 5NL
Company Registration Number: 07500534*

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From: "Taylor, Mike" <mike.taylor@warrington.gov.uk>
Date: Tuesday, 19 January 2021 at 10:17
To: Fiona Bennett <fiona.bennett@highgatetransportation.co.uk>, "Heywood, Robert" <Robert.Heywood@highwaysengland.co.uk>
Cc: "'Wright, Colin'" <Colin.Wright@wsp.com>, "'Rowland, Gary'" <Gary.Rowland@wsp.com>, "jim.sullivan@hotmail.co.uk" <jim.sullivan@hotmail.co.uk>, "colin@satnam.co.uk" <colin@satnam.co.uk>, "'Skinner, Helen'" <HELEN.SKINNER@planninginspectorate.gov.uk>, "Gallagher, Niki" <Niki.Gallagher@warrington.gov.uk>, "Hughes, Martha" <Martha.Hughes@warrington.gov.uk>, "dave.tighe@highgatetransportation.co.uk" <dave.tighe@highgatetransportation.co.uk>, Luke <luke@modelling.group>, "Wong, Lun" <Lun.Wong@atkinsglobal.com>, Jon Parr <jonparr@live.co.uk>

Subject: RE: Peel Hall, Warrington - VISSIM Review Meeting Monday 18th January 10.30

Fiona,

Thank you for your email.

With reference to action point ii I would highlight the discussions that took place during the course of the meeting in respect of whether MOVA could accurately replicate the specific timings suggested in the VISSIM modelling and the fact that I committed to sending an email to clarify the Council's position regarding the impact on M62 J9 which is as follows:

The Council is satisfied that with the recent introduction of MOVA signal control at the A49 / M62 junction 9 that the local road network would not be unduly affected by development-related traffic associated with Appeal site in this location. As highway authority responsible for the MOVA signal control operation at A49 / M62 junction 9 we cannot, however, confirm the amount of 'additional' green time that could be afforded to the motorway off-slip road approaches, whilst maintaining safe and efficient progression of traffic through the junction. Any variance from current signal timings, for a junction that is already operating at capacity, should be expected to be minimal, on a cycle-by-cycle basis. For these reasons there remains a risk that the signal 'optimisation' timings, adopted by the Appellant's consultants Modelling Group, in their future year VISSIM modelling of the junction would not be replicable on the ground, with longer than predicted queues on the motorway off-slips as a consequence.

I can also confirm that the Council has no specific concerns in relation to development impact at the A49 Newton Road/Hollins Lane junction.

Regards

Mike

Mike Taylor

Transport Development Control Team Leader

CURRENTLY WORKING FROM HOME

Environment and Transport Directorate
Transport for Warrington
Warrington Borough Council
New Town House, Buttermarket Street, Warrington, WA1 2NH

 mike.taylor@warrington.gov.uk

 Office: 01925 444086 Mobile: 07966 884639

warrington.gov.uk

From: Fiona Bennett [mailto:fiona.bennett@highgatetransportation.co.uk]

Sent: 18 January 2021 16:50

To: Heywood, Robert <Robert.Heywood@highwaysengland.co.uk>; Taylor, Mike <mike.taylor@warrington.gov.uk>

Cc: 'Wright, Colin' <Colin.Wright@wsp.com>; 'Rowland, Gary' <Gary.Rowland@wsp.com>; jim.sullivan@hotmail.co.uk; colin@satnam.co.uk; 'Skinner, Helen'

<HELEN.SKINNER@planninginspectorate.gov.uk>; Gallagher, Niki <Niki.Gallagher@warrington.gov.uk>; Hughes, Martha <Martha.Hughes@warrington.gov.uk>; dave.tighe@highgatetransportation.co.uk; Luke <luke@modelling.group>; Wong, Lun <Lun.Wong@atkinsglobal.com>; Jon Parr <jonparr@live.co.uk>

Subject: Re: Peel Hall, Warrington - VISSIM Review Meeting Monday 18th January 10.30
Date: Friday, 22 January 2021 at 16:44:15 Greenwich Mean Time
From: Heywood, Robert
To: Fiona Bennett
CC: 'Wright, Colin', Gallagher, Niki, 'Skinner, Helen', colin@satnam.co.uk, jim.sullivan@hotmail.co.uk, 'Rowland, Gary', Hughes, Martha, dave.tighe@highgatetransportation.co.uk, Luke, Wong, Lun, Jon Parr, Taylor, Mike

Dear Fiona,

Having taken the time to consider Mike's response below I am of the opinion that this is a subtly different position to that stated on the call and the sentence*there remains a risk that the signal 'optimisation' timings, adopted by the Appellant's consultants Modelling Group, in their future year VISSIM modelling of the junction would not be replicable on the ground, with longer than predicted queues on the motorway off-slips as a consequence.* is of a concern.

Notwithstanding this it is still felt that mitigation proposed for M62 J9 by yourselves would result in nil detriment from the Peel Hall development on the Strategic Road Network and that with support from the Local Highway Authority that this will be possible to implement.

As you are aware proposed modifications to the SRN must also be supported by an agreed Stage 1 Road Safety Audit (RSA) and any necessary Designer's Response. The RSA is required to provide an independent assessment of the key design and operating arrangements of the new design, to identify any potential issues, and to recommend measures to mitigate any issues that may arise. As the RSA will impact both the SRN and local road network the RSA brief and audit team should be agreed by both Highway Authorities.

Following completion of the Stage 1 RSA I will be able to provide our formal response for the Inspector to set out in detail our position on the modelling and mitigation as well as the proposed conditions which is likely to include (but not limited to) a line regarding the MOVA calibration being submitted to and approved by the LPA having consulted with the Highway Authority for the M62 Motorway.

I trust this provides the assurance on the current position of Highways England.

Kind regards,
Rob

Robert Heywood, Route Manager

Network Development & Planning Team

Highways England | Atlantic House | Birchwood Boulevard | Warrington | WA3 7WE

Mobile: + 44 (0) 7785 925 993

Web: www.highwaysengland.co.uk

From: Fiona Bennett <fiona.bennett@highgatetransportation.co.uk>

Sent: 19 January 2021 18:20

To: Heywood, Robert <Robert.Heywood@highwaysengland.co.uk>

APP35 -

Peel *Hall* WBC-WSP TN12 Future Years VISSIM *Review*

Subject: RE: Peel Hall, Warrington.
Date: Friday, 8 January 2021 at 17:16:31 Greenwich Mean Time
From: Taylor, Mike
To: Gallagher, Niki, Skinner, Helen, Colin Griffiths, Hughes, Martha, Clisby, Paul
CC: 'jim.sullivan@hotmail.co.uk', 'Spencer Tewis-Allen', Carney, Matthew, fiona.bennett@highgatetransportation.co.uk, dave.tighe@highgatetransportation.co.uk, Heywood, Robert
Attachments: image001.png, image002.png, image003.jpg, TN12 A49 VISSIM Forecast Model Review Dec 2020 v14.pdf

Helen,

Apologies for the slight delay but I have been involved in another Public Inquiry. Please find attached the review carried out by WSP on behalf of the Council for the information of all parties.

Regards

Mike

Mike Taylor

Transport Development Control Team Leader

CURRENTLY WORKING FROM HOME

Environment and Transport Directorate
Transport for Warrington
Warrington Borough Council
New Town House, Buttermarket Street, Warrington, WA1 2NH

 mike.taylor@warrington.gov.uk

 Office: 01925 444086 Mobile: 07966 884639

warrington.gov.uk

From: Gallagher, Niki
Sent: 22 December 2020 09:57
To: Skinner, Helen <HELEN.SKINNER@planninginspectorate.gov.uk>; Colin Griffiths <colin@satnam.co.uk>; Hughes, Martha <Martha.Hughes@warrington.gov.uk>; Clisby, Paul <pclisby@warrington.gov.uk>; Taylor, Mike <mike.taylor@warrington.gov.uk>
Cc: 'jim.sullivan@hotmail.co.uk' <jim.sullivan@hotmail.co.uk>; 'Spencer Tewis-Allen' <spencer.tewis-allen@townlegal.com>; Carney, Matthew <Matthew.Carney@warrington.gov.uk>
Subject: RE: Peel Hall, Warrington.

Dear Helen

In Martha's absence, I can confirm that the Council will endeavour to issue its review by 11th January. Please note that any changes to this anticipated date will be conveyed to you at the earliest opportunity in the new year and a further, more detailed response to matters raised in correspondence by the appellant since your email below may also be provided.

Wishing you a happy festive break.



TECHNICAL NOTE 12

DATE:	11 January 2021	CONFIDENTIALITY:	Public
SUBJECT:	A49 VISSIM Forecast Model Review Dec 2020		
PROJECT:	Peel Hall	AUTHOR:	TL/CEW
CHECKED:	JP	APPROVED:	GR

INTRODUCTION

WSP has been commissioned by Warrington Borough Council (WBC) to provide technical advice regarding transport modelling for a development site at Peel Hall. This includes a Vissim microsimulation model of the A49 Corridor between A49 Winwick Link Road/Newton Road/Winwick Park Avenue junction and A49/A50/Hawleys Lane junction including the M62 mainline at Junction 9. The Vissim model has been developed by Modelling Group (MG) on behalf of Highgate (and Satnam).

Between January and November 2020, we have undertaken numerous reviews of the 2019 base model and concluded in Technical Note 11, dated 27/11/2020, that the base model is broadly acceptable for the purpose of testing forecast scenarios.

On 02/12/2020 an updated package of forecast modelling and reporting was provided to WSP. This package of information is the subject of this review. Submitted documentation includes:

- Data – a series of spreadsheets detailing the forecasting process from SATURN to VISSIM via Linsig, these are:
 - BaseModelRatioBalances.xlsx
 - Link Flow Summary Strategy A_HTp_M62 Summary.xlsx
 - MG0123_A49Warrington_PeelHall_DevFlowInputs_v1.xlsx
 - MG0123_Lin2VIS_MtxConv_SATVISSIM_FY_v10.xlsx
 - MG0123_Lin2VIS_MtxConv_SATVISSIM_FY_v10_ODmatrix_Result.xlsx
- Models – forecast models for all development scenarios, forecast years and time periods;
- Forecasting Report – detailing the forecast scenarios and the key model outputs:
 - MG0123_A49WarringtonCorridor_OptionA_ModellingReport_v6.3.pdf
- Results – spreadsheets containing the base year performance metrics and forecast year model outputs:
 - MG0123_A49Warrington_VISSIM_CalVal_v6.xlsx
 - MG0123_A49Warrington_PeelHallOptA_Results_v6.2.xlsx



REVIEW

1. Forecast Models

1.1. Forecast Scenarios

All of the scenarios are saved in 'Scenario Management' in a Vissim file, which include 2019 Base Year models and the forecast models. Forecast scenarios include:

- **2022 DM:** 2022 Background & Committed Traffic Growth + Committed Mitigation Measures (Reference Case)
- **2022 DS:** 2022 Background & Committed Traffic Growth + Peel Hall Development Traffic (Full Development Scenario) + Committed & Proposed Mitigation Measures (Proposed Test)
- **2022 DS+M4 Mitigation:** 2022 Background & Committed Traffic Growth + Peel Hall Development Traffic (Full Development Scenario) + Committed & Proposed Mitigation Measures + M4 Mitigation Package (Mitigation Test)
- **2027 DM:** 2027 Background & Committed Traffic Growth + Committed Mitigation Measures (Reference Case)
- **2027 DS:** 2027 Background & Committed Traffic Growth + Peel Hall Development Traffic (Part-Build Out with no Internal Link Development Scenario) + Committed & Proposed Mitigation Measures (Proposed Test)
- **2027 DS+M4 Mitigation:** 2027 Background & Committed Traffic Growth + Peel Hall Development Traffic Part-Build Out with no Internal Link Development Scenario) + Committed & Proposed Mitigation Measures + M4 Mitigation Package (Mitigation Test)
- **2032 DM:** 2032 Background & Committed Traffic Growth + Committed Mitigation Measures (Reference Case)
- **2032 DS:** 2032 Background & Committed Traffic Growth + Peel Hall Development Traffic (Full Development Scenario) + Committed & Proposed Mitigation Measures (Proposed Test)
- **2032 DS + M4 Mitigation:** 2032 Background & Committed Traffic Growth + Peel Hall Development Traffic (Full Development Scenario) + Committed & Proposed Mitigation Measures + M4 Mitigation Package (Mitigation Test)

The 2022 forecast scenarios have been produced at the request of Highways England. These are theoretical forecasts where the full development trips are assessed in the opening year.

The modelling periods are:

- **AM:** 07:00-09:30 (07:00-08:00 warm up, 08:00-09:00 peak hour and 09:00-09:30 cool down)
- **PM:** 16:00-18:30 (16:00-17:00 warm up, 17:00-18:00 peak hour and 18:00-18:30 cool down)

1.2. Mitigation Measures

Several changes have been made to the network to reflect the committed mitigation works. These include:

Committed Mitigation Measures:

- A49 Newton Rd/Hollins Lane Junction: improved northbound capacity



- A49 Newton Road/ Winwick Link Road Junction (Winwick Island): widening of northbound, southbound and westbound approach; segregated left turn lane
- A49 Newton Road / Delph Lane Junction A49: additional lane for Newton Road northbound
- Winwick Road/ Junction Nine Retail Park Junction: widening of northbound and southbound lanes

Proposed Mitigation Measures

- A49 Newton Road/Golborne Road Junction: Increase road widths to increase queueing capacity
- A49 Winwick Road/ A50 Long Lane/Hawley's Lane Junction: Improved signal controller

M4 Mitigation Measures

- A49 Winwick Road/Sandy Lane West/A574 Cromwell Avenue Junction: widening of northbound left-turn filter lane
- M62 Junction 9: widening of eastbound on-slip road

2. Forecast Demand

2.1. Development of Forecast Demand

The forecast demand for the Vissim model is derived from the Saturn model (WMMTM16) and the Vissim base year model. The percentage changes between the Saturn base model and the future scenarios have been applied to the Vissim model to create future origin-destination values.

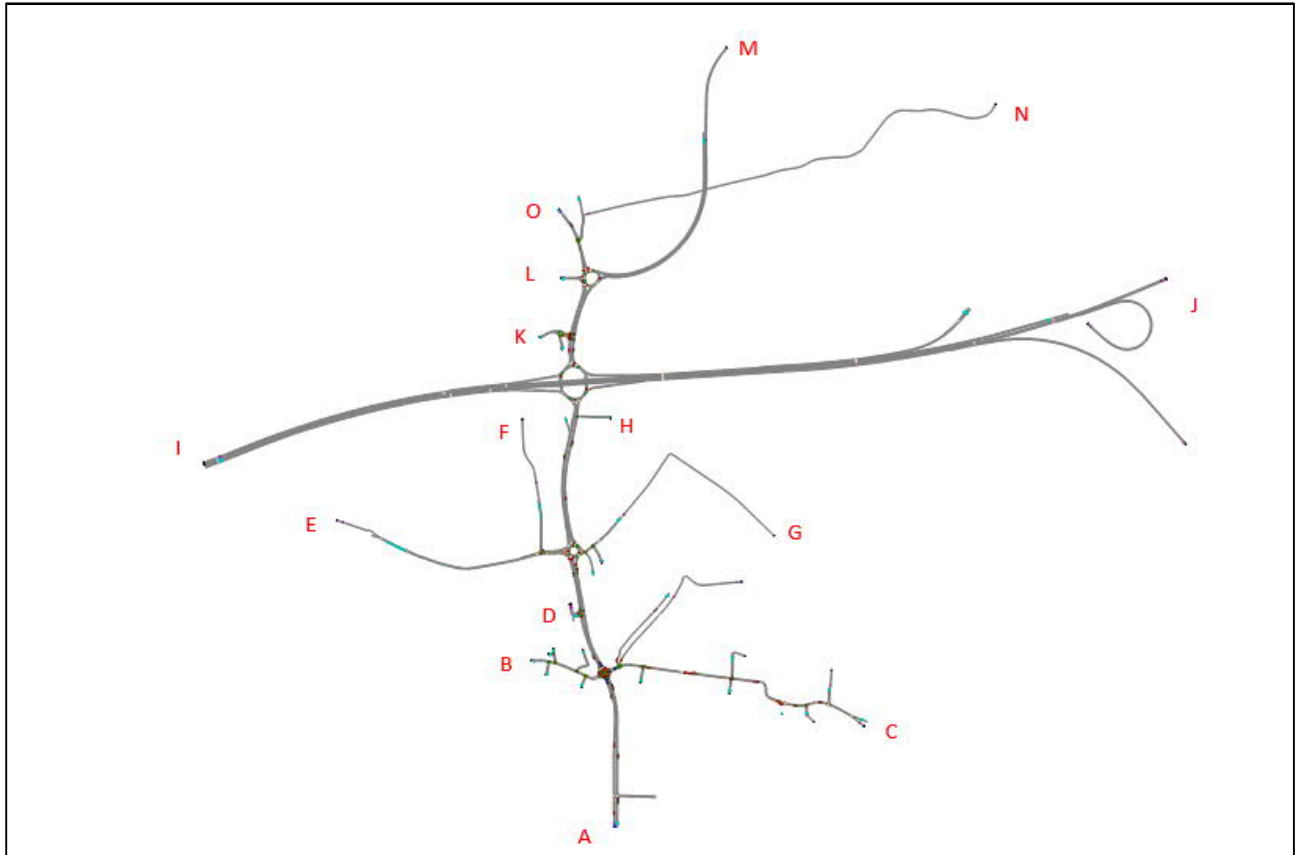
For the Do Minimum scenarios percentage growth (Saturn base to Saturn DM) has been applied to the base year model. For the Do Something scenario the percentage growth (Saturn base to Saturn DS with development trips removed) is applied to Vissim base demand with absolute development trip matrix then added on top.

The option to use absolute demand differences exists should the percentage method produce illogical results. This was applied to origin-destination between Winwick Link Road (Zone M), Goldborne Road (Zone N) and A49 Newton Road (Zone O).

The zoning system can be found in Figure 1 and the comparisons of Saturn and Vissim trip ends can be found in Appendix 1.

The comparisons indicate that the Saturn and Vissim development trips are almost exact. The 2027 scenarios have differing trip rates than the full build out applied in 2022 and 2032 models due to internal trip discounting not being applied, and this has been applied correctly.

Figure 1 Zoning System



2.2. Comparison of Matrices of Saturn and Vissim

However, trip from/ to some zones do not appear to be consistent between Saturn and Vissim models. Table 1 to Table 5 provide examples of where trips from/ to zones might be underestimated. Saturn flows are taken from *Peel Hall Access Strategy A - Flow Diagram Spreadsheet - REISSUE 210120.xlsm* issued by Highgate on 21st January 2020. Vissim flows are taken from *MG0123_Lin2VIS_MtxConv_SATVISSIM_FY_v10_ODmatrix_Result.xlsx* and *MG0123_Lin2VIS_MtxConv_SATVISSIM_FY_v10.xlsx* issued by Highgate on 2nd December 2020. This is a comparison of total vehicle flow. Saturn flows are actual flows in pcus, Vissim flows are vehicles.

Table 1 Comparison of Development Trips from Sandy Lane West

Zone	Location	Origin or Destination	Modelling Year	Time Period	Scenario	Saturn	Vissim
G	Sandy Lane West	Origin	2032	AM	DM	532	821
					DS (without Peel Hall Developments)	-	724
					Peel Hall Development	104	106
					DS (with Peel Hall Developments)	584	830
					DS (with Peel Hall Developments)/ DM	110%	101%
					DS (with Peel Hall Developments) - DM	+52	+9

Table 2 Comparison of Development Trips to Sandy Lane West

Zone	Location	Origin or Destination	Modelling Year	Time Period	Scenario	Saturn	Vissim
G	Sandy Lane West	Destination	2027	PM	DM	712	1105
					DS (without Peel Hall Developments)	-	981
					Peel Hall Development	88	89
					DS (with Peel Hall Developments)	805	1070
					DS (with Peel Hall Developments)/ DM	113%	97%
					DS (with Peel Hall Developments) - DM	+93	-35

Table 3 Comparison of Development Trips from Junction Nine Retail Park 2022

Zone	Location	Origin or Destination	Modelling Year	Time Period	Scenario	Saturn	Vissim
D	Retail Park	Origin	2022	PM	DM	343	375
					DS (without Peel Hall Developments)	-	287
					Peel Hall Development	22	21
					DS (with Peel Hall Developments)	365	308
					DS (with Peel Hall Developments)/ DM	107%	82%
					DS (with Peel Hall Developments) - DM	+22	-67

Table 4 Comparison of Development Trips from Junction Nine Retail Park 2027

Zone	Location	Origin or Destination	Modelling Year	Time Period	Scenario	Saturn	Vissim
D	Retail Park	Origin	2027	PM	DM	361	464
					DS (without Peel Hall Developments)	-	344
					Peel Hall Development	19	18
					DS (with Peel Hall Developments)	380	362
					DS (with Peel Hall Developments)/ DM	105%	78%
					DS (with Peel Hall Developments) - DM	+19	-102

Table 5 Comparison of Development Trips from Junction Nine Retail Park 2032

Zone	Location	Origin or Destination	Modelling Year	Time Period	Scenario	Saturn	Vissim
D	Retail Park	Origin	2032	PM	DM	381	572
					DS (without Peel Hall Developments)	-	407
					Peel Hall Development	22	20
					DS (with Peel Hall Developments)	404	427
					DS (with Peel Hall Developments)/ DM	106%	75%
					DS (with Peel Hall Developments) - DM	+23	-145

The demand differences highlighted could lead to an underestimation of the impacts of the development on the A49 corridor, specifically at the A49 / Sandy Lane West / Cromwell Avenue junction. For the example given in Table 1 this is most likely due to a large difference between base year flows in the Saturn and Vissim models. Application of absolute growth (Saturn DS-DM added to Vissim DM) would have produced a Vissim DS flow that would be more likely to show the impact of the developments in comparison with the DM flow.

Further examination into the construction of the Vissim demand for Zone D (Table 3 to Table 5) revealed that the step where the Saturn development matrix is subtracted from the Saturn DS matrix can produce negative trips between certain OD pairs. Thus when the proportional growth is applied to the Vissim base matrix, the OD pairs with negative growth are set to 0.1, as a negative trip is illogical. The lights/car trips from Zone D to G in 2022 PM are presented below to show the impact this has on forecasting.

Table 6 Forecasting of lights/car trips from Zone D to G in 2022 PM

Model	Trips
1 Saturn Base	3
2 Saturn Do Minimum	2
3 Growth from Base to Do Minimum (2/1)	67%
4 Saturn Do Something (inc devs)	3
5 Saturn development trips	6
6 Saturn Do Something (without devs) (4-5)	-3
7 Growth from Base to Saturn Do Something (without devs)	-100%
8 Vissim Base	67
9 Vissim Do Minimum (8*3)	45
10 Vissim Do Something (without devs) (8*7)	-67
11 Adjusted Vissim Do Something (without devs)	0
12 Vissim Do Something (with devs) (5+11)	6

For this OD pair the Vissim DS (with devs) forecast is around 40 trips lower than it should be. The full list of OD pairs which produce negative lights trips after removing the development trips from the Saturn Do Something matrix are:

- 2022 AM – G to D, G to H, H to G, I to H, N to H and N to M;
- 2027 AM - G to D, G to H, H to G, I to H, and N to H;
- 2032 AM - G to D, G to H, H to D, H to G, I to H, and N to H;
- 2022 PM – D to G, G to D, G to H, H to G and M to N;
- 2027 PM – D to G, G to D, G to H, and H to G; and
- 2032 PM – D to G, G to D, G to H, and H to G.

These taken from *MG0123_Lin2VIS_MtxConv_SATVISSIM_FY_v10.xlsx*, worksheets *Matrix_Diffs_AM* and *Matrix_Diffs_PM*. The differences in many cases are small, but as shown in Table 6 above, can have an impact on the forecast flows. It is not clear why negative values occur, as both the Do Something (with devs) and development matrices come from the same SATURN assignment.

3. Network Coding Check

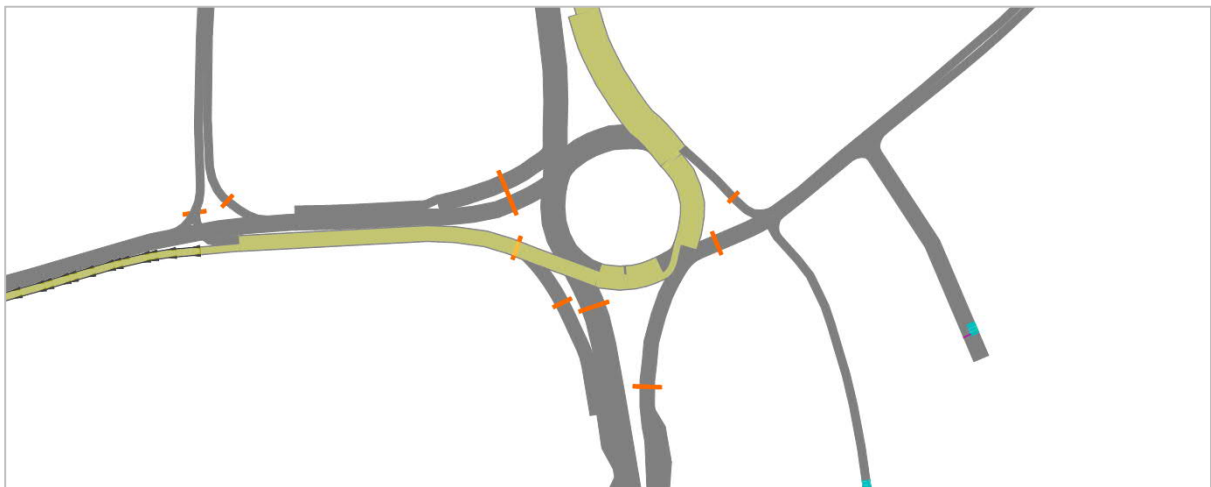
3.1. Reference Case (Do Minimum)

The committed mitigation in the reference cases have been checked against the drawings provided in Appendix D1 of MG0123_A49WarringtonCorridor_OptionA_ModellingReport_v6.3.pdf. and the coding is satisfactory.

In our previous reviews, we observed some vehicles are stuck in the dedicated right turn on Cromwell Avenue into Calver Road and have to change into the ahead lane after the platoon of traffic has passed. This is due to the exit from the roundabout circulatory coded as two ahead lanes on the roundabout and immediately after becomes one ahead and one dedicated right.

The latest modelling has been amended to simulate tighter lane discipline at A49 / Sandy Lane West / Cromwell Avenue junction in forecast scenarios. Figure 2 indicates that vehicle routes have been correctly coded in the model.

Figure 2 Lane Discipline on A49/ Sandy Lane Junction



3.2. Do Something Scenarios

The proposed mitigation at A49 Newton Road / Golborne Road Junction has been checked against the drawings provided in Appendix D2 of MG0123_A49WarringtonCorridor_OptionA_ModellingReport_v6.3.pdf. and the coding is satisfactory.

The proposed mitigation measures in Do Something scenarios also include improved signal controller at A49 Winwick Road/ A50 Long Lane/Hawley's Lane Junction.

3.3. M4 Mitigation

The proposed drawing for M4 mitigation at A49 / Sandy Lane West / Cromwell Avenue is shown in Figure 3 (an extract from Appendix D2 of MG0123_A49WarringtonCorridor_OptionA_ModellingReport_v6.3.pdf). The northbound left-turn filter lane from A49 Winwick Road to Cromwell Avenue has been widened to two lanes.

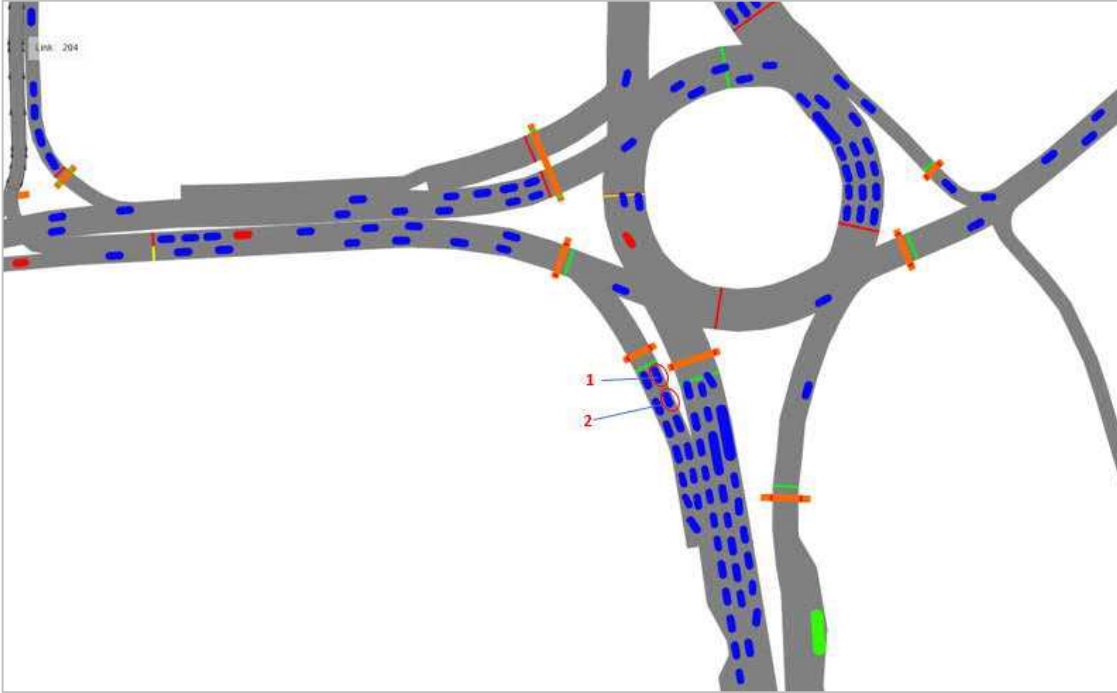
Figure 3 M4 Mitigation Drawing



From the drawing there is no lane dedication marking on the left turn lanes. The model animation indicates vehicles would use the offside lane of the left turn lanes even if their destination is Cromwell Avenue westbound. Figure 4 to Figure 7 are screenshots of 2032 DS+ M4 Mitigation.

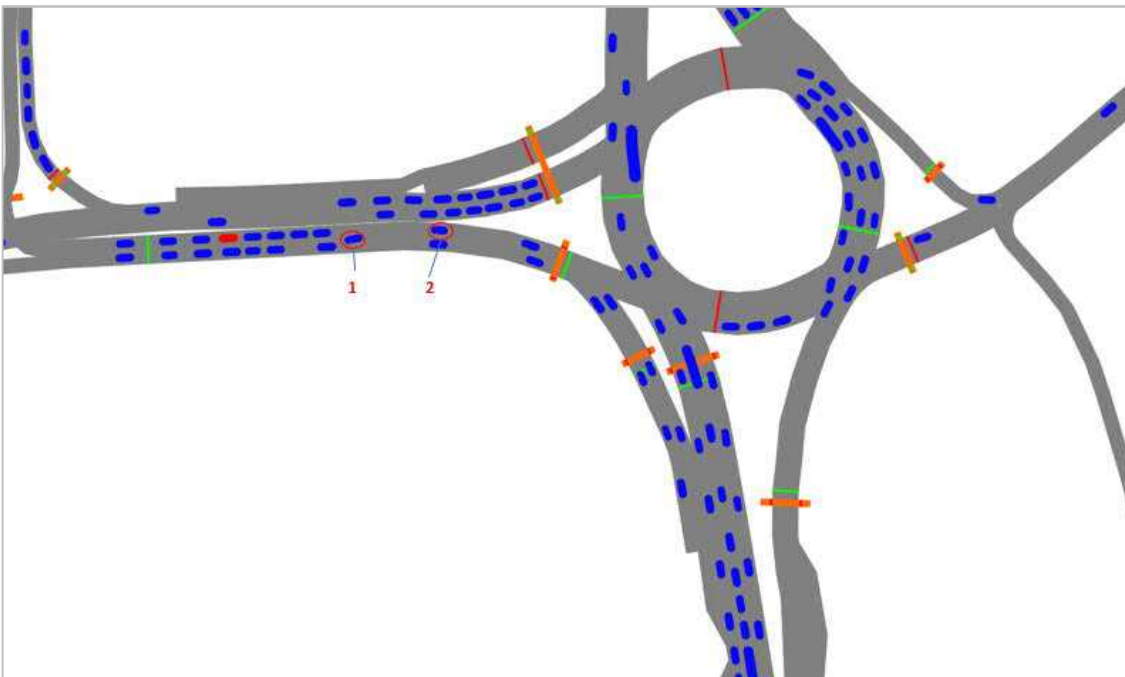
In Figure 4, Vehicle No 1 and No 2 are travelling to Cromwell Avenue westbound but using offside lane of the two dedicated left turn lanes.

Figure 4 Screenshot of 2032 DS + Mitigation #1



In Figure 5, Vehicle No 1 finds a gap and moves to the nearside lane of Cromwell Avenue.

Figure 5 Screenshot of 2032 DS + Mitigation #2



However, as shown in Figure 6 and Figure 7, Vehicle No 2 is stuck by the platoon of traffic and could only change into ahead lane near the signal stop line on Cromwell Avenue for Calver Road.

Figure 6 Screenshot of 2032 DS + Mitigation #3

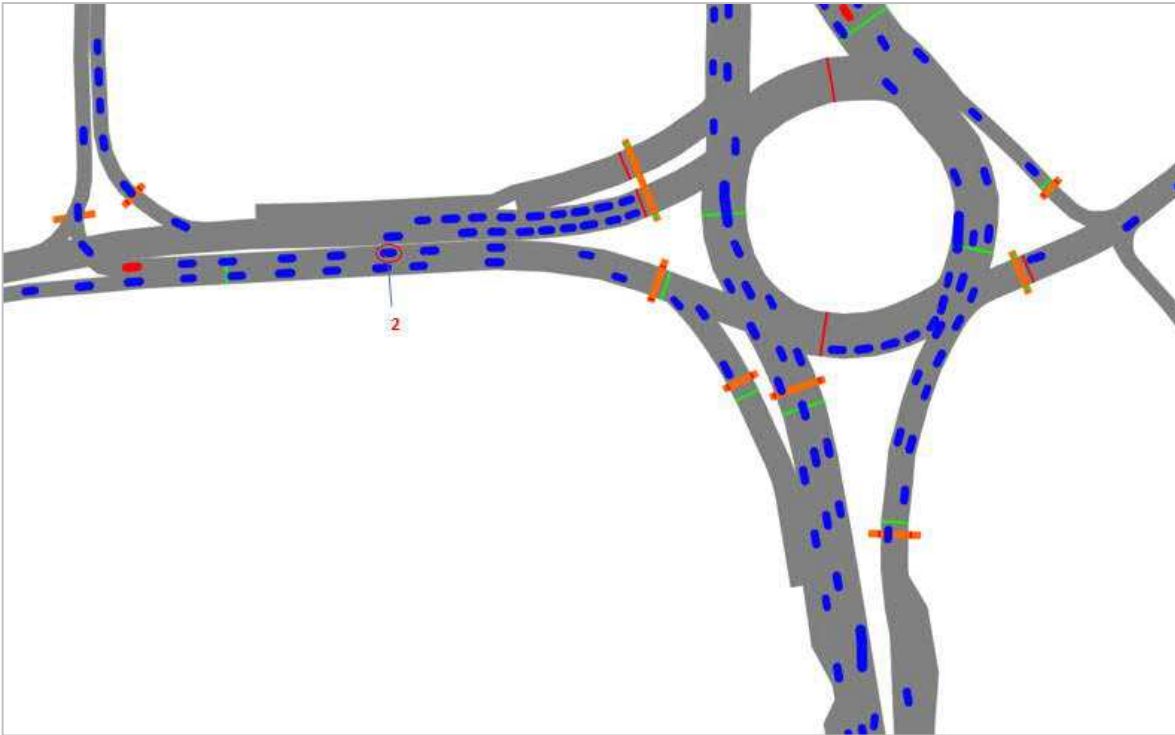
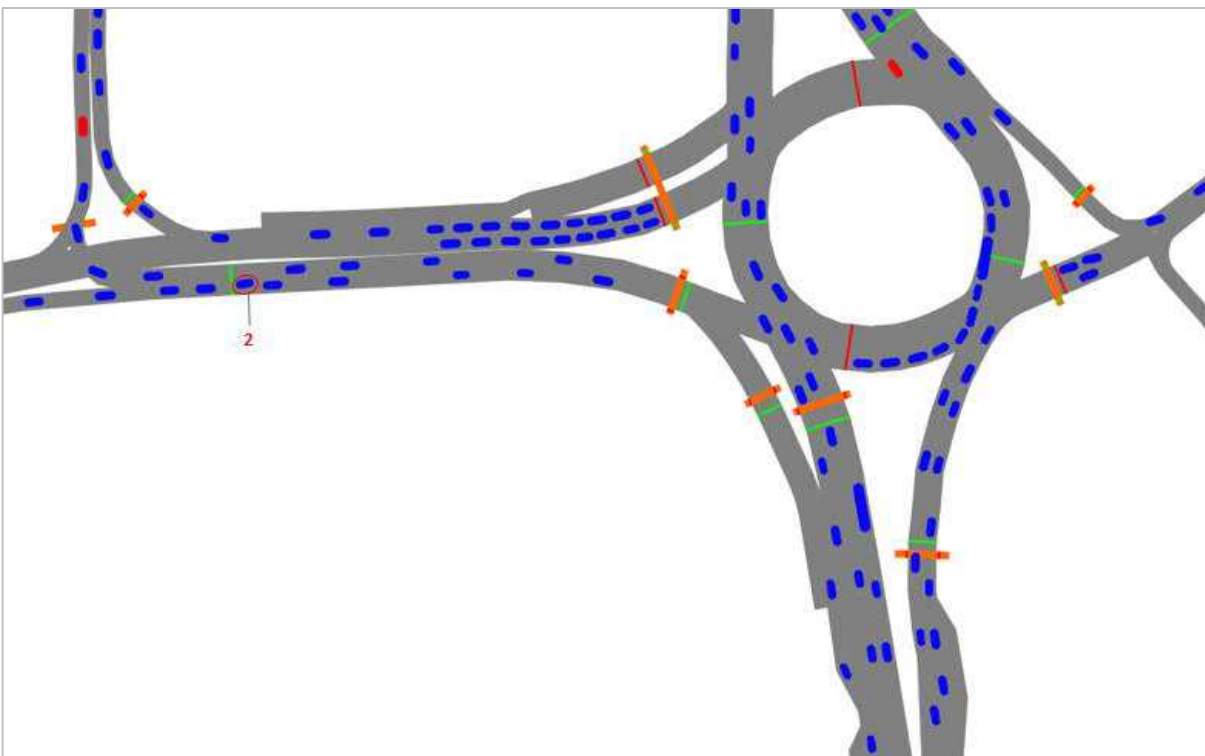


Figure 7 Screenshot of 2032 DS + Mitigation #4



Permitting use of the offside lane of the left turn lanes from A49 to Cromwell Avenue will increase the number of vehicle conflicts through merge movements on the short link between the roundabout and the Calver road junction. In addition, the current coding may overstate the impact of the mitigation as dedicated lanes in the left turn filter could lead to blocking of vehicles in the nearside lane with destination on Cromwell Avenue into the A49.

3.4. Signal Optimisation

The base year signal timings have been altered in the reference case (Do Minimum) models. The reason for this is given in paragraph 2.3.2 of

MG0123_A49WarringtonCorridor_OptionA_ModellingReport_v6.3.pdf:

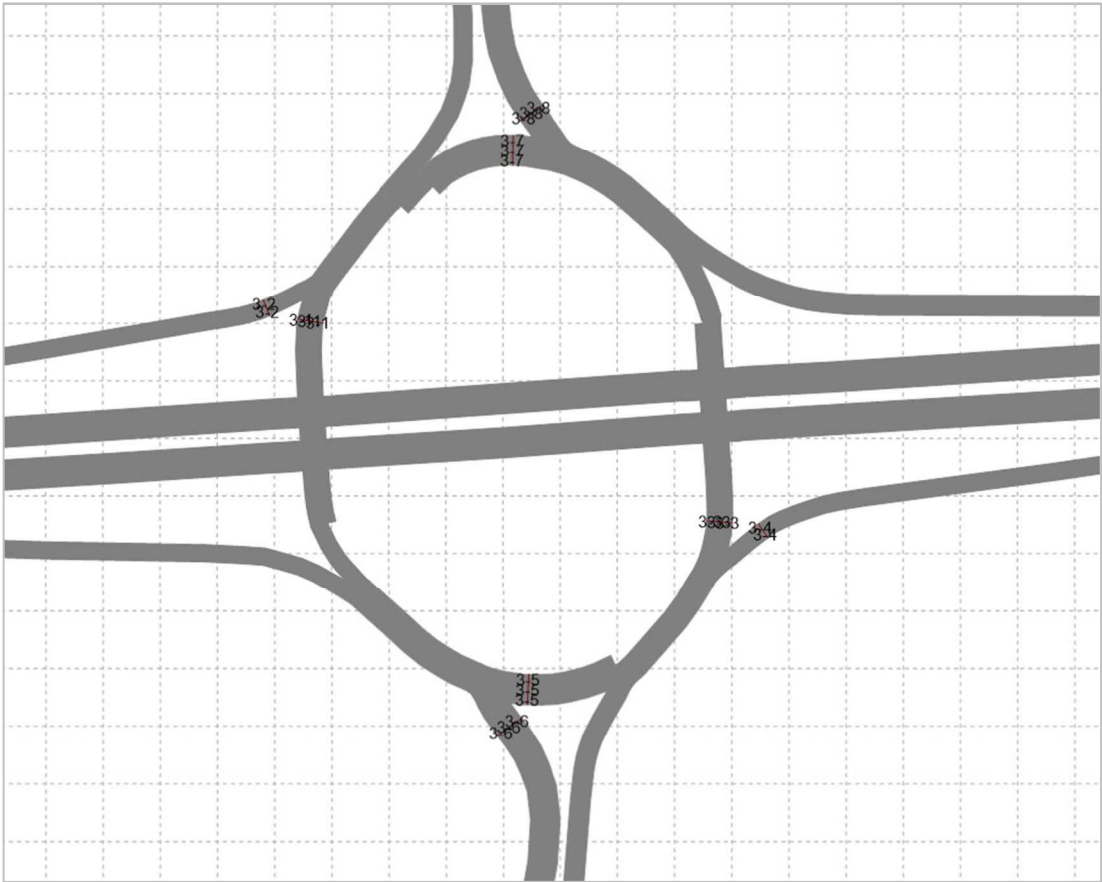
“As a result of the level of change these committed mitigation works (ref paragraph 2.3.1) made to flow patterns around the network, it was reasoned to be an acceptable approach to carry out signal optimisation (consisting of small, iterative changes to individual phase and stage green-times, rather than any sort of wholesale change to signal controller operation) where needed, in each future year scenario”.

No further information is provided on which signals have been altered or the rationale and logic behind the changes. We have therefore extracted green times from the Vissim forecast models at all signalised junctions and compared reference case timings with base year timings. The main changes to signals come at the junctions of M62 / A49 and A49 / Sandy Lane West / Cromwell Avenue, where the green time on approach arms has been increased and green time on the circulatory carriageway reduced. The cycle times and offsets remain unaltered. The green time for base year and reference case models at both junctions are given below. Green cells are where green time has increased from the base, red cells are where it has decreased. This is shown in Table 7 and Figure 8 (M62 J9), and Table 8 and Figure 9 (A49 / Sandy Lane West / Cromwell Avenue).

Table 7 M62 J9 green times

Sc 3	M62 EB Off Slip		M62 WB Off Slip		A49 NB		A49 SB	
	Sc 3_1	Sc 3_2	Sc 3_3	Sc 3_4	Sc 3_5	Sc 3_6	Sc 3_7	Sc 3_8
	1	2	3	4	5	6	7	8
1_AM_Base	23	13	22	14	14	22	13	23
3_AM_DM_2022	17	19	19	17	19	17	11	25
5_AM_DM_2027	18	18	20	16	21	15	10	26
7_AM_DM_2032	18	18	18	18	21	15	10	26
2_PM_Base	22	12	22	12	12	23	21	14
4_PM_DM_2022	22	12	22	12	14	21	17	18
6_PM_DM_2027	22	12	22	12	14	21	16	19
8_PM_DM_2032	20	14	21	13	15	20	14	21

Figure 8 M62 J9 signal controllers

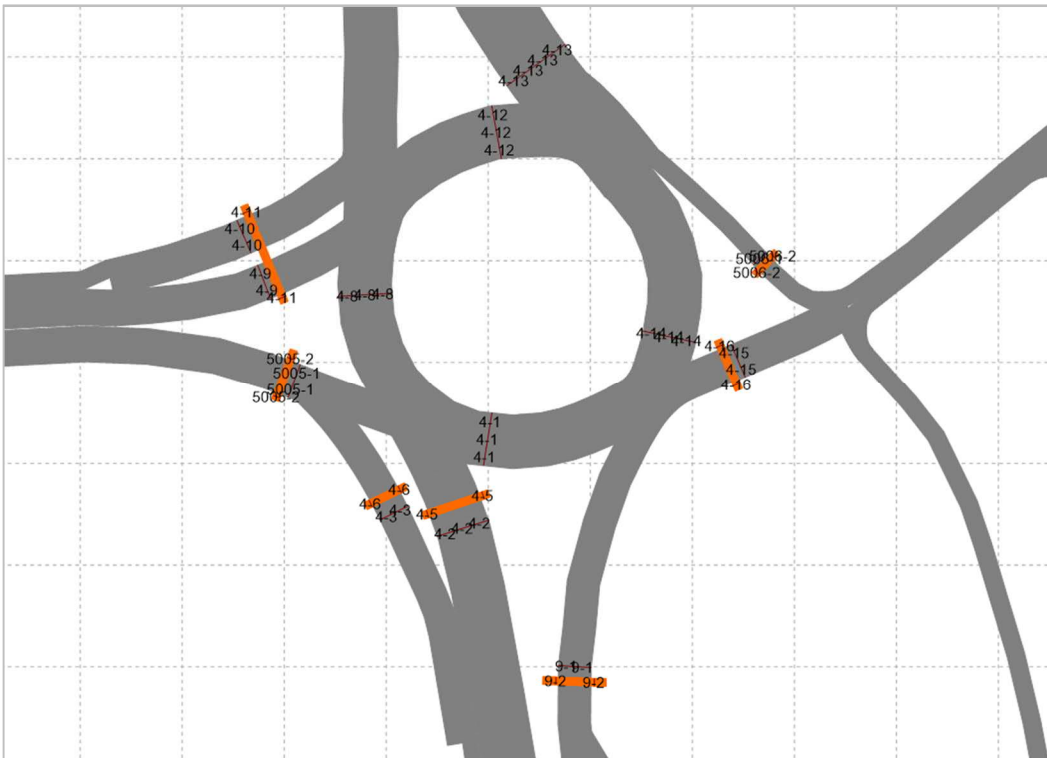


In the AM peak green times have been increased on three of the four approach arms to the junction, the off slips and A49 SB, with increase in green time of between 3 and 7 seconds. Given the cycle time is 48 seconds, this equates to a green time proportion increase of 6-15%. In the PM peak only changes to the A49 approach arms are made until 2032.

Table 8 A49 / Sandy Lane West / Cromwell Avenue green times

Sc 4	A49 NB					Cromwell Avenue				A49 SB		Sandy Lane West		
	Sc 4_1	Sc 4_2	Sc 4_3	Sc 4_5	Sc 4_6	Sc 4_8	Sc 4_9	Sc 4_10	Sc 4_11	Sc 4_12	Sc 4_13	Sc 4_14	Sc 4_15	Sc 4_16
	1	2	3	5	6	8	9	10	11	12	13	14	15	16
1_AM_Base	25	15	14	22	25	27	13	13	22	19	21	32	10	30
3_AM_DM_2 022	22	17	18	20	21	30	10	10	25	15	25	28	14	26
5_AM_DM_2 027	22	17	18	20	21	30	10	10	25	15	25	28	14	26
7_AM_DM_2 032	22	17	18	20	21	29	11	11	24	14	26	27	15	25
2_PM_Base	29	29	27	26	30	39	19	19	34	35	23	47	13	45
4_PM_DM_20 22	27	31	31	24	26	39	19	19	34	35	23	44	16	42
6_PM_DM_20 27	28	30	30	25	27	39	19	19	34	35	23	40	20	38
8_PM_DM_20 32	29	29	29	26	28	39	19	19	34	31	27	37	23	35

Figure 9 A49 / Sandy Lane West / Cromwell Avenue signal controllers



In the AM peak green times have been increased on three of the four approach arms to the junction, A49 and Sandy Lane West arms with increase in green time of between 2 and 5 seconds. Given the cycle time is 48 seconds, this equates to a green time proportion increase of 4-10% In the PM peak only changes to the A49 NB approach and Sandy Lane West arms are made until 2032.

The optimisation at both junctions prioritises the approach arms over the circulatory carriageway of the roundabouts. Thus vehicles are less likely to get a “green wave” on the circulatory carriageway and this will lead to increased stopping and starting.

The subject of signal optimisation was discussed at meeting on 24/09/2020 following the adjournment of the Public Inquiry. In the minutes of the meeting (point iv. c) Highgate stated:

The optimisation provided is to give an indication of the level of network performance; not to be prescriptive to signal engineers in the future.

As such we sought the opinion of Warrington UTC signal engineers regarding the optimisation applied. With regard to the changes at A49 / Sandy Lane West / Cromwell Avenue their response was:

The Sandy Lane junction has been looked at in the past and we have spent some considerable time ‘honing’ the timings and even trying to implement scoot. This was also looked at in great detail as part of the Warrington Intelligent Transport System (WITS) project when looking at journey times through the A49 corridor.

The junction currently runs fixed UTC plans which allow us to coordinate the timings between the nodes and maintain the progression required to prevent exit blocking around the gyratory. The timings are changed throughout the day in response to peak times by introducing different plan timings but also in response to certain conditions reactively by monitoring congestion levels/flows via the various scoot loops.

We consider the current timings to be the optimal ones in achieving the best performance from the junction with congestion at an acceptable and manageable level.

The response from Warrington UTC would cast doubt on whether this signal optimisation would actually work when implemented on site, as extensive signal time optimisation has already been undertaken.

3.5. Signal Time Gating

Paragraph 3.3.5 of *MG0123_A49WarringtonCorridor_OptionA_ModellingReport_v6.3.pdf* introduces the concept of gating the flow on the A49 in the northern part of the model to stop too much flow arriving in the southern part of the model, on the A49 south of A49 / A50 / Hawleys Lane junction. It is not clear how this gating is applied in the model. In section 3.4.15 signal green time gating is discussed ahead of the A49 SB queuing results at the Delph Lane junction. However, extraction of the signal green times from the models show that the only changes to A49 SB green time at Delph Lane occurs in 2032 PM model.

As with the signal optimisation we sought additional opinion from Warrington UTC. Their response was:

Gating the traffic in the north of the model or holding it back is not recommended as this will have an adverse effect on the Winwick Link Roundabout, Newton Road and Delph Lane junctions, which is a very busy route into Warrington and this would seem to merely shift the problems elsewhere.



4. Model Outputs

4.1. Network Performance Statistics

Network performance statistics are provided in section 3.2 of *MG0123_A49WarringtonCorridor_OptionA_ModellingReport_v6.3.pdf*. In section 4.2 (paragraphs 4.21. and 4.2.3) the report states:

For the majority of the network, the combined effect of committed and proposed mitigation measures either allow maintained levels of performance or produce significant improvements when compared against the Reference Case models.

When Peel Hall development traffic is added to the network, there is an impact on levels of congestion, however, the addition of the full M4 mitigation package clearly improves upon or resolves many of the congestions contributing factors. Added to this, the mitigation measures contribute towards the creation of a network with the ability to produce comparatively improved and consistent network performance in each sequential future year scenario, particularly in the evening peak.

The network performance provided in section 3.2 have been summarised in Table 9. Average vehicle delay and average speeds have been extracted along with latent demand. The results show that in all the forecast scenarios the level of performance has not been improved compared with the Reference Case models.

In the PM peak, with the M4 mitigation the average network speeds increase and average delay per vehicle reduce, and the reference case performance has broadly been achieved. However, the comparison shows the latent demand is much higher in DS + M4 Mitigation scenarios, which means a high volume of vehicles have been held out of the network. Therefore the results presented are not directly comparable to the reference case.

Table 9 Network Performance

	Average Delay per Vehicle (sec)	Average Speed (mph)	Latent Demand
2022 DM AM	170	23	1
2022 DS AM	224	19	153
2022 DS AM + M4 Mitigation	232	19	134
2027 DM AM	251	18	72
2027 DS AM	281	17	278
2027 DS AM + M4 Mitigation	285	17	279
2032 DM AM	288	17	445
2032 DS AM	315	16	1123
2032 DS AM + M4 Mitigation	312	16	1162
2022 DM PM	134	27	294
2022 DS PM	172	24	683
2022 DS PM + M4 Mitigation	143	26	827
2027 DM PM	150	25	583
2027 DS PM	165	24	955



2027 DS PM + M4 Mitigation	154	25	1072
2032 DM PM	181	23	1250
2032 DS PM	193	22	1480
2032 DS PM + M4 Mitigation	180	23	1721

Using the data provided in section 3.2 of *MG0123_A49WarringtonCorridor_OptionA_ModellingReport_v6.3.pdf* a comparison of average vehicle delay, that accounts for latent demand and the delay associated with it, has been produced. These are provided in Table 10 to Table 15.

Table 10 Network Performance (inc Latent Demand) 2022 AM

	2022 DM AM	2022 DS AM	2022 DS+M4 AM
Vehicles Active	1921	2340	2391
Vehicles Arrived	16941	17029	17032
Total Delay Time (for vehicles in the network or those exited the network)	3202541	4340595	4506864
Avg Delay (for vehicles in the network or those exited the network)	170	224	232
Latent Delay	2371	245076	219922
Latent Demand	1	153	134
Total Delay (incl latent delay)	3204912	4585671	4726786
Total Demand (incl latent demand)	18863	19522	19557
Avg Delay (incl latent delay)	170	235	242

Table 11 Network Performance (inc Latent Demand) 2027 AM

	2027 DM AM	2027 DS AM	2027 DS+M4 AM
Vehicles Active	2618	2805	2885
Vehicles Arrived	17716	17724	17639
Total Delay Time (for vehicles in the network or those exited the network)	5114462	5764520	5847960
Avg Delay (for vehicles in the network or those exited the network)	252	281	285
Latent Delay	61665	394050	378441
Latent Demand	72	278	279
Total Delay (incl latent delay)	5176127	6158570	6226401
Total Demand (incl latent demand)	20406	20807	20803
Avg Delay (incl latent delay)	254	296	299

Table 12 Network Performance (inc Latent Demand) 2032 AM

	2032 DM AM	2032 DS AM	2032 DS+M4 AM
Vehicles Active	2952	3121	3086
Vehicles Arrived	18252	18058	18014
Total Delay Time (for vehicles in the network or those exited the network)	6113766	6661435	6576192
Avg Delay (for vehicles in the network or those exited the network)	288	315	312
Latent Delay	625450	2235859	2192542
Latent Demand	445	1123	1162
Total Delay (incl latent delay)	6739216	8897294	8768734
Total Demand (incl latent demand)	21649	22302	22262



Avg Delay (incl latent delay)	311	399	394
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Table 13 Network Performance (inc Latent Demand) 2022 PM

	2022 DM PM	2022 DS PM	2022 DS+M4 PM
Vehicles Active	1844	2165	1904
Vehicles Arrived	19701	19759	19865
Total Delay Time (for vehicles in the network or those exited the network)	2879292	3779869	3103514
Avg Delay (for vehicles in the network or those exited the network)	134	172	143
Latent Delay	623900	1508715	1935825
Latent Demand	294	683	827
Total Delay (incl latent delay)	3503192	5288584	5039339
Total Demand (incl latent demand)	21839	22607	22596
Avg Delay (incl latent delay)	160	234	223

Table 14 Network Performance (inc Latent Demand) 2027 PM

	2027 DM PM	2027 DS PM	2027 DS+M4 PM
Vehicles Active	2079	2121	2034
Vehicles Arrived	20818	20844	20867
Total Delay Time (for vehicles in the network or those exited the network)	3424519	3790916	3537904
Avg Delay (for vehicles in the network or those exited the network)	150	165	154
Latent Delay	1316518	2164020	2588861
Latent Demand	583	955	1072
Total Delay (incl latent delay)	4741037	5954936	6126765
Total Demand (incl latent demand)	23480	23920	23973
Avg Delay (incl latent delay)	202	249	256

Table 15 Network Performance (inc Latent Demand) 2032 PM

	2032 DM PM	2032 DS PM	2032 DS+M4 PM
Vehicles Active	2336	2538	2359
Vehicles Arrived	21744	21797	21804
Total Delay Time (for vehicles in the network or those exited the network)	4369719	4700628	4342486
Avg Delay (for vehicles in the network or those exited the network)	181	193	180
Latent Delay	2925046	3430711	4015723
Latent Demand	1250	1480	1721
Total Delay (incl latent delay)	7294765	8131339	8358209
Total Demand (incl latent demand)	25330	25815	25884
Avg Delay (incl latent delay)	288	315	323

Including the latent demand and delay in the comparison shows that the M4 mitigation has minimal impact in comparison to the DS models.

4.2. Comparison of Latent Demand

Further comparisons have been carried out on latent demand for each zone. Latent demand has been extracted for one seed run and is presented in Table 16 to Table 18.

The comparison shows that the majority of latent demand in the model across all time periods and scenarios is at the southern end of the model, on the approach arms to the A49 / A50 / Hawleys Lane junction, zones A, B and C. The highest latent demand is found in zone C across all scenarios.

Latent demand has also been found on Sandy Lane West (Zone G) in the PM peak. The M4 mitigation package at the junction of A49 / Sandy Lane West / Cromwell Avenue slightly improves but does not eliminate the latent demand on Sandy Lane West. The M4 mitigation increases latent demand elsewhere in the model, especially from zones A, B and C.

Figure 10 Zones with High Volume of Latent Demand

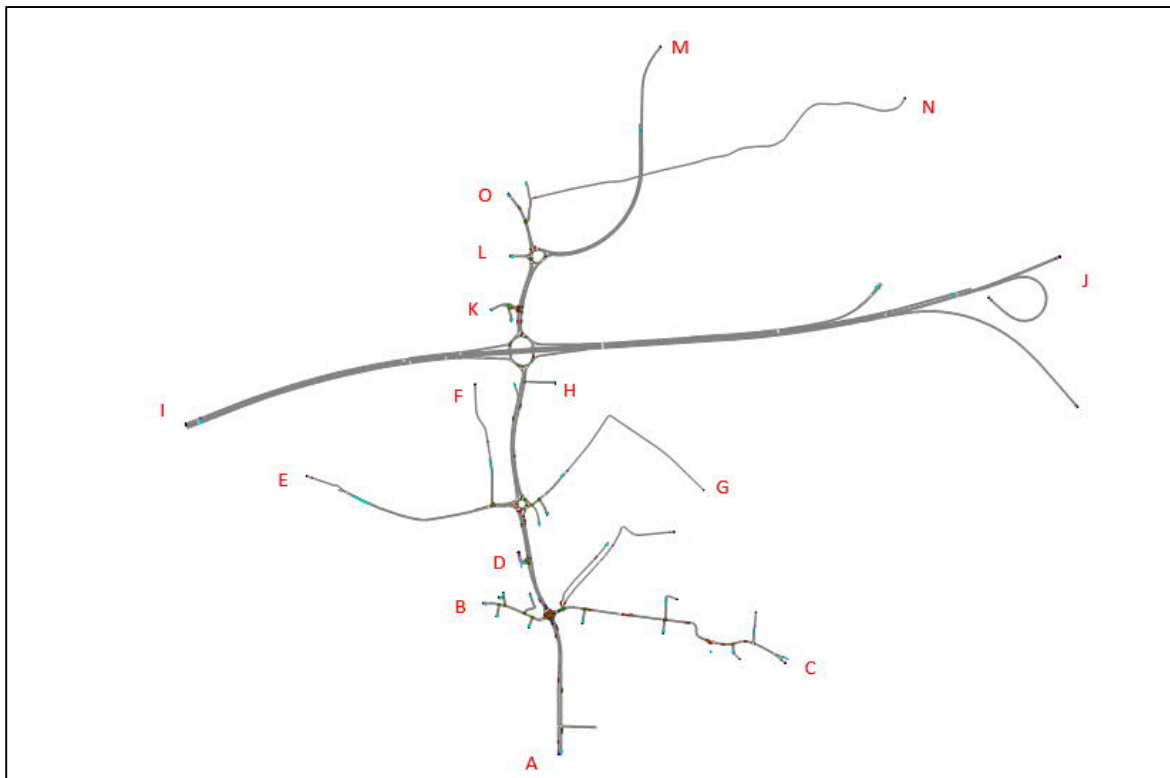


Table 16 Latent Demand Comparison in 2022

Zone	AM DM 2022	AM DS 2022	AM DS MIT 2022	PM DM 2022	PM DS 2022	PM DS MIT 2022
Zone A	0	0	0	0	0	114
Zone B	0	0	0	80	238	321
Zone C	0	256	234	170	312	361
Zone G	0	0	0	0	194	0
Zone L	0	0	0	0	27	46

Table 17 Latent Demand Comparison in 2027

Zone	AM DM 2027	AM DS 2027	AM DS MIT 2027	PM DM 2027	PM DS 2027	PM DS MIT 2027
Zone A	0	0	0	55	57	114
Zone B	0	0	0	230	259	360
Zone C	103	310	380	281	484	573
Zone F	33	116	35	0	0	0
Zone G	0	0	0	0	148	28
Zone L	0	0	19	0	0	0

Table 18 Latent Demand Comparison in 2032

Zone	AM DM 2032	AM DS 2032	AM DS MIT 2032	PM DM 2032	PM DS 2032	PM DS MIT 2032
Zone A	0	0	0	212	417	352
Zone B	0	0	0	502	493	566
Zone C	515	1178	1118	546	624	738
Zone F	153	169	211	22	0	0
Zone G	0	0	0	0	155	119
Zone L	69	10	123	0	8	152
Zone O	0	0	0	0	99	0

4.3. Comparisons of Queue Lengths

Queue length analysis is provided in Section 3.4 of *MG0123_A49WarringtonCorridor_OptionA_ModellingReport_v6.3.pdf*.

The comparisons for Sandy Lane West westbound traffic have been extracted from the report and are shown in Figure 11 to Figure 16. The comparisons indicate that in the Do Something and Do Something + M4 Mitigation scenarios, the queue lengths are higher than those in the Reference Case.

In the AM peak the queue profile shows that the queue length is beginning to decrease towards the end of the time period and the mitigation M4 is effective only in 2022 and 2027. In 2032 the DS+M4 queue is longer than DS.

In the PM peak the queue profile shows that the queue length is not decreasing towards the end of the time period for DS and DS+M4 in 2027 and 2032. In 2032, the queue lengths have reached the edge of the network from 17:20 onwards in both DS and DS+M4 scenarios.

Discussing the queues in the PM peak, the report states in paragraph 3.4.10:

“This effect is, at least in part, due to the fixed constraint used to validate the base model – although there is an increased traffic volume, it is not possible to do much to mitigate the delays with the signal green time at the junction with the A49, as the constraint is further to the east, slowing vehicles before they get to the signalised junction”.

In the base year model review we accepted this method in principle, and we also commented in Section 4 of *TN11 A49 Corridor Base VISSIM Model Review Oct2020 final v2.pdf*:

“A new speed distribution ‘SandyLaneWestWBDelay’ has been added with maximum speed of 16 mph and used on Sandy Lane West westbound to simulate delays from side road entry points, as stated in the Changes Registry. Whilst this is generally acceptable, we would expect to see empirical data or observations to support the parameters used or increase the details of the side roads”.

As Sandy Lane West is the main corridor for Peel Hall development trips and therefore a significant area of interest within the model, we would expect the impact of the side roads to be better detailed and quantified at this stage.

Figure 11 Queue Comparison AM Peak 2022 Sandy Lane West WB

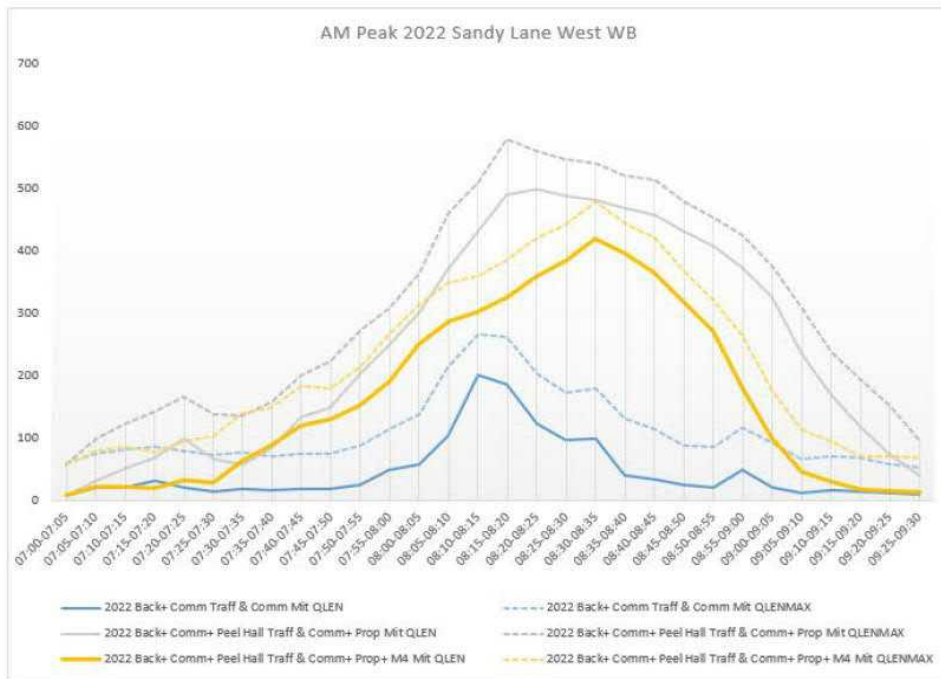


Figure 12 Queue Comparison AM Peak 2027 Sandy Lane West WB

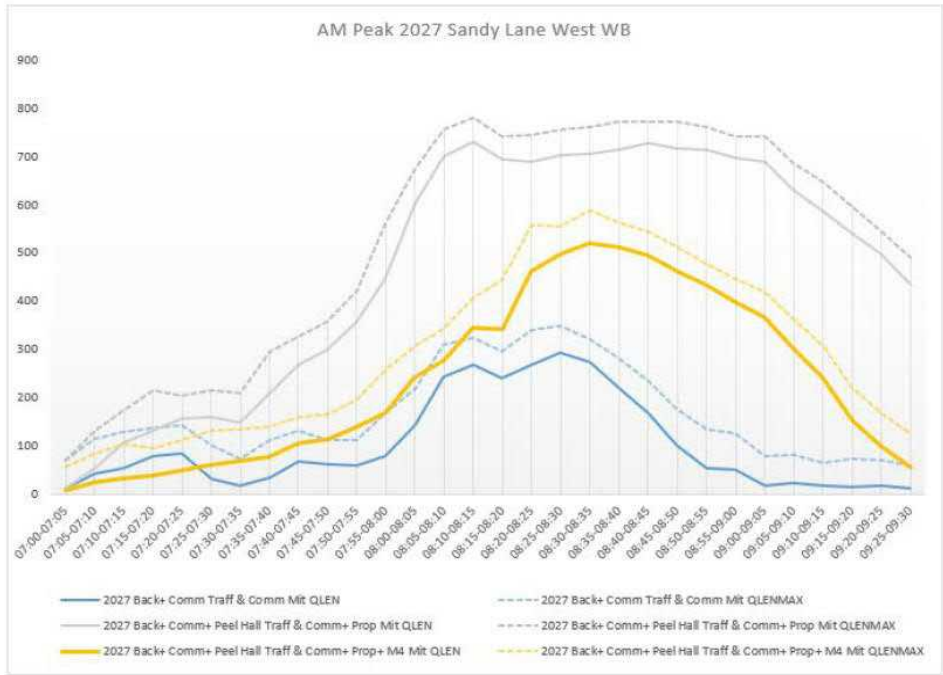


Figure 13 Queue Comparison AM Peak 2032 Sandy Lane West WB

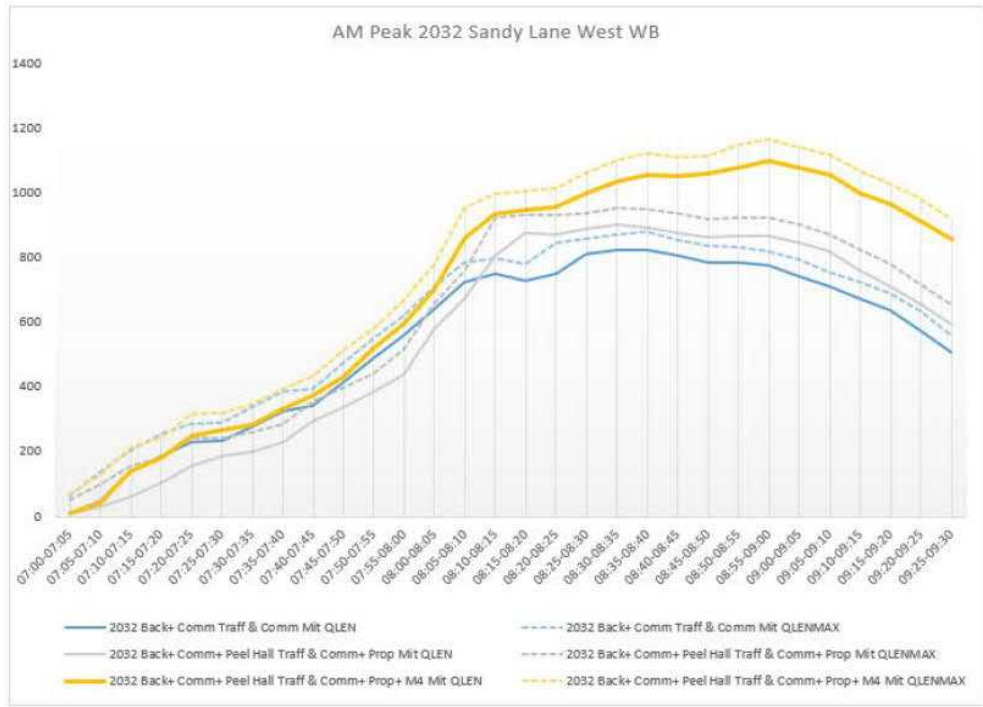


Figure 14 Queue Comparison PM Peak 2022 Sandy Lane West WB

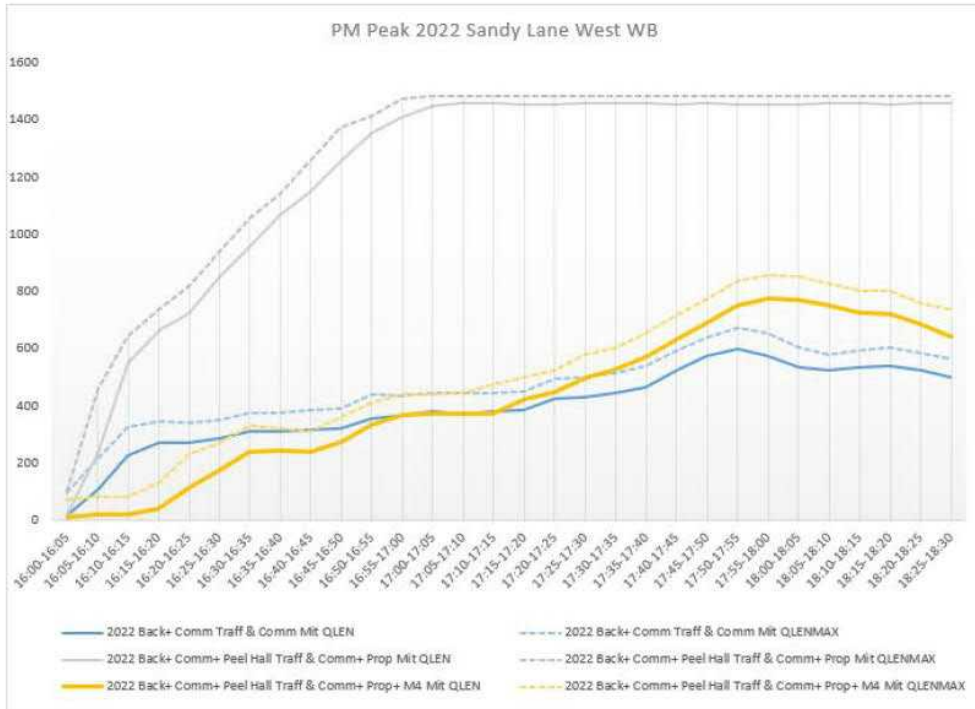


Figure 15 Queue Comparison PM Peak 2027 Sandy Lane West WB

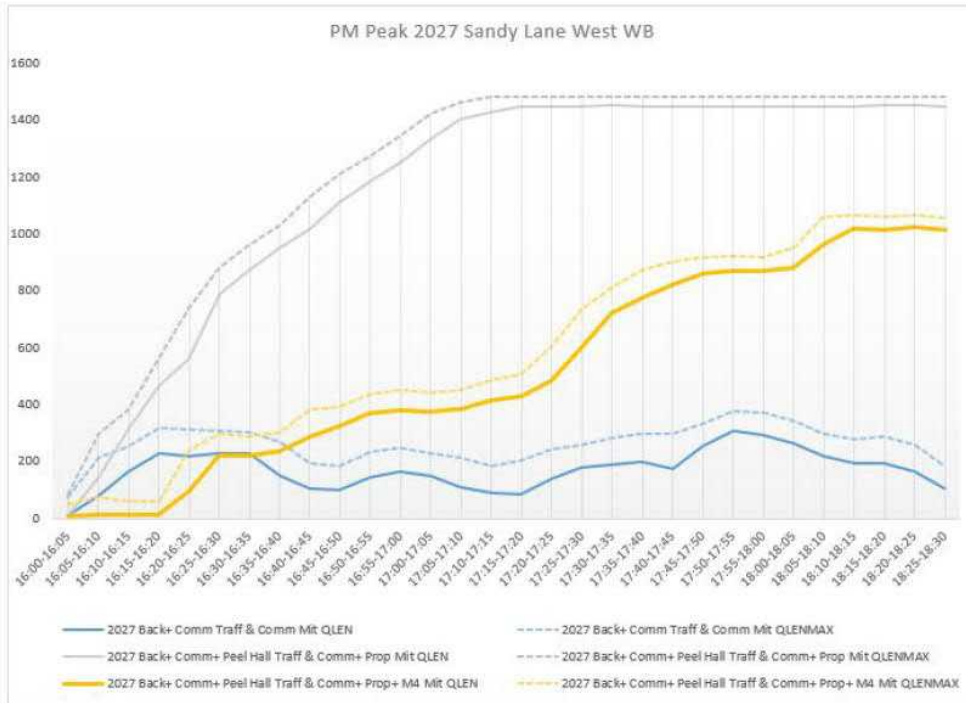
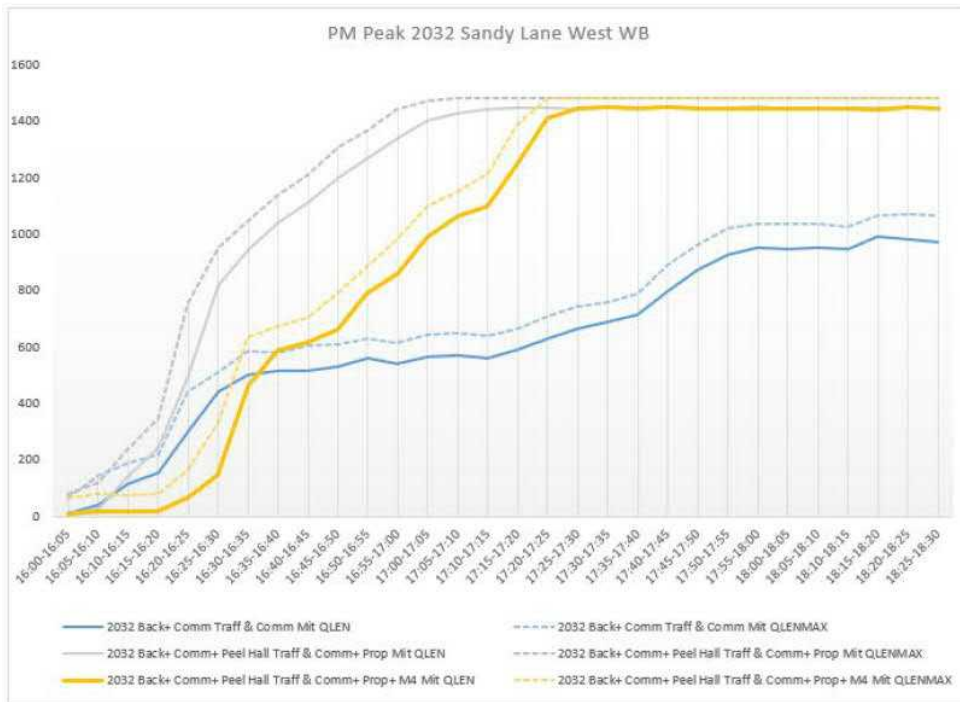


Figure 16 Queue Comparison PM Peak 2032 Sandy Lane West WB



The comparisons for Long Lane westbound traffic have been extracted from the report and are shown in Figure 17 to Figure 22. The comparisons indicate that in the Do Something and Do Something + M4 Mitigation scenarios, the queue lengths are higher than those in the Reference Case.

In the AM peak the queue profile shows that the queue lengths are not decreasing towards the end of the time period and in 2032 queues in all scenarios reach the edge of the network.

In the PM peak the queue profile shows that queue lengths are reaching the edge of the network in all modelled years. In 2032, the edge of the network is reached from 16:40 (DS and DS+M4) and 16:50 (DM), this is before the peak hour commences.

Only Sandy Lane West carries more development trips than Long Lane. The queue length data and the latent demand assessment show that Long Lane westbound cannot accommodate the levels of forecast traffic, and as such the impact of the development trips on Long Lane cannot be quantified.

This is in part due to a speed restriction on the southern exit of the model on the A49 as detailed in Paragraphs 3.3.4 and 3.3.20-3.3.22 of *MG0123_A49WarringtonCorridor_OptionA_ModellingReport_v6.3.pdf*. Vehicles on the A49 cannot exit the network and block back to the A49 / A50 / Hawleys Lane junction.

The queue comparisons for other arms of the A49 / A50 / Hawleys Lane junction (and A49 / Sandy Lane West / Cromwell Avenue) have been replicated in Appendix 2. As per the latent demand assessment they indicate that queues reach the edge of the network on A49 NB and Hawleys Lane approaches in the PM peak in 2027 and 2032. The latent demand present at this junction will have an impact in assessing the operation on mitigation measures at A49 NB approach to A49 / Sandy Lane West / Cromwell Avenue, as the approach flow will be lower than what it should be.

Figure 17 Queue Comparison AM Peak 2022 Long Lane WB

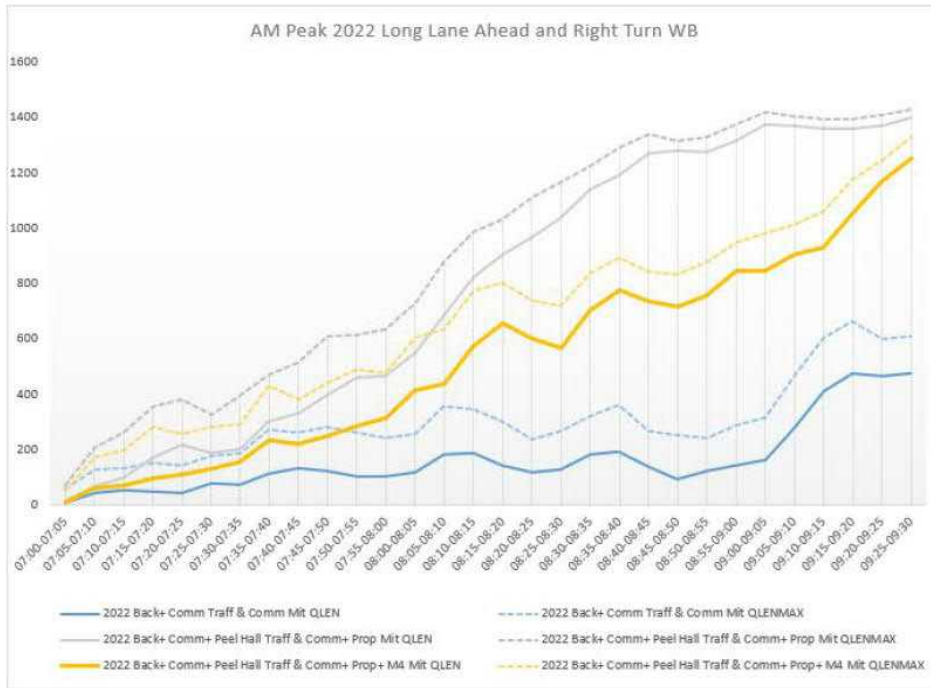


Figure 18 Queue Comparison AM Peak 2027 Long Lane WB

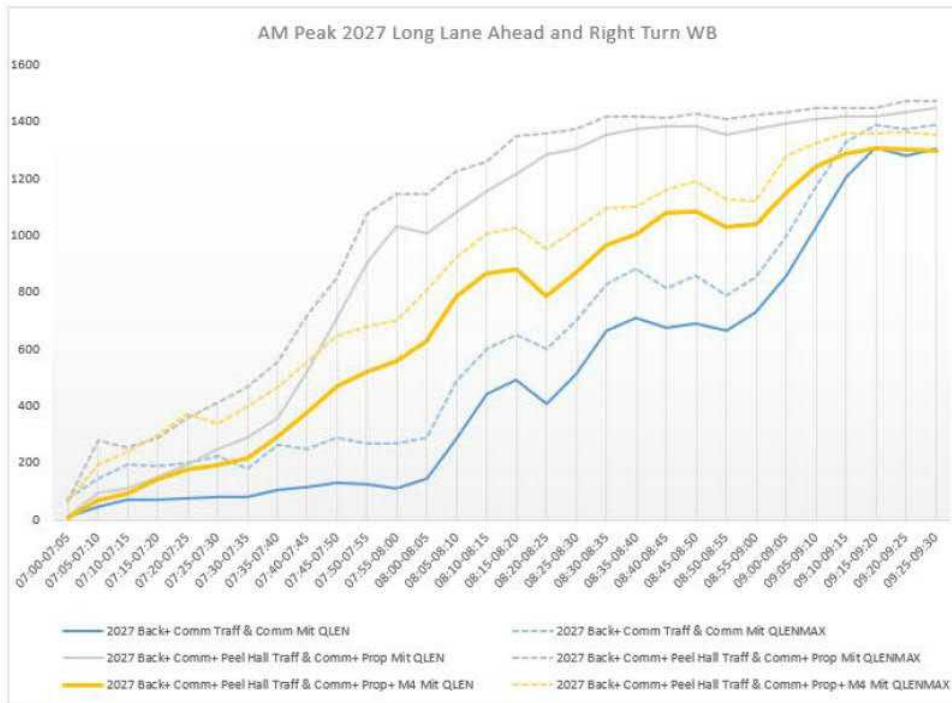


Figure 19 Queue Comparison AM Peak 2032 Long Lane WB

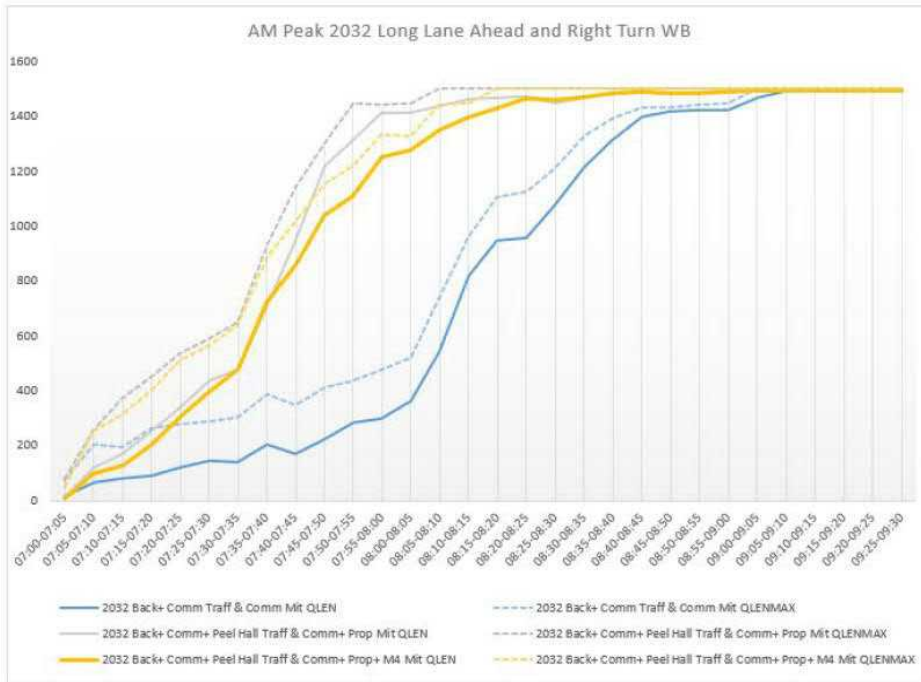


Figure 20 Queue Comparison PM Peak 2022 Long Lane WB

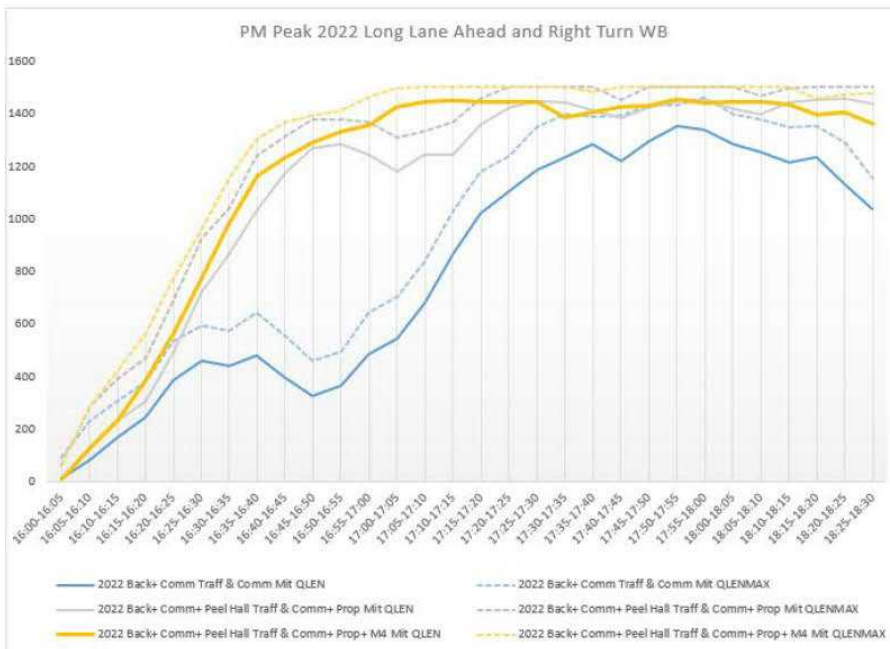




Figure 21 Queue Comparison PM Peak 2027 Long Lane WB

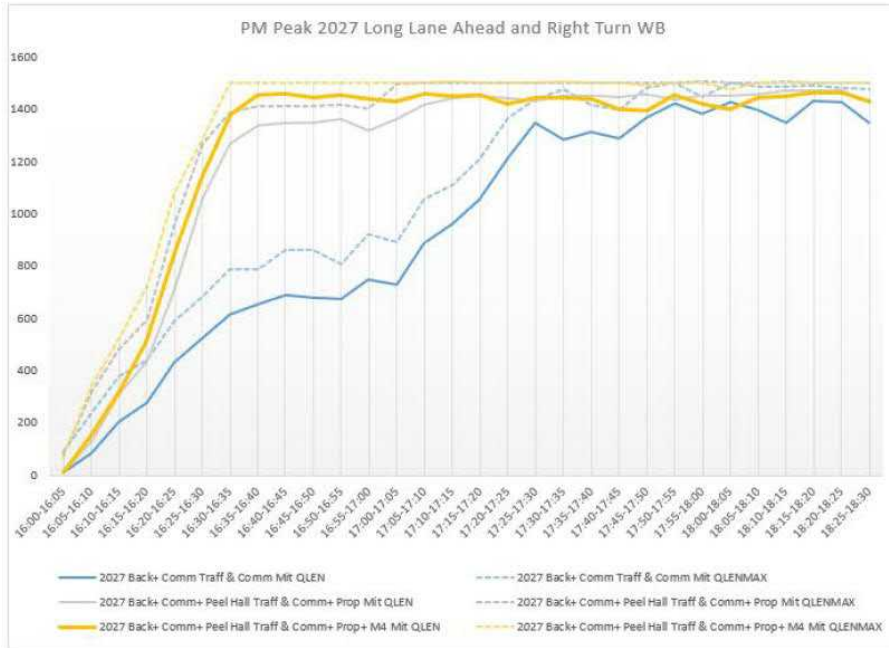
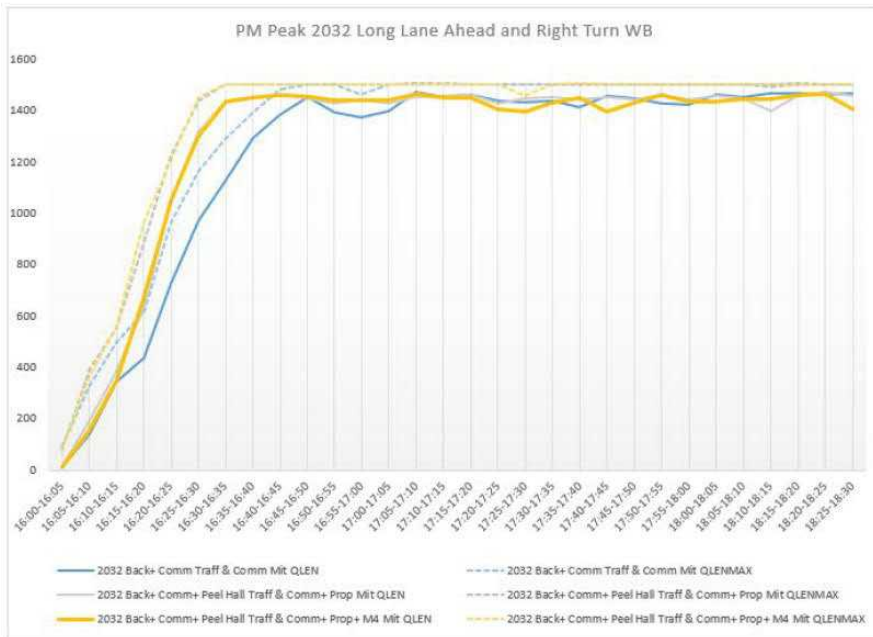


Figure 22 Queue Comparison PM Peak 2032 Long Lane WB



SUMMARY

An updated package of forecast modelling and reporting was provided to WSP. This package of information has been reviewed and a summary of the main technical issues are given below.

