APPENDIX I – TRANSPORT STATEMENT

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Stannergate 400kV Substation

Appendix I: Transport Statement

Scottish & Southern Electricity Network

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Delivering a better world

Quality information

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1 Introduction

1.1 Background

1.1.1 AECOM has been commissioned by Scottish and Southern Electricity Networks (SSEN) to prepare a Transport Assessment (TA) in support of a planning application to construct and operate a new 132 kilovolt (kV) Network Rail Traction Transformer station and a 132kV Gas Insulated Switchgear (GIS) substation, east of Dundee City Centre, immediately north of East Dock Street, and south of Broughty Ferry Road, hereafter referred to as 'the Proposed Development'.

1.2 TA Structure

1.2.1 The structure of this TA is as follows.

- Proposed Development
- Scoping Correspondence
- Transport Baseline
- Sensitivity of Receptors
- Forecast Development Traffic
- Fear and Intimidation
- Accident Forecast Calculations
- Traffic Impacts
- Abnormal Indivisible Loads
- Stage 1 Road Safety Audit
- Framework Construction Traffic Management Plan

2 Proposed Development

2.1 Proposed Development Site

2.1.1 The Proposed Development Site is a currently disused industrial site in Dundee. The site is dominated by sealed surfaces, buildings and structures associated with the former use of the site. A retaining wall separates the Proposed Development Site between north and south, with the northern part of the site (formerly a cattle market) the more elevated of the two. The south of the site is the disused Nynas site, which mainly comprises large cylindrical oil storage tanks. East of this, across the now overgrown Roodyards Road, is an area of the site now in use by Scotriders for motorbike training. To the west and south there are similar industrial areas, with the A92 road immediately to the south and east. The Proposed Development Site is bound to the north by the Broughty Ferry road, beyond which lies existing residential areas.

2.2 Proposed Development

2.2.1 The Proposed Development will comprise the following elements:

- New 132 kV GIS substation building (including staff welfare and maintenance area)
- Two new 132 kV Network Rail feeder station (or 'traction transformer') buildings; and
- Two new switching station (or 'grid transformer') buildings.

2.2.2 The Proposed Development site layout is shown in **Figure 2-1.**

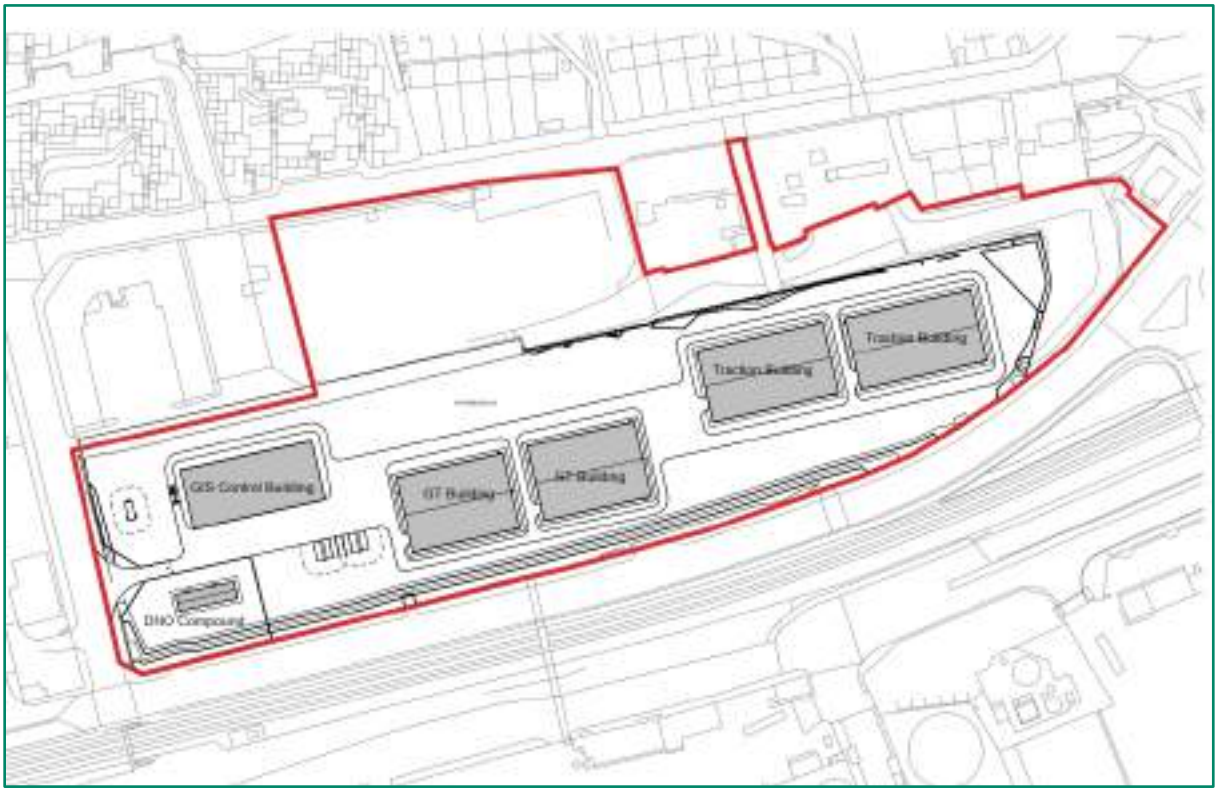


Figure 2-1: Site Layout

2.2.3 The following buildings would make up the ancillary aspects of the Proposed Development:

- Distribution Network Operator (DNO) supply building;
- Generator building;
- 33 kV distribution compound;
- Photovoltaic (PV) panels;
- 25 kV underground cable;

- New proposed site accesses from Market Street and East Dock Street;
- Onsite access roads and parking bays; and
- Adequate security measures such as gated access.

2.3 Site Access

2.3.1 During construction, the main site access will be on Market Street. This will be formed of a new priority junction and be used for the access and egress of all HGV and AIL construction traffic. AECOM Drawing Substation Site Access is included in Appendix A and shows an indicative layout of the proposed access junction on Market Street.

