

PROPOSED SERVICE STATION

A16, CROWLAND, PETERBOROUGH

Recharge Roadside Services Ltd
Transport Statement

January 2021

Recharge Roadside Services Ltd
Proposed Service Station including Petrol Filling Station
A16, Crowland, Peterborough

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1.0 INTRODUCTION

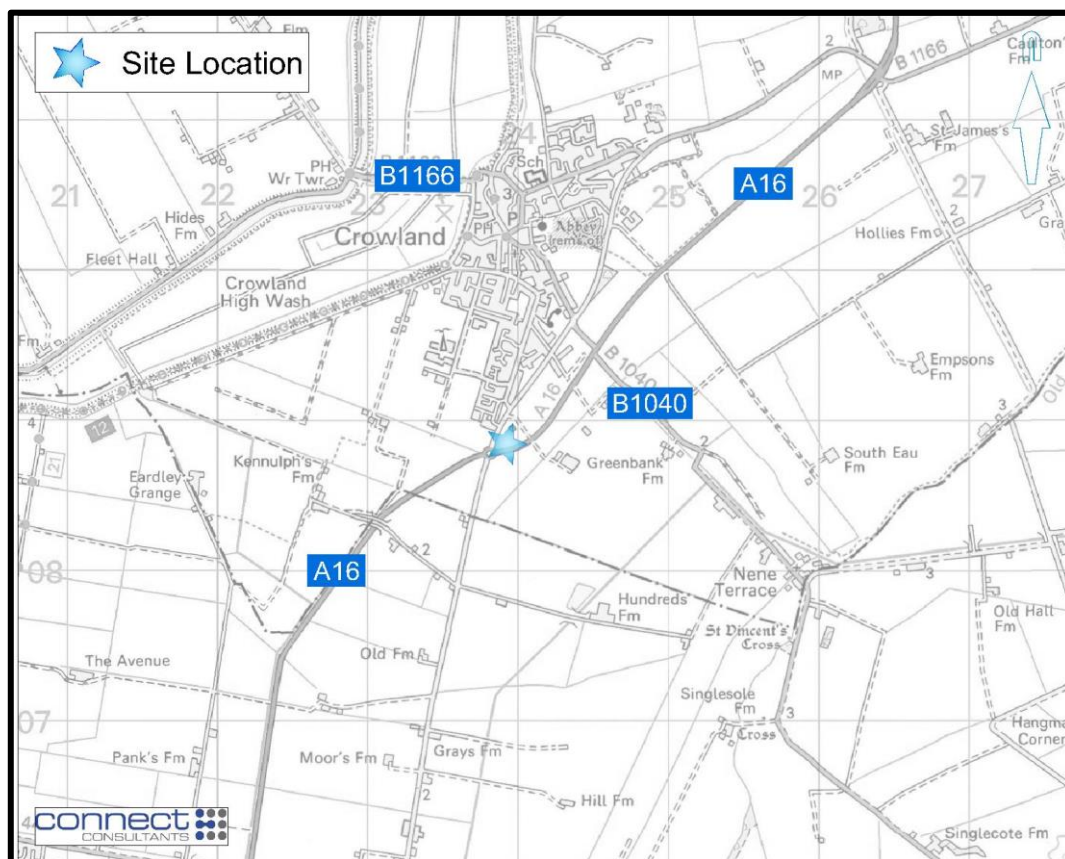
1.1 Appointment of Connect Consultants

- 1.1.1 Connect Consultants Limited is a firm of transport planning and highway design consultants that have been instructed by Recharge Roadside Services Ltd in relation to the proposed Service Station on land between the A16 and James Road, Crowland, Peterborough.

1.2 Site Location

- 1.2.1 The proposal site is located on undeveloped land between the A16 and James Road, to the south of the town of Crowland. Crowland is located to the west of the A16, c9km northeast of Peterborough and c12km south of Spalding.
- 1.2.2 The proposal site is bound to the north by further undeveloped land and the Concrete Company, to the east by undeveloped land and Carrington's Drove, to the south by the A16 and to the west by the James Road and the A16 / James Road / Peterborough Road roundabout.
- 1.2.3 The location of the proposal site, in the context of the urban area, is presented at Figure 1.1 below.

Figure 1.1 – Site Location Plan



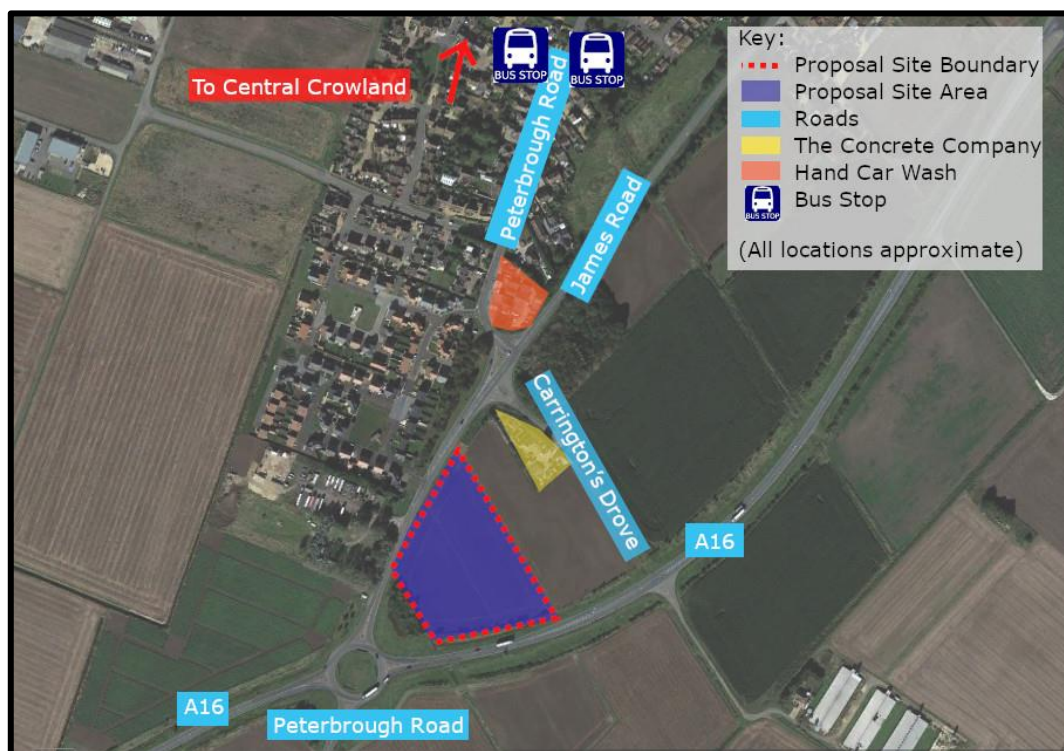
Source: Promap

- 1.2.4 The site is located on the edge of the largely residential town of Crowland, with a number of residential dwellings, including the new development to the south of Harvester Way in close proximity.

1.2.5 Crowland includes retail and commercial units, particularly concentrated in the centre of the town.

1.2.6 Figure 1.2 below identifies the context of the site in relation to the local area.

Figure 1.2 – Site in its Local Context



Source: Google

1.2.7 Existing PFS's are located at the following locations surrounding the proposal site: -

- Esso Eye Green (A47) – c6km south of site.
- Esso Morrisons (Paston Parkway) – c9km south of the site.
- Esso Tesco (Peterborough) – c10km southwest of the site.
- Apple Garage Services (A16) - c14km north of site.

1.2.8 Based on the above, Crowland does not currently have readily accessible service station.

1.3 Development Proposals

1.3.1 The development proposals are shown on the plan provided at Appendix 1. The proposals include the development of a Service Station with site composition including the following: -

- A petrol filling station which includes 8 pumping bays for light vehicles and 6 pumping bays for heavy goods vehicles (HGVs).
- A small service station building of 637.83sq.m of Gross Internal Area (GIA), with the following composition: -
 - Retail outlets.
 - Café / restaurant.
 - Takeaway food kiosks.
 - Seating area.
 - Toilets.
 - ATM.
- 21 customer parking spaces, of which 2 spaces are for disabled users and two are electric vehicle charging spaces.
- 61 HGV parking spaces and a further 12 staff parking spaces are located in a segregated HGV parking area.
- A waiting bay adjacent to the service station building.
- 3 Jet-wash bays.

1.3.2 The proposed site access arrangements are also shown on the proposed site layout access plans at Appendix 2 and Appendix 3. A brief description of the site access arrangements is set out below: -

- The site will be accessed via a left in only access from the A16, c80m east of the A16 / James Road / Peterborough Road roundabout junction as shown at Appendix 2. The access will be via a barrier separated slip road to prevent vehicles from turning right into the site. It will be for both cars and HGV's.
- Egress from the site will be provided via an all movement junction onto James Road c110m north of the A16 / James Road / Peterborough Road roundabout junction as shown at Appendix 3. This too will be for cars and HGV's.
- A pedestrian connection between the site and Goldcrest Road.

1.4 Planning Policy Background

National Planning Policy Framework (February 2019)

1.4.1 A revised NPPF was published in February 2019. It sets out the Government's planning policies for England and sets out a framework for local authorities to produce their own local plans.

- 1.4.2 The key purpose of the NPPF is to contribute to the achievement of sustainable development. It sets out three overarching interdependent objectives as, a) an economic objective, b) a social objective, and c) an environmental objective.
- 1.4.3 At its heart, the NPPF maintains its presumption in favour of sustainable development.
- 1.4.4 Chapter 9 *Promoting sustainable transport* sets out at paragraph 106 that,
"Maximum parking standards for residential and non-residential development should only be set where there is a clear and compelling justification that they are necessary for managing the local road network,..."
- 1.4.5 Paragraph 108 addresses how development proposals are to be considered. It sets out that,
"In assessing sites that may be allocated for development in plans, or specific applications for development, it should be ensured that:
a) appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location;
b) safe and suitable access to the site can be achieved for all users; and
c) any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree."
- 1.4.6 Paragraph 109 states,
"Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe."

South East Lincolnshire Local Plan 2011-2036

- 1.4.7 The South East Lincolnshire Local Plan 2011-2036, was adopted in March 2019. The Local Plan will guide development and the use of land in South East Lincolnshire from 1st April 2011 to 31st March 2036, and will help to shape how the area will change over this period. As stated in the introduction of the plan: -
"it will need to deal effectively with the issues facing the area, and has many roles, including:
- *identifying those areas of land that need to be developed for new homes, shops, or employment uses in order to meet the area's needs;*
 - *identifying those areas of land which must be protected from development – perhaps because of their historic or environmental importance;*
 - *ensuring that infrastructure and local facilities are provided at the same time as new homes, shops or employment uses; and*
 - *setting out policies against which planning applications can be judged."*

1.4.8 Chapter 8 of the plan relates to Transport, providing a number of specific policies including the following: -

- Delivering a More Sustainable Transport Network.
- Delivering the Boston Distributor Road.
- Delivering the Spalding Transport Strategy.
- Vehicle and Cycle Parking.

1.5 Report Overview

1.5.1 The remainder of this report is divided into five further sections, which are as follows:-

Section 2.0 Site Transport Context

1.5.2 This section of the report provides details of the site context, including its accessibility by all relevant transport modes.

Section 3.0 Proposed Development

1.5.3 The various components of the development proposal, including the site access arrangements and parking provision, are described within this section of the report.

Section 4.0 Traffic Assessment

1.5.4 This report section provides an assessment of the vehicular attraction of the proposed development and its traffic effects.

Section 5.0 Junction Capacity Assessment

1.5.5 The results of the traffic assessment have been used to inform junction capacity and the methodology and results are outlined in this section of the report.

Section 6.0 Summary & Conclusions

1.5.6 A summary and the conclusions of the report are provided in this section.

2.0 SITE TRANSPORT CONTEXT

2.1 Introduction

- 2.1.1 This section of the report considers the accessibility of the site in terms of a range of transport modes.
- 2.1.2 Due to the nature of the development being a Service Station, which typically attract car drivers for refuelling, customer footfall to the site via non-car modes is expected to be low.
- 2.1.3 Some staff may live locally, and so for the purpose of this assessment all non-car access modes have been investigated below.

2.2 Pedestrian Access

- 2.2.1 The Department for Transport's (DfT) document titled 'Manual for Streets' dated 2007 provides guidance in relation to walk distances. Section 4.4 gives the following advice: -

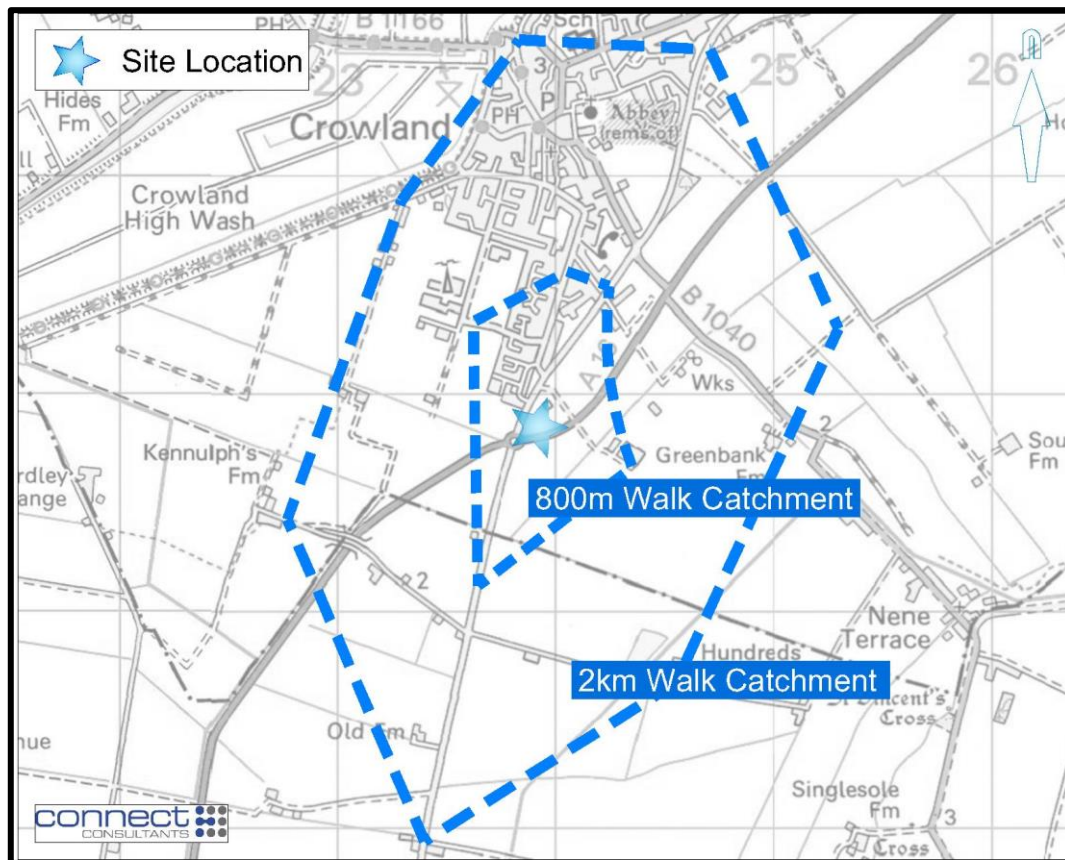
"Walkable neighbourhoods are typically characterised by having a range of facilities within 10 minutes' (up to about 800 m) walking distance of residential areas which residents may access comfortably on foot".

- 2.2.2 The CIHT document 'Planning for Walking' (April 2015) reiterates the advice presented in 'Manual for Streets', Section 6.4 of 'Planning for Walking' states the following:

"Walking neighbourhoods are typically characterised as having a range of facilities within 10 minutes' walking distance (around 800 metres). However, the propensity to walk or cycle is not only influenced by distance but also the quality of the experience; people may be willing to walk or cycle further where their surroundings are more attractive, safe and stimulating. Developers should consider the safety of the routes (adequacy of surveillance, sight lines and appropriate lighting) as well as landscaping factors (indigenous planting, habitat creation) in their design."

- 2.2.3 Furthermore, 'Planning for Walking' indicates that approximately 80% of journeys shorter than 1 mile (1.6km) are made wholly on foot.
- 2.2.4 Table 3.2 of The Institute of Highways and Transportation (IHT) guidance document titled 'Providing for Journeys on Foot' identifies a maximum walk distance of 2.0km for commuter, school and sightseeing walk trips, 800m for town centre walk trips and 1.2km for trips elsewhere.
- 2.2.5 The actual distance that people will be prepared to walk will vary depending on the trip purpose and other factors such as the presence of road crossings, terrain, and the attractiveness of the environment.
- 2.2.6 Based on a maximum walk distance of 2km, the approximate walk catchments are shown at Figure 2.1 below.

Figure 2.1 – 2km Walk Catchment



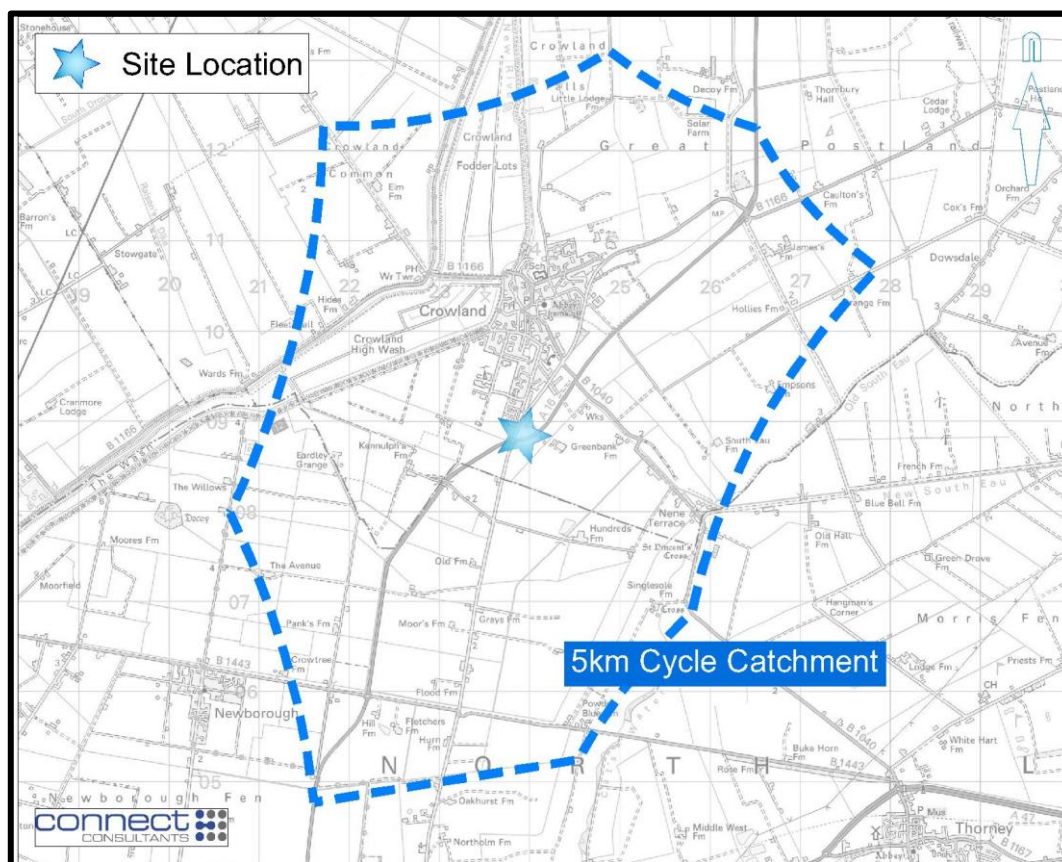
Source: Promap

- 2.2.7 The walk catchments above indicate that there are some residential dwellings, including the new development to the south of Harvester Way within the 800m walk catchment. Further dwellings are located within the 2km walk catchment.
- 2.2.8 There are no existing footways on the A16 or James Road in the vicinity of the proposal site.
- 2.2.9 Existing footways are present throughout the Goldcrest Road development to the south of Harvester Way linking Crowland Town Centre with James Road.
- 2.2.10 The proposals include a pedestrian connection between the site and Goldcrest Road, with a crossing of James Road including dropped kerbs and a refuge island.
- 2.2.11 Considering the existing and proposed pedestrian infrastructure surrounding the site, walking offers access opportunities, particularly for staff.