- Forecast demand in Vissim is not consistent with Saturn in some zones. These zones include Sandy Lane West and Junction Nine Retail Park. Trips from / to these zones are underestimated, therefore the impact of the development may not be fully reflected in the models.
- The model animation of M4 mitigation shows vehicles using the offside lane of the two dedicated left turn lanes to reach Cromwell Avenue. This involves merging on the short link between the roundabout and Calver Road signals which will increase vehicle conflicts. A Stage 1 Road Safety Audit would be beneficial for this mitigation scheme.
- The reference case models apply signal timings that have been optimised from the base year models. This optimisation involves increasing green time for approach arms at the expense of the circulatory carriageway at both M62 J9 and A49 / Sandy Lane West / Cromwell Avenue junctions. This will increase stopping and starting movements on the circulatory carriageways.
- This optimisation approach is stated as not being prescriptive to signal engineers in the future. The opinion of Warrington UTC with regards to the optimisation at A49 / Sandy Lane West / Cromwell Avenue is that the current signal timings are optimal and have been investigated thoroughly in the past. Comparison of the base and forecast model outputs show how sensitive the corridor is to any signal changes. The green time changes proposed are significant, and it is questionable whether this would be able to be realised on site.

Notwithstanding the technical issues raised above the review of the model is summarised below.

- The comparisons of latent demand and queue lengths on Sandy Lane West indicate the development impact cannot be mitigated on this link in the PM peak in 2027 and 2032.
- Given the level of latent demand and queuing that occurs on Long Lane in all models, the impact of the development on this link cannot be adequately assessed.
- The M4 mitigation produces a minimal change in network performance in the AM peak compared to the DS scenario. In the PM peak the M4 mitigation returns network performance to a level similar to the reference case. However, this is achieved by increasing the amount of latent demand across all modelled years in the PM peak. The majority of this latent demand is in the south of the model, at the A49 / A50 / Hawleys Lane junction. The presence of the latent demand in the south of the model and the forecast demand issues identified at both Junction Nine Retail Park and Sandy Lane West, would suggest that the performance of the M4 mitigation has not been fully assessed as the A49 NB and junction circulatory flows will be underestimated.



APPENDIX 1

Demand Trip End Comparison

Instances of DS demand being less than DM are highlighted in red. Note that for zones I and J, SATURN does not include the mainline flow.

SATURN																				
AM	2018 (No Development)		2022 DM		2022 DS		2022 Dev Trips		2027 DM		2027 DS		2027 Dev Trips		2032 DM		2032 DS		2032 Dev Trips	
Linsig Zone	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination
A	1112	1553	1190	1626	1209	1728	8	82	1259	1702	1279	1756	14	51	1334	1782	1351	1876	8	82
B	412	643	432	677	439	692	7	15	452	709	457	717	5	9	475	744	481	757	7	15
C	693	491	719	435	829	413	101	5	756	374	818	371	61	2	819	350	928	347	101	3
D	177	179	188	189	190	197	2	8	199	199	200	204	2	5	211	207	213	213	2	8
E	871	711	923	751	935	801	11	51	972	788	981	819	9	31	1026	828	1037	866	11	51
F	334	218	354	229	382	252	6	7	418	283	446	300	6	6	471	327	483	342	9	11
G	437	499	473	596	529	652	81	46	492	719	542	778	60	57	532	822	584	858	104	50
H	19	2	20	2	31	7	11	5	21	2	32	7	11	5	23	2	34	7	11	5
I	912	742	966	781	989	807	24	26	1035	840	1054	823	19	16	1091	884	1115	910	24	26
J	763	940	801	986	806	1021	5	33	838	1033	840	1054	4	20	876	1088	880	1119	5	33
K	386	487	404	508	405	515	4	4	418	527	419	538	2	1	429	538	430	529	1	0
L	163	27	173	30	173	30	1	0	183	31	182	31	1	0	193	33	193	34	1	0
M	800	593	841	624	844	634	1	8	931	685	932	689	1	5	979	721	980	731	1	8
N	630	647	625	686	678	695	63	26	632	700	658	703	29	10	612	704	634	713	40	23
O	652	575	690	605	693	617	3	13	774	702	776	709	2	8	813	728	816	729	3	13
TOTAL	8359	8306	8798	8723	9132	9062	329	329	9379	9293	9618	9500	225	225	9882	9757	10158	10030	327	327

VISSIM																				
AM	AM_2019_Base		AM_2022_DoMin		AM_2022_DoSom		2022 Dev Trips		AM_2027_DoMin		AM_2027_DoSom		2027 Dev Trips		AM_2032_DoMin		AM_2032_DoSom		2032 Dev Trips	
VISSIM Zone	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination
A	1087	1950	1191	2059	1208	2187	8	81	1278	2183	1298	2268	13	49	1360	2357	1394	2474	9	81
B	344	414	422	477	424	496	6	15	436	490	441	489	4	9	449	514	458	531	7	15
C	1676	1385	1775	1386	1923	1383	100	4	1855	1346	1928	1342	60	2	1983	1324	2124	1319	100	3
D	100	119	126	126	130	137	1	8	169	134	168	139	2	3	186	140	188	152	2	9
E	969	726	1028	762	1014	840	11	50	1030	805	1024	840	9	30	1057	854	1062	916	11	50
F	390	397	413	415	445	423	6	7	490	434	527	446	6	6	561	489	588	527	9	11
G	658	645	715	805	775	861	82	46	748	919	806	988	60	57	821	1016	830	1075	106	52
H	64	2	72	11	104	17	10	6	72	11	109	16	9	5	74	11	64	17	11	6
I	4164	4351	4406	4624	4455	4661	23	24	4651	4930	4679	4921	18	13	4897	5209	4945	5158	23	25
J	4019	4001	4334	4229	4362	4283	4	31	4603	4429	4604	4458	3	18	4822	4657	4805	4709	4	32
K	316	255	322	276	337	309	3	5	338	350	343	370	1	1	345	364	350	356	1	0
L	289	22	348	35	353	35	1	0	409	35	406	35	0	0	449	35	442	35	1	0
M	993	704	1061	749	1078	762	1	7	1185	803	1167	810	0	5	1227	841	1228	853	1	8
N	231	360	229	406	304	423	63	25	224	433	256	442	29	10	210	426	262	438	40	23
O	703	668	780	863	793	887	2	12	894	1080	901	1094	1	7	955	1161	957	1139	3	13
TOTAL	16000	16000	17223	17223	17705	17705	321	321	18383	18383	18658	18658	215	215	19397	19397	19697	19697	328	328



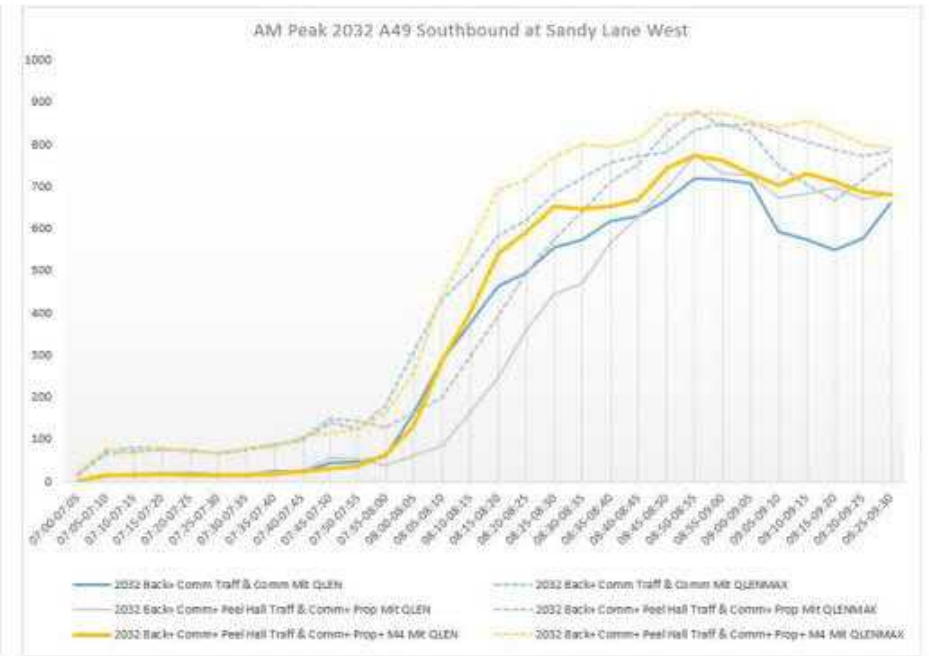
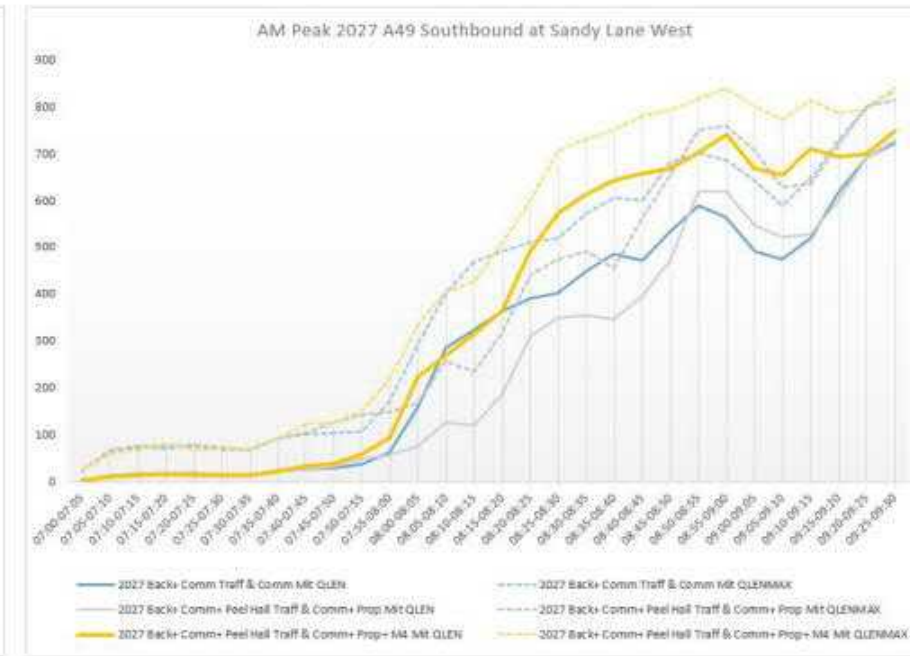
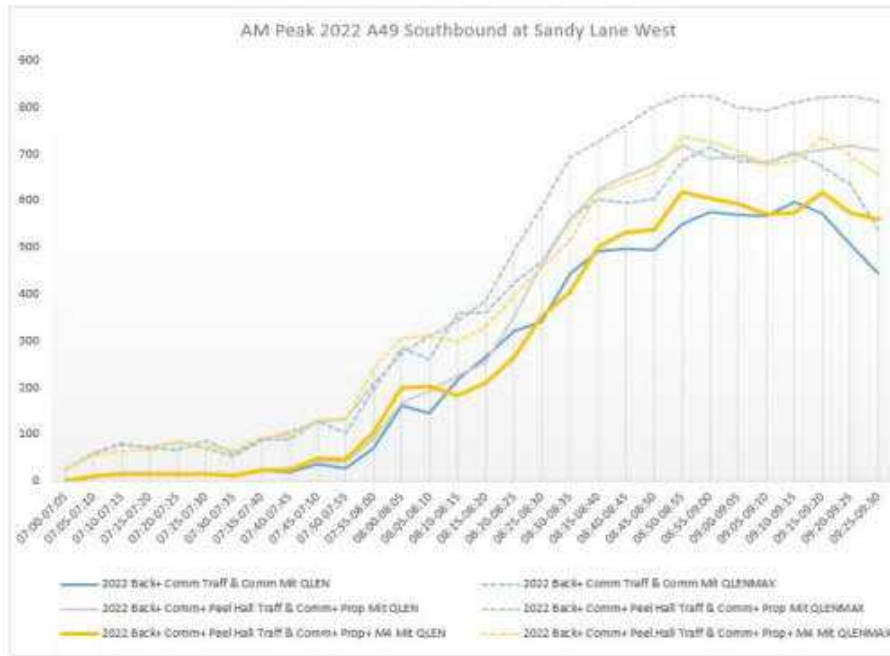
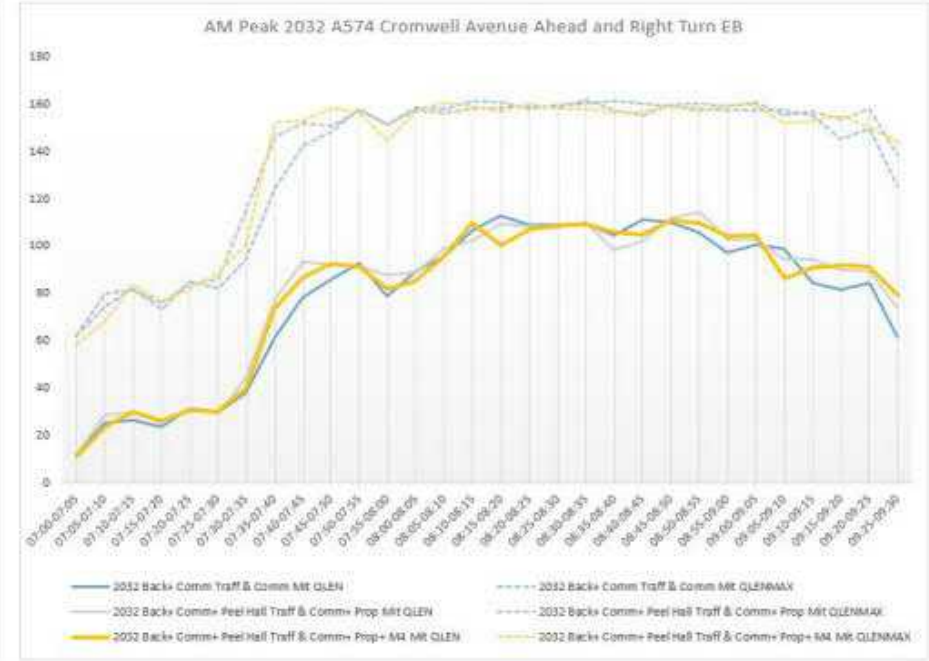
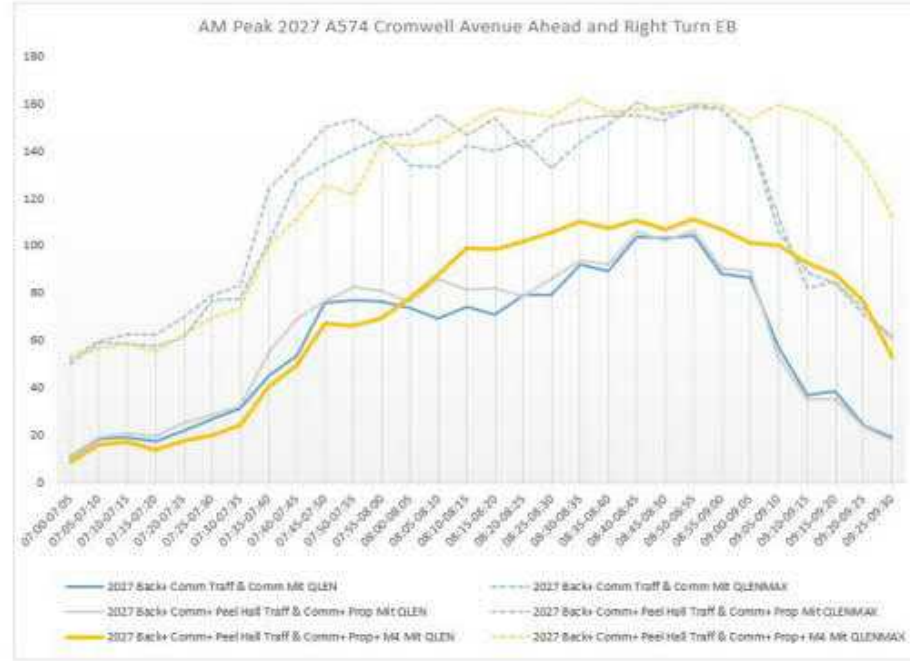
SATURN

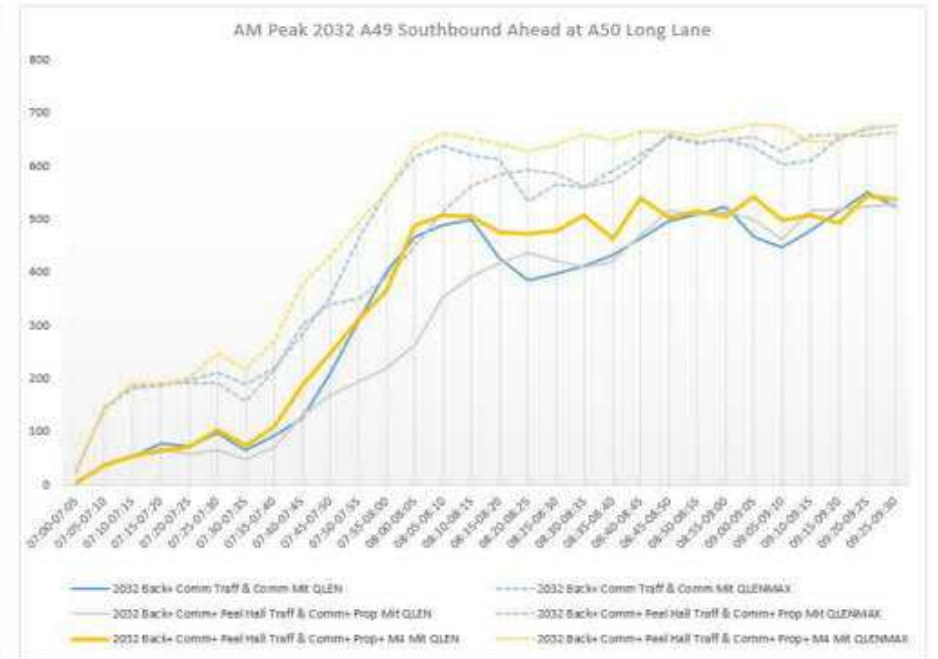
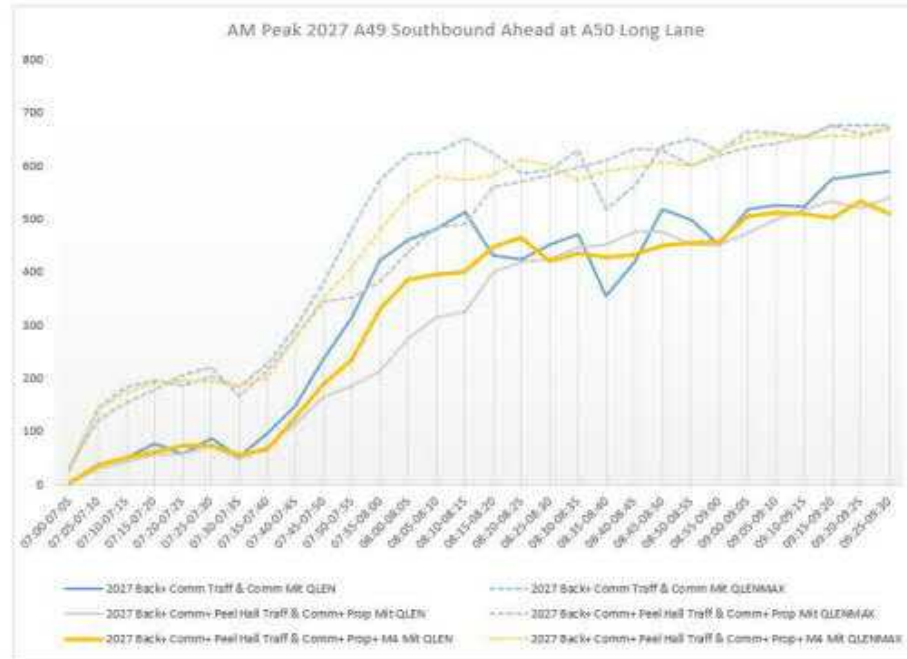
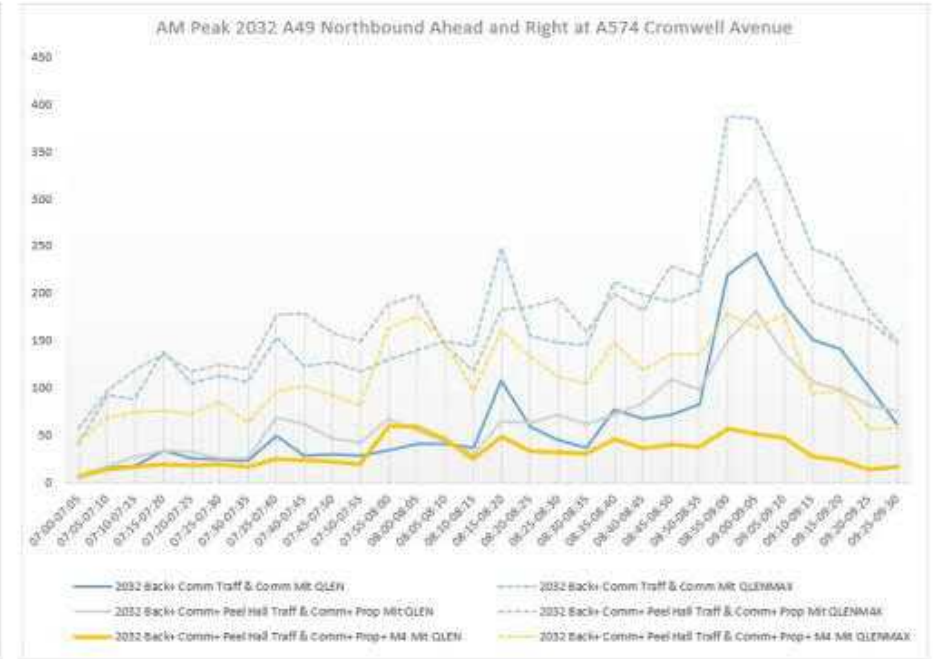
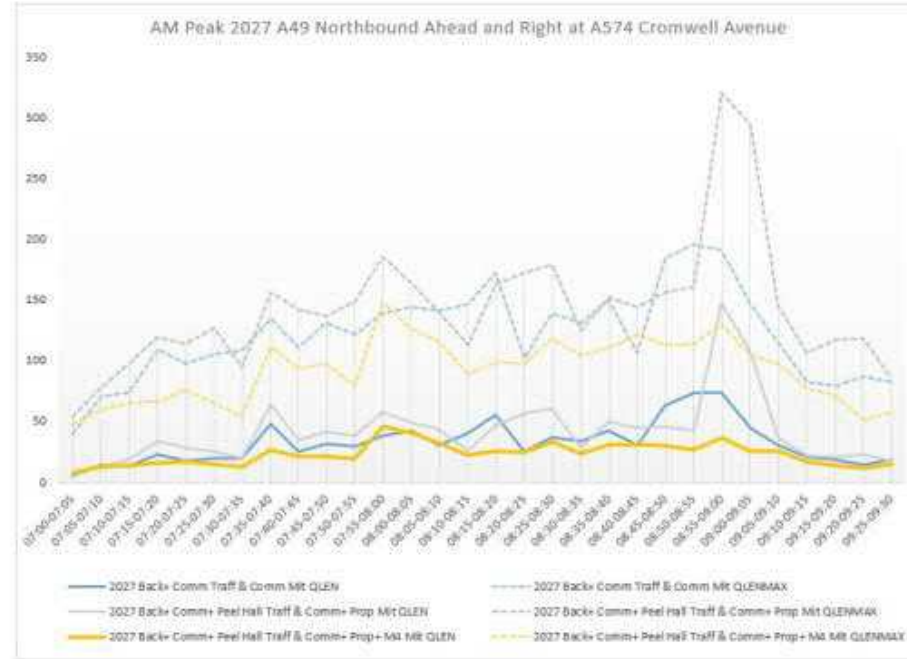
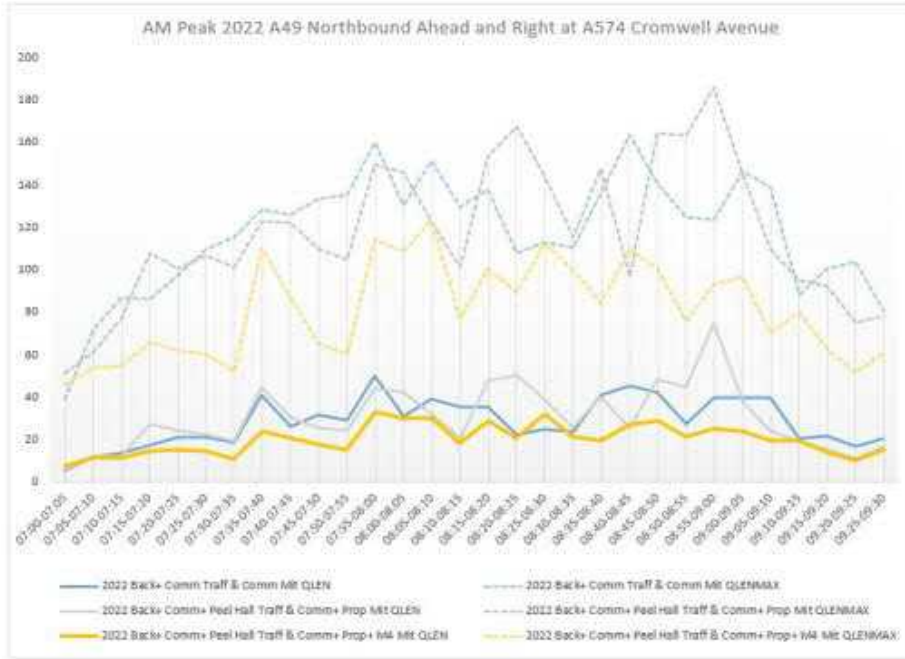
PM	2018 (No Development)		2022 DM		2022 DS		2022 Dev Trips		2027 DM		2027 DS		2027 Dev Trips		2032 DM		2032 DS		2032 Dev Trips	
	Linsig Zone	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin
A	1595	1602	1685	1640	1715	1706	29	67	1760	1694	1789	1763	45	75	1815	1755	1731	1812	28	67
B	629	419	662	425	677	429	15	9	693	433	706	441	13	9	727	449	743	449	15	9
C	572	600	585	577	656	602	75	42	614	579	696	613	83	49	666	575	723	585	75	22
D	324	179	343	201	365	216	22	12	361	219	380	231	19	13	381	228	404	234	22	12
E	1048	903	1106	950	1133	982	27	34	1160	994	1184	1028	24	36	1220	1036	1247	1050	27	34
F	207	603	219	710	224	746	5	14	229	784	235	810	5	19	241	833	246	845	5	18
G	511	483	579	610	685	821	84	81	634	712	738	805	107	88	701	802	781	1006	89	101
H	2	12	2	12	8	22	6	10	3	13	9	23	6	10	3	13	9	23	6	10
I	1050	749	1107	869	1192	878	14	9	1176	938	1188	948	12	10	1235	987	1321	996	14	9
J	591	434	618	456	656	457	11	0	643	477	652	478	9	0	672	501	711	502	11	0
K	388	276	476	282	495	285	2	4	529	289	536	289	1	1	559	291	556	285	2	0
L	28	110	29	116	79	118	0	1	31	121	33	124	0	1	33	128	83	130	0	1
M	899	1009	947	1062	949	1068	6	7	1029	1172	1035	1178	5	8	1084	1227	1085	1233	6	7
N	443	702	434	726	426	752	19	27	431	722	435	729	13	23	436	731	436	751	15	27
O	585	711	618	741	626	743	8	7	734	812	741	811	7	7	770	817	778	813	8	7
TOTAL	8871	8788	9407	9375	9887	9823	325	325	10026	9958	10356	10270	349	350	10541	10371	10853	10715	324	324

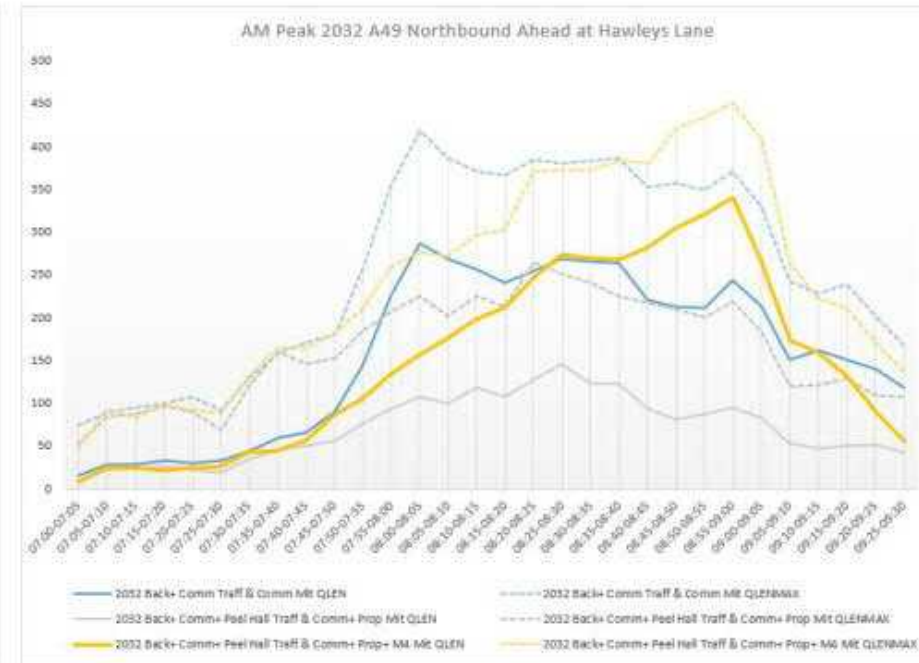
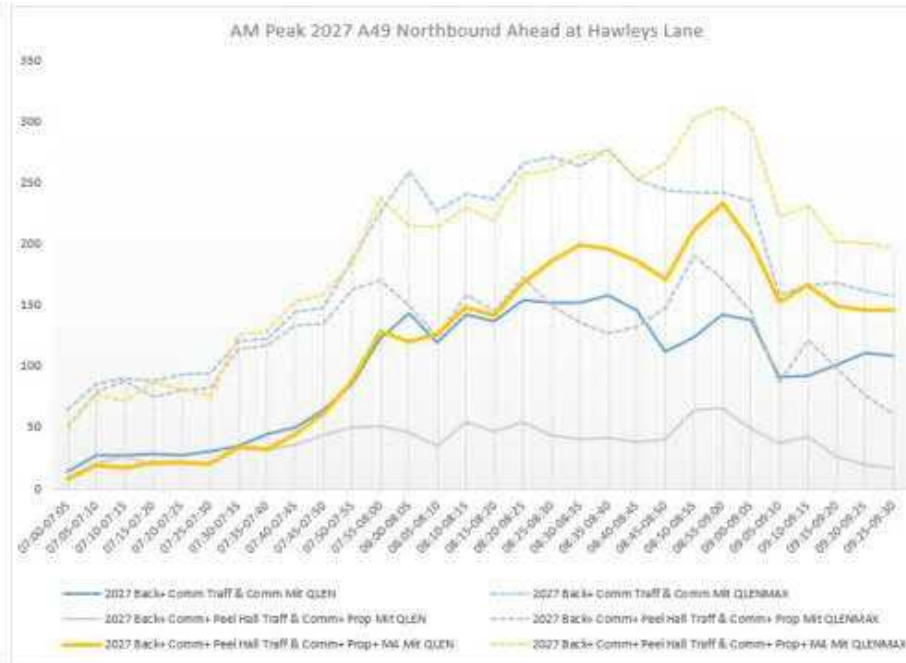
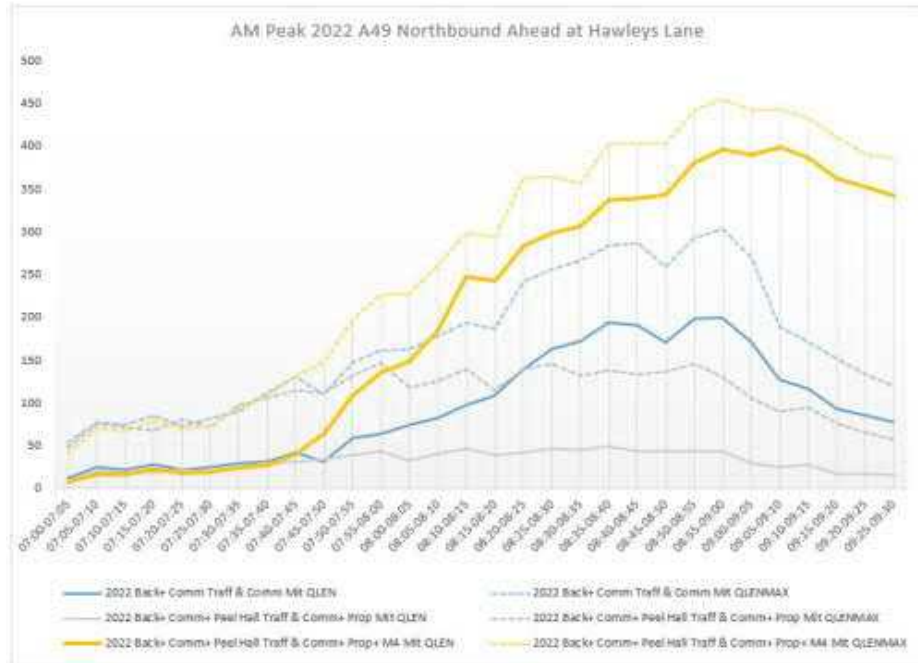
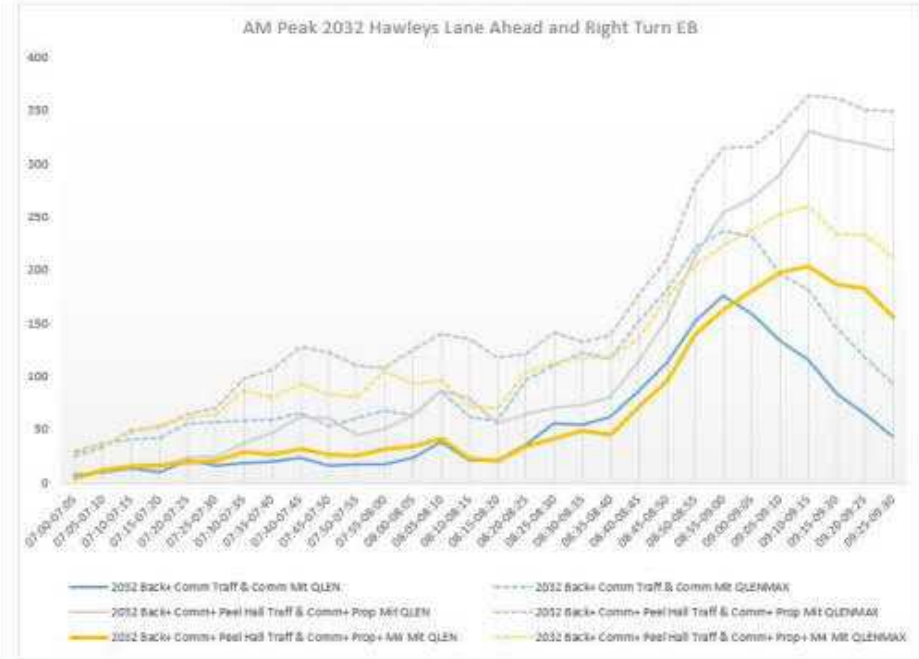
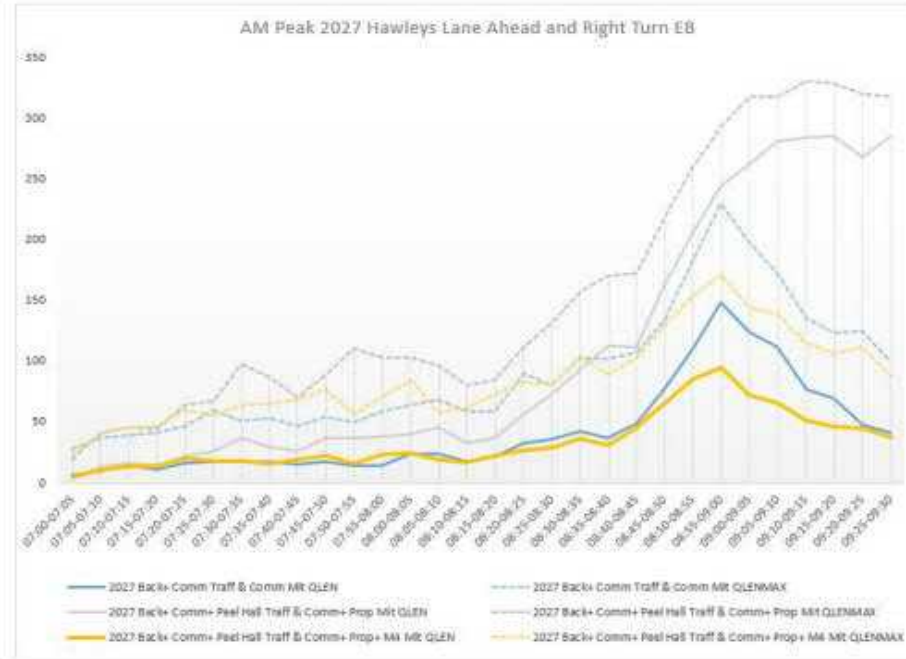
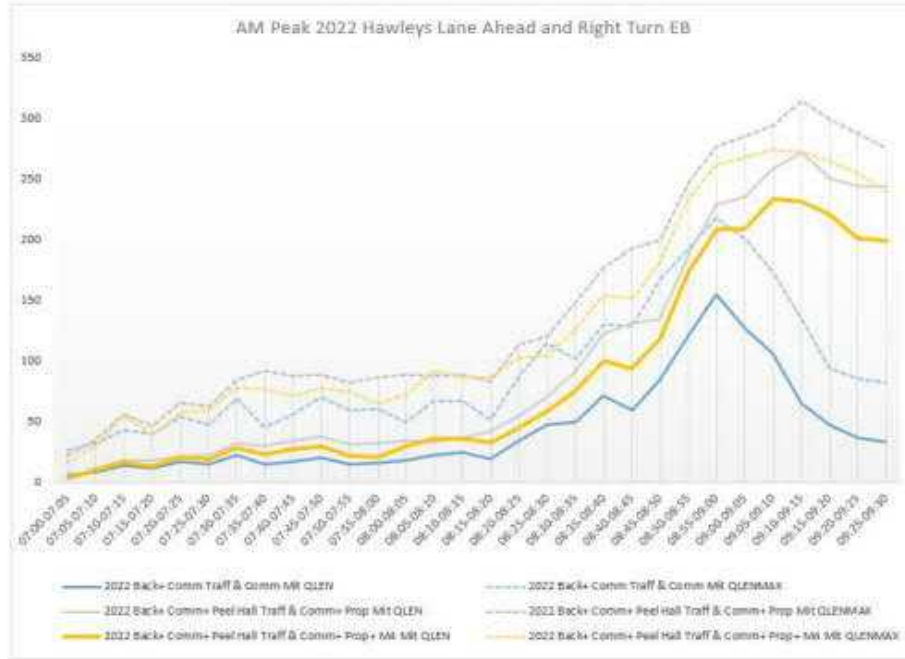
VISSIM

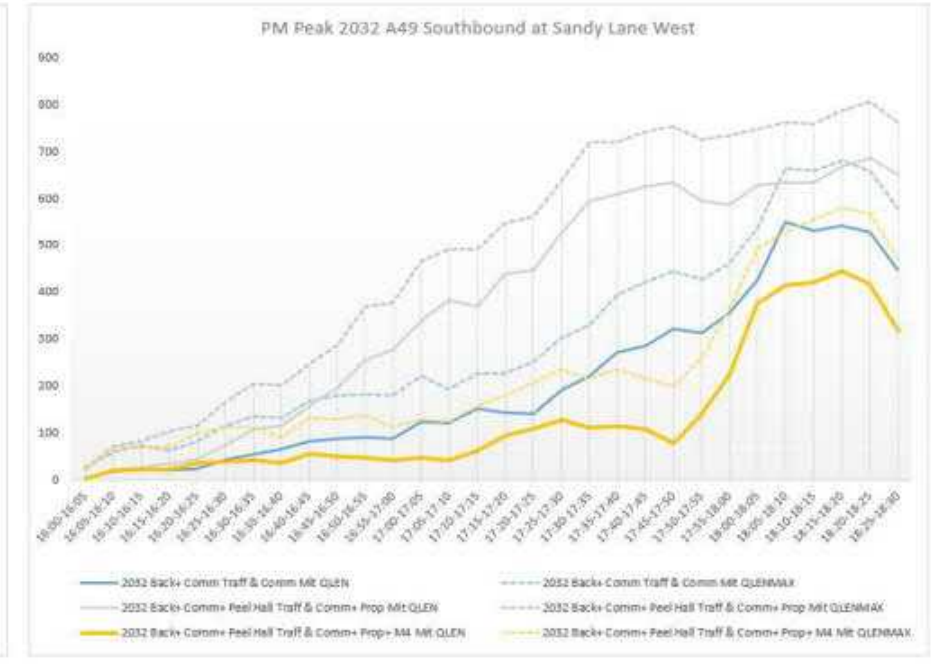
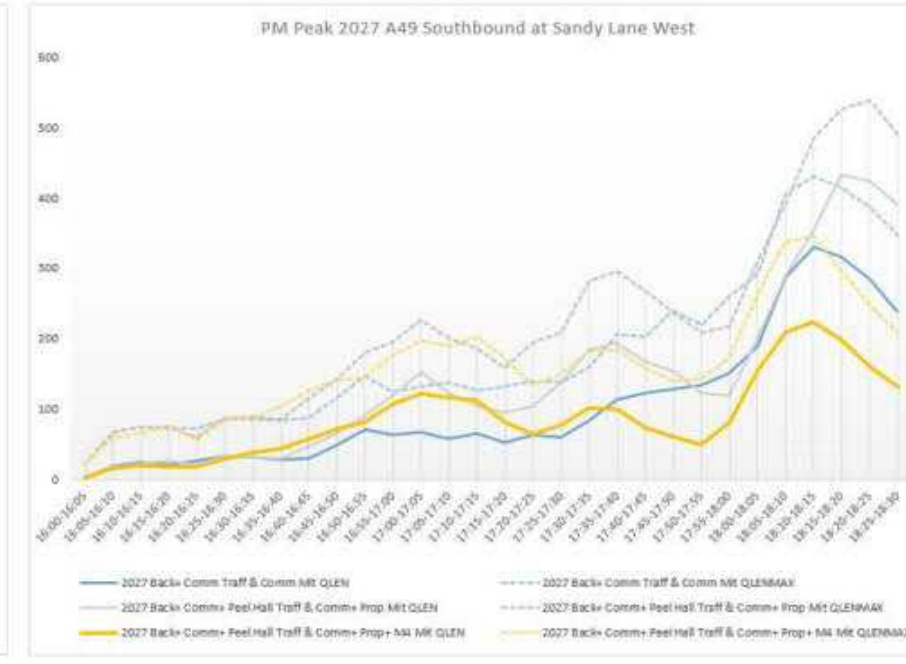
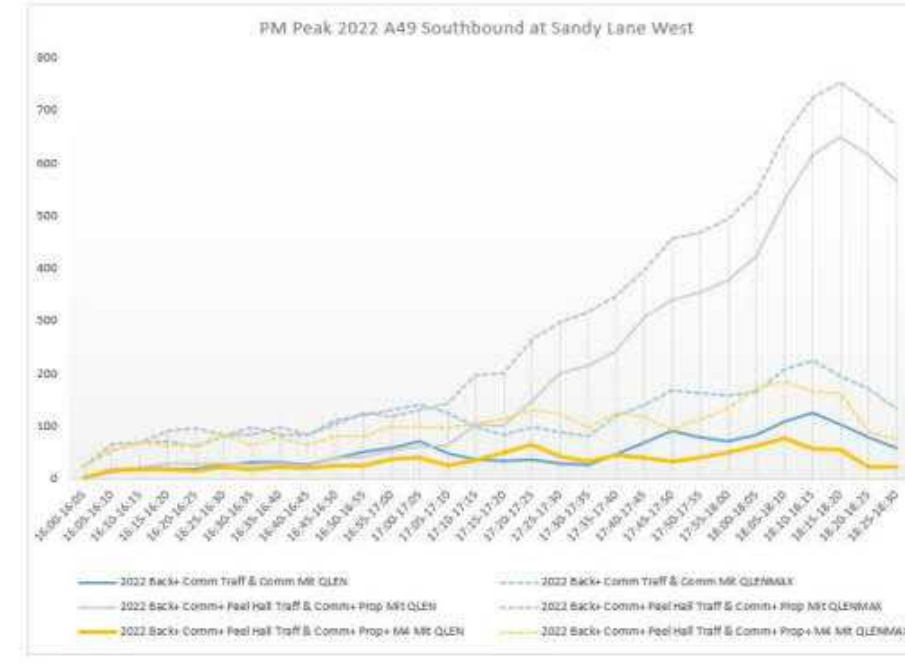
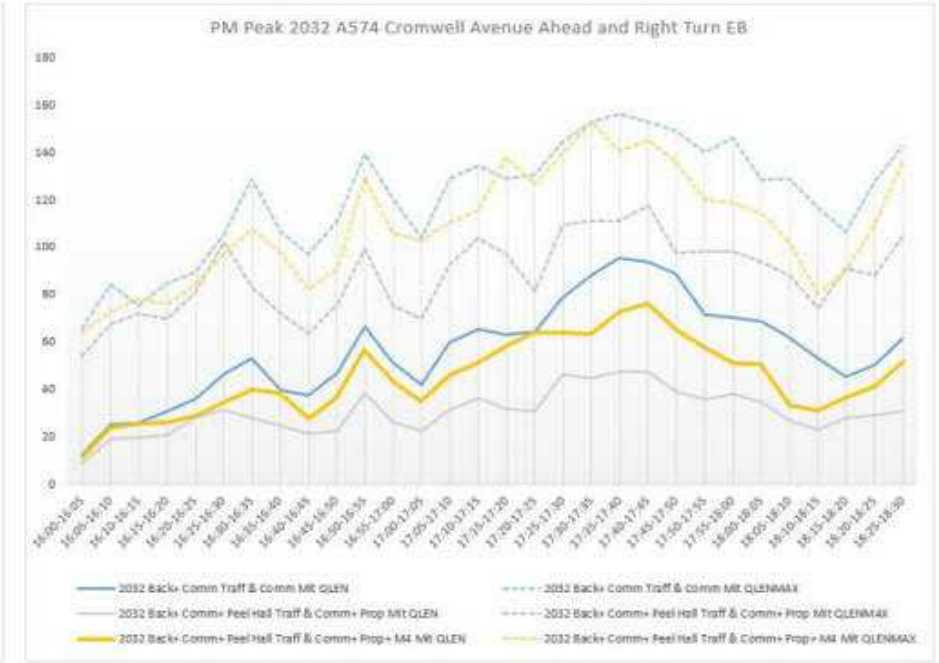
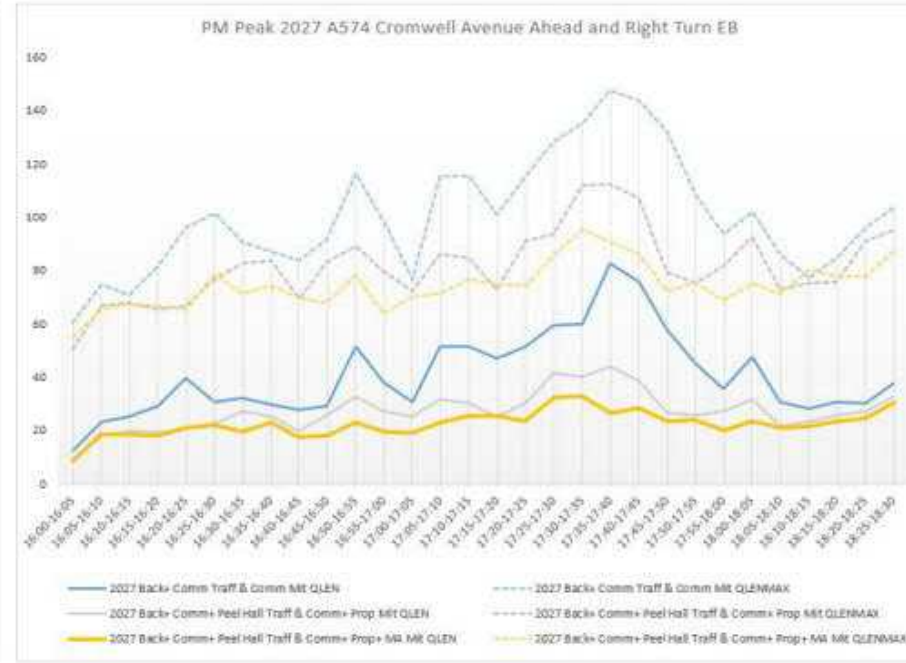
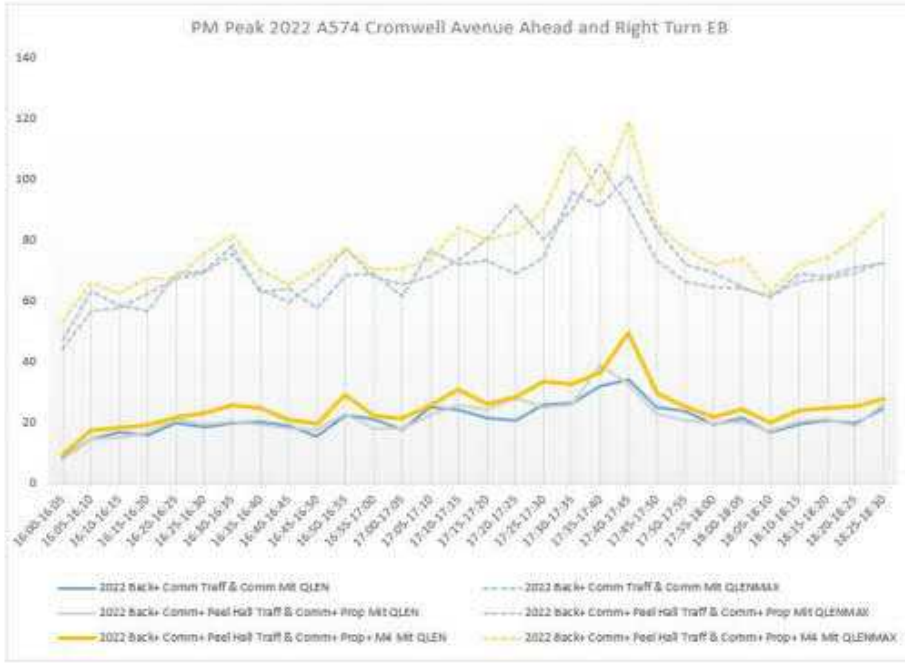
PM	PM_2019_Base		PM_2022_DoMin		PM_2022_DoSom		2022 Dev Trips		PM_2027_DoMin		PM_2027_DoSom		2027 Dev Trips		PM_2032_DoMin		PM_2032_DoSom		2032 Dev Trips	
	VISSIM Zone	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Origin
A	1717	1285	1832	1337	1847	1461	27	67	1876	1412	1874	1471	44	74	1911	1527	1982	1639	28	67
B	588	398	690	460	707	471	14	9	745	463	758	475	12	9	798	484	789	493	14	9
C	1365	1186	1501	1230	1580	1228	75	42	1549	1215	1670	1256	82	49	1629	1205	1723	1250	75	22
D	365	256	375	315	308	331	21	11	464	330	362	378	18	12	572	342	427	391	20	11
E	965	1005	1053	1085	1086	1117	27	33	1119	1143	1150	1175	24	35	1176	1211	1218	1252	27	33
F	529	482	534	575	529	610	5	14	540	631	534	658	5	19	565	676	558	694	5	18
G	640	783	740	938	862	1140	84	81	795	1105	917	1070	106	89	866	1270	950	1356	88	102
H	12	1	21	9	27	18	6	9	21	9	27	17	6	8	21	9	27	17	6	8
I	4832	5934	5158	6444	5282	6447	15	8	5432	6849	5452	6862	12	9	5732	7334	5844	7319	15	8
J	5488	4655	5841	4942	5908	4932	10	0	6165	5186	6180	5180	8	0	6610	5439	6673	5445	10	0
K	386	364	491	375	498	394	2	4	554	405	551	411	1	1	583	444	578	437	2	0
L	179	132	190	150	293	151	0	1	190	162	190	163	0	1	192	168	312	171	0	1
M	900	862	942	883	914	903	5	7	1019	1058	1010	1053	5	7	1057	1085	1025	1075	6	7
N	311	424	343	441	366	477	19	26	422	437	439	458	13	23	439	445	439	479	14	26
O	460	970	548	1076	550	1077	8	6	706	1195	713	1200	6	6	744	1255	732	1261	8	6
TOTAL	18737	18737	20260	20260	20758	20758	318	318	21599	21599	21828	21828	342	342	22895	22895	23279	23279	318	318

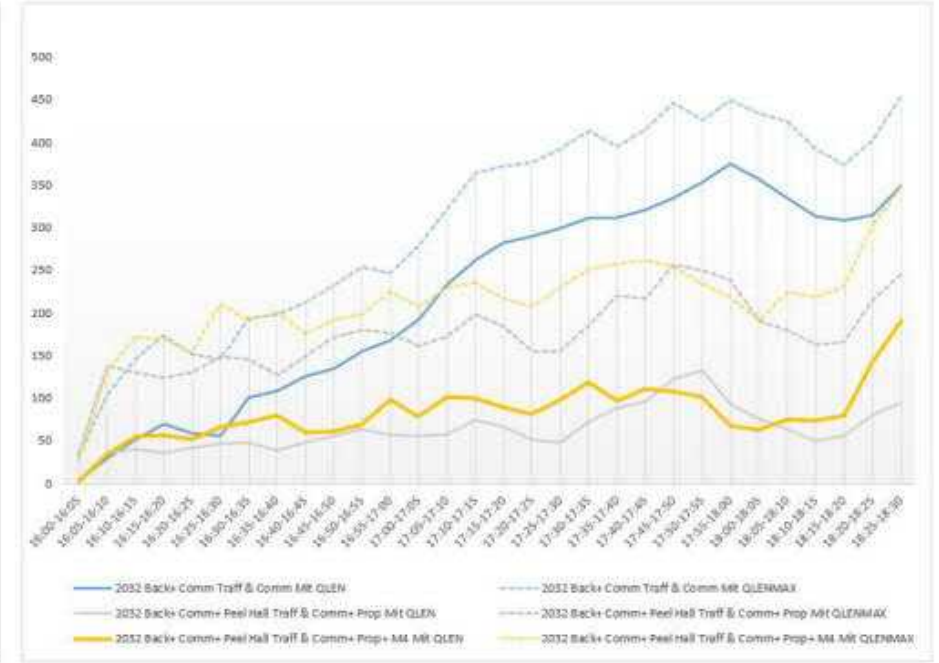
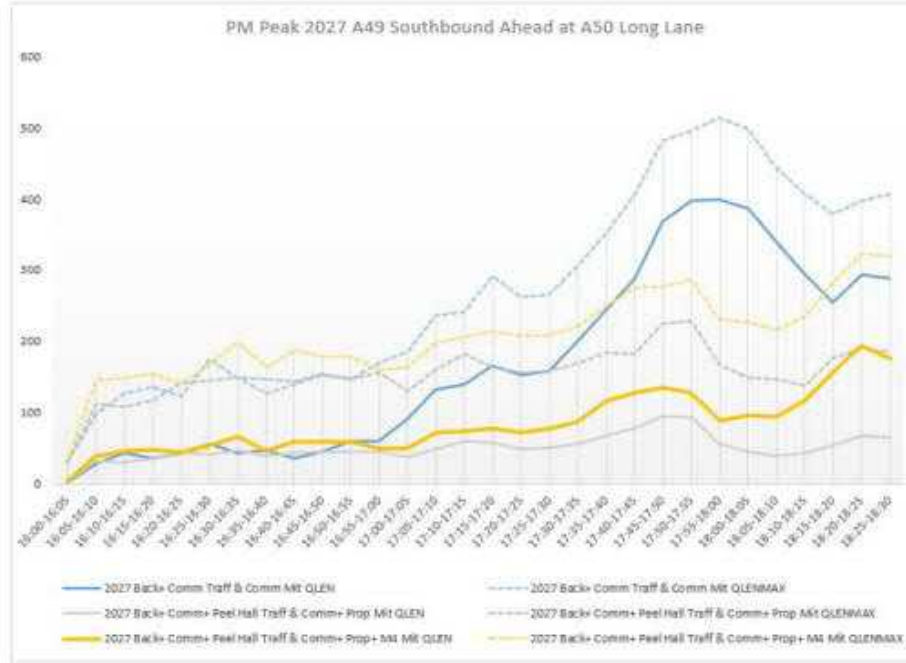
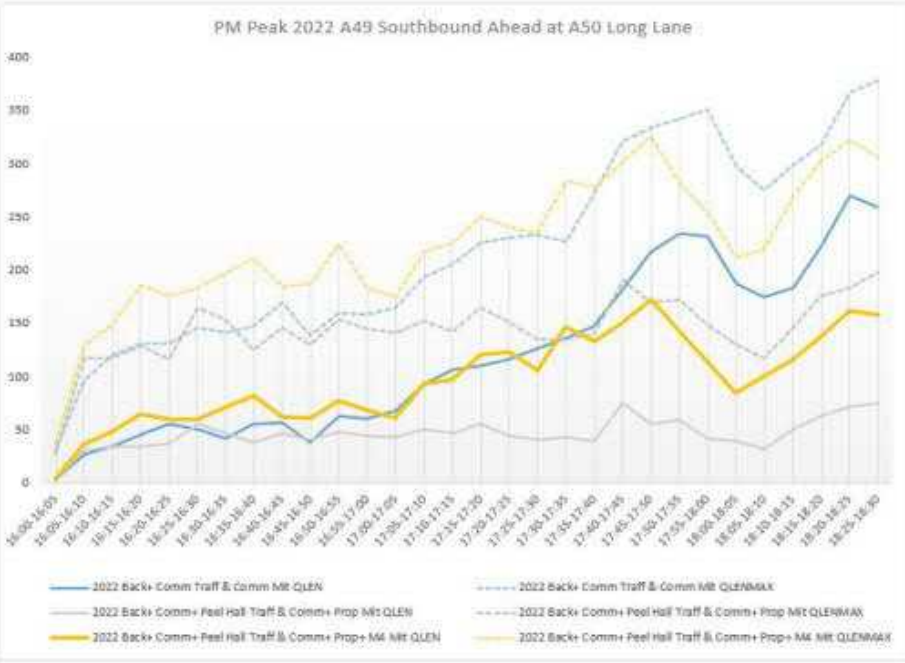
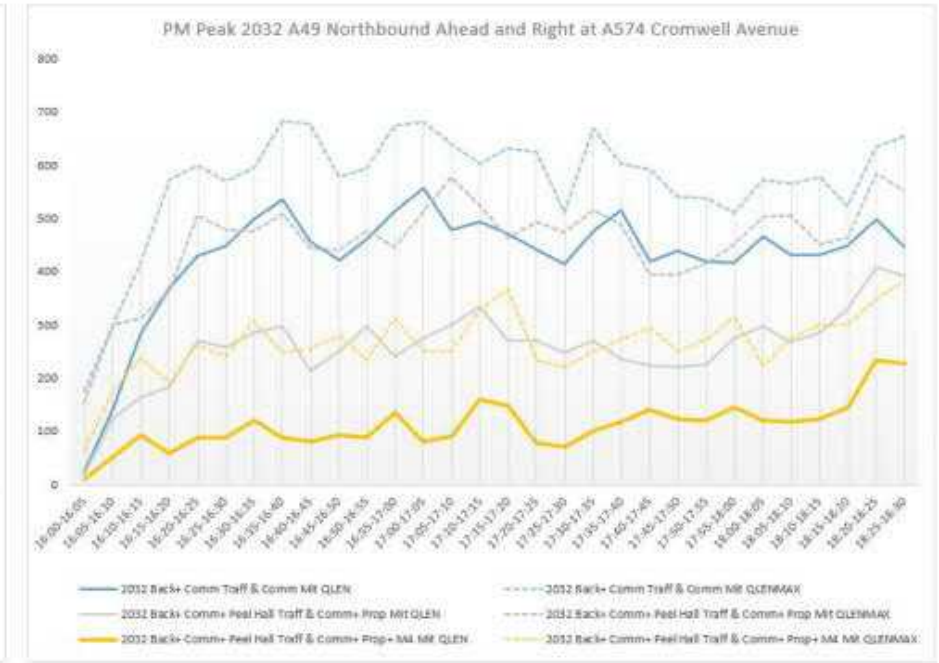
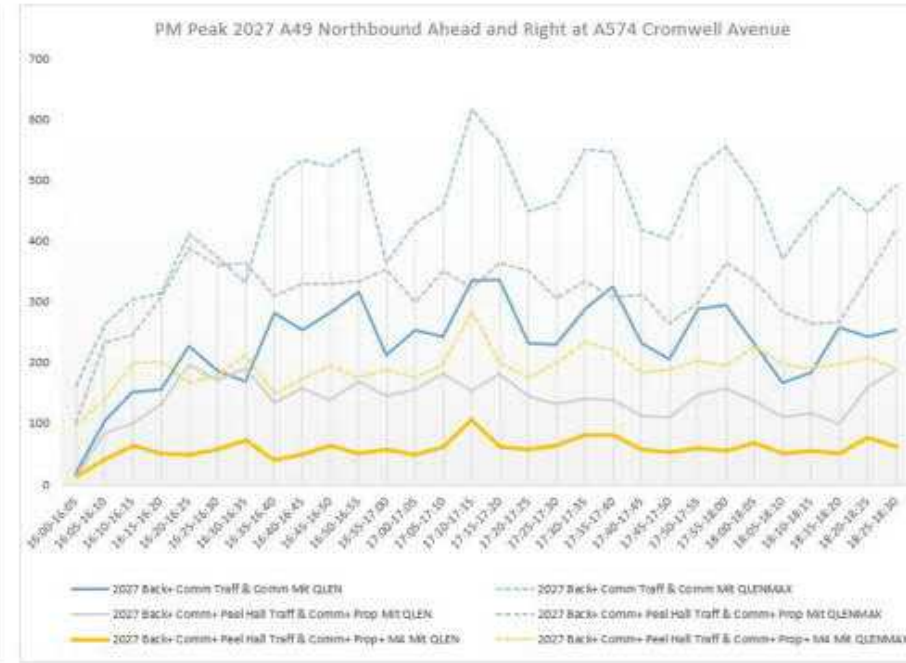
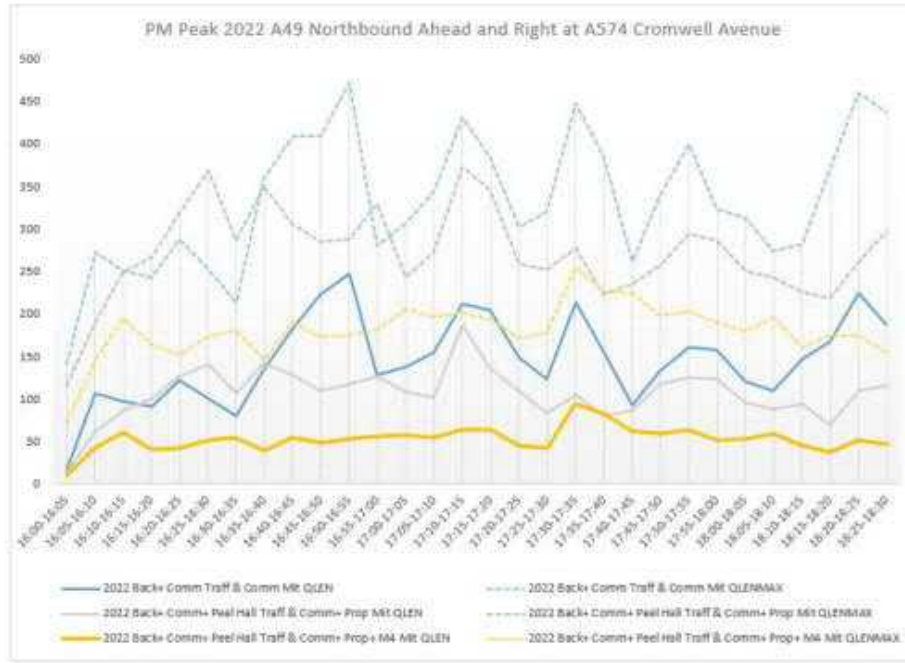
APPENDIX 2

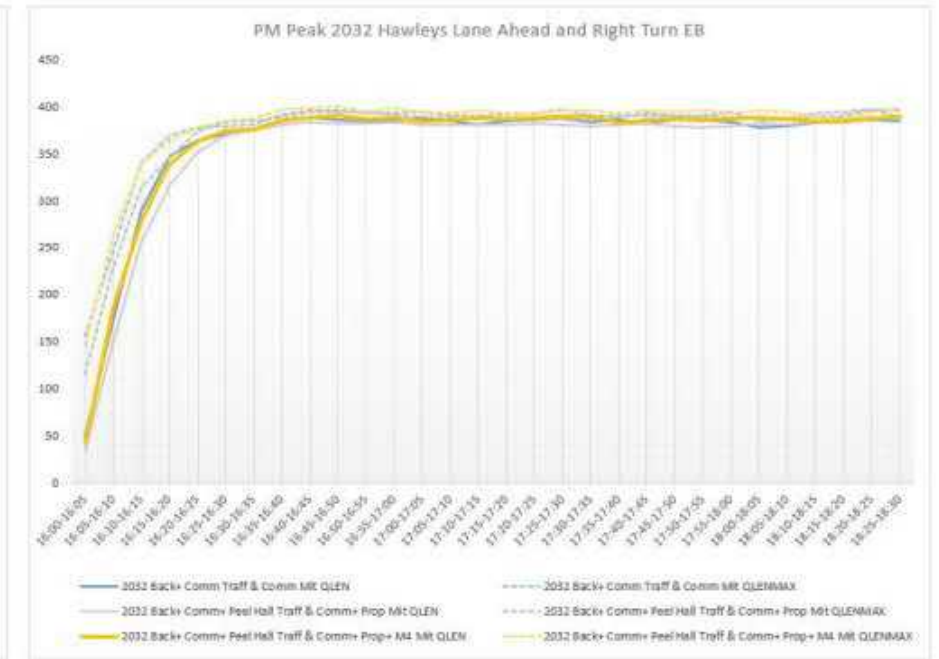
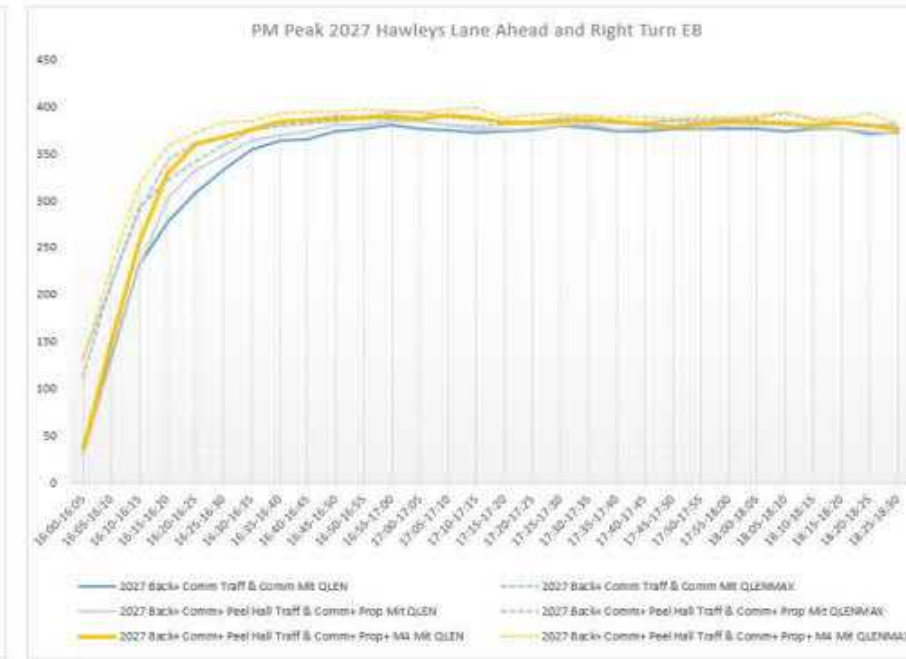
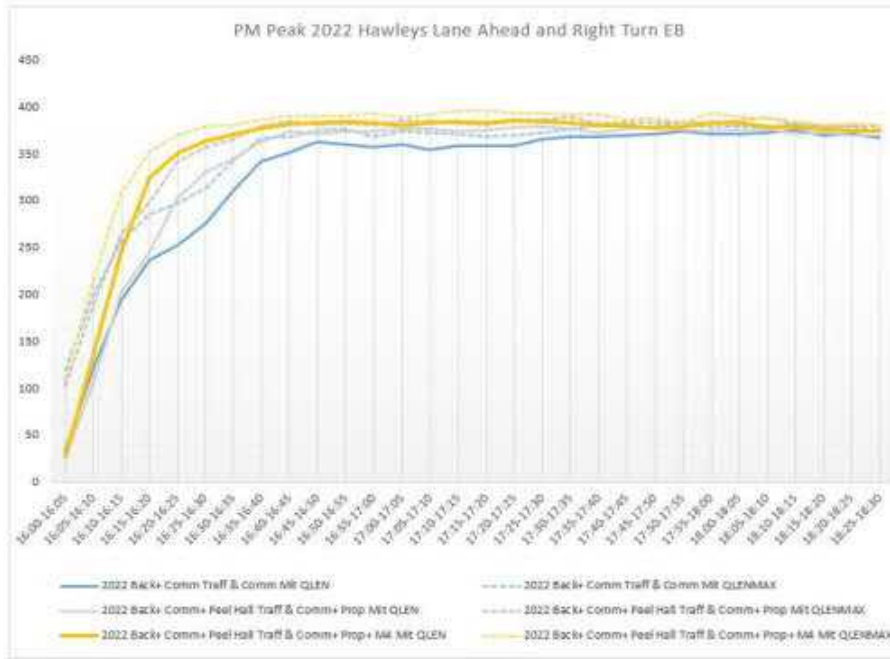
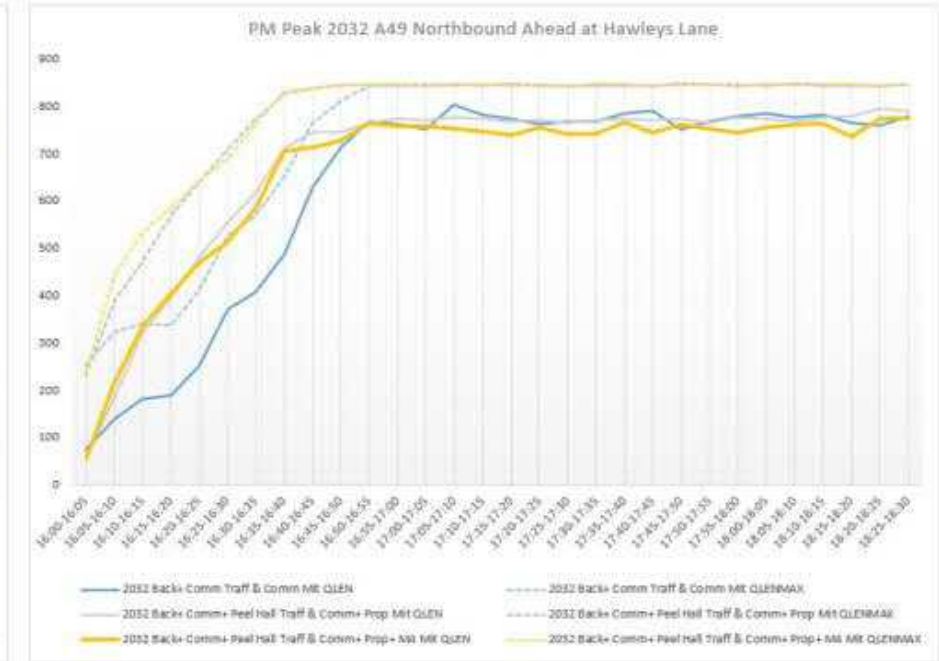
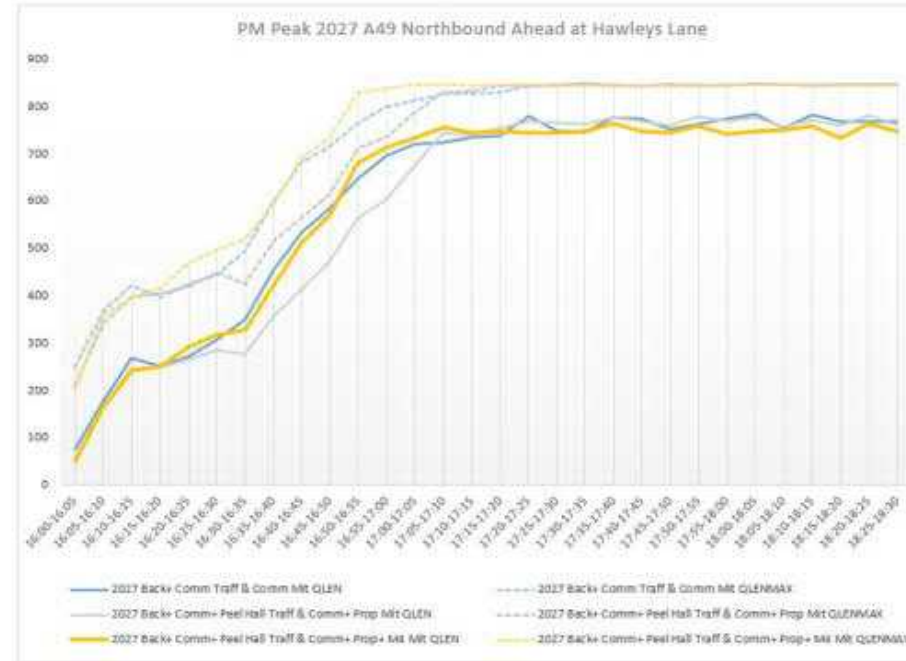
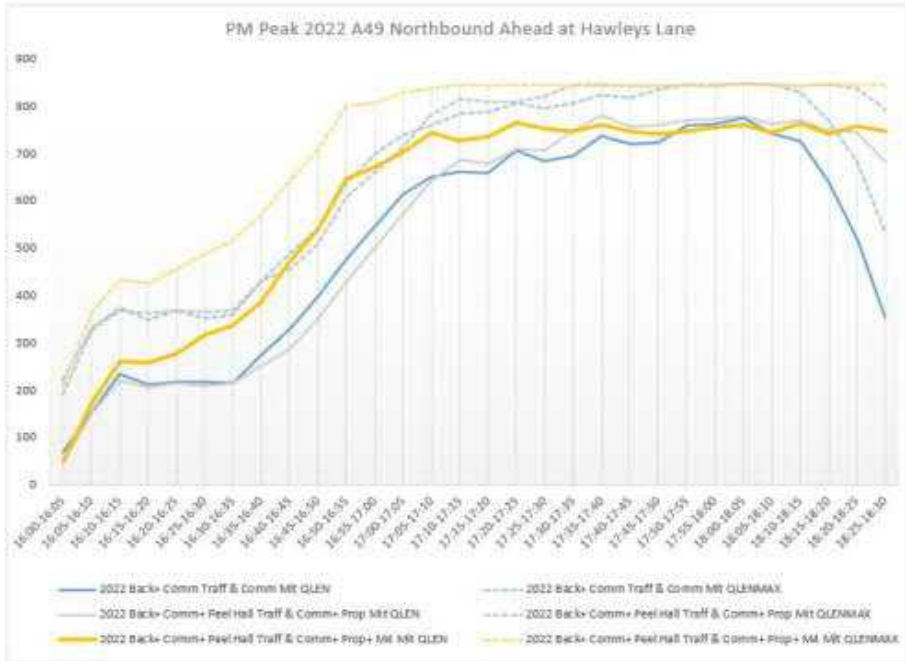












APP36 -
TN28 *Technical Notes on Traffic Flows*

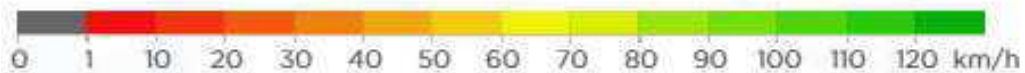
TECHNICAL NOTE

PROJECT: Peel Hall, Warrington

REPORT: 1901/TN/28

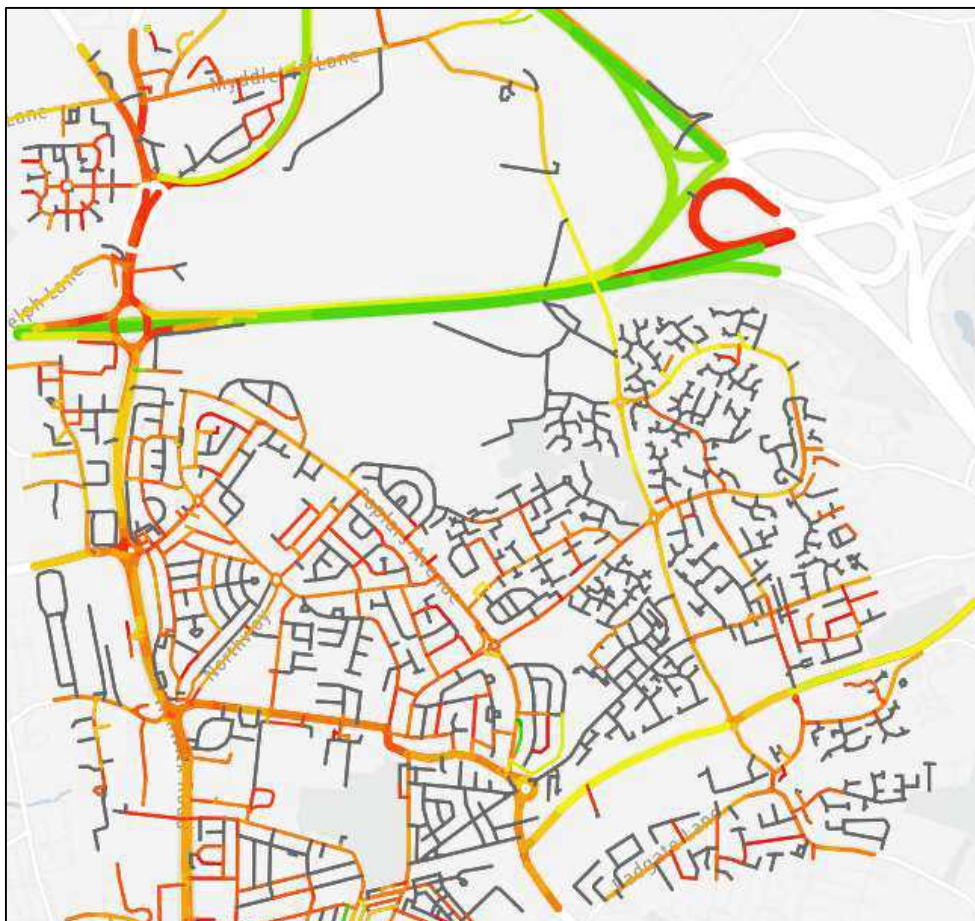
DATE: 03/04/2019 (TomTom Data)

1. 08:00 – 09:00 - Traffic
2. 08:00 – 0900 - Sandy Lane/ Sandy Lane West/Cotswold Road/ Clevedon Road
3. 16:00 – 17:00 Traffic
4. 16:00 – 17:00 Sandy Lane/ Sandy Lane West/Cotswold Road/ Clevedon Road