2.3.2 A secondary access will be provided from Broughty Ferry Road. This is formed of an existing priority controlled access and will lead to the laydown area in the north of the site. This area within the site is intended for staff parking and potentially the storage of some equipment and will not be used for HGV access. It is proposed that this junction will operate on a left in / left out basis.

2.3.3 Access to the Proposed Development during operation will be via the proposed entrance at Market Street. A transformer delivery road will provide access to the proposed infrastructure within the site itself.

2.4 Parking

2.4.1 During construction, the laydown area in the north of the site will be used for staff Car / LGV parking. During construction, there is expected to be a maximum of 39 Car / LGV arrivals to the site. The laydown area is sufficiently large to accommodate parking of all Car / LGV arrivals.

2.4.2 Once operational, it is proposed to provide 12 car parking spaces on site. These will be situated opposite the GIS building and adjacent to the laydown area in the north of the site. On site parking will be accessed from Market Street and Broughty Ferry Road respectively. It is considered that this will be sufficient to accommodate staff working on site on a daily basis as well as maintenance staff who will require access to the site on an infrequent basis. It is forecast that most operational trips will be undertaken by Car / LGV with the potential for occasional HGV trips if larger scale maintenance is required.

3 Scoping Correspondence

3.1 Screening Opinion

3.1.1 EA screening opinion was received by Transport Scotland and Dundee City Council's Sustainable Transport and Roads Division in July 2024.

3.1.2 The requirements of Transport Scotland were:

- A Transport Statement, detailing traffic generation by volume, type and distribution for the proposals, during both construction and operation.
- Design details for the proposed site access points confirming compliance with DMRB requirements including visibility splays.
- A Stage 1 Road Safety Audit covering these access proposals.
- Construction Traffic Management Plan (CTMP).
- Assessment of any abnormal loads and the likely routes for the proposals.

3.1.3 The requirements of Dundee City Council's Sustainable Transport and Roads Division were:

- Transport Scotland must be consulted as the site is adjacent to the Trunk Road.
- A Transport Assessment/Transport Statement is required. The level of the assessment/statement shall be agreed with both DCC Transportation and Transport Scotland.
- Details of all proposed parking within the site.
- Details of all proposed new/altered accesses.

3.2 Further Scoping

3.2.1 AECOM reached out to both Transport Scotland and Dundee City Council to scope the parameters of the Transport Assessment. A copy of the Scoping Note, issued in August 2024 is included in Appendix B.

3.2.2 Transport Scotland responded to the Scoping Note in September 2024. The full response is included within Appendix B and summarised as follows:

- Site Access from the A92 (directly or indirectly via Market Street) should be restricted to left-in / left-out movements only.
- Left-in / left-out movements through the A92 / Market Street junction should be addressed via the CTMP.
- Any proposed junction from Roodyards Road to the A92 should be formed as a left-in / left-out junction.
- The access junction at the former 'Scotriders' motor cycle training site should be closed off along with any other redundant access points on the A92.
- TS would prefer to manage AIL movements through the A92 / Market Street junction via left-in / left-out movements however acknowledge this may not be feasible. TS are satisfied that these movements can be managed through the CTMP.

3.2.3 Dundee City Council responded to the Scoping Note in September 2024. The full response is included within Appendix B and summarised as follows:

- The site access on Market Street should be set back from the A92 at a distance to allow an HGV to sit fully on Market Street and not block other traffic using Market Street.
- As a minimum, a right turn harbourage on Broughty Ferry Road, which allows for HGVs to safely sit while waiting and not blocking other traffic, should be provided at the Broughty Ferry Road access. Further details are required if this access is to be used during construction.

- DCC state that orders may be required on Roodyards Road if alterations are proposed.

4 Transport Baseline

4.1 Introduction

4.1.1 The following chapter summarises the transport network and baseline traffic in the area surrounding the Proposed Development Site.

4.2 Existing Site

4.2.1 The site is on brownfield land, approximately 1.5km east of Dundee city centre. The site is bounded by East Dock Street (A92 Trunk Road) to the south, Market Street to the west and Broughty Ferry Road to the north. Within the red line boundary of the site, the unclassified Roodyards Road routes north to south between Broughty Ferry Road and the A92.

4.3 Pedestrians

4.3.1 The site is connected to nearby residential areas from where construction and operational staff may originate by Broughty Ferry Road, Market Street and the A92. Broughty Ferry Road is an east / west route connecting to Dundee city centre in the west and Broughty Ferry in the east. The route has footways on both sides of the carriageway which are up to 4m wide on the north side and approximately 2m wide on the south side. The footways are lit with good quality surfaces and provide access to bus services for pedestrians.

4.3.2 Market Street is a north / south route, connecting the footways on Broughty Ferry Road with those on the A92. They are approximately 2.5m wide and lit with good surfacing. At present, these footways provide access to the Dundee Transport Museum and other adjacent properties. Footways and on street parking present on Market Street can be viewed in **Figure 4-1**, taken during an AECOM site visit in October 2024.

Figure 4-1: Market Street Footways and On-Street Parking

4.3.3 The A92 is an east / west route in the vicinity of the site with footways on both sides the carriageway. These are lit with good surfacing and vary in width between 3m on the north side and 2m on the south. Pedestrians on footways on the south side of the A92 are protected from traffic by crash barriers. Figure **4-2** and Figure **4-3** show pedestrian footways on the north and south side of the A92, taken during an AECOM site visit in October 2024. Pedestrian crossing facilities are present on the A92 approximately 600m west of the site, opposite the Gallagher Retail Park.

Figure **4-2**: Footway on Northern Side of the A92 East Dock Street

Figure **4-3**: Footway on Southern Side of the A92 East Dock Street

4.4 Cyclists

4.4.1 There are no dedicated cycling provisions on any of the public roads adjacent to the proposed development. Cyclists accessing the site will cycle on-carriageway via the public road network.

4.5 Public Transport

4.5.1 Local bus services are available from stops which fall within 400m of the site, this being the recommended distance from PAN75 for access to bus services. The closest bus stops to the proposed development are located on Broughty Ferry Road. An eastbound and westbound bus stop is located on Broughty Ferry Road approximately 50m to the west of the junction Broughty Ferry Road / Market Street junction. . The westbound stop is equipped with a shelter and seating with timetabling information while the eastbound stop consists of a stand with timetabling information.