2.3 Cycling

- 2.3.1 The 2018 National Travel Survey specified average journey lengths, by cycle in England of c.5.3km. This suggests that cycling can offer an alternative to car travel particularly for trips of less than 5km.
- 2.3.2 For the purposes of this assessment, it has been assumed that cycling has the potential to replace short car trips, particularly for journeys of less than 5km in length.
- 2.3.3 Based on a maximum cycle distance of 5km, the approximate cycle catchment is shown at Figure 2.2 below.

Figure 2.2 – Cycle Catchment Area



Source: Promap

- 2.3.4 The above figure shows that all of Crowland is within 5km cycle distance of the site, as well as the rural areas surrounding the town.
- 2.3.5 Considering that the roads local to the site within central Crowland are urban in character, and that the local topography is generally gentle, cycling provides an opportunity to access the store by a sustainable mode of transport.
- 2.3.6 Roads in the wider area, outside of Crowland, are generally rural in character with the national speed limit prevalent. These roads are also likely to be unlit most likely limiting the cycling catchment to the built-up area of Crowland.
- 2.3.7 In light of the cycling facilities, the site is accessible by cycle.

2.4 Bus Access

- 2.4.1 The publication 'Planning for Public Transport in Developments' produced by the Institution of Highways and Transportation (IHT) specifies that new developments should be located within 400m of the nearest bus stop, albeit longer walk distances are not uncommon.
- 2.4.2 The two nearest bus stops to the site are located on the Peterborough Road, c440m north of the proposal site, as shown at Figure 1.2 above, which are accessible by foot via the proposed and existing pedestrian infrastructure.
- 2.4.3 The bus stops are served by the Stagecoach 37 service which runs once an hour Monday to Saturday and 4 times a day on a Sunday. The 37 service runs between Spalding, Crowland and Peterborough.
- 2.4.4 Bus is therefore a possible method of travel for staff of the proposed development, albeit that the bus stops are slightly outside the IHT recommended walk distance.

2.5 Highways Access

- 2.5.1 The proposal site is located on undeveloped land between the A16 and James Road, to the south of the town of Crowland.
- 2.5.2 The A16 / James Road / Peterborough Road roundabout junction is located immediately southwest of the proposal site.
- 2.5.3 The site will be accessed via a left in only access from the A16, c80m east of the A16 / James Road / Peterborough Road roundabout junction. The A16 provides a route between Peterborough, c9km southwest of the site, and Spalding, c9km north of the site.
- 2.5.4 Egress from the site will be provided via a priority junction onto James Road c110m north of the A16 / James Road / Peterborough Road roundabout junction.
- 2.5.5 James Road provides a route to central Crowland c1.5km north of the proposal site.
- 2.5.6 Figure 2.3 below shows the site in its local highway context.

Figure 2.3 – Highway Network

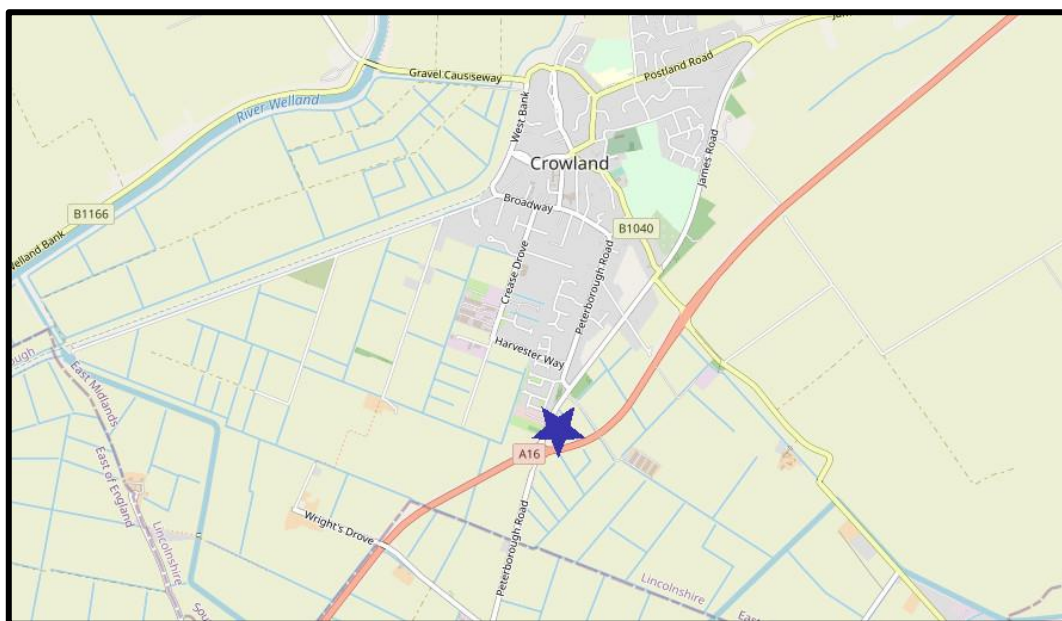


Image Source: OpenStreetMap.org

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- 2.5.7 Overall, the site has a prominent location in relation to the local road network from which it is readily accessible. The majority of trips to the proposed Service Station are likely to be by car or HGV.

2.6 Section Conclusion

- 2.6.1 Based on the above assessment, the proposal site is accessible by non-car modes, however non-car trips are likely to be limited in number given the nature of the development proposals.
- 2.6.2 The site benefits from a good location in relation to the local road network from which it is accessible. The majority of trips to the proposed service station are likely to be by car or HGV.

3.0 PROPOSED DEVELOPMENT

3.1 Introduction

3.1.1 The development proposals are shown on the plan provided at Appendix 1. The proposals include the development of a Service Station with site composition including the following: -

- A petrol filling station which includes 8 pumping bays for light vehicles and 6 pumping bays for heavy goods vehicles (HGVs).
- A small service station building of 637.83sq.m of Gross Internal Area (GIA), with the following composition: -
 - Retail outlets.
 - Café / restaurant.
 - Takeaway food kiosks.
 - Seating area.
 - Toilets.
 - ATM.
- 21 customer parking spaces, of which 2 spaces are for disabled users and two are electric vehicle charging spaces.
- 61 HGV parking spaces and a further 12 staff parking spaces are located in a segregated HGV parking area.
- A waiting bay adjacent to the service station building.
- 3 Jet-wash bays.

3.2 Proposed Site Access Arrangements

3.2.1 The proposed site access arrangements are also shown on the site layout plan at Appendix 1. A brief description of the site access arrangements is set out below:-

- The vehicular site access will be via a left in only junction from the A16, c80m east of the A16 / James Road / Peterborough Road roundabout junction as shown at Appendix 2.
- Egress from the site will be provided via a left and right out priority junction onto James Road c110m north of the A16 / James Road / Peterborough Road roundabout junction as shown at Appendix 3. Vision splays of 2.4 x 160m appropriate for the speed limit of 50mph are shown on the plan at Appendix 3.
- A pedestrian connection between the site and Goldcrest Road.

3.3 Servicing

3.3.1 Customer vehicles including HGV's and service vehicles will arrive at the site via the proposed left in only access from the A16, and depart from the site via the priority junction on James Road.

- 3.3.2 The proposed site layout has been assessed for service vehicle manoeuvres, with details of the swept path assessment are provided at Appendix 4.
- 3.3.3 The track plots indicate that the service routes through the site are satisfactory and that vehicles will be able to manoeuvre within the site, with vehicles arriving and departing in forward gear.

3.4 Car Parking Policy

- 3.4.1 Paragraph 105 of the National Planning Policy Framework (NPPF), February 2019 states:-

"If setting local parking standards for residential and non-residential development, policies should take into account:-

- The accessibility of the development;*
- The type, mix and use of the development;*
- The availability of and opportunities for public transport;*
- Local car ownership levels; and*
- The need to ensure an adequate provision of spaces for charging plug-in and other ultra-low emission vehicles."*

- 3.4.2 Paragraph 106 of the NPPF 2019 states: -

"Maximum parking standards for residential and non-residential development should only be set where there is a clear and compelling justification that they are necessary for managing the local road network, or for optimising the density of development in city and town centres and other locations that are well served by public transport (in accordance with chapter 11 of this Framework). In town centres, local authorities should seek to improve the quality of parking so that it is convenient, safe and secure, alongside measures to promote accessibility for pedestrians and cyclists."

- 3.4.3 The parking standards applicable to the proposed development are set out at Appendix 6 of the South East Lincolnshire Local Plan 2011-2036, adopted in March 2019.
- 3.4.4 The parking standards do not include specific standards for service stations or petrol filling stations. The local plan states that *"All other types of development will be assessed on a site-by-site basis."*
- 3.4.5 The proposed parking provision of 21 customer parking spaces, 12 staff parking spaces and 61 HGV parking spaces are proposed based on operator requirements.

3.5 Section Conclusion

- 3.5.1 Swept path analysis has shown that access arrangements of the proposed development are suitable for their intended use.
- 3.5.2 The proposed development parking provision is based on operational requirements.

4.0 TRAFFIC ASSESSMENT

4.1 Introduction

4.1.1 This section of the report provides details of the traffic data used for the assessment of the study area junctions. The assessment considers the effect of the traffic that would be attracted to the development using the following study area: -

- 1) A16 / Proposed Ingress junction.
- 2) James Road / Proposed Egress junction.
- 3) A16 / James Road / Peterborough Road roundabout ('the A16 Roundabout').

4.2 Existing Traffic Flows

4.2.1 Traffic surveys of the A16 / James Road / Peterborough Road roundabout were conducted on Wednesday 29th January 2020, therefore before any of the Covid-19 restrictions came into force, between the hours of 07:00 – 19:00.

4.2.2 An analysis of the survey data of the A16 Roundabout shows that the peak hours for the local road network were as follows:

- Weekday AM Peak: 07:15 – 08:15 Hours.
- Weekday PM Peak: 17:00 – 18:00 Hours.

4.2.3 Traffic flow diagrams showing the 2020 surveyed flows are provided at Appendix 5.

4.3 Base Year Traffic Flows

4.3.1 The assessment will be based on a future assessment year of 2026 (Application year + 5 years). Growth factors have been applied to the January 2020 surveyed traffic flows to represent the future year to account for projected economic growth and local development forecasts.

4.3.2 The growth factors have been derived based on the TEMPRO version 7.2 database for the period 2020 and 2026. This has been adjusted based on the TEMPRO output for car drivers for the geographical area of "South Holland 011" (with area type "All" and road type "All") and the results of the assessment are summarised below at Table 4.1.

Table 4.1 – TEMPRO Growth Rates

Peak Period	2020 to 2026
	Resultant Growth
AM	1.0890
PM	1.0878

4.3.3 The calculated TEMPRO growth factors have been applied to the January 2020 surveyed flows to form the 2026 Base scenario, traffic flow diagrams for this are provided at Appendix 6.

4.4 Committed Development

4.4.1 No committed developments have been identified for specific inclusion within this assessment.

4.5 Proposed Service Station Trip Attraction

- 4.5.1 The TRICS database (version 7.7.4) has been used to calculate the traffic effect of the proposed development using the category 'FOOD & DRINK/F - MOTORWAY SERVICE AREAS (res./PFS/mot)' for sites in England excluding Greater London surveyed from the year 2012 onwards. All location types have been used to increase the number of surveys. Vehicle surveys only have been used.
- 4.5.2 The resultant trip attractions, during the surveyed peak hours, are set out at Table 4.2 and TRICS outputs are provided at Appendix 7.

Table 4.2 – TRICS Data – Motorway Service Areas

Peak	Average Trip Rates (Per 100 sq.m)			Traffic Attraction (637.83 sq.m)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
AM	4.155	4.005	8.159	26	26	52
PM	4.953	4.671	9.624	32	30	61

4.6 Pass-by / Diverted / Linked Trips / Trade Diversions

- 4.6.1 The traffic that will be attracted to the proposed service station will comprise the following trip types: -
- Pass by trips resulting from people who currently use the road adjacent to the site (A16) for a trip involving another purpose who will visit the site while passing.
 - Diverted trips derived from people who are using the road network close to the site (James Road or Peterborough Road) for another purpose who will divert their trips to visit the service station while passing in the broad vicinity.
 - Primary trips made by people who travel for the specific purpose of visiting the proposed service station, but not included in the trip types above.

Assessment of Secondary Trip Types

- 4.6.2 The first principles that determine the proportion of secondary trips used within this assessment involve consideration of the site and location characteristics.
- 4.6.3 Given the sites location adjacent to the A16, a main route between Peterborough and Spalding, the majority of trips to the service station will come from passing traffic. As the site can only be accessed directly from vehicles travelling northbound on the A16 and all vehicles having to exit via James Road and utilise the A16 / James Road / Peterborough Road roundabout junction the pass-by trips are likely to manifest as a combination of pass-by and diverted trips.
- 4.6.4 Pass-by trips from James Road will also have to enter the site from the A16 and so use the A16 / James Road / Peterborough Road roundabout, before existing back on to James Road.
- 4.6.5 From Peterborough Road vehicles will use the A16 and James Road to access and egress the site (both via the A16 / James Road / Peterborough Road roundabout junction) before continuing their journey.
- 4.6.6 For simplicity, this assessment is based on a combined pass-by and diverted rated of 90%. 35% from vehicles travelling northbound on the A16, 35% from vehicles travelling southbound on the A16, and 20% from vehicles travelling north and southbound on James Road.

- 4.6.7 Traffic flow diagrams showing the pass-by trips to the site are provided at Appendix 8, and traffic flow diagrams showing the diverted trips to the site are provided at Appendix 9.

Assessment of Primary Trip Types

- 4.6.8 Primary trips to the proposed development will be a combination of transferred trips from journeys (already using the study area network) to competing attractions and new trips to the study area network.
- 4.6.9 The assessment is based on the simplified assumption that 0% of trips are transferred and 10% are 'new' to the study area network.
- 4.6.10 New trips to the service station are based on the assumption that a number of people may purchase petrol as part of a 'home-petrol-home' trip or to purchase goods from the convenience store, such as cigarettes, milk etc, or food from the café / restaurant. This is likely to occur for a small number of trips.
- 4.6.11 For simplicity, the distribution of primary trips is assumed to be 100% from Crowland to the north of the site via James Road.
- 4.6.12 Traffic flow diagrams showing the primary trips to the site are provided at Appendix 10.

Assessment of Secondary Trip Types

- 4.6.13 By way of summary, this assessment is based on the trip type assumptions shown at Table 4.3.

Table 4.3 – Summary of Trip Types

Trip Type	Assessed Value (%)
New to Study Area Network	10%
Pass-by Trips / Diverted Trips	90%

4.7 Net Development Effect

- 4.7.1 Based on the above trip type assumptions, only 10% of trips will be new to the study area network. This equates to a total of 5 trips in the AM peak and 6 trips in the PM peak, a negligible change.
- 4.7.2 The 90% pass-by and diverted trips will not result in new trips on the study area network, but will result in a redistribution of trips on the A16 and James Road and in particular at the James Road approach of the A16 / James Road / Peterborough Road roundabout junction.
- 4.7.3 Traffic flow diagrams showing the net traffic effect of the proposed development are provided at Appendix 11.
- 4.7.4 The net traffic effect of the proposed development has then been combined with the 2026 Base traffic flows to form the 2026 + Proposed development scenario, traffic flow diagrams for which are provided at Appendix 12.

4.8 Section Conclusions

- 4.8.1 The potential increase to traffic due to the proposed development has been calculated based on data from the TRICS database.
- 4.8.2 Based on the above trip type assumptions, only 10% of trips will be new to the study area network. This equates to a total of 5 trips in the AM peak and 6 trips in the PM peak, a negligible change.

5.0 JUNCTION CAPACITY ASSESSMENT

5.1 Introduction

- 5.1.1 The assessment in Section 4.0 identifies that based on the assumed trip type assumptions, only 10% of trips will be new to the study area network. This equates to a total of 5 trips in the AM peak, 6 trips in the PM peak and 17 during the Saturday peak, a negligible increase.
- 5.1.2 The 90% pass-by and diverted trips will not result in new trips on the study area network, but will result in a redistribution of trips on the A16 and James Road and in particular at the A16 / James Road / Peterborough Road roundabout junction.
- 5.1.3 Based on the above, junction capacity tests have been undertaken for the following junctions:
- 1) James Road / Proposed egress junction.
 - 2) A16 / James Road / Peterborough Road roundabout junction.

5.2 Computer Modelling Software

- 5.2.1 Industry-standard junction capacity modelling software, appropriate to the specific study junctions, has been used to assess the development traffic effect on their capacity and operation.
- 5.2.2 The PICADY9 module of the Junctions9 package is an industry standard computer package for modelling the operation of priority (give-way) junctions. PICADY uses the geometry of the junction combined with traffic flow information to predict capacity. The software provides a number of results in its output, the most meaningful of which is the Ratio of Flow to Capacity (RFC), where an RFC of 1.00 on any approach to the junction reflects a traffic demand equal to the theoretical capacity of that approach.
- 5.2.3 Similarly, the ARCADY9 module of the Junctions9 package is an industry standard computer package for modelling roundabouts, using the same principles and outputs as PICADY.

5.3 Capacity Analysis

James Road / Proposed Egress Junction

- 5.3.1 The PICADY9 computer program has been used to assess the operation of James Road / Proposed egress junction.
- 5.3.2 The operation of the junction has been assessed in the 2026 Base + Proposed Development scenario in the Weekday AM and PM Peaks, based on the proposed junction geometry.
- 5.3.3 PICADY has been used in "ONE HOUR" mode, which simulates a peak within the peak hour.
- 5.3.4 The results of the PICADY tests are set out at Table 5.1.

Table 5.1 – PICADY Summary – James Road / Proposed Egress Junction

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
2026 Base + Proposed						
Stream B-C	0.1	8.54	0.05	0.0	4.76	0.03
Stream B-A	0.0	13.79	0.01	0.0	7.52	0.02
Stream C-AB	0.0	0.00	0.00	0.0	0.00	0.00

Arm A = James Road (South), Arm B = Site Egress, Arm C = James Road (North).

5.3.5 The PICDAY results indicate that the James Road / Proposed Egress Junction will operate within capacity in the future scenario with the proposed service station in place.

5.3.6 Full PICADY outputs are provided at Appendix 13.

A16 Roundabout

5.3.7 The ARCADY9 computer program has been used to assess the operation of the A16 Roundabout in the Weekday AM and PM peak periods in the 2020 Surveyed, 2026 Base and 2026 Base + Proposed Development scenarios.