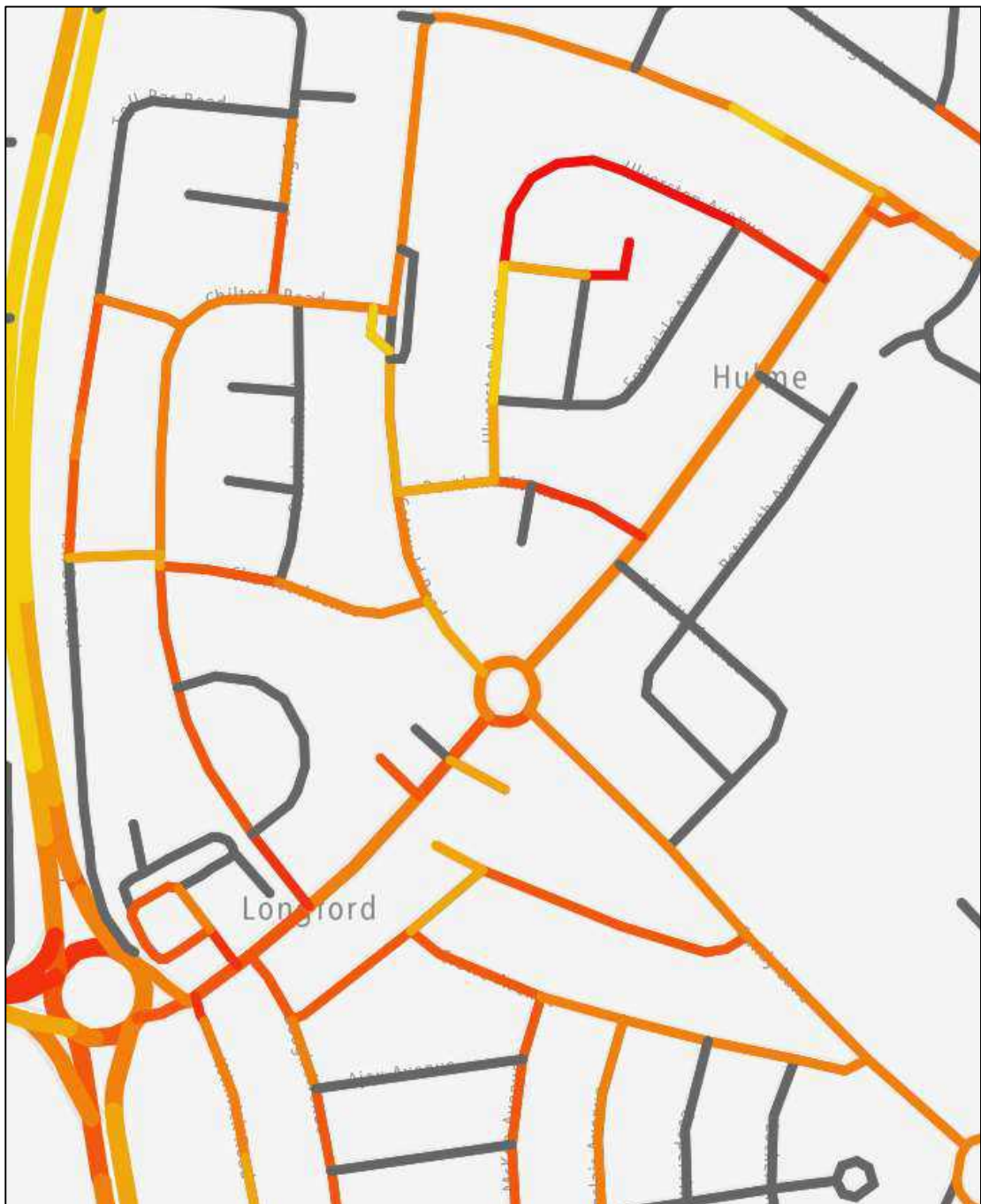


Note: black = no data

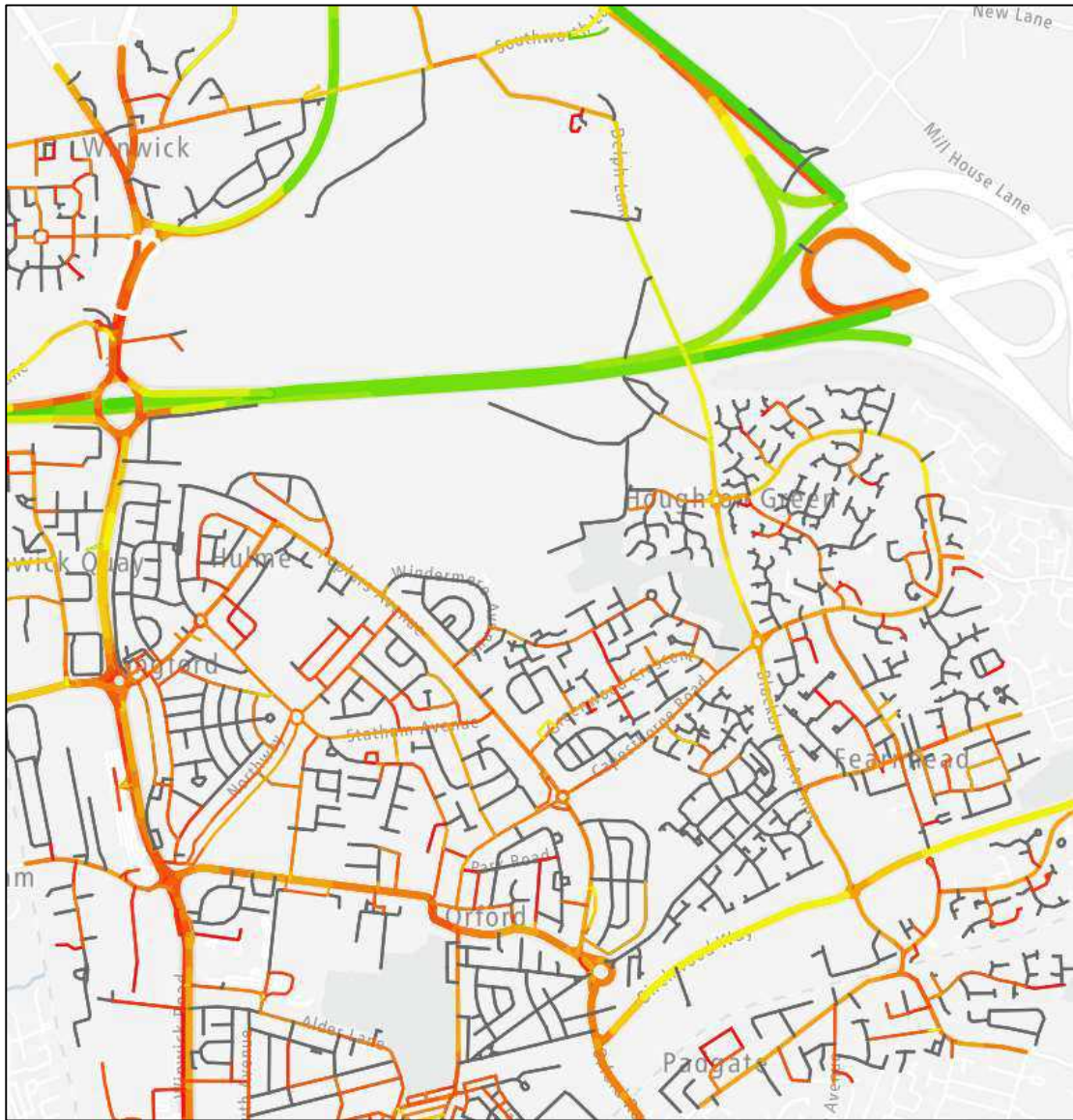
1. 08:00-09:00 Average Speed



2. 08:00-09:00 Average Speed - Sandy Lane / Sandy Lane West / Cotswold Road / Clevedon Road



3. 16:00-17:00 Average Speed



4. 16:00-17:00 - Sandy Lane / Sandy Lane West /
Cotswold Road / Clevedon Road



TECHNICAL NOTE

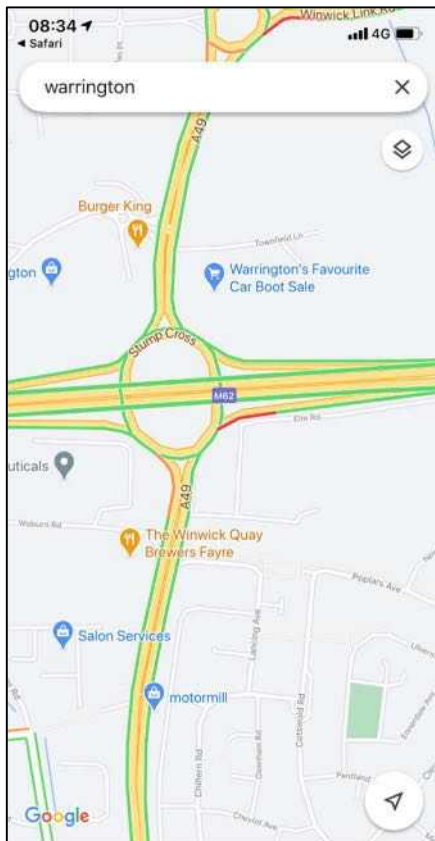
PROJECT: Peel Hall, Warrington

REPORT: 1901/TN/28

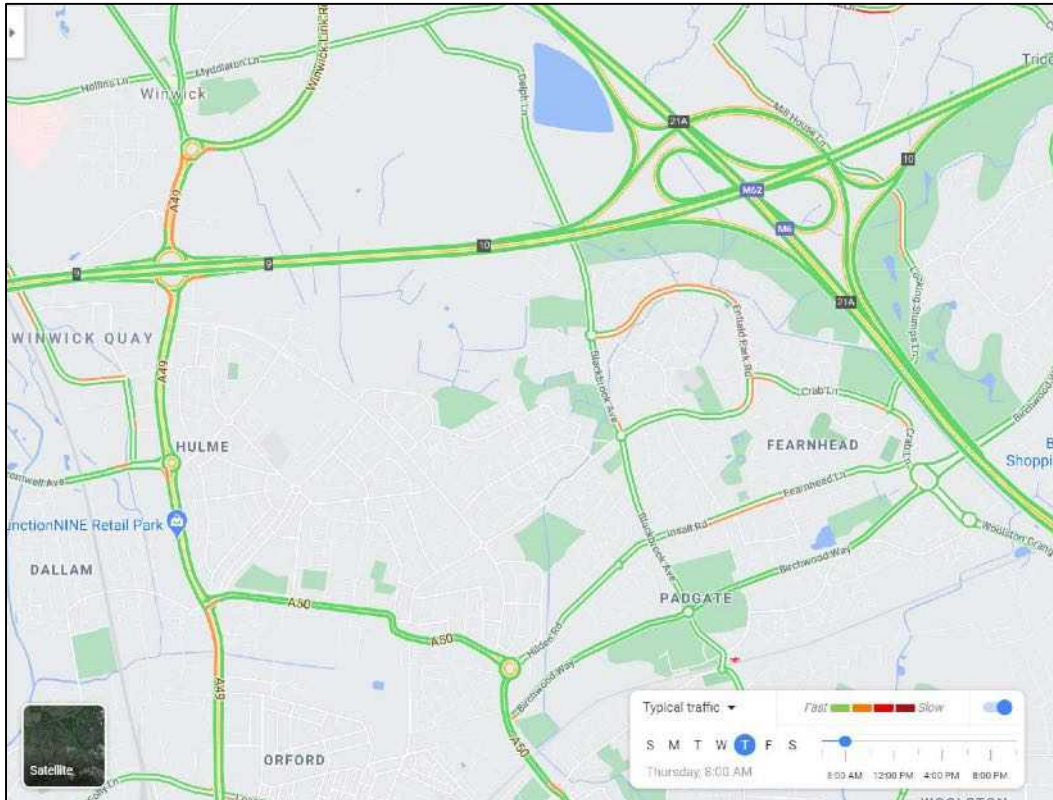
DATE: 10/09/2020

1. 08:30 Live Traffic Screenshot
2. 08:00 Retrospective Traffic Screenshot
3. 09:00 Retrospective Screenshot
4. 17:00 Live Traffic Screenshot
5. 16:30 Retrospective Traffic Screenshot
6. 17:30 Retrospective Screenshot
7. 08:30 Live Weather Screenshot
8. 17:00 Live Weather Screenshot

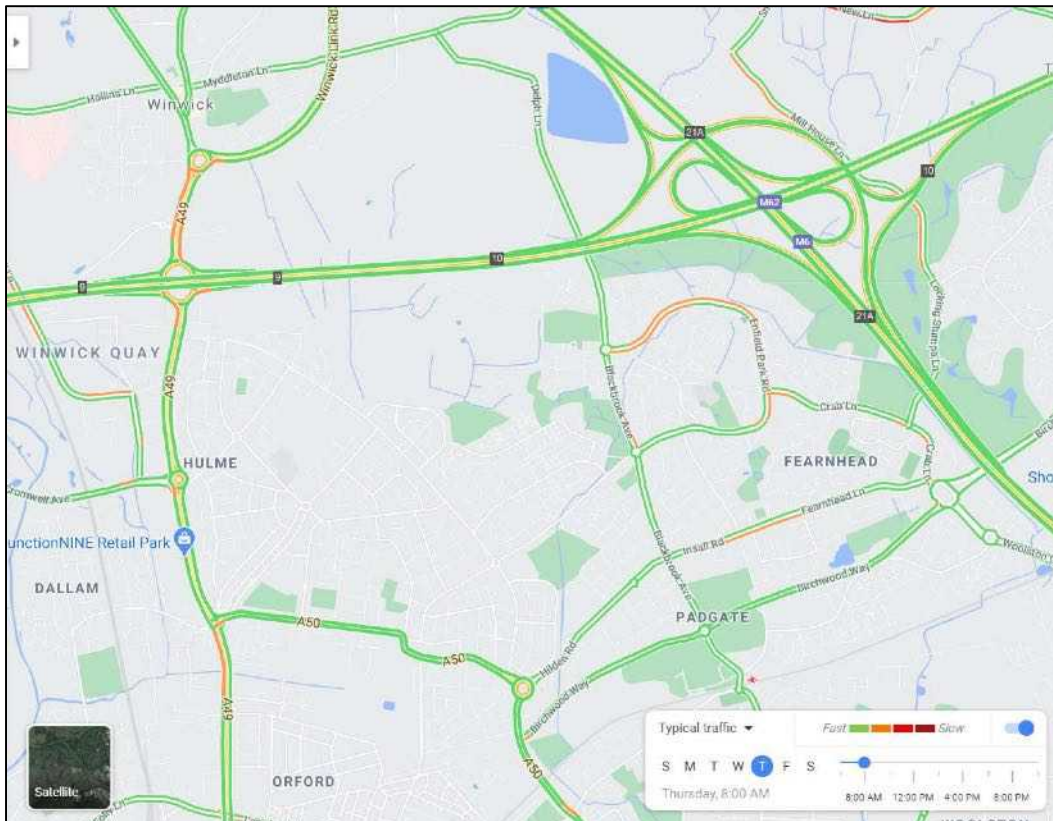
1. 08:30 Live Traffic Screenshot



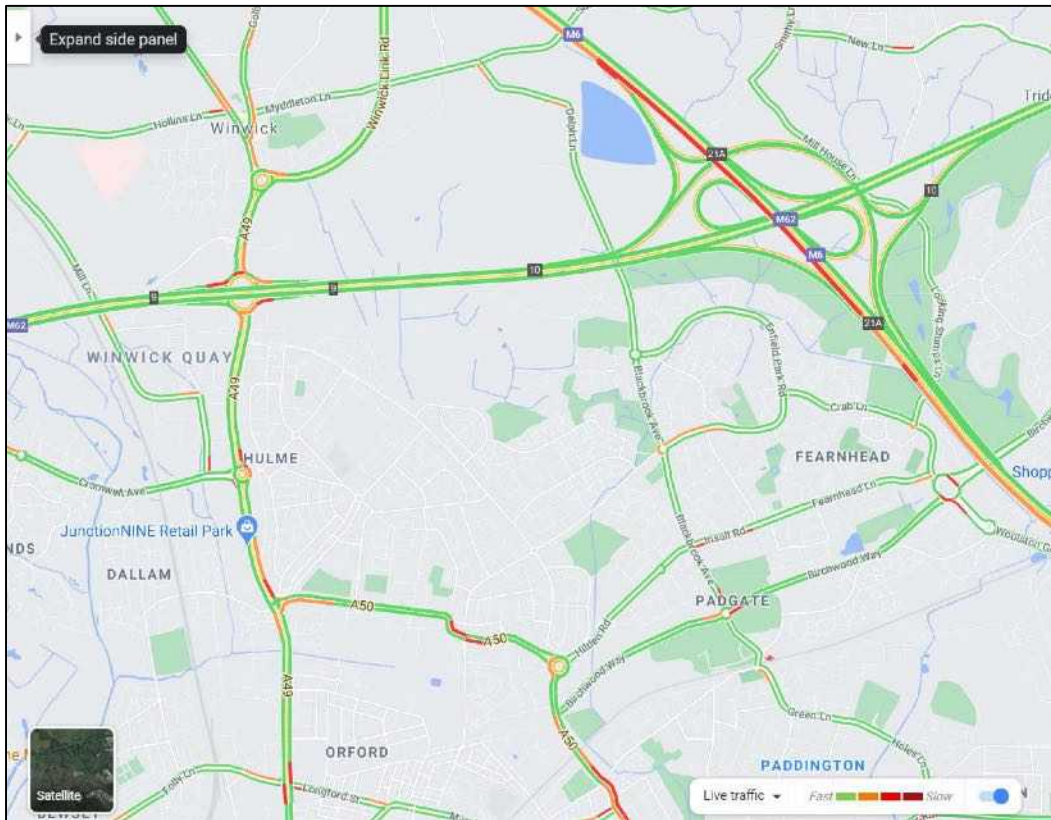
2. 08:00 Retrospective Traffic Screenshot



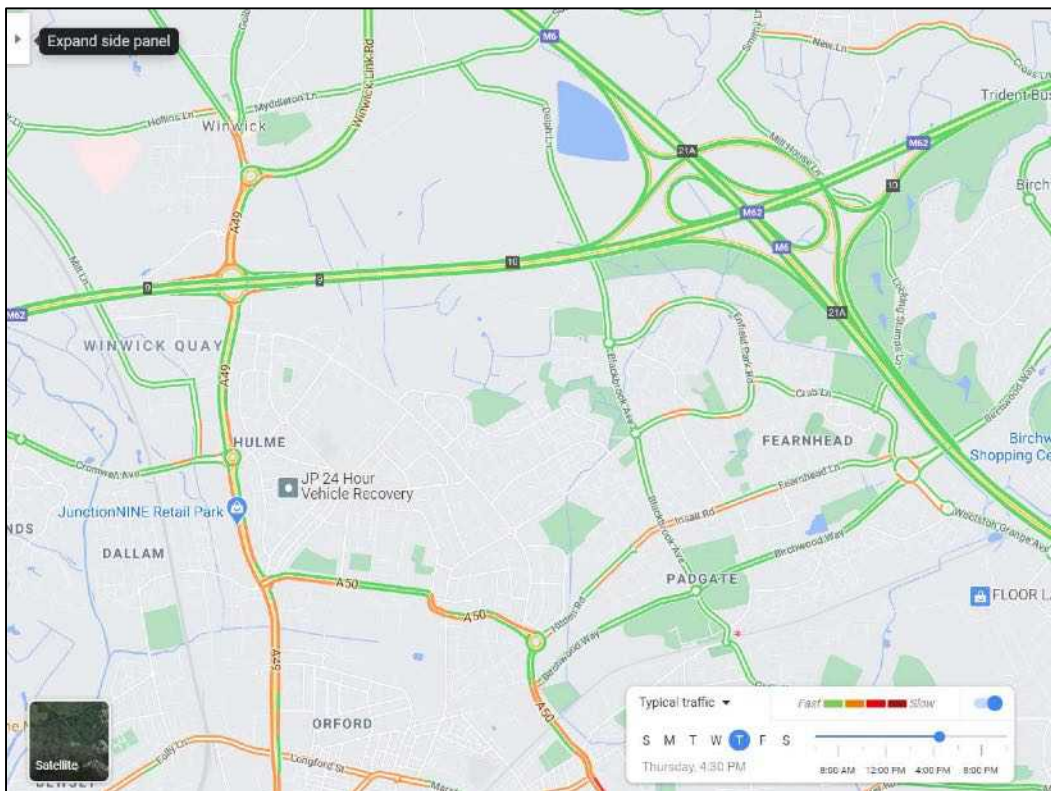
3. 09:00 Retrospective Screenshot



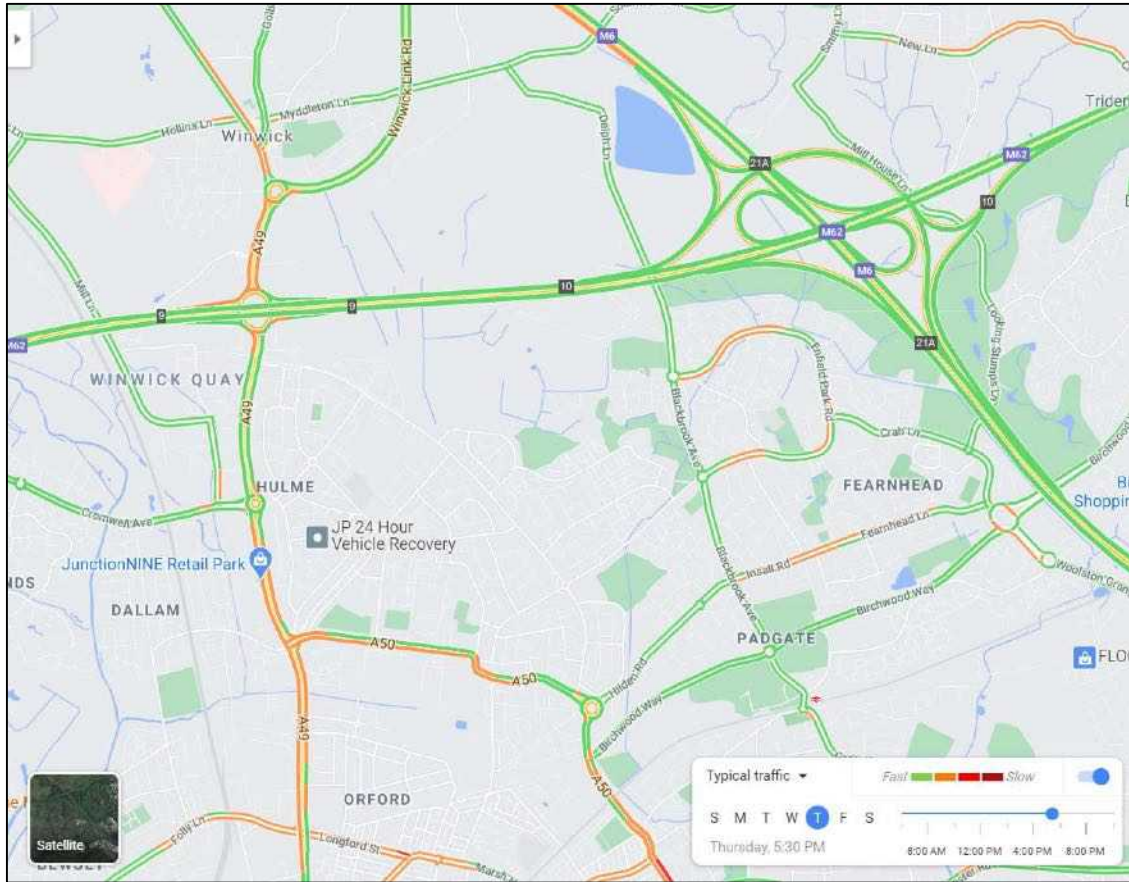
4. 17:00 Live Traffic Screenshot



5. 16:30 Retrospective Traffic Screenshot

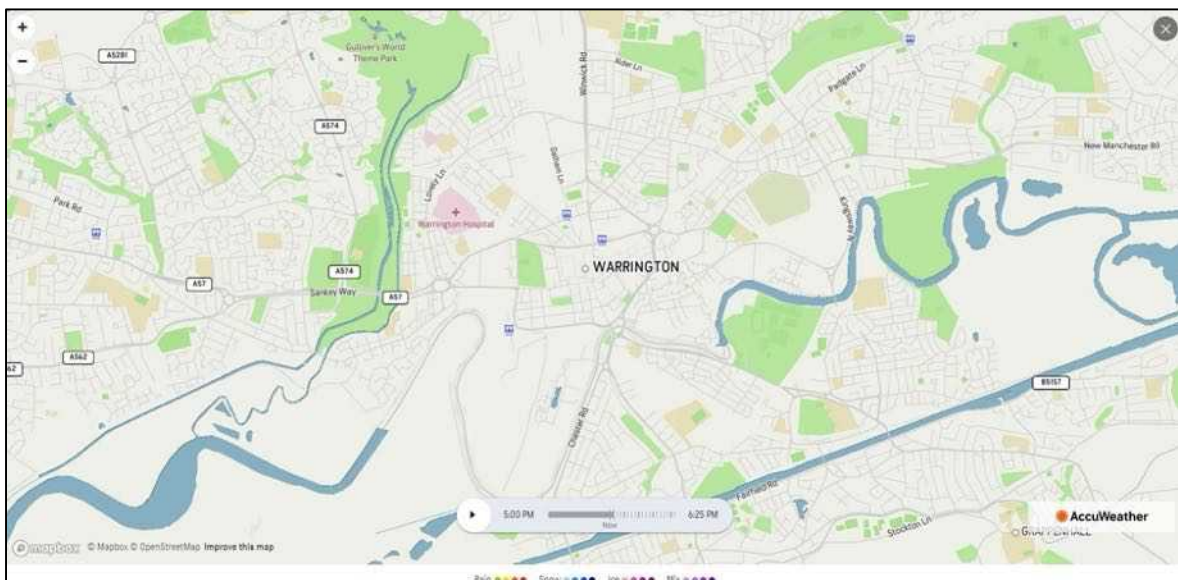


6. 17:30 Retrospective Screenshot



7. 08:30 Live Weather Screenshot

8. 17:00 Live Weather Screenshot



TECHNICAL NOTE

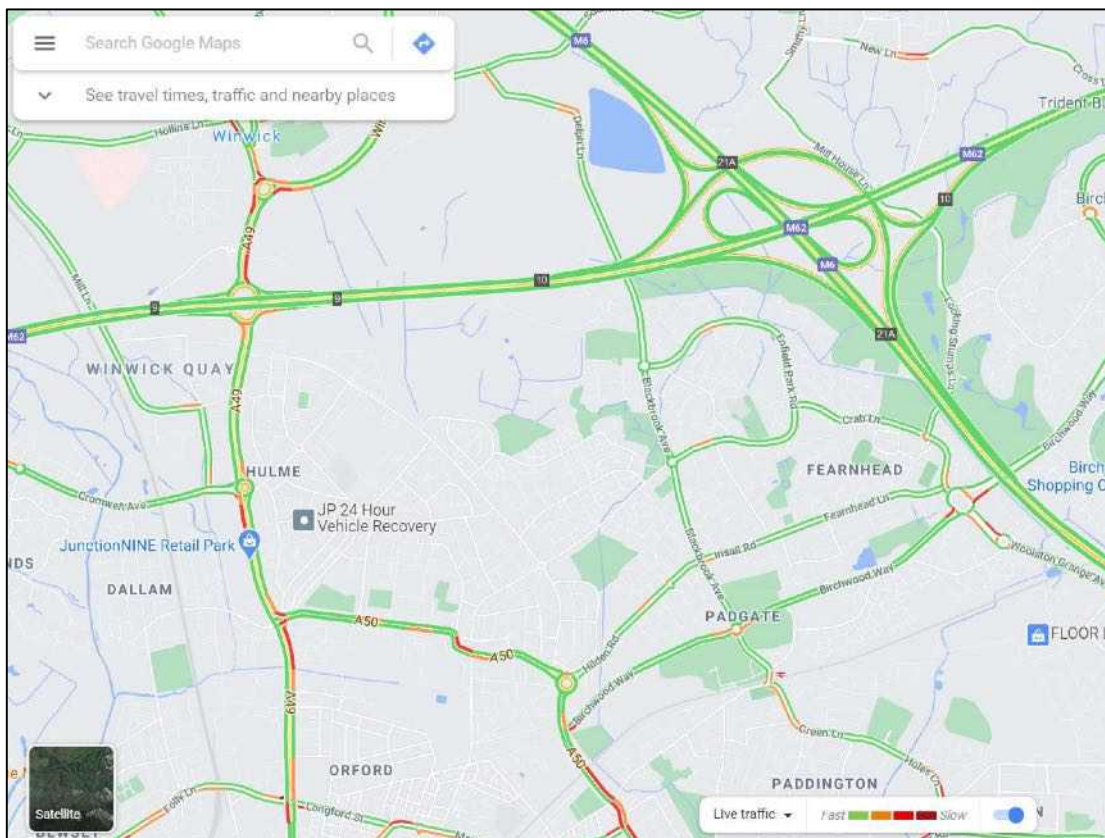
PROJECT: Peel Hall, Warrington

REPORT: 1901/TN/28

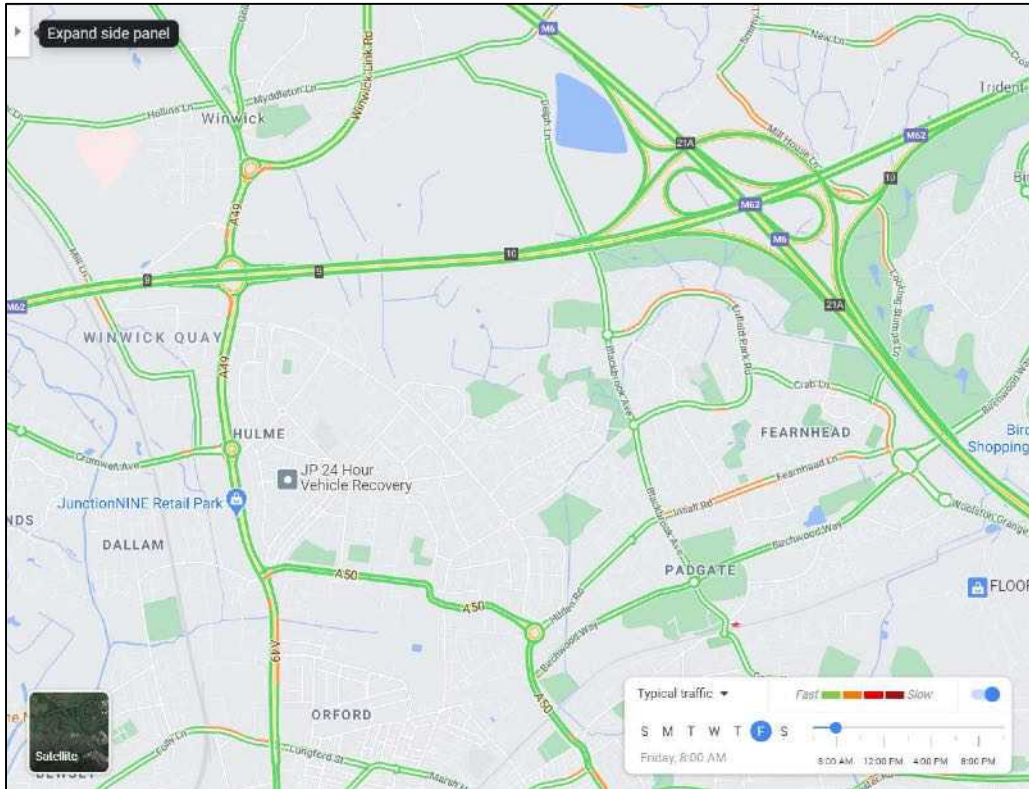
DATE: 11/09/2020

1. 08:30 Live Traffic Screenshot
2. 08:00 Retrospective Traffic Screenshot
3. 09:00 Retrospective Screenshot
4. 17:00 Live Traffic Screenshot
5. 16:30 Retrospective Traffic Screenshot
6. 17:30 Retrospective Screenshot
7. 08:30 Live Weather Screenshot
8. 17:00 Live Weather Screenshot

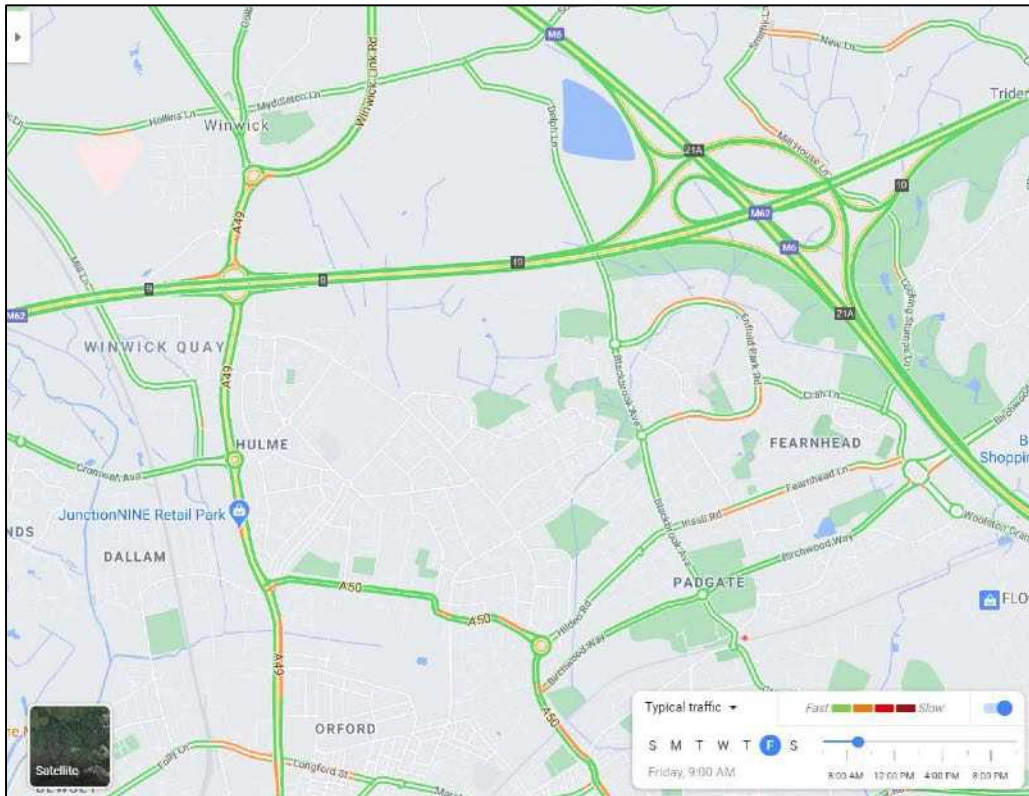
1. 08:30 Live Traffic Screenshot



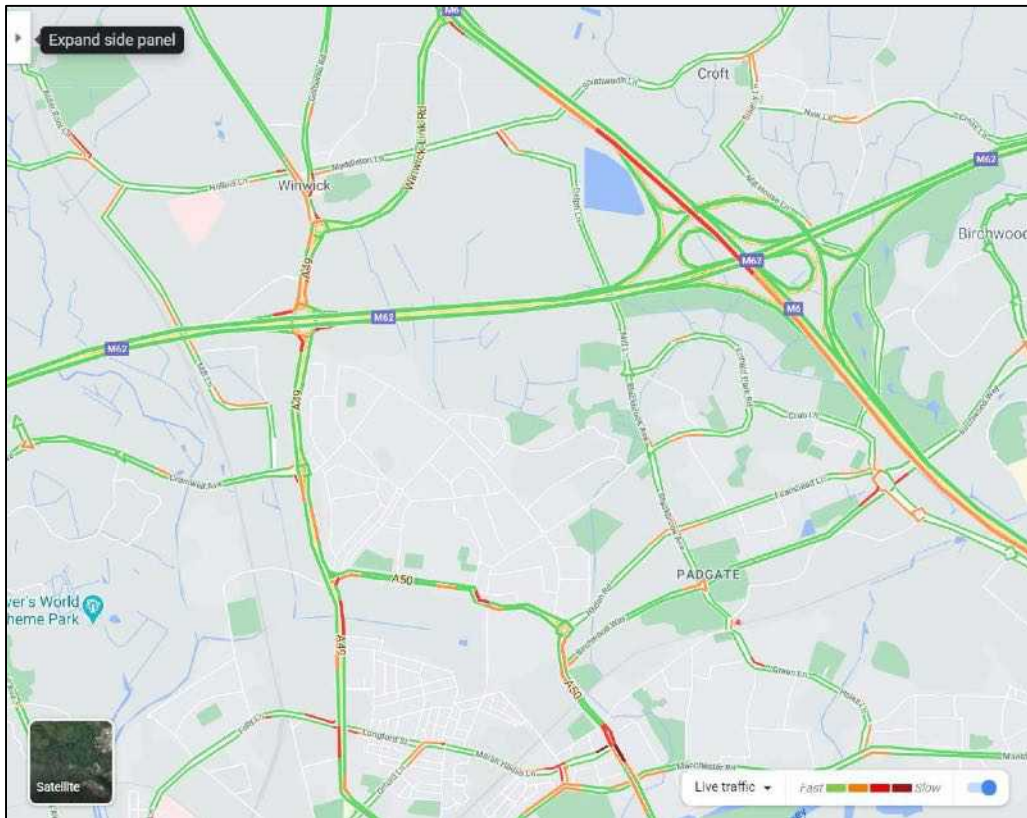
2. 08:00 Retrospective Traffic Screenshot



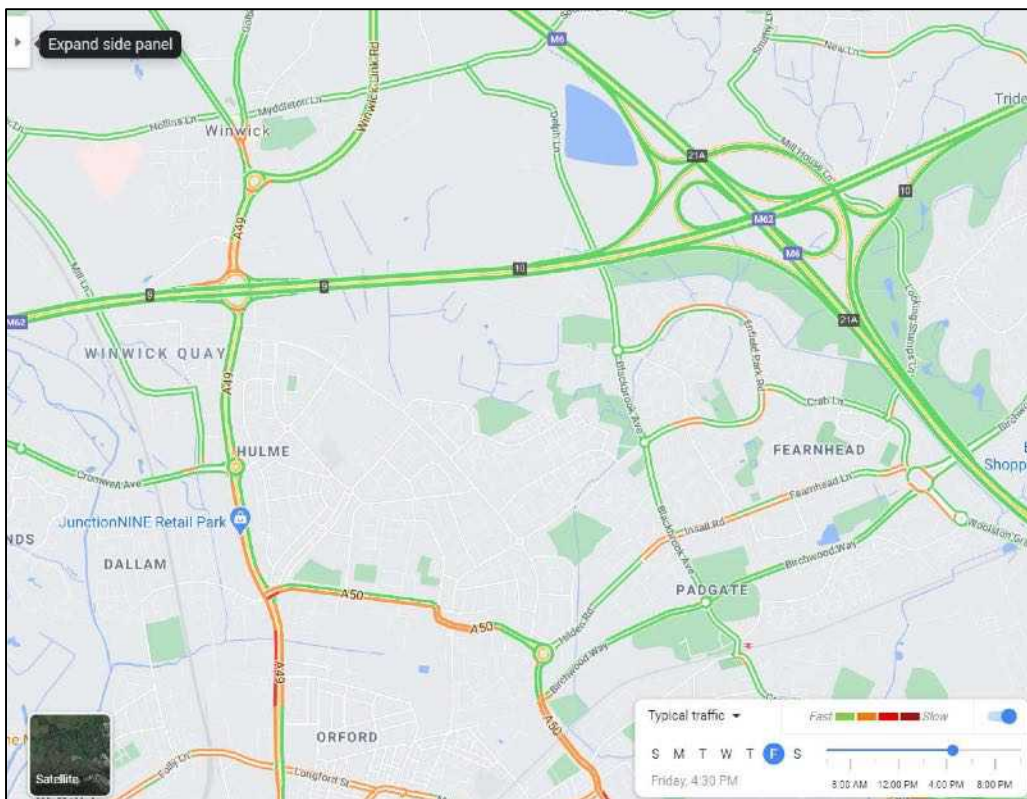
3. 09:00 Retrospective Screenshot



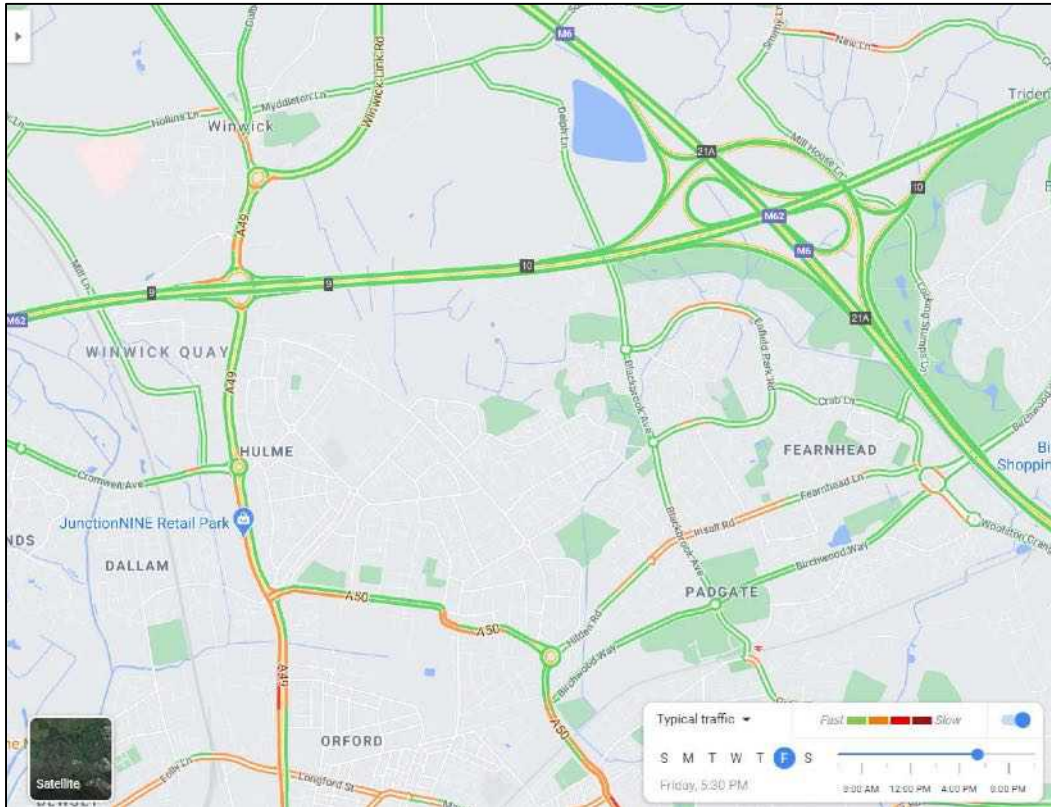
4. 17:00 Live Traffic Screenshot



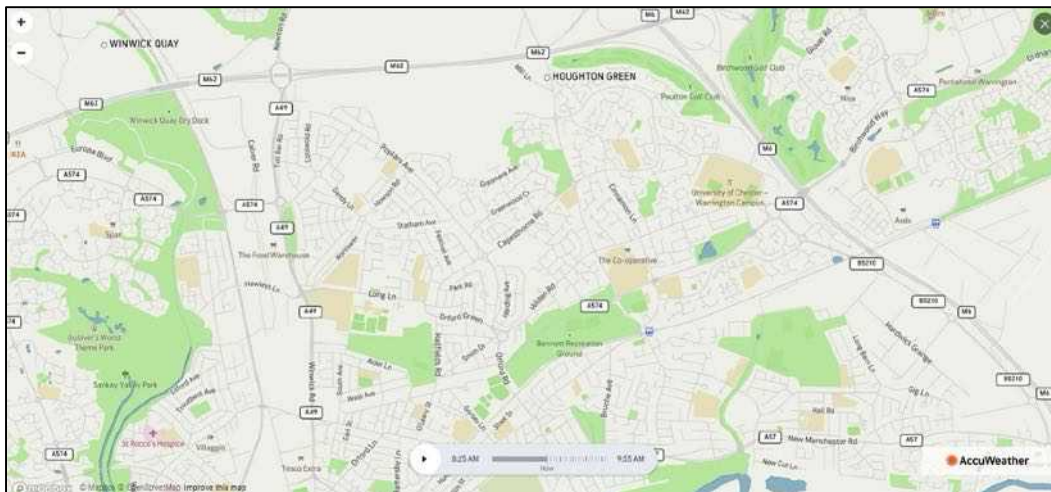
5. 16:30 Retrospective Traffic Screenshot



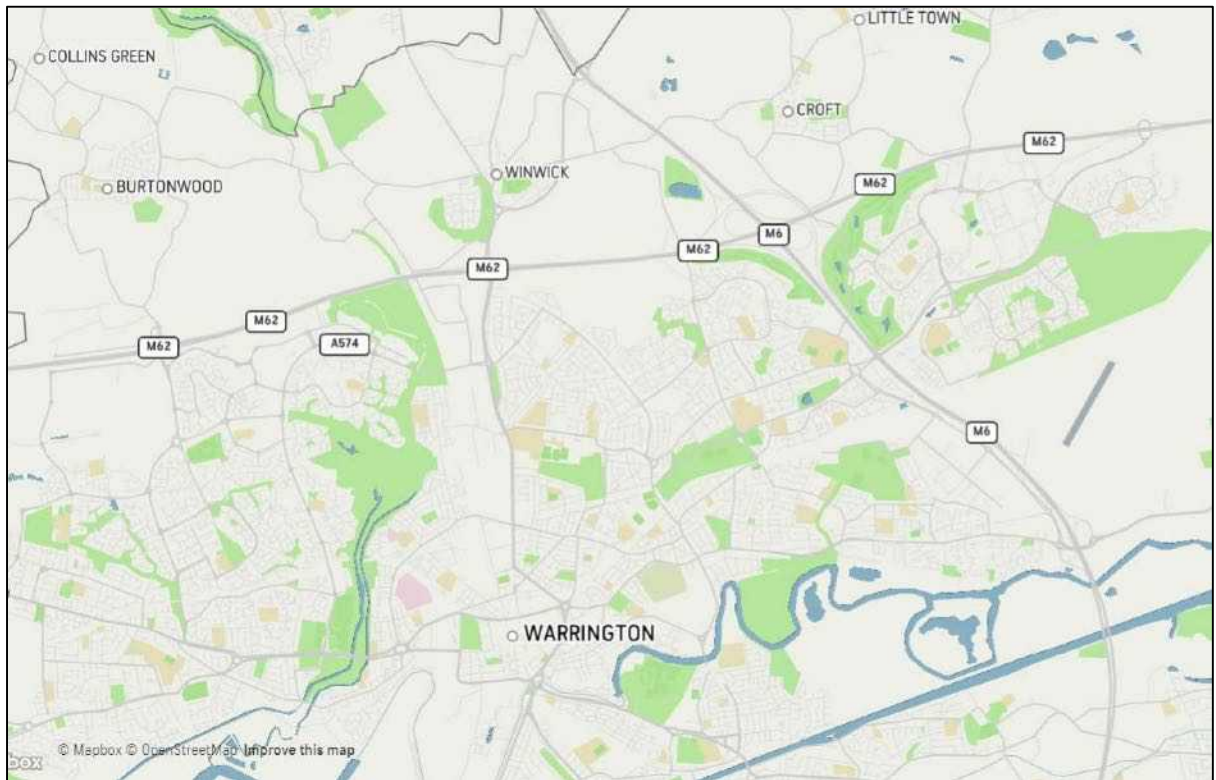
6. 17:30 Retrospective Screenshot



7. 08:30 Live Weather Screenshot



8. 17:00 Live Weather Screenshot



TECHNICAL NOTE

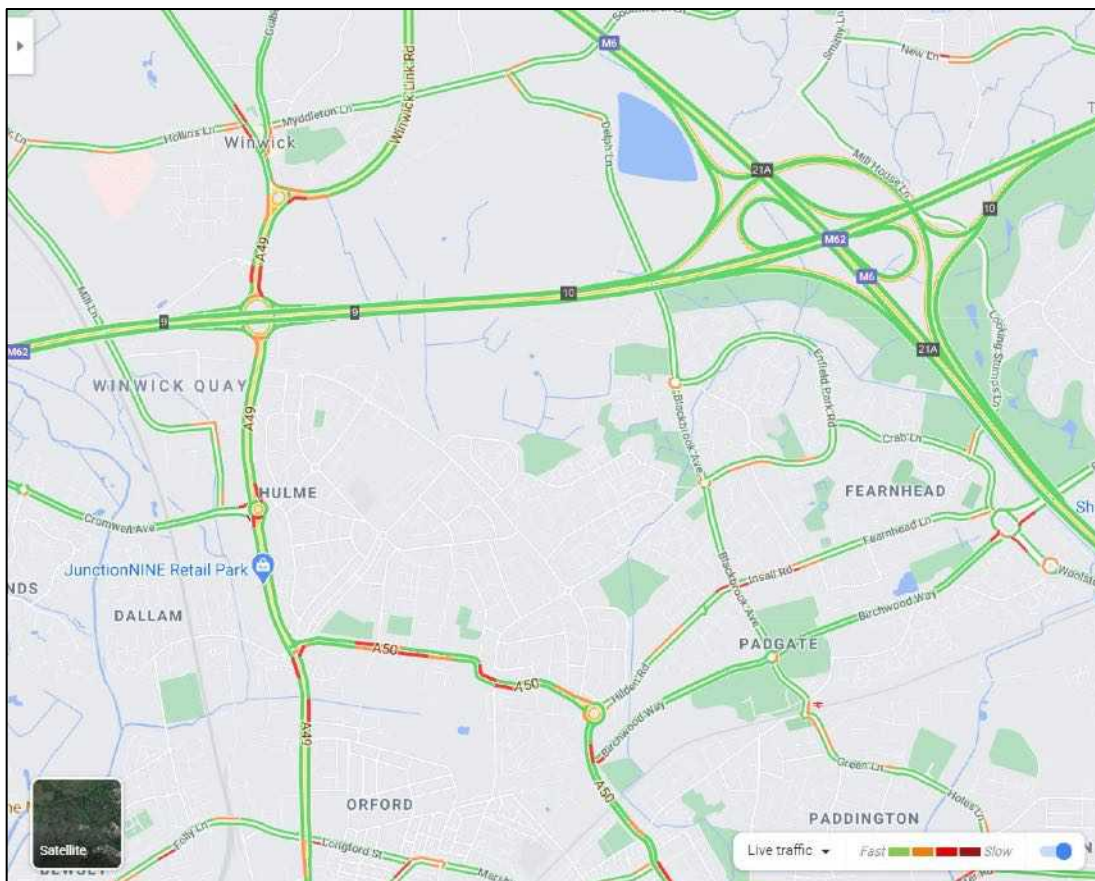
PROJECT: Peel Hall, Warrington

REPORT: 1901/TN/28

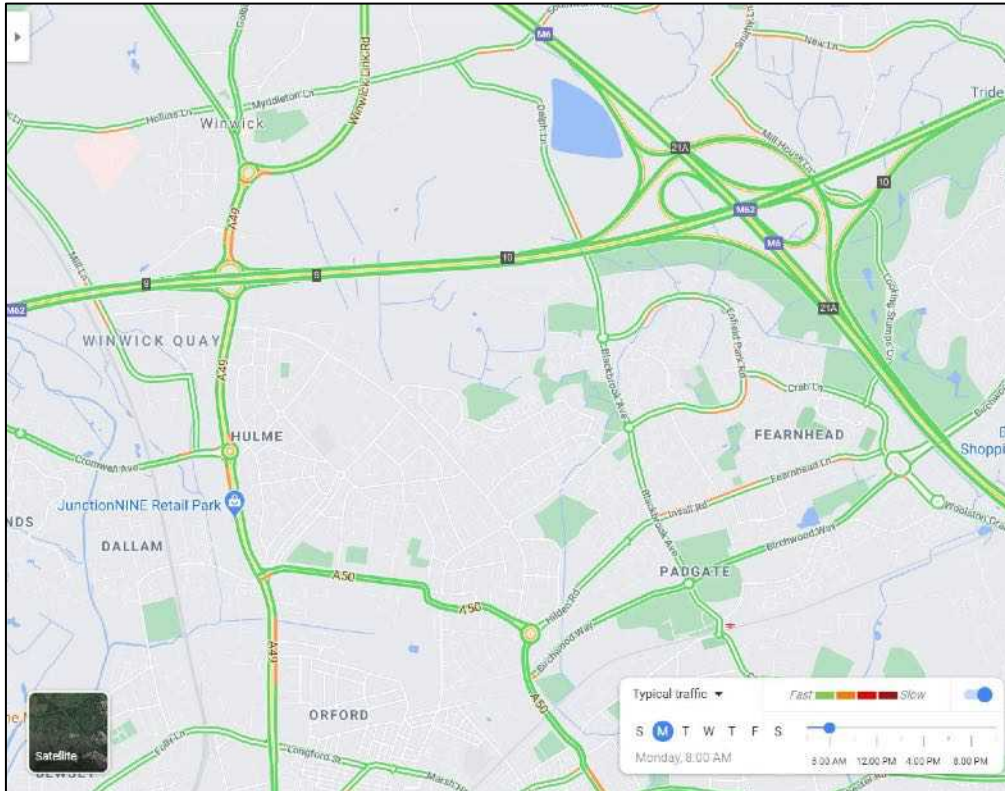
DATE: 14/09/2020

1. 08:30 Live Traffic Screenshot
2. 08:00 Retrospective Traffic Screenshot
3. 09:00 Retrospective Screenshot
4. 17:00 Live Traffic Screenshot
5. 16:30 Retrospective Traffic Screenshot
6. 17:30 Retrospective Screenshot
7. 08:30 Live Weather Screenshot
8. 17:00 Live Weather Screenshot

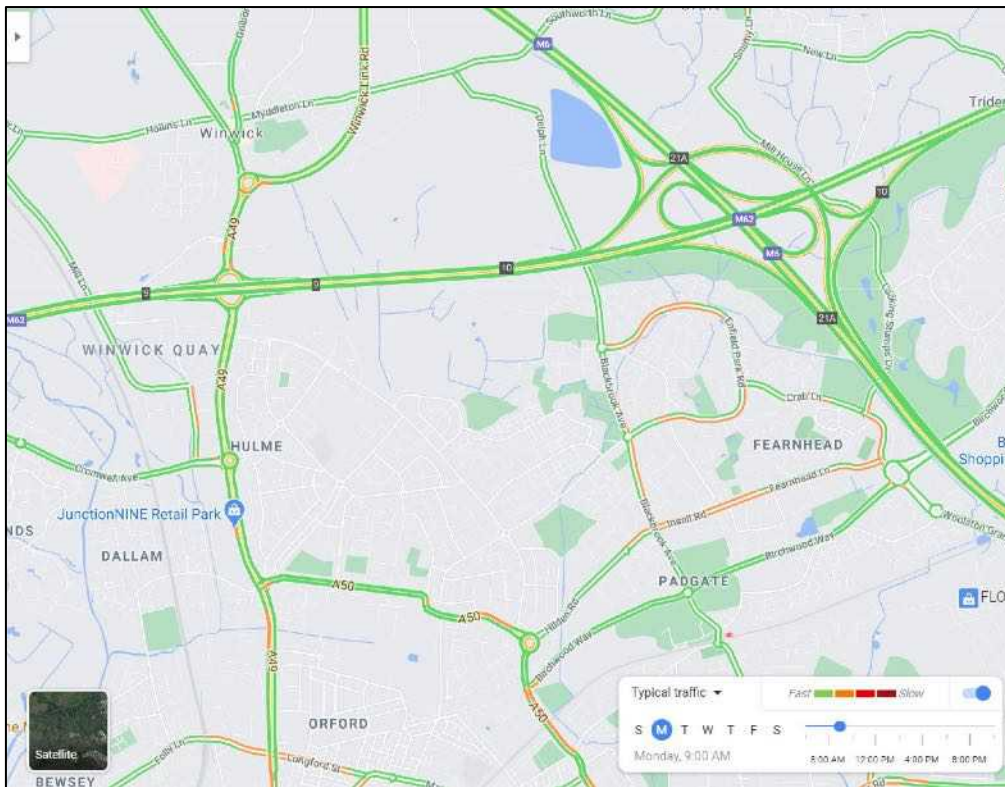
1. 08:30 Live Traffic Screenshot



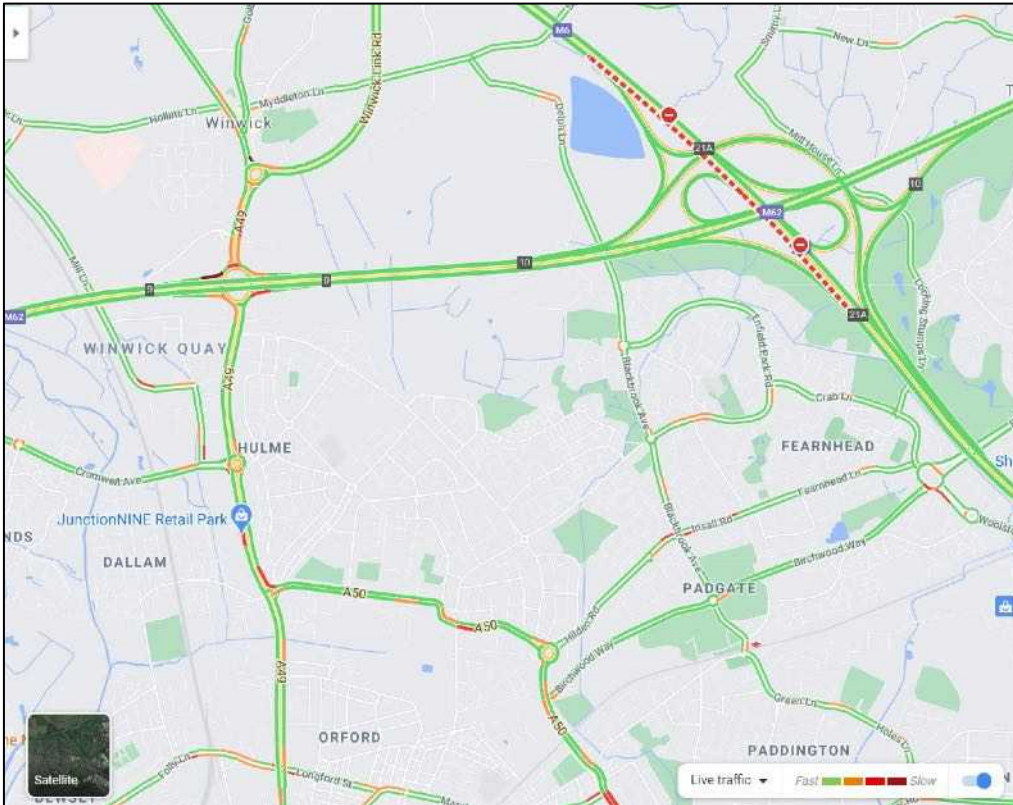
2. 08:00 Retrospective Traffic Screenshot



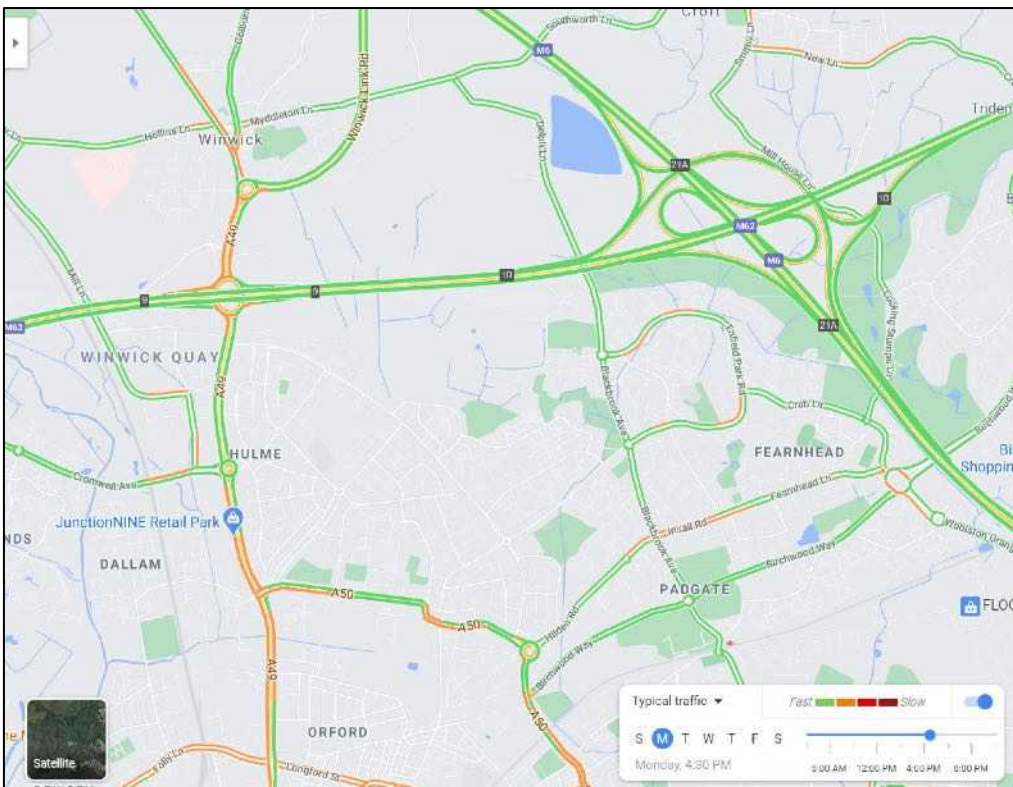
3. 09:00 Retrospective Screenshot



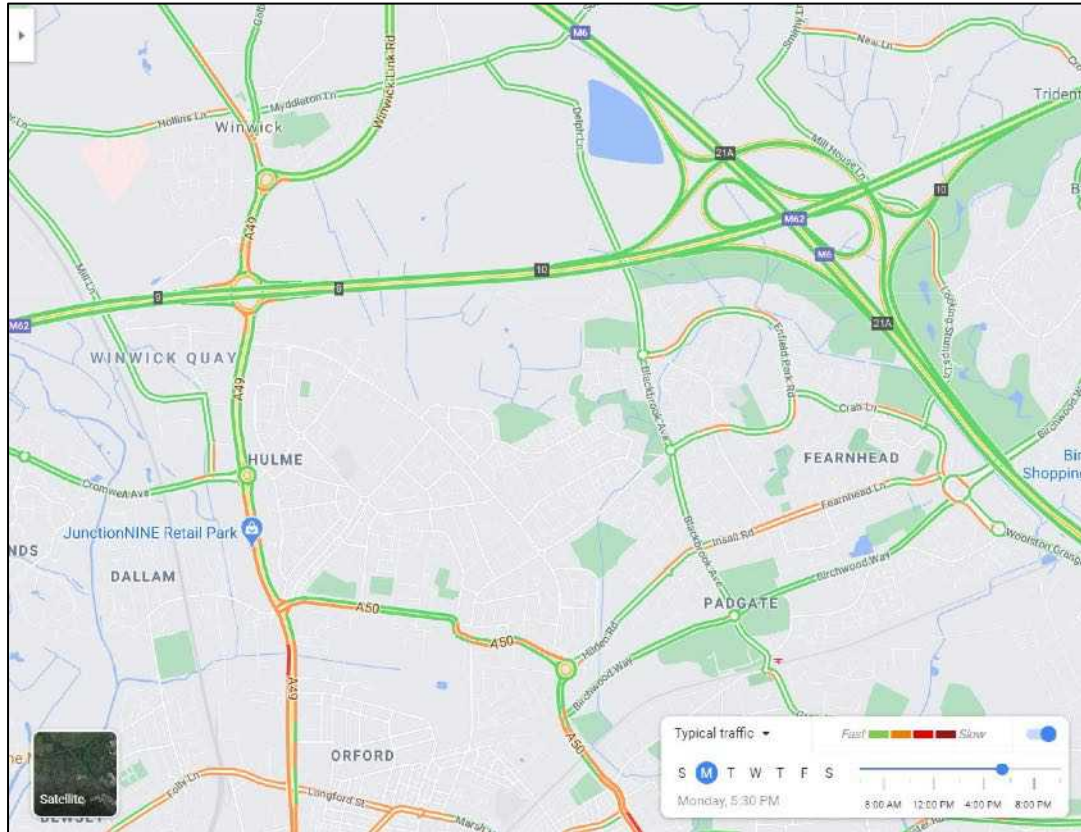
4. 17:00 Live Traffic Screenshot



5. 16:30 Retrospective Traffic Screenshot



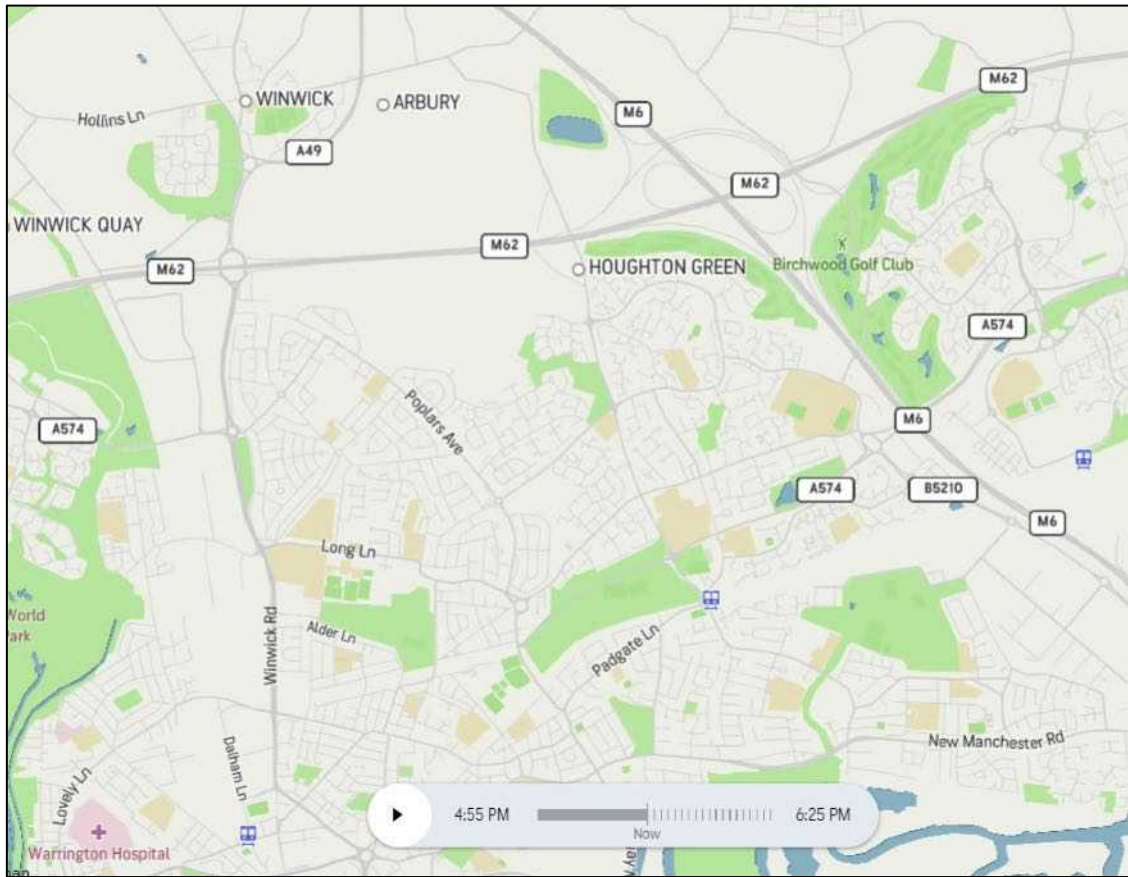
6. 17:30 Retrospective Screenshot



7. 08:30 Live Weather Screenshot



8. 17:00 Live Weather Screenshot



TECHNICAL NOTE

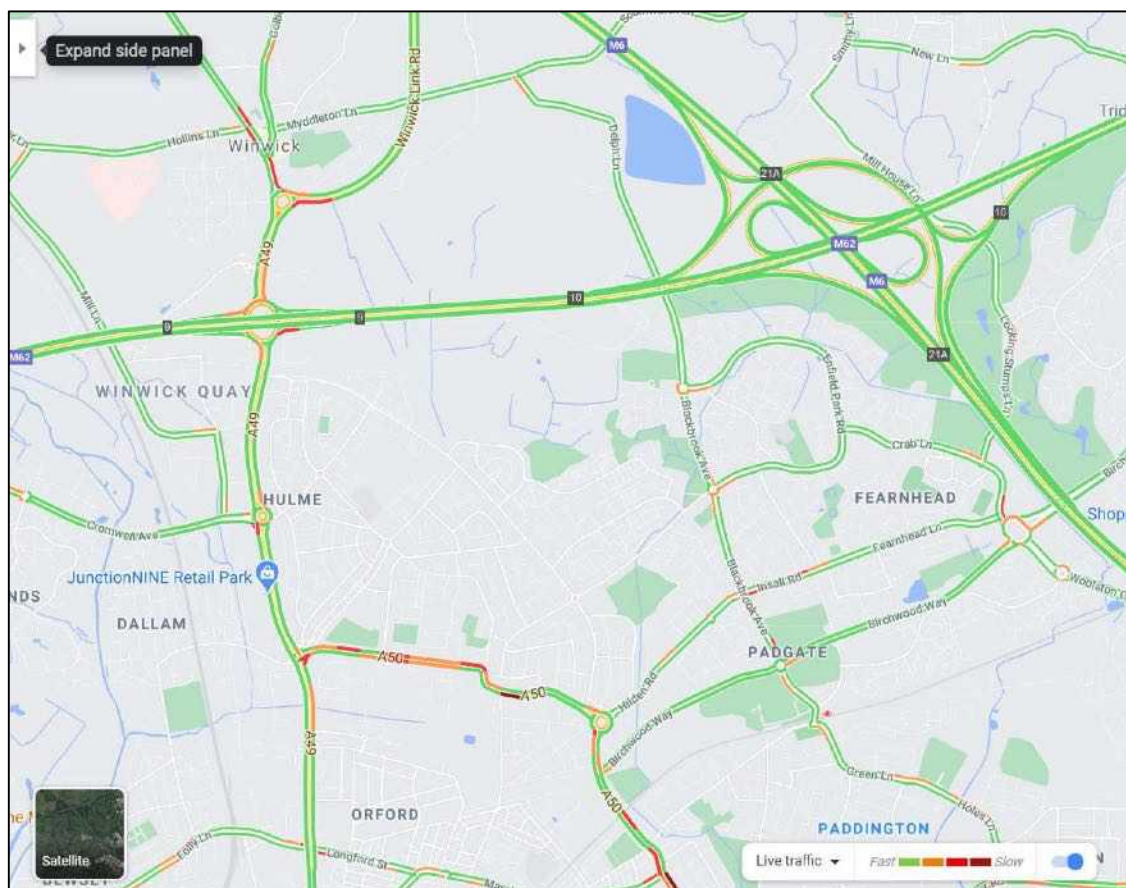
PROJECT: Peel Hall, Warrington

REPORT: 1901/TN/28

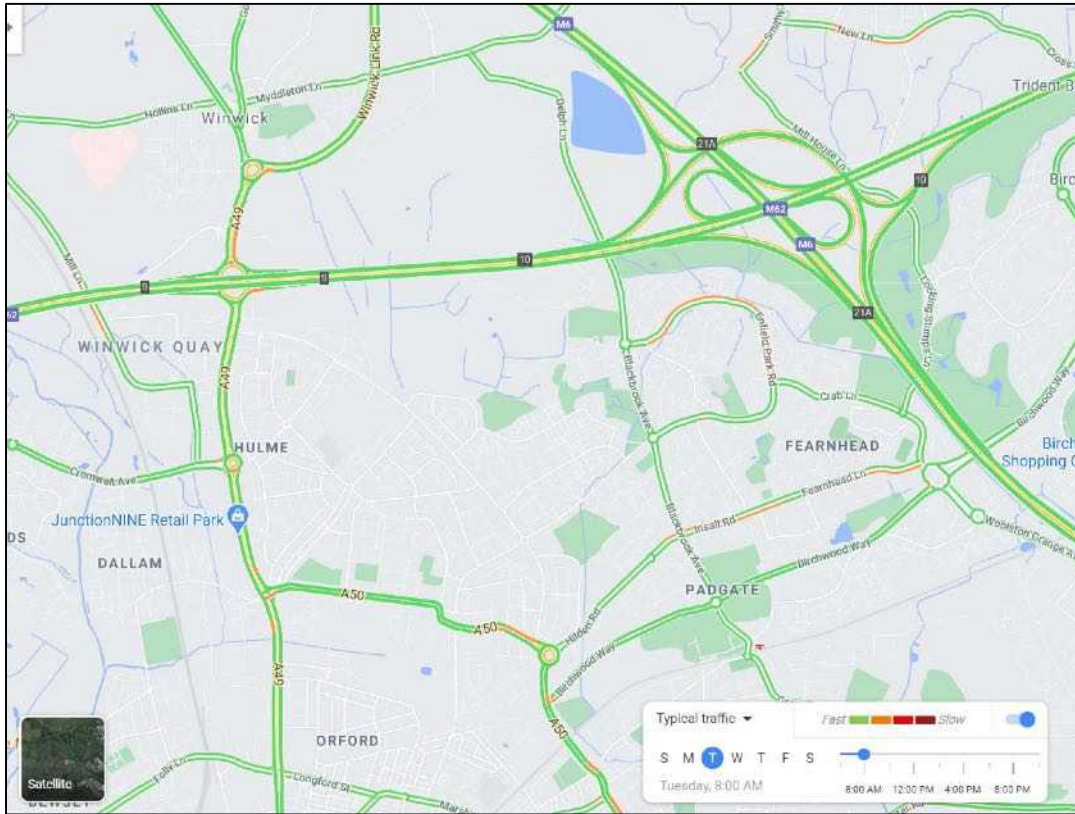
DATE: 15/09/2020

1. 08:30 Live Traffic Screenshot
2. 08:00 Retrospective Traffic Screenshot
3. 09:00 Retrospective Screenshot
4. 17:00 Live Traffic Screenshot
5. 16:30 Retrospective Traffic Screenshot
6. 17:30 Retrospective Screenshot
7. 08:30 Live Weather Screenshot
8. 17:00 Live Weather Screenshot

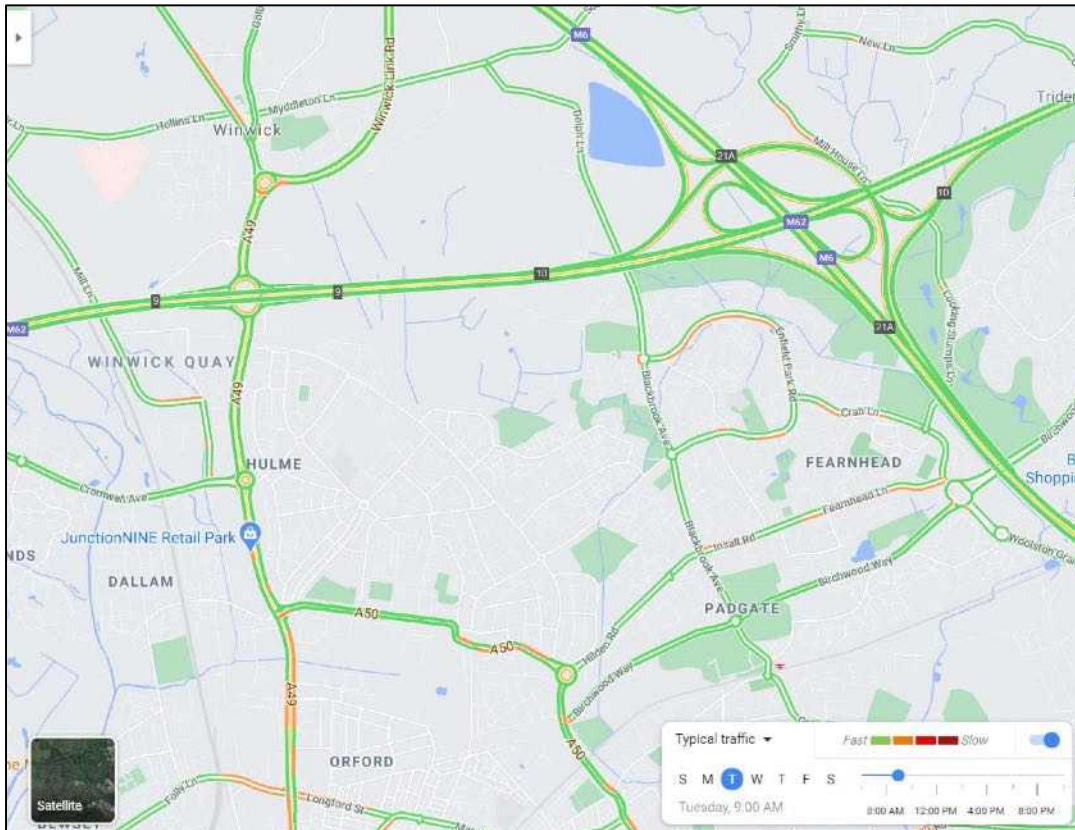
1. 08:30 Live Traffic Screenshot



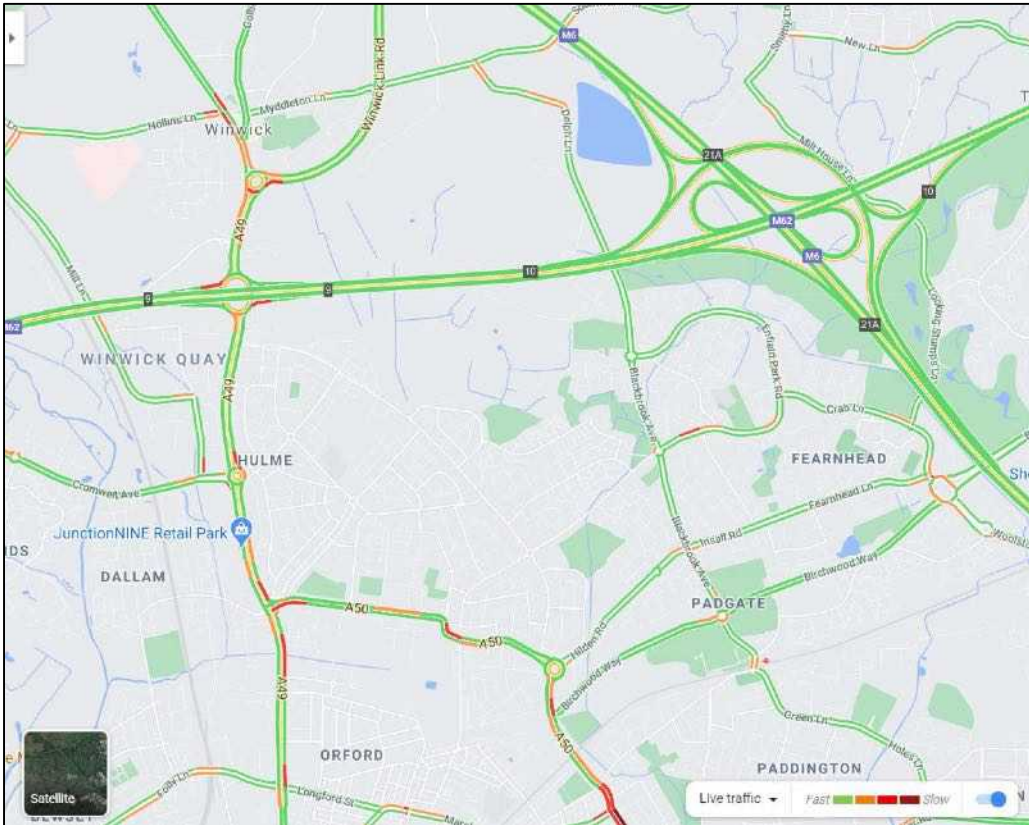
2. 08:00 Retrospective Traffic Screenshot



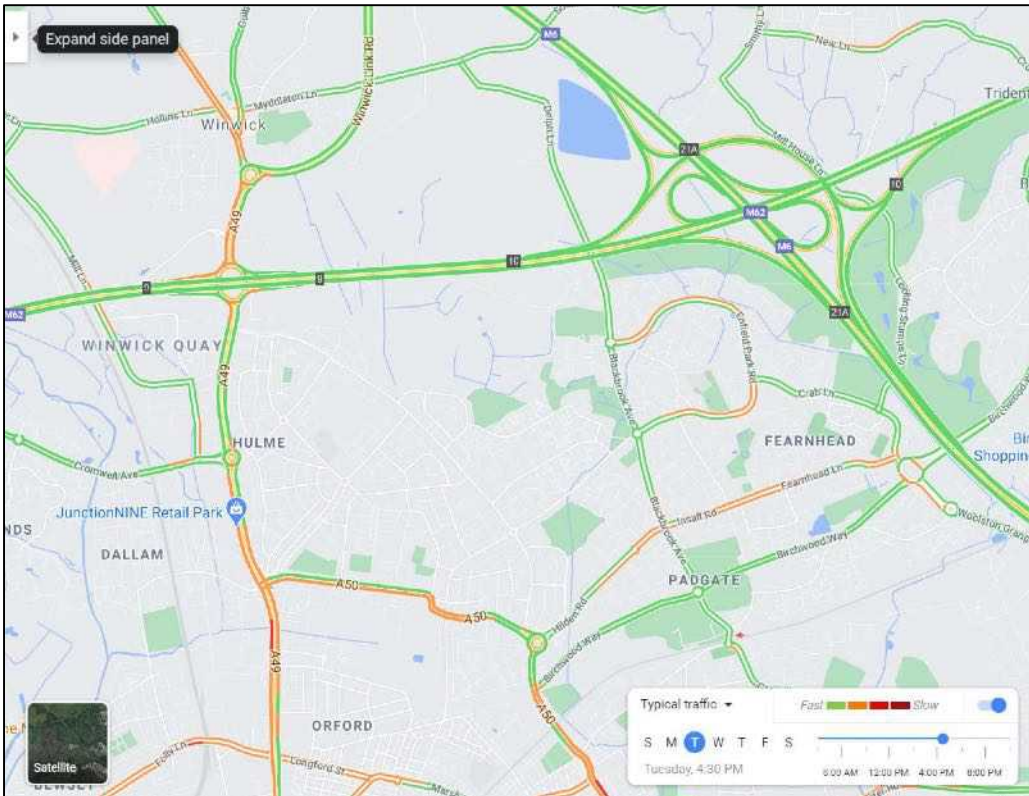
3. 09:00 Retrospective Screenshot



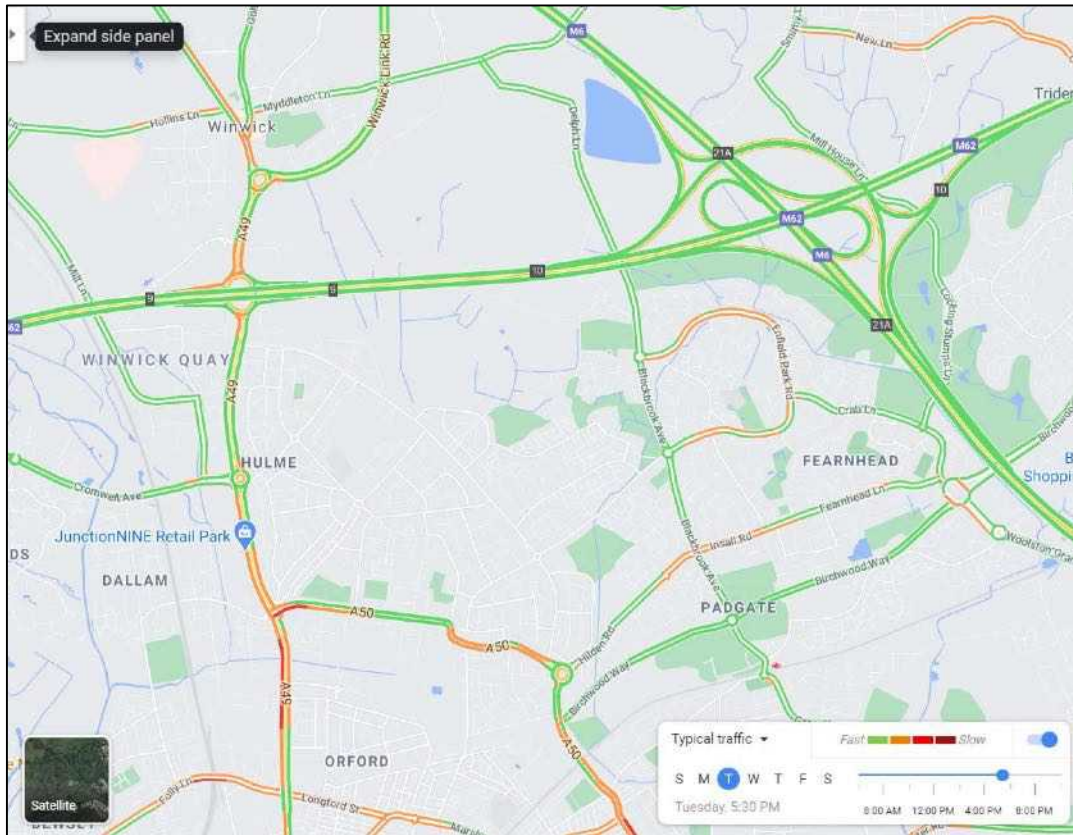
4. 17:00 Live Traffic Screenshot



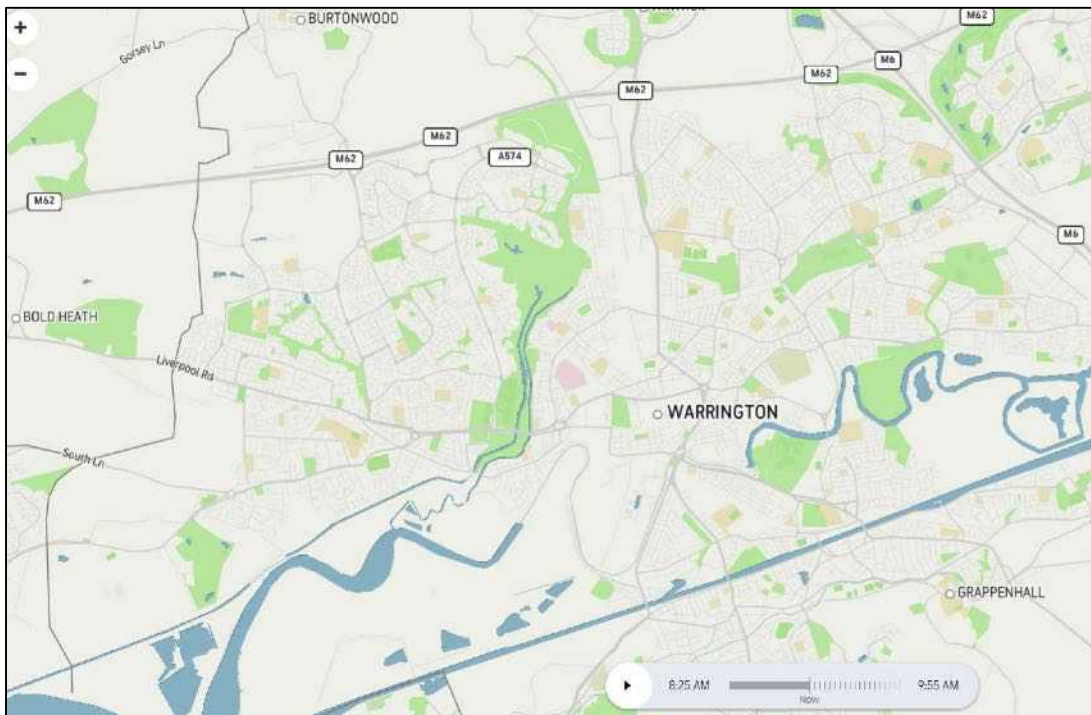
5. 16:30 Retrospective Traffic Screenshot