4.5.2 The services which operate from this location are shown in **Table 4-1: Bus Services Near the Proposed Development Site.**

Table 4-1: Bus Services Near the Proposed Development Site

Service Number	Route	Monday – Friday	Saturday	Sunday
5 / 5A	Ninewells Hospital to Barnhill	Approx. every 30 mins between 05:00 – 23:00	Approx. every 30 mins between 06:30 – 23:00	Approx. every hour from 08:00 – 23:00
73B	Ninewells Hospital to Arbroath	2 services in each direction daily between 19:00 and 21:00	4 services in each direction daily between 19:00 and 23:00	2 services in each direction daily between 19:00 and 21:00
78 (A & C)	Dundee – Monikie	4 services in each direction daily	4 services in each direction daily	1 service in each direction daily
79 (A & C)	Dundee – Monikie	3 services in each direction daily	3 services in each direction daily	3 service in each direction daily

4.6 Vehicles

4.6.1 Vehicle access to the Proposed Development will be via the existing public road network. Study area roads are identified as routes likely to carry construction traffic to and from the Proposed Development Site. Study Area roads will include the A92, A972, A90, Broughty Ferry Road and Market Street. Figure 8.1: Study Area Roads located in Appendix C shows the extent of routes to be used by construction traffic.

4.6.2 The A92 is an east / west four-lane single carriageway road with a speed limit of 40mph. It routes past the southern boundary of the Proposed Development Site, connecting to Dundee city centre and the Tay Bridge to the west and the Kingsway to the east. The route forms part of Scotland's trunk road network.

4.6.3 The A90 is a dual carriageway trunk road connecting Perth and Dundee. In Dundee, the A90 forms part of the Kingsway, from where the route connects Dundee to Forfar. The A972 Kingsway is also a dual carriageway trunk road within Dundee, and connects the A90 with the A92.

4.6.4 Broughty Ferry Road is an east / west road which passes the Proposed Development Site along its northern boundary. It is a two-way single carriageway with a speed limit of 30mph and connects to the A92 in the east via a priority controlled junction. Broughty Ferry Road provides access to Dundee city centre in the west via Blackscroft and Seagate.

4.6.5 Market Street routes north / south along the western boundary of the Proposed Development Site, connecting Broughty Ferry Road and the A92 via priority-controlled junctions. There is a speed limit of 30mph and on street parking is present on both sides of the carriageway. The carriageway is approximately 12m wide, allowing two-way vehicle flow to be maintained despite the on-street parking. Market Street also provides access to Market Mews which leads to the Dundee Transport Museum. Market Street can be viewed from its junction with the A92 in **Figure 4-4** taken during an AECOM site visit in October 2024.

Figure 4-4: Market Street / A92 Junction

4.6.6 To inform baseline traffic conditions on study area roads, traffic data was collected between 21st October 2024 and 27th October 2024. These comprised seven Automatic Traffic Counts (ATCs) and four Junction Turning Counts (JTCs). ATCs were recording for 7 days and JTCs were recording between the hours of 07:00 and 10:00 and 16:00 and 19:00 on 22nd October 2024. ATC data was complimented by Department for Transport (DfT) Traffic Count data on study area roads. Traffic survey locations are shown in Figure 8.2: Traffic Survey and DfT Traffic Count Locations located in Appendix C**.**

4.6.7 Table 4-2: 2024 Traffic Data Summary below outlines the average weekday traffic count data across the fourteen study area roads from the data gathered by ATC traffic surveys and DfT traffic count data.

Table 4-2: 2024 Traffic Data Summary

Study Area Road	Data Source	HGVs	Total
Tay Road Bridge	DfT Survey	730	29,112
A92 East Dock Street (west)	AECOM ATC Survey	761	24,415
A92 East Dock Street (east)	AECOM ATC Survey	769	23,751
Market Street	AECOM ATC Survey	16	659
Broughty Ferry Road	AECOM ATC Survey	26	6,127
A92 Broughty Ferry Road	AECOM ATC Survey	805	27,988
A930 Broughty Ferry Road	DfT Survey	93	13,505
Port Entry road	AECOM ATC Survey	112	1,189
A92 Greendykes Road	DfT Survey	432	12,721
A92 Arbroath Road west	DfT Survey	797	23,032
A92 Arbroath Road east	DfT Survey	955	23,346
A972 Kingsway East	DfT Survey	919	26,934
A90 Kingsway	DfT Survey	3,043	42,476
A90 Forfar Road	DfT Survey	2,187	29,376

4.6.8 The 2024 traffic data has been factored up to 2027 to align with the busiest construction period. A TEMPro factor of 1.0327 is applied to the 2024 traffic data to produce a 2027 baseline. This provides a robust assessment in terms of applying IEMA Guidelines Rule 1 and Rule 2 to determine which roads should be included in the environmental assessment. 2027 baseline traffic used to determine which roads should be included in the environmental assessment can be seen in full in Appendix D.

4.7 Injury Accident Records

4.7.1 Historical accident data has been obtained via Police Scotland data which uses Department for Transport (DfT) system CRaSH (the Collision Recording and SHaring System). Accident data has been obtained for a four-year period between 2020-2023. The location and severity of the accidents recorded on study area roads are shown in Figure 8.3: Injury Accident Locations 2020-2023 within Appenidx C and summarised in **Table 4-3: Summary of Injury Accident Data (2020-2023)** below.

Table 4-3: Summary of Injury Accident Data (2020-2023)

Study Area Road	Accident Severity		
	Slight	Serious	Fatal
Tay Road Bridge	0	1	0
A92 East Dock Street (west)	6	0	0
A92 East Dock Street (east)	2	0	0
Market Street	0	0	0
Broughty Ferry Road	0	0	0
A92 Broughty Ferry Road	7	0	0
A930 Broughty Ferry Road	1	3	0
Port Entry road	0	0	0
A92 Greendykes Road	2	1	0
A92 Arbroath Road west	3	1	0
A92 Arbroath Road east	3	2	0
A972 Kingsway East	2	4	0

Study Area Road	Accident Severity		
	Slight	Serious	Fatal
A90 Kingsway	3	0	0
A90 Forfar Road	5	1	0

4.7.2 **Table 4-3: Summary of Injury Accident Data (2020-2023)** show that there were 47 accidents recorded between 2020 and 2023 on study area roads. There were 34 ‘slight’ accidents and 13 ‘serious’ accidents recorded. No ‘fatal’ accidents were recorded.