5.3.8 ARCADY has been used in "DIRECT" mode, which assesses the junction based on directly inputted traffic flows for the four 15-minute periods within each peak hour.

5.3.9 The results of the ARCADY tests are set out at Table 5.2 below.

Table 5.2 – ARCADY Summary – A16 Roundabout

	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
2020 Surveyed Flows						
Arm 1	1.9	9.24	0.67	0.5	2.98	0.32
Arm 2	0.2	7.31	0.19	0.4	4.28	0.30
Arm 3	0.9	4.44	0.49	2.1	7.40	0.69
Arm 4	4.7	15.45	0.84	0.2	3.07	0.16
2026 Base						
Arm 1	3.0	13.83	0.77	0.5	3.14	0.35
Arm 2	0.3	8.83	0.24	0.5	4.62	0.33
Arm 3	1.1	4.85	0.53	3.0	9.53	0.76
Arm 4	10.7	30.38	0.95	0.2	3.23	0.17
2026 Base + Proposed Developments						
Arm 1	3.1	13.99	0.77	0.5	3.16	0.35
Arm 2	0.3	8.90	0.24	0.5	4.64	0.33
Arm 3	1.1	4.90	0.53	3.0	9.69	0.76
Arm 4	13.6	36.52	0.97	0.2	3.32	0.19

Arm 1 = A16 (North), Arm 2 = Peterborough Road, Arm 3 = A16 (South), Arm 4 = James Road.

5.3.10 The results of the ARCADY tests indicate that the A16 Roundabout will operate within capacity in the 2026 Base scenario and with the proposed development in place, with the proposed development having a minimal effect on the overall operation of the junction.

5.3.11 Full ARCADY outputs are provided at Appendix 13.

5.4 Existing Collision Analysis

5.4.1 Collision data has been obtained from CrashMap, an online database of collision information, for the study area shown below, which has been informed by the traffic data indicating the effects of the development, for the last 5-year period (2015 – 2019). A plan showing the details and location of the recorded personal injury collisions over this period is shown at Figure 5.1 below.

Figure 5.1 – Collision Study Area

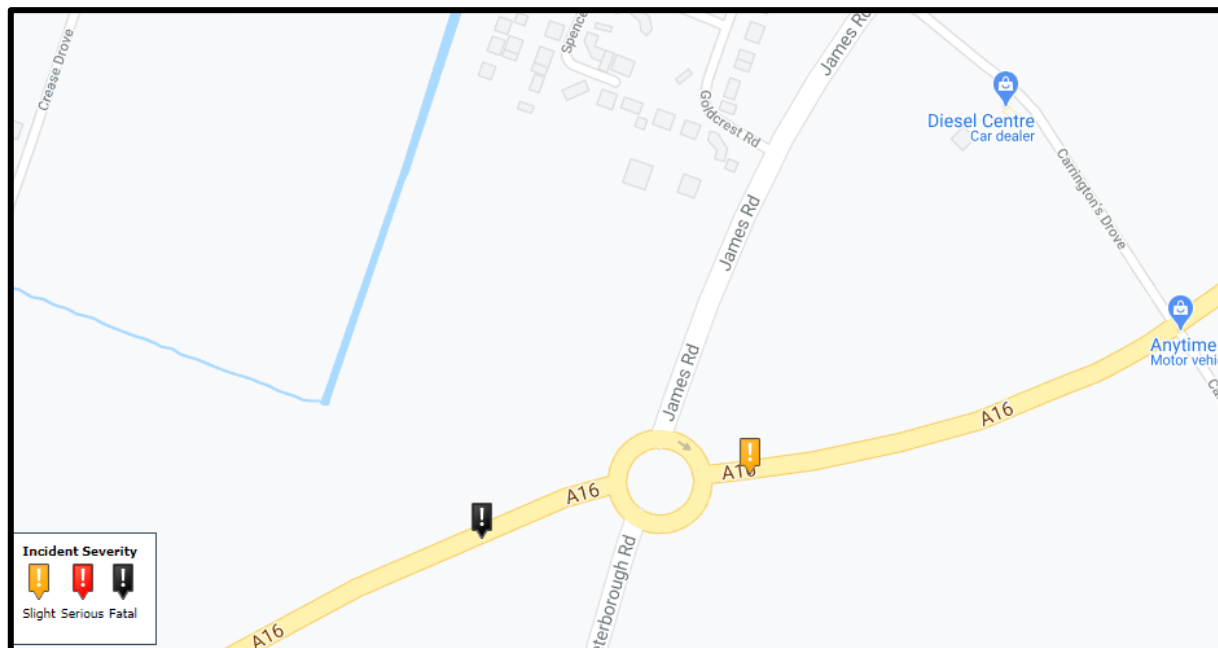


Image Source: CrashMap.

- 5.4.2 The collision plan shows that there was a total of 2 collisions recorded within the study area, during the study period, less than one a year.
- 5.4.3 Of the 2 collisions, one was classified as 'Fatal' and the remaining as 'slight'. The 'slight' collision involved two cars, whilst the 'Fatal' collision involved a car, LGV and an HGV. Both collisions occurred at different locations.
- 5.4.4 The proposed development traffic effect shown at Section 4.0, is not likely to materially worsen the occurrence or materially affect the pattern of collisions.
- 5.4.5 On this basis, overall, no pattern of collisions has been identified which is attributable to a road layout deficiency, nor one which is likely to be materially worsened by the development proposals.

5.5 Section Conclusions

- 5.5.1 The PICADY and ARCADY modelling shows that the site egress junction on James Road and the A16 Roundabout are predicted to operate within capacity in the future year with the proposed development in place.
- 5.5.2 No pattern of collisions has been identified which is attributable to a road layout deficiency, nor one which is likely to be materially worsened by the development proposals.
- 5.5.3 Overall, therefore, the traffic effect of the proposed development is acceptable.

6.0 SUMMARY AND CONCLUSIONS

6.1 Summary

6.1.1 Connect Consultants Limited is a firm of transport planning and highway design consultants that have been instructed by Recharge Roadside Services Ltd in relation to their proposed Service Station on land between the A16 and James Road, Crowland, Peterborough.

6.1.2 The report is summarised as follows: -

- The proposal site is broadly accessible by non-car modes, but non-car trips are likely to be limited in number given the nature of the development proposals.
- The site benefits from a good location in relation to the local road network from which it is accessible. The majority of trips to the proposed Service Station are likely to be by car or HGV.
- The proposed development is well conceived in terms of its access arrangements, composition and layout.
- The proposed development parking will accord with operational requirements.
- It has been demonstrated that the access and egress arrangements will be able to accommodate HGV traffic.
- The potential increase to traffic due to the proposed development has been calculated based on data from the TRICS database.
- Based on the above trip type assumptions, only 10% of trips will be new to the study area network. This equates to a total of 5 trips in the AM peak, 6 trips in the PM peak and 17 during the Saturday peak, a negligible increase.
- The 90% pass-by and diverted trips will not result in new trips on the study area network, but will result in a redistribution of trips on the A16 and James Road and in particular at the A16 / James Road / Peterborough Road roundabout junction.
- The PICADY and ARCADY modelling shows that the site egress junction on James Road and the A16 Roundabout are predicted to operate within capacity in the future year with the proposed development in place.
- No pattern of collisions has been identified which is attributable to a road layout deficiency, nor one which is likely to be materially worsened by the development proposals.

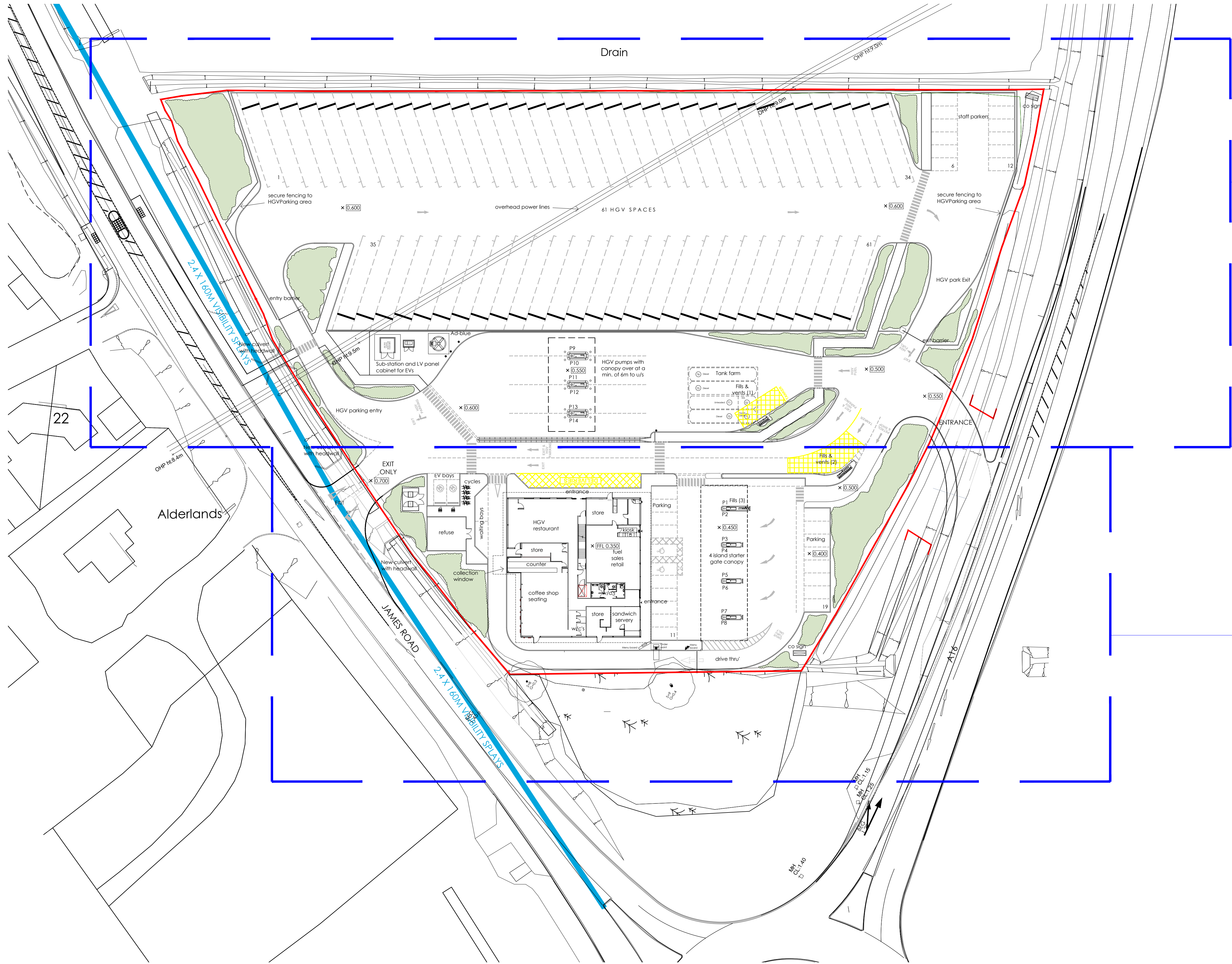
6.2 Conclusions

6.2.1 The results of this assessment highlight that the proposed development is acceptable from a transport perspective.

APPENDICES

Appendix 1

Site Layout



Proposed Site Layout Plan
Scale 1:400

Scale Bar 1:400(metres)
0 5 10 15 20 25 30m

DRAWING P-05

DRAWING P-06

B	21/01/21	DB	Road entrance into site amended. Road crossing in James Road added and footbridge in to site indicated, landscaping and kerbs amended to suit. Visibility splays added.
A	04/12/20	DB	Client name changed. Titleblock updated to suit.
-	27/11/20	DB	Drawing created.
rev	date	by	description



RECHARGE ROADSIDE SERVICES LTD

PROJECT LOCATION
Crowland Services
A16 Crowland
Peterborough, Cambridgeshire

DRAWING
Proposed Site Redevelopment
Proposed Site Layout Plan

Wyeth
Projects Services

The Cart Shed, Amberley Court,
Amberley Lane, Millford, Surrey,
GU8 5EB, United Kingdom

Tel: +44 (0)1483 424704
Email: enquires@wyethprojects.com

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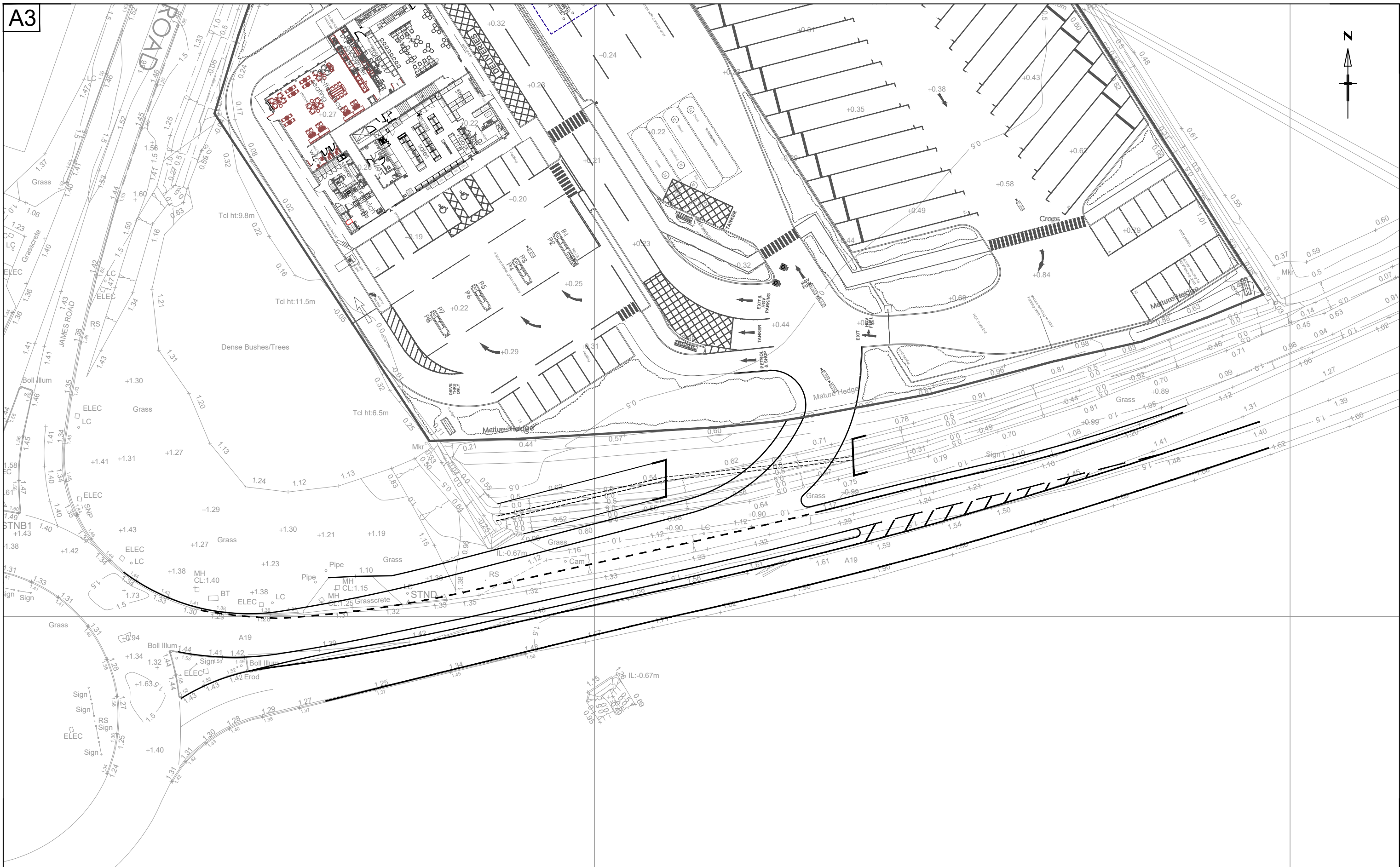
Date: November 2020	Draw By: DB	A1 original plot size
Scale: 1:400	Dwg No: WPS-PPL-005-P-04	Rev: B

PLANNING

Appendix 2

Proposed Access Arrangements (A16)

A3

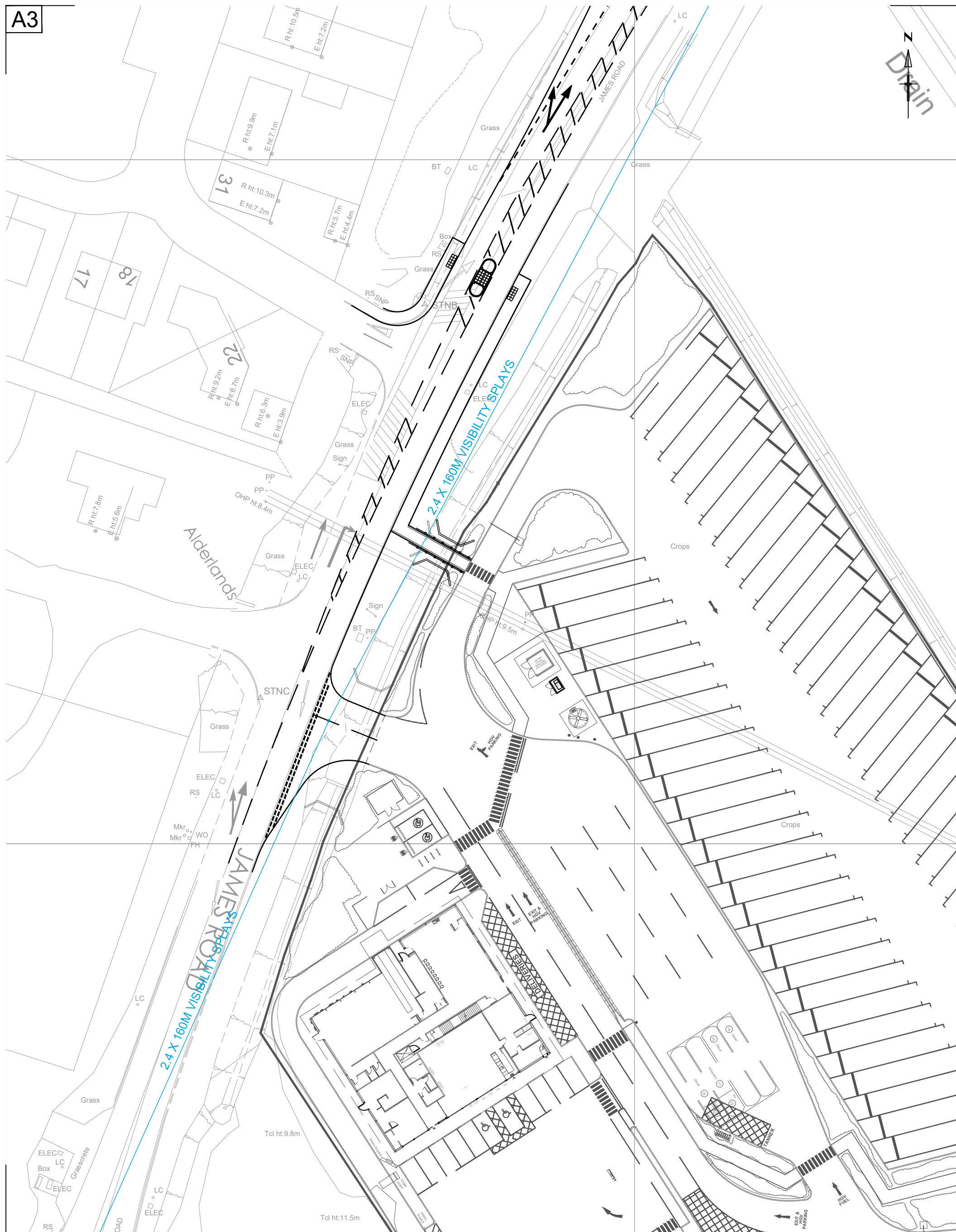


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connectCONSULTANTS 78 BROAD STREET, CHIPPING SODBURY, BRISTOL. BS37 6AG Tel: 01454 320 220 Web: www.connect-consultants.com Fax: 01454 320 099 Email: bristol@connect-consultants.com bsi UKAS MANAGEMENT SYSTEM ISO 9001 : 2015 FS 594947	client ONESTO		title PROPOSED SITE ACCESS ARRANGMENTS		date NOVEMBER 2020	drawn by T.A.S	checked by C.B.W
	project PROPOSED DEVELOPMENT CROWLAND JAMES ROAD				scale 1:500	status PLANNING	
					drawing number 20080 - 010	rev. A	