6. 17:30 Retrospective Screenshot



7. 08:30 Live Weather Screenshot



TECHNICAL NOTE

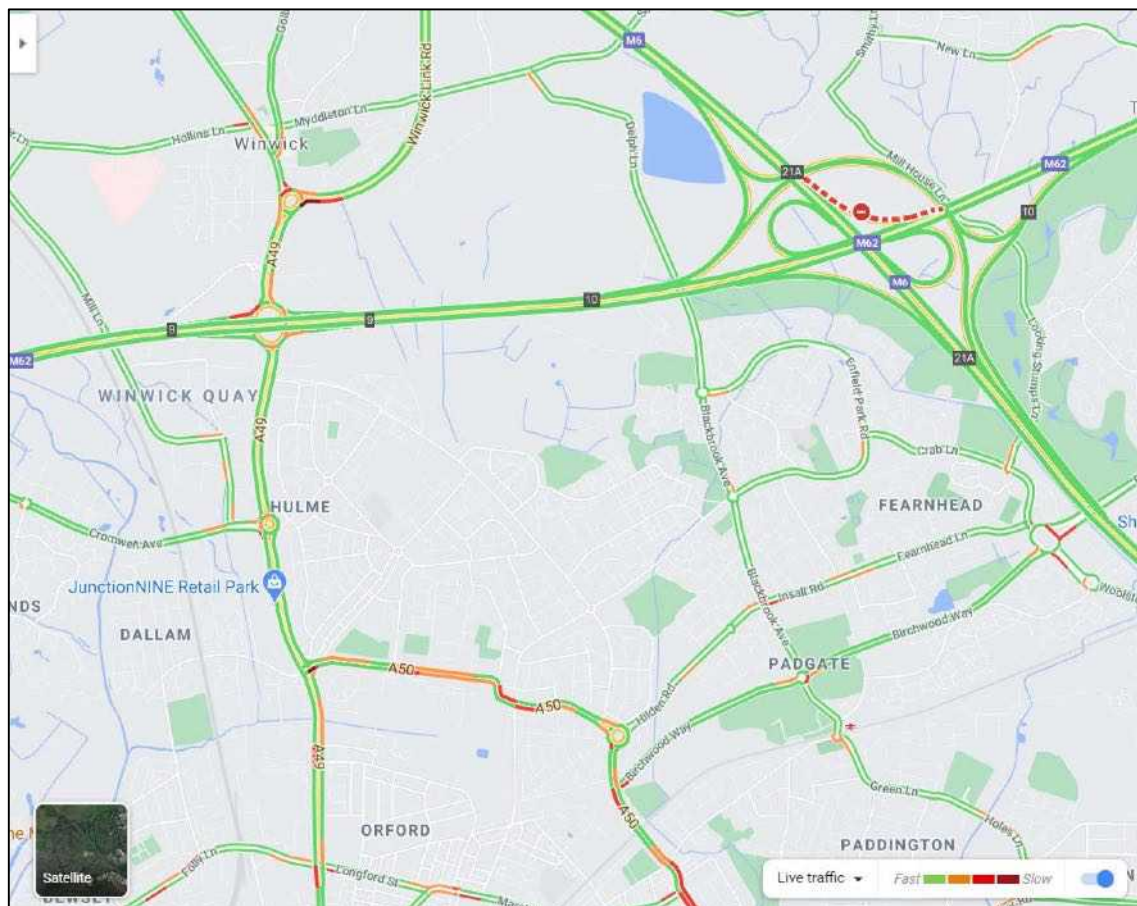
PROJECT: Peel Hall, Warrington

REPORT: 1901/TN/28

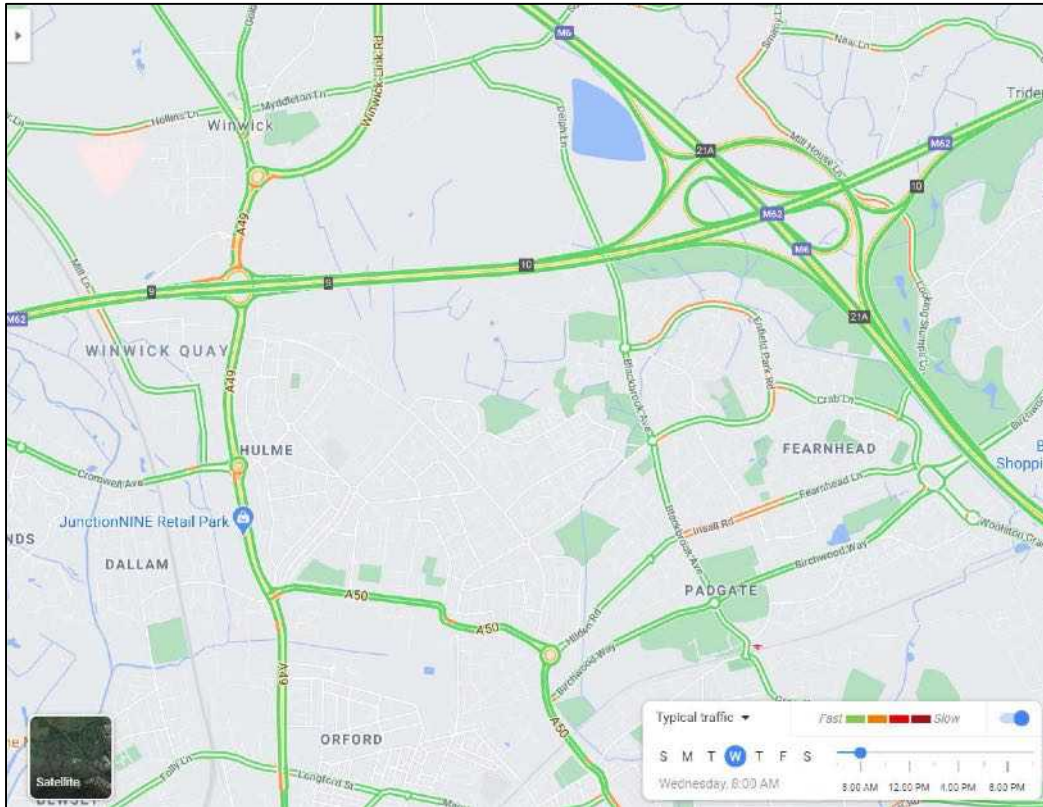
DATE: 16/09/2020

1. 08:30 Live Traffic Screenshot
2. 08:00 Retrospective Traffic Screenshot
3. 09:00 Retrospective Screenshot
4. 17:00 Live Traffic Screenshot
5. 16:30 Retrospective Traffic Screenshot
6. 17:30 Retrospective Screenshot
7. 08:30 Live Weather Screenshot
8. 17:00 Live Weather Screenshot

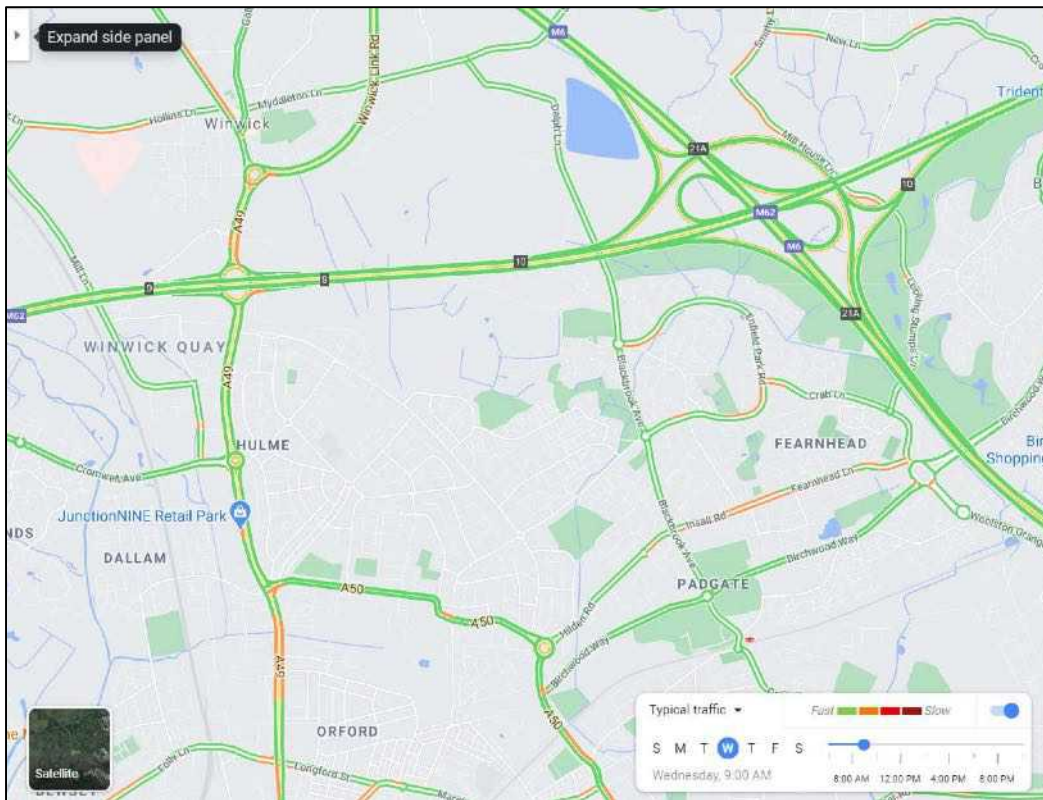
1. 08:30 Live Traffic Screenshot



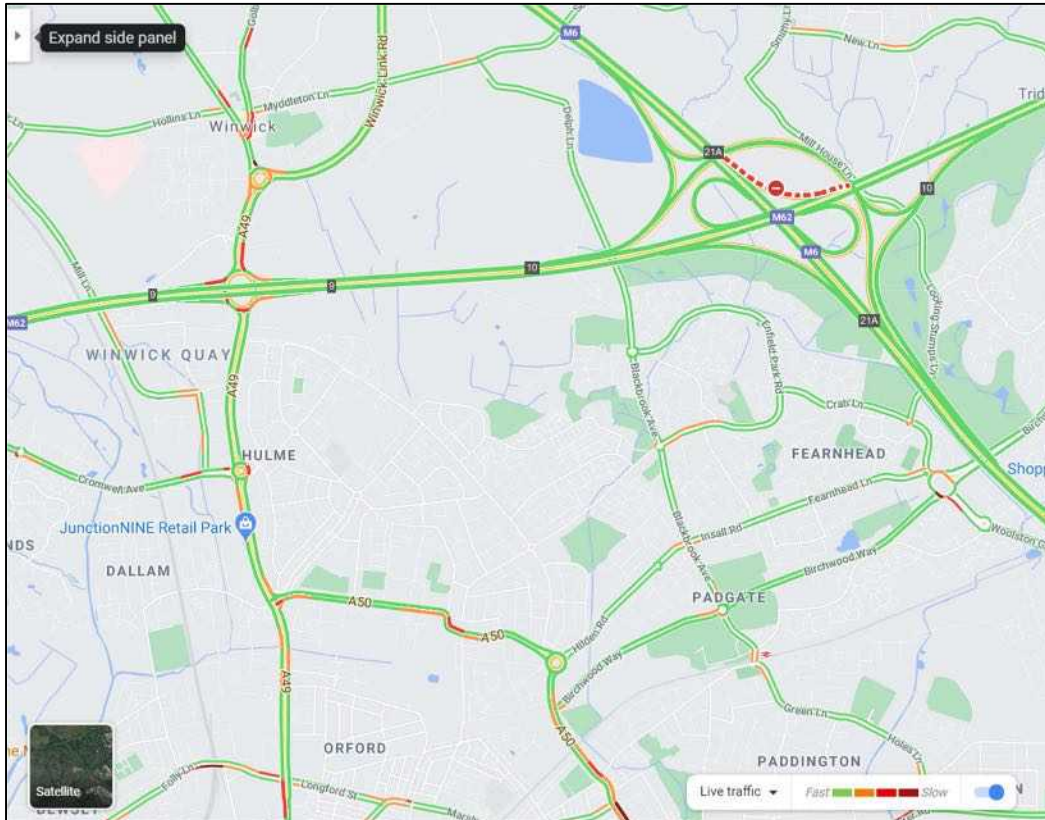
2. 08:00 Retrospective Traffic Screenshot



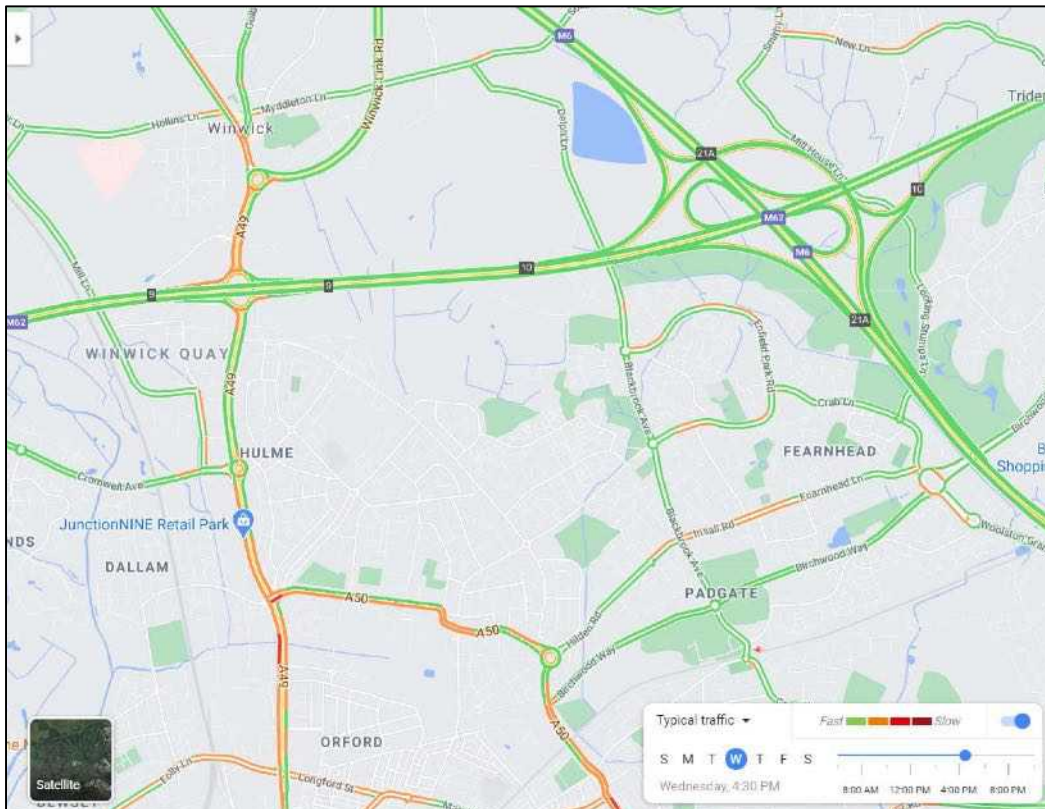
3. 09:00 Retrospective Screenshot



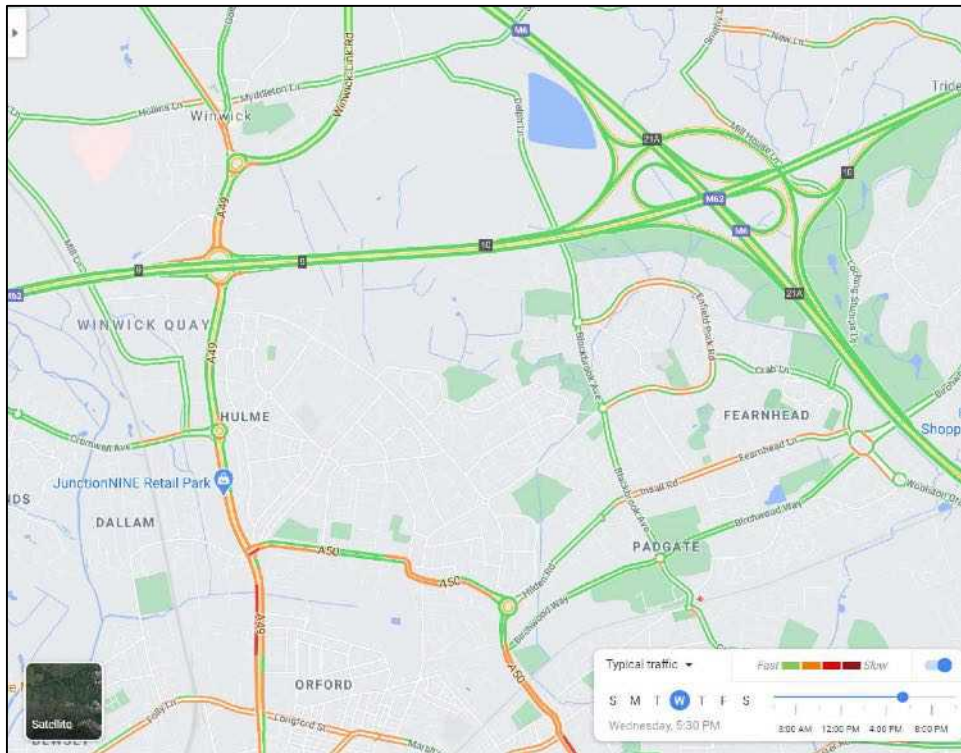
4. 17:00 Live Traffic Screenshot



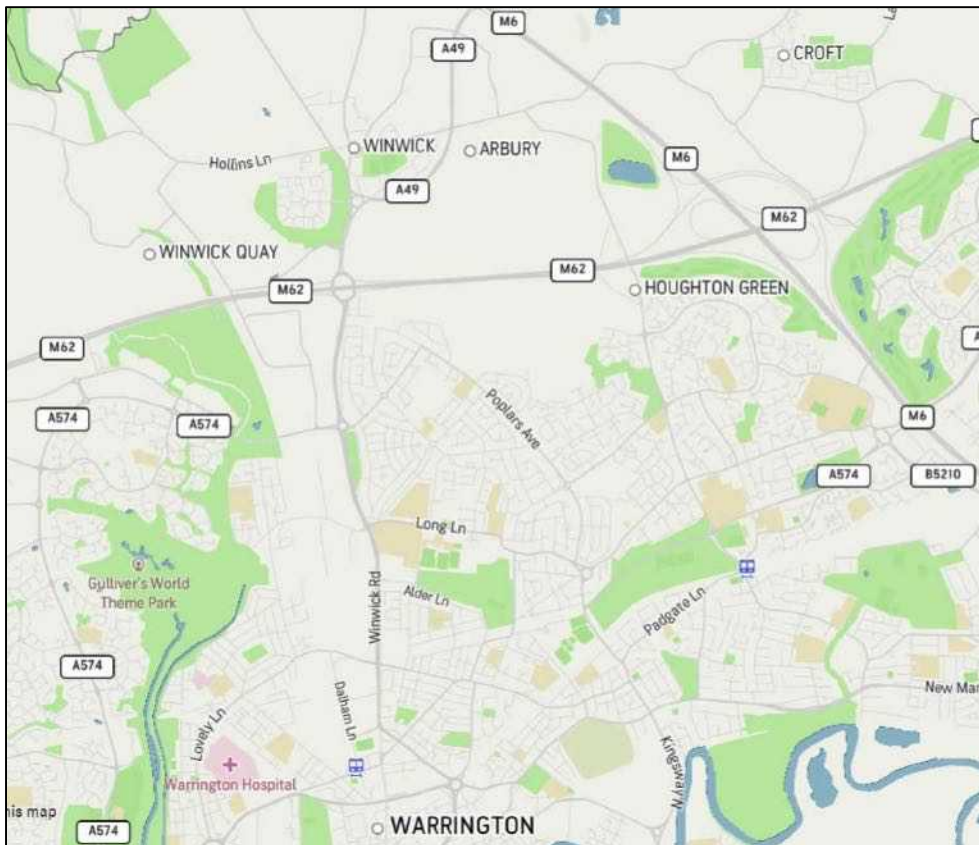
5. 16:30 Retrospective Traffic Screenshot



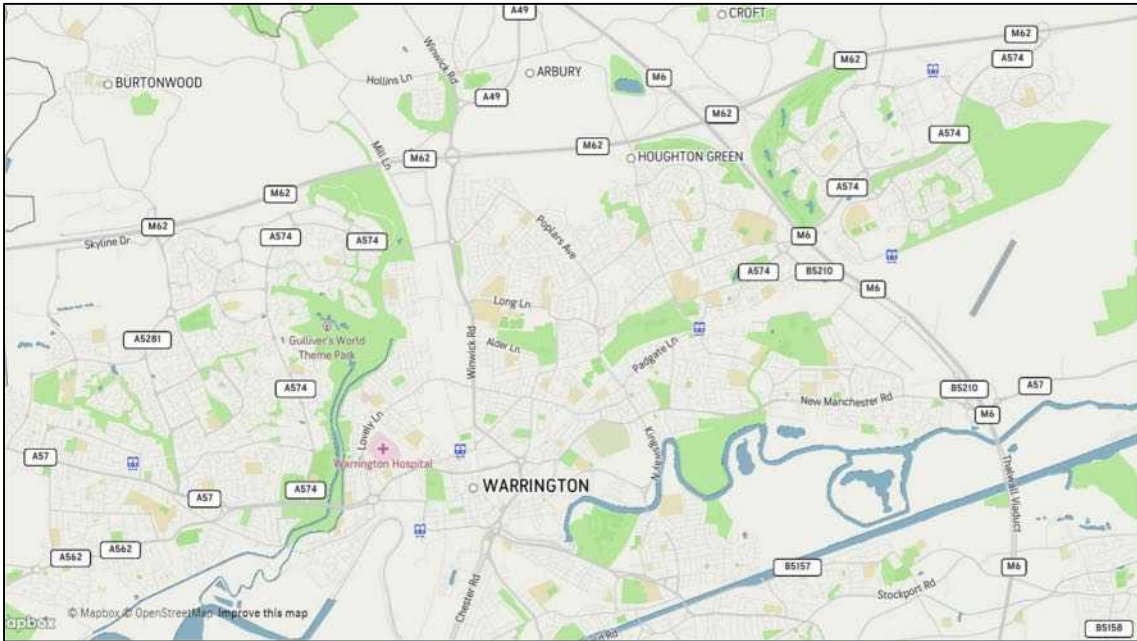
6. 17:30 Retrospective Screenshot



7. 08:30 Live Weather Screenshot



8. 17:00 Live Weather Screenshot



TECHNICAL NOTE

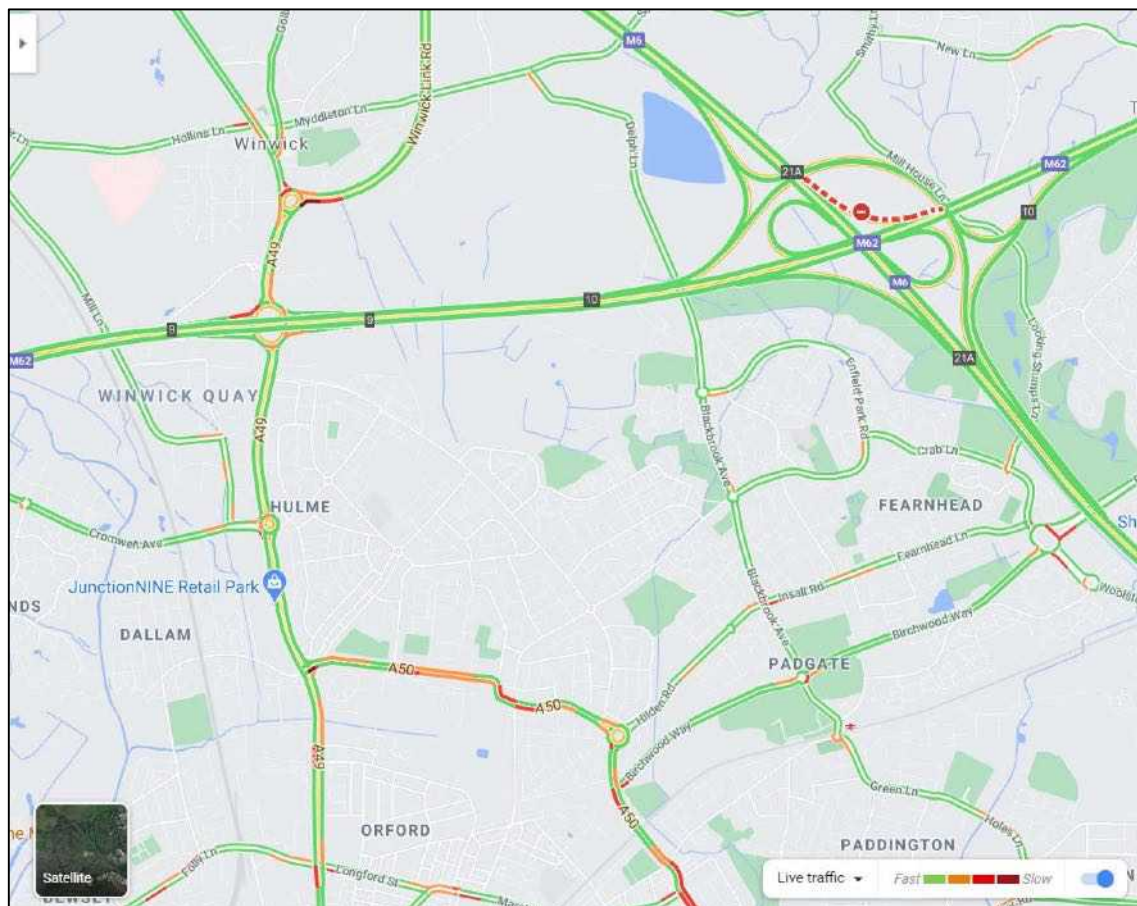
PROJECT: Peel Hall, Warrington

REPORT: 1901/TN/28

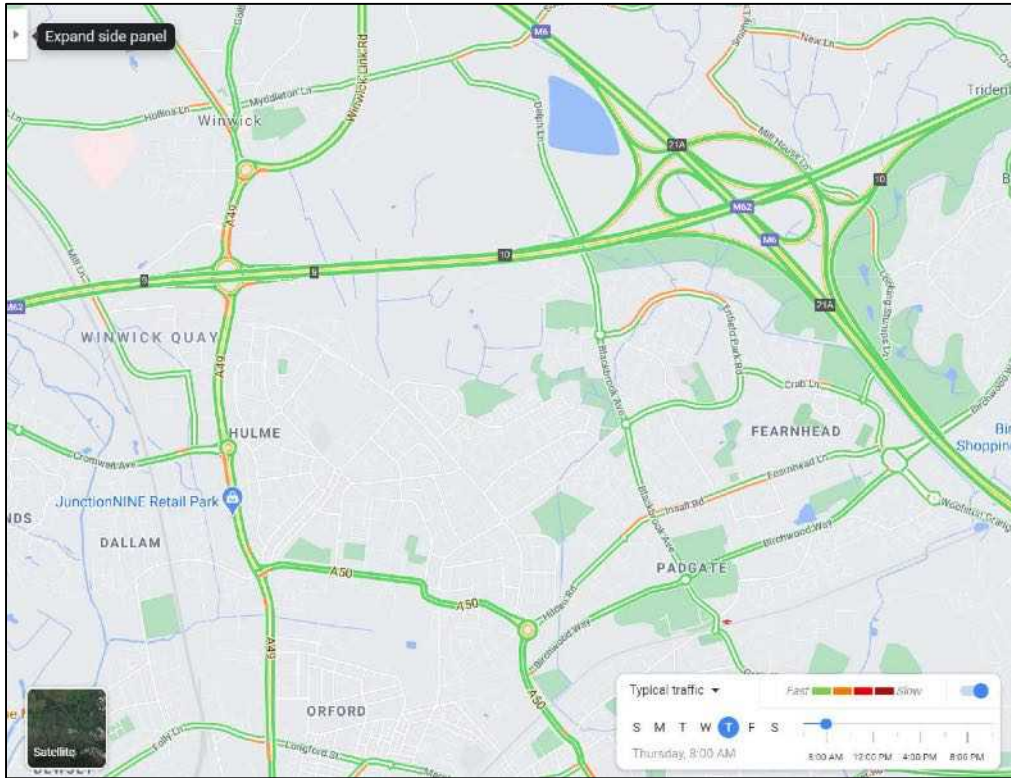
DATE: 17/09/2020

1. 08:30 Live Traffic Screenshot
2. 08:00 Retrospective Traffic Screenshot
3. 09:00 Retrospective Screenshot
4. 17:00 Live Traffic Screenshot
5. 16:30 Retrospective Traffic Screenshot
6. 17:30 Retrospective Screenshot
7. 08:30 Live Weather Screenshot
8. 17:00 Live Weather Screenshot

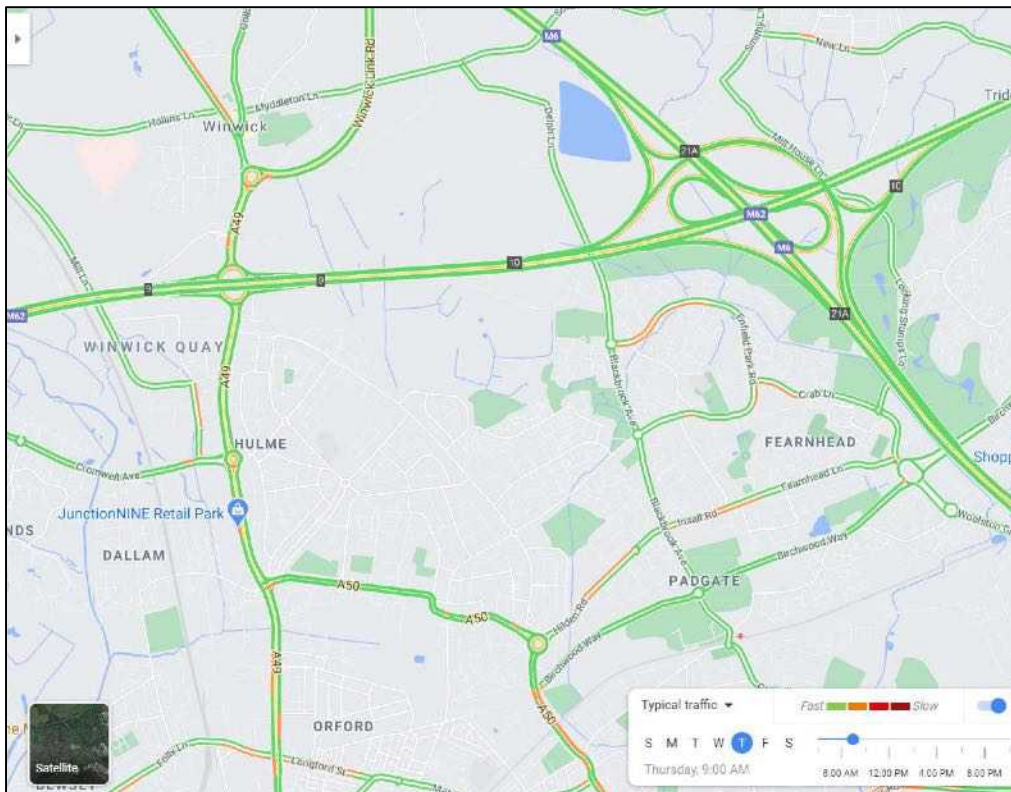
1. 08:30 Live Traffic Screenshot



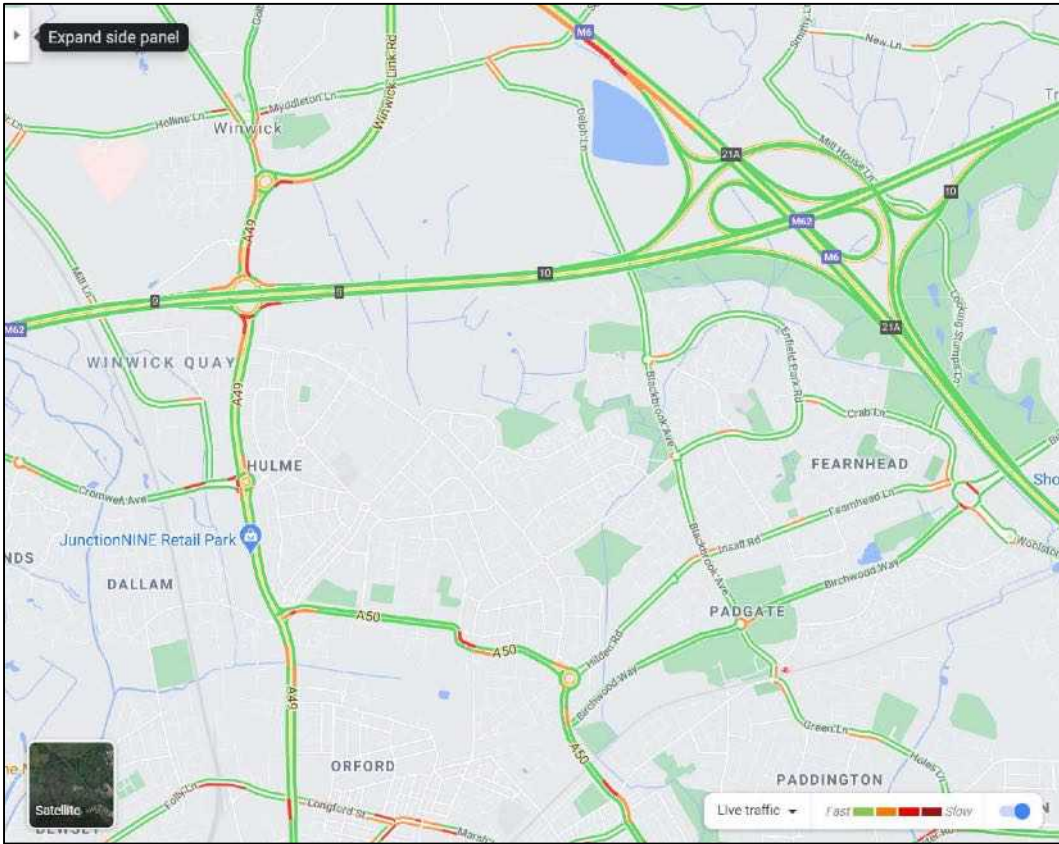
2. 08:00 Retrospective Traffic Screenshot



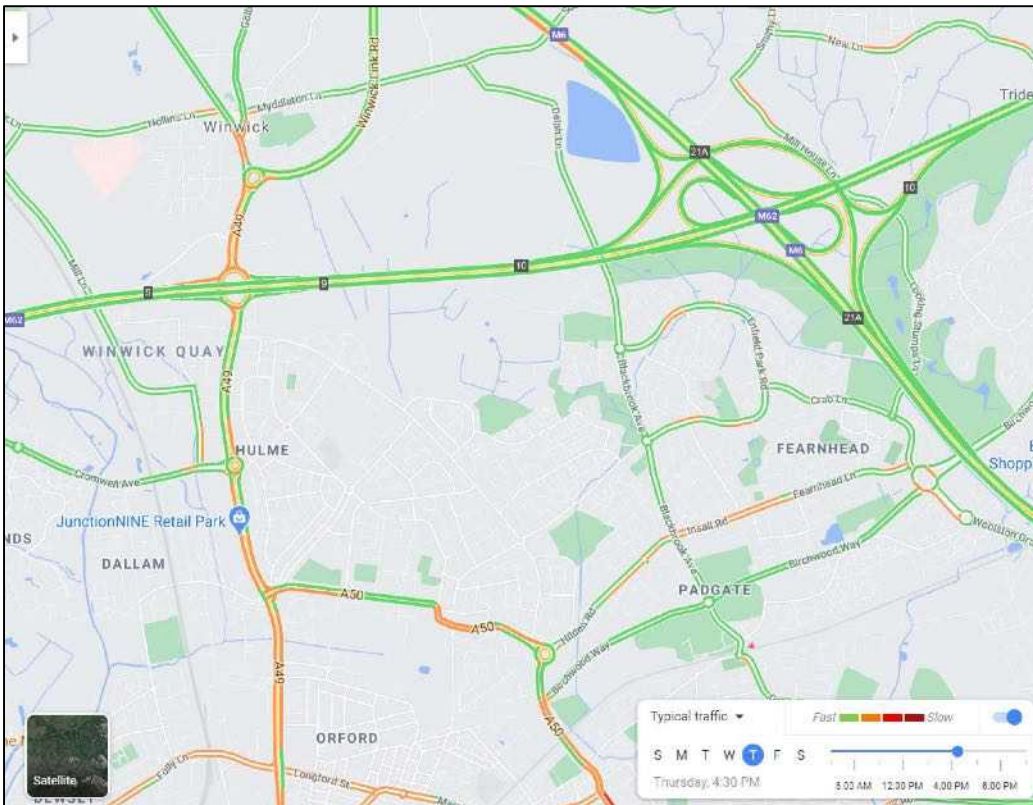
3. 09:00 Retrospective Screenshot



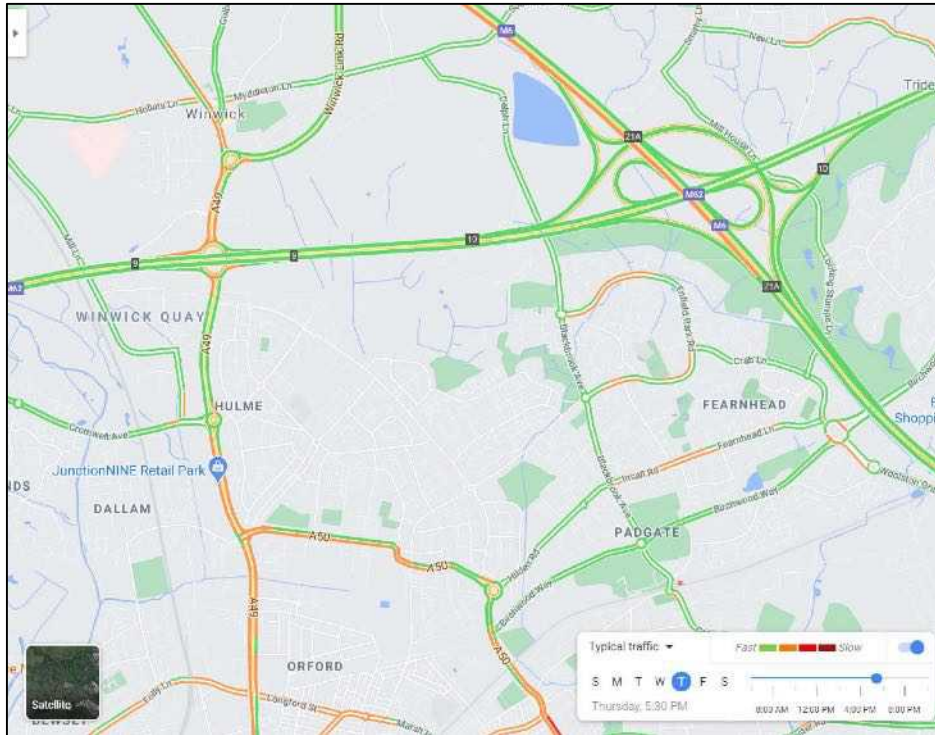
4. 17:00 Live Traffic Screenshot



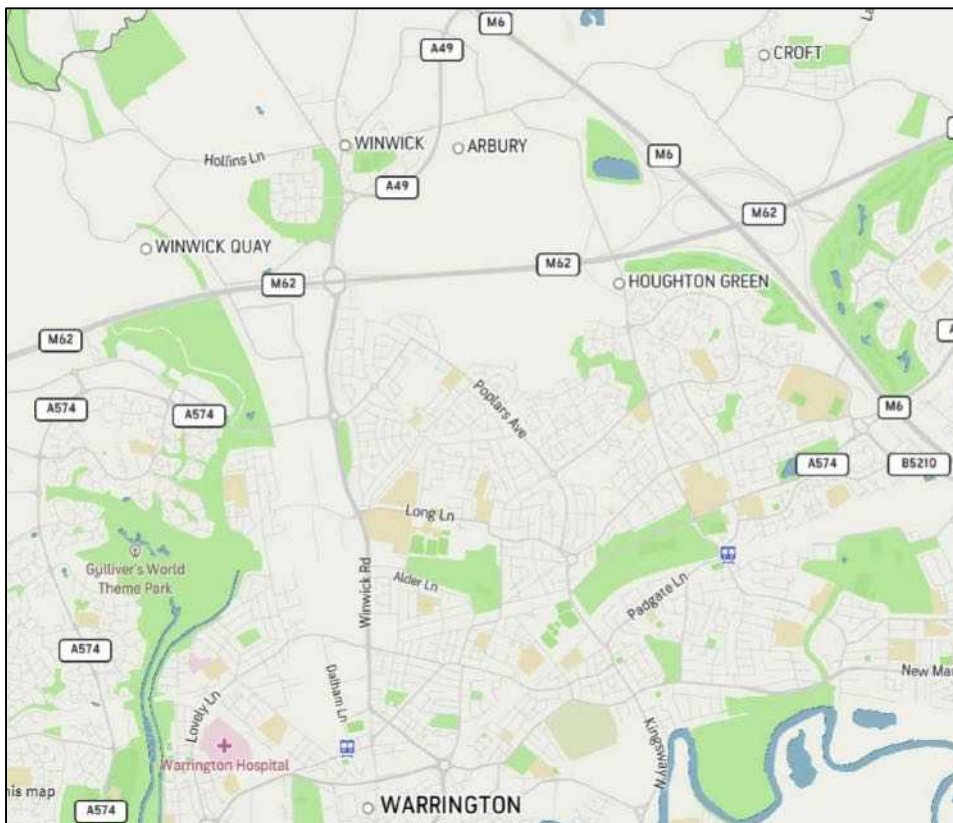
5. 16:30 Retrospective Traffic Screenshot



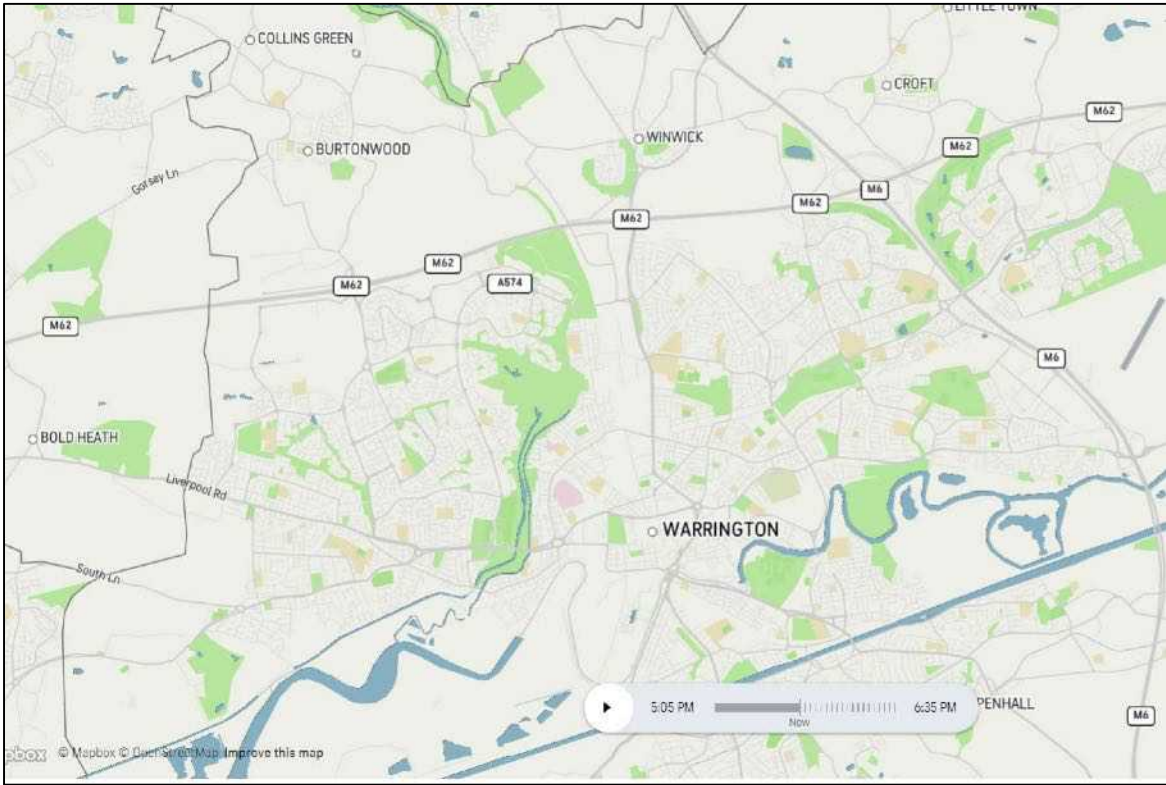
6. 17:30 Retrospective Screenshot



7. 08:30 Live Weather Screenshot



8. 17:00 Live Weather Screenshot



TECHNICAL NOTE

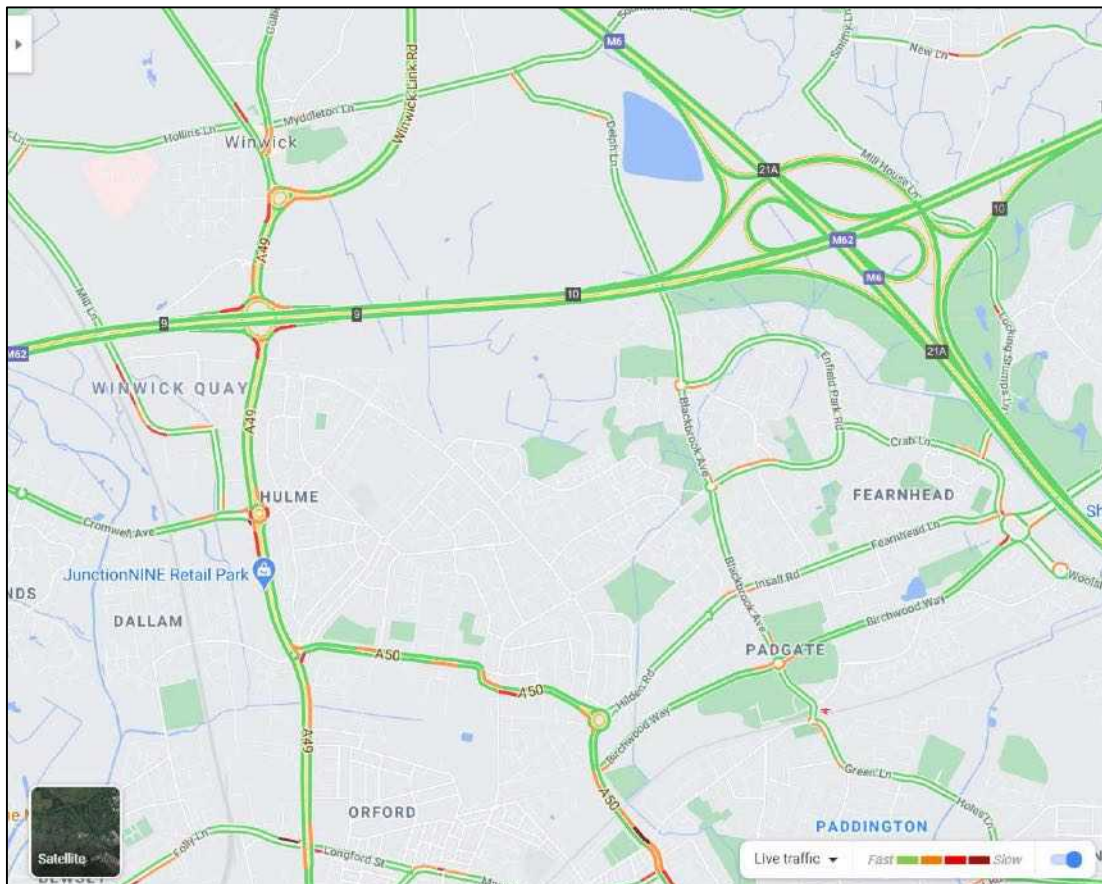
PROJECT: Peel Hall, Warrington

REPORT: 1901/TN/28

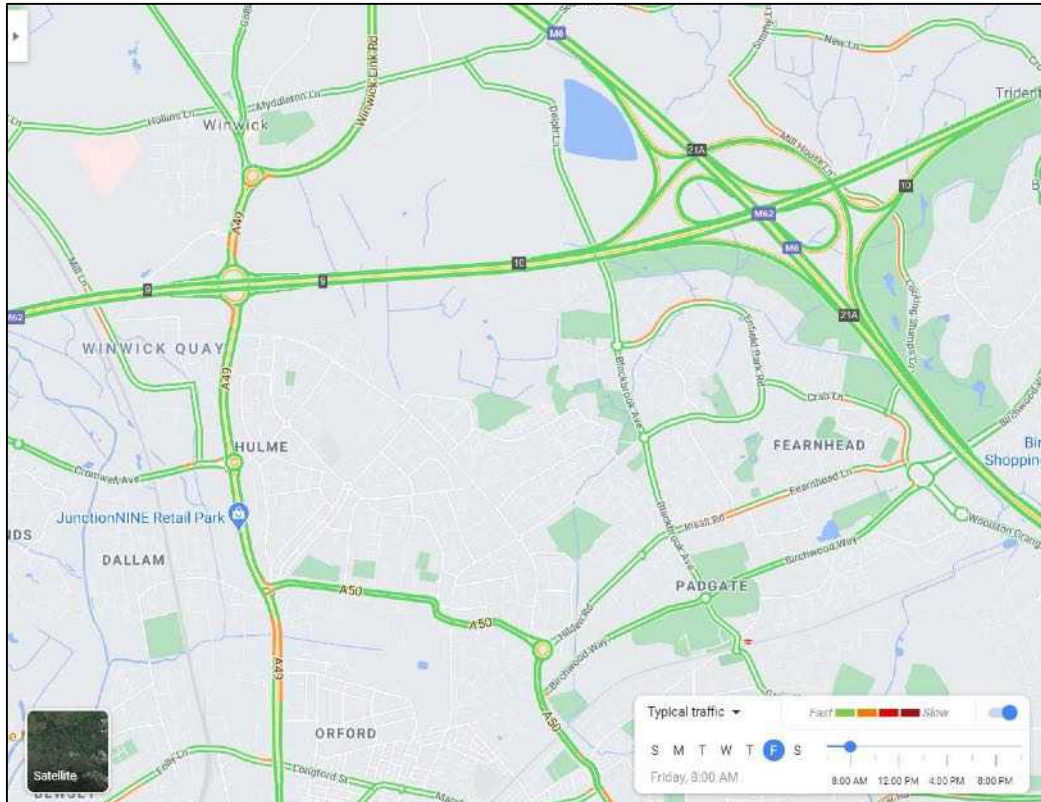
DATE: 18/09/2020

1. 08:30 Live Traffic Screenshot
2. 08:00 Retrospective Traffic Screenshot
3. 09:00 Retrospective Screenshot
4. 17:00 Live Traffic Screenshot
5. 16:30 Retrospective Traffic Screenshot
6. 17:30 Retrospective Screenshot
7. 08:30 Live Weather Screenshot
8. 17:00 Live Weather Screenshot

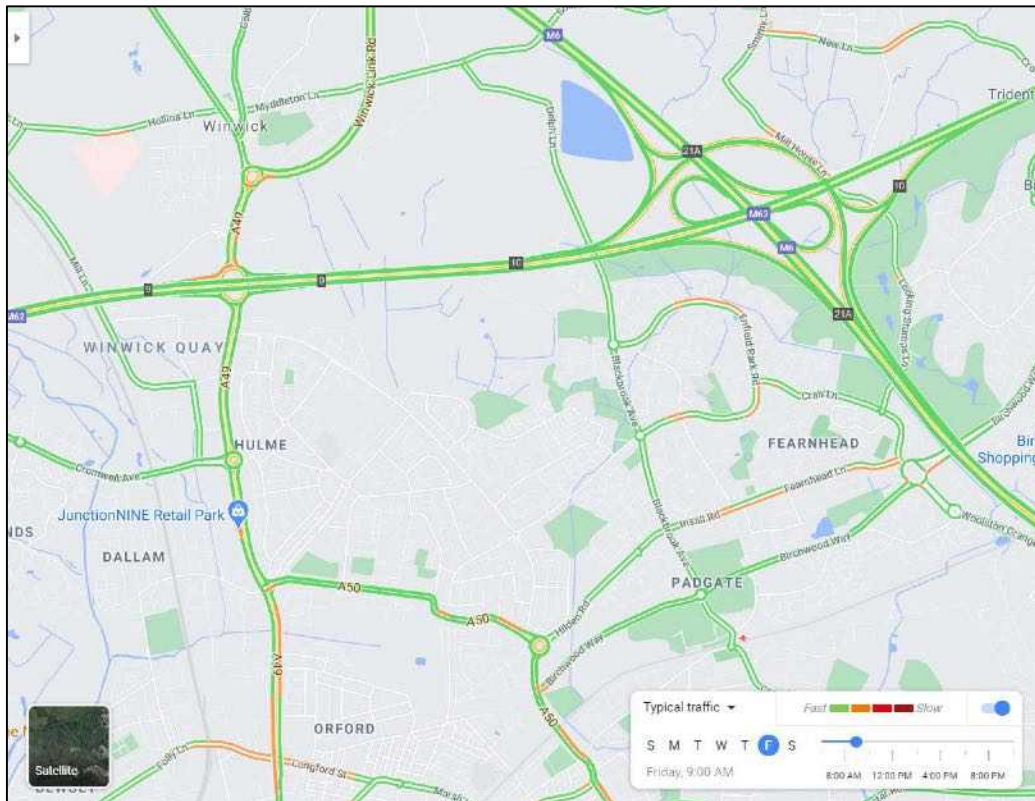
1. 08:30 Live Traffic Screenshot



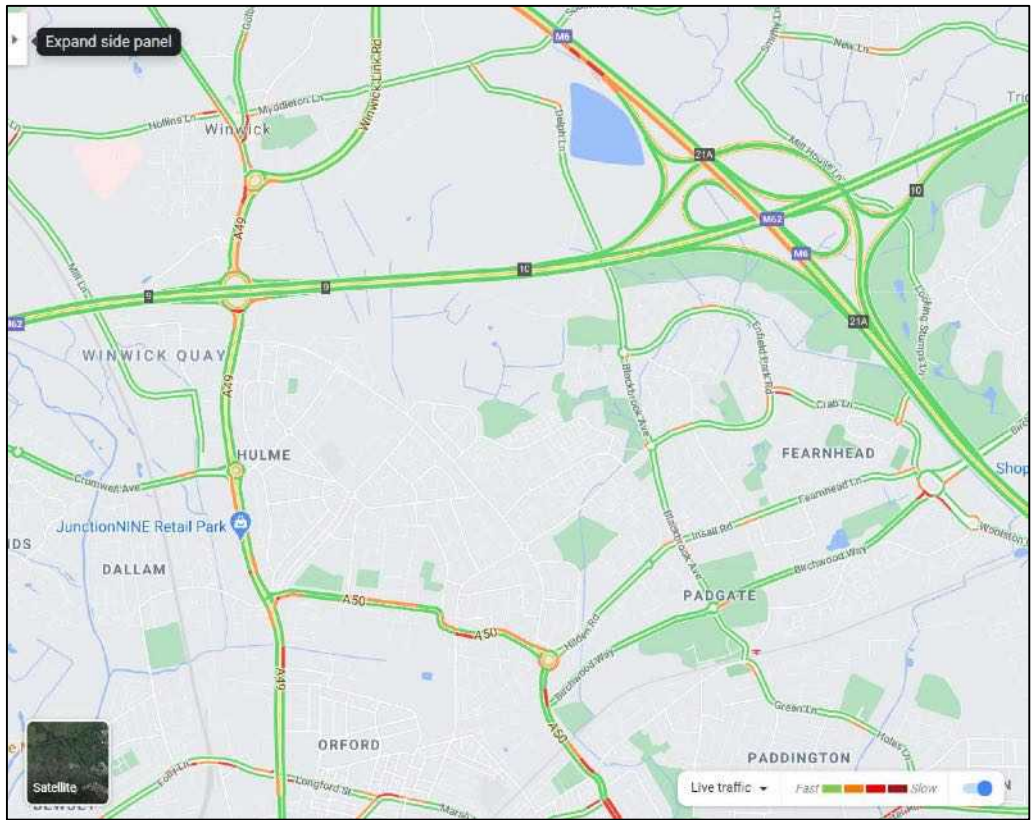
2. 08:00 Retrospective Traffic Screenshot



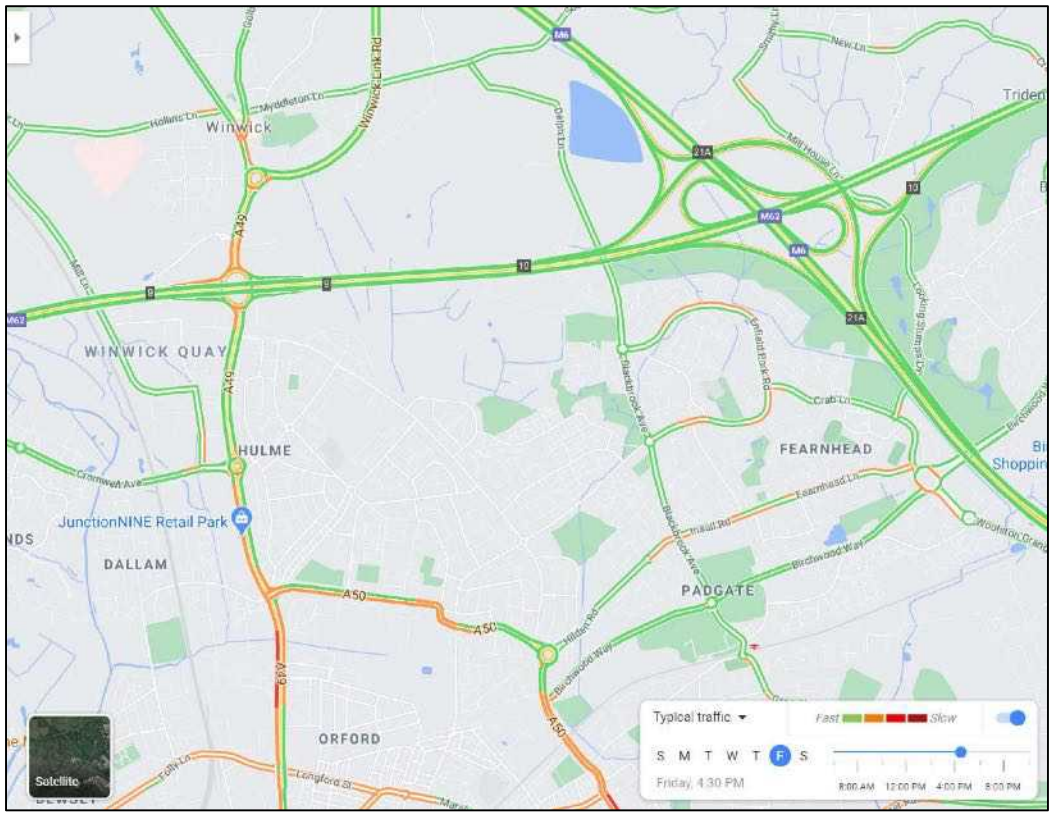
3. 09:00 Retrospective Screenshot



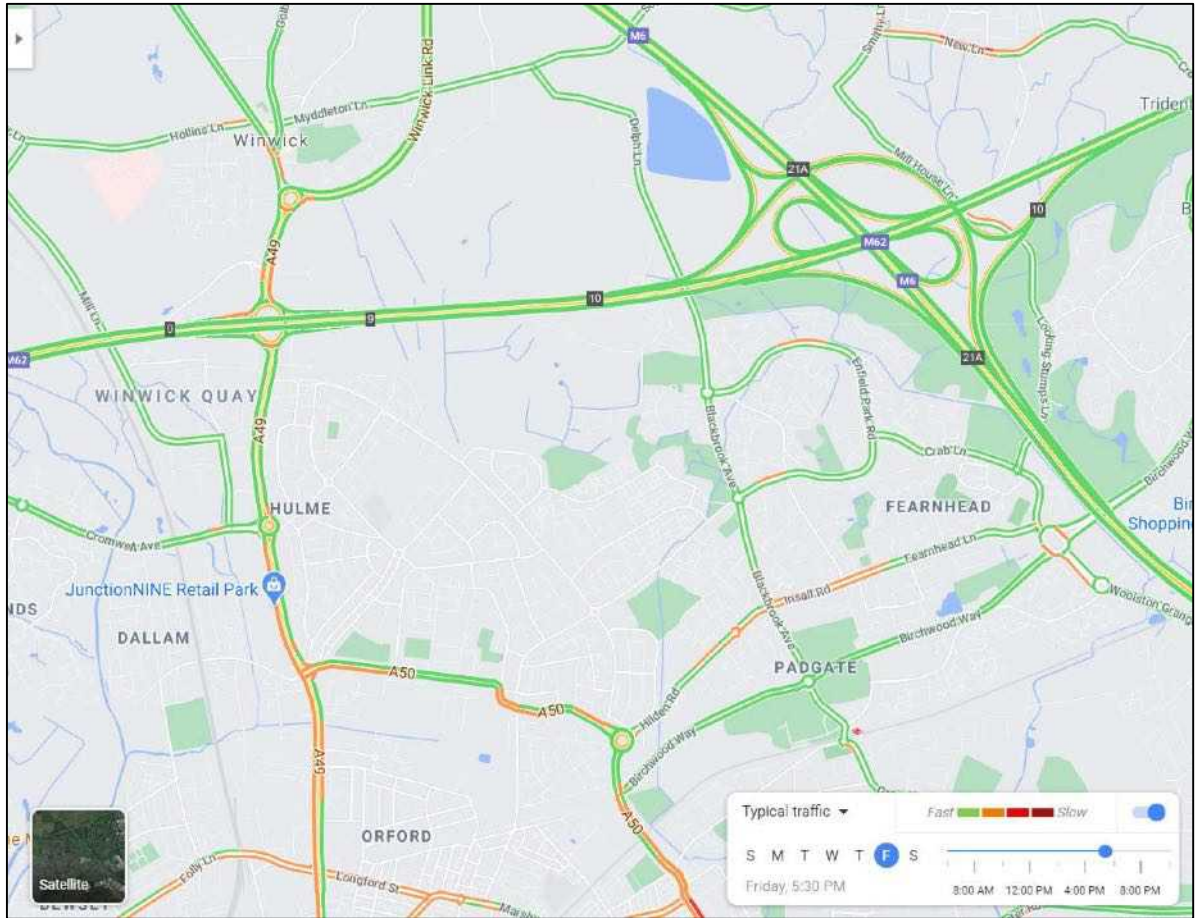
4. 17:00 Live Traffic Screenshot



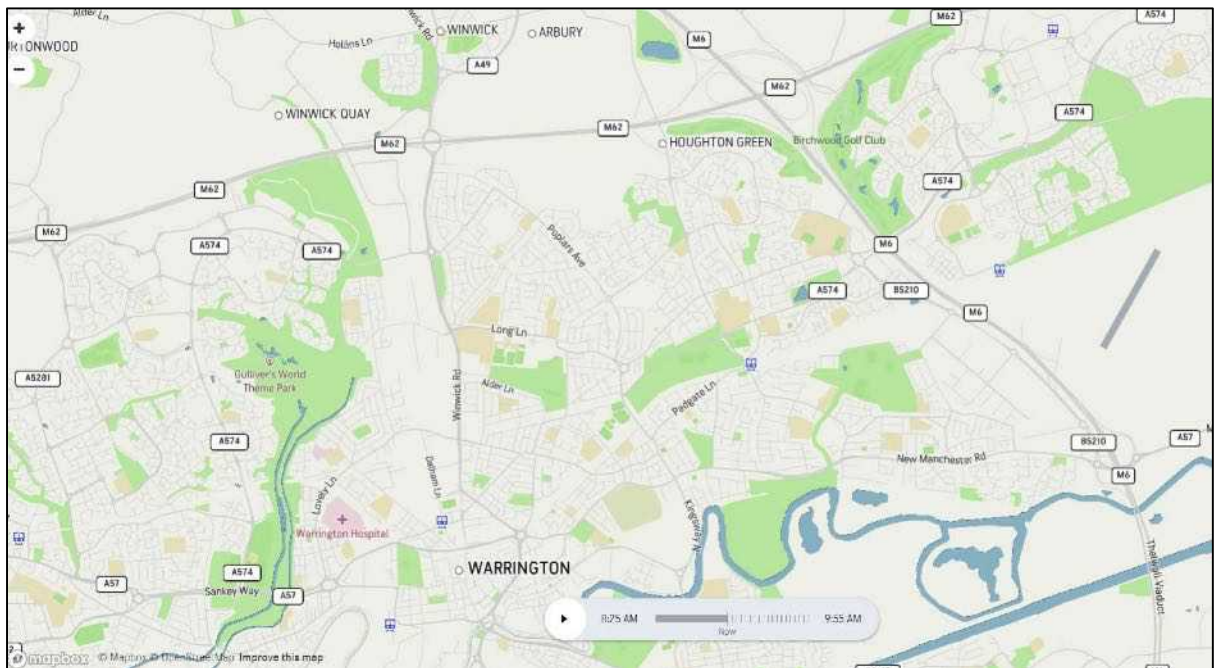
5. 16:30 Retrospective Traffic Screenshot



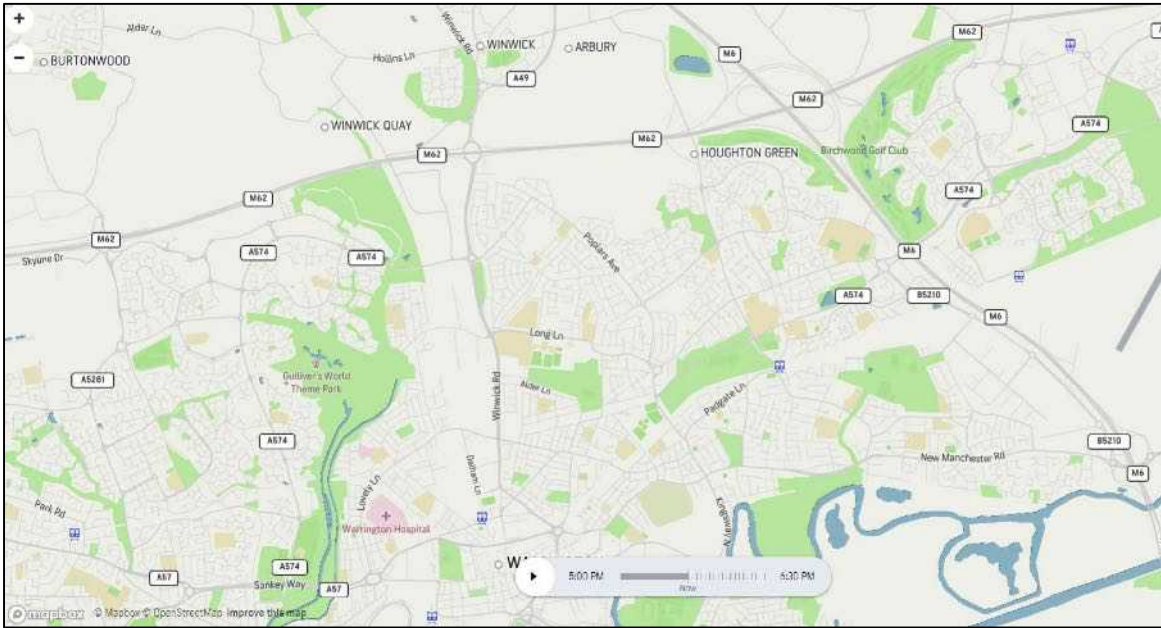
6. 17:30 Retrospective Screenshot



7. 08:30 Live Weather Screenshot



8. 17:00 Live Weather Screenshot



TECHNICAL NOTE

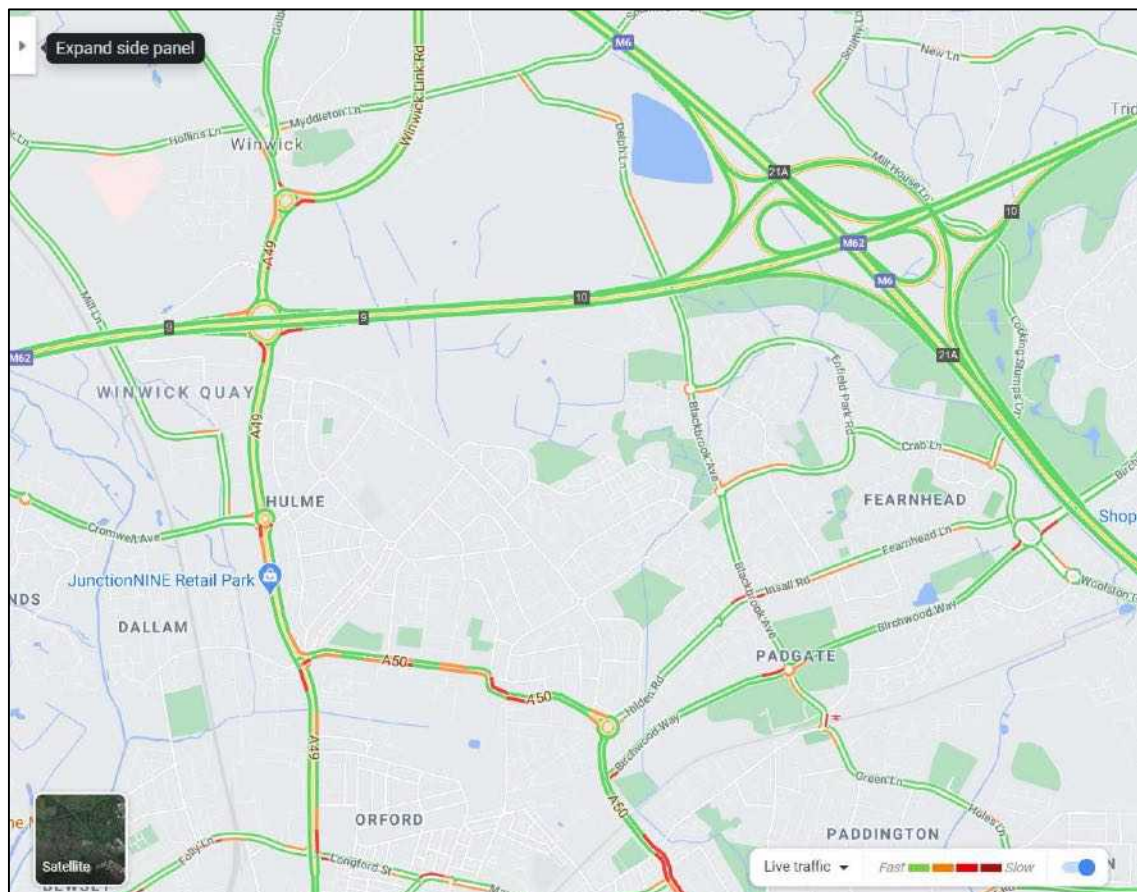
PROJECT: Peel Hall, Warrington

REPORT: 1901/TN/28

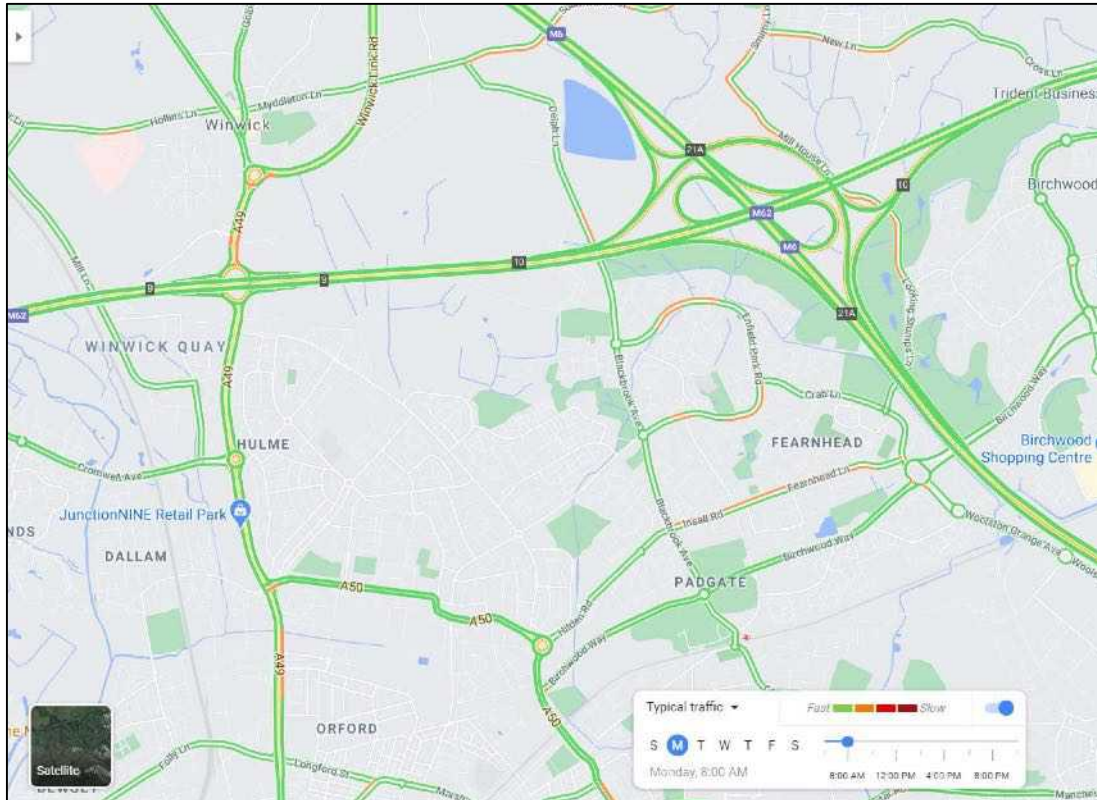
DATE: 21/09/2020

1. 08:30 Live Traffic Screenshot
2. 08:00 Retrospective Traffic Screenshot
3. 09:00 Retrospective Screenshot
4. 17:00 Live Traffic Screenshot
5. 16:30 Retrospective Traffic Screenshot
6. 17:30 Retrospective Screenshot
7. 08:30 Live Weather Screenshot
8. 17:00 Live Weather Screenshot

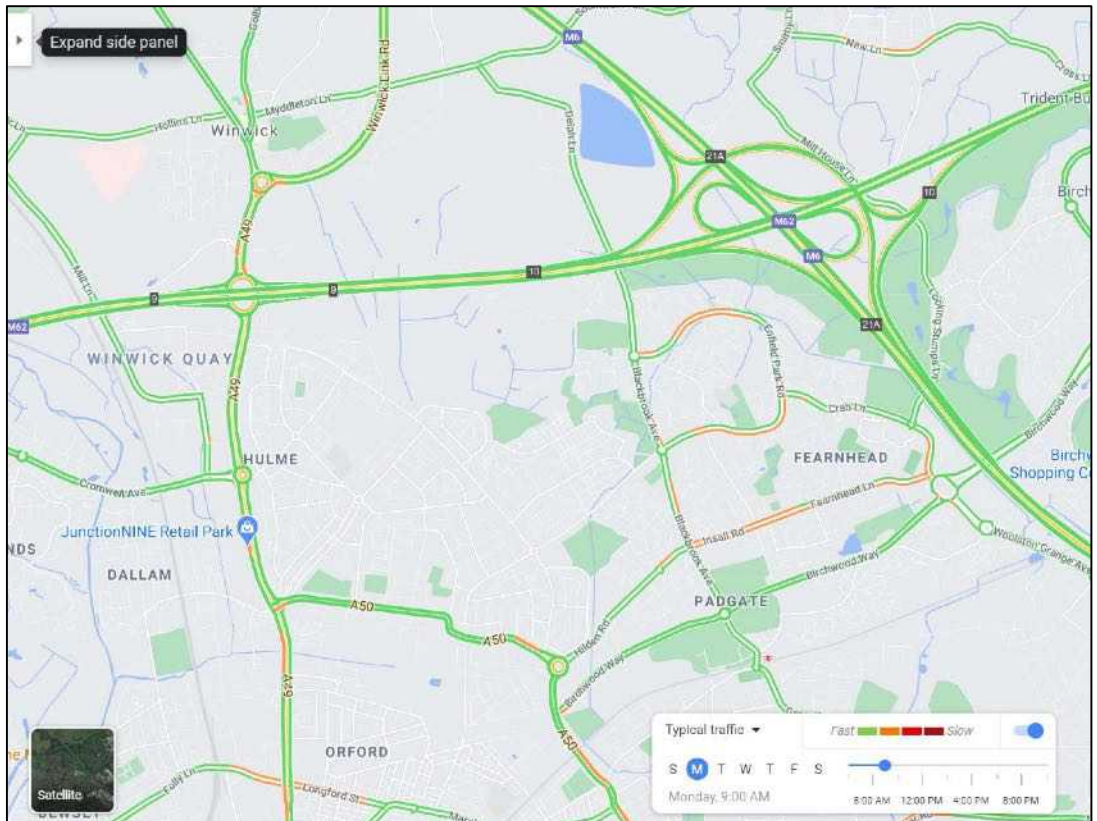
1. 08:30 Live Traffic Screenshot



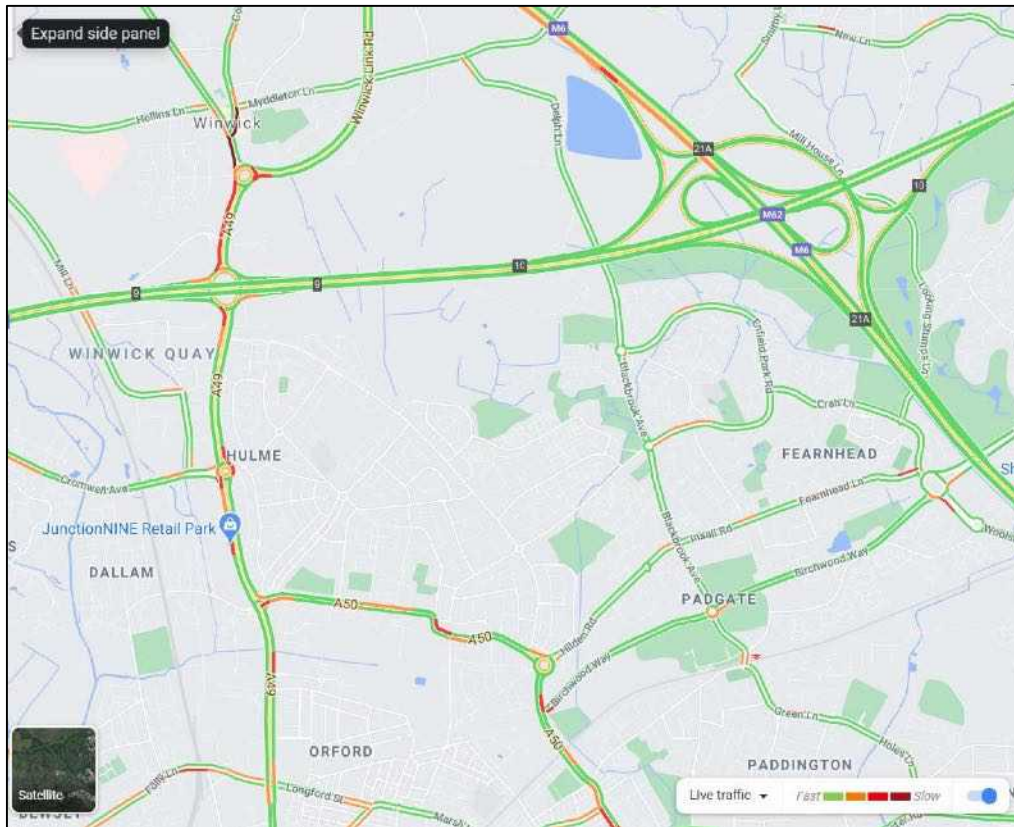
2. 08:00 Retrospective Traffic Screenshot



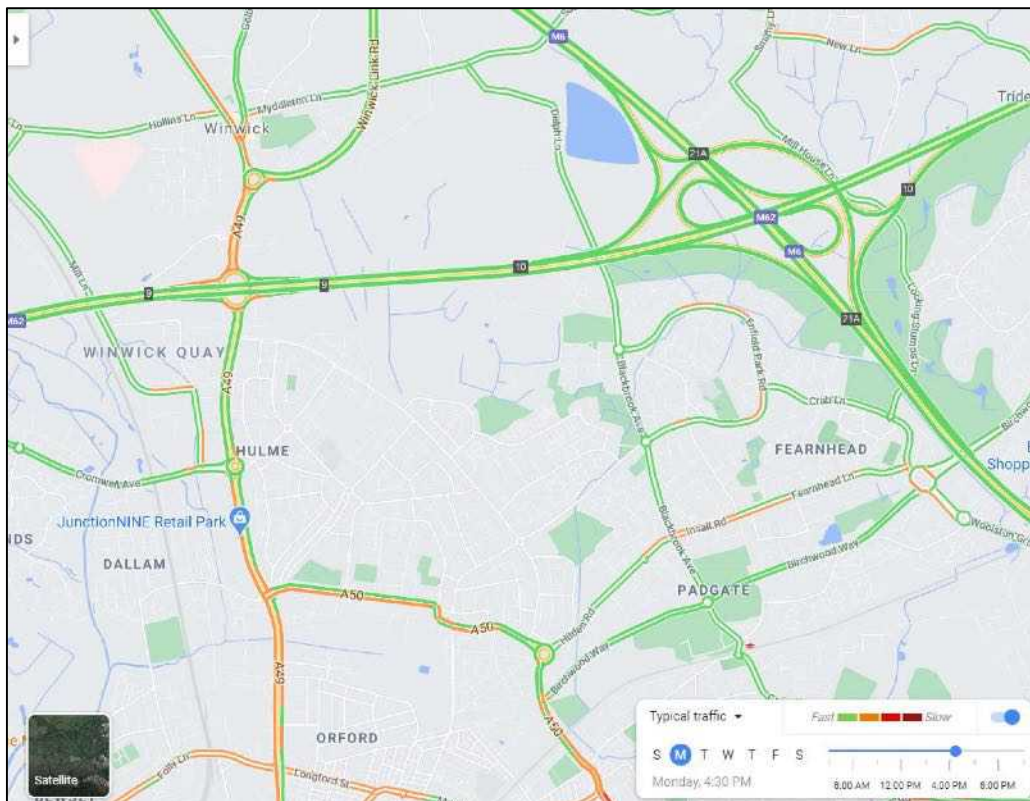
3. 09:00 Retrospective Screenshot



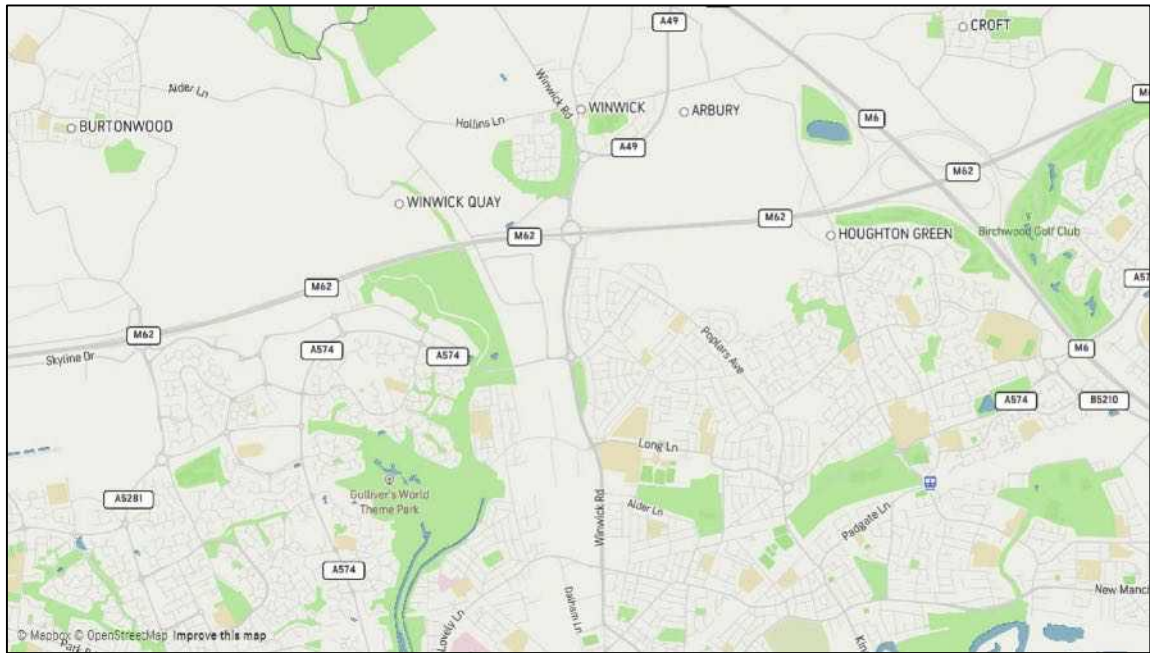
4. 17:00 Live Traffic Screenshot



5. 16:30 Retrospective Traffic Screenshot



8. 17:00 Live Weather Screenshot



TECHNICAL NOTE

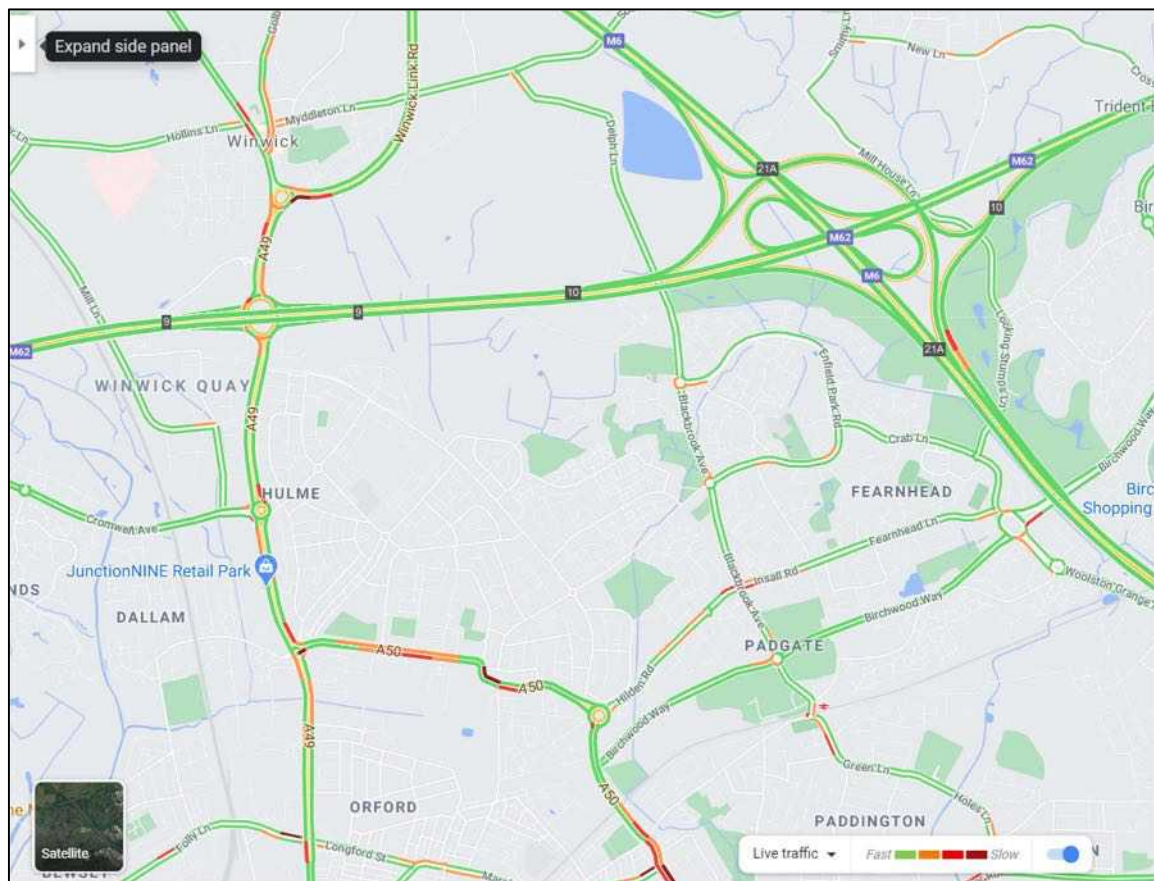
PROJECT: Peel Hall, Warrington

REPORT: 1901/TN/28

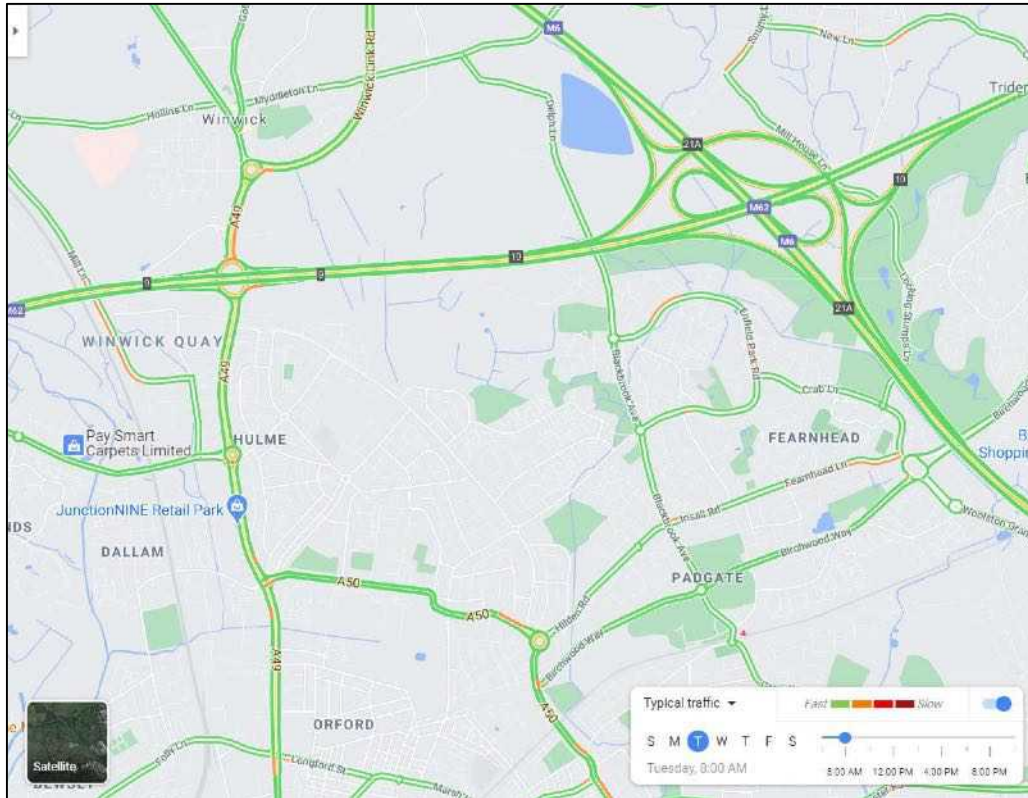
DATE: 22/09/2020

1. 08:30 Live Traffic Screenshot
2. 08:00 Retrospective Traffic Screenshot
3. 09:00 Retrospective Screenshot
4. 17:00 Live Traffic Screenshot
5. 16:30 Retrospective Traffic Screenshot
6. 17:30 Retrospective Screenshot
7. 08:30 Live Weather Screenshot
8. 17:00 Live Weather Screenshot