5 Sensitivity of Receptors

5.1 Introduction

5.1.1 This section sets out the approach for determining the sensitivity of receptors on each study area road for the Proposed Development.

5.2 Determining Sensitivity of Receptors

5.2.1 Receptors are locations or land-uses categorised by sensitivity or environmental value. **Table 5-1: Sensitivity of Receptors** describes the receptor sensitivity adopted for the assessment of Development traffic.

Table 5-1: Sensitivity of Receptors

Receptor Sensitivity	Description
Very High	The receptor has little or no ability to absorb change without fundamentally altering its present character, is of very high environmental value, or of international importance.
High	The receptor has low ability to absorb change without fundamentally altering its present character, is of high environmental value, or of international importance.
Medium	The receptor has moderate capacity to absorb change without significantly altering its present character, has some environmental value or is of regional importance.
Low	The receptor is tolerant of change without detriment to its character, is low environmental value, or local importance.
Negligible	The receptor is resistant to change and is of little environmental value.

5.2.2 For the purposes of this assessment, the Institute of Environmental Management and Assessment (IEMA) Guidelines identify receptors which are:

- People at home
- People at work
- Sensitive and/or vulnerable groups (including young age; older age; income; health status; social disadvantage; and access and geographic factors)
- Locations with concentrations of vulnerable users (e.g. hospitals, places of worship, schools)
- Retail areas
- Recreational areas
- Tourist attractions
- Collision clusters and routes with road safety concerns
- Junctions and highway links at (or over capacity)

5.2.3 Each road link within the study area has been assessed against the criteria above. Professional engineering judgement has been used to assign a rating of Negligible, Low, Medium, High or Very High for each road link against each of the categories above. To assign each road link an overall sensitivity score, a numbering system has been used which assigns scores for each category based on the sensitivity level as set out above. The scoring system works as follows:

- Negligible – 1 point
- Low – 2 points
- Medium – 3 points
- High – 4 points
- Very High – 5 points

5.2.4 Once each link had been assigned a score for each category, an average score was obtained across all the categories to determine the overall score each link. The average score allowed an overall sensitivity for each link to be determined. If a road link had at least one category scored as High or Very High, its overall scoring was updated to reflect this given that a highly sensitive receptor was observed to be present on the road link.

5.3 Assessment of Receptors

5.3.1 The full assessment result of the sensitivity of receptors assessment is shown in **Figure 5-1: Sensitivity of Receptors Assessment** overleaf.

IEMA Environmental Assessment of Traffic and Movement - Sensitivity of Receptors

Study Area Roads			IEMA 2023 Sensitive Receptors												
Road	Between		People at Home (Residential Areas)	People at Work (Employment Areas)	Sensitive and/or Vulnerable Groups	Locations with Concentrations of Vulnerable Users	Retail Areas	Recreational Areas	Tourist Attractions	Collision Clusters and routes with road safety concerns	Junctions and Highway Links at or Over Capacity	Total Score	Average Score	Overall Rating	Final Rating
Tay Road Bridge	Tay Bridge Roundabout	Tay Road Bridge / Dock Street Junction	Negligible 1	Low 2	Low 2	Low 2	Negligible 1	Negligible 1	Low 2	Low 2	Low 2	15	1.667	Low	Low
A92 East Dock Street (west)	Tay Road Bridge / Dock Street Junction	A92 East Dock Street / Market Street Junction	Medium 3	Medium 3	Medium 3	Medium 3	High 4	Low 2	Medium 3	Low 2	Medium 3	26	2.889	Medium	High
A92 East Dock Street (east)	A92 East Dock Street / Market Street Junction	A92 East Dock Street / Broughty Ferry Road Junction	Low 2	Medium 3	Low 2	Low 2	Low 2	Low 2	Negligible 1	Low 2	Low 2	18	2.000	Low	Low
Market Street	Junction with A92 East Dock Street	Junction with Broughty Ferry Road	Low 2	Medium 3	Low 2	Low 2	Low 2	Low 2	Medium 3	Negligible 1	Medium 3	20	2.222	Medium	Medium
Broughty Ferry Road	Broughty Ferry Road / Market Street Junction	Junction with the A92	High 4	Low 2	Medium 3	Medium 3	Low 2	Low 2	Negligible 1	Low 2	Low 2	21	2.333	Medium	High
A92 Broughty Ferry Road	A92 East Dock Street / Broughty Ferry Road Junction	Broughty Ferry Road / Greendykes Road Junction	High 4	Low 2	Low 2	Low 2	Low 2	Low 2	Low 2	High 4	Low 2	22	2.444	Medium	High
A930 Broughty Ferry Road	Broughty Ferry Road / Greendykes Road Junction	A930 roundabout at Port Entry road	High 4	Low 2	Low 2	Low 2	Low 2	Low 2	Low 2	Medium 3	Low 2	21	2.333	Medium	High
Port Entry road (Broughty Ferry Road)	Roundabout with A930	Stannergate Road	Negligible 1	Medium 3	Low 2	Low 2	Negligible 1	Negligible 1	Negligible 1	Low 2	Low 2	15	1.667	Low	Low
A92 Greendykes Road	A92 Broughty Ferry Road / A92 Greendykes Road Junction	Scott Fyffe Roundabout	High 4	Low 2	Low 2	Low 2	Negligible 1	Low 2	Negligible 1	High 4	Medium 3	21	2.333	Medium	High
A92 Arbroath Road west	Scott Fyffe Roundabout	A92 Arbroath Road / Claypotts Road Junction	High 4	Low 2	Medium 3	Medium 3	Low 2	High 4	Low 2	Low 2	Low 2	24	2.667	Medium	High
A92 Arbroath Road east	Arbroath Road / Claypotts Road Jun	Grange Junction	Low 2	Low 2	Low 2	Low 2	Medium 3	Low 2	Low 2	Medium 3	Low 2	20	2.222	Medium	Medium
A972 Kingsway East	Scott Fyffe Roundabout	Junction with the A90 Forfar Road	Medium 3	Medium 3	Low 2	Low 2	Medium 3	Low 2	Low 2	Medium 3	Low 2	22	2.444	Medium	Medium
A90 Kingsway	Junction with the A90 Forfar Road	Kingsway / Old Glamis Road Junctio	Medium 3	Low 2	Low 2	Low 2	Low 2	Medium 3	Low 2	Low 2	Low 2	20	2.222	Medium	Medium
A90 Forfar Road	Junction with A972 Kingsway	Emmock Roundabout	Medium 3	Low 2	Low 2	Low 2	Medium 3	Medium 3	Low 2	Medium 3	Medium 3	23	2.556	Medium	Medium