Appendix 3

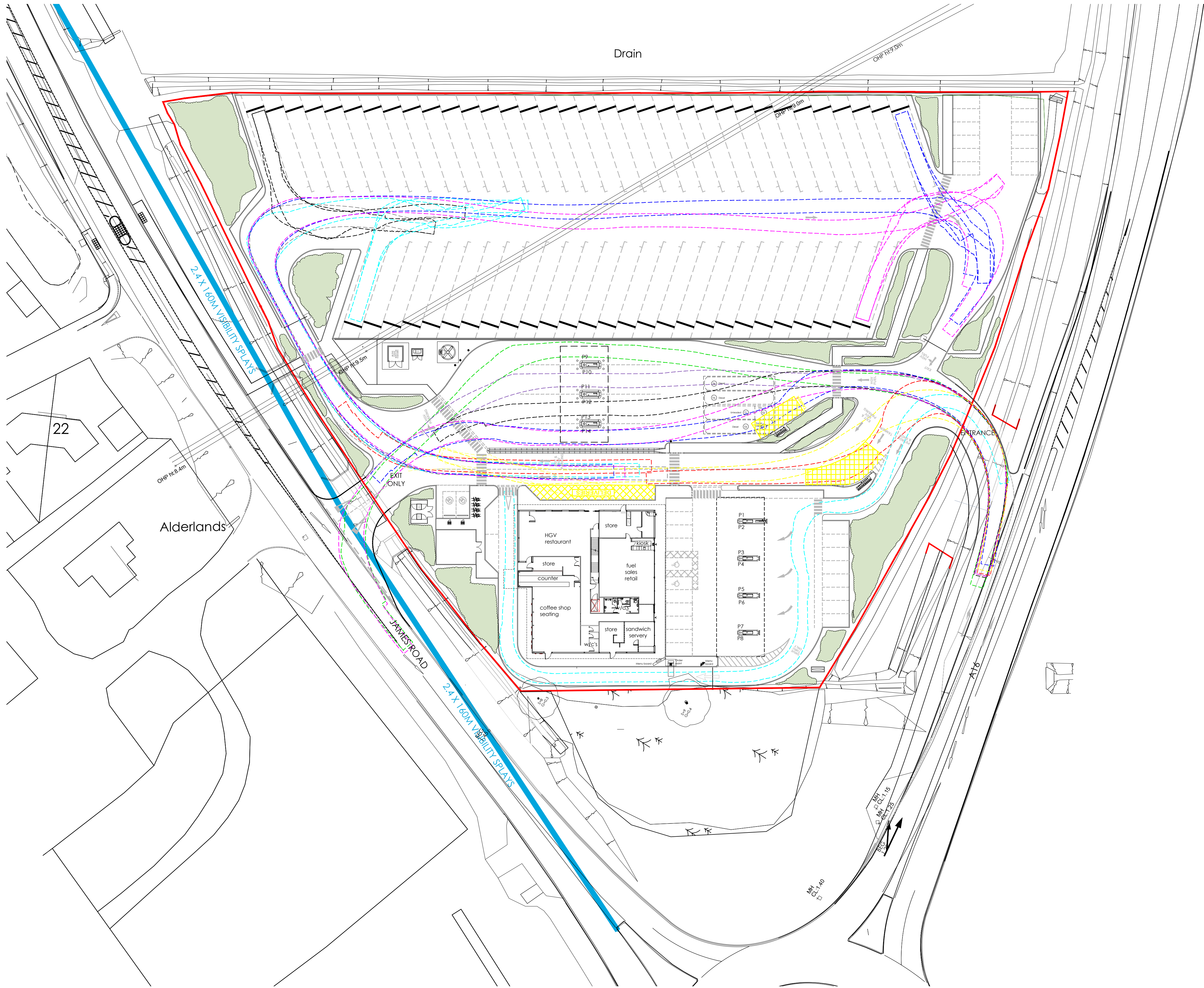
Proposed Access Arrangements (James Road)



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Appendix 4

Swept Path Analysis



SWEEP PATH LEGEND	
Tanker delivering to the PFS area	Red dashed line
Delivery lorry delivering to PFS	Yellow dashed line
Transit van accessing drive thru lane	Cyan dashed line
Tanker delivering to the HGV area	Blue dashed line
Lorry refuelling at Pump 14 HGV area	Magenta dashed line
Lorry refuelling at Pump 12/13 HGV area	Black dashed line
Lorry refuelling at Pump 10/11 HGV area	Purple dashed line
Lorry refuelling at Pump 9 HGV area	Green dashed line
HGV lorry parking Bay 1 HGV area	Black dashed line
HGV lorry parking Bay 34 HGV area	Blue dashed line
HGV lorry parking Bay 35 HGV area	Cyan dashed line
HGV lorry parking Bay 61 HGV area	Magenta dashed line

Swept Path Analysis Plan
Scale 1:400



B	21/01/21	DB	Road entrance into site amended. Road crossing in James Road added and footbridge in to site indicated, landscaping and kerbs amended to suit. Visibility splays added.
A	04/12/20	DB	Client name changed. Titleblock updated to suit.
-	27/11/20	DB	Drawing created.
rev	date	by	description

CLIENT	RECHARGE ROADSIDE SERVICES LTD

PROJECT LOCATION	Crowland Services A16 Crowland Peterborough, Cambridgeshire
------------------	---

DRAWING	Proposed Site Redevelopment Swept Path Analysis Plan
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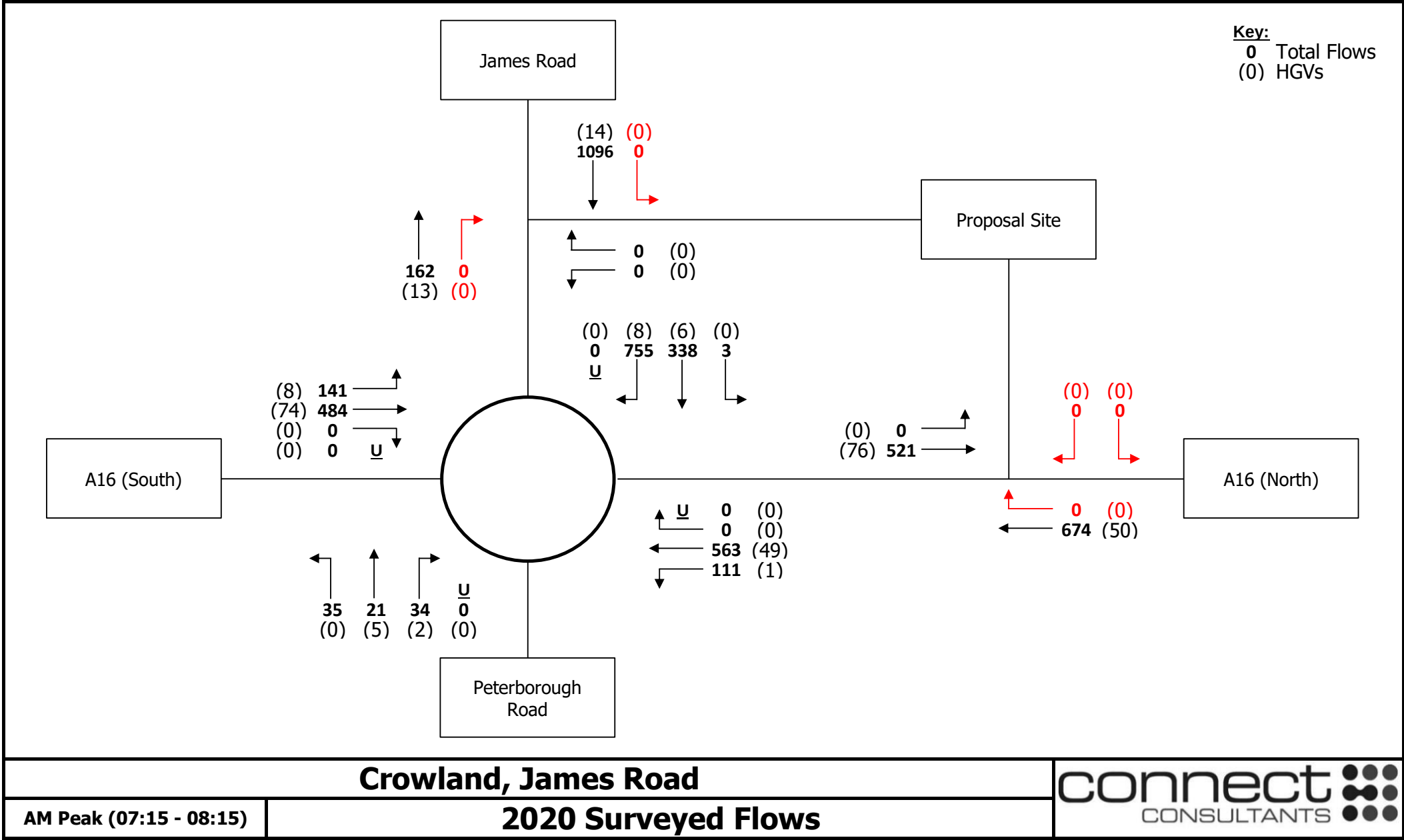
		The Cart Shed, Amberley Court, Amberley Lane, Millford, Surrey, GU8 5EB, United Kingdom Tel: +44 (0)1483 424704 Email: enquires@wyethprojects.com © This drawing is the copyright of WYETH PROJECTS SERVICES LTD.
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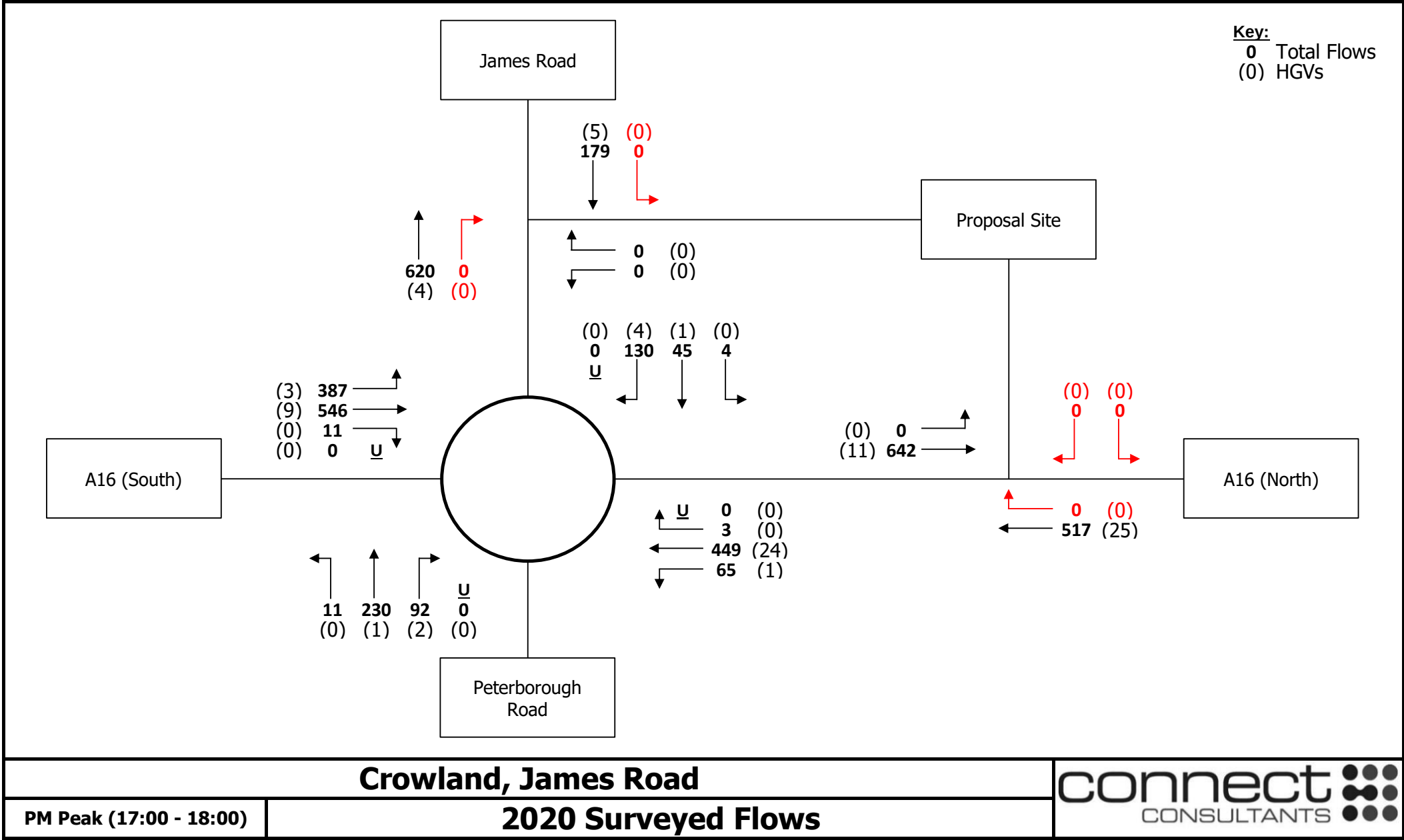
Date: November 2020	Draw By: DB	A1 original plot size
Scale: 1:400	Dwg No: WPS-PPL-005-P-11	Rev: B

PLANNING

Appendix 5

Traffic Flow Diagrams 2020 Surveyed Flows

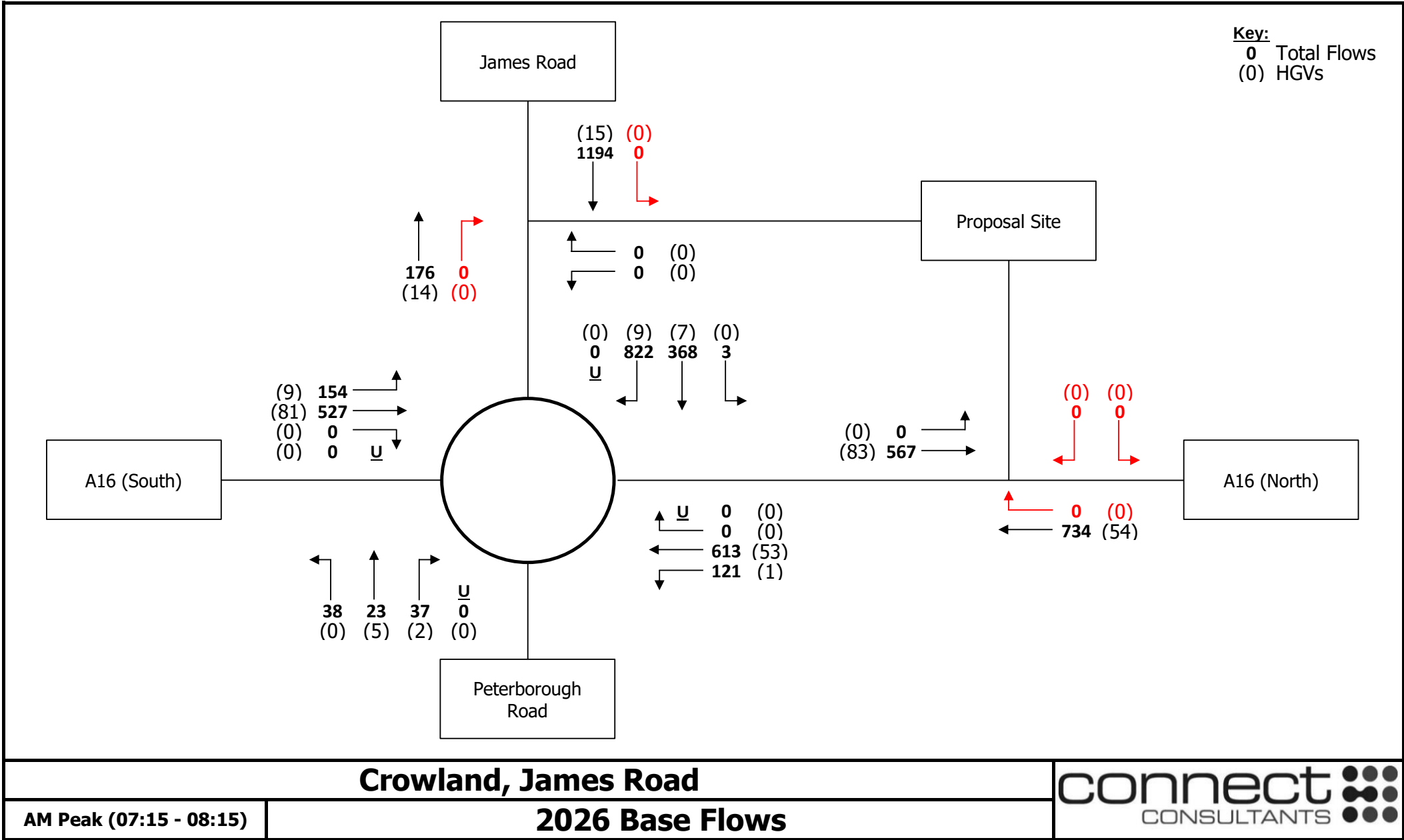


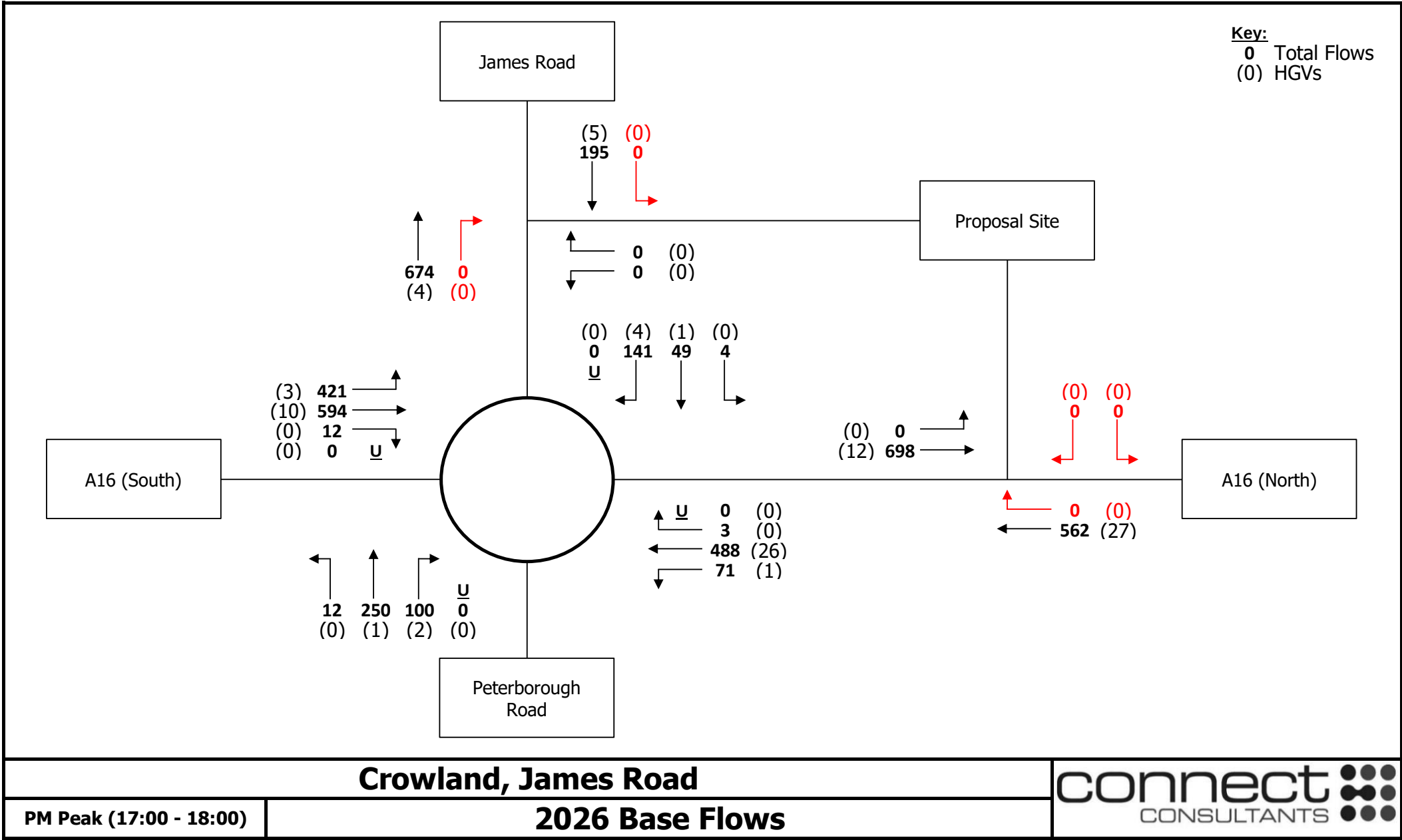


Appendix 6

Traffic Flow Diagrams

2026 Base





Appendix 7

TRICS Outputs

Calculation Reference: AUDIT-142301-210120-0121

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 06 - HOTEL, FOOD & DRINK
 Category : F - MOTORWAY SERVICE AREAS (res./PFS/mot)
TOTAL VEHICLES