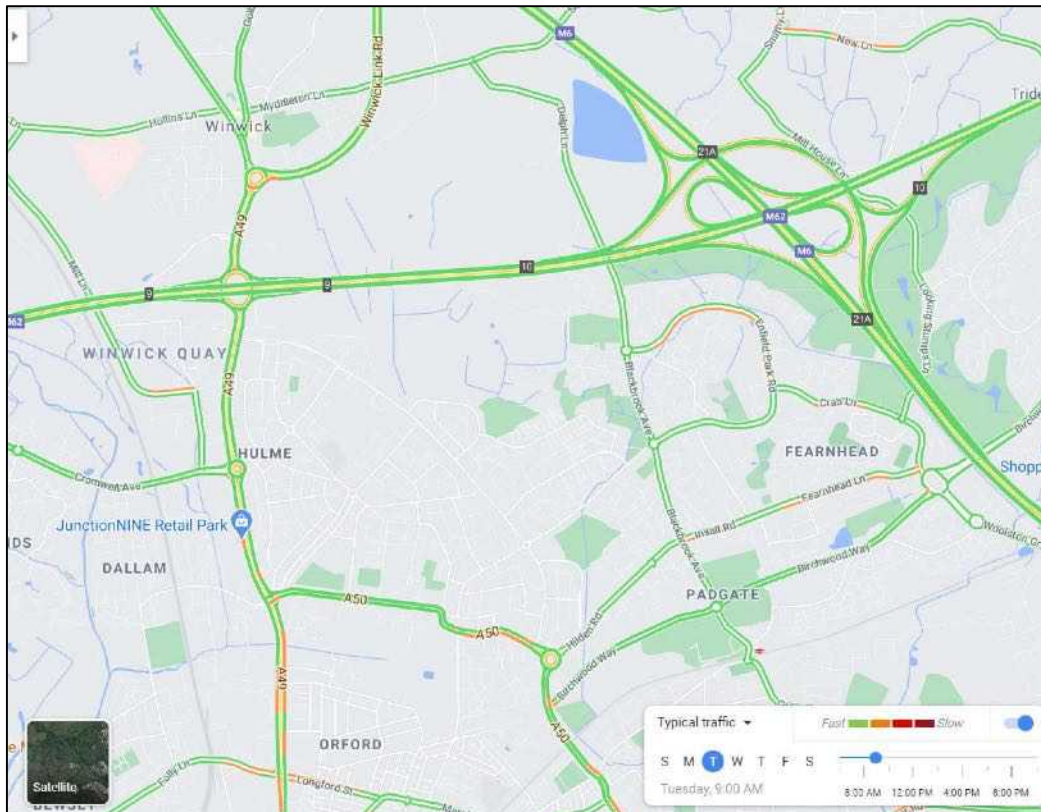
1. 08:30 Live Traffic Screenshot



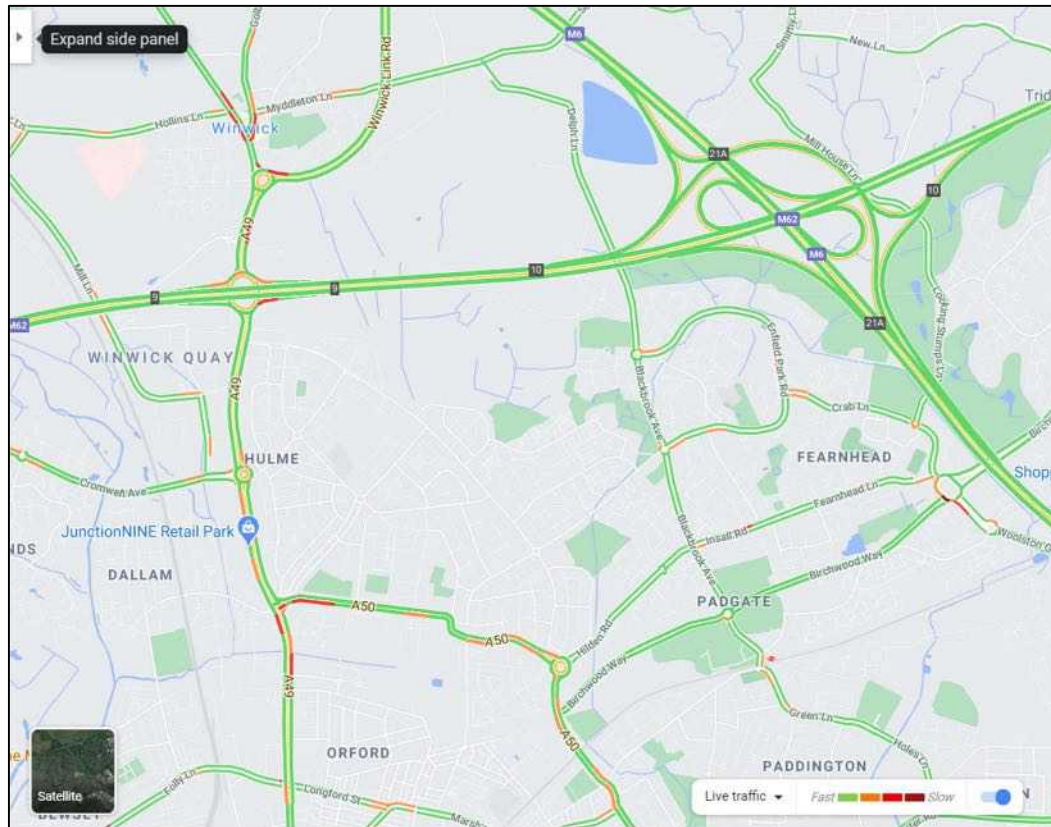
2. 08:00 Retrospective Traffic Screenshot



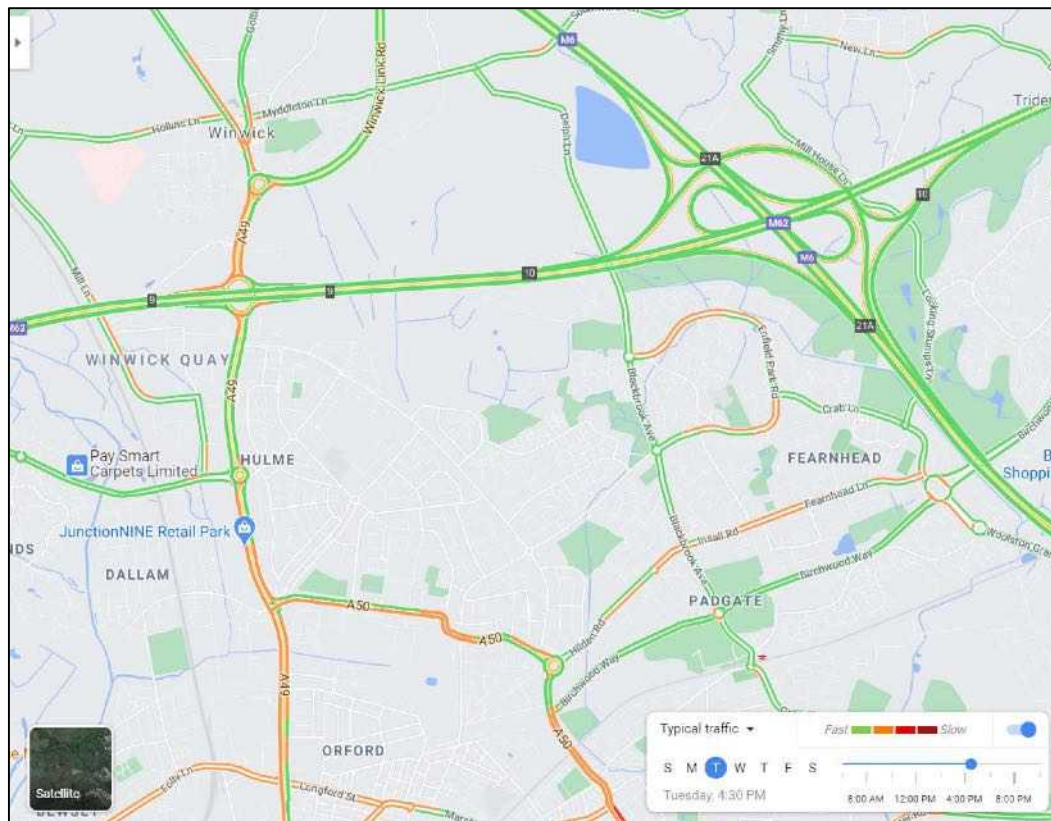
3. 09:00 Retrospective Screenshot



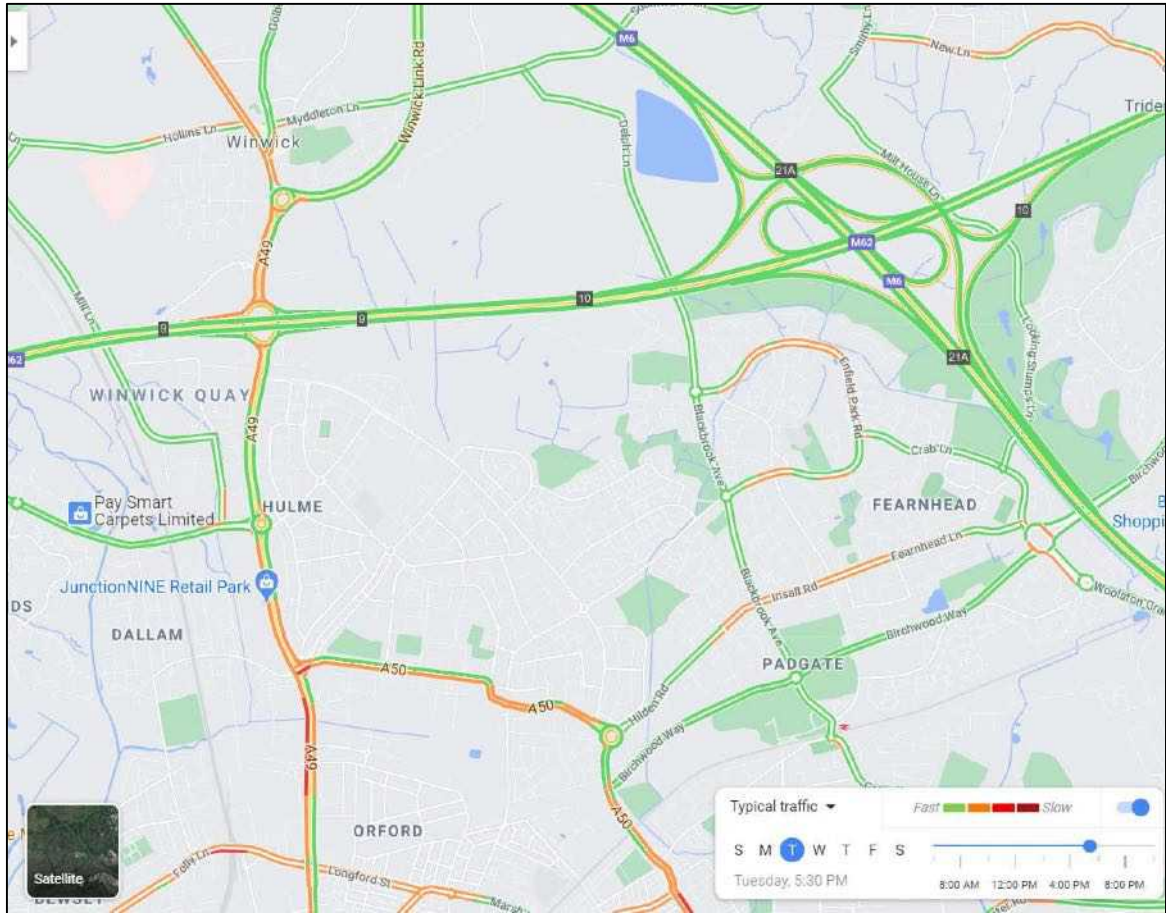
4. 17:00 Live Traffic Screenshot



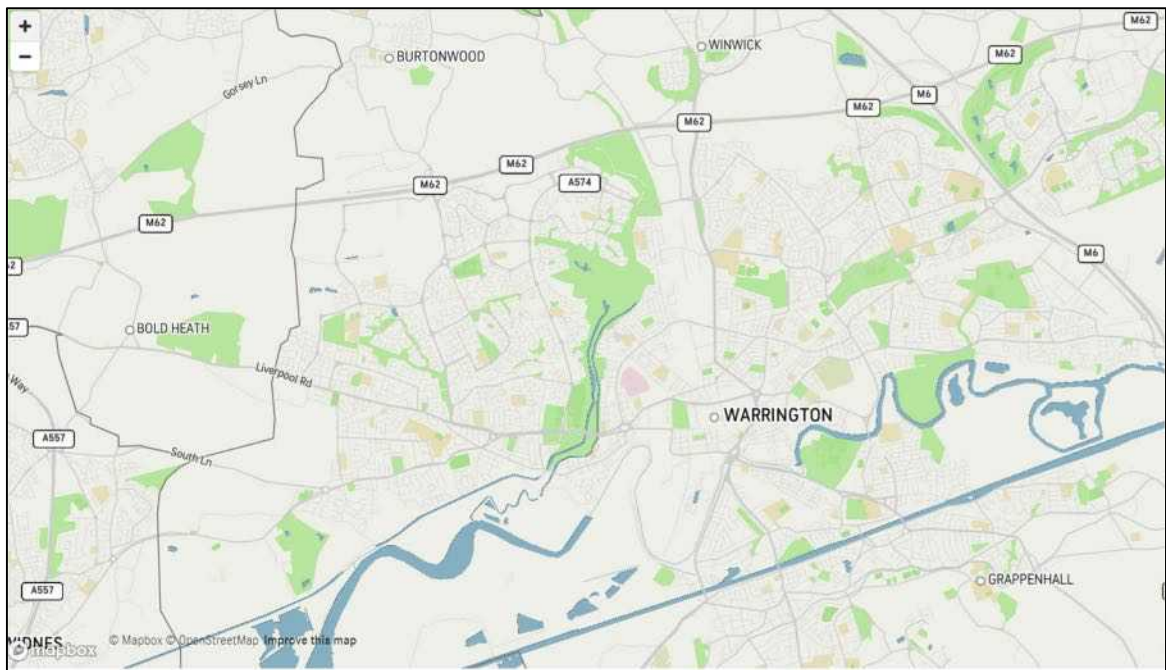
5. 16:30 Retrospective Traffic Screenshot



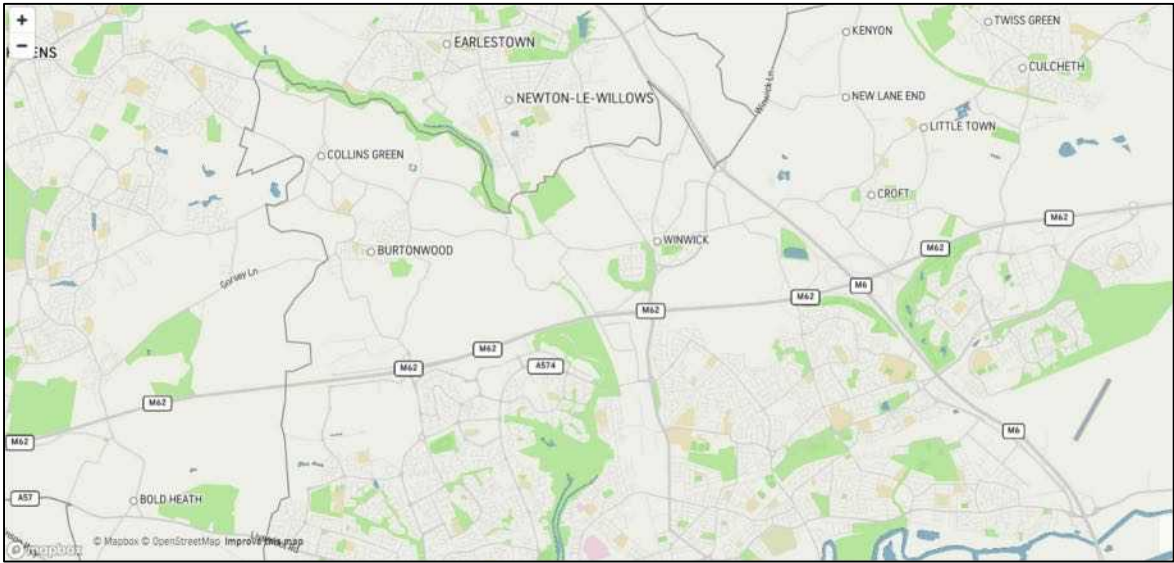
6. 17:30 Retrospective Screenshot



7. 08:30 Live Weather Screenshot



8. 17:00 Live Weather Screenshot



TECHNICAL NOTE

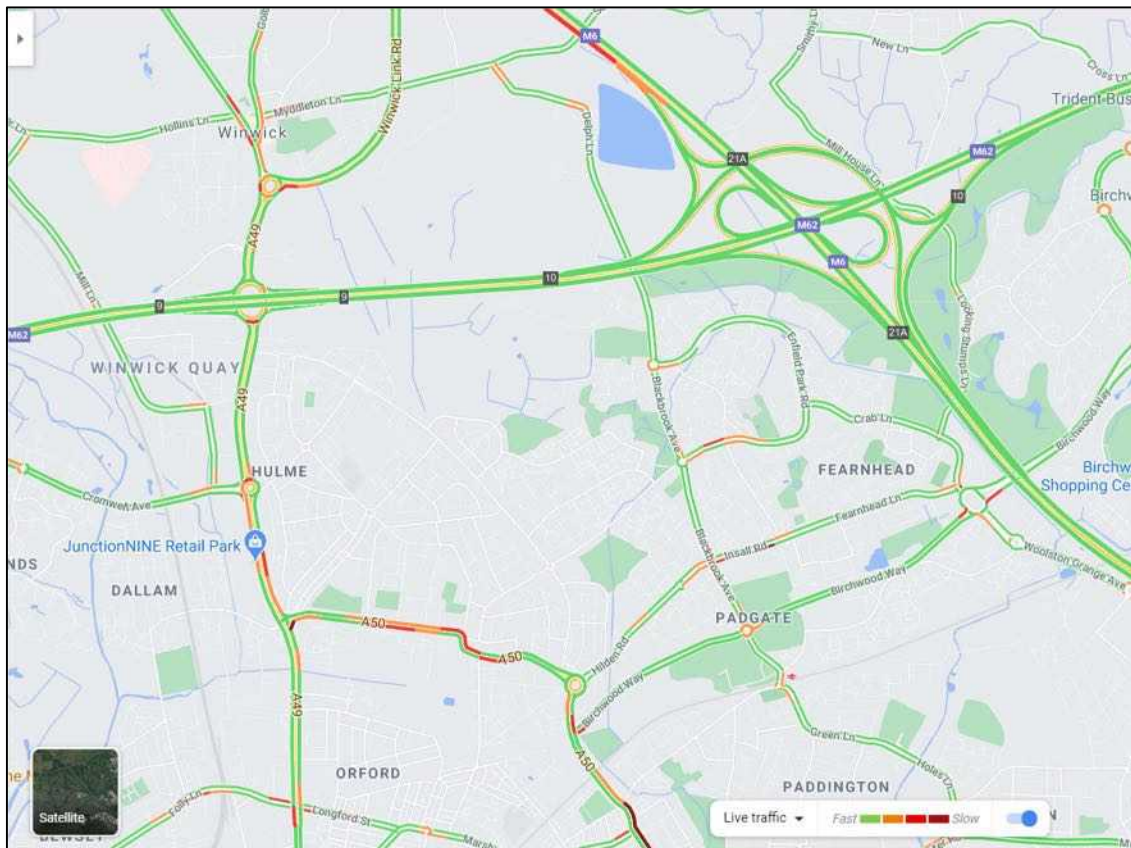
PROJECT: Peel Hall, Warrington

REPORT: 1901/TN/28

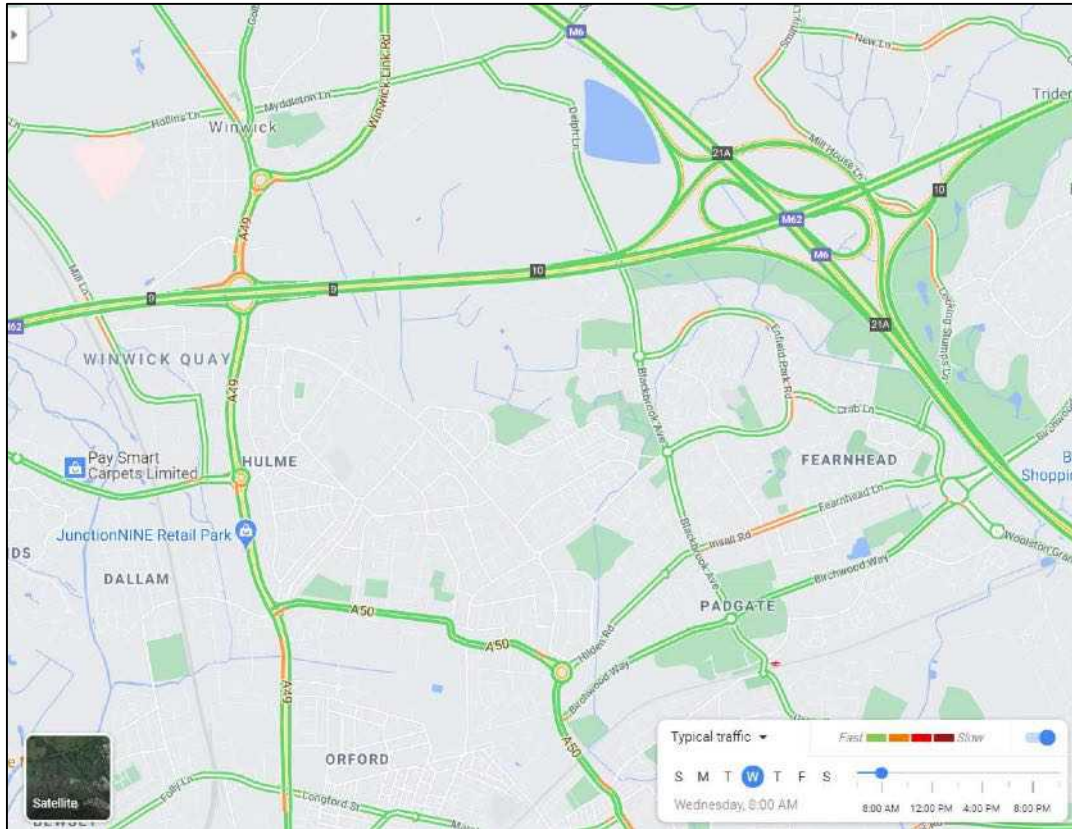
DATE: 23/09/2020

1. 08:30 Live Traffic Screenshot
2. 08:00 Retrospective Traffic Screenshot
3. 09:00 Retrospective Screenshot
4. 17:00 Live Traffic Screenshot
5. 16:30 Retrospective Traffic Screenshot
6. 17:30 Retrospective Screenshot
7. 08:30 Live Weather Screenshot
8. 17:00 Live Weather Screenshot

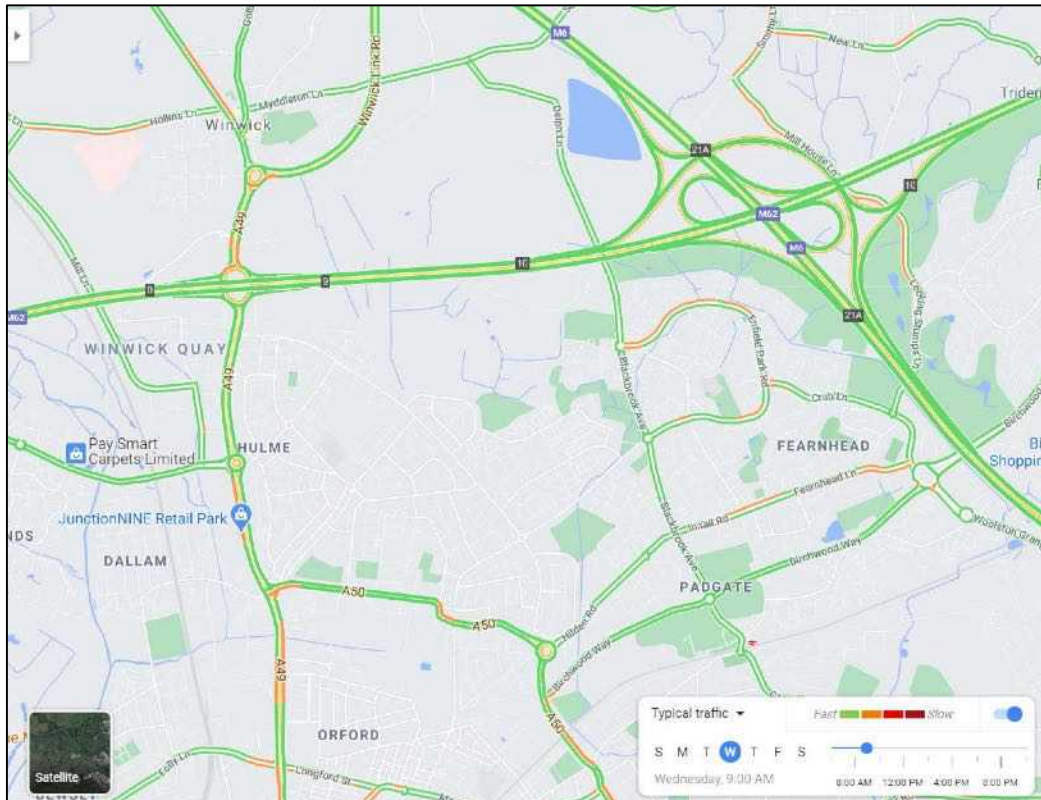
1. 08:30 Live Traffic Screenshot



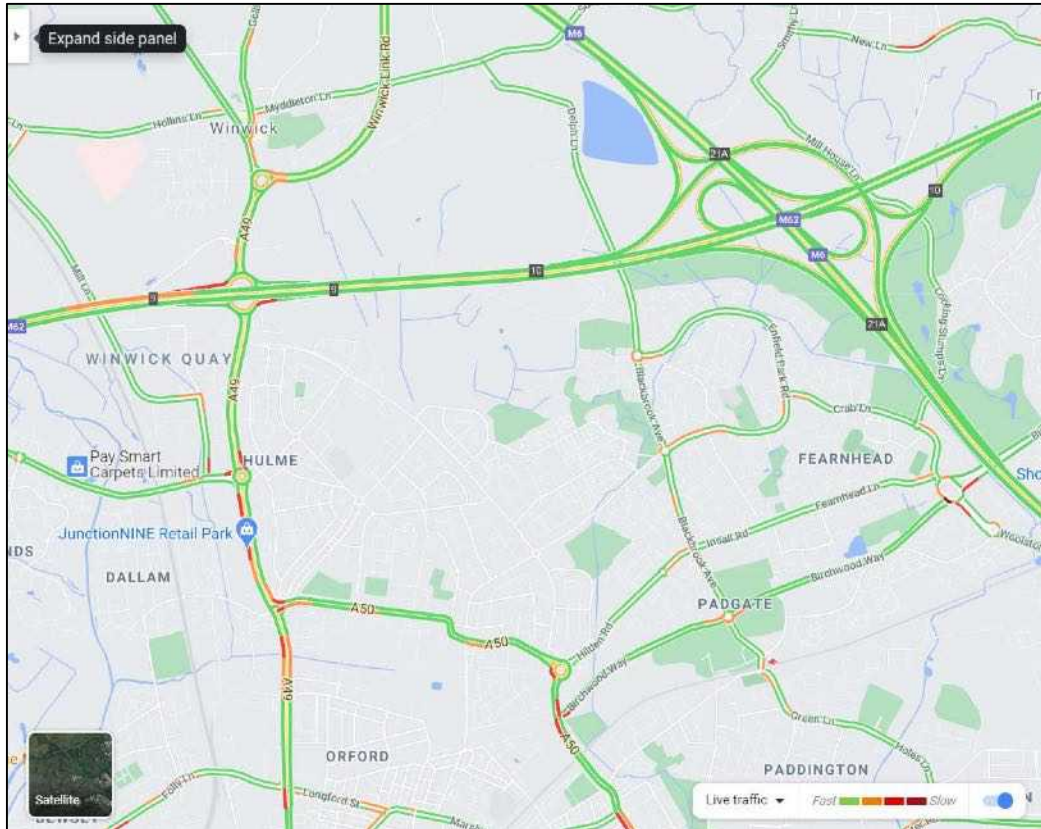
2. 08:00 Retrospective Traffic Screenshot



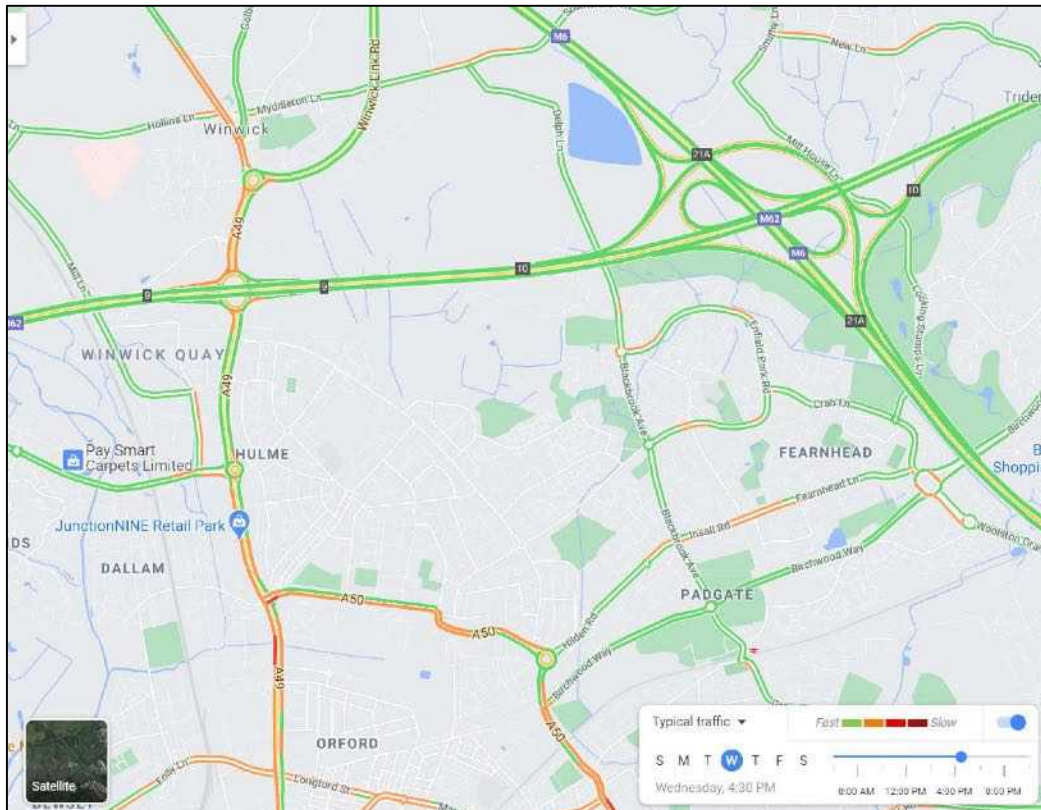
3. 09:00 Retrospective Screenshot



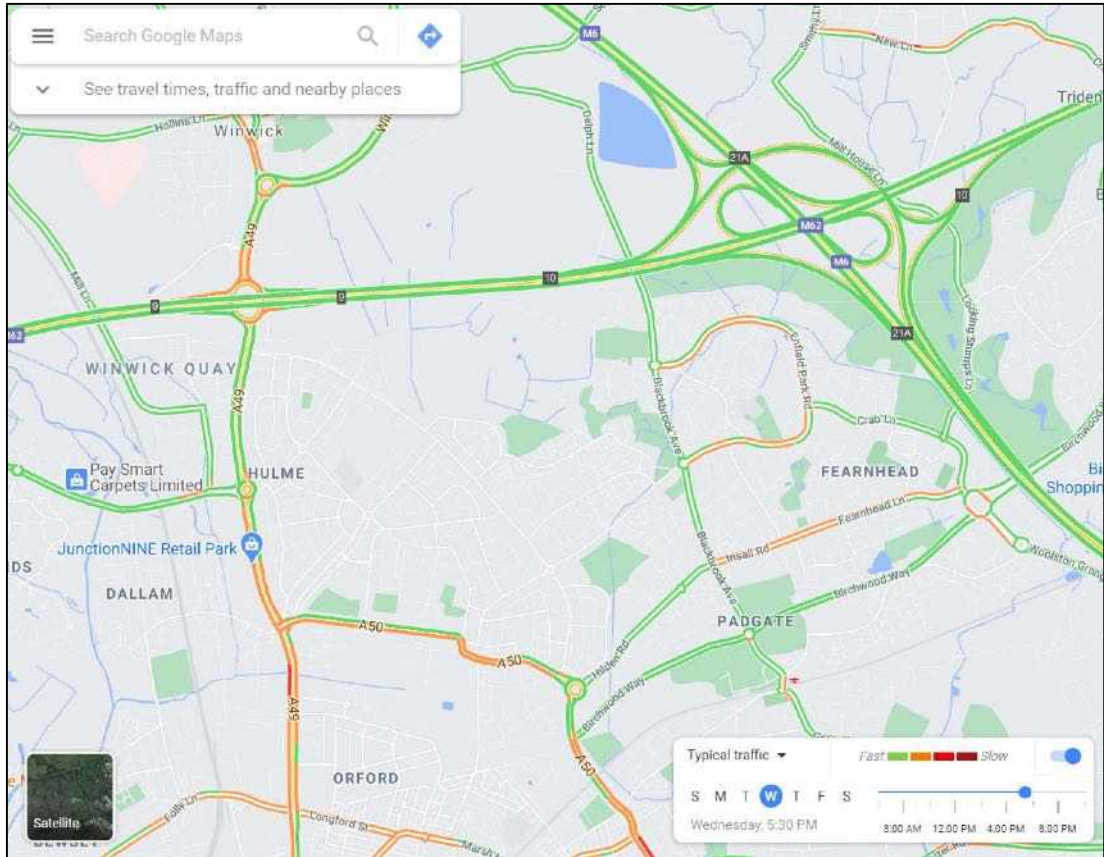
4. 17:00 Live Traffic Screenshot



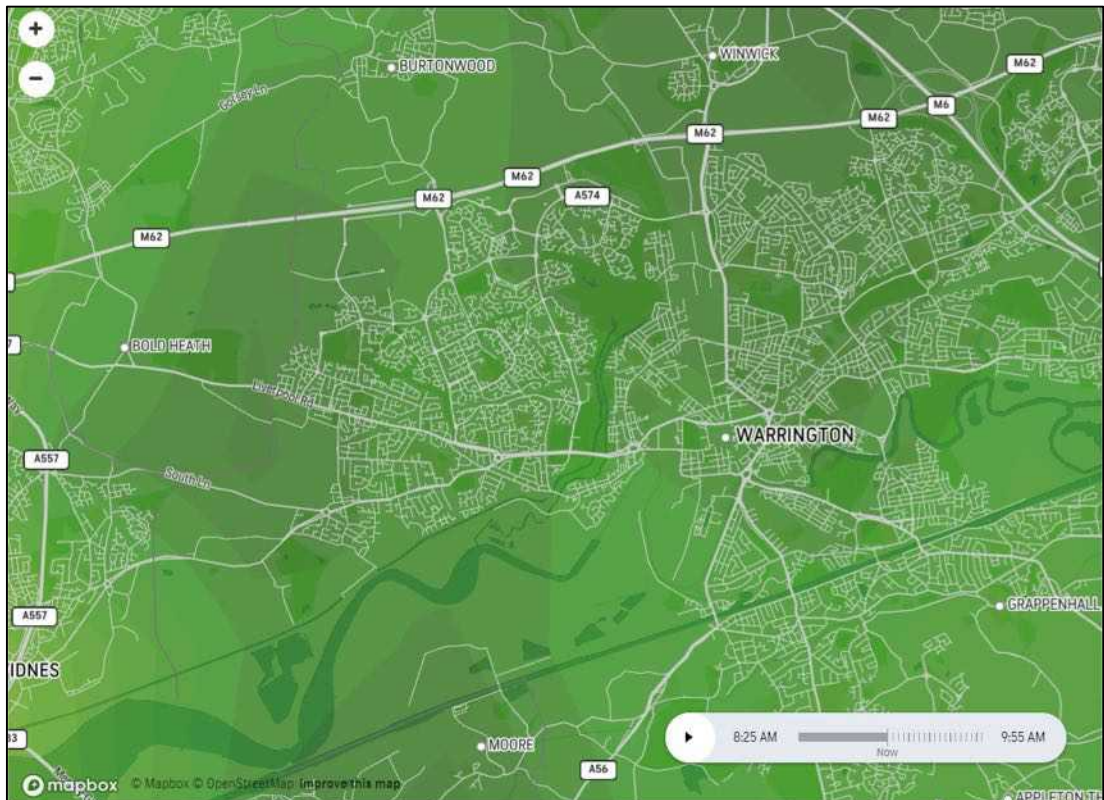
5. 16:30 Retrospective Traffic Screenshot



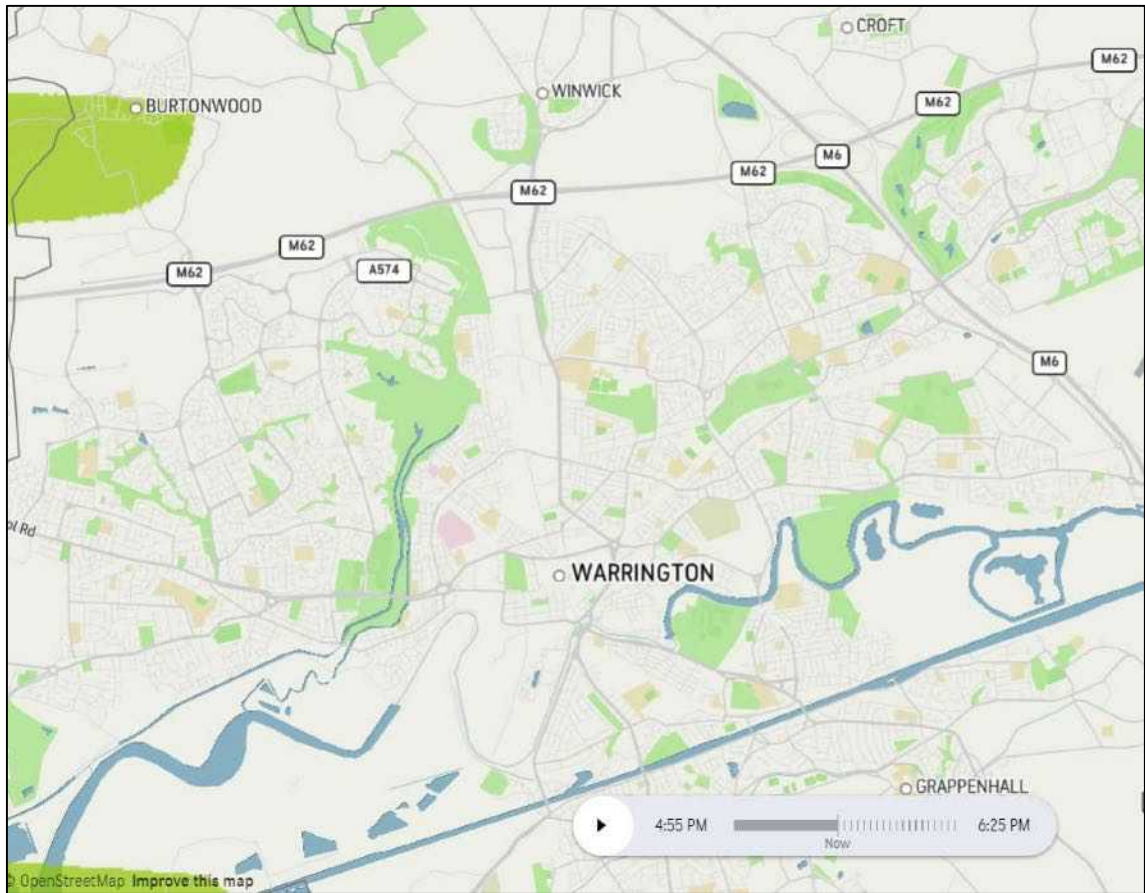
6. 17:30 Retrospective Screenshot



7. 08:30 Live Weather Screenshot



8. 17:00 Live Weather Screenshot



TECHNICAL NOTE

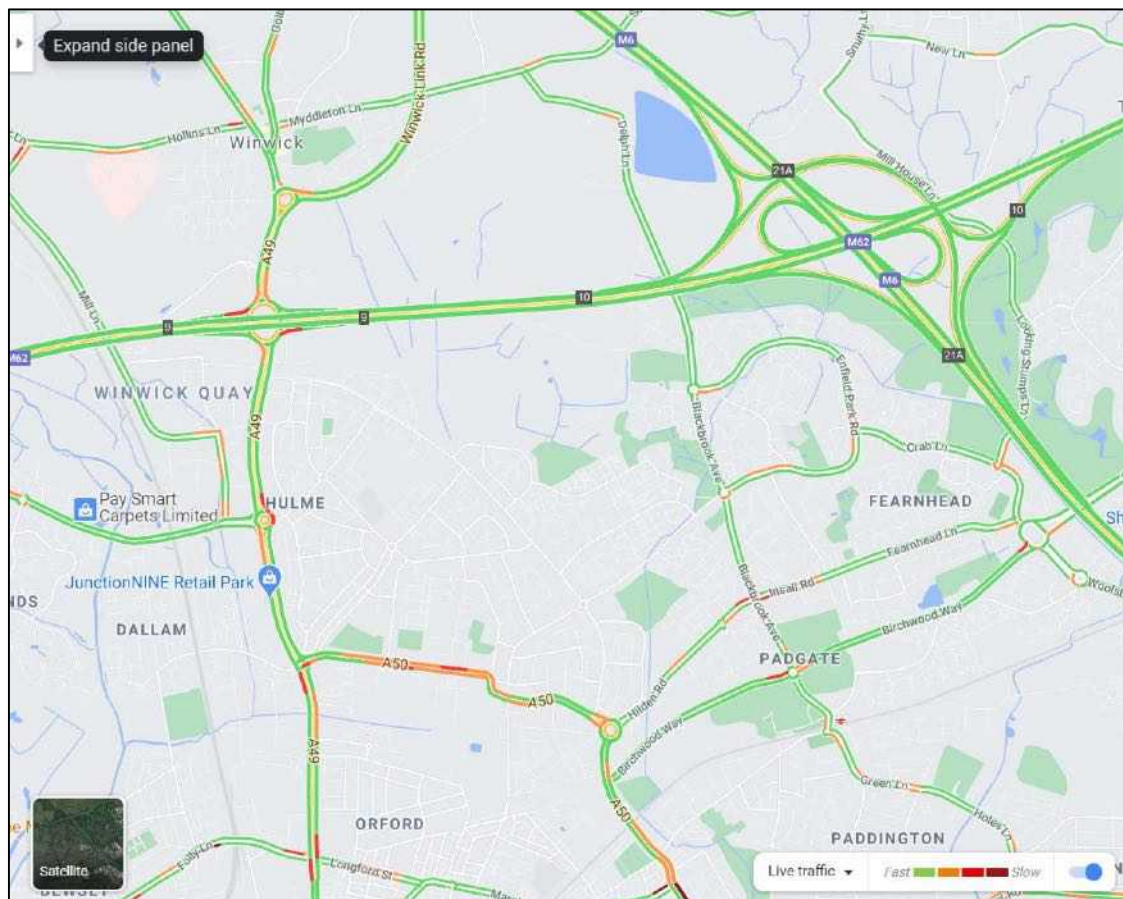
PROJECT: Peel Hall, Warrington

REPORT: 1901/TN/28

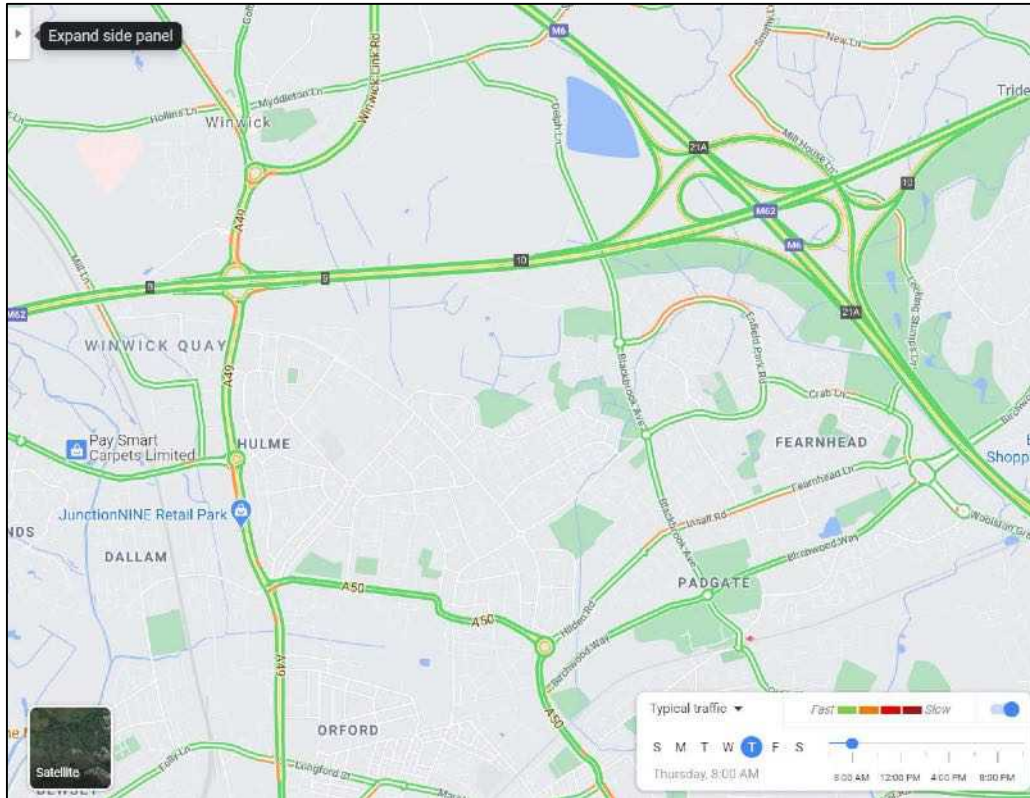
DATE: 24/09/2020

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8. 17:00 Live Weather Screenshot

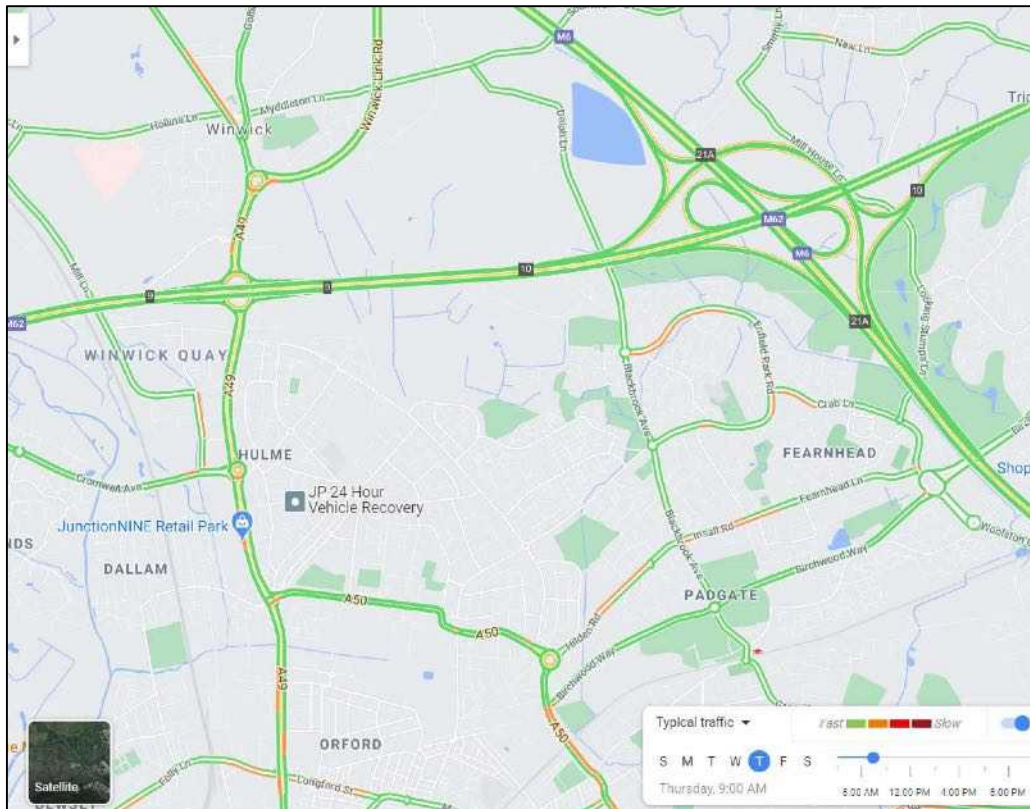
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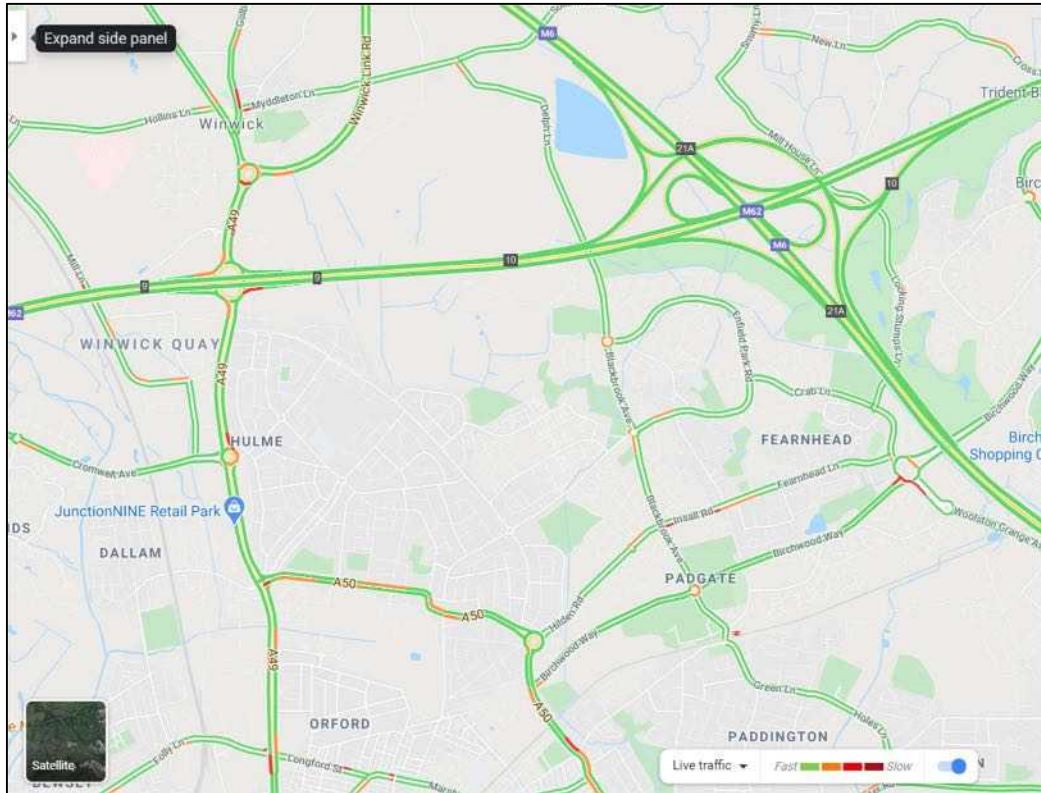
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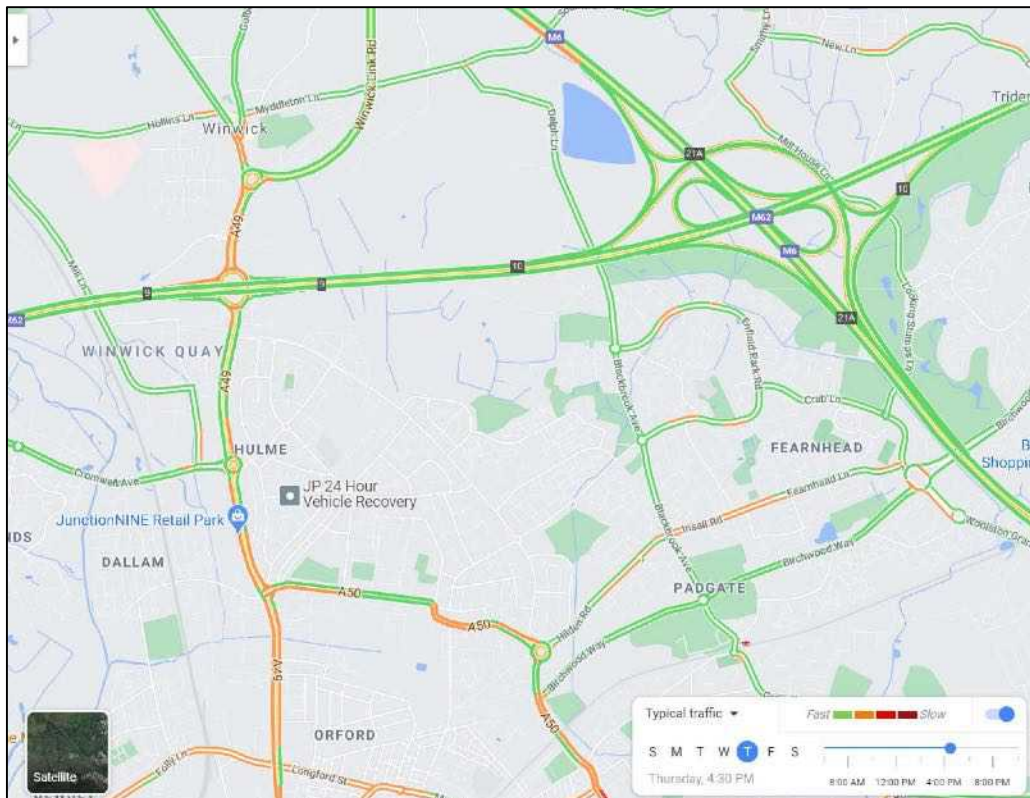
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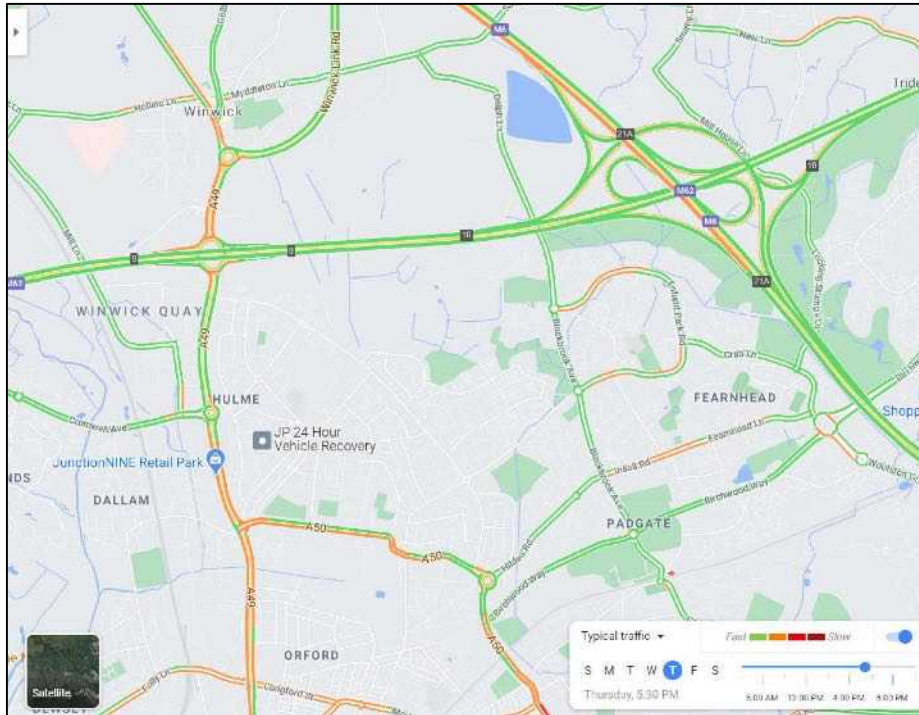
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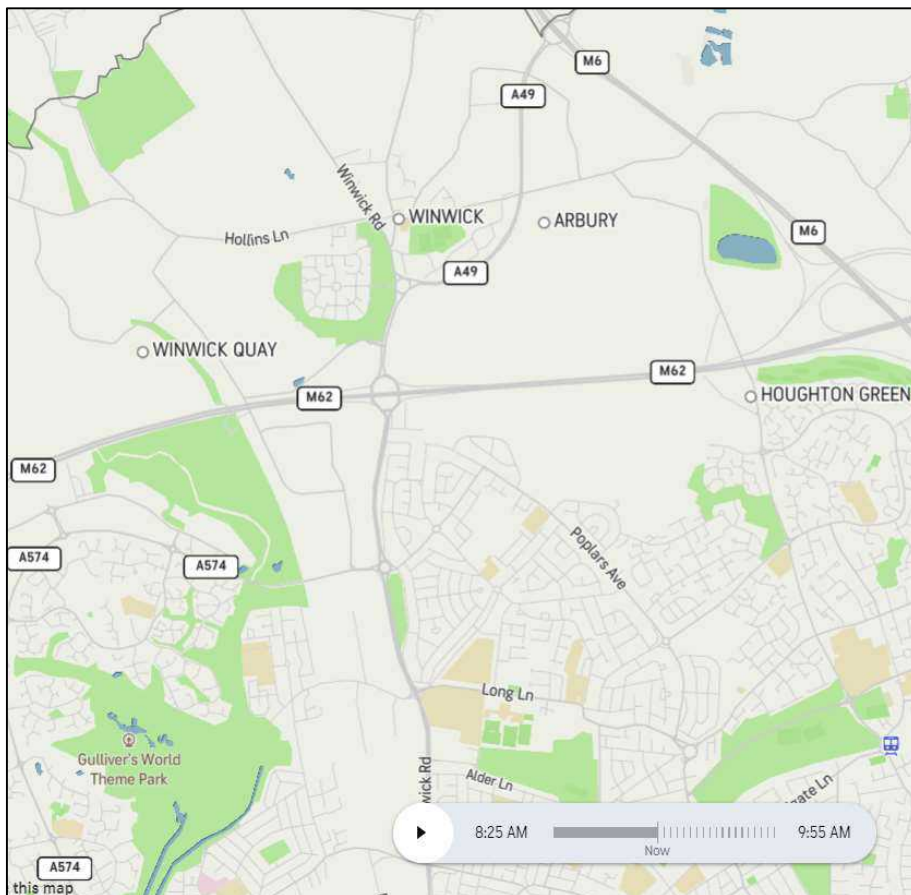
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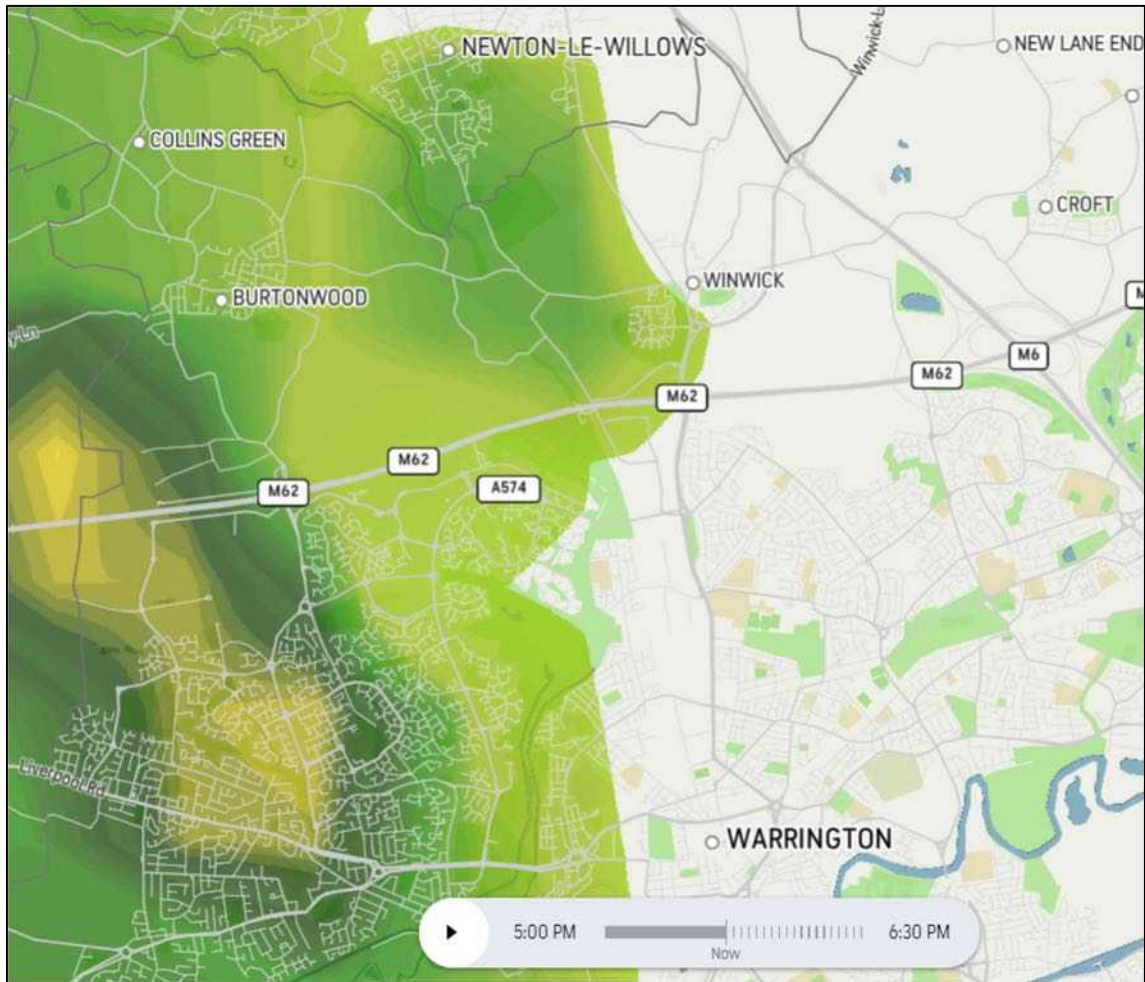
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7. 08:30 Live Weather Screenshot



8. 17:00 Live Weather Screenshot



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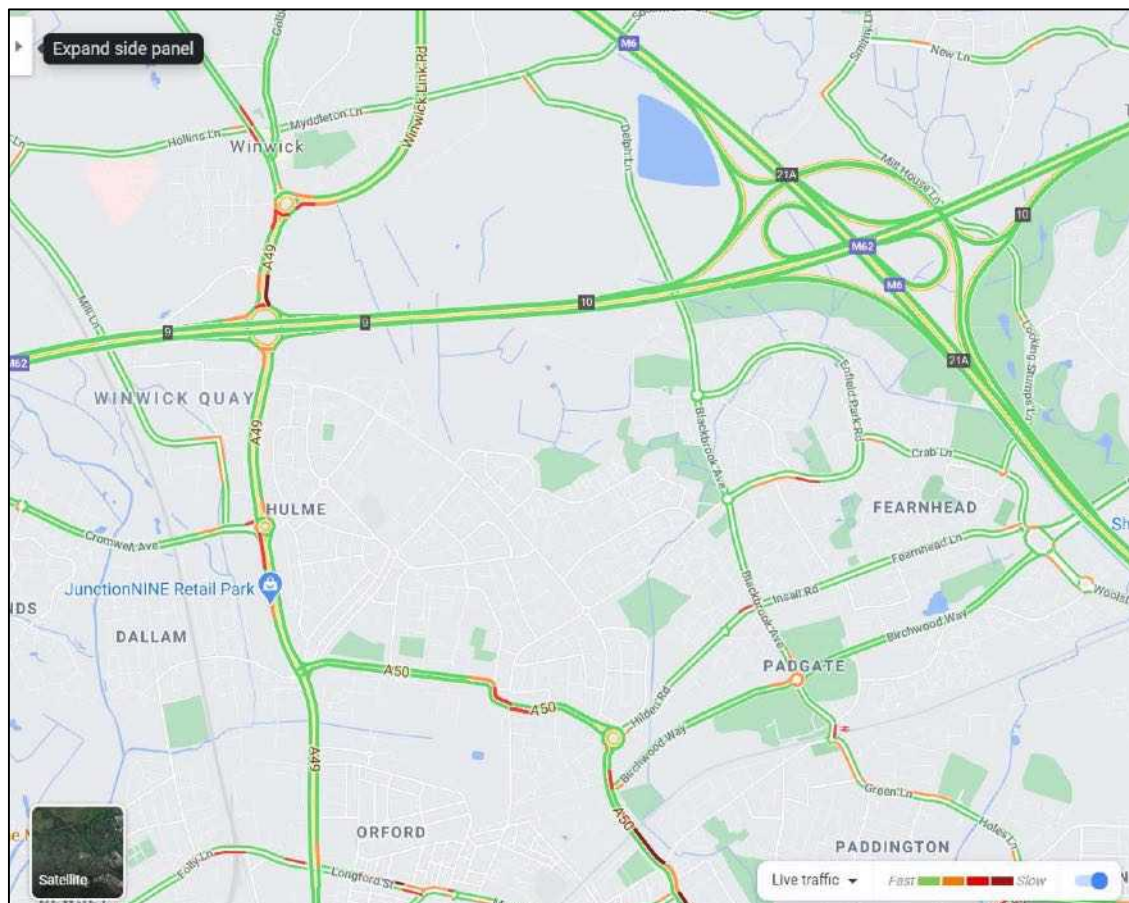
PROJECT: Peel Hall, Warrington

REPORT: 1901/TN/28

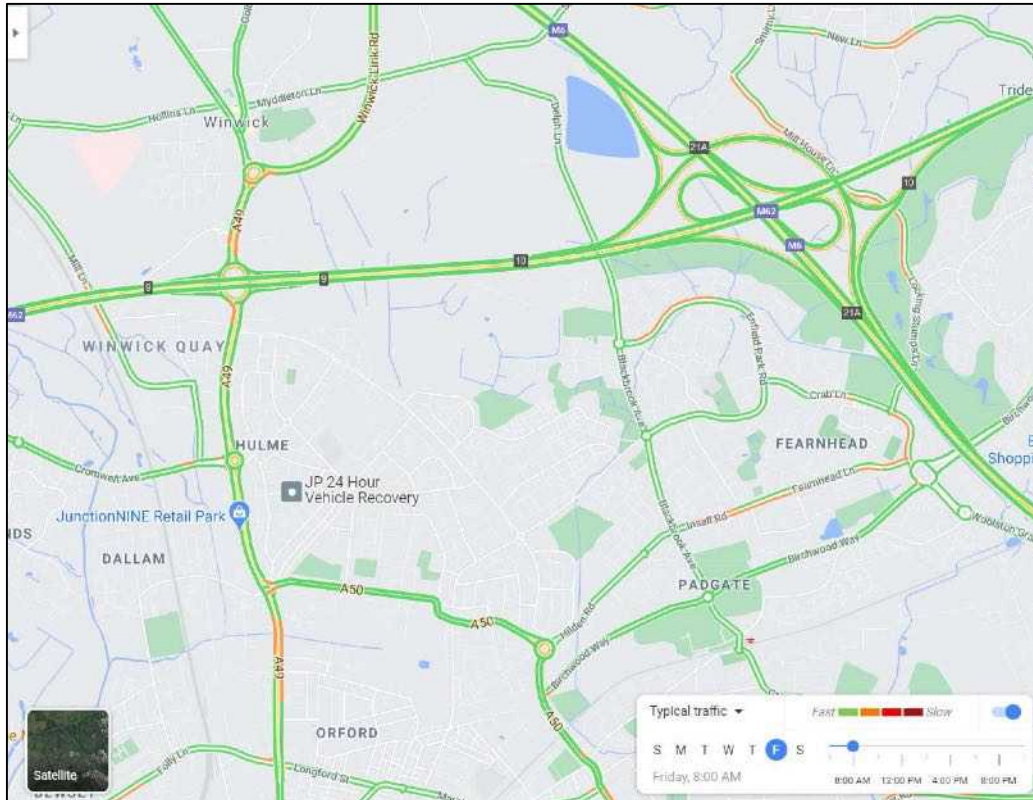
DATE: 25/09/2020

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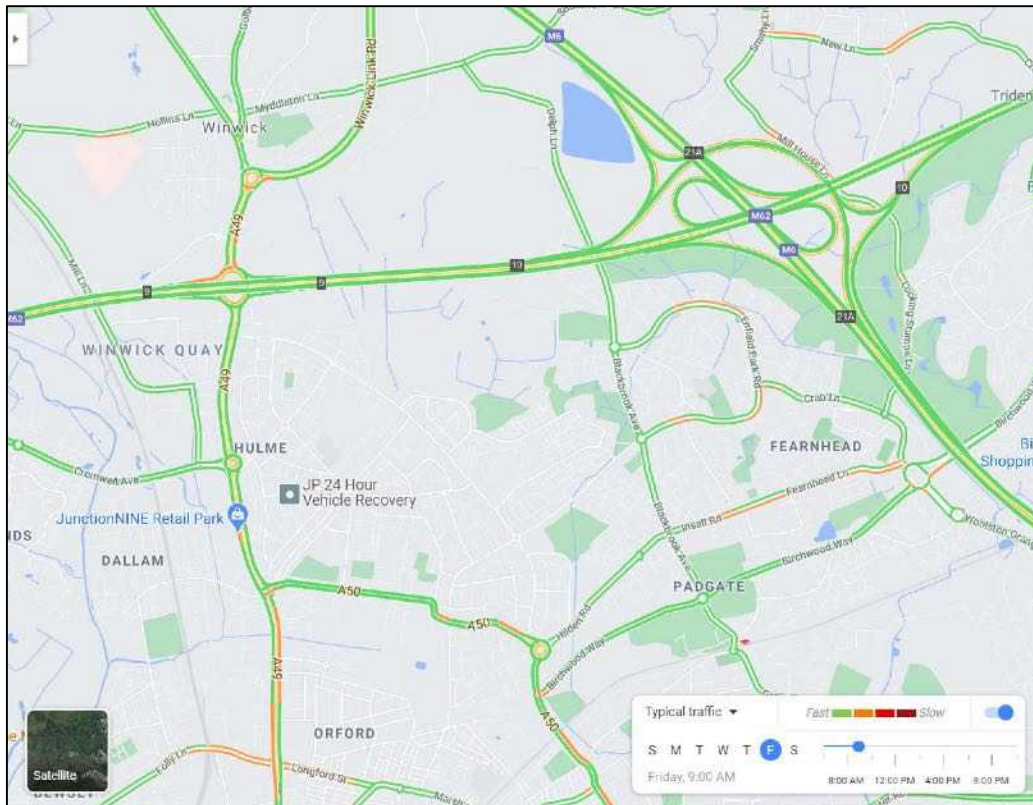
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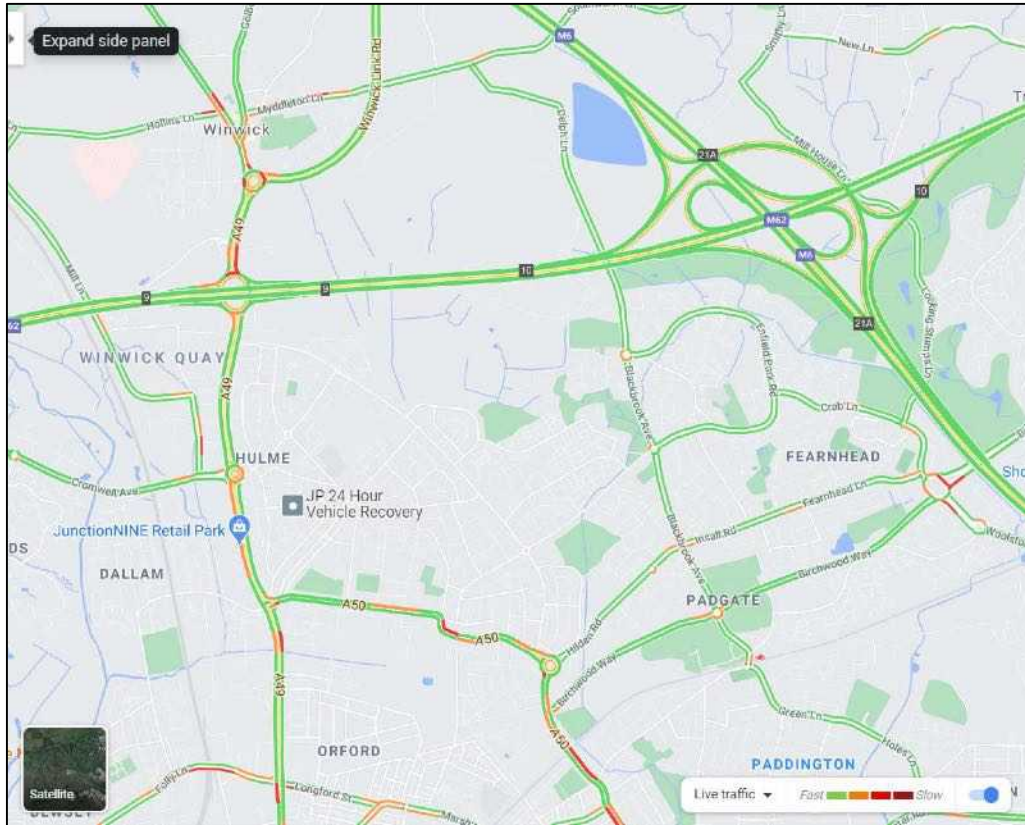
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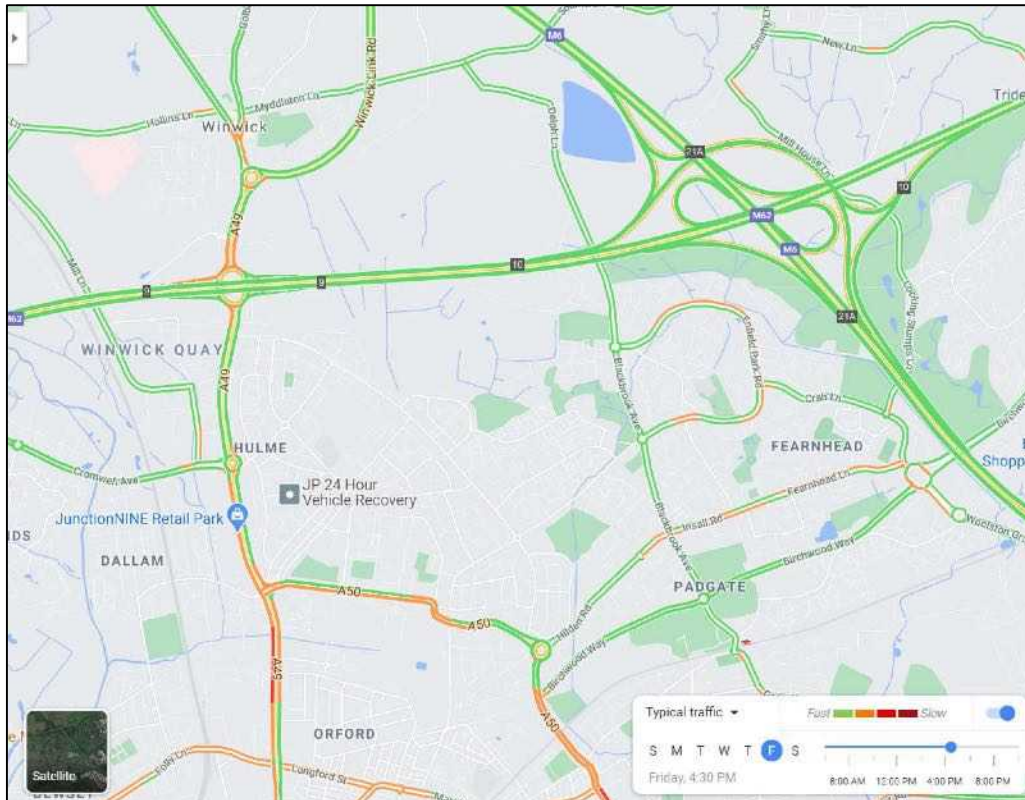
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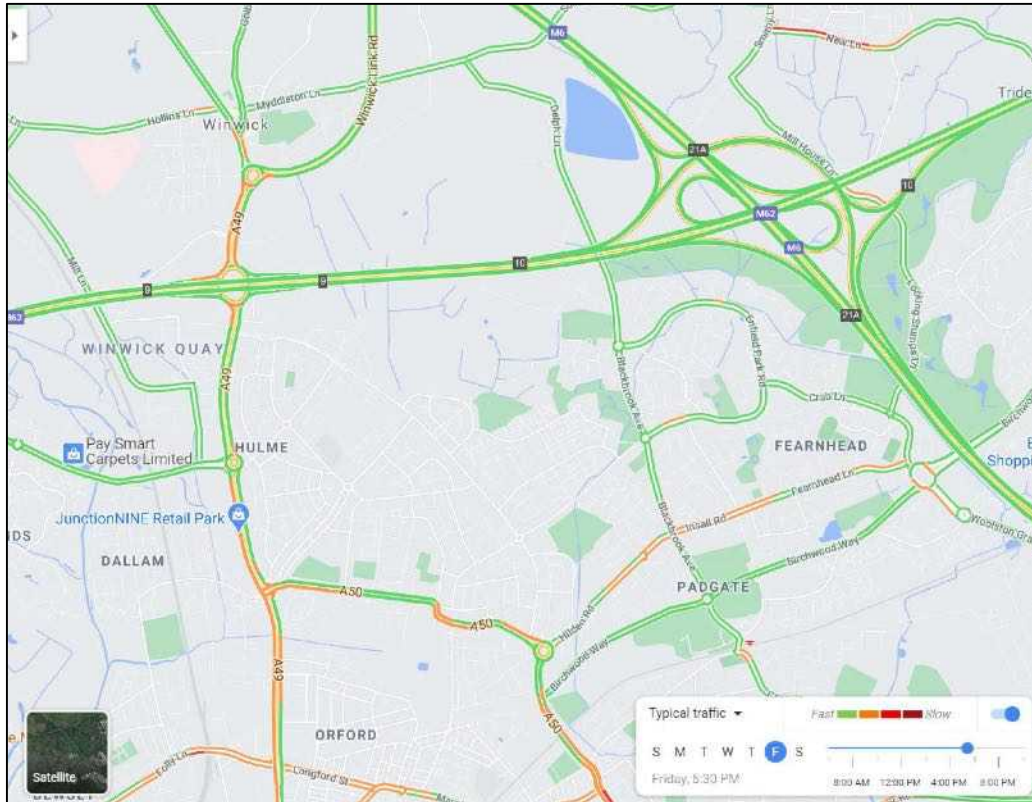
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5. 16:30 Retrospective Traffic Screenshot



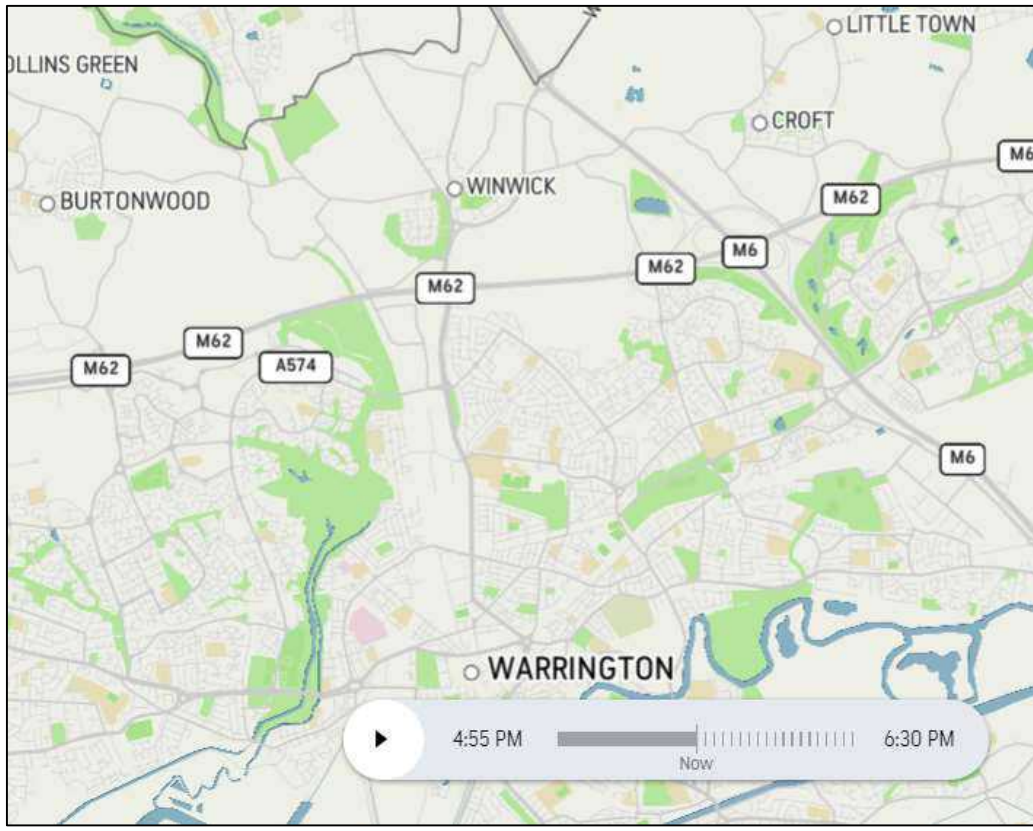
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7. 08:30 Live Weather Screenshot