Figure 5-1: Sensitivity of Receptors Assessment

6 Forecast Development Traffic

6.1 Introduction

6.1.1 This chapter provides an overview of the forecast travel demands to and from the Proposed Development during construction and during operation.

6.2 Construction

6.2.1 A forecast of the number of construction vehicle movements has been made based on material quantities provided by the applicant. The principal materials required and the associated vehicle likely to transport them have been provided as follows:

- Cut / Fill: 49,057m³ net import (4-axle Tipper HGV – 20 tonne capacity)
- Aggregate: 81,241m³ (4-axle Tipper HGV – 20 tonne capacity)
- Concrete: 9,495m³ (Concrete Mixer – 8m³ capacity)
- Buildings: 1,252m² (Articulated Flatbed Lorry – Assumed 25m² per vehicle)
- Building Cladding: 14,235m² (Articulated Flatbed Lorry – Assumed 200m² per vehicle)
- Equipment: 2,946m² (Articulated Flatbed Lorry – Assumed 25m² per vehicle)
- Steel: 759 tonnes (Articulated Flatbed Lorry – 30 tonne capacity)

6.2.2 It is forecast that a total of 32,962 two-way HGV movements will be required through the construction phase, anticipated to last up to 3 years. It is forecast that the site would generate a daily peak of 194 HGV (97 arrivals, 97 departures) and 78 Car / LGV movements (39 arrivals, 39 departures) to and from the site. A programme of forecast construction traffic movements is included in Appendix E. A diagrammatic representation of daily and peak hour flows in the immediate vicinity of the Proposed Development Site are included in Appendix F.

6.2.3 It is anticipated that there will be a requirement for abnormal loads to be delivered to the Site, the number of such delivers and other relevant details will be outlined in the Construction Traffic Management Plan (CTMP) and routing and timing will be agreed with the DCC and Transport Scotland in advance. The route for AIL deliveries would be anticipated to be from the port of entry at Dundee harbour, via the A930, A92 and Market Street.

6.2.4 It should also be noted that a full CTMP would be prepared once a contractor for the work has been identified. Again, this would have the aim of minimising the impact during construction on local communities, reducing delay on the local network and ensuring safety during the period. A framework for a CTMP is found in Chapter 12 of this TA.

6.3 Construction Traffic Routing

6.3.1 The routing of construction traffic will depend on the origins of materials. Assumptions have been made on where materials associated with each material will originate for the purposes of this assessment. An access strategy has been provided which considers the route that vehicles will take based on the direction they are arriving / departing to and from. **Table 6-1: Construction Traffic Routing Strategy** summarises the routing strategy.

Table 6-1: Construction Traffic Routing Strategy

Material	Assumed Origin		Routing
Cut / Fill	Quarry north of Monifieth	Arrival	A92 Arbroath Road, Greendykes Road, A92, Broughty Ferry Road, Market Street
		Departure	Market Street, A92, Greendykes Road, A92 Arbroath Road

Material	Assumed Origin		Routing
Aggregate	Quarry north of Monifieth	Arrival	A92 Arbroath Road, Greendykes Road, A92, Broughty Ferry Road, Market Street
		Departure	Market Street, A92, Greendykes Road, A92 Arbroath Road
Concrete	Either from quarry north of Monifieth or concrete facility at East Marketgait	Arrival	A92 Arbroath Road, Greendykes Road, A92, Broughty Ferry Road, Market Street **OR** A92, Market Street
		Departure	Market Street, A92, Greendykes Road, A92 Arbroath Road **OR** Market Street, A92, Greendykes Road, A92 after performing U-turn at Greendykes Road roundabout
Buildings, Cladding, Equipment and Steel	Central Belt	Arrival	Kingsway, Greendykes Road, A92, Broughty Ferry Road, Market Street
		Departure	Market Street, A92, Greendykes Road, Kingsway

6.4 Operation

6.4.1 Once operational, staff attendance will be on an ad hoc basis for maintenance and fault repairs only. Vehicle traffic movements are therefore likely to not be significant and no further analysis of operational traffic is undertaken.

7 Fear and Intimidation

7.1 Methodology

7.1.1 IEMA Guidelines 2023 states that fear and intimidation on a given road link is dependent on:

- The total volume of traffic
- The heavy vehicle composition
- The speed of vehicles
- The proximity of traffic to people

7.1.2 A weighting system is set out in IEMA Guidelines 2023 to allow assessors to determine the likelihood of fear and intimidation given the characteristics set out above. This is achieved by determining a 'degree of hazard' which allows a score to be provided for each highway link within the Study Area and a resulting 'magnitude of impact' to be determined.

7.1.3 A degree of hazard score for each of total volume of traffic, heavy vehicle flow and average vehicle speed is determined using Table 3.1 in the IEMA Guidelines 2023, replicated below.