Selected regions and areas:

02	SOUTH EAST	
	KC KENT	1 days
04	EAST ANGLIA	
	CA CAMBRIDGESHIRE	1 days
05	EAST MIDLANDS	
	LN LINCOLNSHIRE	1 days
09	NORTH	
	DH DURHAM	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Primary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Gross floor area
 Actual Range: 2500 to 6000 (units: sqm)
 Range Selected by User: 200 to 6930 (units: sqm)

Parking Spaces Range: All Surveys Included

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/12 to 27/10/18

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Tuesday	2 days
Friday	2 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	4 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaken using machines.

Selected Locations:

Free Standing (PPS6 Out of Town)	4
----------------------------------	---

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Out of Town	4
-------------	---

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Secondary Filtering selection:

Use Class:

Not Known	1 days
Sui Generis	3 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 500m Range:

All Surveys Included

Secondary Filtering selection (Cont.):

Population within 1 mile:

1,000 or Less	3 days
1,001 to 5,000	1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

25,001 to 50,000	1 days
50,001 to 75,000	1 days
100,001 to 125,000	2 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.5 or Less	1 days
1.1 to 1.5	2 days
1.6 to 2.0	1 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

No	4 days
----	--------

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:

No PTAL Present	4 days
-----------------	--------

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1	CA-06-F-01	SERVICE STATION		CAMBRIDGESHIRE
	A14			
	CAMBRIDGE			
	BOXWORTH			
	Free Standing (PPS6 Out of Town)			
	Out of Town			
	Total Gross floor area:	6000	sqm	
	Survey date: FRIDAY	12/10/12		Survey Type: MANUAL
2	DH-06-F-02	ROAD CHEF		DURHAM
	TURSDALE ROAD			
	NEAR DURHAM			
	BOWBURN			
	Free Standing (PPS6 Out of Town)			
	Out of Town			
	Total Gross floor area:	2500	sqm	
	Survey date: TUESDAY	20/11/12		Survey Type: MANUAL
3	KC-06-F-01	ROADCHEF		KENT
	M20 (JUNCTION 8)			
	NEAR MAIDSTONE			
	EYHORNE STREET			
	Free Standing (PPS6 Out of Town)			
	Out of Town			
	Total Gross floor area:	4069	sqm	
	Survey date: TUESDAY	22/05/18		Survey Type: MANUAL
4	LN-06-F-01	MOTO		LINCOLNSHIRE
	A1/GREAT NORTH ROAD			
	NEAR GRANTHAM			
	GONERBY MOOR			
	Free Standing (PPS6 Out of Town)			
	Out of Town			
	Total Gross floor area:	3058	sqm	
	Survey date: FRIDAY	06/10/17		Survey Type: MANUAL

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 06 - HOTEL, FOOD & DRINK/F - MOTORWAY SERVICE AREAS (res./PFS/mot

TOTAL VEHICLES

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00	1	3058	1.766	1	3058	1.995	1	3058	3.761
07:00 - 08:00	4	3907	3.820	4	3907	3.776	4	3907	7.596
08:00 - 09:00	4	3907	5.158	4	3907	4.691	4	3907	9.849
09:00 - 10:00	4	3907	5.030	4	3907	5.094	4	3907	10.124
10:00 - 11:00	4	3907	5.951	4	3907	5.638	4	3907	11.589
11:00 - 12:00	4	3907	7.052	4	3907	5.996	4	3907	13.048
12:00 - 13:00	4	3907	7.935	4	3907	7.577	4	3907	15.512
13:00 - 14:00	4	3907	7.314	4	3907	7.916	4	3907	15.230
14:00 - 15:00	4	3907	5.862	4	3907	6.828	4	3907	12.690
15:00 - 16:00	4	3907	5.158	4	3907	5.452	4	3907	10.610
16:00 - 17:00	4	3907	5.529	4	3907	5.343	4	3907	10.872
17:00 - 18:00	4	3907	4.953	4	3907	5.030	4	3907	9.983
18:00 - 19:00	4	3907	4.831	4	3907	4.671	4	3907	9.502
19:00 - 20:00	4	3907	3.449	4	3907	3.731	4	3907	7.180
20:00 - 21:00	4	3907	2.182	4	3907	2.105	4	3907	4.287
21:00 - 22:00	1	4069	1.868	1	4069	1.868	1	4069	3.736
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			77.858			77.711			155.569

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: $COUNT/TRP*FACT$. Trip rates are then rounded to 3 decimal places.

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Parameter summary

Trip rate parameter range selected: 2500 - 6000 (units: sqm)
Survey date range: 01/01/12 - 27/10/18
Number of weekdays (Monday-Friday): 4
Number of Saturdays: 0
Number of Sundays: 0
Surveys automatically removed from selection: 0
Surveys manually removed from selection: 0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 06 - HOTEL, FOOD & DRINK/F - MOTORWAY SERVICE AREAS (res./PFS/mot
OGVS

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00	1	3058	0.818	1	3058	1.014	1	3058	1.832
07:00 - 08:00	4	3907	0.717	4	3907	0.870	4	3907	1.587
08:00 - 09:00	4	3907	0.857	4	3907	0.870	4	3907	1.727
09:00 - 10:00	4	3907	0.793	4	3907	0.749	4	3907	1.542
10:00 - 11:00	4	3907	1.094	4	3907	1.088	4	3907	2.182
11:00 - 12:00	4	3907	1.312	4	3907	1.120	4	3907	2.432
12:00 - 13:00	4	3907	1.209	4	3907	1.267	4	3907	2.476
13:00 - 14:00	4	3907	1.145	4	3907	1.190	4	3907	2.335
14:00 - 15:00	4	3907	0.915	4	3907	1.030	4	3907	1.945
15:00 - 16:00	4	3907	0.762	4	3907	0.768	4	3907	1.530
16:00 - 17:00	4	3907	0.813	4	3907	0.762	4	3907	1.575
17:00 - 18:00	4	3907	0.621	4	3907	0.589	4	3907	1.210
18:00 - 19:00	4	3907	0.576	4	3907	0.454	4	3907	1.030
19:00 - 20:00	4	3907	0.397	4	3907	0.429	4	3907	0.826
20:00 - 21:00	4	3907	0.326	4	3907	0.198	4	3907	0.524
21:00 - 22:00	1	4069	0.270	1	4069	0.295	1	4069	0.565
22:00 - 23:00									
23:00 - 24:00									
Total Rates:		12.625			12.693				25.318

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

TRIP RATE for Land Use 06 - HOTEL, FOOD & DRINK/F - MOTORWAY SERVICE AREAS (res./PFS/mot
CYCLISTS

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00	1	3058	0.000	1	3058	0.000	1	3058	0.000
07:00 - 08:00	4	3907	0.000	4	3907	0.000	4	3907	0.000
08:00 - 09:00	4	3907	0.000	4	3907	0.000	4	3907	0.000
09:00 - 10:00	4	3907	0.000	4	3907	0.000	4	3907	0.000
10:00 - 11:00	4	3907	0.000	4	3907	0.000	4	3907	0.000
11:00 - 12:00	4	3907	0.000	4	3907	0.000	4	3907	0.000
12:00 - 13:00	4	3907	0.000	4	3907	0.000	4	3907	0.000
13:00 - 14:00	4	3907	0.000	4	3907	0.000	4	3907	0.000
14:00 - 15:00	4	3907	0.000	4	3907	0.000	4	3907	0.000
15:00 - 16:00	4	3907	0.032	4	3907	0.000	4	3907	0.032
16:00 - 17:00	4	3907	0.000	4	3907	0.000	4	3907	0.000
17:00 - 18:00	4	3907	0.000	4	3907	0.032	4	3907	0.032
18:00 - 19:00	4	3907	0.000	4	3907	0.000	4	3907	0.000
19:00 - 20:00	4	3907	0.000	4	3907	0.000	4	3907	0.000
20:00 - 21:00	4	3907	0.000	4	3907	0.000	4	3907	0.000
21:00 - 22:00	1	4069	0.000	1	4069	0.000	1	4069	0.000
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.032			0.032			0.064

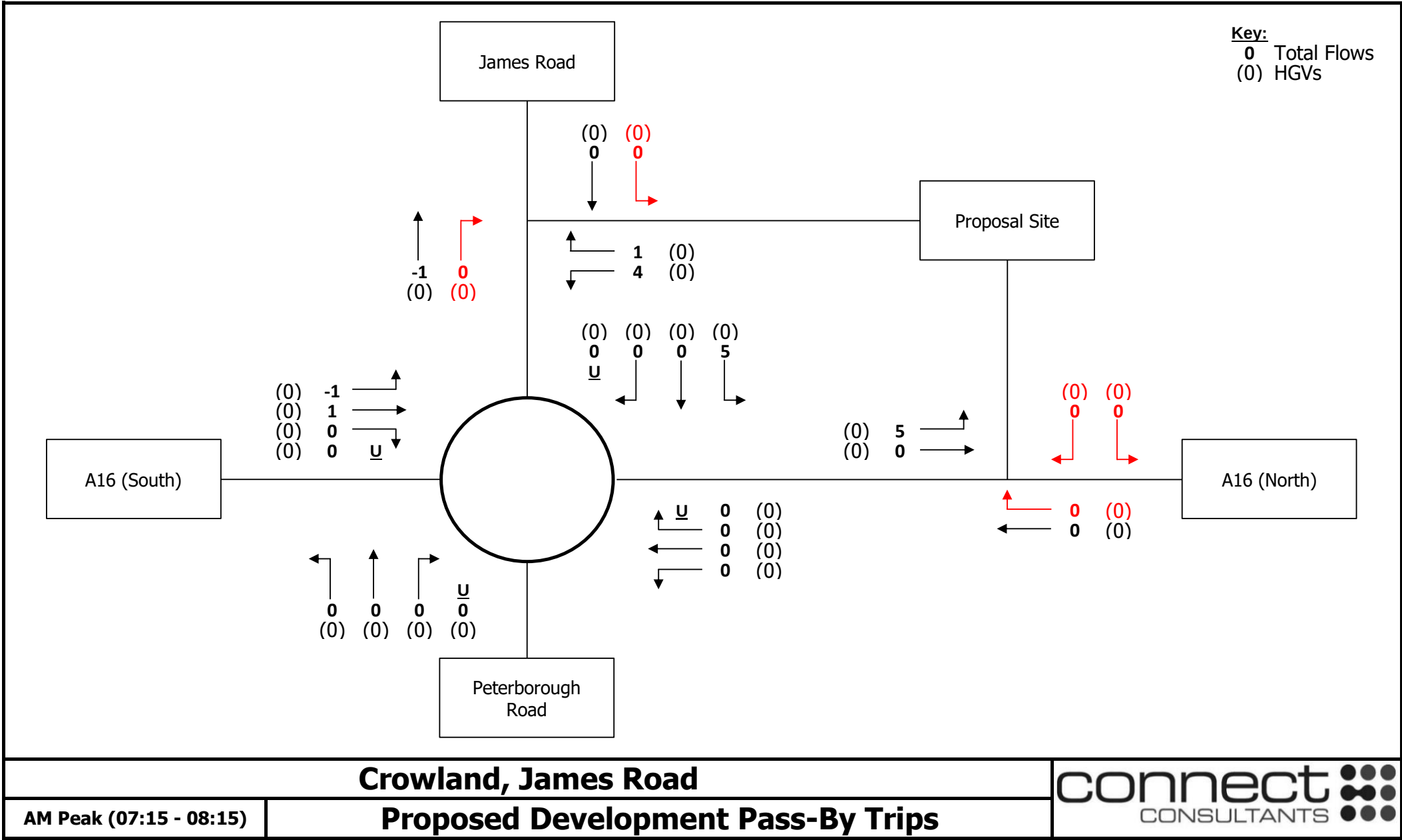
This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Appendix 8

Traffic Flow Diagrams

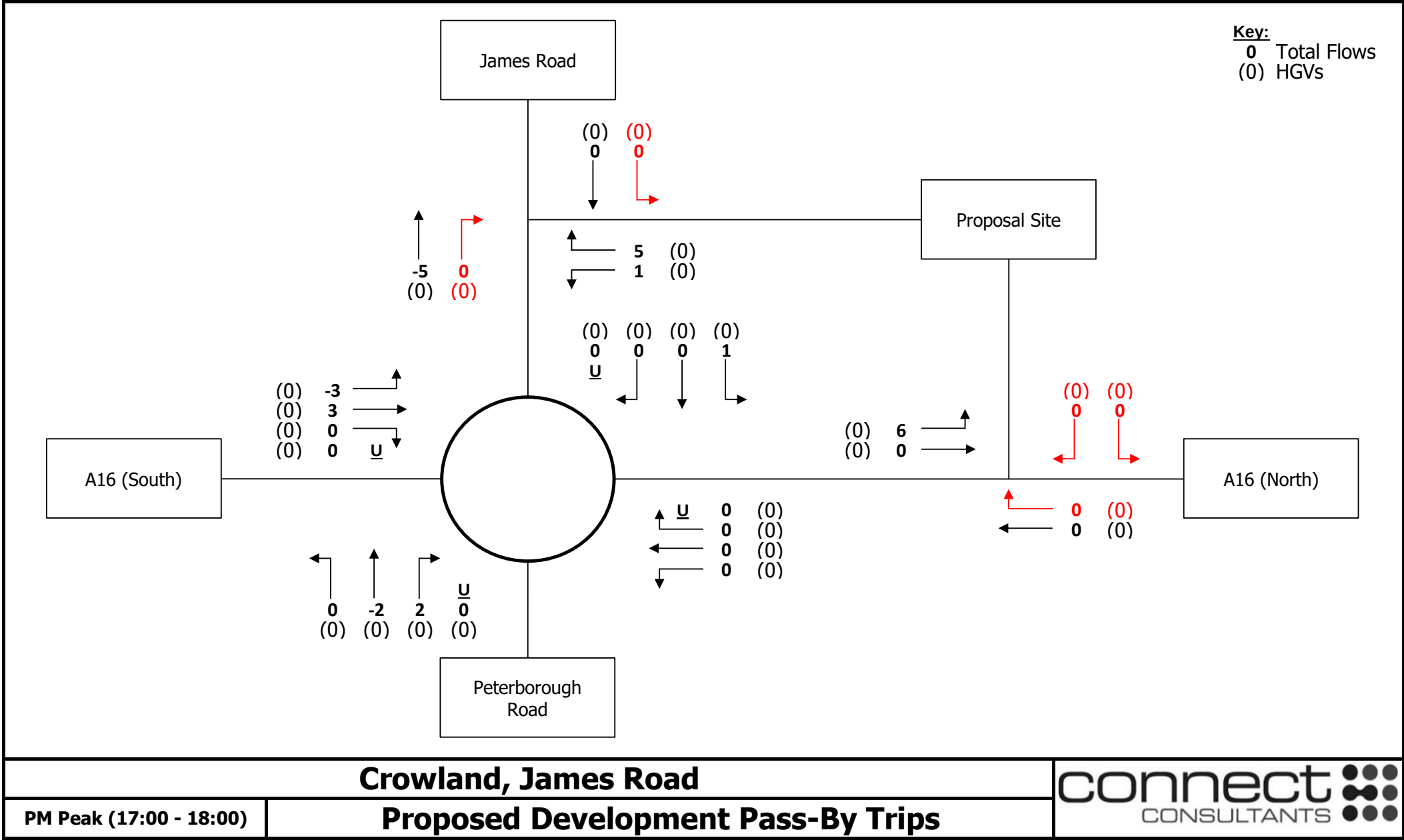
Pass-by Trips



Crowland, James Road

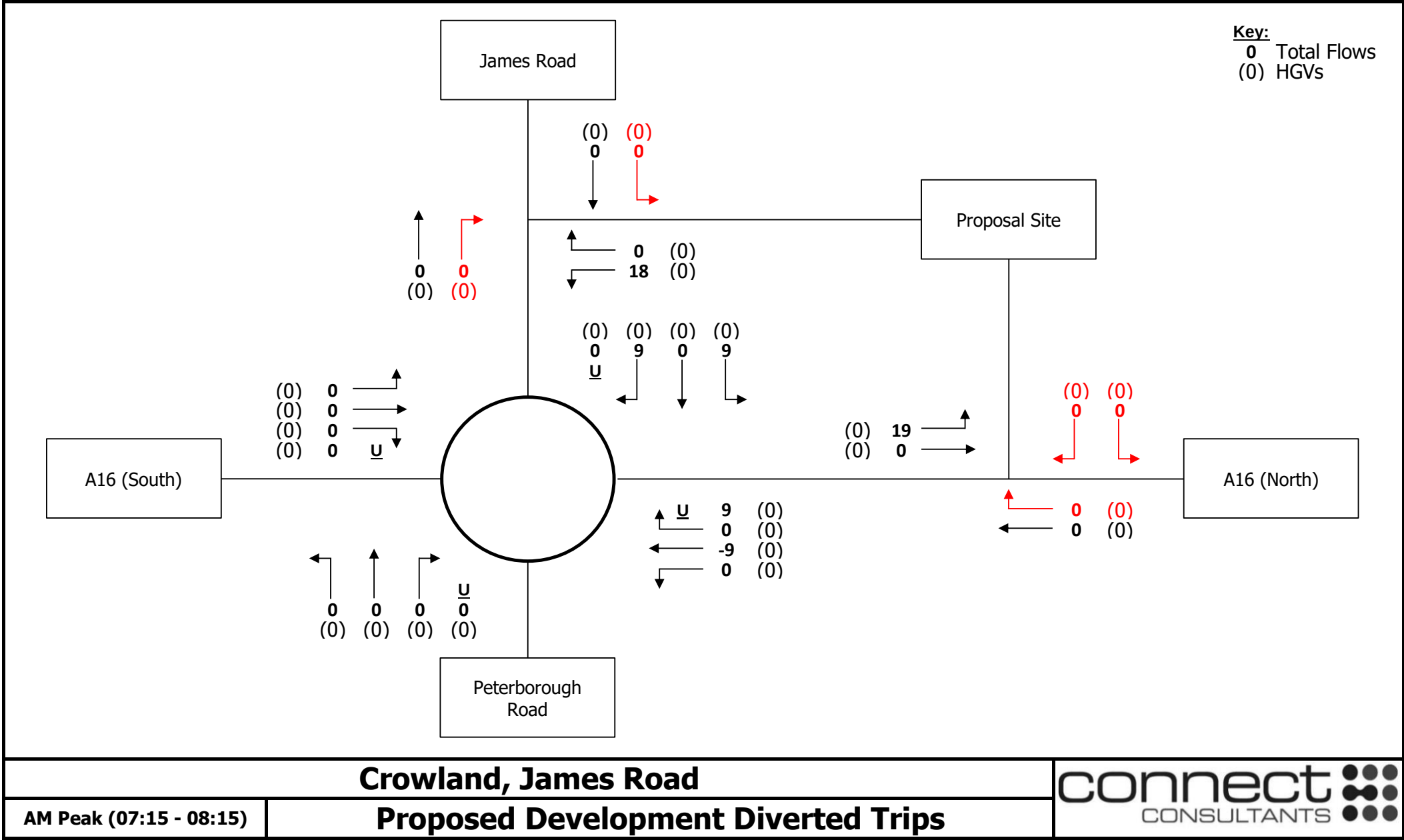
AM Peak (07:15 - 08:15)