8. 17:00 Live Weather Screenshot



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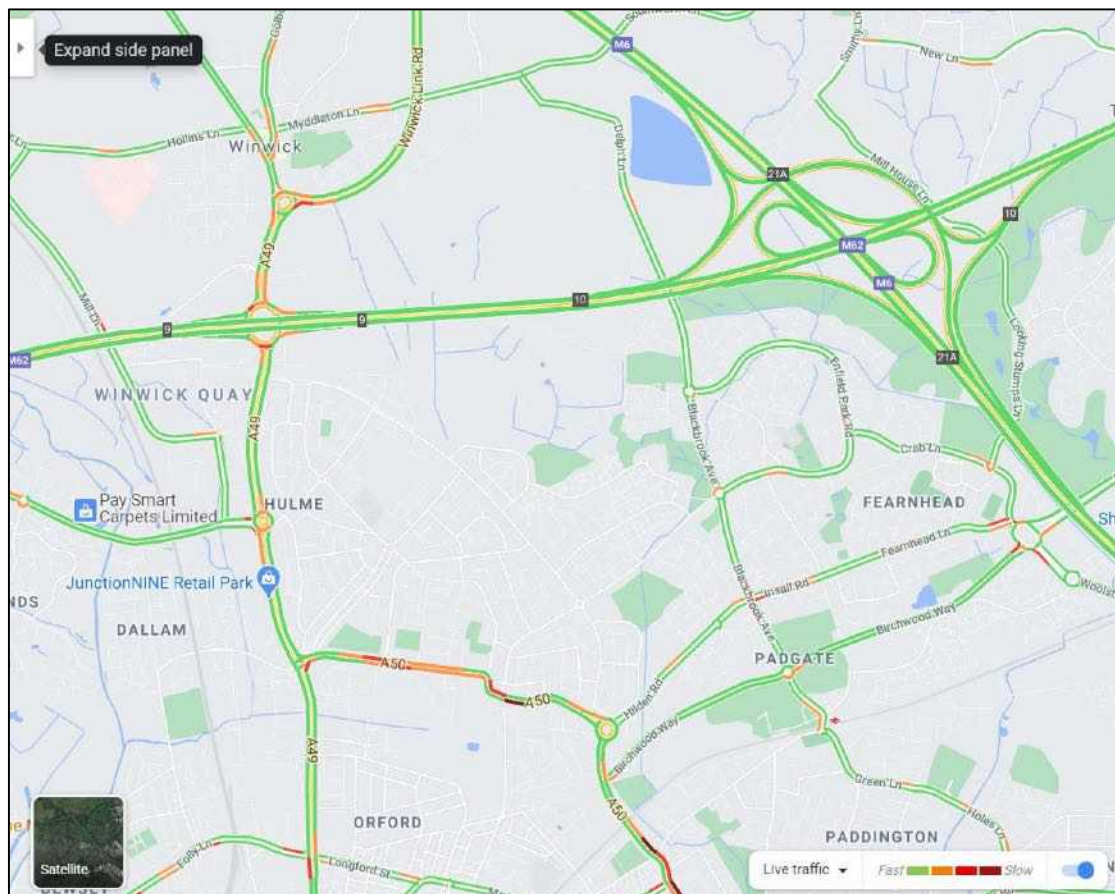
PROJECT: Peel Hall, Warrington

REPORT: 1901/TN/28

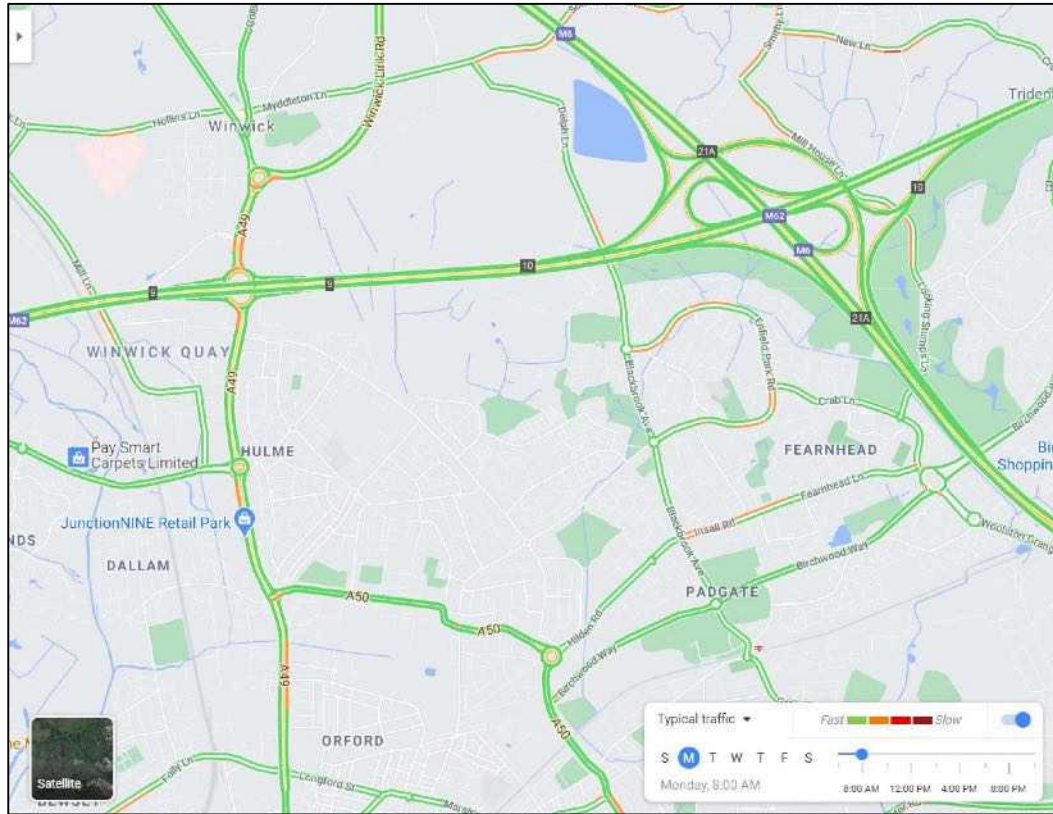
DATE: 28/09/2020

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8. 17:00 Live Weather Screenshot

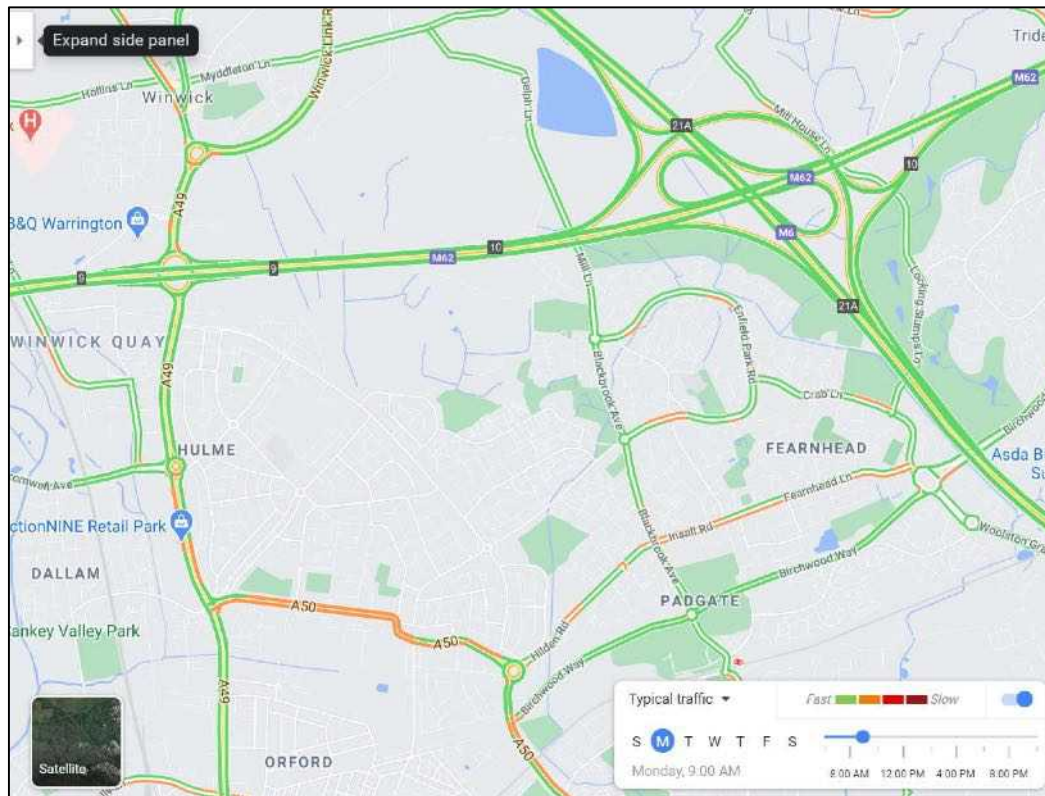
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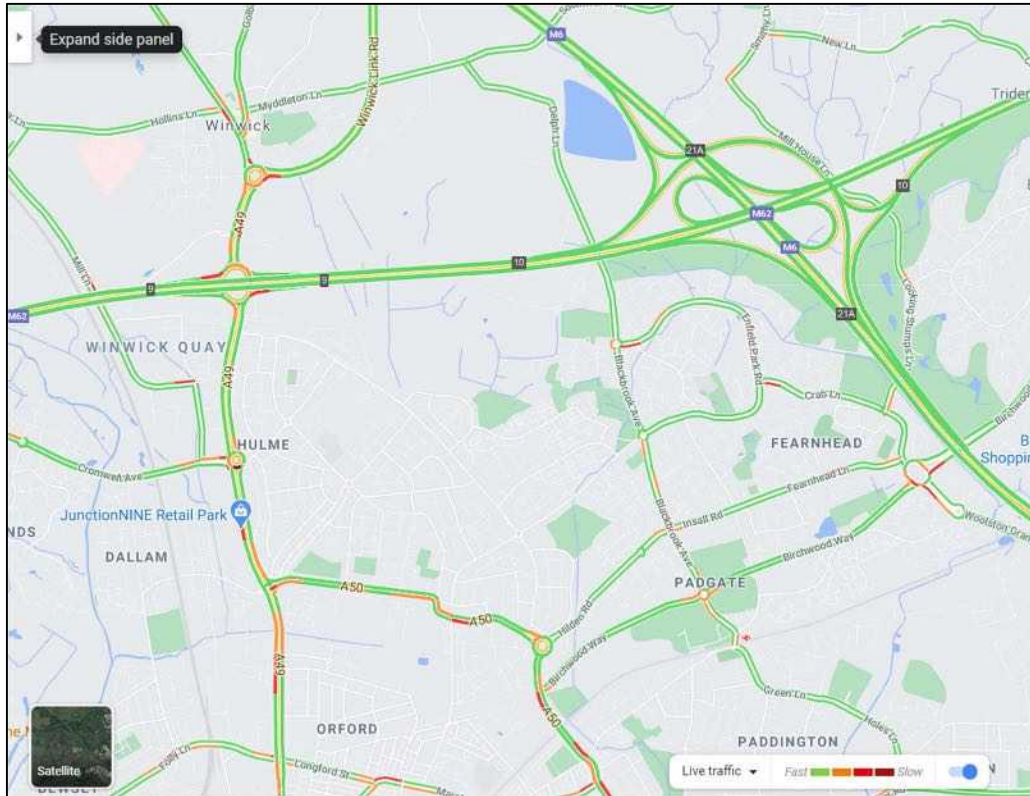
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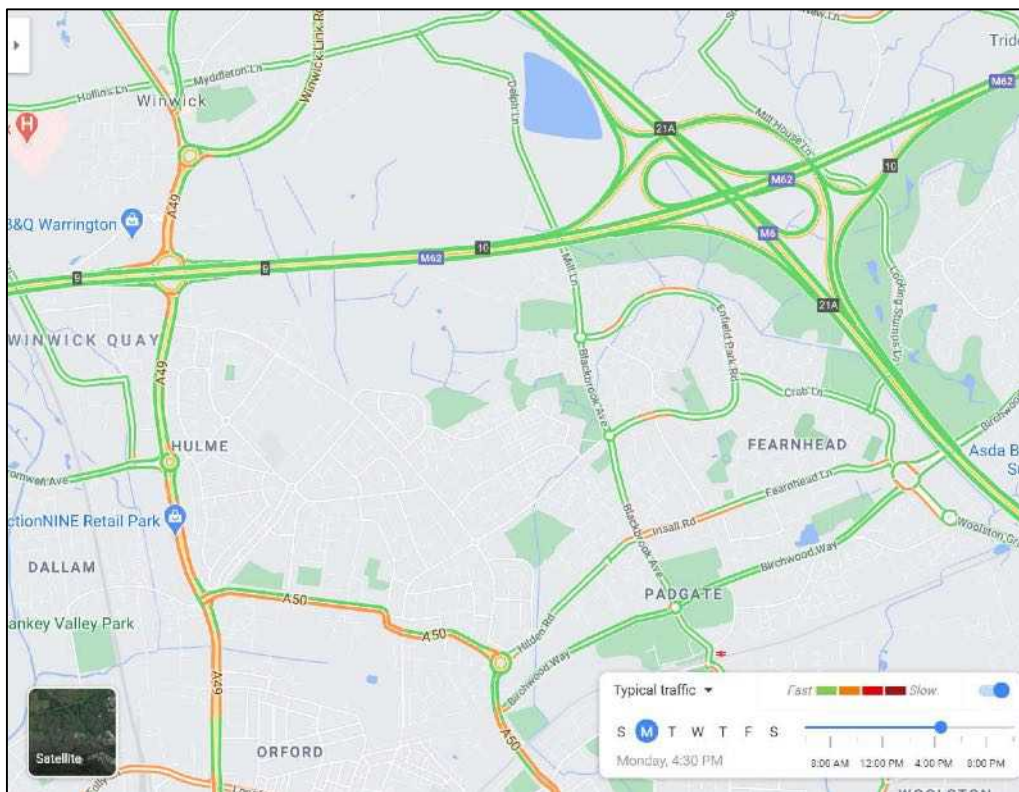
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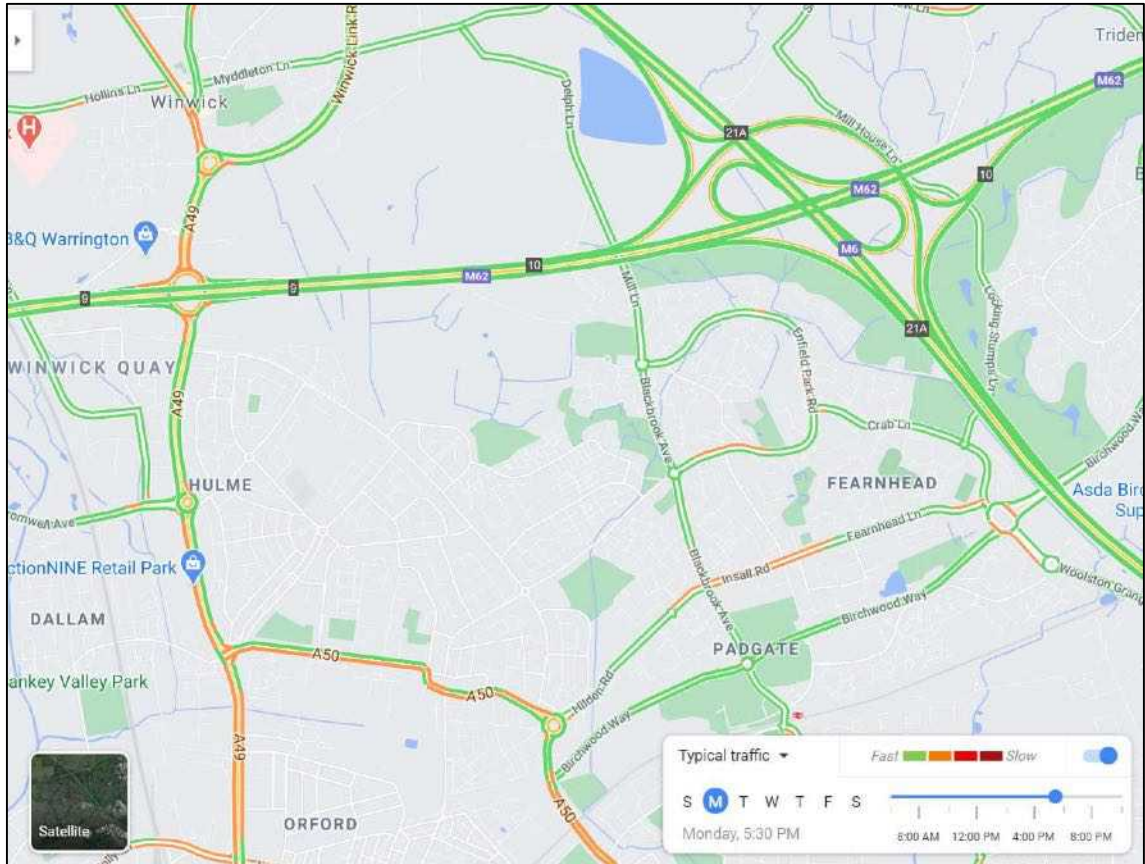
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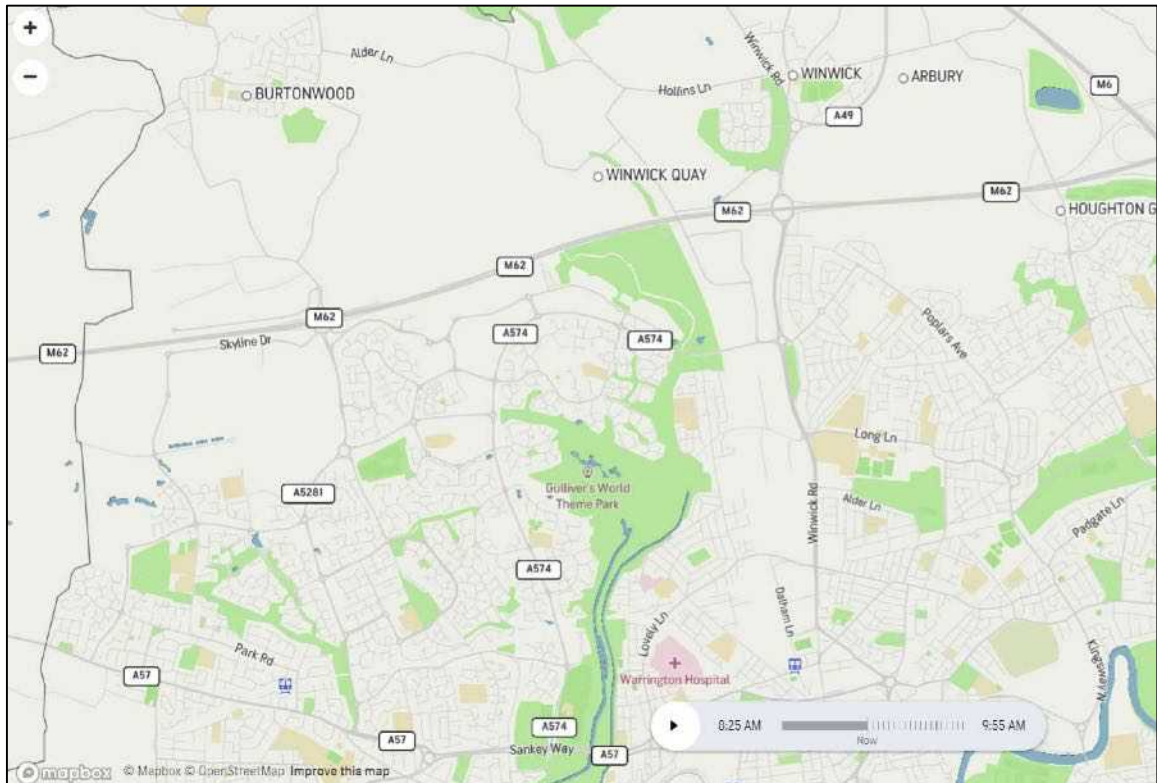
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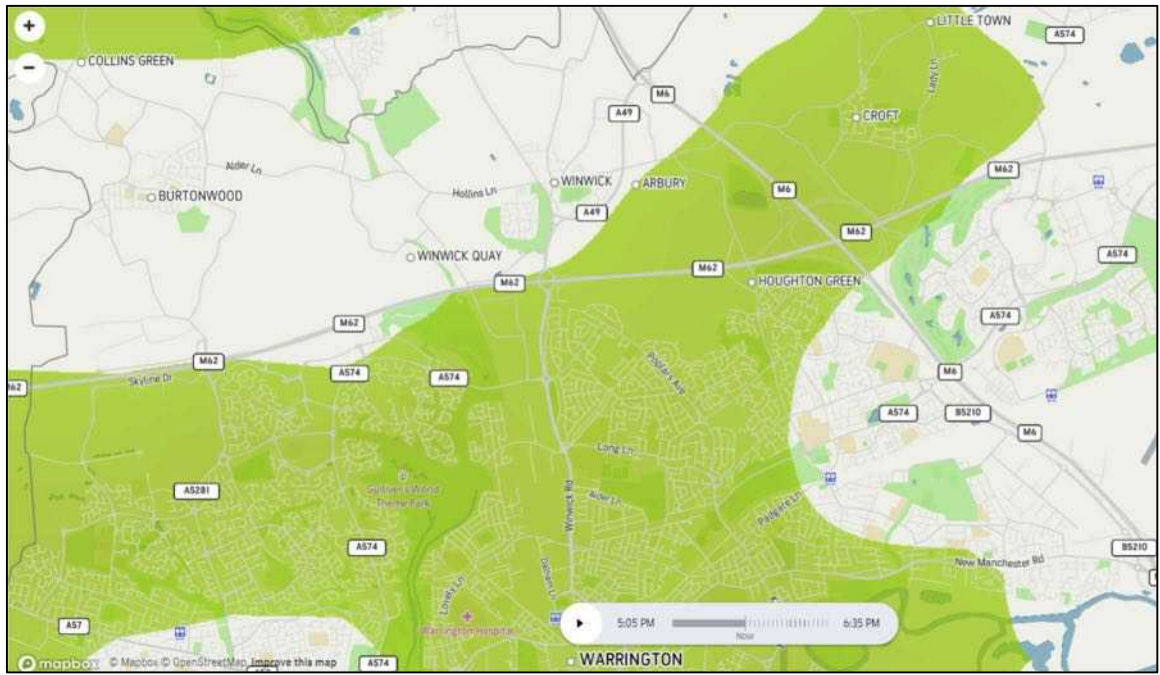
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7. 08:30 Live Weather Screenshot



8. 17:00 Live Weather Screenshot



TECHNICAL NOTE

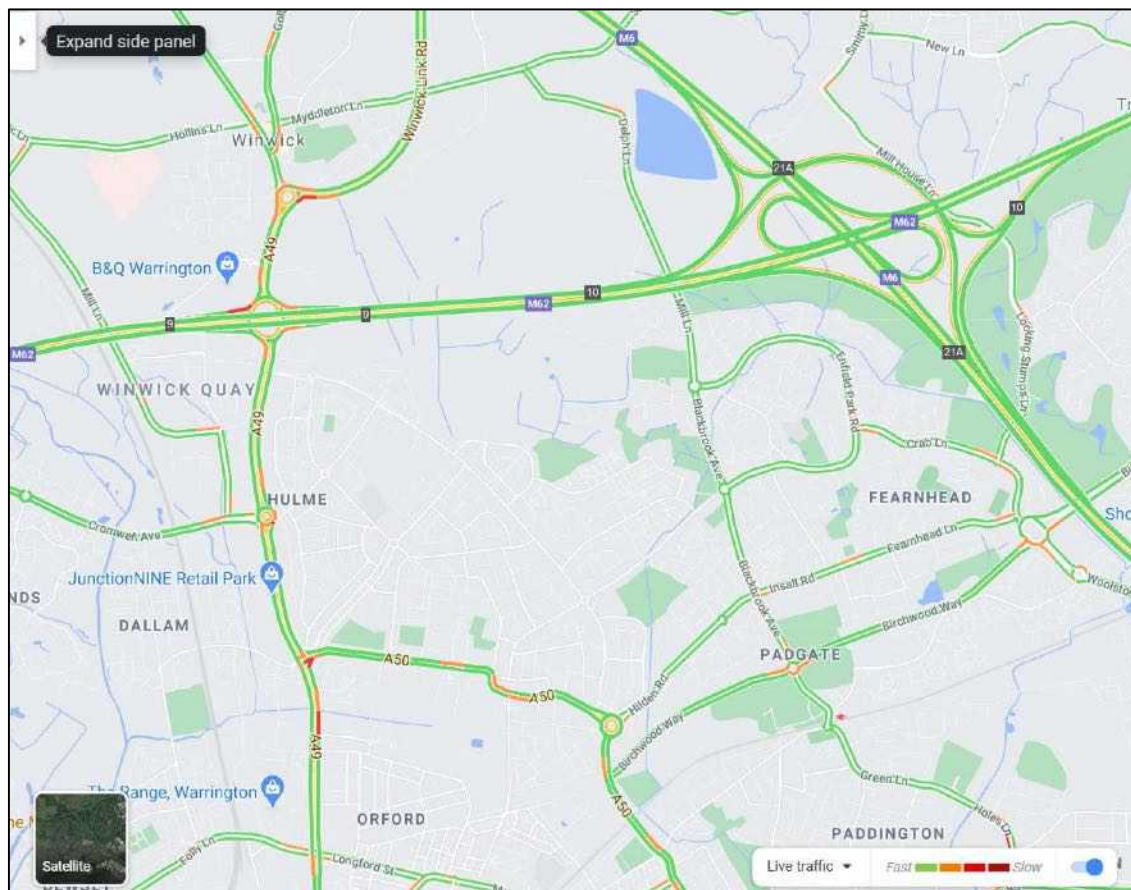
PROJECT: Peel Hall, Warrington

REPORT: 1901/TN/28

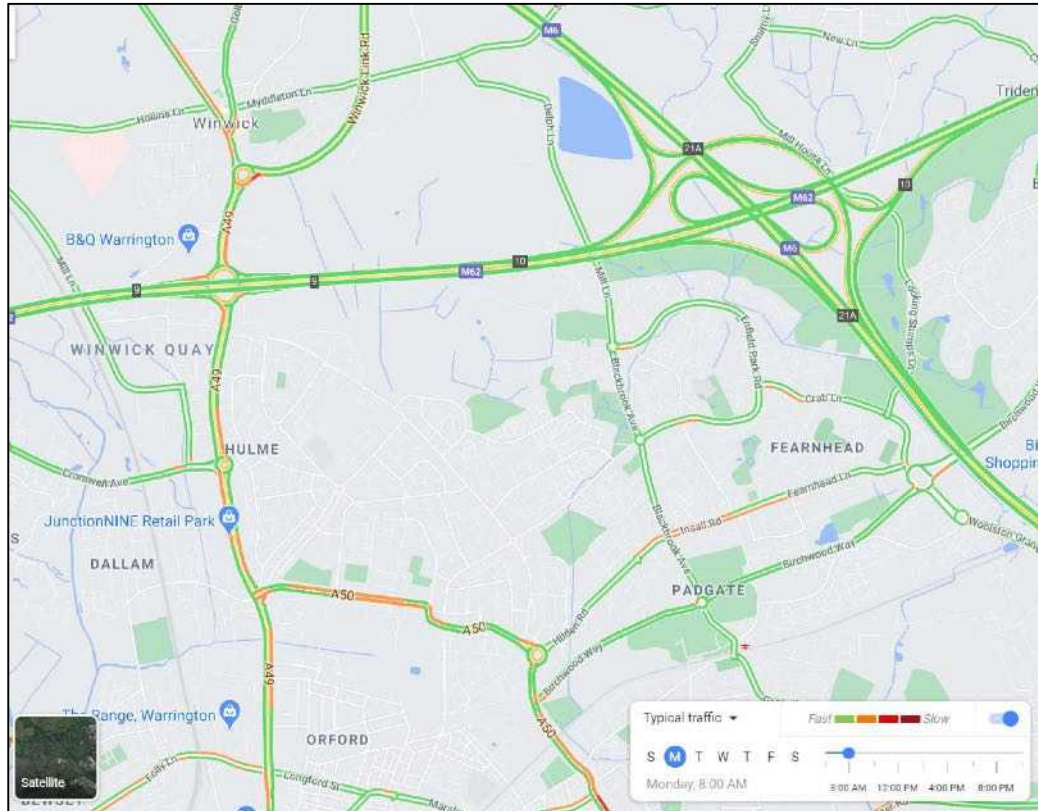
DATE: 18/01/2021

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8. 17:00 Live Weather Screenshot

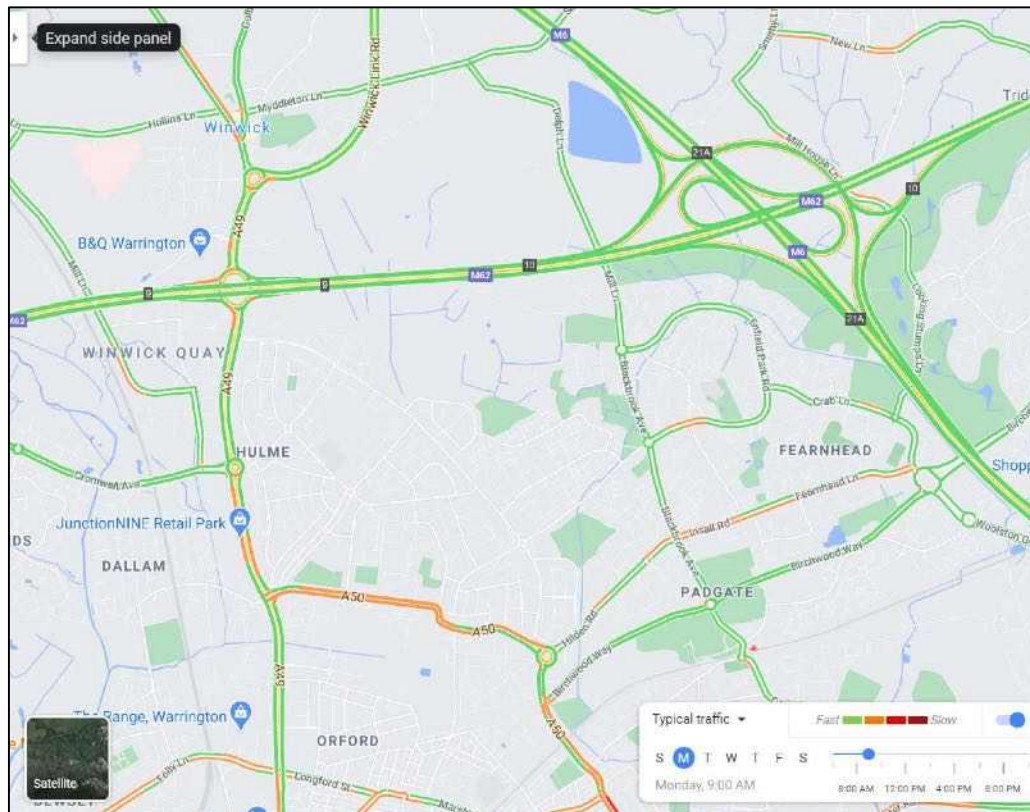
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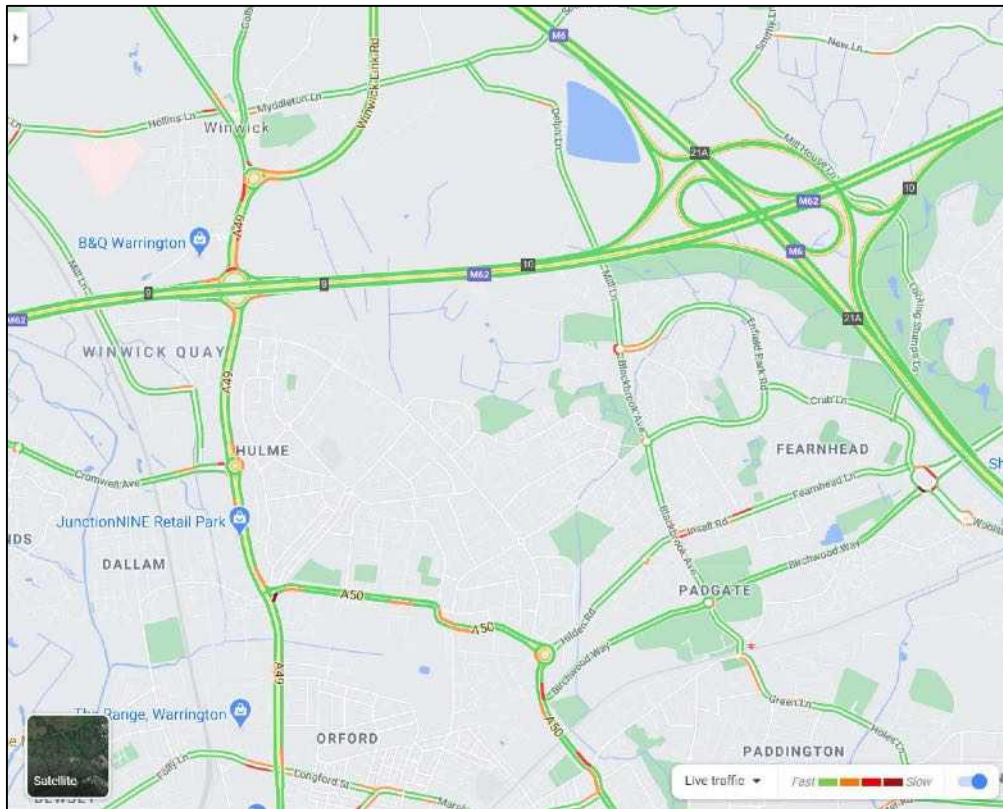
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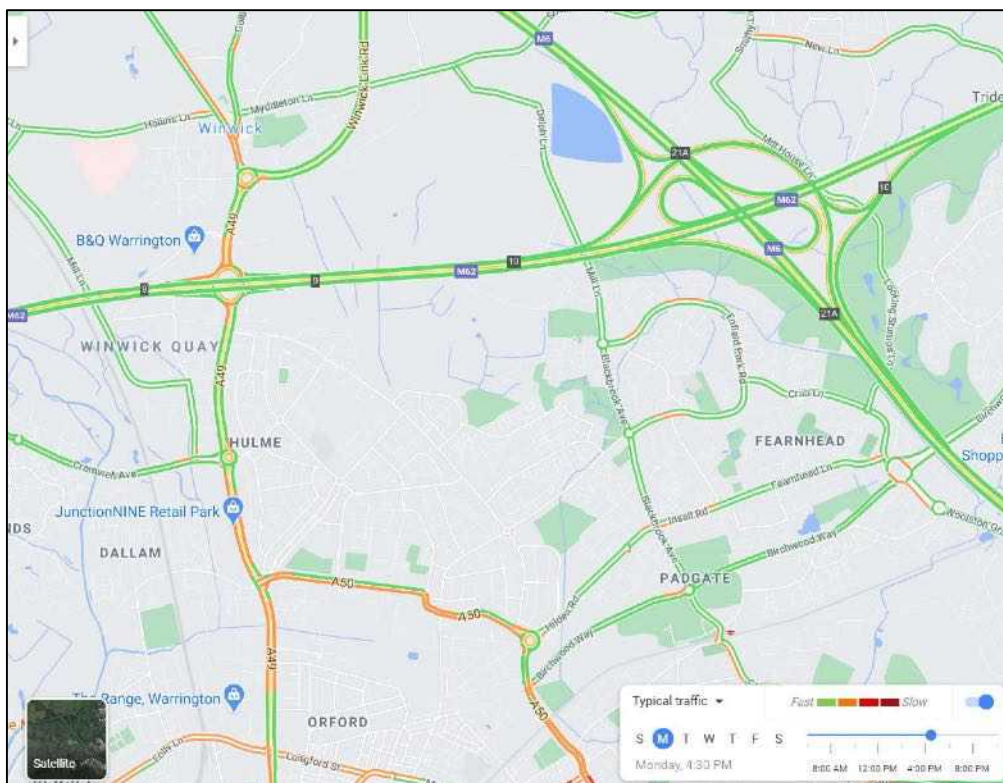
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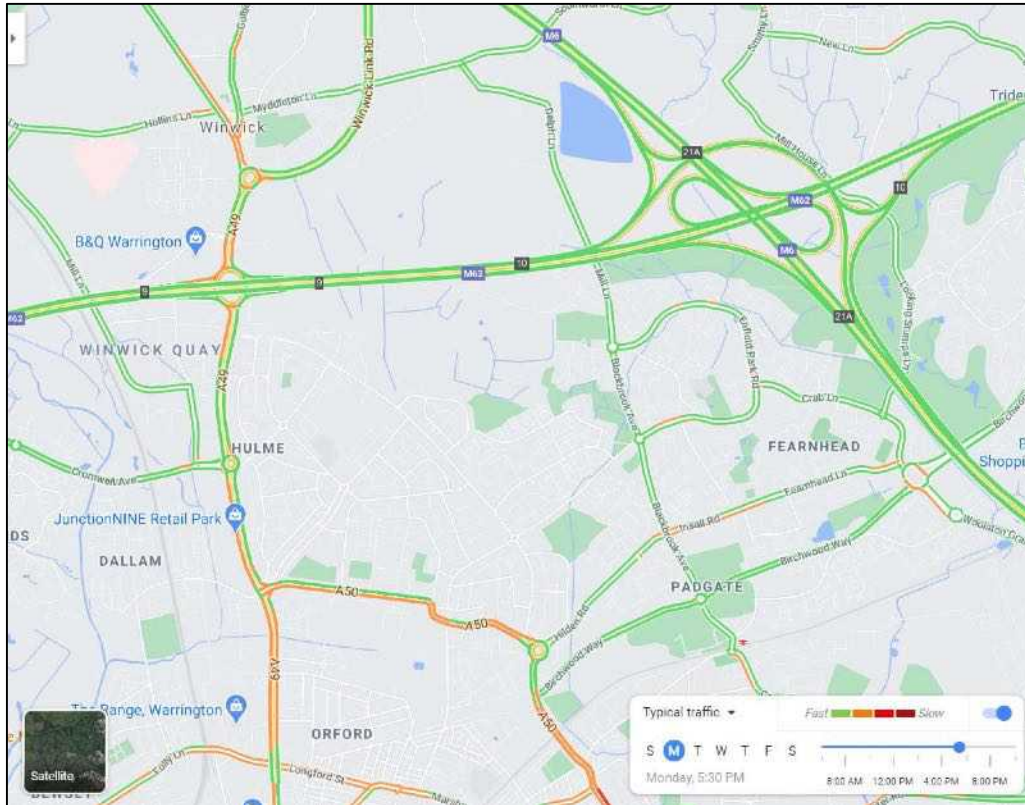
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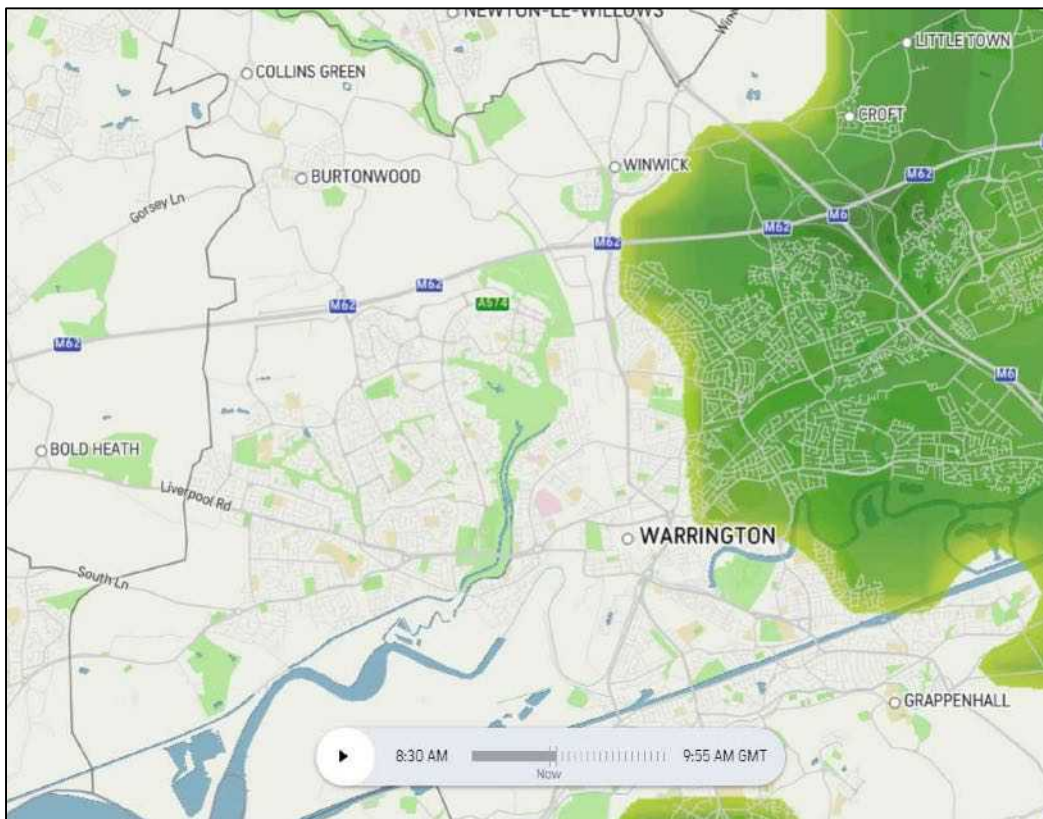
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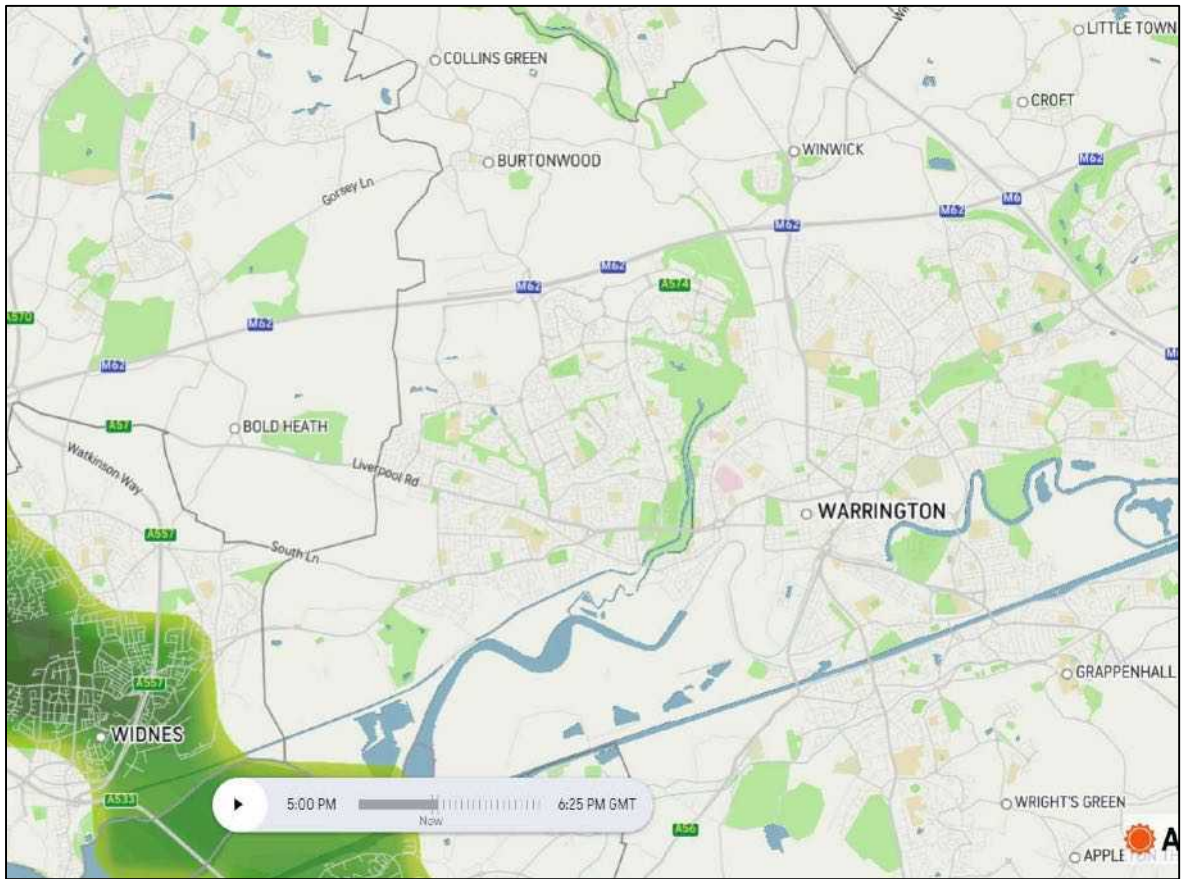
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7. 08:30 Live Weather Screenshot



8. 17:00 Live Weather Screenshot



TECHNICAL NOTE

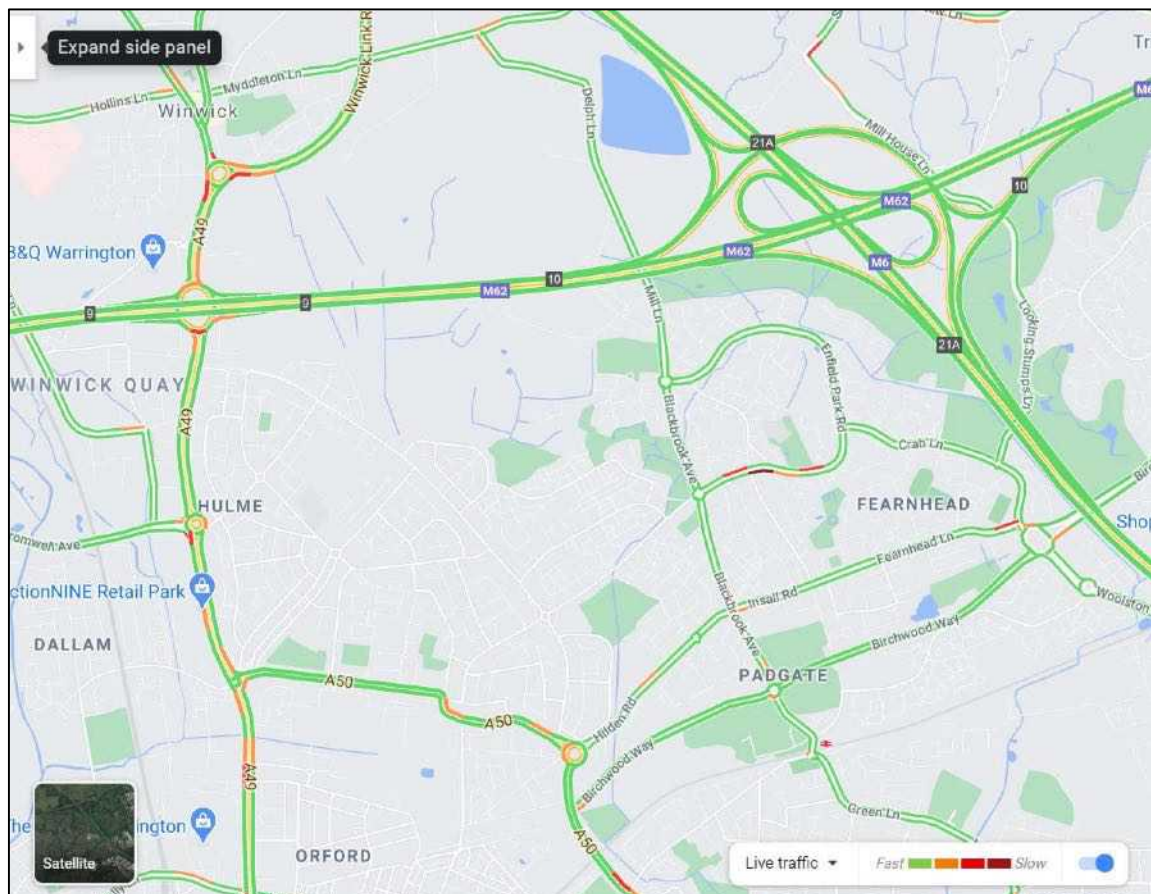
PROJECT: Peel Hall, Warrington

REPORT: 1901/TN/28

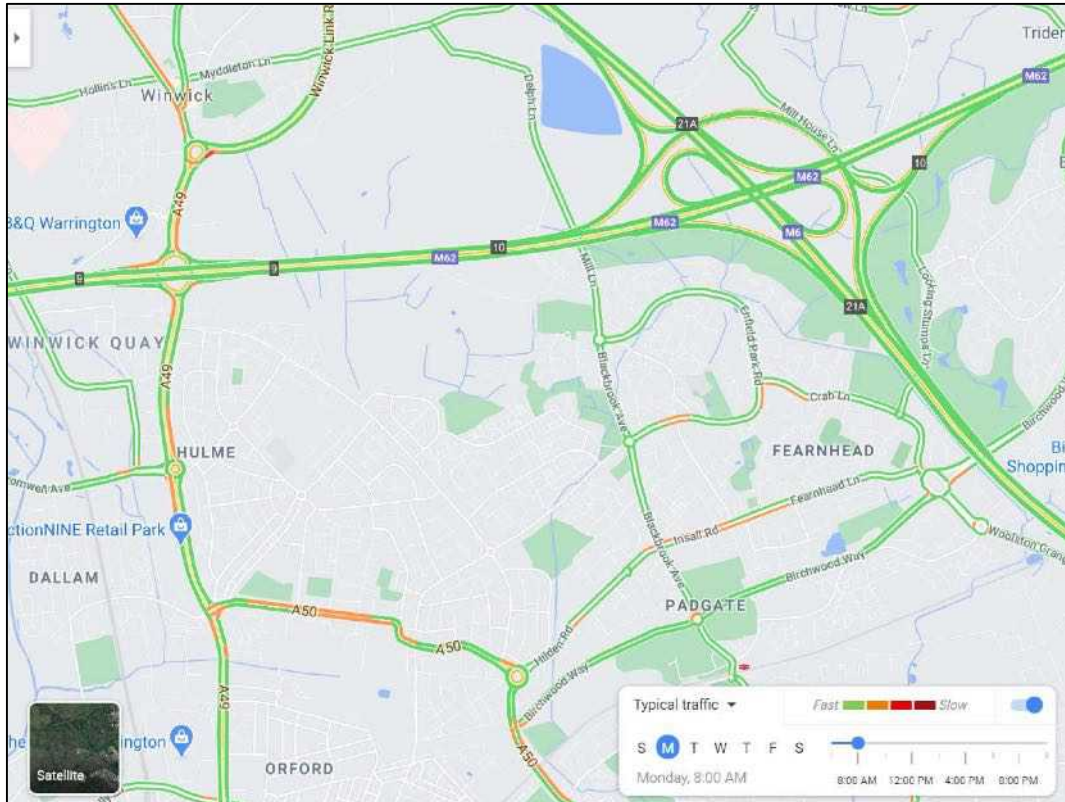
DATE: 29/01/2021

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7. 08:30 Live Weather Screenshot
8. 17:00 Live Weather Screenshot

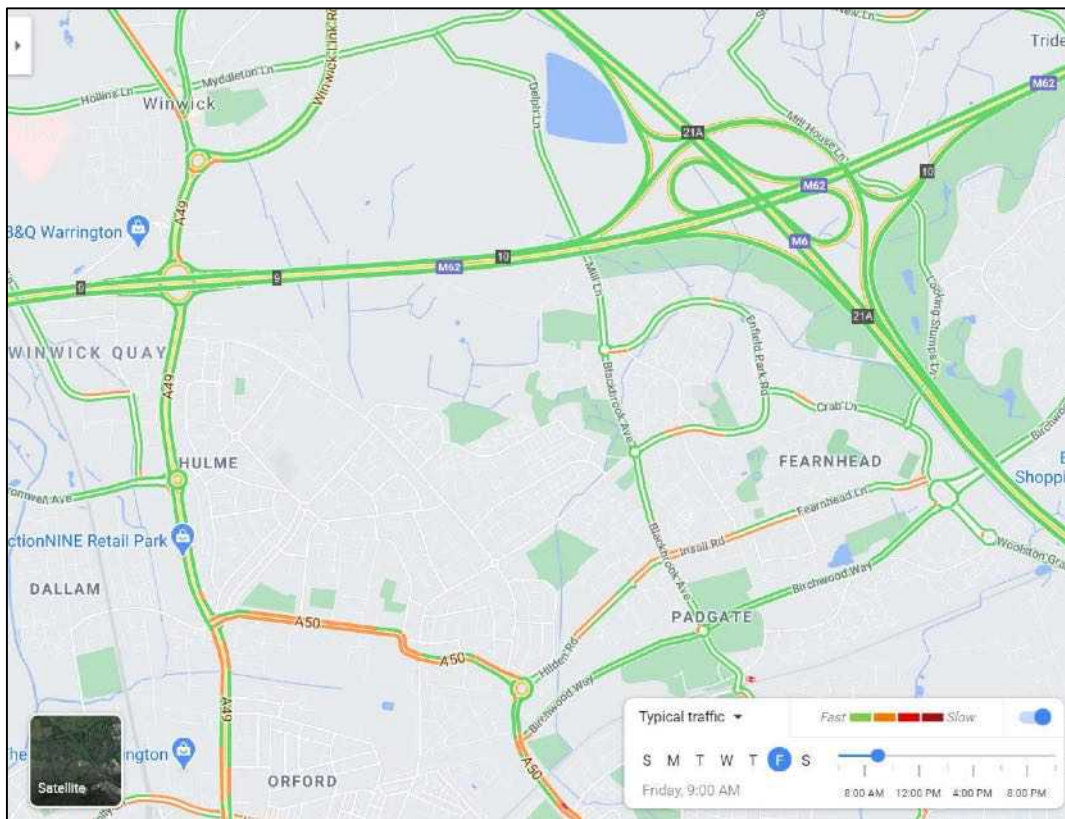
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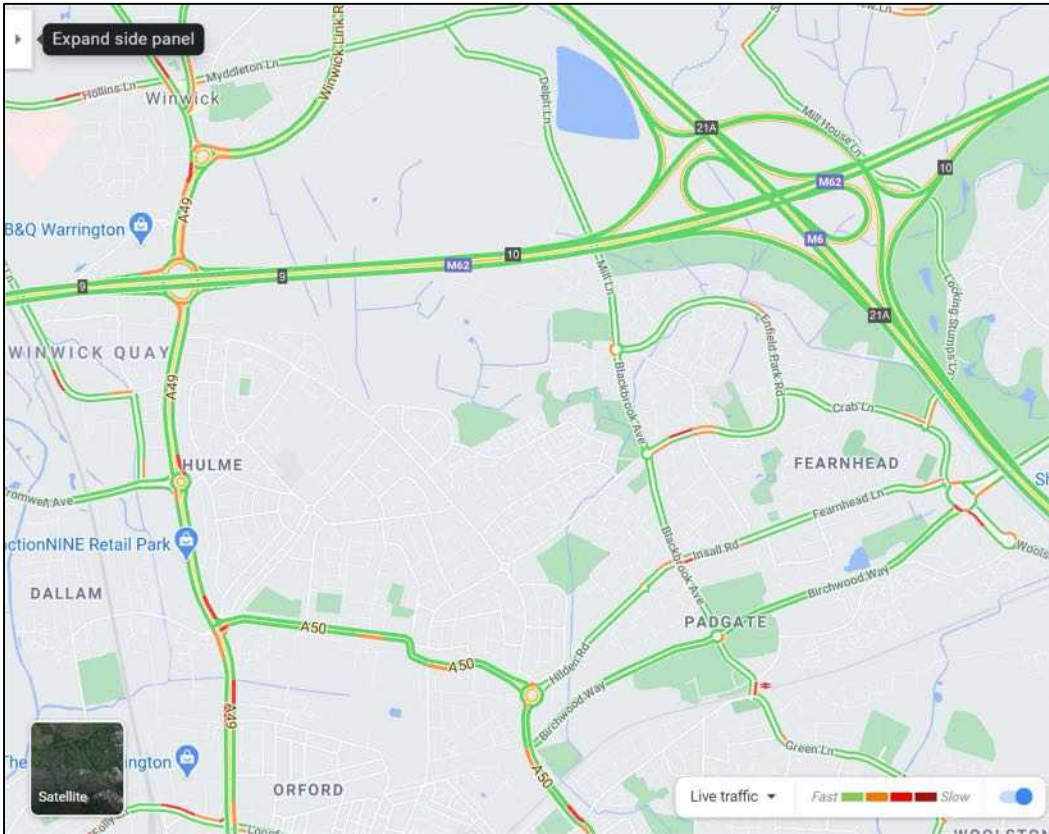
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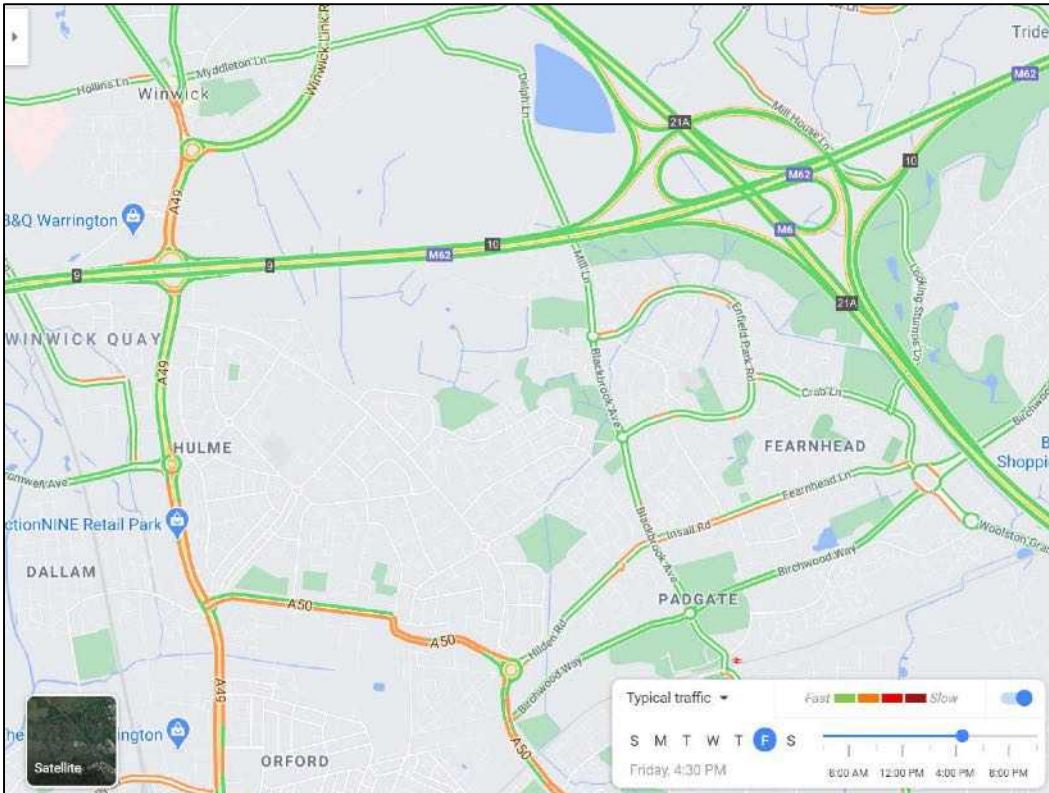
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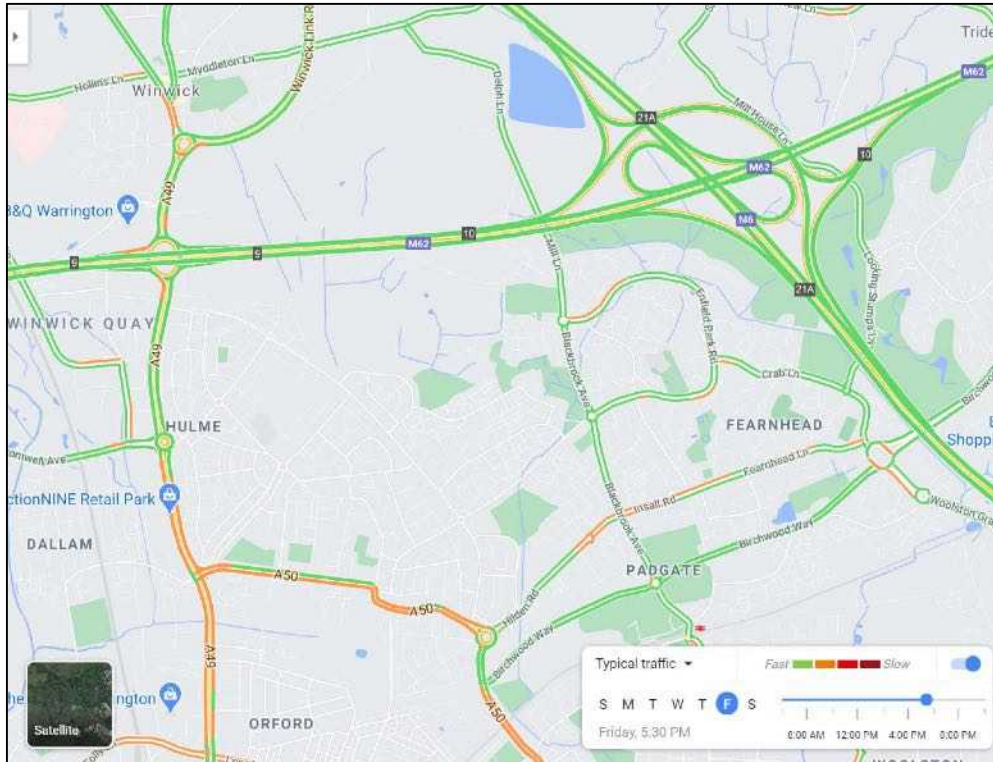
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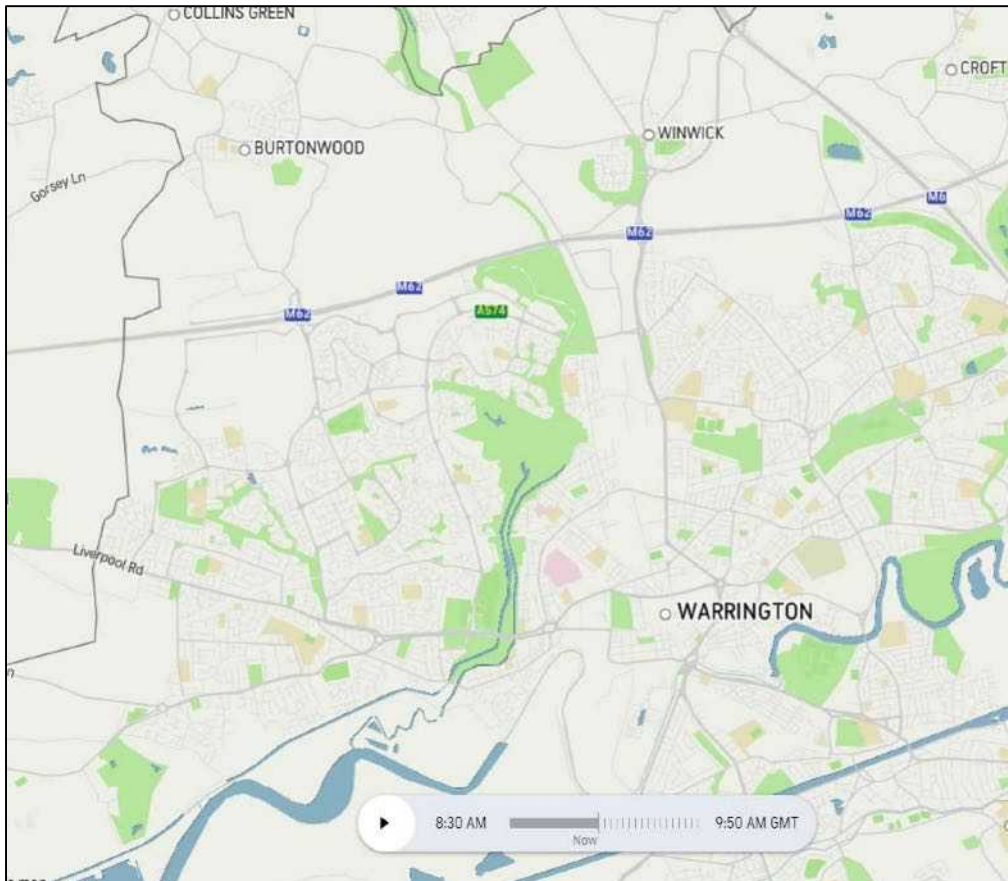
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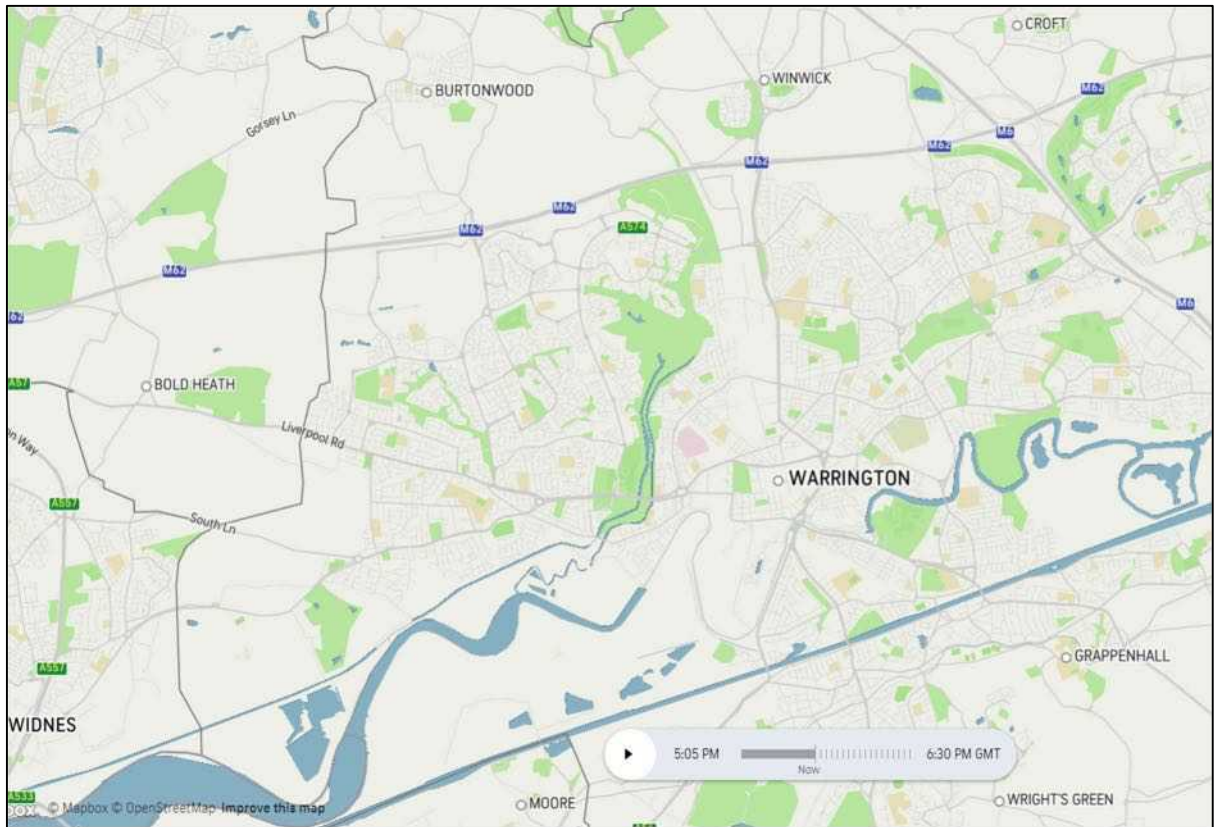
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7. 08:30 Live Weather Screenshot



8. 17:00 Live Weather Screenshot



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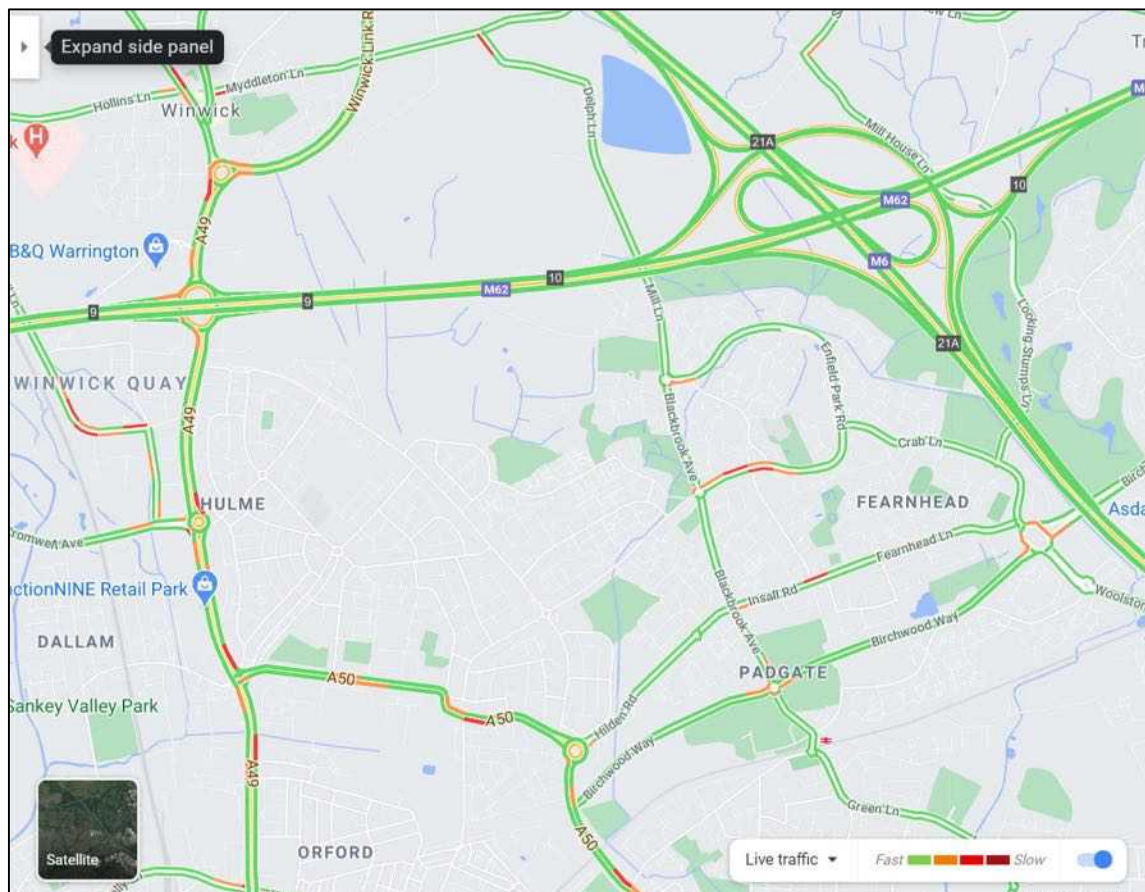
PROJECT: Peel Hall, Warrington

REPORT: 1901/TN/28

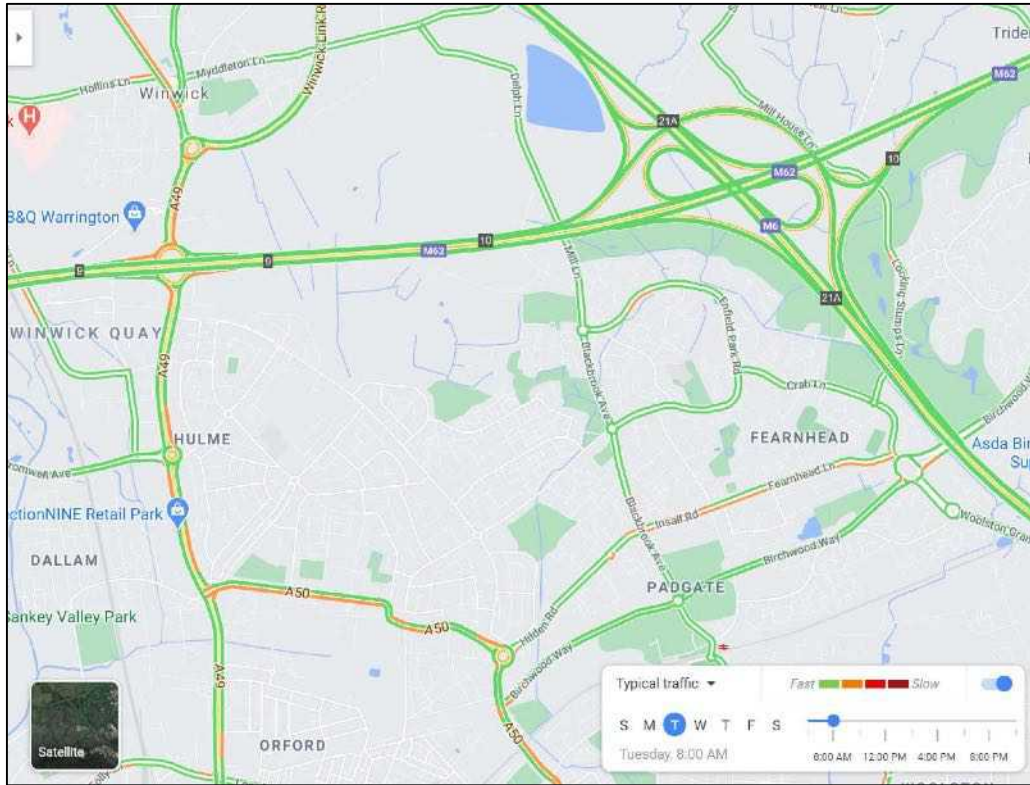
DATE: 02/02/2021

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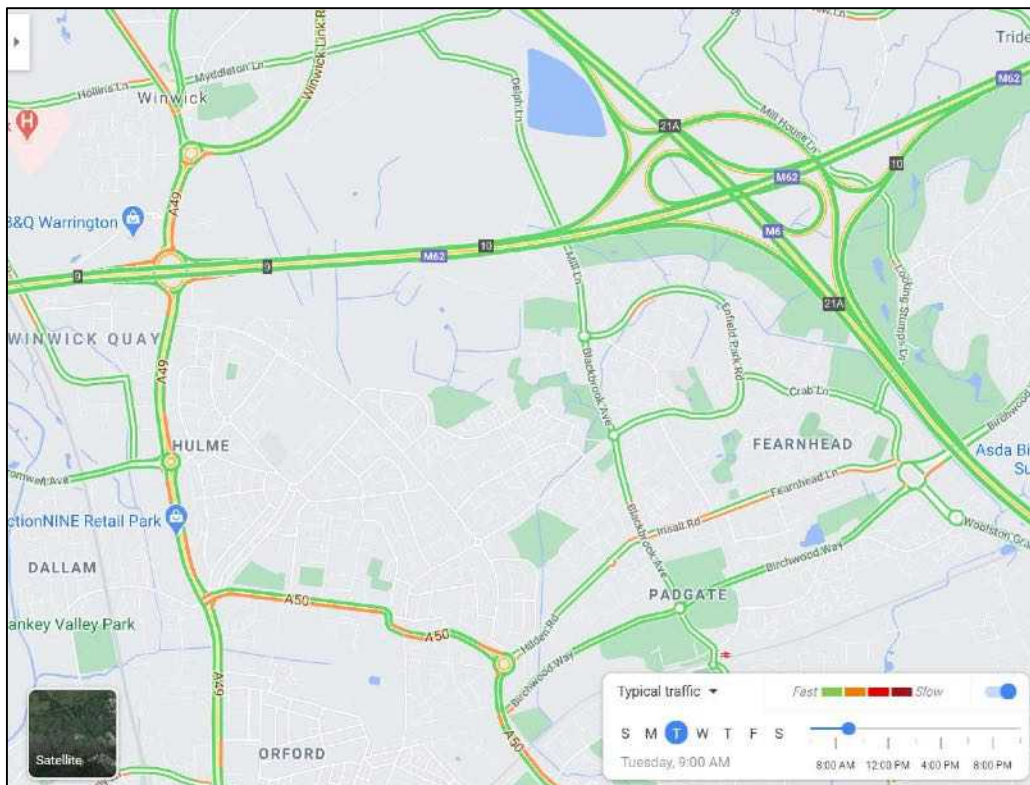
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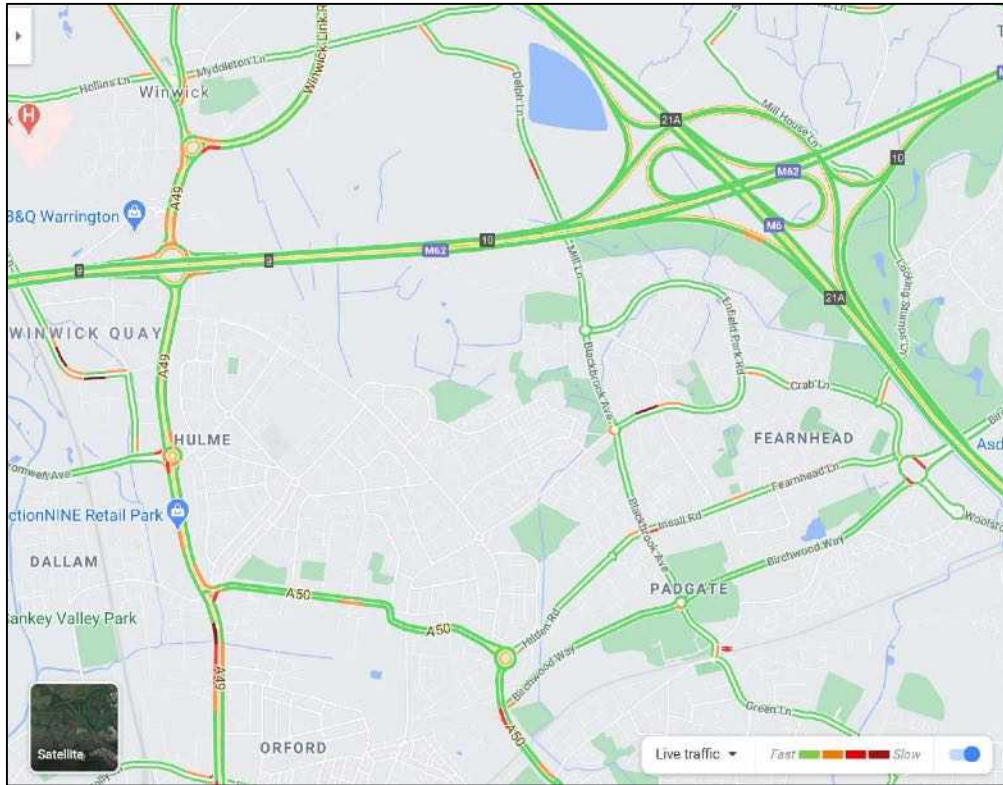
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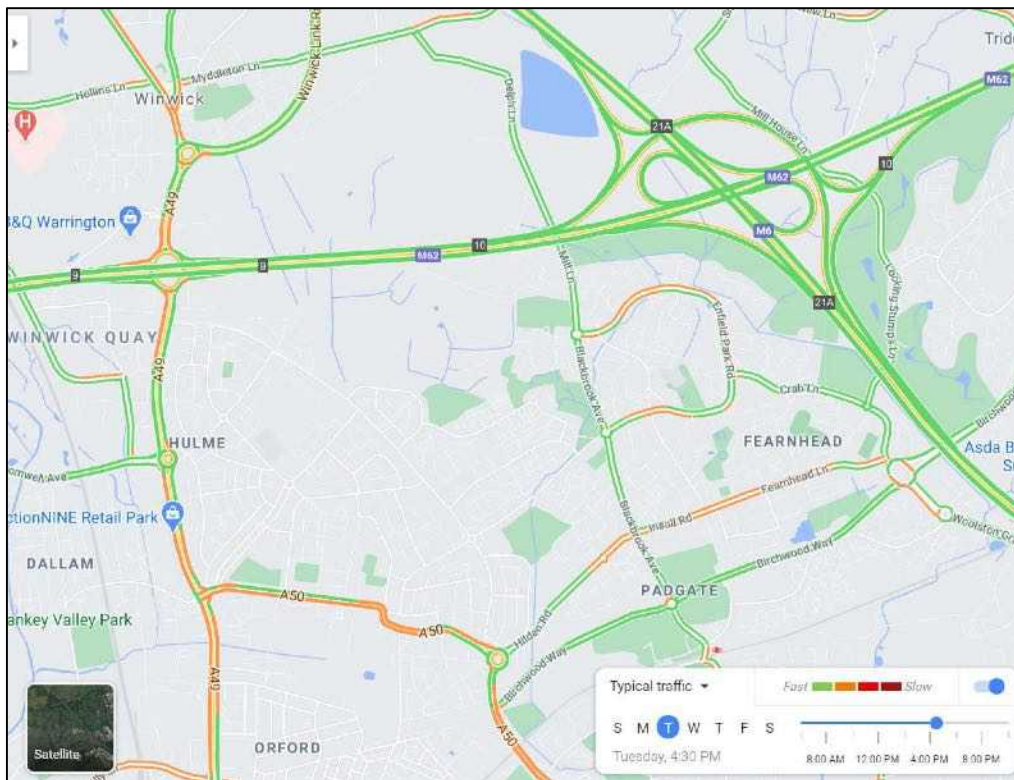
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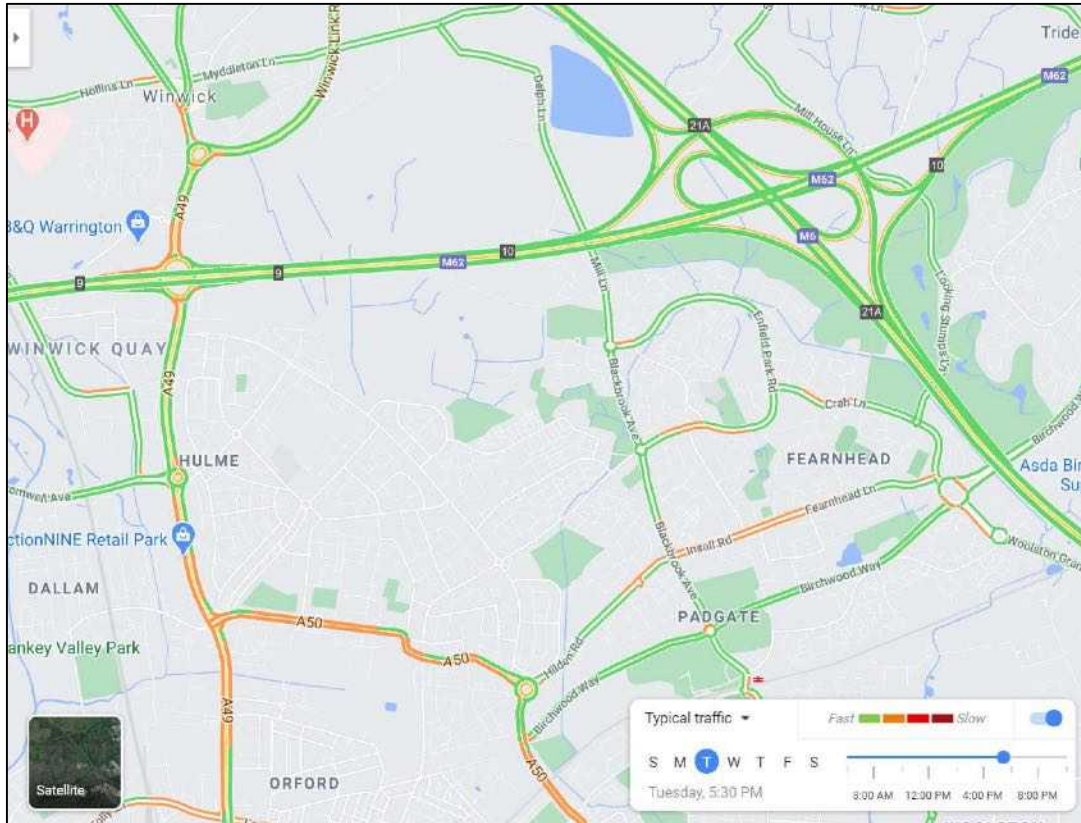
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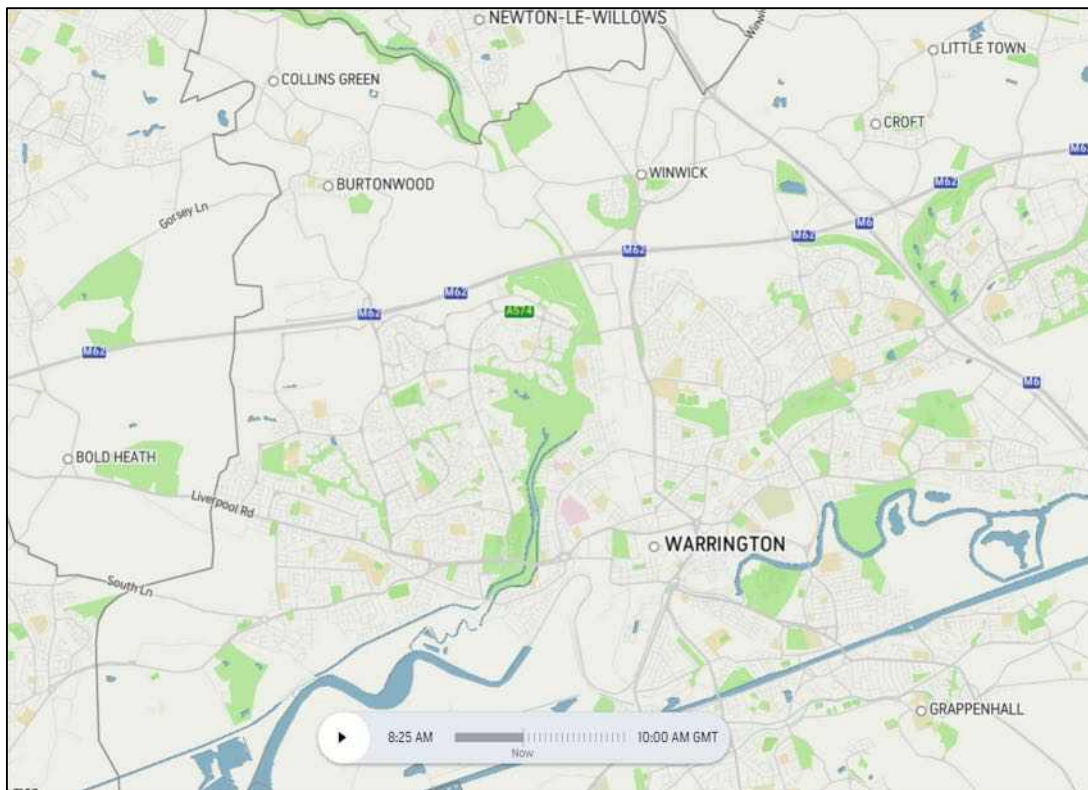
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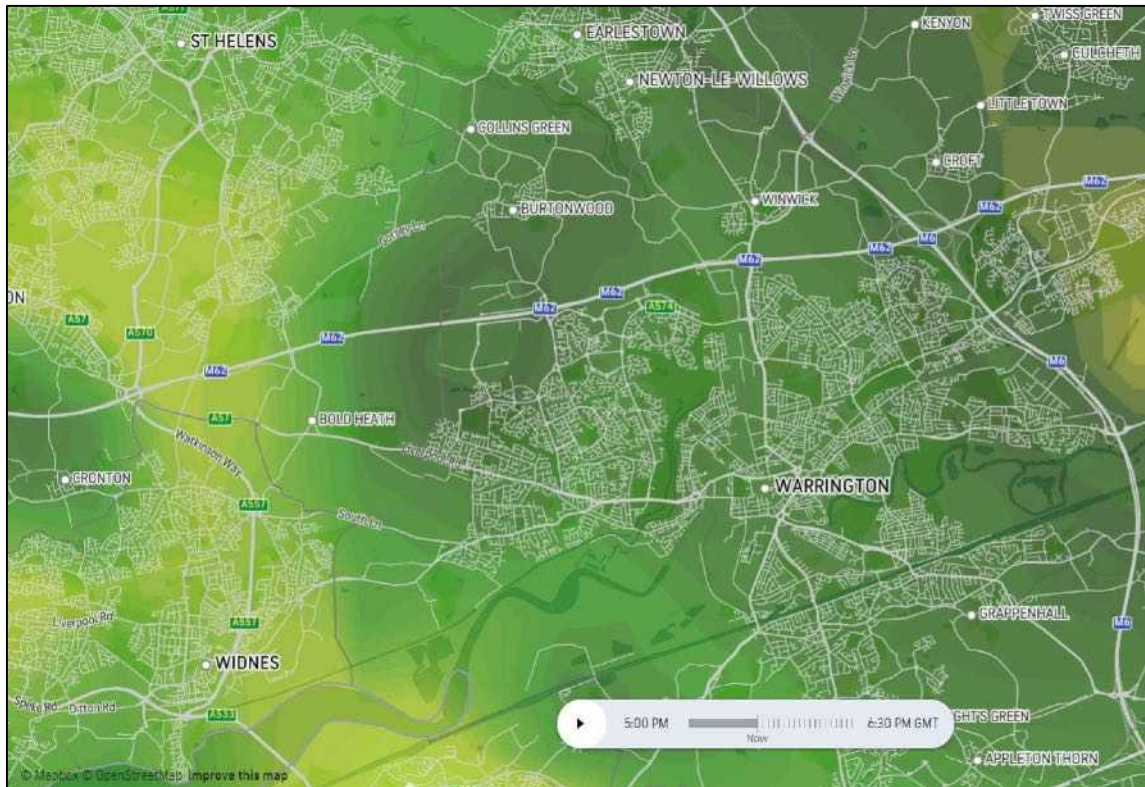
6. 17:30 Retrospective Screenshot



7. 08:30 Live Weather Screenshot



8. 17:00 Live Weather Screenshot



APP40 -
DC 2012.20795_Highways Comments_Additional

Town and Country Planning Act 1990

Mr Keith Jones,
Steven Abbott Associates
Broadsword House
North Quarry Business Park
Appley Bridge
Wigan
Lancashire
WN6 9DB

Professor Steven
Broomhead
Interim Chief
Executive

Peter Taylor
Assistant Director
Development & Public
Protection

New Town House
Buttermarket Street
Warrington
WA1 2NH

Application for Full Planning Permission NOTICE OF DECISION ON PLANNING APPLICATION Application Number: 2012/20795

PROPOSAL:	Proposed construction of a supermarket, two retail units, a drive-thru restaurant and a public house together with the formation of new vehicular site access and pedestrian access points, car parking, servicing and landscaping.
LOCATION:	Site of Former Leisure Centre, Chiltern Road, WARRINGTON, WA2 9SX
DECISION:	THE BOROUGH COUNCIL HAS DECIDED TO GRANT PERMISSION SUBJECT TO THE FOLLOWING CONDITION(S);

CONDITION(S)

- 1) Prior to first occupation of the development, a scheme for the removal of redundant vehicular access points on Sandy Lane West and Chiltern Road and their reinstatement as footway shall be submitted to and agreed in writing with the Local Planning Authority. Such scheme as is agreed shall be implemented prior to first occupation of the development.
- 2) Prior to first occupation of the development, the car and cycle parking spaces shown on the approved drawings shall be provided and shall be retained thereafter unless otherwise agreed in writing with the Local Planning Authority.
- 3) Prior to the commencement of the development hereby approved, a scheme/details shall be submitted to and agreed (in writing) with the Local Planning Authority to enable the Local Highway Authority to provide temporary traffic management signage, Keep Clear markings and parking prohibitions on Sandy Lane West, and parking prohibitions on Toll Bar Road. The development shall thereafter accord with

approved details.