Table 7-1: Fear and Intimidation Degree of Hazard Scoring

Average Traffic Flow over 18-hour day – all vehicles/hour 2-way (a)	Total 18-hour heavy vehicle flow (b)	Average vehicle speed (c)	Degree of hazard score
+1,800	+3,000	>40	30
1,200–1,800	2,000–3,000	30-40	20
600–1,200	1,000-2,000	20-30	10
<600	<1,000	<20	0

Source: Table 3.1 IEMA Guidelines 2023

7.1.4 The total degree of hazard score from all three elements (total volume of traffic, heavy vehicle flow and average vehicle speed) is combined to provide a level of fear and intimidation. Table 3.2 in IEMA Guidelines 2023 provides the thresholds that should be used to determine this.

Table 7-2: Levels of Fear and Intimidation

Level of Fear and Intimidation	Total Degree of Hazard Score (a)+(b)+(c)
Extreme	71+
Great	41-70
Moderate	21-40
Small	0-20

Source: Table 3.2 IEMA Guidelines 2023

7.1.5 The magnitude of change for fear and intimidation for a Proposed Development is then approximated with reference to the changes in the level of fear and intimidation from baseline conditions. Table 3.3 from the IEMA Guidelines is used to determine the magnitude of change from a given change in level of fear and intimidation. This table is replicated below.

Table 7-3: Fear and Intimidation - Magnitude of Change

Magnitude of Change	Change in Fear and Intimidation Level from Baseline Conditions
High	Two step changes in Fear and Intimidation Level
Medium	One step change in Fear and Intimidation Level, but with: • >400 veh increase in average 18hr AV two-way all vehicle flow; and/or • >500 HV increase in total 18hr HV flow

Magnitude of Change	Change in Fear and Intimidation Level from Baseline Conditions
Low	One step change in Fear and Intimidation Level, but with: • <400 veh increase in average 18hr AV two-way all vehicle flow; and/or • <500 HV increase in total 18hr HV flow
Negligible	No step change in Fear and Intimidation Level

7.2 Fear and Intimidation Magnitude of Change Assessment

7.2.1 Traffic data collected via ATC in October 2024 and from DfT Traffic Count Locations were used as the baseline to provide a robust fear and intimidation assessment. The results of the fear and intimidation magnitude of change assessment for the Proposed Development and Cumulative development are included in Appendix G and are summarised in **Table 7-4: Fear and Intimidation Magnitude of Change Assessment Summary**. The full fear and intimidation assessment against the IEMA Guidelines 2023 is set out in Chapter 8: Traffic and Transport.

Table 7-4: Fear and Intimidation Magnitude of Change Assessment Summary

Road Link	Magnitude of Change	
	The Proposed Development	Cumulative Development
Tay Road Bridge	Negligible	Negligible
A92 East Dock Street (west)	Negligible	Negligible
A92 East Dock Street (east)	Negligible	Negligible
Market Street	Negligible	Negligible
Broughty Ferry Road	Negligible	Negligible
A92 Broughty Ferry Road	Negligible	Low
A930 Broughty Ferry Road	Negligible	Negligible
Port Entry road	Negligible	Negligible
A92 Greendykes Road	Negligible	Negligible
A92 Arbroath Road west	Negligible	Low
A92 Arbroath Road east	Low	Low
A972 Kingsway East	Negligible	Negligible
A90 Kingsway	Negligible	Negligible
A90 Forfar Road	Negligible	Negligible

8 Accident Forecast Calculations

8.1 Injury Accident Forecasts

8.1.1 The calculation for forecasting increases in road traffic accidents during the construction period of the Proposed Development has been based on 2024 traffic survey data, DfT count data and accident history gathered from Police Scotland and CrashMap. 2024 traffic survey data and DfT count data has been used to calculate a 'total annual vehicle kilometres' for each link in the study area. The Police Scotland and CrashMap data for each link has then been used to derive a 'vehicle accident rate' for each link for 'slight,' 'serious' and 'fatal' accident severities. This rate is then applied to the increased vehicle kilometres generated because of the construction of the Proposed Development to arrive at a forecast for additional vehicle accidents.

8.1.2 **Table 8-1: Forecast Road Accidents on Study Area Roads during the Proposed Development Construction** forecasts the additional annual road traffic accidents during the Proposed Development construction period.

Table 8-1: Forecast Road Accidents on Study Area Roads during the Proposed Development Construction

Road Link	Forecast Annual Injury Accidents by Severity					
	Recorded 2020-2023			The Proposed Development Construction Phase (Annual)		
	Slight	Serious	Fatal	Slight	Serious	Fatal
Tay Road Bridge	0	1	0	0.00	0.00	0.00
A92 East Dock Street (west)	6	0	0	0.02	0.00	0.00
A92 East Dock Street (east)	2	0	0	0.01	0.00	0.00
Market Street	0	0	0	0.00	0.00	0.00
Broughty Ferry Road	0	0	0	0.00	0.00	0.00
A92 Broughty Ferry Road	7	0	0	0.05	0.00	0.00
A930 Broughty Ferry Road	1	3	0	0.00	0.00	0.00
Port Entry road	0	0	0	0.00	0.00	0.00
A92 Greendykes Road	2	1	0	0.03	0.02	0.00
A92 Arbroath Road west	3	1	0	0.03	0.01	0.00
A92 Arbroath Road east	3	2	0	0.03	0.02	0.00
A972 Kingsway East	2	4	0	0.00	0.01	0.00
A90 Kingsway	3	0	0	0.00	0.00	0.00
A90 Forfar Road	5	1	0	0.01	0.00	0.00

8.1.3 **Table 8-1: Forecast Road Accidents on Study Area Roads during the Proposed Development Construction** shows a very small annual increase in road traffic accidents because of the construction of the Proposed Development. The forecast increases would be considerably less than 1 road traffic accident with the maximum of these occurring on the A92 Broughty Ferry Road with an additional 0.05 slight accidents and the A92 Greendykes Road and the A92 Arbroath Road east with an additional 0.02 serious accidents each.

8.1.4 **Table 8-2: Forecast Road Accidents on Study Area Roads (Cumulative Development)** summarises the forecast cumulative development effect on road traffic accidents for the construction period of the Proposed Development.