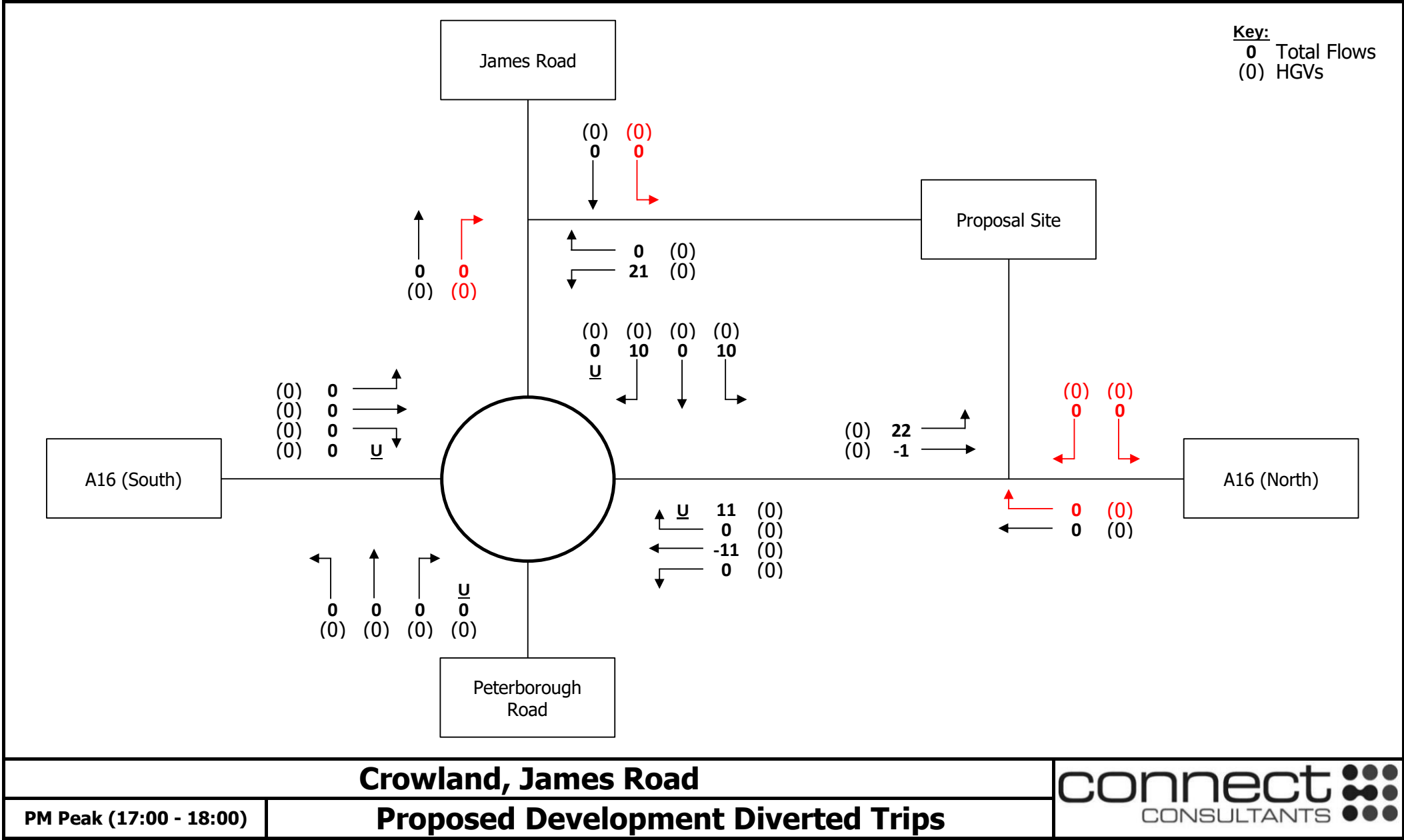
Proposed Development Pass-By Trips



Appendix 9

Traffic Flow Diagrams Diverted Trips

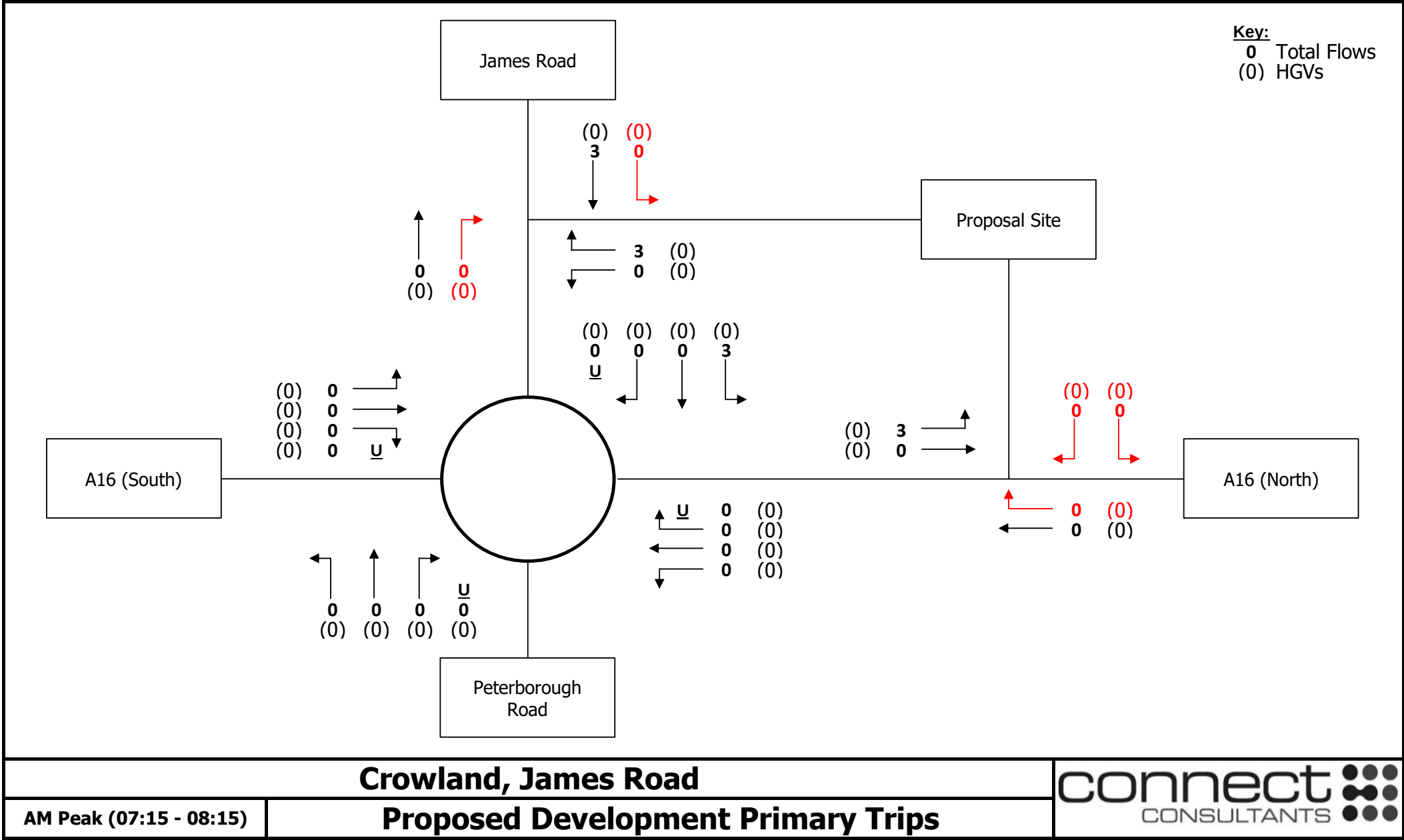


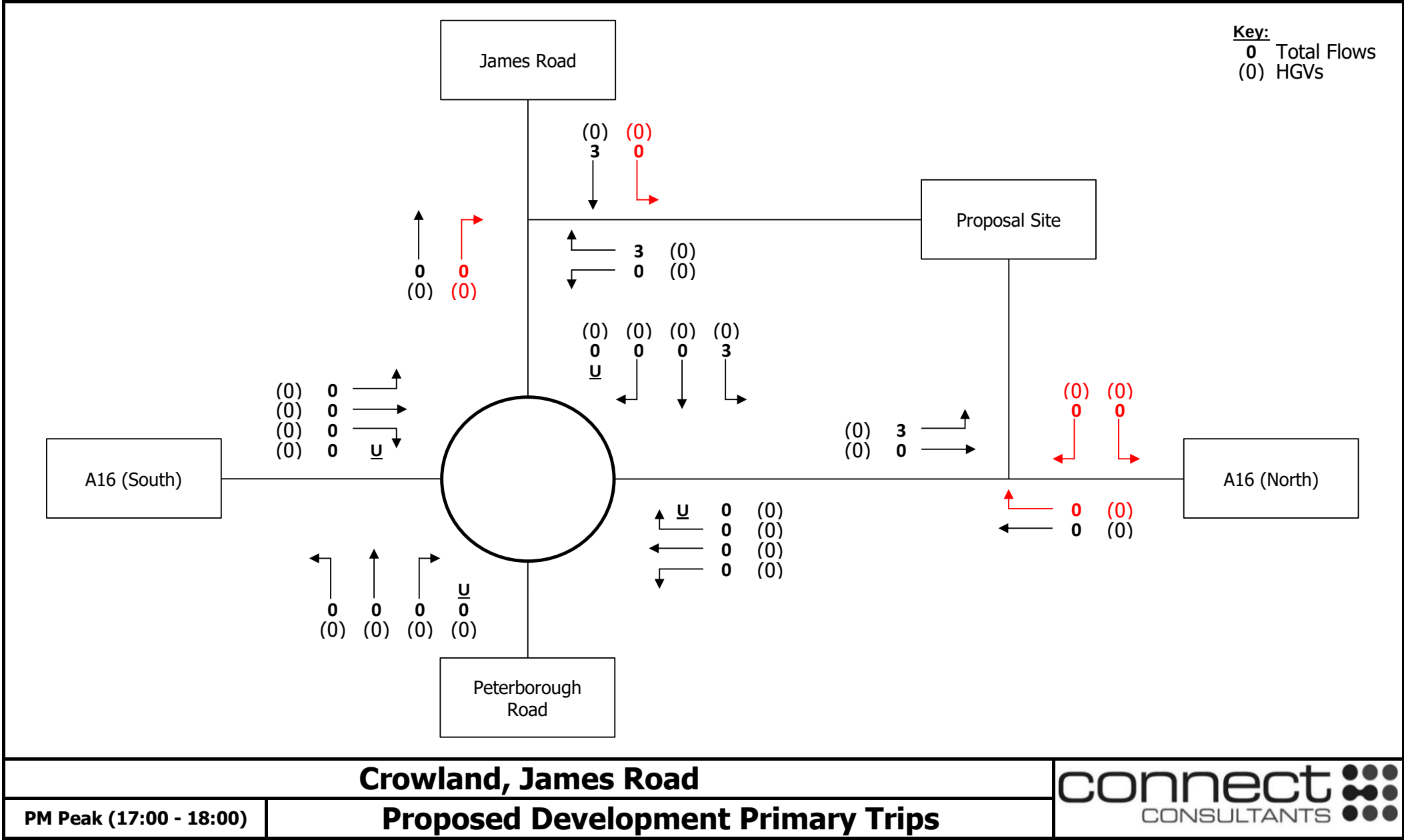


Appendix 10

Traffic Flow Diagrams

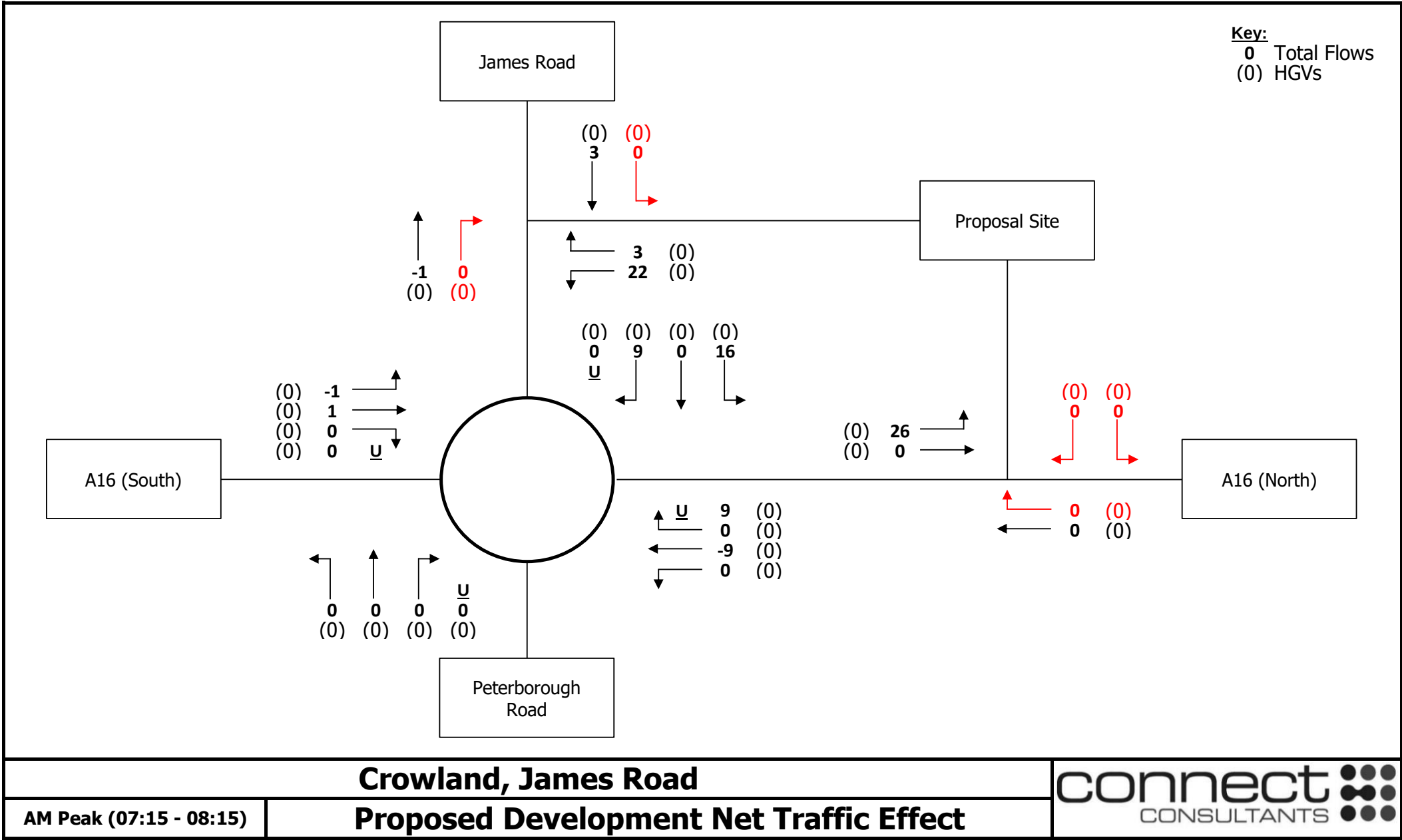
Primary Trips

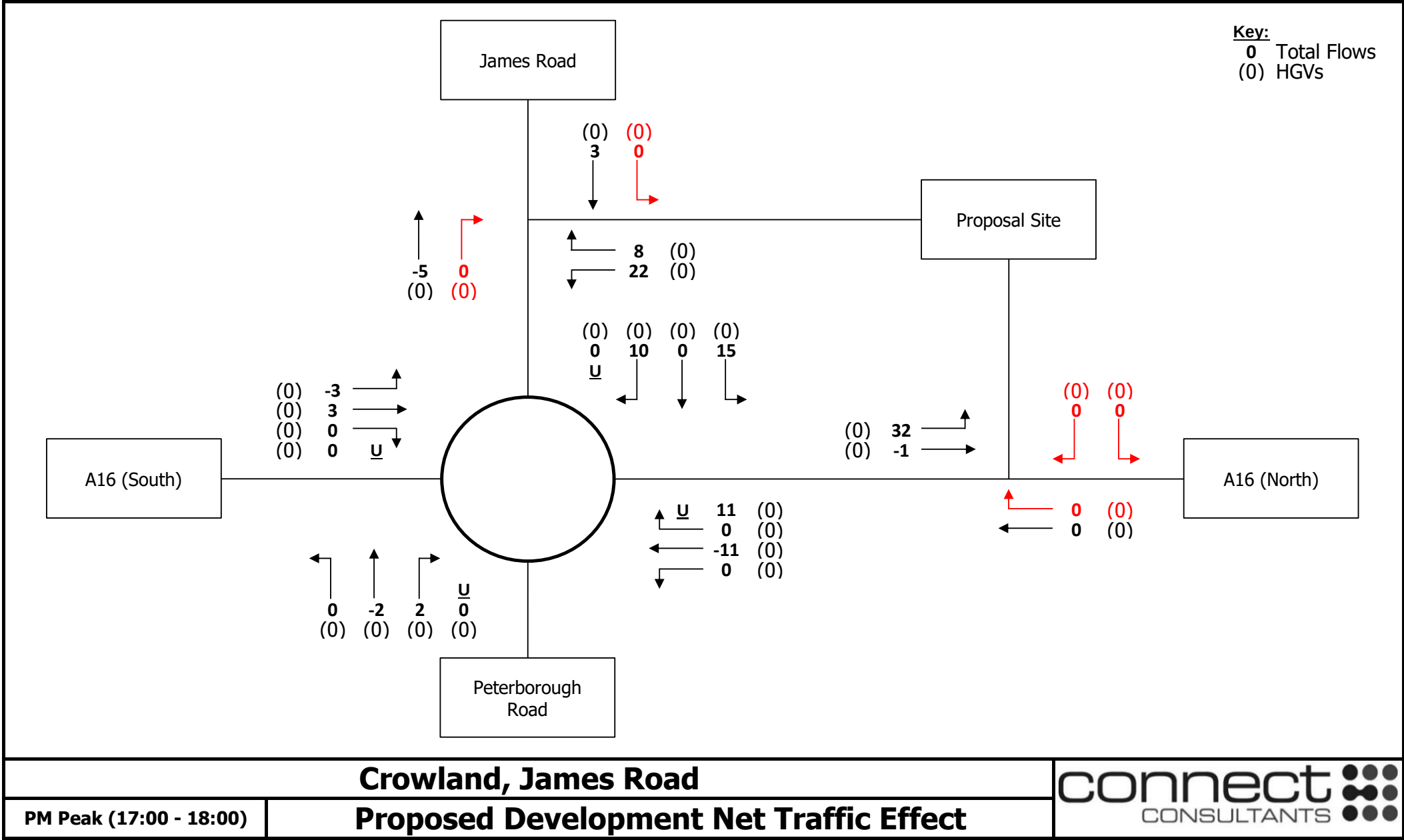




Appendix 11

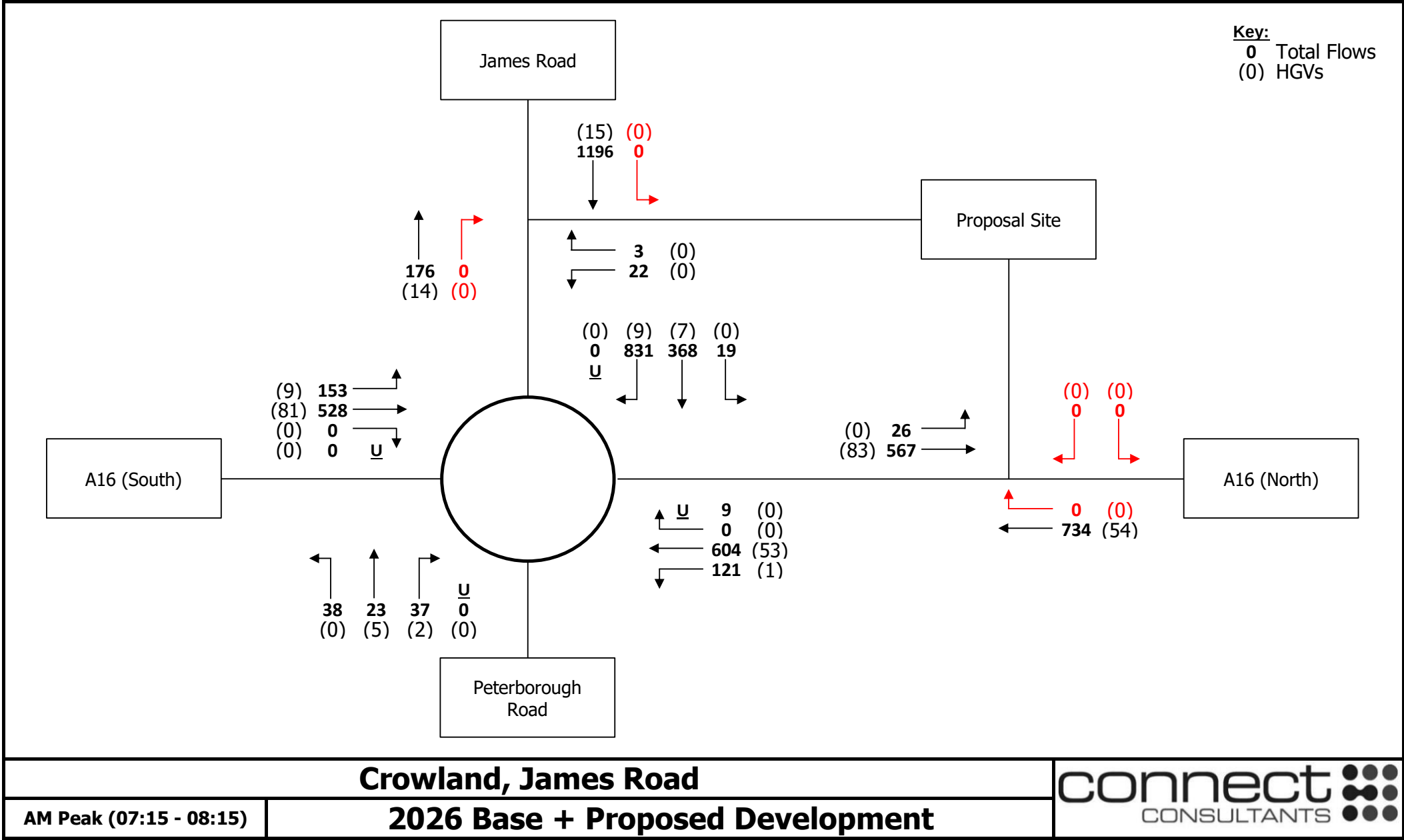
Traffic Flow Diagrams Net Traffic Effect

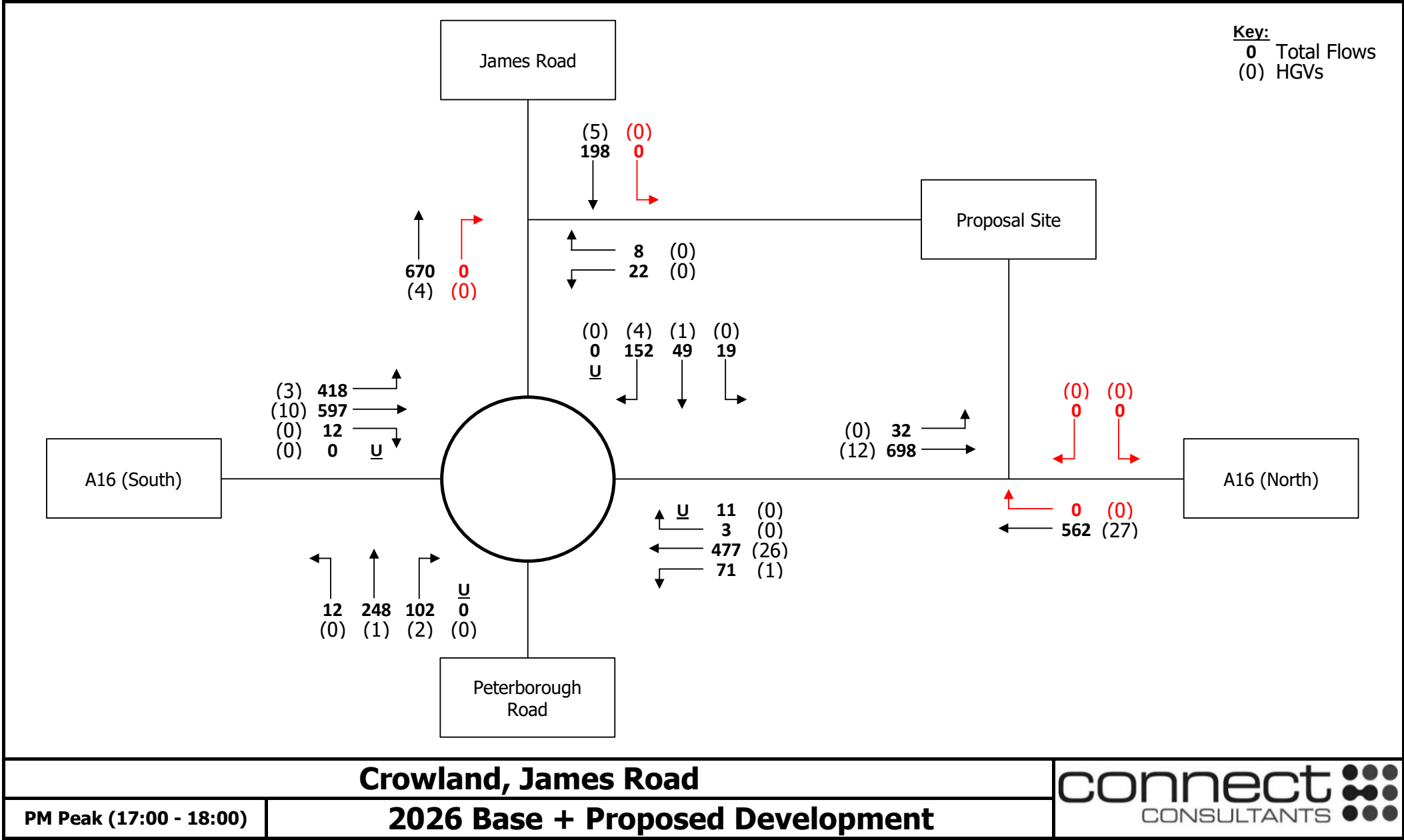




Appendix 12

Traffic Flow Diagrams
2026 Base + Proposed Development





Appendix 13

PICADY / ARCADY Outputs

Junctions 9						
ARCADY 9 - Roundabout Module						
Version: 9.5.1.7462 © Copyright TRL Limited, 2019						
For sales and distribution information, program advice and maintenance, contact TRL: +44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk						
The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution						

Filename: 20210120 A16 Roundabout ARCADY (DIRECT) FINAL.j9

Path: K:\Onesto Ltd\Crowland, James Road\Calcs\Tests

Report generation date: 20/01/2021 17:11:30

- »2020 Surveyed Flows, AM
- »2020 Surveyed Flows, PM
- »2026 Base, AM
- »2026 Base, PM
- »2025 Base + Proposed Developments, AM
- »2025 Base + Proposed Developments, PM

Summary of junction performance

	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
2020 Surveyed Flows						
Arm 1	1.9	9.24	0.67	0.5	2.98	0.32
Arm 2	0.2	7.31	0.19	0.4	4.28	0.30
Arm 3	0.9	4.44	0.49	2.1	7.40	0.69
Arm 4	4.7	15.45	0.84	0.2	3.07	0.16
2026 Base						
Arm 1	3.0	13.83	0.77	0.5	3.14	0.35
Arm 2	0.3	8.83	0.24	0.5	4.62	0.33
Arm 3	1.1	4.85	0.53	3.0	9.53	0.76
Arm 4	10.7	30.38	0.95	0.2	3.23	0.17
2025 Base + Proposed Developments						
Arm 1	3.1	13.99	0.77	0.5	3.16	0.35
Arm 2	0.3	8.90	0.24	0.5	4.64	0.33
Arm 3	1.1	4.90	0.53	3.0	9.69	0.76
Arm 4	13.6	36.52	0.97	0.2	3.32	0.19

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	
Location	
Site number	
Date	18/12/2020
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	CCL\Jsymington
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D1	2020 Surveyed Flows	AM	DIRECT	07:15	08:15	60	15	✓
D2	2020 Surveyed Flows	PM	DIRECT	17:00	18:00	60	15	✓
D3	2026 Base	AM	DIRECT	07:15	08:15	60	15	✓
D4	2026 Base	PM	DIRECT	17:00	18:00	60	15	✓
D5	2025 Base + Proposed Developments	AM	DIRECT	07:15	08:15	60	15	✓
D6	2025 Base + Proposed Developments	PM	DIRECT	17:00	18:00	60	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2020 Surveyed Flows, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 1 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	10.49	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	A16 (East)	
2	Peterborough Road	
3	A16 (West)	
4	James Road	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.40	7.40	40.0	25.0	30.0	45.0	
2	3.50	7.40	15.0	15.0	30.0	45.0	
3	3.75	7.30	25.0	22.0	30.0	45.0	
4	3.70	7.10	30.0	20.0	30.0	30.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.702	1979
2	0.614	1589
3	0.661	1787
4	0.694	1877

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D1	2020 Surveyed Flows	AM	DIRECT	07:15	08:15	60	15	✓

Vehicle mix varies over time	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
1		DIRECT	✓	100.000
2		DIRECT	✓	100.000
3		DIRECT	✓	100.000
4		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

07:15 - 07:30

		To				
From		1	2	3	4	
	1	0	128	528	0	
	2	24	0	44	16	
	3	400	0	0	108	
	4	0	236	852	0	

Demand (Veh/hr)

07:30 - 07:45

		To				
From		1	2	3	4	
	1	0	132	636	0	
	2	32	0	56	28	
	3	496	0	0	172	
	4	0	248	872	0	

Demand (Veh/hr)

07:45 - 08:00

		To				
From		1	2	3	4	
	1	0	80	528	0	
	2	52	0	16	32	
	3	396	0	0	164	
	4	12	364	688	0	

Demand (Veh/hr)

08:00 - 08:15

		To				
From		1	2	3	4	
	1	0	104	560	0	
	2	28	0	24	8	
	3	644	0	0	120	
	4	0	504	608	0	

Vehicle Mix

Heavy Vehicle Percentages

07:15 - 07:30

		To				
From		1	2	3	4	
	1	0	3	8	0	
	2	0	0	0	0	
	3	22	0	0	4	
	4	0	2	1	0	

Heavy Vehicle Percentages

07:30 - 07:45

	To				
		1	2	3	4
From	1	0	0	4	0
	2	0	0	0	29
	3	15	0	0	9
	4	0	2	0	0

Heavy Vehicle Percentages

07:45 - 08:00

	To				
		1	2	3	4