- 4) Prior to the commencement of the development, a scheme of traffic signal improvements and signal timing changes at the Winwick Road / Sandy Lane West / Cromwell Avenue junction shall be submitted to and agreed in writing with the Local Planning Authority. The agreed scheme of traffic signal improvements and signal timing changes shall be implemented prior to first occupation of the development.
- 5) The development must be begun not later than three years from the date of this permission.
- 6) The development hereby approved shall be carried out entirely in accordance with following submitted plans and specifications:
 - supermarket elevations ref. 12007 – 102 rev A
 - supermarket floor plans ref. 12007 - 101
 - coffee shop elevations ref. 12007 – 104 rev B
 - coffee shop floor plans ref. 12007 – 103 rev B
 - pub elevations 4673 / 12
 - pub floor plans 4673 / 10
 - retail units elevations ref. 12007 – 115
 - retail units floor plans ref. 12007-114
 - site access arrangements ref. 023-01/GA-03 rev D
 - Track Plot Analysis 023-01/ATR-07
 - site plan ref. 12007-100 rev J
 - landscaping scheme ref. 1531 04 rev. G and 1531 03 rev. I
 - acoustic fencing scheme ref. 12007-108 rev. A
 - signage tower 12007 – 107 rev. A
- 7) Prior to the commencement of use of each building hereby approved, the approved car and cycle parking spaces shall be laid out in accordance with the approved details and retained thereafter unless otherwise agreed in writing with the Local Planning Authority.
- 8) Prior to the construction of each building, samples of the materials to be used in the construction of the external surfaces of the building shall be submitted to and approved in writing by the Local Planning Authority. The development shall thereafter accord with approved details
- 9) The approved landscaping scheme, shall be implemented no later than the first planting season or seeding seasons following the completion of the development. Any trees or plants / grassed areas which within a period of 5 years from the date of planting die, are removed or become seriously damaged or diseased shall be replaced in the next planting season with others of similar size, and species or quality,

unless the Local Planning Authority gives written consent to any variation.

- 10)** The approved acoustic fencing scheme shall be implemented prior to the commencement of use of any building on the site, and shall be retained at all times thereafter unless an alternative fencing scheme is approved in writing with the Local Planning Authority.
- 11)** The development hereby approved shall not be implemented until an energy statement had been submitted to and approved by the local planning authority. The statement shall set out the energy saving/carbon reduction measures to be incorporated into the construction of the approved buildings. The development shall be built in accordance with the approved energy statement.
- 12)** Prior to the erection of external lighting / floodlights, details of the level of illumination, angling and cowling of the light sources shall be agreed in writing with the Local Planning Authority. The agreed scheme shall be implemented in full prior to the use of the lighting commencing and retained thereafter.
- 13)** Prior to the commencement of use of any building hereby approved, details of acoustic insulation shall be submitted to and agreed in writing with the Local Planning Authority. This shall be in accordance with the Cheshire Environmental Associates Acoustic Report (CEA 977 dated 26/11/2012), i.e. a maximum noise level for external plant and equipment of 34dB (A) Leq (5 mins) @ 10 metres distance.
- 14)** A scheme for protective tree fencing shall be implemented prior to the commencement of development to protect all trees shown to be retained on the approved drawings. The tree protection fencing shall be erected prior to the start of construction work and remain in place for the duration of the works with no excavations, stockpiling or mixing of aggregates undertaken within the crown spread of any retained tree.
- 15)** The development hereby permitted shall not be commenced until such time as a scheme to limit the surface water runoff generated by the proposed development has been submitted to and approved in writing by the Local Planning Authority.
- 16)** The development hereby permitted shall not be commenced until such time as a scheme to manage the risk of flooding from overland flow of surface water has been submitted to

and approved in writing by the Local Planning Authority.

- 17) Unless otherwise agreed with the Local Planning Authority, development works of any kind shall not begin until the following requirements have been undertaken to the satisfaction of the Local Planning Authority and written approval to commence development works has been issued by the Local Planning Authority. All requirements to be completed in accordance with the following guidance references: CLR11 (Environment Agency/DEFRA, 2004); BS10175 (British Standards Institution, 2011); C665 (CIRIA, 2007).

A: Characterisation: With specific consideration to human health, controlled waters and wider environmental factors, the following must be provided (as required) to fully characterise the site in terms of potential risk to sensitive receptors:

- o Preliminary Risk Assessment (PRA or Desk Study)
- o Intrusive Site Investigation
- o Generic Quantitative Risk Assessment (GQRA)
- o Detailed Quantitative Risk Assessment (DQRA)
- o Remedial Options Appraisal

PRA is the minimum requirement. DQRA only to be submitted if GQRA findings require it. The investigation(s) and risk assessment(s) must be undertaken by competent persons and all findings must form the subject of a written report.

B: Submission Of A Remediation & Verification Scheme: If required by Section A, a remediation scheme must be agreed with the Local Planning Authority to ensure the site is suitable for the intended use and mitigate risks to human health, controlled waters and environmental receptors. Proposals should be derived from the Remedial Options Appraisal and form the subject of a written Remediation & Verification Strategy Report, detailing proposed remediation measures/objectives and how proposed remedial measures are to be verified / validated. All must be agreed in writing with the Local Planning Authority.

- 18) Unless otherwise agreed with the Local Planning Authority occupancy or use of the development shall not be permitted until the following requirements have been satisfied and discharged by the Local Planning Authority. All requirements to be completed in accordance with the following guidance references: CLR11 (Environment Agency/DEFRA, 2004); BS10175 (British Standards Institution, 2011); C665 (CIRIA,

2007).

A: Remediation & Verification: The remediation scheme approved by the Local Planning Authority shall be carried out in accordance with the agreed Remediation Strategy and remedial works shall be verified in accordance with the agreed Verification Strategy. Following completion of all measures, a Verification/Validation/Completion Report must be produced and submitted to the Local Planning Authority for approval.

B: Reporting Of Unexpected Contamination: Unexpected or previously-unidentified contamination encountered during development works must be reported immediately to the Local Planning Authority and works halted within the affected area. Contamination must then be characterised by intrusive investigation and risk assessment reporting, with remediation/verification measures (if required) being agreed with the Local Planning Authority. An updated Remediation & Verification Strategy Report must then be submitted to the Local Planning Authority for approval and procedures followed as per Section A of this Condition.

C: Long-Term Monitoring & Maintenance: If required as part of the agreed remediation scheme, monitoring and/or maintenance of remedial measures may be required to be carried out post-completion of development works and in accordance with the 'Model Procedures for the Management of Land Contamination' (Ref: CLR11) guidance document, published by DEFRA and the Environment Agency. Following completion of all works, findings must form the subject of a written report and be submitted to the Local Planning Authority for approval.

- 19) Cooking equipment installed within any building hereby approved shall have an associated air extraction and filtration system details of which shall be submitted to and approved by the Local Planning Authority prior to its installation.
- 20) Development shall not commence until a scheme outlining the means of delivering a local employment agreement have been submitted to and approved in writing by the Local Planning Authority. Details within the scheme shall be implemented and maintained thereafter, unless the local planning authority gives written approval to any variation.
- 21) Deliveries to and waste collection from the development hereby approved shall only take place between the following hours:

- Supermarket: 06:00 to 23:00 hours Monday to Sunday
- Public House: 07:00 to 18:00 hours Monday to Sunday
- Drive Thru Cafe and Other Retail Units: 06:30 to 20:00 Monday to Saturday and 07:30 to 18:00 on Sundays

- 22) The development hereby approved shall only be open to members of the public between the following hours:
- Supermarket: 08:00 to 22:00 hours Monday to Saturday and 10:00-17:00 on Sundays
 - Public House: 11:00 to 24:00 Sunday to Thursday and 11:00 to 01:00 on Friday and Saturday
 - Drive Thru Cafe and Other Retail Units: 06:00 to 20:30 Monday to Saturday and 06:30 to 20:00 on Sunday
- 23) The recommendations of the Ecological Survey and Assessment (September 2012 - ERAP Ltd Ref: 2012_128) shall be implemented in full prior to the commencement and ongoing duration of construction.
- 24) No building shall be occupied or used until such time as a Green Travel Plan has been submitted to the local planning authority for approval. The plan shall include measures for the management of car use and on-site car parking and a strategy to secure and sustain decreases in car use for travel to, from and at work and increases in car sharing, public transport use, cycling and walking. The Plan shall specify a plan period and contain relevant surveys, reviews and monitoring mechanisms and identify targets, timescales, phasing programme and management responsibilities.
- 25) Prior to first occupation of the development, construction details of the widening of Sandy Hall West/A49 Winwick Road / Cromwell Avenue junction shall be submitted to and agreed in writing by the Local Planning Authority. The approved widening works shall be implemented in accordance with approved details prior to first occupation.
- 26) Prior to first occupation of the development, visibility splays of 2.4m x 42m as shown on the approved drawings shall be provided at the site access onto Sandy Lane West and shall be maintained thereafter. Nothing shall be erected or allowed to grow above 0.6m within the splays unless agreed in writing with the Local Planning Authority.
- 27) No development shall commence until a service delivery scheme has been submitted to the Local Planning Authority for approval. This shall include areas of car park that will not

be used at delivery times and including details of signage (indicating when cars can and cannot park within designated areas). The approved service delivery scheme shall be fully implemented and thereafter retained.

REASON(S) FOR CONDITION(S)

- 1) In order to accord with the UDP car parking standards and in the interests of sustainability and to accord with the NPPF
- 2) In order to accord with Policy QE6 of the Warrington Core Strategy
- 3) In the interests of highway safety and to ensure acceptable traffic movements and to accord with Policy QE6 of the Warrington Core Strategy
- 4) In the interests of highway safety and to accord with Policy QE6 of the Warrington Core Strategy
- 5) To comply with provisions of Section 91 of the Town & Country Planning Act 1990. (As amended by Section 51 of the Planning and Compulsory Purchase Act 2004).
- 6) To ensure a satisfactory development and to avoid any ambiguity as to what constitutes this permission.
- 7) To ensure adequate car and cycle parking provision having regard to the increased floor space of the store. This is in accordance with the following policies of the Warrington UDP: Policy LUT1 Land Use / Transportation Strategy; Policy LUT2 Transport Priorities in Development Control; Policy LUT20 Parking.
- 8) In the interests of visual amenity. This is in accordance with the following policies of the Warrington UDP: Policy DCS1 Development Control Strategy.
- 9) In the interests of visual amenity. This is in accordance with the following policies of the Warrington UDP: Policy DCS1 Development Control Strategy; Policy GRN22 Protection and Enhancement of Landscape Features.
- 10) In the interests of visual amenity and to reduce the noise impact of the development. This is in accordance with the following policies of the Warrington UDP: Policy DCS1 Development Control Strategy; Policy REP10 Noise.
- 11) The application makes reference to measures to be considered to reduce energy demand. It is thus necessary to

clarify what measures are to be carried forward and ensure implementation in order ensure the adoption of suitable energy minimisation, conservation and low carbon energy measures. This is in accordance with the following policies of the Warrington UDP: Policy REP1 The Prudent Use of Resources; Policy DCS1 Development Control Strategy.

- 12) To ensure light proliferation would not be harmful to the living conditions of nearby residential properties. This is in accordance with the following policies of the Warrington UDP: Policy DCS1 Development Control Strategy.
- 13) To ensure externally mounted plant or equipment would not generate noise that would be harmful to the living conditions of nearby residential properties. This is in accordance with the following policies of the Warrington UDP: Policy DCS1 Development Control Strategy; Policy REP10 Noise.
- 14) To ensure minimal disturbance to trees. This is in accordance with the following policies of the Warrington UDP: Policy DCS1 Development Control Strategy; Policy GRN22 Protection and Enhancement of Landscape Features.
- 15) To prevent flooding by ensuring the satisfactory storage / disposal of surface water from the site. This is in accordance with the following policies of the Warrington UDP: Policy DCS1 Development Control Strategy; Policy REP5 Surface Water Run-off and SUDS.
- 16) To reduce the risk of flooding to the proposed development and future users. This is in accordance with the following policies of the Warrington UDP: Policy DCS1 Development Control Strategy; Policy REP5 Surface Water Run-off and SUDS.
- 17) To ensure that risks from land contamination to the future users of the land and neighbouring land are minimised, together with those to controlled waters, property and ecological systems, and to ensure that the development can be carried out safely without unacceptable risks to workers, neighbours and other offsite receptors in accordance with the following policies of the Warrington UDP: Policy REP8 Land Contamination.
- 18) To ensure that risks from land contamination to the future users of the land and neighbouring land are minimised, together with those to controlled waters, property and ecological systems, and to ensure that the development can

be carried out safely without unacceptable risks to workers, neighbours and other offsite receptors in accordance with the following policies of the Warrington UDP: Policy REP8 Land Contamination.

- 19) To prevent proliferation of odours to the local area in accordance with the following policy of the Warrington UDP: Policy REP11 Odours.
- 20) In the interests of social progress and having regard to the sites location outside a designated centre and and the specific economic and regeneration benefits the proposal would bring. This is in accordance with the following policies of the Warrington UDP: Policy SOC1 Social Progress.
- 21) To ensure that deliveries do not occur at times when ambient noise levels are low in the interests of the amenity of any local residents. This is in accordance with the following policies of the Warrington UDP: Policy REP10 Noise.
- 22) To ensure that activity does not occur at times when ambient noise levels are low in the interests of the amenity of any local residents. This is in accordance with the following policies of the Warrington UDP: Policy REP10 Noise.
- 23) In the interests of biodiversity. This is in accordance with the following policies of the Warrington UDP: Policy GRN18 Key Biodiversity Habitats and Priority Species; Policy GRN21 Protection of Nature Conservation Resource.
- 24) To ensure a transport choice is provided in order to comply with the NPPF and saved Policy LUT10 of the Warrington UDP and Policy MP7 of the Warrington Core Strategy.
- 25) In the interests of highway safety and to accord with Policy QE6 of the Warrington Core Strategy
- 26) In the interests of highway safety and to accord with Policy QE6 of the Warrington Core Strategy
- 27) In order that service vehicles can move within the site at ease and to accord with Policy QE6 of the Warrington Core Strategy

INFORMATIVES

- 1) It is necessary to apply for a premises licence for the sale of

alcohol. The Licensing team at WBC will be able to provide advice and guidance on the application process. Licensing can be contacted on 01925 442119.

- 2) The operator of the public house should implement any necessary mitigation measures to reduce the noise of patrons entering and leaving the premises or those smoking outside the premises. The adjacent residential uses may be susceptible from noise from people outside the premises – the applicant and/or landlord may ultimately be responsible for noise from such patrons outside the premises which may cause impacts on amenity or otherwise cause a statutory nuisance.
- 3) The Local Planning Authority has worked positively and proactively with the applicant to ensure that the proposal is an appropriate form of development with significant economic and regenerative benefits, minimal implications for the retail hierarchy, and without any significant impact upon the road network, trees, biodiversity, flood risk or the environment from land quality issues. The proposal was the subject of pre-application discussion and as a result on ongoing negotiation during determination the proposal accords with the development plan. The Local Planning Authority has therefore implemented the requirements in paragraphs 186-187 of the National Planning Policy Framework.
- 4) The applicant is advised to consider the installation of electric vehicle charging points in the proposed car park. The provision of electric charging facilities is being promoted as low emissions vehicular power source, thereby providing a positive contribution to reducing carbon emissions and improving the long term impact on local air quality from transportation.
- 5) Works audible at the site boundary should not exceed the following times unless with the written permission of the Local Planning Authority or Environmental Health & Protection. Monday to Friday 08.00 to 18.00 hrs, Saturday 08.30 to 13.30 and at no time whatsoever on Sundays or Public/Bank Holidays. This includes deliveries to the site and any work undertaken by contractors and sub contractors. Contractors and sub contractors must have regard to BS 5228 and the Control of Pollution Act 1974. Where permission is sought for works to be carried out outside the hours stated, applications in writing must be made with at least seven days notice to Environmental Health & Protection, Warrington Borough Council, New Town House, Buttermarket Street, Warrington, WA1 2HN. Local residents that may be affected by the work shall also be notified in writing, after approval is received from the Local Planning Authority or Environmental Health &

Protection. Works audible at the site boundary outside these hours may result in the service of a Notice restricting the hours as above. Breach of the notice may result in prosecution and fines of up to £5000 plus £50 for each further breach and/or six months imprisonment.

- 6) Irrespective of any involvement by this Local Planning Authority, the responsibility to address land quality issues, including safe (re)development and secure occupancy, resides entirely with the Landowner/Developer of the site.
- 7) If your proposal involves activities that could affect the operations/installations of the Statutory Undertakers you are advised to consult the relevant party BEFORE commencing work. The Local Planning Authority disclaims all responsibility in the event of any accident, mishap or damage should you fail to act on this advice.

IMPORTANT

This decision relates solely to planning legislation, and does not grant authority under the Building Regulations, nor any other legislation that might be required. The guidance notes enclosed with this decision notice will help you to understand this decision, your rights and other things you may have to do.

DATED: 08-Mar-2013

SIGNED:



Peter Taylor
Assistant Director
Development & Public Protection

NOTES

1. This decision is not an approval under the Building Regulations, nor is it a Listed Building or Conservation Area Consent for demolition or other works, consent to display advertisements, consent to lop or fell protected Trees (unless immediately required in connection with the carrying out of the development and the Council has confirmed in writing that all conditions relating to details which affect trees have been satisfied), or authority to close/divert a public right of way. It relates to the development described. Carrying out of a different form of development could result in enforcement action. You should therefore seek advice in writing on any proposed amendment or alteration.
2. The formation or alteration of footway crossings and other highway works must be to the specification of the Council as Highway Authority. Please refer to the Highways Department at New Town House, Buttermarket Street prior to commencement.
3. The granting of planning permission should not be taken as indicating that the requirements of legislation concerned with public health, public safety, and pollution control or food hygiene have been satisfied. Please refer to the Environmental Protection at New Town House, Buttermarket Street prior to commencement.
4. The opening of a place of work, premises into which the public will go or an educational facility gives rise to a legal duty to make provision for the needs of the disabled.
5. You can appeal to the Planning Inspectorate against the decision, including any conditions imposed by the Council (your formal rights are set out below). If you wish to appeal, you should do so by writing to The Planning Inspectorate, Temple Quay House, 2 The Square, Temple Quay, Bristol, BS1 6PN within 6 months of the decision date.
If your application related to an extension or alteration to a domestic dwelling a fast track householder appeal process will normally apply. Appeals relating to this type of development must be submitted to the Planning Inspectorate **within 12 weeks** of the date of the decision. This type of process **does not** apply to any in circumstances where an appeal against the refusal to grant listed building consent or conservation area consent is submitted at the same time as an appeal against the refusal to grant planning permission.
6. If you feel your application was not dealt with properly, you can write to Peter Taylor, Assistant Director for Development & Regeneration who will investigate and advise you. Alternatively, you can speak to one of your local Ward Councillors and, if appropriate, they will have your complaint investigated. It is also possible to approach the Local Government Ombudsman (The Commission for Local Administration in England, Beverley House, 17 Shipton Road, York, YO3 6FZ, tel. 01904 663200) and ask her to investigate the matter.
7. Further guidance can be obtained by telephoning the Development Control Support Team on 01925 442819

Formal statement of applicant's rights, in accordance with Article 22 of the Town and Country Planning (General Development Procedure) Order 1995

- If you are aggrieved by the decision of your Local Planning Authority to refuse permission for the proposed development or to grant it subject to conditions, then you can appeal to the Secretary of State for the Environment under Section 78 of the Town and Country Planning Act 1990.
- If you want to appeal, then you must do so within six months of the date of this notice, using a form, which you can get from The Planning Inspectorate, Temple Quay House, 2 The Square, Temple Quay, Bristol, BS1 6PN.
- The Secretary of State can allow a longer period for giving notice of an appeal, but he will not normally be prepared to use this power unless there are special circumstances, which excuse the delay in giving notice of appeal.
- The Secretary of State need not consider an appeal if it seems to him that the Local Planning Authority could not have granted planning permission for the proposed development or could not have granted it without the conditions they imposed, having regard to the statutory requirements, to the provisions of any development order and to any directions given under a development order.
- In practice, the Secretary of State does not refuse to consider appeals solely because the Local Planning Authority based their decision on a direction given by him.

Purchase Notices

If either the Local Planning Authority or the Secretary of State for the Environment refuses permission to develop land or grants it subject to conditions, the owner may claim that he can neither put the land to a reasonably beneficial use in its existing state nor render the land capable of a reasonably beneficial use by the carrying out of any development which has been or would be permitted.

In these circumstances, the owner may serve a purchase notice on the Council. This notice will require the Council to purchase his interest in the land in accordance with the provisions of Part VI of the Town and Country Planning Act 1990.

From: Burrows, Andrew
Sent: 22 February 2013 17:35
To: Lewis, Jason
Cc: devcontrol; Hartley, Daniel
Subject: 2012 / 20795 - Site of Former Leisure Centre, Chiltern Road

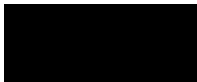
Jason

Please find attached highways comments in respect of the above planning application.

Should you require anything further then please feel free to contact me.

Kind regards

Andrew Burrows
Principal Engineer (Transport Development Control)
Environment and Regeneration Directorate
New Town House
Buttermarket Street
Warrington, WA1 2NH
Tel: 01925 443540
Email: aburrows1@warrington.gov.uk
Web: www.warrington.gov.uk



Environment and Regeneration Services Internal Memorandum

To: Jason Lewis

From: Andrew Burrows

Date: 22nd February 2013

Ref: 2012 / 20795

Site of Former Leisure Centre, Chiltern Road

The application seeks approval for the development of a supermarket, two retail units, a drive thru restaurant and public house / restaurant, together with the formation of a new vehicular site access and pedestrian access points, car parking, servicing and landscaping.

1. Proposed Development

In terms of floorspace, the proposed development comprises the following:

- Discount Foodstore = 1418 sqm GFA
- Drive Thru Restaurant = 172 sqm GFA
- 2 x Retail Units = 186 sqm GFA
- Pub / Restaurant = 1017 sqm GFA

2. Proposed Site Access Arrangements

The site currently has existing vehicular access points on Sandy Lane West (to the north of Gough Avenue), and on Chiltern Road (to the north of Chiltern Crescent).

The proposed development seeks to close the existing vehicular access points and provide a new priority access to the site on Sandy Lane West (to the south of Gough Avenue). As shown on drawing number 023 – 01 / GA – 03, visibility splays of 2.4m x 42m will be provided at the proposed new access. The provision and maintenance of the site access visibility splays should be ensured by planning condition.

In addition, the proposed site plan also seeks to provide 3 pedestrian access routes between the development and the A49 Winwick Road and Chiltern Road. This will assist in ensuring the proposed development site is accessible and permeable by pedestrians.

3. Sandy Lane West – Proposed Highway Improvement Works

As the proposal will generate a need for HGV servicing of the proposed foodstore and pub / restaurant, in the interests of highway safety it is necessary to ensure that Sandy Lane West is widened to accommodate two way HGV flows to and from the site.

Revised site access arrangement track plot analysis plan drawing number 023 – 01 / ATR – 07 has been received. This demonstrates that two 16.5m length HGV's will be able to pass safely on Sandy Lane West following works to widen the highway. The

proposed widening works to Sandy Lane West have been reviewed by the Council's Highways Design Manager who has confirmed that these are acceptable.

The plan also shows that a 2m wide footway on the north side of Sandy Lane West will be maintained along the section of highway to be widened. This will ensure satisfactory pedestrian access along Sandy Lane West is retained.

The above works to widen Sandy Lane West (which will need to be subject to the applicant entering into a S.278 agreement with the Council) should be ensured via planning condition.

In addition it is to be noted that as shown on revised site access and off site highways works plan drawing number 023-01/GA-03, forward visibility levels of 22m will be provided across the corner of the proposed development site. This will ensure that vehicles entering Sandy Lane West will benefit from appropriate forward visibility levels in accordance with the national guidance document "Manual for Streets". The provision and retention of the above forward visibility splays should be ensured via planning condition.

4. Servicing

It is anticipated that HGV's will be required to service the proposed foodstore and pub / restaurant.

Track plot analysis drawing number 023 - 01 / ATR-04 demonstrates that a HGV can access the proposed service area for the foodstore. However, in order to do this, it will be necessary to ensure HGV access across a number of parking bays within the site. This should be controlled via a planning condition which requires a site management / operation plan to be submitted, agreed and maintained thereafter.

The submitted track plot analysis also demonstrates that the proposed pub / restaurant can be adequately serviced by a HGV, and the drive thru coffee shop and small retail units (which are not expected to generate a need for HGV servicing) can be serviced from within the site.

5. Stage 1 Road Safety Audit

The original submitted proposals have been subject to a Stage 1 Road Safety Audit undertaken by the Council's Road Safety Auditor. The Stage 1 Road Safety Audit raised the following highway safety issues:

1. Amended kerb radius on Sandy Lane West is inadequate in terms of deflection.
2. Requirement to ensure appropriate forward visibility of vehicles using Sandy Lane West.
3. Temporary traffic management signage to warn of a change in carriageway layout will be required at the proposed new access onto Sandy Lane West.
4. A proposed swept path analysis is required to demonstrate that a HGV can enter the site whilst a car is leaving.
5. The proposals do not show an adequate delivery area for the small retail units.
6. The existing hammer head turning area adjacent to the development on Toll Bar Road may attract parked vehicles, which may reduce the adequacy of this area for vehicle manoeuvring.

In response the following has been agreed / confirmed with the applicant:

1. The proposal for an amended kerb line on Sandy Lane West has been revised, and subject to detailed design (ensured within the required S.278 agreement), this is now considered acceptable.
2. Forward visibility splays on the entrance into Sandy Lane West (based on a 20mph mean speed requiring forward visibility splays of 22m) have now been proposed.
3. The applicant has agreed to provision of new temporary traffic management signage on Sandy Lane West.
4. The proposed access onto Sandy Lane West has been widened so that a HGV can pass whilst a car or another HGV is entering or leaving.
5. The three retail units have now been reduced to two in order to accommodate the required forward visibility splays on Sandy Lane West. As the retail units are relatively small in size, it is not anticipated that these will be serviced by HGV's. Servicing is expected to take place from within the on site car parking areas.
6. The applicant has agreed that a No Waiting At Any Time (Double Yellow Line) Traffic Regulation Order should be progressed on Toll Bar Road.

Given the above, it is considered that the issues raised within the Stage 1 Road Safety Audit have now been satisfactorily addressed.

6. Proposed Parking Provision

6.1 Car Parking

As shown on the proposed site plan, it is proposed to provide 150 parking spaces to serve the development. This will include provision of 8 parent and child spaces at the foodstore, and 8 disabled spaces throughout the development site.

In terms of accordance with the Council's adopted maximum car parking standards, it should be noted that levels of parking provision up to the maximum identified below in Table 1 below could theoretically be provided:

Proposed Land Use	GFA (sqm)	Maximum Parking Standard	Maximum Parking Provision
Discount Foodstore	1418	1 space per 16 sqm	89
Drive Thru Restaurant	172	1 space per 8.5 sqm GFA	20
2 x Retail Units	186	1 space per 22 sqm GFA	8
Pub / Restaurant	1017	1 space per 7sqm public floorspace	58 (Assuming 40% of GFA is public floorspace)
Total Maximum Allowable Parking Provision			175

Table 1: Potential Maximum Parking Provision

As can be seen above, the proposed provision of 150 car parking spaces would provide in the region of 85% of the maximum allowable parking provision (175 spaces). The provision of 150 spaces is considered to be acceptable in this instance, particularly considering the opportunities for shared parking use across the site, and the fact that

the proposed land uses largely do not coincide in terms of their expected times of peak parking demand.

6.2 Cycle Parking

In terms of proposed cycle parking, the proposed site plan demonstrates provision of 5 Sheffield Stands by the entrance to the foodstore, 2 by the proposed retail units, and 3 by the pub / restaurant. The provision of 10 Sheffield Stands will provide 20 cycle parking spaces. Such levels of cycle parking provision are acceptable.

7. Likely Traffic Generation

The proposed development is expected to generate the following levels of traffic during the weekday AM and PM peak hours.

Proposed Land Use	AM Peak (0800 – 0900 hours)			PM Peak (1700 – 1800 hours)		
	Arrivals	Deps	Two Way	Arrivals	Deps	Two Way
Discount Foodstore	10	5	15	72	87	159
Drive Thru Restaurant	37	34	71	25	25	50
2 x Retail Units	10	10	20	12	12	24
Pub / Restaurant	5	3	8	30	22	52
Totals	62	52	114	139	146	285

Table 2: Likely Traffic Generation

As can be seen above, the proposed development is expected to result in approximately 2 vehicle movements per minute in the AM peak hour and approximately 4.75 vehicle movements per minute in the PM peak hour.

8. Traffic Modelling

The submitted Transport Assessment examines the projected impact of the development on the junction of Sandy Lane West / Winwick Road / Cromwell Avenue during the Friday AM and PM peak hour periods and the Saturday PM peak hour period.

Initial modelling results suggested that without “optimisation” of the traffic signal timings at the Sandy Lane West / Winwick Road / Cromwell Avenue junction, the traffic generated by the proposed development could be expected to have a detrimental impact, significantly increasing queuing and delay on the Sandy Lane West approach to the A49 Winwick Road in particular. Optimisation of the traffic signals has been suggested by the applicant in order to ensure that expected increases in queuing and delay on Sandy Lane West will be minimised.

It is therefore required that the applicant obtains confirmation that, in order to minimise expected increases in queuing and delay at the Sandy Lane West approach, the Council’s UTMC section are agreeable to the proposed optimisation of traffic signal timings at the Sandy Lane West / Winwick Road / Cromwell Avenue junction.

WBC Highways have also requested that a further assessment of current and projected queuing and delay on Sandy Lane West on a neutral weekday is undertaken. This work is currently being progressed by the applicant.

As the above issues are currently subject to the results of further queue counts and consultations with the Council's UTMC section, an update in respect of these issues will need to be presented to Development Management Committee.

Notwithstanding the above, we would seek to ensure that a scheme of traffic signal improvements and signal timing changes are ensured by way of planning condition.

9. Required Traffic Regulation Orders

As noted within the Stage 1 Road Safety Audit, a scheme of No Waiting At Any Time (Double Yellow Line) parking restrictions will be required on Toll Bar Road, adjacent to the proposed development site.

Additionally, due to the proposed widening of Sandy Lane West (which will create greater opportunities for on street parking in this location) a scheme of No Waiting At Any Time parking restrictions will also be required.

In order to ensure that safe access to and from the proposed development site can be achieved at times of congestion on Sandy Lane West, a scheme of Keep Clear markings is required.

It should also be noted that due to the proposed widening works on Sandy Lane West, the replacement of ward boundary signage, street lighting columns and traffic signage will also need to be secured.

Progression of the above Traffic Regulation Orders should be ensured via planning condition, whilst the relocation of traffic and ward boundary signage and street lighting columns will need to be ensured as part of a S.278 agreement.

10. Framework Travel Plan

A Framework Travel Plan has been provided in support of the application. This seeks to ensure reductions in car travel to and from the development (primarily for staff). The Framework Travel Plan has been reviewed by the Council's Travel Plan Officer and the following comments have been received.

"The framework travel plan is acceptable in this instance as it promises a full travel plan before occupation – we should condition this to ensure it happens.

The full travel plan should include details of how / when the staff induction packs will be collated and identify locations within the individual units where travel information will be displayed."

A full travel plan for the site should therefore be ensured via way of planning condition.

11. Summary and Conclusions

No highways objections are raised in respect of the proposals, subject to attachment of the following planning conditions:

"Prior to first occupation of the development, visibility splays of 2.4m x 42m as shown on drawing number 023 – 01 / GA – 03 shall be provided at the site access onto Sandy Lane West and shall be maintained thereafter. Nothing shall be erected or allowed to grow above 0.6m within the splays unless agreed in writing with the Local Planning Authority."

"Prior to first occupation of the development, a scheme for the removal of redundant vehicular access points on Sandy Lane West and Chiltern Road and their

reinstatement as footway shall be submitted to and agreed in writing with the Local Planning Authority. Such scheme as is agreed shall be implemented prior to first occupation of the development.”

“Prior to first occupation of the development, the car and cycle parking spaces shown on drawing number 023-01/GA-03 shall be provided and shall be retained thereafter unless otherwise agreed in writing with the Local Planning Authority.”

“Prior to first occupation of the development, the forward visibility area as marked on drawing number 023 - 01 / GA - 03 shall be provided and thereafter shall be kept clear of obstruction at all times and any landscaping within this area shall not at any time exceed a height of 0.6 metres above ground level.”

“No development shall commence until full construction details of the widening of Sandy Lane West / A49 Winwick Road have been submitted to and approved in writing by the Local Planning Authority. The approved widening works shall be implemented in accordance with approved details prior to the erection of any buildings hereby approved.”

“No development shall commence until a service delivery scheme has been submitted to the Local Planning Authority for approval. This shall include areas of car park that will not be used at delivery times and include details of signage (indicating when cars can and cannot park within designated areas). The approved service delivery scheme shall be fully implemented and retained thereafter.”

“Prior to the commencement of the development hereby approved, a scheme/details shall be submitted to and agreed (in writing) with the Local Planning Authority to enable the Local Highway Authority to provide temporary traffic management signage, Keep Clear markings and parking prohibitions on Sandy Lane West, and parking prohibitions on Toll Bar Road.”

“Prior to the commencement of the development, a scheme of traffic signal improvements and signal timing changes at the Winwick Road / Sandy Lane West / Cromwell Avenue junction shall be submitted to and agreed in writing with the Local Planning Authority. The agreed scheme of traffic signal improvements and signal timing changes shall be implemented prior to first occupation of the development.”

“No building shall be occupied or used until such time as a Travel Plan has been submitted to and approved by the Local Planning Authority. The plan shall include measures for the management of car use and on-site car parking and a strategy to secure and sustain decreases in car use for travel to, from and at work and increases in car sharing, public transport use, cycling and walking. The Plan shall specify a plan period and contain relevant surveys, reviews and monitoring mechanisms and identify targets, timescales, phasing programme and management responsibilities.”

Andrew Burrows
Principal Engineer (Transport Development Control)

Subject: FW: 2012 / 20795 ii - Site of Former Leisure Centre, Chiltern Road
Attachments: 2012 20795 ii.doc

From: devcontrol
Sent: 08 March 2013 08:19
To: Burgess, Sharon
Subject: FW: 2012 / 20795 ii - Site of Former Leisure Centre, Chiltern Road

Another one for Fordton as per my message last night

Regards
Melissa Mountain
Senior Planning Technician
Tel: 01925 442819
Fax: 01925 442823
E-mail: mmountain@warrington.gov.uk

Development Services
Warrington Borough Council
Regeneration & Development
New Town House
Buttermarket Street
Warrington
WA1 2NH

From: Lewis, Jason
Sent: 08 March 2013 08:15
To: devcontrol
Subject: FW: 2012 / 20795 ii - Site of Former Leisure Centre, Chiltern Road

[Scanning s.4](#)

From: Hartley, Daniel
Sent: 08 March 2013 07:54
To: Lewis, Jason
Subject: FW: 2012 / 20795 ii - Site of Former Leisure Centre, Chiltern Road

Jason

please ensure that this goes on the file

Daniel

From: Pickles, Julie
Sent: Thursday, March 07, 2013 4:54 PM
To: McCarthy, Councillor Tony; Richards, Councillor Jeff; Barr, Councillor Bob; Axcell, Councillor Brian; Davidson,

Councillor Jan; Friend, Councillor Graham; Higgins, Councillor Tony; Hoyle, Councillor Les; Jordan, Councillor Celia; Ladbury, Councillor Lottie; Murphy, Councillor Laurence; Rashid, Councillor Faisal; Settle, Councillor Geoff
Cc: Hartley, Daniel; Burrows, Andrew; Lewis, Jason; Boyer, David; Hunter, Stephen
Subject: FW: 2012 / 20795 ii - Site of Former Leisure Centre, Chiltern Road

Dear all

I have just been requested to forward the enclosed on to you, paper copies will available at the meeting this evening

Many thanks

Julie

Julie Pickles
Democratic and Member Services
Warrington Borough Council
Town Hall
Sankey Street
Warrington
WA1 1UH

Email jpickles@warrington.gov.uk
Tel. 01925 443212
Fax. 01925 656278

From: Burrows, Andrew
Sent: 07 March 2013 16:46
To: Lewis, Jason; Pickles, Julie; Hartley, Daniel
Cc: Boyer, David; Hunter, Stephen
Subject: 2012 / 20795 ii - Site of Former Leisure Centre, Chiltern Road

Jason

Please find attached additional highways comments in respect of the above planning application. Apologies for the lateness of this submission but the information required to complete this note only came through from the applicants transport consultant to me at 8pm last night.

Kind regards

Andrew Burrows
Principal Engineer (Transport Development Control)
Environment and Regeneration Directorate
New Town House
Buttermarket Street
Warrington, WA1 2NH

Tel: 01925 443540

Email: aburrows1@warrington.gov.uk

Web: www.warrington.gov.uk

Environment and Regeneration Services Internal Memorandum

To: Jason Lewis

From: Andrew Burrows

Date: 7th March 2013

Ref: 2012 / 20795 ii

Site of Former Leisure Centre, Chiltern Road

Further to previous highways comments issued on the 22nd February 2013, these additional highway comments provide an update in respect of submitted traffic modelling and the likely traffic impact of the proposals.

1. Likely Traffic Generation

The submitted Transport Assessment notes that the previous use of the site as a leisure centre was observed to generate traffic levels as noted below in Table 1 in the weekday (Friday) AM and PM peak hour periods.

	Arrivals	Departures	Two Way Trips
AM peak hour (0800 – 0900 hours)	74	29	103
PM peak hour (1700 – 1800 hours)	44	54	98

Table 1: Observed Leisure Centre Trip Generation

As noted in previous highways comments, the proposed development is expected to result in the following levels of trip generation during the Friday AM and PM periods as shown below in Table 2.

	Arrivals	Departures	Two Way Trips
AM peak hour (0800 – 0900 hours)	62	52	114
PM peak hour (1700 – 1800 hours)	139	146	285

Table 2: Likely Mixed Use Development Traffic Generation

When compared against each other, the expected difference between previous and expected trip generation of the site are as set out below in Table 3.

	Arrivals	Departures	Two Way	% Change Two Way Trips
AM peak hour (0800 – 0900 hours)	-12	+23	+11	+10.6
PM peak hour (1700 – 1800 hours)	+95	+92	+187	+290

Table 3: Likely Difference in Traffic Generation

As can be seen from Table 3 above, the proposed development is expected to result in an approximate increase in traffic levels of approximately 11% in the AM peak hour and 290% in the PM peak hour. The large percentage increase in PM peak hour traffic levels reflects the relatively high traffic levels expected to be generated by the proposed discount foodstore and pub / restaurant uses during the PM peak hour period.

2. Observed Queue Lengths – Sandy Lane West

The proposed access to the development is on Sandy Lane West. Accordingly, the above increases in traffic generation to and from the site have been considered in relation to existing and observed queue lengths on Sandy Lane West.

The submitted modelling results note that currently queue lengths of approximately 10 vehicles can be observed on Sandy Lane West during the Friday AM peak hour period (Fridays and Saturdays are the days of highest traffic generation for foodstore uses).

WBC site observations have confirmed that the above queue lengths are accurate. However it should be noted that the queue lengths on Sandy Lane West during other weekdays are typically significantly higher than on Fridays. For example queues between 20 and 30 vehicles have been regularly observed during other weekdays on Sandy Lane West during the AM period.

The submitted modelling results indicate that existing queues on Sandy Lane West are typically lower during the PM peak hour period than observed during the AM peak hour period. WBC site observations also confirm this to be the case.

3. Predicted Increases in Queuing and Delay

The submitted modelling results indicate that as a result of the proposed development, in the AM peak hour, the following increases in queuing and delay can be expected as shown below in Table 4.

	% Saturation / Mean Maximum Queue (Vehicles)					
	Practical Reserve Capacity %	A49 Southbound	Sandy Lane West	A49 Northbound	Cromwell Avenue	Calver Road
2013	-9.1	94 / 18	89 / 8	87 / 10	78 / 10	72 / 8
2013 + Devt	-18.3	100 / 27	94 / 11	93 / 13	82 / 11	74 / 8

Table 4: Traffic Modelling Results: Friday AM Peak Hour

As can be seen from the above, in the AM peak hour without development, the A49 southbound and Sandy Lane West are currently experiencing capacity difficulties, with these arms running at 94% and 89% of theoretical capacity. The proposed development will increase this to running at 100% and 94% of theoretical capacity.

	% Saturation / Mean Maximum Queue (Vehicles)					
	Practical Reserve Capacity %	A49 Southbound	Sandy Lane West	A49 Northbound	Cromwell Avenue	Calver Road
2013	-0.6	91 / 14	78 / 7	89 / 15	76 / 9	62 / 7
2013 + Devt	-6.6	92 / 15	96 / 14	96 / 21	79 / 10	67 / 7

Table 5: Traffic Modelling Results: Friday PM Peak Hour

As shown above in Table 5, in the PM peak hour without development, capacity difficulties are experienced on the A49 northbound and A49 southbound, with these arms running at 89% and 91% of capacity respectively, whilst Sandy Lane West is operating at 78% capacity. With the proposed development, it is anticipated that Sandy Lane West and the A49 northbound will run at approximately 96% of theoretical capacity.

As the above relate to a Friday scenario, at the request of WBC Highways the applicant has run a sensitivity test in the AM period which adds 10% to traffic flows. This sensitivity test replicates the existing queues that can be observed on Sandy Lane West on other weekdays. The results of this sensitivity test are presented below:

	% Saturation / Mean Maximum Queue (Vehicles)					
	Practical Reserve Capacity %	A49 Southbound	Sandy Lane West	A49 Northbound	Cromwell Avenue	Calver Road
2013	-14.3	99 / 26	103 / 20	100 / 22	82 / 11	74 / 8
2013 + Devt	-25.9	107 / 69	113 / 40	105 / 37	90 / 15	81 / 10

Table 6: Traffic Modelling Results AM Peak Hour – Sensitivity Test

As can be seen above in Table 6, during a typical weekday, capacity difficulties are observed on all arms of the A49 and Sandy Lane West, with all arms running between 99% and 103% of theoretical capacity.

With the proposed development, it is anticipated that the A49 will run at between 105% and 107% of its capacity, whilst Sandy Lane West will run at 113% of its capacity with mean maximum queues doubling during this period from 20 vehicles to 40 vehicles.

It should be noted that WBC Highways also requested a similar test for the PM scenario to be undertaken; although this has not been received. However, it would be reasonable to assume that due to the high traffic generation levels associated with the proposed development in the PM peak hour, that levels of queuing and delay approaching that observed in the AM peak hour (shown above in Table 6) could be expected during this period also.

4. Access Onto Sandy Lane

Given the above levels of existing and expected queuing and delay on Sandy Lane West, it can be expected that across approximately half of all weekday AM and PM peak hour periods, vehicles exiting the site turning right towards the A49 will have to enter a queue. A planning condition requiring Keep Clear markings to be installed in this location in order to facilitate access out on Sandy Lane West has been agreed with the applicant.

5. Optimisation of Traffic Signals

It should be noted that the modelling undertaken by the applicant also indicates that the expected increases in queuing and delay at the junction of Sandy Lane West / A49 / Cromwell Avenue can be significantly minimised or brought back to a situation of “nil detriment” by optimisation of the signals.

6. Consultations with the Council's Urban Traffic Management and Control section (UTMC)

Consultations with the Council's UTMC section have confirmed that the traffic model submitted by the applicant is acceptable, however the UTMC section, whilst accepting that there is scope for optimisation of the signal junction of Sandy Lane West and the A49, have queried the extent to which the expected reductions in queue lengths and delay asserted by the applicant as a result of traffic signal optimisation can be achieved.

Nevertheless it should be noted that a planning condition requiring a scheme of traffic signal improvements and signal timing changes at the A49 / Sandy Lane West / Cromwell Avenue junction has been agreed with the applicant and the Council's UTMC section.

7. Summary and Conclusions

In summary, based on the above trip generation and traffic modelling data, the following can be concluded:

- Existing queuing and delay on Sandy Lane West is significant and is noted to be more acute during the weekday AM period.
- The proposals can be expected to lead to some worsening in queuing and delay in the AM peak hour period. This increase could potentially double observed levels of queues on Sandy Lane West during normal weekdays.
- The proposals would lead to a significant worsening of queuing and delay in the PM peak hour period on Sandy Lane West and the A49. Similarly, this increase could potentially lead to a doubling of observed queues on Sandy Lane West.
- The applicant asserts that with optimisation of the traffic signal junction of the A49 / Sandy Lane West / Cromwell Avenue junction, that queuing and delay can be maintained to existing levels. The Council's UTMC section agrees that there is scope for the signal junction to be optimised in order to bring some capacity benefits, but queries the extent of reductions in queuing and delay that may be associated with this.

Finally, it is also worth noting advice contained within the National Planning Policy Framework (NPPF) relative to the above matters. Para 32 of the NPPF states that:

“Plans and decisions should take account of whether...improvements can be undertaken within the transport network that cost effectively limit the significant impacts of the development. Development should only be refused on transport grounds where the residual cumulative impacts of development are severe.”

In light of this, it can be concluded that, to some extent, optimisation of the traffic signal junction of the A49 and Sandy Lane West would cost effectively limit the predicted increases in queuing and delay associated with the proposed development.

In view of the above, we would wish to maintain our previous recommendation of raising no highways objections to the proposals, but would also wish to express some concerns that even with the optimisation of traffic signals proposed by the applicant, the

proposed development may lead to significant increases in queuing and delay on Sandy Lane West and the A49 during both AM and PM weekday peak hour periods.

Andrew Burrows
Principal Engineer (Transport Development Control)

APP41 -

Meeting Note *from Highways Meeting 24.09.20 - MT email 06.10.20*

Subject: RE: Peel Hall VISSIM Meeting Notes (24th September 2020)
Date: Tuesday, 6 October 2020 at 10:22:55 British Summer Time
From: Taylor, Mike
To: fiona.bennett@highgatetransportation.co.uk, 'Heywood, Robert'
CC: 'Colin Griffiths', dave.tighe@highgatetransportation.co.uk, 'Wright, Colin', Hughes, Martha
Attachments: image001.png, image002.png

Fiona,

Whilst I don't agree with some of the points made in your post-meeting notes I have no further comments at this stage. More pressing is understanding your position in respect of my suggestion that immediate work on the base model would be more productive. Can you confirm your intentions?

Regards

Mike

Mike Taylor
Transport Development Control Team Leader

CURRENTLY WORKING FROM HOME

Environment and Transport Directorate
Transport for Warrington
Warrington Borough Council
New Town House, Buttermarket Street, Warrington, WA1 2NH

 mike.taylor@warrington.gov.uk
 Office: 01925 444086 Mobile: 07966 884639

warrington.gov.uk

From: Taylor, Mike
Sent: 01 October 2020 17:09
To: fiona.bennett@highgatetransportation.co.uk; 'Heywood, Robert' <Robert.Heywood@highwaysengland.co.uk>
Cc: 'Colin Griffiths' <colin@satnam.co.uk>; dave.tighe@highgatetransportation.co.uk; 'Wright, Colin' <Colin.Wright@wsp.com>; Hughes, Martha <Martha.Hughes@warrington.gov.uk>
Subject: RE: Peel Hall VISSIM Meeting Notes (24th September 2020)

Fiona,

Thank you for your email. I am currently on leave and will review the amendments on my return on Monday.

However I would make one key point, given that WBC won't be in a position to agree any forecasting until the base model is agreed, can I suggest that rather than submit the full modelling package by 30th October as highlighted in point ix, you endeavour to provide an updated base model for us to review and/or responses to our concerns on the base model at the earliest opportunity.

This would seem an efficient use of the time involved and may prevent any abortive work.

Regards.

Mike

Subject: RE: Peel Hall VISSIM Meeting Notes (24th September 2020)
Date: Thursday, 1 October 2020 at 17:09:24 British Summer Time
From: Taylor, Mike
To: fiona.bennett@highgatetransportation.co.uk, 'Heywood, Robert'
CC: 'Colin Griffiths', dave.tighe@highgatetransportation.co.uk, 'Wright, Colin', Hughes, Martha
Attachments: image001.png, image002.png

Fiona,

Thank you for your email. I am currently on leave and will review the amendments on my return on Monday. However I would make one key point, given that WBC won't be in a position to agree any forecasting until the base model is agreed, can I suggest that rather than submit the full modelling package by 30th October as highlighted in point ix, you endeavour to provide an updated base model for us to review and/or responses to our concerns on the base model at the earliest opportunity.

This would seem an efficient use of the time involved and may prevent any abortive work.

Regards.

Mike

Sent from my Samsung Galaxy smartphone.

----- Original message -----

From: fiona.bennett@highgatetransportation.co.uk
Date: 01/10/2020 11:47 (GMT+00:00)
To: "Taylor, Mike" <mike.taylor@warrington.gov.uk>, "'Heywood, Robert'" <Robert.Heywood@highwaysengland.co.uk>
Cc: 'Colin Griffiths' <colin@satnam.co.uk>, dave.tighe@highgatetransportation.co.uk, "'Wright, Colin'" <Colin.Wright@wsp.com>, "Hughes, Martha" <Martha.Hughes@warrington.gov.uk>
Subject: RE: Peel Hall VISSIM Meeting Notes (24th September 2020)

Good morning Mike,

Thank you for your email and notes. Please see updated meeting note below:

- i. It was noted that DM was not present and we delayed the start of the meeting in case he was able to join.
- ii. RH opened the meeting and handed over to DT.
- iii. DT thanked both parties for providing their audits at close of play yesterday. DT confirmed that we will review in detail but have carried out a very quick high level review and make the following points:
 - a. HTp set out that VISSIM is validated against journey times and turning counts, not queues. This was set out in the agreed VISSIM scoping note.

WBC stated following the meeting that the scoping note states in 4.3 ♦ Checks of flows and turning counts will be carried out using the GEH statistic and WebTAG flow criteria. Journey time data will be assessed using WebTAG guidance, as a minimum. Queues will be assessed visually. ♦

Post meeting note HTp ♦ The queues are shown along the length of the SLW link. The link was artificially extended in VISSIM to load latent demand.

We are reviewing the base model queue lengths (see point (v) below).
 - b. HTp stated that this VISSIM is a corridor model for the A49 and for testing the effect of the development on journey times and flows along this corridor.

WBC commented after the meeting that the VISSIM model is not solely being developed as a corridor model. The VISSIM model is to be used to assess the impact of the development on the following junctions: M62 J9; A49/A50/Hawleys Lane; A49/Junction 9 Retail Park;

Subject: RE: Peel Hall VISSIM Meeting Notes (24th September 2020)
Date: Thursday, 1 October 2020 at 11:46:40 British Summer Time
From: fiona.bennett@highgatetransportation.co.uk
To: 'Taylor, Mike', 'Heywood, Robert'
CC: 'Colin Griffiths', dave.tighe@highgatetransportation.co.uk, 'Wright, Colin', 'Hughes, Martha'
Attachments: image001.png, image002.png

Good morning Mike,

Thank you for your email and notes. Please see updated meeting note below:

- i. It was noted that DM was not present and we delayed the start of the meeting in case he was able to join.
- ii. RH opened the meeting and handed over to DT.
- iii. DT thanked both parties for providing their audits at close of play yesterday. DT confirmed that we will review in detail but have carried out a very quick high level review and make the following points:
 - a. HTP set out that VISSIM is validated against journey times and turning counts, not queues. This was set out in the agreed VISSIM scoping note.

WBC stated following the meeting that the scoping note states in 4.3 "Checks of flows and turning counts will be carried out using the GEH statistic and WebTAG flow criteria. Journey time data will be assessed using WebTAG guidance, as a minimum. Queues will be assessed visually."

Post meeting note HTP – The queues are shown along the length of the SLW link. The link was artificially extended in VISSIM to load latent demand.

We are reviewing the base model queue lengths (see point (v) below).
 - b. HTP stated that this VISSIM is a corridor model for the A49 and for testing the effect of the development on journey times and flows along this corridor.

WBC commented after the meeting that the VISSIM model is not solely being developed as a corridor model. The VISSIM model is to be used to assess the impact of the development on the following junctions: M62 J9; A49/A50/Hawleys Lane; A49/Junction 9 Retail Park; A49/A574/Sandy Lane West. This was agreed on 14/01/2020, as documented in 1.26-1.29 of the TAA and referenced in the Highways Statement of Common Ground. It therefore imperative that all approach arms of these junctions reflect base year conditions before forecasting and development impact assessment is carried out.

HTP post meeting note – The VISSIM has been provided at the request of the Council (and HE) to test development impact. This was known when the modelling scope was provided. There is nothing in the minutes of 14/01/20 or immediately following when agreeing the meeting note, that the VISSIM methodology (as set out in the scoping note) was to be updated/changed from that provided in November 2019. The argument at the 2018 Inquiry was that stand-alone models were not sufficient to test development impact on the A49 corridor and therefore a VISSIM should have been provided. We have provided a VISSIM that is validated to journey times and turning counts; as all are aware there is no UK specification for validating to queue data (see point (v) below).
 - c. This model has been designed to provide a comparison that shows what the impact of the Peel Hall development traffic is and to assess if the Peel Hall mitigation proposed is sufficient.
- iv. FB explained that following HTP/MG's high level review of the two audit submissions, the following points are made:
 - a. The only comments regarding the base VISSIM now are around the requirement from both parties for an updated LMVR to accompany the base model and that WSP comment on Sandy Lane West queue lengths:
 - FB stated that we would provide an updated LMVR
 - FB set out that there is no UK standard for validation of queue lengths

- LB added that anecdotal evidence should not be used to calibrate or validate a model
- CW said that WBC were not requesting that the model be validated against queue lengths. CW stated that due to the relatively short journey time validation section on Sandy Lane West [*HTp note – this is because the Sandy Lane West link is relatively short*], it was important to examine the queueing as journey time validation could be achieved with a varying range of queue lengths. WBC/WSP have previously raised the issue that the journey time validation section is too short.

HTp post meeting note – we have previously responded to this. Journey time link is the same as the actual link length - circa 300m.

- CW stated that the current base model predicts a queue of 700m in the AM peak between 0900-0915 and that this doesn't represent average AM peak conditions.
- CW queried why the queueing profile on Sandy Lane West had changed in the last two releases of the base model.
- HTp stated that the queue profile should be examined, not just the 15 minute sections, to understand the overall picture of the changes to the queue profile i.e. changes to the peak times throughout the hour. The vehicle flow and signal timings did not change in the base model.
- LB stated that there wasn't a queue of 700m on Sandy Lane West, as Sandy Lane West is only 300m long so the remaining queue of 400m would actually be split onto the three roads that feed into Sandy Lane West which are not in the VISSIM model.
- TL said that Sandy Lane West was a key link for WBC to assess the impact of the development. Queue lengths are a key comparator to assess the impact and as such it is important that the base model is realistic.

HTp post meeting note – In terms of Sandy Lane West there is no empirical data to confirm the queue lengths beyond the 300m link to the Sandy Lane/Cleveland Road/Cotswold Road roundabout.

- HTp stated that this has always been a comparative exercise, to compare the reference case against the respective Peel Hall traffic scenario. This remains the case.

- b. There are no further issues raised with spreadsheet data input/output for the model. However a number of different points are noted with regard to flows, percentage increases and growth. All these are taken from the agreed Council WMMTM16 data, as per the methodology agreed.

Post meeting note from WBC - The forecasting spreadsheet was not issued with the latest VISSIM package, so no comment can be made on whether any issues still exists. The forecast outputs still seem different to what we would expect based on the WMMTM16 outputs.

Post meeting note from HTp – the forecasting spreadsheet was issued on 8th September. It should be noted that all were emailed to confirm this and that there had been no change to the forecasting spreadsheet from the previous package everyone had. It is not clear from the statement 'we would expect' what the empirical basis is.

- c. In terms of signal optimisation, it is agreed that the principle of signal optimisation is sound. Signal optimisation arises as a result of flow changes throughout the corridor in future years leading to signal timings being adapted. The optimisation provided is to give an indication of the level of network performance; not to be prescriptive to signal engineers in the future. FB further noted that the approach has been to optimise the reference case (i.e. no development traffic) before adding the Peel Hall flows as per the agreed methodology, so as to provide a direct comparison. MG have not optimised for Peel Hall traffic.

- d. FB confirmed it is expected that a response can be provided for all points raised in the audits, and that many are straight forward, for example Atkins' Table 2 and the flow data values of zero, as follows:

- The link coded as 'A49 SB to Winwick Link Rd' is provided as part of the committed mitigation and therefore would be expected to have values of zero in the 'background + committed traffic/ background + committed + Peel Hall traffic' columns

- It should be noted that the columns referred to that have been taken from the model are not the reference case (background + committed traffic/ background + committed + Peel Hall traffic) for the comparisons, which is instead (background + committed traffic + committed mitigation/ background + committed + Peel Hall traffic + committed mitigation); and as such are not used for comparisons in any event

- v. MT commented that the review was very technical and the issue of queues was one for discussion between modellers. The Council consider that queue lengths are an important measure of assessing impact. DT stressed that the VISSIM is validated to journey times and that is what the comparison exercise should be to test the impact of Peel Hall traffic; this is as per the agreed modelling scoping report.

After the meeting WBC commented that the comparison exercise presented in TAA Chapter 9 relies solely on queue data from the VISSIM model to address the impact of the development on Sandy Lane West. Queue data will be used to assess the impact of the development (as is also highlighted in the Highways Statement of Common Ground) and attention needs to be paid to it in the base model development as it will affect the forecast queues both DM and DS.

Post meeting note from HTP - Chapter 9 of the TAA relied on the VISSIM report that provided journey time information as well as queue lengths at key junctions. The queue data is used as a comparison between the reference case and the respective Peel Hall traffic scenario. WSP confirmed only in late August that the July base model was acceptable, and by that time a change had already been made to the base model and work on the 8th September submission was being finalised. On this basis MG are using the time provided by the Inspector to further investigate the queue lengths on Sandy Lane West in the base model to accommodate WSP's latest audit comments from 8th September submission; it is noted that if the queues are reduced in the base model this will have the knock on effect of reducing queue lengths on the respective links in the future years. This does not detract from the principle of the comparison exercise between the reference case and the respective Peel Hall traffic scenario.

- vi. LW reiterated that Atkins require an updated LMVR to accompany the base model and that evidence needs to be provided in the forthcoming response to clarify the points raised regarding flows in their audit so that they can agree the future year traffic flow inputs. The next iteration of modelling should address mitigation requirements at the M62 Junction 9.

- vii. CW reiterated that they are interested in the level of demand for Sandy Lane West to enable development impact to be considered. CW stated that in line with the SATURN outputs presented in TN09, WBC will expect similar levels of growth between DM and DS demand on Sandy Lane West. CW said the issue of illogical forecast demand had been raised several times previously without response.

HTp post meeting note – this is the same comment as (iv)(b) above. We have responded before that this aligns with WMMTM16 DM and DS scenarios.

CW asked DT/FB if they were prepared to make any changes to the base model given the earlier discussion around validating to journey times.

DT/FB said they would consider whether further changes to the base model should be made.

- viii. RH and MT agreed that they can provide their responses to further VISSIM submissions within the 3 week timetable.

- ix. RH asked if HTP would respond to the audits of yesterday afternoon within two weeks. FB replied that until a proper review of the audit reports that we had just received had been carried out over the next few days, it would not be possible to provide a response on a likely date for our responses to the audits.

HTp post meeting note – We will submit a complete modelling package including audit responses by 30th October.

- x. GC asked for the various modelling runs presented to be condensed to provide a more concise package for audit. FB agreed that the package would be streamlined to the relevant comparison models required.

- xi. CW asked that the proposed mitigation at the A49/Cromwell Avenue arm be investigated in terms of lane designations within the model. FB agreed that this would be reviewed and a response provided.

xii. Meeting closed.

Post meeting note by WBC - Finally notwithstanding the comment made by DT about the need for evidence to be prepared on the VISSIM model I hope that this will not be necessary and that agreed base and forecasting models can be provided in advance of the Inquiry deadlines.

HTp post meeting note - This is welcomed. DT did comment at the end of the meeting that he hoped that the need for witnesses to provide proofs of evidence on this would not be required.

Happy to discuss.

Kind regards,
Fiona

Fiona Bennett
Highgate Transportation
Tel: 0117 934 9121
Mob: 07595 892 217
fiona.bennett@highgatetransportation.co.uk

*Highgate Transportation Ltd
First Floor, 43-45 Park Street
BRISTOL BS1 5NL
Company Registration Number: 07500534*

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From: Taylor, Mike <mike.taylor@warrington.gov.uk>
Sent: 28 September 2020 11:26
To: Fiona Bennett <fiona.bennett@highgatetransportation.co.uk>; Heywood, Robert <Robert.Heywood@highwaysengland.co.uk>
Cc: Colin Griffiths <colin@satnam.co.uk>; dave.tighe@highgatetransportation.co.uk; Wright, Colin <Colin.Wright@wsp.com>; Hughes, Martha <Martha.Hughes@warrington.gov.uk>
Subject: RE: Peel Hall VISSIM Meeting Notes (24th September 2020)

Fiona,

Thank you for your email.

I would make the following points referenced against your bullet numbers:

iii. *DT thanked both parties for providing their audits at close of play yesterday as we were concerned that we would not receive them until next week.*

I am unsure as to why you thought there would be any delay in receiving a response in respect of the VISSIM modelling; as you know WBC/WSP have provided feedback and comments on all of the previous VISSIM packages promptly and in short time. Indeed the main bullet issues were provided to you on 14th September.

- a. *VISSIM is validated against journey times and turning counts, not queues. This was set out in the agreed scoping note.*
The scoping note states in 4.3 "Checks of flows and turning counts will be carried out using the GEH statistic and WebTAG flow criteria. Journey time data will be assessed using WebTAG guidance, as a minimum. Queues will be assessed visually." The requirement to examine queues is clearly stated.
- b. *This VISSIM is a corridor model for the A49 and for testing the effect of the development on*

Subject: RE: Peel Hall VISSIM Meeting Notes (24th September 2020)
Date: Monday, 28 September 2020 at 11:26:28 British Summer Time
From: Taylor, Mike
To: Fiona Bennett, Heywood, Robert
CC: Colin Griffiths, dave.tighe@highgatetransportation.co.uk, Wright, Colin, Hughes, Martha
Attachments: image001.png, image002.png

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The scoping note states in 4.3 "Checks of flows and turning counts will be carried out using the GEH statistic and WebTAG flow criteria. Journey time data will be assessed using WebTAG guidance, as a minimum. Queues will be assessed visually." The requirement to examine queues is clearly stated.

b. *This VISSIM is a corridor model for the A49 and for testing the effect of the development on journey times and flows along this corridor.*

The VISSIM model is not solely being developed as a corridor model. The VISSIM model is to be used to assess the impact of the development on the following junctions:

M62 J9

A49/A50/Hawleys Lane

A49/Junction 9 Retail Park

A49/A574/Sandy Lane West

This was agreed on 14/01/2020, as documented in 1.26-1.29 of the TAA and referenced in the Highways Statement of Common Ground. It therefore imperative that all approach arms of these junctions reflect base year conditions before forecasting and development impact assessment is carried out.

iv. *DT also stressed that if the 'urgent' meeting requested by MT on Day 1 of the Inquiry had taken place on Inquiry Day 2 as originally scheduled, many of the points raised in the audits would have been thrashed out.*

I disagree that many of the points would have been thrashed out. This is borne out by your point x where you cannot provide a response on a likely date for response to the audits.

v. I would request that the following be added to point a. iii. after *LB added that anecdotal evidence should not be used to calibrate or validate a model:*

CW said that WBC were not requesting that the model be validated against queue lengths. CW stated that due to the relatively short journey time validation section on Sandy Lane West, it was important to examine the queueing as journey time validation could be achieved with a varying range of queue lengths. WBC/WSP have previously raised the issue that the journey time

validation section is too short.

CW stated that the current base model predicts a queue of 700m in the AM peak between 0900-0915 and that this doesn't represent average AM peak conditions.

CW queried why the queueing profile on Sandy Lane West had changed in the last two releases of the base model.

LB stated that there wasn't a queue of 700m on Sandy Lane West, as Sandy Lane West is only 300m long so the remaining queue of 400m would actually be split onto the three roads that feed into Sandy Lane West which are not in the VISSIM model.

TL said that Sandy Lane West was a key link for WBC to assess the impact of the development. Queue lengths are a key comparator to assess the impact and as such it is important that the base model is realistic.

v. b. *There are no further issues raised with spreadsheet data input/output for the model. However a number of different points are noted with regard to flows, percentage increases and growth. All these are taken from the agreed Council WMMTM16 data, as per the methodology agreed.*
The forecasting spreadsheet was not issued with the latest VISSIM package, so no comment can be made on whether any issues still exists. The forecast outputs still seem different to what we would expect based on the WMMTM16 outputs.

vi. *MT commented that the review was very technical and the issue of queues was one for discussion between modellers. The Council consider that queue lengths are an important measure of assessing impact. DT stressed that the VISSIM is validated to journey times and that is what the comparison exercise should be to test the impact of Peel Hall traffic; this is as per the agreed modelling scoping report.*
The comparison exercise presented in TAA Chapter 9 relies solely on queue data from the VISSIM model to address the impact of the development on Sandy Lane West. Queue data will be used to assess the impact of the development (as is also highlighted in the Highways Statement of Common Ground) and attention needs to be paid to it in the base model development as it will affect the forecast queues both DM and DS.

viii. I would request that the following be added after *CW reiterated that they are interested in the level of demand for Sandy Lane West to enable development impact to be considered.*

CW stated that in line with the SATURN outputs presented in TN09, WBC will expect similar levels of growth between DM and DS demand on Sandy Lane West. CW said the issue of illogical forecast demand had been raised several times previously without response.

CW asked DT/FB if they were prepared to make any changes to the base model given the earlier discussion around validating to journey times and how queue lengths were not to be considered in base model development. DT/FB said they would consider this and provide a response.

Finally notwithstanding the comment made by DT about the need for evidence to be prepared on the VISSIM model I hope that this will not be necessary and that agreed base and forecasting models can be provided in advance of the Inquiry deadlines.

Regards

Mike

Mike Taylor

Transport Development Control Team Leader

Environment and Transport Directorate

Transport for Warrington

Warrington Borough Council

New Town House, Buttermarket Street, Warrington, WA1 2NH

Subject: Peel Hall VISSIM Meeting Notes (24th September 2020)
Date: Thursday, 24 September 2020 at 14:19:32 British Summer Time
From: Fiona Bennett
To: Heywood, Robert, Taylor, Mike
CC: Colin Griffiths, dave.tighe@highgatetransportation.co.uk
BCC: Luke Best

Dear Rob and Mike,

Please find below our meeting note from the call earlier today.

- i. It was noted that DM was not present and we delayed the start of the meeting in case he was able to join.
- ii. RH opened the meeting and handed over to DT.
- iii. DT thanked both parties for providing their audits at close of play yesterday as we were concerned that we would not receive them until next week. DT confirmed that we will review in detail but have carried out a very quick high level review and make the following points:
 - a. VISSIM is validated against journey times and turning counts, not queues. This was set out in the agreed scoping note.
 - b. This VISSIM is a corridor model for the A49 and for testing the effect of the development on journey times and flows along this corridor.
 - c. This model has been designed to provide a comparison that shows what the impact of the Peel Hall development traffic is and to assess if the Peel Hall mitigation proposed is sufficient.
- iv. DT also stressed that if the 'urgent' meeting requested by MT on Day 1 of the Inquiry had taken place on Inquiry Day 2 as originally scheduled, many of the points raised in the audits would have been thrashed out.
- v. FB explained that following HTP/MG's high level review of the two audit submissions, the following points are made:
 - a. The only comments regarding the base VISSIM now are around the requirement from both parties for an updated LMVR to accompany the base model and that WSP comment on Sandy Lane West queue lengths:
 - i. FB stated that we would provide an updated LMVR
 - ii. FB set out that there is no UK standard for validation of queue lengths and that this did not form part of the agreed modelling scope
 - iii. LB added that anecdotal evidence should not be used to calibrate or validate a model
 - b. There are no further issues raised with spreadsheet data input/output for the model. However a number of different points are noted with regard to flows, percentage increases and growth. All these are taken from the agreed Council WMMTM16 data, as per the methodology agreed.
 - c. In terms of signal optimisation, it is agreed that the principle of signal optimisation is sound. Signal optimisation arises as a result of flow changes throughout the corridor in future years leading to signal timings being adapted. The optimisation provided is to give an indication of the level of network performance; not to be prescriptive to signal engineers in the future. FB further noted that the approach has been to optimise the reference case (i.e. no development traffic) before adding the Peel Hall flows as per the agreed methodology, so as to provide a direct comparison. We have not optimised for Peel Hall traffic.
 - d. FB confirmed it is expected that a response can be provided for all points raised in the audits, and that many are straight forward, for example Atkins' Table 2 and the flow data values of zero, as follows:
 - The link coded as 'A49 SB to Winwick Link Rd' is provided as part of the committed mitigation and therefore would be expected to have values of zero in the 'background + committed traffic/ background + committed + Peel Hall traffic' columns

- It should be noted that the columns referred to that have been taken from the model are not the reference case (background + committed traffic/ background + committed + Peel Hall traffic) for the comparisons, which is instead (background + committed traffic + committed mitigation/ background + committed + Peel Hall traffic + committed mitigation); and as such are not used for comparisons in any event
- vi. MT commented that the review was very technical and the issue of queues was one for discussion between modellers. The Council consider that queue lengths are an important measure of assessing impact. DT stressed that the VISSIM is validated to journey times and that is what the comparison exercise should be to test the impact of Peel Hall traffic; this is as per the agreed modelling scoping report.
- vii. LW reiterated that Atkins require an updated LMVR to accompany the base model and that evidence needs to be provided in the forthcoming response to clarify the points raised regarding flows in their audit so that they can agree the future year traffic flow inputs. The next iteration of modelling should address mitigation requirements at the M62 Junction 9.
- viii. CW reiterated that they are interested in the level of demand for Sandy Lane West to enable development impact to be considered.
- ix. RH and MT agreed that they can provide their responses within the 3 week timetable
- x. RH asked if HTP would respond to the audits of yesterday afternoon within two weeks. FB replied that until a proper review of the audit reports that we had just received had been carried out over the next few days, it would not be possible to provide a response on a likely date for our responses to the audits.
- xi. GC asked for the various modelling runs presented to be condensed to provide a more concise package for audit. FB agreed that the package would be streamlined to the relevant comparison models required.
- xii. CW asked that the proposed mitigation at the A49/Cromwell Avenue arm be investigated in terms of lane designations within the model. FB agreed that this would be reviewed and a response provided.
- xiii. Meeting closed.

Happy to discuss.

Kind regards,
Fiona

Fiona Bennett

Highgate *Transportation*

Tel: 0117 934 9121

Mob: 07595 892 217

fiona.bennett@highgatetransportation.co.uk

www.highgatetransportation.co.uk

Highgate Transportation Ltd

First Floor, 43-45 Park Street

BRISTOL BS1 5NL

Company Registration Number: 07500534

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APP42 -

Transcript of Highways Meeting 180121

MEETING TRANSCRIPT

PROJECT: Peel Hall, Warrington

DATE: 18th January 2021

VIRTUAL MEETING (TEAMS): Technical Meeting to Discuss VISSIM (10:30-11.30)

PRESENT:

Mike Taylor	WBC
Martha Hughes	WBC
Dave Rostron	WBC
Paul Clisby	WBC
Colin Wright	WSP
Gary Rowlands	WSP
Tao Lu	WSP
Dave Tighe	Highgate Transportation
Fiona Bennett	Highgate Transportation
Luke Best	Modelling Group
Robert Haywood	Highways England
Lun Wong	Atkins
Colin Griffiths	Satnam
C. Lockhart-Mummery QC	Landmark Chambers

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DT – In terms of the Junction 9 and optimisation, clearly the signal timings are not provided to be prescriptive. It's a mitigation test to show that it's possible for the network to operate in the future with 12 years' worth of growth committed development, and PH traffic as well. Today's signals timings will be affected by future differences in traffic flows irrespective of PH and no one is certainly suggesting that from what I can gather that the intergreens or signal stages modelled to mitigate the future reference case demands are not sensible, so we are struggling to see what the concerns were. What do you feel about that Rob? Or Lun?

RH – I think from our perspective we have looked at what you have propose for the M62 Junction 9 including the eastbound entry slip and the signal optimisation and whilst we are happy with what's being proposed in terms of how it would actually work with the junction, I think very much so we need Warrington to be satisfied that that optimisation is possible. Given it's their junction, the signals are WBC's it would be themselves that would have to make any amendments. That's basically where we are at from our point of view it is very much a case of whilst we may accept it needs to be WBC that will also accept those, you need both parties to do so – I think it's where we are at with that one. I don't know if any of you have got anything different from that one? Lun if there is anything more technical you need to add to that one?

LW - I think that is basically what our views are. Because ultimately like Dave mentioned quite rightly those are simultaneous optimisations to prove that with the Peel Hall traffic (the junction) will work – we get that. I think the concern that we've got is obviously based on information provided. It just seems that there would be a lot of vehicles going into the circulatory lanes that is causing operational issues that would be something that would need some advice from Warrington to ensure that what is proposed is acceptable.

DR – From a Warrington perspective we've got a few concerns obviously with this one. Our main concerns are with the Cromwell Avenue and Sandy Lane Junction but even with this one it is following the same kind of ilk as the Sandy Lane one, where the model just shows that you are increasing the approach greens at the expense of the circulatory greens. So one of our concerns obviously with this is that if you are reducing the circulatory greens to such an extent you will not clear that and that could effectively block the head movement – there is no off-sets shown, we haven't seen any off-sets and would just like a better view of the off-sets between the nodes really.

DT – We will come on to talk about Cromwell Avenue, Cromwell Road, Sandy Lane West later – dealing with Junction 9 at the moment. It's recently been upgraded to full MOVA so surely it is going to be optimised all the time now and going forward.

DR - Yes that is correct it is.

DT – So it is difficult then to see what the issue is going to be at this junction with what's been presented, given that it has MOVA.

DR – Well I can say this is less of a concern compared to the other one. But obviously we don't like to see the circulatory greens reduced to such an extent that you get affectively block or lock the actual roundabout itself.

LUKE – Is it OK if I add something here – sorry it is Luke Best here, Modelling Group. From the point of view of how the signal optimising was approached. In general the way that the signal optimising was done was to use the advantage of it being a microsim model to watch it, quite a lot, in real time all the way through the peak and to take time when there was obviously time spare and the majority of that, obviously there was more traffic on the road, it's a future year, so it was about flushing more traffic into the junction, you are right, but

visually, even though the internal signal timings were being reduced, it was because the visual watching of the model suggested that they could be. Even if there were the odd totals where that wasn't necessarily the perfect flush through of traffic, it did suggest that that was the way to increase the capacity at the junction. Just that that was how it was approached is all.

DT – That's helpful Luke and perhaps Dave (R) will come back on that but dealing specifically with Rob (H) given that he is not here for much longer, it's just been said (by DR) it's less of a concern – is it significantly less of a concern that it means that Highways England have enough comfort that they are not actually going to lob in a formal objection.

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RH - From our point of view, I think our position is quite clear in terms of we will accept the mitigation that you propose in terms of the eastbound entry slip and the Junction 9 signal optimisation, so long as it is satisfactory to Warrington. So that is going to be our position before the Inquiry. I mean obviously you are going to come on to conversations with Warrington in terms of how Warrington move forward, but should Warrington be accepting of that position then I've stated that Highways England are happy to accept that. But without Warrington accepting that position we are not in a position to do so. However, our response to the Inquiry will be, unless something else is agreed as an outcome of this meeting as we progress forward that our position will be that, subject to Warrington accepting any signal optimization, they should know we are prepared to accept the mitigation as proposed. I don't know what else we can suggest to that one I'm afraid, at this moment in time it's not, we're not saying there is an issue with it as long as Warrington are accepting of it.

DT – Going back to the Inquiry Rob (H), I remember you saying at the last Inquiry that if you were happy with the modelling work then with regard to your part of the network, then you would not be participating in the Inquiry and you said that was your default position, but if you were unhappy then you would appear independently as a witness and give evidence - so we are at that stage now as to trying to establish what your position is in that sense.

RH – Well as I just said we, from the VISSIM model – the VISSIM in relation to Highways England area of interest i.e. M62 Junction 9, and Lun correct me if I am speaking out of turn here, we are reasonably happy and can accept that – I think that is the correct wording Lun is that right?

LW – Yes

RB – Yes, so from a VISSIM perspective, the area of interest to Highways England – we are happy.

GR - Can I just say – Dave (R) please correct me ,or Mike (T), if my understanding is wrong, but in terms of the impact on the local network Warrington’s position is satisfied that as you say Dave the recent introduction of MOVA provides adequate mitigation or the impact associated with the development on top of MOVA with your mitigation would be acceptable as far as it affects the local road network. What is less certain is whether MOVA would replicate the signal timings that Luke (B) has established. So in terms of Warrington’s position I think they are satisfied that the junction operates satisfactorily from their perspective – is that fair Mike (T), Dave (R)?

DR – I was going to say, you know, within the model itself, have the timings you put in your VISSIM model effectively can they be replicated within MOVA itself as the model is showing?

LB - Is that a question to me sorry?

DR – Yes it is, I guess, it is a question to the modellers really.

LB – I mean from my perspective they should be able to be, just because they are a set of fixed timings, the inter-greens and the staging’s are only based on the existing inter-greens and staging’s, nothing has changed there and there have just been small tweaks second by second to the actual amount of green time per stage so I don’t see there is anything radically different there that should effect, certainly from what was in the existing model, or any reason why that wouldn’t be able to be replicated in MOVA with improvement that that MOVA’s able to adjust cycle to cycle.

DT – Was that good enough Rob (H)?

RH – I was going to say listening to what’s been said and Lun, coming from a technical point of view here, that’s what’s required. But my understanding of what has just been said there Dave was that the optimisation timings that are proposed in terms of the mitigation that you have reviewed they are what yourselves, you, would be happy to put those into place at the M62 Junction 9. Is that right Dave (R)?

DR – Yes if MOVA could replicate those times and its shown that the actual model timings with the increased flows would work, yes I would be reasonably happy with that. What I'm slightly concerned with even now at the base model level see some congestion at that Junction even with MOVA on as it is at the moment and this is even without any future trip generations and that's a thing concerning me. Obviously the only mitigation you are proposing on this one is to tweak some of the green times of the Junction itself and the slight improvement on the east bound on-slip. So there is very little mitigation there.

RH – It's the eastbound entry slips (widened) out to two lanes with some realignment on the northern section of the gyratory i.e. 2 lanes to the M62 as you go around the top. Some lane realignment – I think that's correct? Like I say, we've reviewed it from Highways England point of view because obviously looking at the slip-road queuing. What we've come to the conclusion of is that it's proportionate, so nil-detriment from our own perspective so if you are accepting of those signal timings, optimisation changes I should say sorry not timings, then I think from our perspective we are OK with those proposed changes. I know we've got another couple of questions about Hollins Lane etc., but I think broadly that would be acceptable to us. I think we just need for that to be followed up in writing, so to speak, from Warrington but then we can update our response. I mean I broadly said the same in the response that's already been sent anyway – but if we get an updated response from Warrington we can update our response on that.

DT – That sounds positive. OK, so is that something that Mike, I am looking at you as our main point of contact, is that something that between yourself and Gary (R) and Dave (R) or whoever, can put in train then hopefully we can at least put this issue to one side?