Table 8-2: Forecast Road Accidents on Study Area Roads (Cumulative Development)

Road Link	Forecast Annual Injury Accidents by Severity					
	Recorded 2020-2023			Cumulative Development Construction Phase (Annual)		
	Slight	Serious	Fatal	Slight	Serious	Fatal
Tay Road Bridge	0	1	0	0.00	0.00	0.00
A92 East Dock Street (west)	6	0	0	0.04	0.00	0.00
A92 East Dock Street (east)	2	0	0	0.02	0.00	0.00
Market Street	0	0	0	0.00	0.00	0.00
Broughty Ferry Road	0	0	0	0.00	0.00	0.00
A92 Broughty Ferry Road	7	0	0	0.10	0.00	0.00
A930 Broughty Ferry Road	1	3	0	0.00	0.00	0.00
Port Entry road	0	0	0	0.00	0.00	0.00
A92 Greendykes Road	2	1	0	0.06	0.03	0.00
A92 Arbroath Road west	3	1	0	0.05	0.02	0.00
A92 Arbroath Road east	3	2	0	0.05	0.03	0.00
A972 Kingsway East	2	4	0	0.01	0.02	0.00
A90 Kingsway	3	0	0	0.01	0.00	0.00
A90 Forfar Road	5	1	0	0.02	0.00	0.00

8.1.5 **Table 8-2: Forecast Road Accidents on Study Area Roads (Cumulative Development)** shows a very small annual increase in road traffic accidents because of the construction of the cumulative development. The forecast increases would be considerably less than 1 road traffic accident with the maximum of these occurring on the A92 Broughty Ferry Road with an additional 0.1 slight accidents and the A92 Greendykes Road and the A92 Arbroath Road east with an additional 0.03 serious accidents each.

8.1.6 The full calculations to arrive at these forecasts are contained in Appendix H.

9 Traffic Impacts

9.1.1 Junction modelling analysis has been undertaken at three junctions on study area roads to assess the AM and PM peak hour effects during the construction phase of the Proposed Development. The junctions which have been assessed are:

- A92 / Market Street junction
- A92 / Broughty Ferry Road junction
- Broughty Ferry Road / Market Street junction

9.1.2 These junctions have been assessed due to their proximity to the Proposed Development site and the potential for construction traffic to influence the operation of these junctions.

9.1.3 The industry standard Junctions 10 Software (version 10.1.1.1905) has been used. Junctions 10 can be used to model various types of priority-controlled junctions including standards T-junctions, crossroads and roundabouts. Junctions 10 uses standards geometric measures of the junction alongside traffic flows to determine the operational capacity of the junction. The key outputs which are normally considered are: Ratio of Flow to Capacity (RFC), Queue Length and Delay.

9.1.4 RFC is used as a means of assessing the viability of designs under future year traffic load. A predicted 'practical' RFC of 0.85 is usually considered an acceptable coefficient for priority junctions. Advice Note TA 23/81 from the DMRB states that, if the RFC is 0.85 then queuing will theoretically be avoided in the chosen design year in the peak hour in five out of six cases i.e. queuing delays will not be excessive and there will be no capacity problems.

9.1.5 The scenarios which have been tested at each junction are:

- 2027 Baseline AM Peak (07:45 – 08:00);
- 2027 Baseline PM Peak (16:30 -17:30);
- 2027 with Proposed Development Construction Traffic AM Peak (07:45 – 08:00); and
- 2027 with Proposed Development Construction Traffic PM Peak (16:30 -17:30).

9.1.6 The results of the junction modelling assessment are shown in **Table 9-1, Table 9-2** and **Table 9-3**.

Table 9-1: A92 / Market Street Junctions 10 Results

Scenario	Junction Arm	AM Peak Hour (0900-1000)				PM Peak Hour (1645-1745)			
		Queue (PCU)	Delay	RFC	Level of Service	Queue (PCU)	Delay	RFC	Level of Service
2027 Baseline	Market Street – Right / Left	0.5	16.37	0.06	C	0.9	29.47	0.17	D
	A92 – Ahead / Right	0.5	6.69	0.01	A	0.5	11.42	0.02	B
2027 with Proposed Development	Market Street – Right / Left	0.7	17.04	0.09	C	2.9	33.17	0.35	D
	A92 – Ahead / Right	0.5	6.81	0.01	A	0.5	11.44	0.02	B

9.1.7 **Table 9-1** shows that the A92 / Market Street junction operates well within capacity during both the AM and PM peak hours once Proposed Development construction traffic is added. There are minor increases in delay for emerging vehicles from Market Street of <1 second during the AM peak and approximately 4 seconds during the PM peak. There are also increases in queue of 0.2 PCU during the AM peak and 2 PCU during the PM peak.

Table 9-2: A92 / Broughty Ferry Road Junctions 10 Results

Scenario	Junction Arm	AM Peak Hour (0900-1000)				PM Peak Hour (1700-1800)			
		Queue (PCU)	Delay	RFC	Level of Service	Queue (PCU)	Delay	RFC	Level of Service
2027 Baseline	Broughty Ferry Road – Right / Left	0.5	9.6	0.33	A	6.4	75.44	0.90	F
	A92 – Ahead / Right	4.5	35.80	0.83	E	0.8	18.62	0.46	C
2027 with Proposed Development	Broughty Ferry Road – Right / Left	0.5	9.67	0.33	A	7.7	88.72	0.92	F
	A92 – Ahead / Right	9.5	67.96	0.93	F	1.1	22.68	0.51	C

9.1.8 **Table 9-2** shows that the A92 / Broughty Ferry Road junction operates close to capacity both during the Baseline and With Development Scenario. During the PM peak hour, the Broughty Ferry Road arm of the junction presents an RFC value of 0.9 in the Baseline scenario and 0.92 during the With Development scenario. During the PM peak hour, there is forecast to be increases in queue of 1.3 PCU during the PM peak hour and delay of approximately 13 seconds. It is expected that the junction would operate very similarly to the present with development traffic added, albeit this is very close to exceeding the capacity of the junction.

9.1.9 During the AM peak period, the A92 arm of the junction is also operating very close to capacity. Adding development traffic is forecast to increase the RFC value from 0.83 to 0.93 and delay is forecast to increase by approximately 30 seconds.