From	1	0	0	11	0
	2	8	0	0	25
	3	11	0	0	7
	4	0	1	2	0

Heavy Vehicle Percentages

08:00 - 08:15

	To				
		1	2	3	4
From	1	0	0	14	0
	2	14	0	0	50
	3	14	0	0	0
	4	0	2	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.67	9.24	1.9	A	674	674
2	0.19	7.31	0.2	A	90	90
3	0.49	4.44	0.9	A	625	625
4	0.84	15.45	4.7	C	1096	1096

Main Results for each time segment

07:15 - 07:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	656	164	1078	1134	0.579	651	422	0.0	1.3	7.375	A
2	84	21	1368	718	0.117	83	361	0.0	0.1	5.666	A
3	508	127	40	1490	0.341	506	1411	0.0	0.5	3.652	A
4	1088	272	422	1505	0.723	1078	123	0.0	2.5	8.248	A

07:30 - 07:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	768	192	1117	1153	0.666	766	527	1.3	1.9	9.239	A
2	116	29	1504	608	0.191	116	379	0.1	0.2	7.310	A
3	668	167	60	1535	0.435	667	1560	0.5	0.8	4.143	A
4	1120	280	527	1453	0.771	1117	200	2.5	3.2	10.619	B

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	608	152	1055	1120	0.543	611	461	1.9	1.2	7.112	A
2	100	25	1222	709	0.141	100	444	0.2	0.2	5.915	A
3	560	140	84	1569	0.357	561	1238	0.8	0.6	3.574	A
4	1064	266	449	1508	0.706	1067	196	3.2	2.5	8.222	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	664	166	1103	1068	0.622	662	671	1.2	1.6	8.847	A
2	60	15	1163	727	0.083	60	602	0.2	0.1	5.403	A
3	764	191	36	1572	0.486	763	1187	0.6	0.9	4.439	A
4	1112	278	671	1327	0.838	1103	128	2.5	4.7	15.445	C

2020 Surveyed Flows, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 1 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	5.30	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D2	2020 Surveyed Flows	PM	DIRECT	17:00	18:00	60	15	✓

Vehicle mix varies over time	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
1		DIRECT	✓	100.000
2		DIRECT	✓	100.000
3		DIRECT	✓	100.000
4		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

17:00 - 17:15

		To			
		1	2	3	4
From	1	0	44	476	4
	2	108	0	0	188
	3	516	4	0	308
	4	8	48	160	0

Demand (Veh/hr)

17:15 - 17:30

		To			
		1	2	3	4
From	1	0	68	500	0
	2	72	0	16	228
	3	500	4	0	440
	4	4	60	128	0

Demand (Veh/hr)

17:30 - 17:45

	To				
From		1	2	3	4
	1	0	88	408	4
	2	76	0	24	268
	3	572	28	0	452
	4	4	40	112	0

Demand (Veh/hr)

17:45 - 18:00

	To				
From		1	2	3	4
	1	0	60	412	4
	2	112	0	4	236
	3	596	8	0	348
	4	0	32	120	0

Vehicle Mix

Heavy Vehicle Percentages

17:00 - 17:15

	To				
From		1	2	3	4
	1	0	0	5	0
	2	4	0	0	0
	3	1	0	0	1
	4	0	0	5	0

Heavy Vehicle Percentages

17:15 - 17:30

	To				
From		1	2	3	4
	1	0	0	4	0
	2	6	0	0	2
	3	2	0	0	1
	4	0	7	3	0

Heavy Vehicle Percentages

17:30 - 17:45

	To				
From		1	2	3	4
	1	0	5	7	0
	2	0	0	0	0
	3	2	0	0	1
	4	0	0	4	0

Heavy Vehicle Percentages

17:45 - 18:00

	To				
From		1	2	3	4
	1	0	0	6	0
	2	0	0	0	0
	3	1	0	0	0
	4	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.32	2.98	0.5	A	517	517
2	0.30	4.28	0.4	A	333	333
3	0.69	7.40	2.1	A	944	944
4	0.16	3.07	0.2	A	179	179

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	524	131	211	1746	0.300	522	629	0.0	0.4	2.939	A
2	296	74	638	1161	0.255	295	96	0.0	0.3	4.156	A
3	828	207	299	1571	0.527	824	634	0.0	1.1	4.791	A
4	216	54	625	1386	0.156	215	497	0.0	0.2	3.074	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	568	142	192	1776	0.320	568	576	0.4	0.5	2.979	A
2	316	79	628	1156	0.273	316	132	0.3	0.4	4.284	A
3	944	236	300	1559	0.606	942	644	1.1	1.5	5.826	A
4	192	48	576	1409	0.136	192	667	0.2	0.2	2.961	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	500	125	180	1735	0.288	500	651	0.5	0.4	2.914	A
2	368	92	524	1247	0.295	368	156	0.4	0.4	4.095	A
3	1052	263	348	1533	0.686	1050	544	1.5	2.1	7.401	A
4	156	39	674	1362	0.115	156	723	0.2	0.1	2.987	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	476	119	160	1774	0.268	476	708	0.4	0.4	2.775	A
2	352	88	536	1245	0.283	352	100	0.4	0.4	4.033	A
3	952	238	352	1544	0.616	954	536	2.1	1.6	6.120	A
4	152	38	717	1375	0.111	152	589	0.1	0.1	2.942	A

2026 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 1 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	18.20	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D3	2026 Base	AM	DIRECT	07:15	08:15	60	15	✓