MT – Yes, I think we can give Highways England the comfort of clarifying our position – based on what's just been discussed. Yes, I think we can do that.

DT – Good, that's ever so helpful thank you for that.

Moving on to Hollins Lane, Rob (H), which was the other issue you that you raised, I mean clearly that falls into a committed mitigation scheme that you were asked to account for in the modelling together with the flows that come from that development and it's for increasing the north-bound capacity associated with, not associated with our development but associated with another development, putting it in context the amount of PH traffic that is going northwards in that location is 13 in the AM and 6 in the PM, so in those circumstances

it is really difficult to see again how that could form the basis of an objection. I don't know whether Lun would to say anything either.

RH – Yes I think I think this is more a technical one that Lun wants to come in and comment on. I suppose because it is slightly outside the modelled network isn't it the junction? I think it's more along the lines of being satisfied with the, because I think you showed the reflection of the improvement by increasing the speed through the junction and I think it is along that line that Lun just wanted to satisfy himself – Lun I will let you come in.

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LW – I think that is exactly what our positions are. So effectively going back to what we've mentioned, VISSIM modelling is fine. I think it is just in terms of improvement through the north of the network because ultimately that junction wasn't covered in the actual modelled network. We just need to have a little more understanding in how this was derived and make sure that the benefits are captured.

DT – Luke would you like to respond to that?

LB – Yes of course. In the existing modelling that, well the prior modelling that this all started from the AECOM model from 2015, the way that exit on blocking had been dealt with was through the use of reduced speed areas in order to replicate the capacity exiting the model. When we were looking at this, as you say the junction is outside the model extents. For the proposal that this improvement related to – I can't remember what the proposal is called, apologies, for this scheme that it related to. In the documentation for that they had done some modelling in LINSIG, which gave an average improvement to capacity per lane at that junction. The way that we approached how to model the exit arm blocking to the north was just to replicate that capacity, was to change the speed limit exiting the model until the number of vehicles existing per hour were the same as that capacity at that junction. That was the approach, that was the best approach without having it in our model that it seemed like we would be able to evidence.

DT – Does that sound reasonable Lun?

LW – Yes and how about Warrington or WSP, are you guys happy as well? Using this approach, this is more to your network?

DT – It wasn't something that was raised.

MT – I am guessing this is a technical question isn't it 'cos the Hollins Lane junction it is extremely tight, the physical mitigation that gets put in there and which has been modelled in this. It's my understand that it's basically nil-detriment for the Parkside scheme, you know it's an improvement over what's there now but there are still constraints because of how tight that junction is. So I guess the question is how much of an impact that increased speed through Hollins Lane has on the rest of the model – so I guess it's one for whether Gary or Colin (W) could; is it going to affect our position? I'm not sure that it does.

DT – Shouldn't do.

CW – Hello Mike, I think we took the view as Dave (T) rightly said there, we were looking at the impact of the development trips and there's very little PH development trips in that area of the model so, we noted the comments for HE on that but as far as we were concerned I guess it was outside the model area and there's limited PH development trips and it didn't really appear to have much impact. Which is why we didn't bring it up in our review.

DT – Thanks Colin (W). Given that Rob (H), where do you think that leaves you in terms of the concern you raised with Hollins Lane?

RH – I think from our perspective, whilst accepting there's not much in the way of PH traffic that does go northbound etc., it's about ensuring that traffic could flush through from the eastbound exit slip. It's more a technical one for Lun and if Lun's happy with it then I am comfortable. I mean I think I am probably a little more comfortable with the junction itself being local and understanding it and obviously being able to see it on the ground that maybe what Lun is from looking at it purely from a VISSIM model perspective. Lun over to you - are you comfortable with the responses we've got from Warrington on that?

LW – Yes.

RH – Yes. In that case I'm happy with that to be honest and if we get the response from Warrington, I'm conscious that I've got to go in a couple of minutes, but if we get a response from Warrington I am more than happy to update our position on that. Obviously the rest of

this meeting for yourselves and Warrington – Lun was going to stay on the call if that's OK with yourself? And give us an update afterwards.

DT – Thanks for your time now Rob and it looks as if we have got to a good position with yourself.

RH – Yep I think so, from a Highways England perspective at this moment in time we will be looking to just condition the improvements and that will be; we will be able to provide that response to you once we've got something from Warrington.

DT – Good, OK thanks for that and catch up with you again.

RH – No problem – I'll dial off and Lun will carry on in my behalf OK; thank you very much.

DT – Thank you. (21:41 into recording).

Fine, OK, so moving on the Agenda that really brings us to the WSP audit and I just put on the Agenda the Audit Summary there on the basis that we can pick up anything that we want to, really want to discuss there. So I mean effectively it's – just looking at the summary I think page 27 of the WSP report.

So we have a series of bullet points the first one being that the forecast demand in VISSIM is not consistent with SATURN in some areas. I'm sure Fiona (B) and Luke (B) will come in at previous points on this, but as I recall it the agreed methodology was / became that we stepped away from direct input from SATURN so you wouldn't, I think, expect there to be the same that sort of consistency there in any event – is that fair?

FB – Yes, Luke do you want to confirm?

LB – Yes, it's not entirely clear but certainly we originally had a methodology that was using direct SATURN flows which then, under agreement, we moved away from and had a proportionally derived set of flows that related the SATURN model to the VISSIM flows and therefore the traffic survey data, and I suppose the confusion that now seems to be being introduced is what the comparisons that are being made are. Where there are tables in the audit response comparing Do Something divided by Do Minimum and Do Something take

away Do Minimum, where actually the distribution in the SATURN model would be different anyway. That sort of seems to be where my confusion was with the response now.

DT – Colin (W) or Gary (R) do you want to pick up on that at all?

CW – I think it is something we have raised before in the previous forecast reports and it's down to the fact that you are comparing two different models, but we are seeking to identify the difference between the Do Something and the Do Min and certainly one of the ones from Sandy Lane West – you know the difference between Do Something and Do Min is a very small number of vehicles. So therefore you are not really seeing the change between the models about the impact of the development trips themselves. The other tables that we've introduced there, we've identified something that appears to be an error in the sheet from the retail park. Did you have a chance to look at that Luke?

LB – I have yeah. What were you referring to sorry, an area from which retail park?

CW – Junction D, Zone D, Junction 9 Retail Park.

LB – Yes.

CW – it's where you subtract the development trip matrix from the Do Something matrix – your LINSIG matrices produces negative trips. I don't understand why that would be the case.

LB – There were some locations where small negative trips were introduced and those were converted to zero. I thought that you were agreeing with that in your response? Sorry if I am missing something here.

CW – No we've identified one where because of the methodology that you've employed you got a lower number in the Do Something. The one added to Junction 9 Retail Park.

LB – Right and even though that's following the methodology, that's wrong – why, sorry? I'm just not sure what it is that you are saying is wrong with that – is the methodology wrong or that the outcome is wrong or?

CW – I think the outcome of the methodology is wrong for that particular zone.

LB – But it is the same methodology that is applied everywhere?

CW – Yes, but there is something not right because your LINSIG, when you do your subtraction you have a Do Something matrix with including the development trips and you subtract the development trip matrix from that you are getting negative changes and that is what is forcing down the Do Something demand in that case.

LB – OK, I'm not sure exactly what that is. Is there a higher amount of Do Something coming out of the retail park?

CW – In this, in the LINSIG matrices I think the trips are quite low but you end up with a negative and then it follows through so I think, I can't remember the VISSIM O-D in the Do Min I think is 67 between D and G and I think that drops off to zero – and that's out of 300.

TL – You can see table 6 in page 6 in our reply.

LB – Yes, I see the one you mean.

TL – And you can see the number 4 in our table. Number 4 there is something in the SATURN or LINSIG model, 3 trips and development trip is 6 so that doesn't make sense. If you include development trips it is lower than development trips itself it's no sense at all, is our concern.

LB – Yes, I apologise - we have gone through all this response, but I don't know how I've missed that then (not in summary). I'm going to have to have a look at exactly what you mean by that so my apologies there for missing that. Yes, sorry about that.

CW – I mean just in terms of your derivation of your LINSIG matrices, how would that occur? Because my understanding the Do Something matrix has the development trips assigned within it? Within the SATURN model so there shouldn't be negative trips so is there

something, some other, something else has happened to them to change the distribution or something?

LB – No, no there's no change to the distribution and the Do Something traffic is dealt with separately so it shouldn't be - I mean the LINSIG is only used to put together the O-D matrices it's not like there is route choice in there or anything.

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CW – Yes, I was just wondering.

LB – So there shouldn't be anything. The development trips are dealt with separately anyway with the SATURN outputs so I can't really see how an error has been introduced when it's exactly the same methodology that's used for every zone.

CW – Yes, we couldn't understand it because if you have the SATURN if you have SATURN cordon matrices I mean the development trips would be assigned within that so if you net 1 of the Do Something and remove the development assignment and the So Something it should have positive O-D numbers, so we didn't understand why that was the case. We listed the negative O-D pairs as identified by your sheet. There's only, I think only between D and G are the ones that have an impact on the demand and that's Sandy Lane West and the retail park, so it's quite important for us. Some of the other ones with negative, I think there are zero trips anyway, so it's not noticeable but between D and G it is. We've highlighted the trips from zone D – it's at 2022 in our report just to break it down.

LB (00:30:38 into recording) – I missed that and then when I'd gone through I thought that generally the ones where it was negative value were such small numbers anyway that it wasn't something that would be significant to the model. But that's why I've missed that single relationship.

DT – Let us drill down on that one Colin (W) and we can come back with a full response.

CW – Yes, the other one about the demand, the general demand growth I mean we've highlighted AM 2022 coming out of Sandy Lane West as somewhere where we would expect to see a sort of bigger impact of the development – so that the flows look kind of similar.

That's down to the levels of flow in VISSIM, between VISSIM and SATURN, but we have highlighted that before in our forecast reports.

LB – You have but we did go back to the SATURN model and is just the result, does seem to be a result of re-routing that is happening in the SATURN model, so that is the flows that are actually arriving at Sandy Lane West, there is hardly a difference between them.

12 **CW** – Well there is more difference within the SATURN model than the VISSIM model - I mean that was our point, that the impact of the development compared to the Do Min has perhaps been understated and 2032 assignment we are particularly interested in because it's the full build out.

LB – Sure, yes, I wish there was a better answer than saying that the methodology has just been followed for all zones in exactly the same way so I'm not quite sure what else to add without drilling into that further.

DT – I think to be fair it's a reasonable answer.

MT – Are we in danger of moving off Agenda here? Because we are not really talking about the issues on the Agenda we're talking about the overall model and I wasn't aware that that was the purpose of the meeting.

DT – Shall we move on then? So looking at the next summary point was 'The model animation of M4 mitigation shows vehicles using off-side lane of the 2 dedicated left turnings to reach Cromwell Avenue this involves merging on the short link between the roundabout at Calver Road signals which will increase vehicle conflict'. So what was the concern there really?

GR – I think our major concern on that one is that you can't model that as 2 left turn lanes at Cromwell Avenue. That has to be modelled as 1 left turn lane Cromwell Avenue and 1 left turn lane for Calver Road because there is not enough room to merge in such a short distance. So that really needs to be modelled differently. 2 separate lanes; 1 for Calver Road and 1 for Cromwell Avenue.

LB – I think from a modelling point of view the only thing I would say about that, and again a lot of the modelling is done watching it in real time. I mean at the moment apart from the fact that the moment it is the left turn lane it is 1 lane and vehicles merge across in order to turn right, so there is space within that 150 – 200m to merge, but also when you watch the model the way that the behaviour is set up is for vehicles to be able to see which lane they are meant to be in and try to get in it. But obviously if 1 lane is blocked you will get some people pulling around and merging across and on the occurrences when that happens when you watch it they do happen generally before the stop line. There is the occasional vehicle which doesn't manage to do that, but when it does happen it is generally happening on that 150m where the merge is there, which is what happens at the moment for the right turners.

GR – Well I think really before we could comment here further that really would need to go through a Stage 1 Safety Audit to see what the comments coming back from the Safety Audit were to see if the modelling needs to be [INAUDIBLE].

DT – We have that commissioned so hopefully that should be available quite soon.

MT – Will you be able to circulate that to us Dave?

DT – Yes of course, as soon as we get it.

MT – Who is it you've commissioned?

DT – That's a good question.

FB – It's RSC and they should be getting in touch soon Mike (T). Road Safety Consultancy.

DT – Road Safety Consultancy is the name – if it helps we'll email you the actual name of the company for the avoidance of doubt.

MT – I don't want to go off tangent but you are aware of our Road Safety Audit Guidance – that's been passed to you before?

DT – It has, you've provided them, and we've discussed them on several occasions in the past, so of course we are.

OK so once we've got the Road Safety Audit hopefully we can finally nail that point.

The next point of the summary was 'Comparison of latent demand and queue lengths on Sandy Lane West indicated by the development impact cannot be mitigated on this link in the PM peak 2027 and 2032'. Luke (B) do you want to comment on that at all?

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LB – Yes, I suppose there are 2 separate bits to this. I think the first is that latent demand has been grouped as 1 issue but actually what's been reported on is 1 set of data that comes from the network performance data which is just for the peak (is timed data) and what the latent demand within that shows is peak spreading rather than demand that can't get into the model it is demand that can't get into the peak where it wants to and I think that usually it is fair to say when looking that far into the future that it is not unreasonable to expect some level of peak spreading where demand can't get into the peak (hour). The other thing that I would say is just that the other type of latent demand or the way it is being referenced is traffic that comes from the error files showing that it doesn't get into the model at all during the model period but there is just no detail about where that traffic is from. It could be from the last 5 minutes, it could be from the last 15 minutes. It's a bit of a blunt tool and certainly blurring the line between those 2 different sorts of data is also a bit of a blunt tool. So I think it just needs a bit of caution in the way that this is being referenced as a sort of objection really I think there should be some expectation that some traffic doesn't get in. And it's just exactly what type of traffic that actually is. That would be my only concern about it.

DT – Colin (W) or Gary (R) do you want to comment on that at all.

GR – I am happy to comment to the extent that what the model and the evidence show, notwithstanding some of the issues that we have with regards to the optimisation because clearly this is with the optimisation strategy that you put in place Luke (B), which we do have concerns about as far as the Sandy Lane West junction is concerned. Is to say that it's evident from the queue graphs that with the mitigation scheme in place that queues extend beyond the traffic model.

MT – Sorry Gary – aren't we in danger of getting involved in evidence here?

GR – Yes. I think we just need to disagree with your view.

DT – I think it's not unreasonable to have a little bit of a discussion about the point Mike (T). I mean Luke (B) do you want to respond to that at all?

LB – Yes, I mean I don't know quite what the constraints are and what we can talk about here but I think that the important thing for Sandy Lane West, is that Sandy Lane West is obviously an important link because of its relationship to the development. Sandy Lane West needed to be validated with as much data as we had. The travel time data on Sandy Lane West suggested that a lot of the delay actually happened halfway along the link, not necessarily originating from the stop line itself. What happened when I was trying to optimise the signal timings is that you quickly get to a point where you can flush the queue through but the delays are actually happening mid-point along the link where the retail park and perhaps other links are joining but we don't have the data to be able to improve on that further really so that's - the queue data didn't really give you that detail that a lot of the delays originating halfway along the link where delays were introduced to validate the model. So you can only mitigate so much at the stop line itself.

DT – Gary (R)?

GR – I hear what Luke says – I don't agree with his conclusions.

DT – OK, we'll come onto SoCG shortly. Is there anything else you want to add.

LB – There is just one other thing I would say about that if that's OK Dave (T). I think the modelling, as much as we try to make it as detailed as we can, stuff like that delay that's introduced halfway along the link, in reality human behaviour in the future, that would change, but we can't provide the evidence base to allow us to change that, we don't have justification to change a delay that is introduced in the base that's possibly to do with traffic coming in and out of the retail park or possibly just to do with how people respond to the queue in front of them and we don't know how that will change in the future. So that bit of the model we can't change what is in the base even though it is very likely that that will change in the future which makes it difficult to evidence the changes beyond the mitigation as the stop line. That is all I would say extra on that.

DT – OK. Is there anything else you want to say on this part of the Agenda Mike (T) or are you happy to move on?

MT – Happy to move on.

GR (42:33 into recording) – All I would say is the fact that the signal optimisation at this location is based on a significant amount of on the ground optimisation and the optimisation strategy does have some very significant changes in green time including Sandy Lane West.

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LB – If I can respond. It is only because of watching the model that those changes were made. It's difficult to know how else to approach it other than using the model to make the changes.

DT – OK, I think we've probably taken this bit as far as we can for Mike (T). Shall we move on?

MT – [NODS ASCENT].

DT – The next item on the Agenda we have actually covered really – it was the mitigation at Sandy Lane West and Cromwell Avenue and the Road Safety Audit; I think that was one you put on the Agenda. Is there anything else you want to say on that part of the Agenda Mike (T)?

MT – I don't think so Dave (T), nothing that hasn't's already been said. Like I say it's linked to the way it's been modelled and the way that scheme would be designed and hopefully the Road Safety Audit will make things a little bit clearer on that.

DT – Sure, OK, so then the next part of the Agenda was looking to a SoCG on VISSIM. I have started to do a draft on that, which we aim to circulate certainly by Wednesday. I envisioned a time-line just showing the development of the VISSIM and then what's really been agreed and then what's left to be agreed. I think there's quite a lot that has been agreed in terms of the modelling, that's accepted and not disputed, and in terms of 'still to be agreed' I mean how do you; what would you envisage on that list from your point of view Mike (T)? At no time in the recent audit did it say that the modelling it was unsuitable, it's more a question of interpretation.

MT – I mean; are you guys going to prepare the SoCG on VISSIM?

DT - We just wanted to do the first draft, which we intend to circulate certainly by Wednesday if not before.

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MT – We'll turn that around as quickly as possible because obviously there are areas in the VISSIM modelling that have been agreed and there are areas that ultimately it's going to be that a lot of the issues are going to be the outputs where the disagreement is and the interpretation but I think you are right and it certainly makes sense for us to have a document, a separate document, a SoCG on the VISSIM – so am more than happy to turn that around as quickly as possible.

DT – I think, to be fair, this was something specifically the Inspector asked for as well. I mean you could almost say that the VISSIM model is accepted as being suitable but you have these issues that are, will form basis of evidence. Is that something you would agree with or is that taking it too far?

MT – Well I think we've accepted the base already haven't we. I think we've highlighted some short-comings in respect of the forecast.

DT – The basis is agreed as suitable and there's nothing, at no time in the recent WSP audit, does it say well certainly none of this 'not fit for purpose' and there is nothing to suggest it's not suitable, but I appreciate that there are issues that you probably would wish to bring forward in this SoCG. Is that, is it being suitable, is that something that we could agree that the modelling is actually suitable it's the outputs.

GR (46.58 into recording) – I think in the main Dave (T) I think the one area where I think Luke (B) has actually drawn attention to a particular weakness in the model is Long Lane, is that fair Luke (B)?

LB – I've drawn attention to weakness in the model? What's that referring to sorry, on Long Lane?

GR – In terms of the ability of the model to replicate conditions as a result of delays going southbound on the A49 blocking back through.

LB – I don't know if I am saying that it can't replicate conditions, but I am certainly saying that there are limits to how it can be mitigated as a result of delays stemming from further south.

DT – Shall we flesh this out in the SoCG? Mike (T)?

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MT – Apologies. Yes.

DT – Then moving on in terms of the September SoCG, I recall you sent it off for signing before the Inquiry and it was said on more than one occasion that it would be signed; can we have a copy? This is the September 2020 SoCG.

MT – It had been sent off for signing, let me take advice on that Dave (T) because I just need to be sure that subsequent events since then haven't changed anything. I don't foresee that we have or that we should. **DT** INTERJECTING, '*they shouldn't have done*'. Yes I don't think they should, but let me take advice and like I say we will get that across to you as soon as possible.

DT – Alright. I mean there were two points in the September SoCG that referred to VISSIM and it just referred to it in a sense that we expected this to be agreed. And the starting point of the Common Ground draft on VISSIM is that it flags those two points up. So there is still nothing that would prevent you signing that in relation to VISSIM. I am a bit disappointed that given it was said that it would be signed it hasn't been signed yet but if you go back and seek the advice that you need then hopefully the signed document will tumble out of that.

So that brings us to evidence. I see Gary (R) is now involved, is this a forbearer of Gary bringing evidence, giving evidence?

MT – Well yes because I think it's clear in the WSP Review that you know the interpretation of your results, that we feel there are some key issues there, so I think Gary will be giving evidence in respect of that and I think we are expecting Dave Rostron to bring evidence in respect of the operation of the signals on the network as well.

DT – OK. How about Colin (W)? Of course, Gary is WSP now.

GR – I will be representing WSP.

DT – Yes well OK.

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GR – And from your side, will it be just you Dave giving evidence?

DT – I think we are still to make that decision on that, but we will certainly advise you as soon as we are in a position to the extent of evidence we will be bringing forward.

Any other business?

MT – Just going back to the Road Safety Audit Dave (T) please. You said it's not been undertaken yet, it's only been commissioned?

DT – It's been commissioned, I don't know whether they've done it yet – or exactly when. We'll find out when they're going to do it and tell you Mike, if they haven't already done it. They may have done it by now.

MT – Because it maybe if it's not been carried out that either our Road Safety Audit or one of their framework consultants may be able to do it a bit quicker?

DT – Yes, well let's find out exactly what the position is and we'll advise you.

OK any other business anyone wants to raise?

It may well be worthwhile having another similar Teams Meeting in the run up to either the exchange of evidence or the inquiry but we can discuss that out of meeting.

In the first instance Mike (T) shall I use you as the first point of contact, obviously copying in Gary and others as required, but is it still fair to use you as the main point of contact?

MT – Yes and Martha (H) as well, don't forget to copy Martha.

DT – Of course yes. OK. Are we done then for today?

MT – I've got nothing more to add.

DT – OK unless anybody raises something now I'll say thank you very much for attending we have made, I think, considerable progress and catch up again with everyone soon. OK bye for now.

ALL - BYE

APP44 -
WBC *HDT* AP Jan 2020 Final

WARRINGTON

Housing Delivery Test Action Plan

January 2020

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1 Introduction

The Government has introduced a new Housing Delivery Test (HDT) as the mechanism to monitor housing delivery locally. This measures net additional dwellings delivered against the homes required, over a three year rolling period, which commenced in 2015/16. The Government issues results on performance for each Local Planning Authority (LPA) in England on an annual basis.

The HDT has three requirements:

1. If delivery has been less than 95% of the housing target, the LPA should prepare an Action Plan to address the reasons for the shortfall.
2. If delivery has been less than 85% of the housing target, the LPA should also include a 20% buffer in calculating its 5 years housing land supply.
3. If delivery has been less than 75%, the presumption in favour of sustainable development is also engaged. As a transitional provision, the threshold in the third element is set at 25% and 45% for the 2018 and 2019 tests.

Warrington Borough Council has prepared this Action Plan because Warrington has delivered 55% of its housing requirement over the first monitoring period. The Action Plan identifies the reasons for this under-delivery and sets out a series of actions to ensure that Warrington is able to meet its housing requirement in future years.

It should be noted that whilst the Council has a key role in housing delivery, it is dependent on private sector landowners and developers to deliver the majority of new homes in Warrington.

2 Housing Delivery Test Performance

Housing Requirement

The Housing Delivery Test 2018 Measurement Technical Note from MHCLG describes how the housing requirements for individual councils are calculated. The calculation is dependent on whether a council has an up to date Local Plan. The Technical Note defines an up-to-date development plan for the purposes of the Housing Delivery Test as one that is less than five years old.

Warrington's current development plan (Warrington Local Plan Core Strategy 2014), was adopted in July 2014. However, upon adoption, there was a High Court Challenge that resulted in parts of the Plan being quashed, most notably the housing target. As such, for the purposes of the HDT, Warrington is not considered to have an up-to-date plan in place at the current time.

In the absence of an up-to-date Local Plan, Warrington's housing requirement is therefore based on previous household projections, as set out in Table 1.

For the purposes of the HDT, the rate of delivery is assessed over the previous three years, also as set out in Table 1.

HDT Assessment

Warrington's performance against the 2018 HDT in terms of comparing the net homes delivered over three years to the homes that should have been built over the same period is also set out in Table 1.

Year	Version of Household Projections	Number of Homes Required	Homes Delivered	Percentage Delivered
2015/16	2012	923	595	
2016/17	2012	902	513	
2017/18	2014	792	359	
Total		2617	1467	55%

Table 1: Housing Projections and Delivery

The Council has delivered 55% of its housing requirement over the past three years - 1,467 properties out of an assessed requirement of 2,617. As a result the Council has failed all three components of the HDT and hence the Government requires:

1. the production of an action plan to demonstrate the steps the Council is taking to boost delivery and meet its housing requirement;
2. the inclusion of a 20% buffer when calculating 5 year land supply;
3. that the presumption in favour of sustainable development will apply.

3 Housing Delivery

This section of the Action Plan deals with the housing market delivery analysis, first by reviewing past performance and then looking forward to projected delivery.

Past Delivery

In understanding why Warrington has not met its housing requirement over the last 3 years, it is helpful to consider housing delivery in Warrington over a longer period, taking into account ‘development cycles’ and changing national planning policy requirements.

In accordance with national planning requirements, Warrington monitors the delivery of new housing across the Borough on an annual basis and produces its findings in the Strategic Housing Land Availability Assessment (SHLAA) and Annual Monitoring Report (AMR).

Figure 1 shows the number of housing completions in the Borough from 2004 to 2018. The graph also shows the Local Plan target at the time to put the housing delivery rate into context.

The graph shows that in the mid 2000s the rate of delivery was substantially exceeding the Local Plan requirement. Whilst delivery rates dropped significantly at the start of the recession in 2008/09, Warrington continued to deliver housing through the recession at a rate in excess of the Local Plan requirement at that time.

Following the removal of the housing target from the Local Plan Core Strategy, Warrington’s housing delivery did not keep pace with its housing requirement.

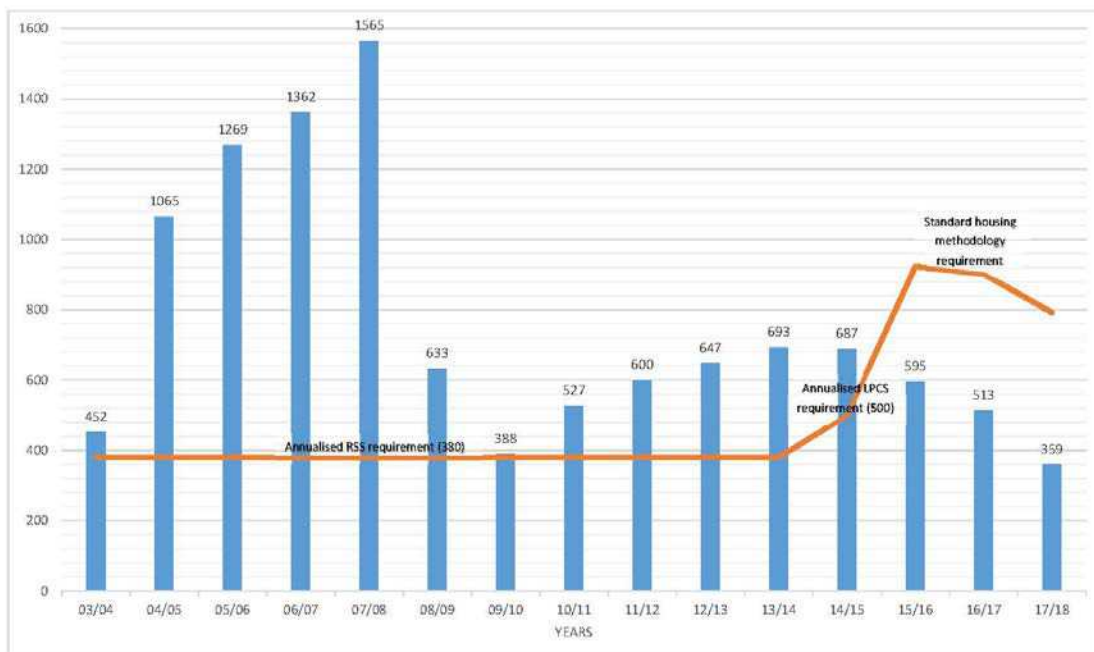


Figure 1: Housing Delivery 2004 - 2018 v Plan Requirement

The Council adopted a new Plan, The Local Plan Core Strategy in July 2014. It was subject to a High Court challenge that removed the housing requirement from the Plan. This reflected a change in national policy which, with the removal of Regional Planning Guidance, required Councils to define and meet their own objectively assessed housing needs. In Warrington’s case, the change in national planning policy means the Council has a higher housing requirement than that established within the Regional Planning Guidance context.

Until the Council adopts a new Local Plan, the Council’s 5 year land supply and performance against the Housing Delivery Test will be assessed against the Government’s Standard Housing Methodology.

Future Delivery

The Housing Trajectory forecasts that the housing delivery test will be met in year 2021, as shown in the table below.

Year	Annual	Rolling 3 year delivery	Annual Target	Rolling 3 year target	HDT (%)
2015	595	-	923	-	-
2016	492	-	902	-	-
2017	359	-	792	-	-
2018	402	1446	860	2617	55%
2019	591	1253	839	2580	49%
2020	1416	1352	819	2517	54%
2021	-	2409	-	2457	98%

Table 2: Projected housing delivery

The Council consulted on the Proposed Submission Version Local Plan (PSVLP) from April until June 2019. The PSVLP identifies that a minimum of 18,900 new homes will need to be delivered over the period 2017 to 2037. This equates to an average of 945 homes per annum, 377 of which must be affordable. The Plan has identified sites and planned for growth to meet this housing target.

The PSVLP seeks to maximise the development of brownfield land. The Plan acknowledges that there is insufficient brownfield land to meet the housing requirements and it is therefore necessary to propose to release some Green Belt land as detailed in the Local Plan spatial strategy below (Fig.2).

Local Plan Spatial Strategy

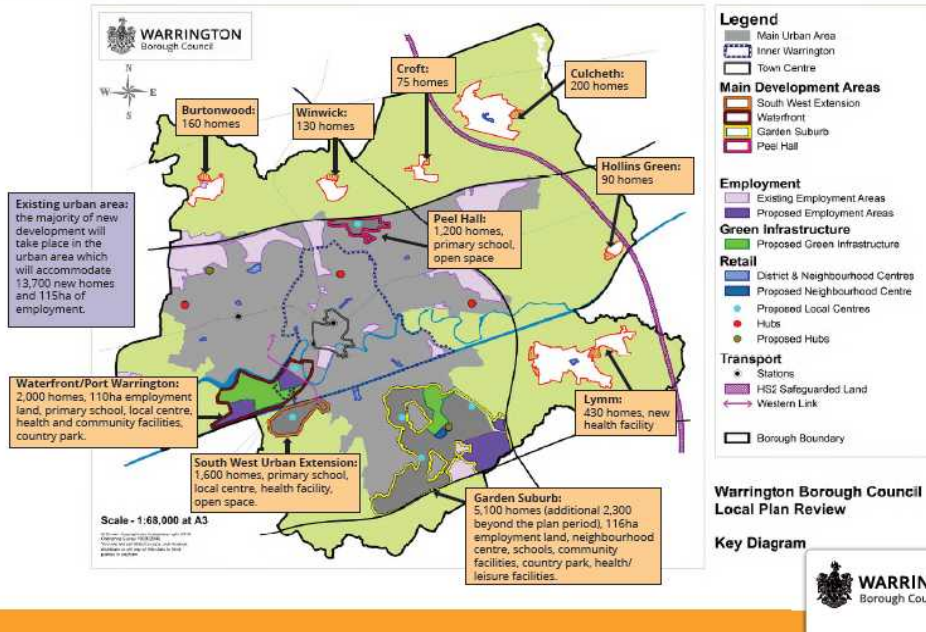


Figure 2: Proposed Submission Version Local Plan (March 2019) – Key Diagram

The Council’s Urban Capacity Assessment 2019, published alongside the PSVLP provides a detailed assessment of the housing trajectory, broken down to the main development areas, up to March 2037 as shown in Figure 3 below.

The trajectory, based on 2018 SHLAA data, illustrates that there is expected to be an increase in the annual average completion rate over the next five years (2018/19 to 2022/23), with 5,081 completions over this period. This equates to an annual average of 1,016 completions.

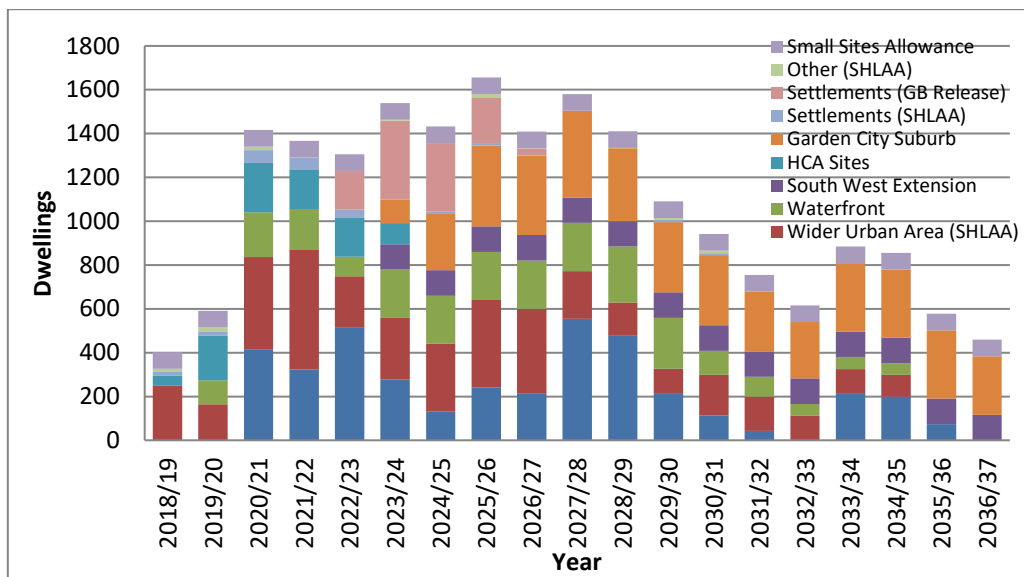


Figure 3: Housing Trajectory to March 2037

The Urban Capacity Assessment also indicates a significant increase in annual rate of delivery occurring in 2020/21 to over 1,300 units and that this will be being maintained at similar levels to 2028/29. The initial increase in supply will be provided from sites within the existing urban area.

This increase in housing delivery is based on a number of sites which now have planning permission and are currently being built out. This will mean that Warrington's performance against the Housing Delivery Test will improve significantly over the short term.

However, in order to sustain delivery over the longer term, the Local Plan is proposing to release Green Belt for around 7,000 new homes, including 2 large urban extensions with significant infrastructure requirements. Warrington's urban capacity over the longer term will also become more challenging to deliver, with the need for interventions including land assembly and infrastructure delivery.

Progress made

Housing completions are forecast to increase significantly in Warrington over the coming years, reflecting the number of permissions that have been granted for residential development.

A large number of these homes will come forward in suburban areas of the Borough, generally in higher value areas where there is already infrastructure or where additional infrastructure capacity can be provided relatively easily.

Given the Council's focus on regeneration of the Town Centre via the Town Centre Masterplan and the Council's investment into the Times Square development, there has been a recent surge of interest in Build-to-Rent schemes over 6 storeys, the first two of which are on site delivering 144 and 362 apartments respectively.

The Council has also set up a Local Housing Company develop commercial housing for private rent. Two sites have been transferred from the Council to the Local Housing Company and planning applications for a total of 160 houses are imminent.

The Council is also working with Registered Providers to bring forward lower value sites and has set up a forum focussing on issues and solutions for housing delivery.

Few residential planning consents remaining un-implemented in the Borough with only 2 identified sites where planning permissions have been implemented but not built. Warrington & Co continue to make efforts with the owners to bring these forward.

The Council has also undertaken the following to increase housing delivery:

- The Corporate Vision of the Council, 2019.
- 'Warrington Means Business' suite of growth and master-planning documents, led by Warrington & Co. including the emerging WBC Housing Delivery Strategy.
- The Proposed Submission Version of the Local Plan 2017 to 2037.
- The Warrington Borough Council Housing Strategy 2018 to 2028.
- The Housing Strategy and Delivery Plan for Cheshire and Warrington LEP, May 2018.

4 Delivery Challenges

Underperformance

There are numerous reasons for underperformance on housing delivery numbers. They are often interrelated and complex and evident in varying degrees across the country and are considered in more detail below.

The significant changes in national planning policy has added to this which means that Warrington needs to plan for a higher housing requirement than previously. Given the time taken to prepare a new Local Plan and the lead in time for large scale developments, there will be a lag between the efforts to increase delivery and the delivery itself.

Interventions

The Council has identified 61 sites, including Local Plan Allocations that are projected to deliver more than 50 units each. Many of these sites require intervention work bringing them forward.

Infrastructure

The Council has a successful track record of infrastructure delivery and the Government has recently confirmed funding for the new Western Link Road, which will unlock significant new housing development capacity across Warrington.

A need has been identified for additional electricity supply in the town centre and a bid has been made to Homes England for Housing Infrastructure Funding to deliver it. Without this funding there is a major risk that town centre sites will not come forward for development as planned.

There are also significant infrastructure requirements for the strategic development sites proposed in the Local Plan. These requirements include new roads, services, schools, health centres, leisure facilities, parks and green spaces. The Council is working closely with the developers promoting these sites, and with Government agencies including Homes England and Highways England, to ensure infrastructure can be delivered in a timely manner to support these sites.

Flood Resilience

The River Mersey flows through the town centre and across the Borough. A number of tributaries run across the wider urban area and whilst the Council, in partnership with the Environment Agency have carried significant flood defence works, many of the sites require further work to make them flood resilient, particularly given the potential impact of climate change.

Contamination

Land contamination needs to be addressed to bring forward many of Warrington's brown field sites. This can raise issues of development viability.

Ownership

The majority of the sites identified for housing are not owned by the Council and therefore the Council is reliant on site owners and private developers to bring these forward.

The sites in Council ownership are a mixture of high and low value sites. The Council has prepared a number of masterplans for areas, particularly in an around the town centre. These masterplans enable the Council to identify and deliver infrastructure requirements and to engage with other landowners in order to promote comprehensive regeneration schemes.

The Council is also working with Homes England to accessing Accelerated Construction Funding to enable lower value sites and bring them forward for development, many in partnership with Registered Providers. Some of these sites are of such low value that they need additional affordable housing funding to ensure viability.

Empty Properties

As at October 2017 there were 624 empty properties in Warrington. This equates to 0.67% of the Borough's housing stock. The Council will continue to work to reduce this percentage, reviewing its Vacant Property Strategy.

Funding

The Council continues to seek and secure Government funding and whilst there is some success, the process to achieve funding can often be complex and lengthy. The Council does not have housing revenue account (HRA) having transferred its stock to a housing association.

Diversification

In common with much of the, smaller housebuilders and Private Registered Providers often find it difficult to compete with the large housebuilders for the larger more profitable sites.

Of the 359 properties completed in 2017/18, 67% were houses and 189 provided at least three bedrooms, largely because it is more profitable to build larger homes for sale. ¹

The Local Plan has identified in Table 3 below, the mix of sizes and tenures required to provide "the right homes in the right places". The mix required is not coming forward in the percentages required. The delivery of an appropriate mix of types and tenures is important to address gaps in provision, provide opportunities to improve lives and sustain economic growth in all areas. It is also important because smaller houses have smaller footprints and therefore providing a percentage of smaller properties to meet this requirement below is likely to deliver more houses.

Table 3 – Housing Demand

	1 bed	2 bed	3 bed	4+bed
Market	0-5%	20-25%	50-55%	20-25%
Low cost homeownership	15-20%	40-45%	30-35%	5-10%
Affordable housing (rented)	20-25%	40-45%	20-30%	5-10%

¹ Warrington Council statistics, Warrington Annual Property Review 2019

The Cheshire and Warrington LEP's Housing Strategy Delivery Plan, Warrington's Housing Needs Assessment² and Homes for the North³ all emphasise the need to address the choice of housing available to younger households. The majority of these households would prefer to buy if they could, as noted in a recent national survey 'Attitudes to Housebuilding' (MHCLG June 2018):*"The majority, 88 per cent, said they would choose to buy and 11 per cent would choose to rent. This figure has changed little in the last thirty years."*

Actions to increase the diversity of housing supply provide the opportunity to better meet the needs of Warrington's residents and to increase the overall rate of housing delivery.

The Council has established a Self-Build register, but the number of permissions it has granted for self-build homes to date is significantly lower than the number of people wanting to build their own home. As such the Council is actively encouraging developers to provide serviced plots.

Changes in the role of housing associations, in particular the need to diversify commercially has also reduced the amount of social and affordable housing provision each year. For both local authorities and housing associations, this has also been related to the reduction in housing subsidies and a switch in government policy from 2012 onwards to assume that social and affordable housing would be a residual function of the private housing market,

² WBC Local Housing Needs Assessment (GL Hearn, Mar 2019)

³ Homes for the North (Litchfield's, 2017)

5 Action Plan

This section summarises key actions that are already being undertaken by the Council or need to be progressed in order to support the increased delivery of housing in Warrington and monitoring arrangements to be implemented.

Emerging Housing Delivery Strategy

The Council is currently preparing a Housing Delivery Strategy that will address supply issues and the other major housing challenges which include; viability, affordability, building the right homes in the right places, quality of housing being delivered, under-occupation, overcrowding and lack of diversification of delivery models.

The key actions in this Housing Delivery Test Action Plan are set out under the following themes:

- Embedding housing delivery and growth as a key priority of the Council;
- Updating the Local Plan and associated planning policies and guidance;
- Monitoring and reviewing housing market information;
- Proactively pursuing housing delivery, promoting diversification of delivery models; accessing funding to assemble and de-risk sites and;
- Ensuring an effective Development Management process;

For each action, responsibilities and timescales have been clearly identified. This provides the basis for the Council to monitor the progress of actions to improve housing delivery.

Monitoring Arrangements

Progress on the individual actions and initiatives are currently reported to the Council's Housing Delivery Group on a monthly basis.

The Housing Delivery Group has implemented a tracker of these actions with to monitor progress.

The Action Plan itself will be formally reviewed and updated on an annual basis as part of the Council's Annual Monitoring Report process.

The Action Plan

The measures and programmes that Warrington Borough Council and its partners are undertaking to accelerate housing delivery in the borough are outlined below.

Responsibility Key:

HDG	Housing Delivery Group
PP	Planning Policy Team
DM	Development Management Team
PEM	Property & Estates Management
PH	Public Health

Programme 1 - Embedding housing delivery and growth as a key priority of the Council

Action	Responsibility	Timescale/deadline
Approve Housing Delivery Test Action Plan and promote it to relevant staff, councillors, partners and other stakeholders	HDG	January 2020
Write Housing Delivery Strategy which addresses other delivery challenges than supply of numbers and promote it to relevant staff, councillors, partners and other stakeholders	HDG	Spring 2020
Embed Housing Delivery Strategy as overarching housing strategy. Consider update of existing Housing Strategy in line with Housing Delivery Strategy	HDG/PH	On-going
Ensure Corporate strategies, Futureproofing of organisation etc. include Housing Delivery Strategy and objectives	HDG	On-going
Review and update other housing policies and strategies to support housing delivery strategy	HDG/PP/PH	On-going
Business intelligence data such as ward profiles, equality agendas, futureproofing organisation to include housing data	HDG	TBC
Set up cross departmental Housing Delivery Group including membership, terms of reference, decision making process	HDG	Established and on-going
Restructure Housing and Regeneration team to support effective housing delivery which optimises and can adapt to delivery options now and in the future, maximising options to fund posts	HDG	On-going
Compile housing development programme register of all sites and sites above 100 units. Use register to monitor progress from pre-app to completion on a quarterly basis and to identify delivery barriers and interventions required	HDG	Established and on-going

Programme 2 - Updating the Local Plan and associated planning guidance

Action	Responsibility	Timescale/deadline
Publication of the Proposed Submission Version (Draft) Local Plan	PP	Completed – March 2019
Regulation 19 Consultation	PP	Completed – June 2019
Submission to SoS	PP	To be confirmed in new Local Development Scheme
Examination in Public (EIP)	PP	To be confirmed in new Local Development Scheme
Estimated date of adoption of Local Plan	PP	To be confirmed in new Local Development Scheme
Consider the use of a Town Centre SPD to facilitate housing delivery in the Town Centre Master Planning areas	PP/DM/HDG	July 2020
Support the delivery of Neighbourhood Plans	PP	On-going

Programme 3 - Monitoring and reviewing housing market information

Action	Responsibility	Timescale/deadline
Maintain Brownfield Land Register	PP	Annually
Maintain Custom & Self-Build Register, identifying opportunities for delivery	PP	Annually
Publish details of Council-owned land for housing in line with the Transparency Code	PEM	Annually
Review constrained sites in housing land supply (SHLAA) to identify any potential sites that could be unlocked	PP/HDG	Annually
Review stalled sites in housing land supply (SHLAA) to identify any potential sites that could be unlocked	PP/HDG	Annually
Identify locations to assist businesses to relocate to in order to unlock land for housing development	HDG	On-going
Establish number of empty homes and actions to bring them back into use	PH	On-going
Review the system of developer viability assessments, monitoring progress and considering a range of initiatives to better appraise Viability Assessments	DM/HDG	On-going

Programme 4 - Proactively pursuing housing delivery and diversification

Action	Responsibility	Timescale/deadline
Establish Local Housing Company	HDG	Established
Establish RP development forum	HDG	Established
Develop partnership approach with RPs and developers with pension funds to invest	HDG	On -going via HDG
Support SMEs to develop in Warrington	HDG	On -going via HDG
Develop other partnership routes including JV companies; in addition to those already established (such as PSP) to support delivery	HDG	On-going
Develop partnership approaches with custom build developers to improve housing offer	HDG	On-going
Identify opportunities and develop approaches for self- build/ serviced plots	HDG/PP	On-going
Continue to work with external partners and experts to improve housing delivery	HDG	On-going
Consider MMC/off site/modular delivery embracing the new Design Code for housing	HDG	On-going
Ensure land disposals have conditions of delivery	PEM	On-going
Acquire more land for future housing development	HDG	On-going
Maximise Government funding to assemble, de-risk land and provide infrastructure to unlock land for housing	HDG	On-going

Programme 5 - Ensuring an effective Development Management process

Action	Responsibility	Timescale/deadline
Restructure DM Team to provide resource to deal with increase in significant major applications	DM	January 2020
Update the standard planning application checklists	DM	April 2020
Introduce Development Team approach to pre-application process	DM	On-going
Introduce a standard S106 Agreement Template to facilitate faster determination of planning applications	DM	April 2020
Expand use of Planning Performance Agreements	DM	On-going
Review and update standard planning conditions and review their use.	DM	July 2020

APP45 -
WBC HDTAP Oct_2020

WARRINGTON

Housing Delivery Test Action Plan

Monitoring Period 2 (2019 Measurement)

October 2020

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1 Introduction

The Government has introduced a Housing Delivery Test (HDT) as the mechanism to monitor housing delivery locally. This measures net additional dwellings delivered against the homes required, over three year rolling periods, the first of which commenced in 2015/16. The Government issues results on performance for each Local Planning Authority (LPA) in England on an annual basis.

The HDT has three requirements:

1. If delivery has been less than 95% of the housing target, the LPA should prepare an Action Plan to address the reasons for the shortfall.
2. If delivery has been less than 85% of the housing target, the LPA should also include a 20% buffer in calculating its 5 years housing land supply.
3. If delivery has been less than 75%, the presumption in favour of sustainable development is also engaged. As a transitional provision, the threshold in the third element is set at 25% and 45% for the 2018 and 2019 tests.

Warrington Borough Council published its first Action Plan in January 2020 in response to its housing delivery being 55% of its requirement over the first monitoring period.

The Action Plan identified the reasons for this under-delivery and set out a series of actions to ensure that Warrington is able to meet its housing requirement in future years.

Government subsequently published the results for the second monitoring period in February 2020, confirming that Warrington had delivered 53% of its housing requirement. As such the Council is required to prepare a second Action Plan.

Given the relatively short period of time since the publication of the first Action Plan and the uncertainties arising from the COVID-19 situation, the new Action Plan provides updates on the previously identified actions rather than establishing new actions.

It is understood that Government will publish the results from the 3rd monitoring period in November 2020. If, as anticipated, the Council will be required to prepare a third Action Plan, the Council will then take the opportunity to undertake a comprehensive update of the Action Plan as a whole, to be published in 2021.

It should be noted that whilst the Council has a key role in housing delivery, it is dependent on private sector landowners and developers to deliver the majority of new homes in Warrington.

2 Housing Delivery Test Performance

Housing Requirement

The Housing Delivery Test 2018 Measurement Technical Note from MHCLG describes how the housing requirements for individual councils are calculated. The calculation is dependent on whether a council has an up to date Local Plan. The Technical Note defines an up-to-date development plan for the purposes of the Housing Delivery Test as one that is less than five years old.

Warrington's current development plan (Warrington Local Plan Core Strategy 2014), was adopted in July 2014. However, upon adoption, there was a High Court Challenge that resulted in parts of the Plan being quashed, most notably the housing target. As such, for the purposes of the HDT, Warrington is not considered to have an up-to-date plan in place at the current time.

In the absence of an up-to-date Local Plan, Warrington's housing requirement is therefore based on previous household projections, as set out in Table 1.

For the purposes of the HDT, the rate of delivery is assessed over the previous three years, also as set out in Table 1.

HDT Assessment

Warrington's performance against the 2019 HDT in terms of comparing the net homes delivered over three years to the homes that should have been built over the same period is also set out in Table 1.

Year	Version of Household Projections	Number of Homes Required	Homes Delivered	Percentage Delivered
2016/17	2012	902	513*	
2017/18	2014	792	359	
2018/19	2014	887	503	
Total		2581	1375	53%*

*Note: the housing completion figures reported to MHCLG in 2016/17 were incorrect. This was down to an error with the number of losses recorded. There were 513 net completions (8 losses) not the 521 recorded in the MHCLG Housing Delivery Test calculation.

Table 1: Housing Projections and Delivery

The Council has delivered 53% of its housing requirement over the past three years - 1,375 properties out of an assessed requirement of 2,617. As a result the Council has failed all three components of the HDT and hence the Government requires:

1. the production of an action plan to demonstrate the steps the Council is taking to boost delivery and meet its housing requirement;
2. the inclusion of a 20% buffer when calculating 5 year land supply;
3. that the presumption in favour of sustainable development will apply.

3 Housing Delivery

This section of the Action Plan deals with the housing market delivery analysis, first by reviewing past performance and then looking forward to projected delivery.

Past Delivery

In understanding why Warrington has not met its housing requirement over the last 3 years, it is helpful to consider housing delivery in Warrington over a longer period, taking into account 'development cycles' and changing national planning policy requirements.

In accordance with national planning requirements, Warrington monitors the delivery of new housing across the Borough on an annual basis and produces its findings in the Strategic Housing Land Availability Assessment (SHLAA) and Annual Monitoring Report (AMR).

Figure 1 shows the number of housing completions in the Borough from 2004 to 2019. The graph also shows the Local Plan target at the time to put the housing delivery rate into context.

The graph shows that in the mid 2000s the rate of delivery was substantially exceeding the Local Plan requirement. Whilst delivery rates dropped significantly at the start of the recession in 2008/09, Warrington continued to deliver housing through the recession at a rate in excess of the Local Plan requirement at that time.

Following the removal of the housing target from the Local Plan Core Strategy, Warrington's housing delivery did not keep pace with its housing requirement.

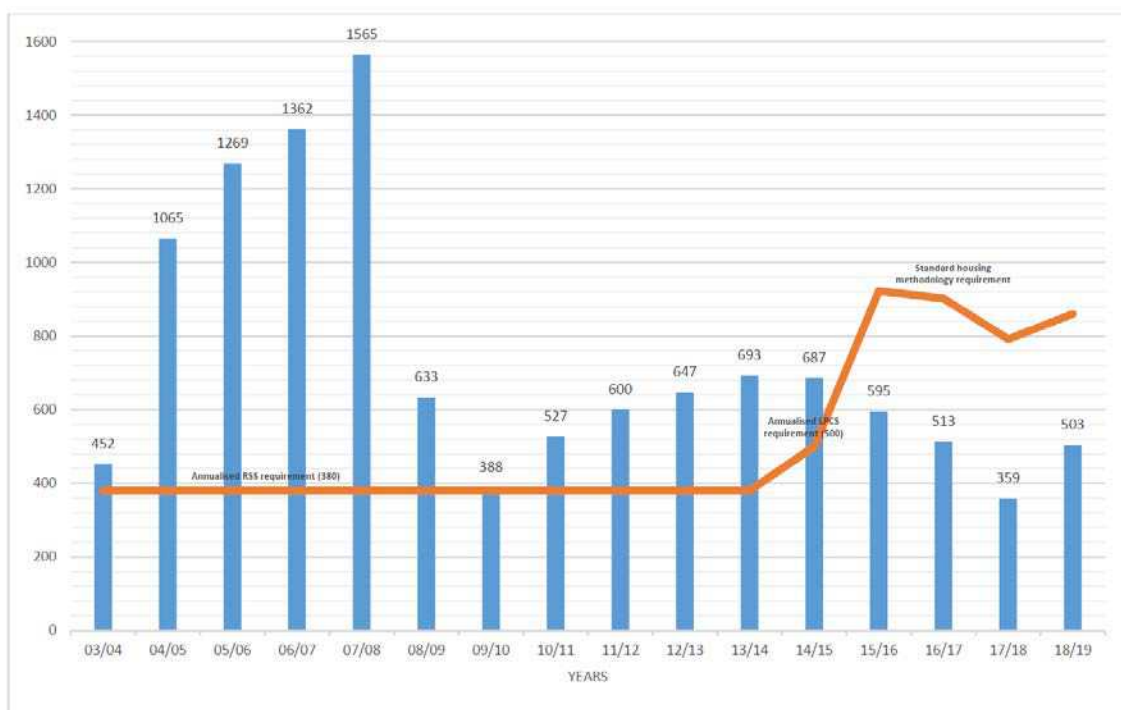


Figure 1: Housing Delivery 2004 - 2019 v Plan Requirement

The Council adopted a new Plan, The Local Plan Core Strategy in July 2014. It was subject to a High Court challenge that removed the housing requirement from the Plan. This reflected a change in national policy which, with the removal of Regional Planning Guidance, required Councils to define and meet their own objectively assessed housing needs. In Warrington’s case, the change in national planning policy means the Council has a higher housing requirement than that established within the Regional Planning Guidance context.

Until the Council adopts a new Local Plan, the Council’s 5 year land supply and performance against the Housing Delivery Test will be assessed against the Government’s Standard Housing Methodology.

Future Delivery

The Housing Trajectory forecasts that the housing delivery test will be met in year 2021, as shown in the table below.

Year	Annual	Rolling 3 year delivery	Annual Target	Rolling 3 year target	HDT (%)
2015	595	-	923	-	-
2016	492	-	902	-	-
2017	359	-	792	-	-
2018	503	1446	860	2617	55%
2019	591	1354	839	2580	53%
2020	1416	1453	819	2517	58%
2021	-	2510	-	2457	102%

Table 2: Projected housing delivery

The Council consulted on the Proposed Submission Version Local Plan (PSVLP) from April until June 2019. The PSVLP identifies that a minimum of 18,900 new homes will need to be delivered over the period 2017 to 2037. This equates to an average of 945 homes per annum, 377 of which must be affordable. The Plan has identified sites and planned for growth to meet this housing target.

The PSVLP seeks to maximise the development of brownfield land. The Plan acknowledges that there is insufficient brownfield land to meet the housing requirements and it is therefore necessary to propose to release some Green Belt land as detailed in the Local Plan spatial strategy below (Fig.2).

Local Plan Spatial Strategy

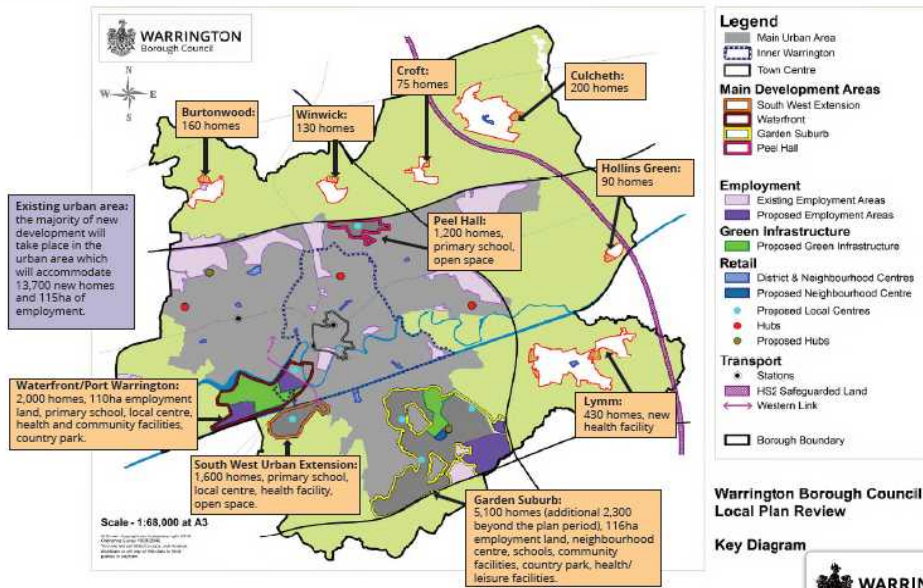


Figure 2: Proposed Submission Version Local Plan (March 2019) – Key Diagram

The Council’s Urban Capacity Assessment 2019, published alongside the PSVLP provides a detailed assessment of the housing trajectory, broken down to the main development areas, up to March 2037 as shown in Figure 3 below.

The trajectory, based on 2018 SHLAA data, illustrates that there is expected to be an increase in the annual average completion rate over the next five years (2018/19 to 2022/23), with 5,081 completions over this period. This equates to an annual average of 1,016 completions.

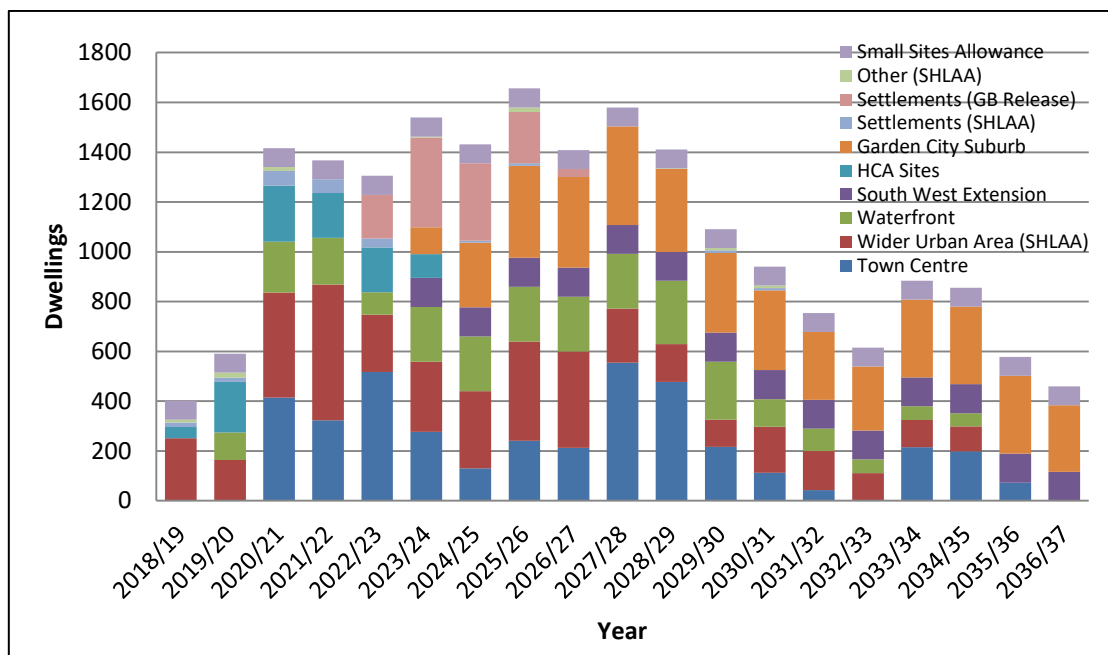


Figure 3: Housing Trajectory to March 2037

The Urban Capacity Assessment also indicates a significant increase in annual rate of delivery occurring in 2020/21 to over 1,300 units and that this will be being maintained at similar levels to 2028/29. The initial increase in supply will be provided from sites within the existing urban area.

This increase in housing delivery is based on a number of sites which now have planning permission and are currently being built out. This will mean that Warrington's performance against the Housing Delivery Test will improve significantly over the short term.

However, in order to sustain delivery over the longer term, the Local Plan is proposing to release Green Belt for around 7,000 new homes, including 2 large urban extensions with significant infrastructure requirements. Warrington's urban capacity over the longer term will also become more challenging to deliver, with the need for interventions including land assembly and infrastructure delivery.

Progress made

Housing completions are forecast to increase significantly in Warrington over the coming years, reflecting the number of permissions that have been granted for residential development.

A large number of these homes will come forward in suburban areas of the Borough, generally in higher value areas where there is already infrastructure or where additional infrastructure capacity can be provided relatively easily.

Given the Council's focus on regeneration of the Town Centre via the Town Centre Masterplan and the Council's investment into the Times Square development, there has been a recent surge of interest in Build-to-Rent schemes over 6 storeys, the first two of which are on site delivering 144 and 362 apartments respectively.

The Council has also set up a Local Housing Company to develop commercial housing for private rent. Two sites have been transferred from the Council to the Local Housing Company and planning applications for a total of 161 houses have now been approved.

The Council is also working with Registered Providers to bring forward lower value sites and has set up a forum focussing on issues and solutions for housing delivery.

Few residential planning consents remaining un-implemented in the Borough with only 2 identified sites where planning permissions have been implemented but not built. Warrington & Co continue to make efforts with the owners to bring these forward.

The Council has also undertaken the following to increase housing delivery:

- The Corporate Vision of the Council, 2019.
- 'Warrington Means Business' suite of growth and master-planning documents, led by Warrington & Co. including the emerging WBC Housing Delivery Strategy.
- The Proposed Submission Version of the Local Plan 2017 to 2037.
- The Warrington Borough Council Housing Strategy 2018 to 2028.
- The Housing Strategy and Delivery Plan for Cheshire and Warrington LEP, May 2018.

4 Delivery Challenges

Underperformance

There are numerous reasons for underperformance on housing delivery numbers. They are often interrelated and complex and evident in varying degrees across the country and are considered in more detail below.

The significant changes in national planning policy has added to this which means that Warrington needs to plan for a higher housing requirement than previously. Given the time taken to prepare a new Local Plan and the lead in time for large scale developments, there will be a lag between the efforts to increase delivery and the delivery itself.

Interventions

The Council has identified 61 sites, including Local Plan Allocations that are projected to deliver more than 50 units each. Many of these sites require intervention work bringing them forward.

Infrastructure

The Council has a successful track record of infrastructure delivery and the Government has recently confirmed funding for the new Western Link Road, which will unlock significant new housing development capacity across Warrington.

A need has been identified for additional electricity supply in the town centre and a bid has been made to Homes England for Housing Infrastructure Funding to deliver it. Without this funding there is a major risk that town centre sites will not come forward for development as planned.

There are also significant infrastructure requirements for the strategic development sites proposed in the Local Plan. These requirements include new roads, services, schools, health centres, leisure facilities, parks and green spaces. The Council is working closely with the developers promoting these sites, and with Government agencies including Homes England and Highways England, to ensure infrastructure can be delivered in a timely manner to support these sites.

Flood Resilience

The River Mersey flows through the town centre and across the Borough. A number of tributaries run across the wider urban area and whilst the Council, in partnership with the Environment Agency have carried significant flood defence works, many of the sites require further work to make them flood resilient, particularly given the potential impact of climate change.

Contamination

Land contamination needs to be addressed to bring forward many of Warrington's brown field sites. This can raise issues of development viability.

Ownership

The majority of the sites identified for housing are not owned by the Council and therefore the Council is reliant on site owners and private developers to bring these forward.

The sites in Council ownership are a mixture of high and low value sites. The Council has prepared a number of masterplans for areas, particularly in an around the town centre. These masterplans enable the Council to identify and deliver infrastructure requirements and to engage with other landowners in order to promote comprehensive regeneration schemes.

The Council is also working with Homes England to accessing Accelerated Construction Funding to enable lower value sites and bring them forward for development, many in partnership with Registered Providers. Some of these sites are of such low value that they need additional affordable housing funding to ensure viability.

Empty Properties

As at October 2017 there were 624 empty properties in Warrington. This equates to 0.67% of the Borough's housing stock. The Council will continue to work to reduce this percentage, reviewing its Vacant Property Strategy.

Funding

The Council continues to seek and secure Government funding and whilst there is some success, the process to achieve funding can often be complex and lengthy. The Council does not have housing revenue account (HRA) having transferred its stock to a housing association.

Diversification

In common with much of the country, smaller housebuilders and Private Registered Providers often find it difficult to compete with the large housebuilders for the larger more profitable sites.

Of the new homes completed in 2018/19, 85% were houses, 36% were 1 or 2 bed and 64% were three bedrooms or larger.

This represents a reasonable mix between smaller and larger properties and broadly reflects the required mix identified in the Council's latest Local Housing Need Assessment.

Table 3 – Housing Demand

	1 bed	2 bed	3 bed	4+bed
Market	0-5%	20-25%	50-55%	20-25%
Low cost homeownership	15-20%	40-45%	30-35%	5-10%
Affordable housing (rented)	20-25%	40-45%	20-30%	5-10%

The Cheshire and Warrington LEP's Housing Strategy Delivery Plan, Warrington's Housing Needs Assessment¹ and Homes for the North² all emphasise the need to address the choice of housing available to younger households. The majority of these households would prefer to buy if they could, as noted in a recent national survey 'Attitudes to Housebuilding' (MHCLG

¹ WBC Local Housing Needs Assessment (GL Hearn, Mar 2019)

² Homes for the North (Litchfield's, 2017)

June 2018):“The majority, 88 per cent, said they would choose to buy and 11 per cent would choose to rent. This figure has changed little in the last thirty years.”

Actions to increase the diversity of housing supply provide the opportunity to better meet the needs of Warrington’s residents and to increase the overall rate of housing delivery.

The Council has established a Self-Build register but the number of permissions it has granted for self-build homes to date is significantly lower than the number of people wanting to build their own home. As such the Council is actively encouraging developers to provide serviced plots.

Changes in the role of housing associations, in particular the need to diversify commercially has also reduced the amount of social and affordable housing provision each year. For both local authorities and housing associations, this has also been related to the reduction in housing subsidies and a switch in government policy from 2012 onwards to assume that social and affordable housing would be a residual function of the private housing market.

5 Action Plan

This section summarises key actions that are already being undertaken by the Council or need to be progressed in order to support the increased delivery of housing in Warrington and the monitoring arrangements to be implemented.

The key actions in this Housing Delivery Test Action Plan are set out under the following themes:

- Embedding housing delivery and growth as a key priority of the Council;
- Updating the Local Plan and associated planning policies and guidance;
- Monitoring and reviewing housing market information;
- Proactively pursuing housing delivery, promoting diversification of delivery models; accessing funding to assemble and de-risk sites and;
- Ensuring an effective Development Management process;

For each action, responsibilities and timescales have been clearly identified. This provides the basis for the Council to monitor the progress of actions to improve housing delivery.

The Actions were established in the original Action Plan. In this version of the Action Plan, actions are identified as:

‘Green’ – completed or on target;

‘Amber’ – original target not met but new target in place for completion; or

‘Red’ – target not met and revised date yet to be confirmed.

The only action currently identified as ‘red’ is the publication of the Housing Delivery Strategy. The Delivery Strategy is currently being prepared and will address supply issues and the other major housing challenges which include; viability, affordability, building the right homes in the right places, quality of housing being delivered, under-occupation, overcrowding and lack of diversification of delivery models. The timescale for publication of the Delivery Strategy is being reviewed and will be confirmed ahead of the publication of the next Housing Delivery Test Action Plan.

Monitoring Arrangements

Progress on the individual actions and initiatives will continue to be reported to the Council’s Housing Delivery Group on a monthly basis.

A comprehensive review of all actions, including identification of any additional actions, will be undertaken to inform the next version of the Action Plan in 2021.

The Action Plan

The measures and programmes that Warrington Borough Council and its partners are undertaking to accelerate housing delivery in the borough are outlined below.

Responsibility Key:

HDG	Housing Delivery Group
PP	Planning Policy Team
DM	Development Management Team
PEM	Property & Estates Management
PH	Public Health

Programme 1 - Embedding housing delivery and growth as a key priority of the Council

Action	Responsibility	Timescale/deadline
Approve Housing Delivery Test Action Plan and promote it to relevant staff, councillors, partners and other stakeholders	HDG	January 2020
Write Housing Delivery Strategy which addresses other delivery challenges than supply of numbers and promote it to relevant staff, councillors, partners and other stakeholders	HDG	Spring 2020
Embed Housing Delivery Strategy as overarching housing strategy. Consider update of existing Housing Strategy in line with Housing Delivery Strategy	HDG/PH	On-going
Ensure Corporate strategies, Futureproofing of organisation etc. include Housing Delivery Strategy and objectives	HDG	On-going
Review and update other housing policies and strategies to support housing delivery strategy	HDG/PP/PH	On-going
Business intelligence data such as ward profiles, equality agendas, futureproofing organisation to include housing data	HDG	TBC
Set up cross departmental Housing Delivery Group including membership, terms of reference, decision making process	HDG	Established and on-going
Restructure Housing and Regeneration team to support effective housing delivery which optimises and can adapt to delivery options now and in the future, maximising options to fund posts	HDG	On-going
Compile housing development programme register of all sites and sites above 100 units. Use register to monitor progress from pre-app to completion on a quarterly basis and to identify delivery barriers and interventions required	HDG	Established and on-going

Programme 2 - Updating the Local Plan and associated planning guidance

Action	Responsibility	Timescale/deadline
Publication of the Proposed Submission Version (Draft) Local Plan	PP	Completed – March 2019
Regulation 19 Consultation	PP	Completed – June 2019
Submission to SoS	PP	To be confirmed in new Local Development Scheme
Examination in Public (EIP)	PP	To be confirmed in new Local Development Scheme
Estimated date of adoption of Local Plan	PP	To be confirmed in new Local Development Scheme
Consider the use of a Town Centre SPD to facilitate housing delivery in the Town Centre Master Planning areas	PP/DM/HDG	July 2020
Support the delivery of Neighbourhood Plans	PP	On-going

Programme 3 - Monitoring and reviewing housing market information

Action	Responsibility	Timescale/deadline
Maintain Brownfield Land Register	PP	Annually
Maintain Custom & Self-Build Register, identifying opportunities for delivery	PP	Annually
Publish details of Council-owned land for housing in line with the Transparency Code	PEM	Annually
Review constrained sites in housing land supply (SHLAA) to identify any potential sites that could be unlocked	PP/HDG	Annually
Review stalled sites in housing land supply (SHLAA) to identify any potential sites that could be unlocked	PP/HDG	Annually
Identify locations to assist businesses to relocate to in order to unlock land for housing development	HDG	On-going
Establish number of empty homes and actions to bring them back into use	PH	On-going
Review the system of developer viability assessments, monitoring progress and considering a range of initiatives to better appraise Viability Assessments	DM/HDG	On-going

Programme 4 - Proactively pursuing housing delivery and diversification

Action	Responsibility	Timescale/deadline
Establish Local Housing Company	HDG	Established
Establish RP development forum	HDG	Established
Develop partnership approach with RPs and developers with pension funds to invest	HDG	On-going via HDG
Support SMEs to develop in Warrington	HDG	On-going via HDG
Develop other partnership routes including JV companies; in addition to those already established (such as PSP) to support delivery	HDG	On-going
Develop partnership approaches with custom build developers to improve housing offer	HDG	On-going
Identify opportunities and develop approaches for self- build/ serviced plots	HDG/PP	On-going
Continue to work with external partners and experts to improve housing delivery	HDG	On-going
Consider MMC/off site/modular delivery embracing the new Design Code for housing	HDG	On-going
Ensure land disposals have conditions of delivery	PEM	On-going
Acquire more land for future housing development	HDG	On-going
Maximise Government funding to assemble, de-risk land and provide infrastructure to unlock land for housing	HDG	On-going

Programme 5 - Ensuring an effective Development Management process

Action	Responsibility	Timescale/deadline
Restructure DM Team to provide resource to deal with increase in significant major applications	DM	January 2020
Update the standard planning application checklists	DM	April 2020
Introduce Development Team approach to pre-application process	DM	On-going
Introduce a standard S106 Agreement Template to facilitate faster determination of planning applications	DM	April 2020
Expand use of Planning Performance Agreements	DM	On-going
Review and update standard planning conditions and review their use.	DM	July 2020

APP46 -
MT WBC *email of* 16.02.

From: Taylor, Mike <mike.taylor@warrington.gov.uk>
Sent: 16 February 2021 15:26
To: Fiona Bennett <fiona.bennett@highgatetransportation.co.uk>
Cc: dave.tighe <dave.tighe@highgatetransportation.co.uk>; Rowland, Gary <Gary.Rowland@wsp.com>; Hughes, Martha <Martha.Hughes@warrington.gov.uk>; Colin Griffiths <colin@satnam.co.uk>; Dickin, Alan <adickin@warrington.gov.uk>
Subject: RE: Peel Hall - Meeting 18.01.21 - RSA1

Fiona,

Thank you for the additional information.

The tracking diagram provided appears to indicate that two HGVs would not be able to make the left turn manoeuvre from A49 into Cromwell Avenue simultaneously; the Council will need to take a view on this as any design is progressed. As you will be aware the Road Safety Audit process falls outside of the planning process and now that we have the complete information there are no further comments at this time; any issues will be picked up through the detailed design process should the scheme progress.

Regards

Mike

Mike Taylor

Transport Development Control Team Leader

CURRENTLY WORKING FROM HOME

Environment and Transport Directorate
Transport for Warrington
Warrington Borough Council
New Town House, Buttermarket Street, Warrington, WA1 2NH

 mike.taylor@warrington.gov.uk

 Office: 01925 444086 Mobile: 07966 884639

warrington.gov.uk

From: Fiona Bennett [<mailto:fiona.bennett@highgatetransportation.co.uk>]
Sent: 12 February 2021 17:12
To: Taylor, Mike <mike.taylor@warrington.gov.uk>
Cc: dave.tighe <dave.tighe@highgatetransportation.co.uk>; Rowland, Gary <Gary.Rowland@wsp.com>; Hughes, Martha <Martha.Hughes@warrington.gov.uk>; Colin Griffiths <colin@satnam.co.uk>; Dickin, Alan <adickin@warrington.gov.uk>
Subject: Re: Peel Hall - Meeting 18.01.21 - RSA1

Afternoon Mike,

Thank you for coming back to me on this.

Please find attached the SPA plan 1901/TR03 carried out on the updated plan of 19th January, as requested. We trust that this will enable you to provide your comments as Overseeing Organisation by close of play on Monday.

In terms of the 2019 data, you will be aware that this has been provided to you on more than one occasion. If you require it again, I can set up a WeTransfer. Let me know.

Have a good weekend.

Kind regards,
Fiona

Fiona Bennett
Highgate*Transportation*
Tel: 0117 934 9121
Mob: 07595 892 217

*Highgate Transportation Ltd
First Floor, 43-45 Park Street
BRISTOL BS1 5NL
Company Registration Number: 07500534*

From: "Taylor, Mike" <mike.taylor@warrington.gov.uk>
Date: Friday, 12 February 2021 at 16:27
To: Fiona Bennett <fiona.bennett@highgatetransportation.co.uk>
Cc: "dave.tighe" <dave.tighe@highgatetransportation.co.uk>, "Rowland, Gary" <Gary.Rowland@wsp.com>, "Hughes, Martha" <Martha.Hughes@warrington.gov.uk>, Colin Griffiths <colin@satnam.co.uk>, "Dickin, Alan" <adickin@warrington.gov.uk>
Subject: RE: Peel Hall - Meeting 18.01.21 - RSA1

Fiona,

Thank you for your email. It is noted that the Audit Team were provided with a swept-path analysis that does not appear to have been shared with the council. It is also noted that 2019 count data and queue length information were provided to the Audit Team.

For completeness I would appreciate a copy of this information.



Regards

Mike

Mike Taylor
Transport Development Control Team Leader

CURRENTLY WORKING FROM HOME

Environment and Transport Directorate
Transport for Warrington
Warrington Borough Council
New Town House, Buttermarket Street, Warrington, WA1 2NH

 mike.taylor@warrington.gov.uk
 Office: 01925 444086 Mobile: 07966 884639

warrington.gov.uk

APP47 -
Notes of CMC 25.01.21

APPEAL REF: APP/Q4245/W/19/3178530

PEEL HALL, WARRINGTON

Mixed use neighbourhood comprising residential care home (Use Class C2); up to 1,200 dwelling houses and apartments (Use Class C3); local centre including food store up to 2,000 m² (Use class A1); financial and professional services; restaurants and cafes; drinking establishments; hot food takeaways (Use Classes A2-A5 inclusive); units within Use Class D1 (non-residential institution) of up to 600 m² total (with no single unit of more than 200 m²); and family restaurant/pub of up to 800 m² (Use Classes A3/A4; primary school; open space including sports pitches with ancillary facilities; means of access and supporting infrastructure).

Outline application with access to be considered at this stage.

**THIRD CASE MANAGEMENT TELEPHONE CONFERENCE (CMC) HELD AT
1300 ON MONDAY, 25 JANUARY 2021**

INSPECTOR'S CONFERENCE NOTE

1. Miss Christina Downes was the Inspector who undertook the third CMC. As before, the Appellant's spokesperson was Mr Christopher Lockhart-Mummery of Queen's Counsel; the Council's spokesperson was Mr David Manley of Queen's Counsel; and Save Peel Hall Campaign Group, the Rule 6 Party's spokespeople were Mr Jim Sullivan and Mr Jon Parr. The three main parties confirmed that they had seen the previously circulated Agenda.

Purpose of the conference

2. The purpose of the third CMC was to consider how the inquiry, which was adjourned on 22 September 2020 due to the need for further traffic modelling, would proceed to conclusion. The Inspector appreciates that the Rule 6 Party maintains its position that further traffic evidence should not be permitted. However, she notes that it will seek to engage fully with the inquiry in view of her decision that such evidence will be accepted.
3. There was no discussion on the merits of the appeal at the CMC and the Inspector did not hear any evidence.

Live streaming

4. It had been agreed before the inquiry adjourned that the inquiry would continue as a virtual event. The Inspector explained that the Planning Inspectorate now offers live streaming and that she considered that this would be a good candidate in view of the public interest and the problems that some of those observing had experienced with accessing the Teams

platform. The Council will re-notify interested persons with the link to the live stream included.

Dates and deadlines

5. The parties have been notified of most of these already, but to re-iterate:

Highways statement of common ground - Mr Manley agreed to chase this up as a matter of urgency as it has been with the Council since last September. It then needs to go to the Rule 6 Party for signature. The Inspector wishes for this to be submitted in final form with agreements and disagreements highlighted by **2 February**

Council's breakdown of the costings for the signalisation contributions in the Planning Obligation: **2 February**

Proofs of evidence: **9 February**

Short additional written statement by Mr Sawyer on behalf of the Rule 6 Party in respect of recent flooding: **9 February**

Rebuttals (if necessary), including flooding response: **23 February**

VISSIM statement of common ground: **23 February**

Time estimates from all main parties: **2 March**

Inquiry opens: **9 March**

The highways evidence

Position regarding the VISSIM modelling

6. The modelling appears to have been successful. The final modelling was submitted to the Council on 2 December. Both the Council and Highways England have responded, and a meeting was held on 18 January. The Rule 6 Party confirmed that it had now received a copy of the recording of this meeting.
7. It was agreed that the main issue will relate to the interpretation of the results and consequent impacts. The Inspector indicated that because the evidence is likely to be highly technical, it must be very carefully presented and explained for all to understand.

The position of Highways England

8. Mr Heywood confirmed that Highways England no longer objects to the appeal proposals on the basis that mitigation would be provided to the eastbound M62 slip road and gyratory and changes made would be made to the signal timings. It is satisfied that these matters could be addressed through an independent Stage 2 Road Safety Audit and controlled through planning conditions.

9. Although Highways England will no longer be presenting evidence, Mr Heywood offered to attend the inquiry if required. The Inspector considered that it would be very helpful for Highways England to be available, especially as the signal optimisation used by the modellers is a matter that is of concern to the local highway authority who control it. Evidence will be heard about this, but the Inspector is concerned to know what the position of Highways England would be if this dispute remains outstanding.

Witnesses and their evidence

10. It was agreed before the inquiry adjourned that the main proofs of evidence and rebuttals that have been submitted would not be changed. The only new evidence will therefore relate to the VISSIM modelling and its implications.

11. The Appellant will call 2 witnesses:

Mr Tighe – has already submitted his evidence but will prepare a short supplementary proof commenting on the VISSIM output.

Mr Best – is the VISSIM modeller and will be producing a new proof to explain the technical work and its outputs.

12. The Council will call 3 witnesses

Mr Taylor - has already submitted his evidence but will prepare a short supplementary proof commenting on the VISSIM output, mainly in respect of queues along Sandy Lane West.

Mr Rowland – will be producing a new proof to deal with the VISSIM modelling.

Mr Rostrom – will be producing a new proof to deal with junction signalisation relating to the VISSIM modelling

13. The Rule 6 Party will call 1 witness

Mr Parr – has already submitted his evidence. He will not be addressing the VISSIM modelling specifically and will rely on the Council for technical evidence. However, Mr Parr indicated that he may wish to ask questions on VISSIM. The Inspector agreed that he could question the Appellant's witnesses on this if he wished. However, he should flag up the areas of concern by rebuttal stage (by 23 February).

VISSIM statement of common ground

14. Mr Lockhart-Mummery indicated that this had been prepared and was now with the Council. Mr Manley confirmed that there would be no problem with the document being signed and submitted by the deadline of 23 February.

The healthcare contribution

15. Mr Manley indicated that it was no longer proposed to seek a site to provide a new joint healthcare facility for the 2 practices. The current plan is to

expand capacity in each of the practices individually at their existing premises. The contribution is in accordance with the formula in the supplementary planning document. However, the Inspector will need to be satisfied that it is justified and that there is evidence of how it will be used to implement the proposed expansions.

16. Mr Lockhart Mummery indicated that a substantial sum of money was involved and that all evidence so far had been on the basis of a new healthcare hub. However, both he and Mr Manley agreed that this may be possible to deal with through a statement of common ground. If there remain substantial points of disagreement however, the Inspector will consider whether a short round table session would be the best way of addressing the issue.

The planning policy and planning balance evidence

17. The evidence of Mrs Hughes (Council) and Mr Griffiths (Appellant) has already been submitted. It was indicated that there would be short supplementary proofs on the emerging policy context, housing land supply and healthcare.
18. The Rule 6 Party has addressed planning policy through the evidence of Mr Black and so it is not expected that further evidence will be submitted. However, there will be the opportunity for the Rule 6 Party to ask relevant questions on Mr Griffiths' evidence if it wishes.
19. Mr Parr said that due to the recent floods, Mr Sawyer wished to submit some additional evidence. Mr Lockhart-Mummery objected to this as the issue had already been heard and cross-examination had taken place. The Inspector pointed out that there were new circumstances and that she was prepared to accept the further evidence from Mr Sawyer. It was agreed that this should be in writing and should only address the recent flooding and should not re-visit evidence already given. The statement should be brief and to the point and submitted by 9 February. Any short response by the Appellant should be made in writing by 23 February.

Planning Obligation update

20. Mr Lockhart-Mummery pointed out that the Appellant had been requesting a breakdown of the signalisation costings of £90,000 and £50,000 requested by the Council since August 2020 but had been told that this would not be forthcoming. Mr Manley agreed that this was unacceptable and agreed that the information would be provided within the next week (by 2 February).
21. Other than the above, Mr Lockhart-Mummery indicated that good progress was being made and that it was hoped to submit an agreed (unsigned) document by 23 February.

22. Mr Sullivan re-iterated the Rule 6 Party's concern that the upkeep of the playing fields was not included in the Planning Obligation. Mr Lockhart-Mummery indicated that this was at the Council's request.

Timetable and Programming

23. The inquiry will commence on 9 March and is scheduled to sit for 8 days. It was agreed that another 2 days should be reserved in case of over-run and that these would be 25 and 26 March.
24. The Inspector explained that due to the technical nature of the highways evidence, the inquiry would sit for 4 days each week (not Mondays) and for 3 x 1.5 hours sessions with good breaks in between. It will start at 0930 and typically there will be 2 sessions before lunch with a half hour break in between and one session in the afternoon. Slightly longer sitting times may be accommodated thereafter, subject to the agreement of all involved.
25. The inquiry will be concluded on a topic basis with highways being first, followed by planning policy and planning balance. If a healthcare round table session is necessary, this will take place after the highways evidence. A further round table session on conditions and the Planning Obligation will follow. A suitable break will be provided before closing submissions.

Digital access to documents

26. Mr Parr indicated that the Council's website was difficult for people to negotiate. He pointed out that at the inquiry in September, the Appellant had placed documents on a website managed by Results Communications, which had been very easy to use. Mr Griffiths confirmed that this would be available again from early February when the proofs and other documents will be uploaded.

Further site visit

27. The Inspector confirmed that she is likely to wish to undertake another site visit following the highway evidence. She could do this unaccompanied, subject to being provided with an agreed itinerary and map of the places to visit on the network.
28. She indicated that as things stand, she would not wish to stay away from home (although this may change by March/ April). That being the case it was unlikely that she would be able to be there for the morning peak but would be able to experience the evening peak. She understands that at the present time traffic flows are not as high as usual because many people are working from home. However, it is not known the extent to which this situation will continue in the longer-term as a result of more enduring changes in workplace behaviour.

29. The CMC ended at 1427.

Christina Downes
26/1/21