Vehicle mix varies over time	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
1		DIRECT	✓	100.000
2		DIRECT	✓	100.000
3		DIRECT	✓	100.000
4		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

07:15 - 07:30

		To			
		1	2	3	4
From	1	0	139	575	0
	2	26	0	48	17
	3	436	0	0	118
	4	0	257	928	0

Demand (Veh/hr)

07:30 - 07:45

		To			
		1	2	3	4
From	1	0	144	693	0
	2	35	0	61	30
	3	540	0	0	187
	4	0	270	950	0

Demand (Veh/hr)

07:45 - 08:00

		To			
From		1	2	3	4
	1	0	87	575	0
	2	57	0	17	35
	3	431	0	0	179
	4	13	396	749	0

Demand (Veh/hr)

08:00 - 08:15

		To			
From		1	2	3	4
	1	0	113	610	0
	2	30	0	26	9
	3	701	0	0	131
	4	0	549	662	0

Vehicle Mix

Heavy Vehicle Percentages

07:15 - 07:30

		To			
From		1	2	3	4
	1	0	3	8	0
	2	0	0	0	0
	3	22	0	0	4
	4	0	2	1	0

Heavy Vehicle Percentages

07:30 - 07:45

		To			
From		1	2	3	4
	1	0	0	4	0
	2	0	0	0	29
	3	15	0	0	9
	4	0	2	0	0

Heavy Vehicle Percentages

07:45 - 08:00

		To			
From		1	2	3	4
	1	0	0	11	0
	2	8	0	0	25
	3	11	0	0	7
	4	0	1	2	0

Heavy Vehicle Percentages

08:00 - 08:15

		To			
From		1	2	3	4
	1	0	0	14	0
	2	14	0	0	50
	3	14	0	0	0
	4	0	2	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.77	13.83	3.0	B	734	734
2	0.24	8.83	0.3	A	98	98
3	0.53	4.85	1.1	A	681	681
4	0.95	30.38	10.7	D	1194	1194

Main Results for each time segment

07:15 - 07:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	714	178	1170	1073	0.666	706	460	0.0	1.9	9.635	A
2	91	23	1485	644	0.141	90	391	0.0	0.2	6.500	A
3	554	139	43	1488	0.372	552	1532	0.0	0.6	3.836	A
4	1185	296	460	1474	0.804	1170	134	0.0	3.8	11.330	B

07:30 - 07:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	837	209	1213	1087	0.770	832	574	1.9	3.1	13.833	B
2	126	31	1633	532	0.237	125	412	0.2	0.3	8.834	A
3	727	182	65	1532	0.475	726	1694	0.6	0.9	4.460	A
4	1220	305	574	1416	0.861	1213	216	3.8	5.6	17.067	C

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	662	166	1152	1057	0.627	668	502	3.1	1.7	9.373	A
2	109	27	1336	643	0.170	109	484	0.3	0.2	6.754	A
3	610	153	92	1563	0.390	611	1353	0.9	0.6	3.787	A
4	1158	289	489	1478	0.784	1165	214	5.6	3.8	11.773	B

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	723	181	1183	1016	0.711	720	729	1.7	2.4	12.048	B
2	65	16	1257	671	0.097	65	647	0.2	0.1	5.945	A
3	832	208	39	1570	0.530	830	1283	0.6	1.1	4.854	A
4	1211	303	729	1281	0.945	1184	140	3.8	10.7	30.380	D

2026 Base, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 1 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	6.42	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D4	2026 Base	PM	DIRECT	17:00	18:00	60	15	✓

Vehicle mix varies over time	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
1		DIRECT	✓	100.000
2		DIRECT	✓	100.000
3		DIRECT	✓	100.000
4		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

17:00 - 17:15

		To			
		1	2	3	4
From	1	0	48	518	4
	2	117	0	0	205
	3	561	4	0	335
	4	9	52	174	0

Demand (Veh/hr)

17:15 - 17:30

		To			
		1	2	3	4
From	1	0	74	544	0
	2	78	0	17	248
	3	544	4	0	479
	4	4	65	139	0

Demand (Veh/hr)

17:30 - 17:45

	To				
From		1	2	3	4
	1	0	96	444	4
	2	83	0	26	292
	3	622	30	0	492
	4	4	44	122	0

Demand (Veh/hr)

17:45 - 18:00

	To				
From		1	2	3	4
	1	0	65	448	4
	2	122	0	4	257
	3	648	9	0	379
	4	0	35	131	0

Vehicle Mix

Heavy Vehicle Percentages

17:00 - 17:15

	To				
From		1	2	3	4
	1	0	0	5	0
	2	4	0	0	0
	3	1	0	0	1
	4	0	0	5	0

Heavy Vehicle Percentages

17:15 - 17:30

	To				
From		1	2	3	4
	1	0	0	4	0
	2	6	0	0	2
	3	2	0	0	1
	4	0	7	3	0

Heavy Vehicle Percentages

17:30 - 17:45

	To				
From		1	2	3	4
	1	0	5	7	0
	2	0	0	0	0
	3	2	0	0	1
	4	0	0	4	0

Heavy Vehicle Percentages

17:45 - 18:00

	To				
From		1	2	3	4
	1	0	0	6	0
	2	0	0	0	0
	3	1	0	0	0
	4	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.35	3.14	0.5	A	562	562
2	0.33	4.62	0.5	A	362	362
3	0.76	9.53	3.0	A	1027	1027
4	0.17	3.23	0.2	A	195	195

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	570	142	229	1733	0.329	568	683	0.0	0.5	3.084	A
2	322	81	694	1126	0.286	320	104	0.0	0.4	4.461	A
3	900	225	324	1554	0.579	895	690	0.0	1.4	5.419	A
4	235	59	678	1349	0.174	234	541	0.0	0.2	3.227	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	618	155	208	1765	0.350	618	625	0.5	0.5	3.139	A
2	343	86	683	1122	0.306	343	143	0.4	0.4	4.618	A
3	1027	257	326	1541	0.666	1025	700	1.4	2.0	6.933	A
4	208	52	625	1375	0.151	208	725	0.2	0.2	3.088	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	544	136	196	1725	0.315	544	707	0.5	0.5	3.052	A
2	401	100	570	1217	0.330	401	170	0.4	0.5	4.412	A
3	1144	286	379	1513	0.756	1140	592	2.0	3.0	9.533	A
4	170	42	732	1322	0.129	170	786	0.2	0.1	3.127	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	517	129	175	1764	0.293	517	771	0.5	0.4	2.886	A
2	383	96	583	1214	0.315	383	109	0.5	0.5	4.330	A
3	1036	259	383	1524	0.680	1039	583	3.0	2.2	7.479	A
4	166	42	780	1331	0.125	166	642	0.1	0.1	3.092	A

2025 Base + Proposed Developments, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 1 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	20.98	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D5	2025 Base + Proposed Developments	AM	DIRECT	07:15	08:15	60	15	✓

Vehicle mix varies over time	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
1		DIRECT	✓	100.000
2		DIRECT	✓	100.000
3		DIRECT	✓	100.000
4		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

07:15 - 07:30

		To			
		1	2	3	4
From	1	9	139	566	0
	2	26	0	48	17
	3	436	0	0	117
	4	16	257	937	0

Demand (Veh/hr)

07:30 - 07:45

		To			
		1	2	3	4
From	1	9	144	683	0
	2	35	0	61	30
	3	541	0	0	187
	4	16	270	958	0

Demand (Veh/hr)

07:45 - 08:00

		To			
From		1	2	3	4
	1	9	87	566	0
	2	57	0	17	35
	3	432	0	0	178
	4	29	396	758	0

Demand (Veh/hr)

08:00 - 08:15

		To			
From		1	2	3	4
	1	9	113	601	0
	2	31	0	26	9
	3	702	0	0	130
	4	16	549	671	0

Vehicle Mix

Heavy Vehicle Percentages

07:15 - 07:30

		To			
From		1	2	3	4
	1	0	3	8	0
	2	0	0	0	0
	3	22	0	0	4
	4	0	2	1	0

Heavy Vehicle Percentages

07:30 - 07:45

		To			
From		1	2	3	4
	1	0	0	4	0
	2	0	0	0	29
	3	14	0	0	9
	4	0	2	0	0

Heavy Vehicle Percentages

07:45 - 08:00

		To			
From		1	2	3	4
	1	0	0	11	0
	2	8	0	0	25
	3	11	0	0	7
	4	0	1	2	0

Heavy Vehicle Percentages

08:00 - 08:15

		To			
From		1	2	3	4
	1	0	0	14	0
	2	14	0	0	50
	3	14	0	0	0
	4	0	2	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.77	13.99	3.1	B	734	734
2	0.24	8.90	0.3	A	98	98
3	0.53	4.90	1.1	A	681	681
4	0.97	36.52	13.6	E	1218	1218

Main Results for each time segment

07:15 - 07:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	714	178	1177	1069	0.668	706	485	0.0	1.9	9.730	A
2	91	23	1492	640	0.142	90	391	0.0	0.2	6.546	A
3	553	138	52	1483	0.373	551	1531	0.0	0.6	3.853	A
4	1210	303	469	1468	0.824	1193	133	0.0	4.3	12.404	B

07:30 - 07:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	836	209	1220	1083	0.772	831	600	1.9	3.2	13.993	B
2	126	31	1639	529	0.238	125	411	0.2	0.3	8.904	A
3	728	182	74	1537	0.474	727	1691	0.6	0.9	4.439	A
4	1244	311	584	1413	0.880	1236	216	4.3	6.4	19.282	C

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	662	165	1162	1052	0.630	668	528	3.2	1.7	9.503	A
2	109	27	1346	638	0.171	109	484	0.3	0.2	6.819	A
3	610	152	101	1558	0.392	611	1354	0.9	0.6	3.805	A
4	1183	296	499	1471	0.804	1191	213	6.4	4.4	13.233	B

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	723	181	1184	1018	0.710	721	756	1.7	2.4	11.999	B
2	66	16	1261	669	0.099	66	643	0.2	0.1	5.973	A
3	832	208	49	1563	0.532	830	1278	0.6	1.1	4.896	A
4	1236	309	740	1274	0.970	1199	139	4.4	13.5	36.519	E

2025 Base + Proposed Developments, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 1 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	6.48	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D6	2025 Base + Proposed Developments	PM	DIRECT	17:00	18:00	60	15	✓

Vehicle mix varies over time	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
✓	✓	✓	HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
1		DIRECT	✓	100.000
2		DIRECT	✓	100.000
3		DIRECT	✓	100.000
4		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

17:00 - 17:15

		To			
		1	2	3	4
From	1	11	48	507	4
	2	119	0	0	203
	3	564	4	0	332
	4	24	52	184	0

Demand (Veh/hr)

17:15 - 17:30

		To			
		1	2	3	4
From	1	11	74	533	0
	2	80	0	17	246
	3	547	4	0	475
	4	19	65	150	0

Demand (Veh/hr)

17:30 - 17:45

	To				
From		1	2	3	4
	1	11	96	433	4
	2	85	0	26	290
	3	625	30	0	488
	4	19	43	132	0

Demand (Veh/hr)

17:45 - 18:00

	To				
From		1	2	3	4
	1	11	65	437	4
	2	124	0	4	255
	3	651	9	0	376
	4	15	35	141	0

Vehicle Mix

Heavy Vehicle Percentages

17:00 - 17:15

	To				
From		1	2	3	4
	1	0	0	5	0
	2	4	0	0	0
	3	1	0	0	1
	4	0	0	5	0

Heavy Vehicle Percentages

17:15 - 17:30

	To				
From		1	2	3	4
	1	0	0	4	0
	2	5	0	0	2
	3	2	0	0	1
	4	0	7	3	0

Heavy Vehicle Percentages

17:30 - 17:45

	To				
From		1	2	3	4
	1	0	5	7	0
	2	0	0	0	0
	3	2	0	0	1
	4	0	0	3	0

Heavy Vehicle Percentages

17:45 - 18:00

	To				
From		1	2	3	4
	1	0	0	6	0
	2	0	0	0	0
	3	1	0	0	0
	4	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.35	3.16	0.5	A	562	562
2	0.33	4.64	0.5	A	362	362
3	0.76	9.69	3.0	A	1026	1026
4	0.19	3.32	0.2	A	220	220

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	570	143	239	1728	0.330	568	714	0.0	0.5	3.098	A
2	322	81	704	1119	0.288	320	104	0.0	0.4	4.497	A
3	900	225	335	1546	0.582	895	689	0.0	1.4	5.477	A
4	260	65	694	1341	0.194	259	536	0.0	0.2	3.324	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	618	154	219	1758	0.352	618	656	0.5	0.5	3.156	A
2	343	86	694	1118	0.307	343	143	0.4	0.4	4.643	A
3	1026	257	337	1535	0.669	1024	700	1.4	2.0	7.011	A
4	234	58	641	1369	0.171	234	719	0.2	0.2	3.172	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	544	136	205	1721	0.316	544	738	0.5	0.5	3.060	A
2	401	100	580	1211	0.331	401	169	0.4	0.5	4.440	A
3	1143	286	390	1506	0.759	1139	591	2.0	3.0	9.688	A
4	194	49	748	1322	0.147	194	780	0.2	0.2	3.191	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	517	129	185	1760	0.294	517	802	0.5	0.4	2.897	A
2	383	96	593	1209	0.317	383	109	0.5	0.5	4.360	A
3	1036	259	394	1516	0.683	1039	582	3.0	2.2	7.598	A
4	191	48	796	1320	0.145	191	637	0.2	0.2	3.190	A

Junctions 9						
PICADY 9 - Priority Intersection Module						
Version: 9.5.1.7462 © Copyright TRL Limited, 2019						
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Filename: 20210120 Site Egress FINAL.j9

Path: K:\Onesto Ltd\Crowland, James Road\Calcs\Tests\Site Egress PICADY

Report generation date: 20/01/2021 17:17:16

»2026 Base + Proposed, AM

»2026 Base + Proposed, PM

Summary of junction performance

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
2026 Base + Proposed						
Stream B-C	0.1	8.54	0.05	0.0	4.76	0.03
Stream B-A	0.0	13.79	0.01	0.0	7.52	0.02
Stream C-AB	0.0	0.00	0.00	0.0	0.00	0.00

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	
Location	
Site number	
Date	08/12/2020
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	CCL\rdunn
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2026 Base + Proposed	AM	ONE HOUR	07:45	09:15	15	✓
D2	2026 Base + Proposed	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2026 Base + Proposed, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		0.16	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	James Road (North)		Major
B	Site Egress		Minor
C	James Road (South)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	7.59			100.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Lane Width (Left) (m)	Lane Width (Right) (m)	Visibility to left (m)	Visibility to right (m)
B	Two lanes	5.00	4.80	113	136

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	689	0.117	0.295	0.186	0.422
B-C	852	0.122	0.307	-	-
C-B	632	0.228	0.228	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2026 Base + Proposed	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	1196	100.000
B		ONE HOUR	✓	25	100.000
C		ONE HOUR	✓	176	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		A	B	C
	A	0	0	1196
	B	3	0	22
	C	176	0	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		A	B	C
	A	0	0	1
	B	0	0	0
	C	8	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.05	8.54	0.1	A	20	30
B-A	0.01	13.79	0.0	B	3	4
C-AB	0.00	0.00	0.0	A	0	0
C-A					162	242
A-B					0	0
A-C					1097	1646

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	17	4	574	0.029	16	0.0	0.0	6.452	A
B-A	2	0.56	399	0.006	2	0.0	0.0	9.081	A
C-AB	0	0	427	0.000	0	0.0	0.0	0.000	A
C-A	133	33			133				
A-B	0	0			0				
A-C	900	225			900				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	20	5	520	0.038	20	0.0	0.0	7.191	A
B-A	3	0.67	342	0.008	3	0.0	0.0	10.602	B
C-AB	0	0	387	0.000	0	0.0	0.0	0.000	A
C-A	158	40			158				
A-B	0	0			0				
A-C	1075	269			1075				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	24	6	446	0.054	24	0.0	0.1	8.539	A
B-A	3	0.83	264	0.013	3	0.0	0.0	13.794	B
C-AB	0	0	332	0.000	0	0.0	0.0	0.000	A
C-A	194	48			194				
A-B	0	0			0				
A-C	1317	329			1317				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	24	6	446	0.054	24	0.1	0.1	8.541	A
B-A	3	0.83	264	0.013	3	0.0	0.0	13.794	B
C-AB	0	0	332	0.000	0	0.0	0.0	0.000	A
C-A	194	48			194				
A-B	0	0			0				
A-C	1317	329			1317				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	20	5	520	0.038	20	0.1	0.0	7.196	A
B-A	3	0.67	342	0.008	3	0.0	0.0	10.603	B
C-AB	0	0	387	0.000	0	0.0	0.0	0.000	A
C-A	158	40			158				
A-B	0	0			0				
A-C	1075	269			1075				

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	17	4	574	0.029	17	0.0	0.0	6.456	A
B-A	2	0.56	399	0.006	2	0.0	0.0	9.083	A
C-AB	0	0	427	0.000	0	0.0	0.0	0.000	A
C-A	133	33			133				
A-B	0	0			0				
A-C	900	225			900				

2026 Base + Proposed, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		0.18	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2026 Base + Proposed	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	198	100.000
B		ONE HOUR	✓	30	100.000
C		ONE HOUR	✓	670	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
	A	B	C	
From	A	0	0	198
	B	8	0	22
	C	670	0	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
	A	B	C	
From	A	0	0	3
	B	0	0	0
	C	1	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.03	4.76	0.0	A	20	30
B-A	0.02	7.52	0.0	A	7	11
C-AB	0.00	0.00	0.0	A	0	0
C-A					615	922
A-B					0	0
A-C					182	273

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	17	4	804	0.021	16	0.0	0.0	4.573	A
B-A	6	2	551	0.011	6	0.0	0.0	6.599	A
C-AB	0	0	598	0.000	0	0.0	0.0	0.000	A
C-A	504	126			504				
A-B	0	0			0				
A-C	149	37			149				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	20	5	794	0.025	20	0.0	0.0	4.648	A
B-A	7	2	525	0.014	7	0.0	0.0	6.955	A
C-AB	0	0	591	0.000	0	0.0	0.0	0.000	A
C-A	602	151			602				
A-B	0	0			0				
A-C	178	44			178				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	24	6	781	0.031	24	0.0	0.0	4.756	A
B-A	9	2	488	0.018	9	0.0	0.0	7.515	A
C-AB	0	0	582	0.000	0	0.0	0.0	0.000	A
C-A	738	184			738				
A-B	0	0			0				
A-C	218	55			218				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	24	6	781	0.031	24	0.0	0.0	4.756	A
B-A	9	2	488	0.018	9	0.0	0.0	7.515	A
C-AB	0	0	582	0.000	0	0.0	0.0	0.000	A
C-A	738	184			738				
A-B	0	0			0				
A-C	218	55			218				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	20	5	794	0.025	20	0.0	0.0	4.650	A
B-A	7	2	525	0.014	7	0.0	0.0	6.955	A
C-AB	0	0	591	0.000	0	0.0	0.0	0.000	A
C-A	602	151			602				
A-B	0	0			0				
A-C	178	44			178				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	17	4	804	0.021	17	0.0	0.0	4.575	A
B-A	6	2	551	0.011	6	0.0	0.0	6.599	A
C-AB	0	0	598	0.000	0	0.0	0.0	0.000	A
C-A	504	126			504				
A-B	0	0			0				
A-C	149	37			149				