Table 9-3: Broughty Ferry Road / Market Street Junctions 10 Results

Scenario	Junction Arm	AM Peak Hour (0900-1000)				PM Peak Hour (1645-1745)			
		Queue (PCU)	Delay	RFC	Level of Service	Queue (PCU)	Delay	RFC	Level of Service
2027 Baseline	Market Street – Right / Left	0.0	8.24	0.03	A	0.2	8.34	0.15	A
	Broughty Ferry Road – Right / Left	0.0	5.21	0.01	A	0.0	4.35	0.01	A
2027 with Proposed Development	Market Street – Right / Left	0.2	10.22	0.14	B	0.2	8.45	0.15	A
	Broughty Ferry Road – Right / Left	0.0	5.23	0.01	A	0.0	4.40	0.01	A

9.1.10 **Table 9-3** shows that the Broughty Ferry Road / Market Street junction would continue to operate well within capacity once development traffic is added. There would be very minor increases in Delay on all movements during the AM and PM peak hours. The increase would be a maximum of approximately 2 seconds on the Market Street arm during the AM peak. Queues remain relatively unchanged during both the AM and PM peak hours when comparing the With Development scenario to the Baseline scenario.

9.1.11 The full outputs of the junction modelling assessment are contained within Appendix I.

10 Abnormal Indivisible Loads (AIL)

10.1 AIL Routing

10.1.1 AIL transformers will be transported to the Proposed Development Site by road in accordance with Special Types General Order (STGO) regulations. The protocols for AIL transport to site require highway authorities and emergency services notifications and approvals to ensure the safe and efficient movement of AIL to the site. A specialist heavy haulage contractor will be appointed for the transport of AIL and all relevant studies and approvals will be made.

10.1.2 It is expected that AIL's being transported to the Proposed Development Site will originate from Dundee Port, using the Port Entry road, the A930, the A92 and Market Street to access the site. STGO regulations will likely see AIL escorted by heavy haulage contractor vehicles and Police Scotland. These escorts and associated temporary traffic management would allow AIL deliveries to site via the A92 / Market Street junction. AIL deliveries are expected to occur outside of the peak construction month, and also would be outside of daily peak traffic hours.

10.2 AIL Swept Path Analysis

10.2.1 Swept path analysis has been undertaken showing a worst case AIL turning from the A92 East Dock Street onto Market Street. The worst case AIL tested is an 8 Axle Trailer with a length of 22.886m, a width of 3m and a height of 3.867m. The heaviest AIL anticipated will be carrying a 95-tonne transformer. The drawings for this swept path analysis are contained within Appendix A and show that the movement between the A92 East Dock Street onto Market Street can be completed without conflict.

10.2.2 Forecast axle loads for the modular trailer are 11.9T per axle. This should be acceptable for road structures on the trunk road network and the route out of the Port of Dundee which already carries abnormal load traffic.

11 Framework Construction Traffic Management Plan

11.1 Purpose

11.1.1 The purpose of this framework CTMP is to provide a framework from which a finalised CTMP can be developed post-consent. This framework outlines the measures which could be used during the construction of the proposed development to mitigate transport-related impacts. Access to the proposed development by HGVs and construction plant vehicles would be planned, managed and executed by the applicant's appointed contractor to ensure the safety and reliability of deliveries to site, reduce congestion on the local road network and minimise the environmental impact.

11.2 CTMP Development

11.2.1 The opportunity to develop, amend and enhance the finalised CTMP in response to comments received on this framework document and through the planning and consultation process should be recognised.

11.2.2 The CTMP will consider feedback from residents and community groups and be developed in consultation with Dundee City Council to establish appropriate methods in which the impact of traffic related to the proposed scheme's construction can be minimised.

11.2.3 This document would be updated as necessary with input from Dundee City Council following feedback from their consultation and planning process.

11.3 Hours of Work

11.3.1 Working hours for construction activities related to the Proposed Scheme would be agreed with Dundee City Council, but are anticipated to be:

- Monday to Friday between 08.00 and 19.00;
- Saturday 08:00 to 13:00; and
- No construction should be carried out on Sundays or bank holidays unless in exceptional circumstances.

11.4 Site Access

11.4.1 The site would be secured by hoarded gates and during working hours would remain under control of an appointed person who would physically control entry to site. Traffic entering or exiting the site would give way to road traffic on the public road network (when required).

11.4.2 Warning signs would be established and maintained throughout the duration of construction works and would be situated at agreed locations to warn pedestrians and road users of potential hazards.

11.5 Construction Traffic Routing

11.5.1 It will be a key responsibility of the applicant / appointed contractor to ensure that each sub-contractor is aware of the route restrictions prior to any works taking place and to enforce the restrictions stated in the proposed development's CTMP.

11.5.2 The site gates would be manned and controlled during normal site working hours and any vehicle arriving on site will be guided to the required location for loading or unloading.

11.5.3 The appointed contractor would also be responsible for mitigating, where possible, the cumulative impacts of other construction projects in the area through careful consideration of routing and access timings.

11.5.4 It would be proposed to develop an inspection, monitoring and repair strategy during the construction of the Proposed Development which would be agreed with Dundee City Council and Transport Scotland

and include provision for insuring that study area roads are kept free of mud and debris during construction.

11.5.5 A routing strategy for construction traffic is contained within Appendix J.

11.6 Deliveries

11.6.1 Due to the scale of the proposed development, the number of daily deliveries to site throughout the construction phases will be scheduled in order that disruption be minimised. Deliveries would occur outside of peak times and AIL movements would likely be undertaken at night.

11.6.2 Construction materials that are delivered will be stored on-site.

11.7 Enforcement

11.7.1 All contractors would be required to adhere to the CTMP. Compliance will be monitored by the applicant's site representative via spot checks to ensure that vehicles follow the measures set out in the CTMP.

11.8 Speed Limit

11.8.1 The applicant would ensure that all site traffic abides by local speed limits to maintain the safety of other road users and pedestrians. A site speed limit of 5 mph would be established and enforced throughout the duration of construction works to provide a safe environment for site workers and any pedestrians which pass the proposed development.

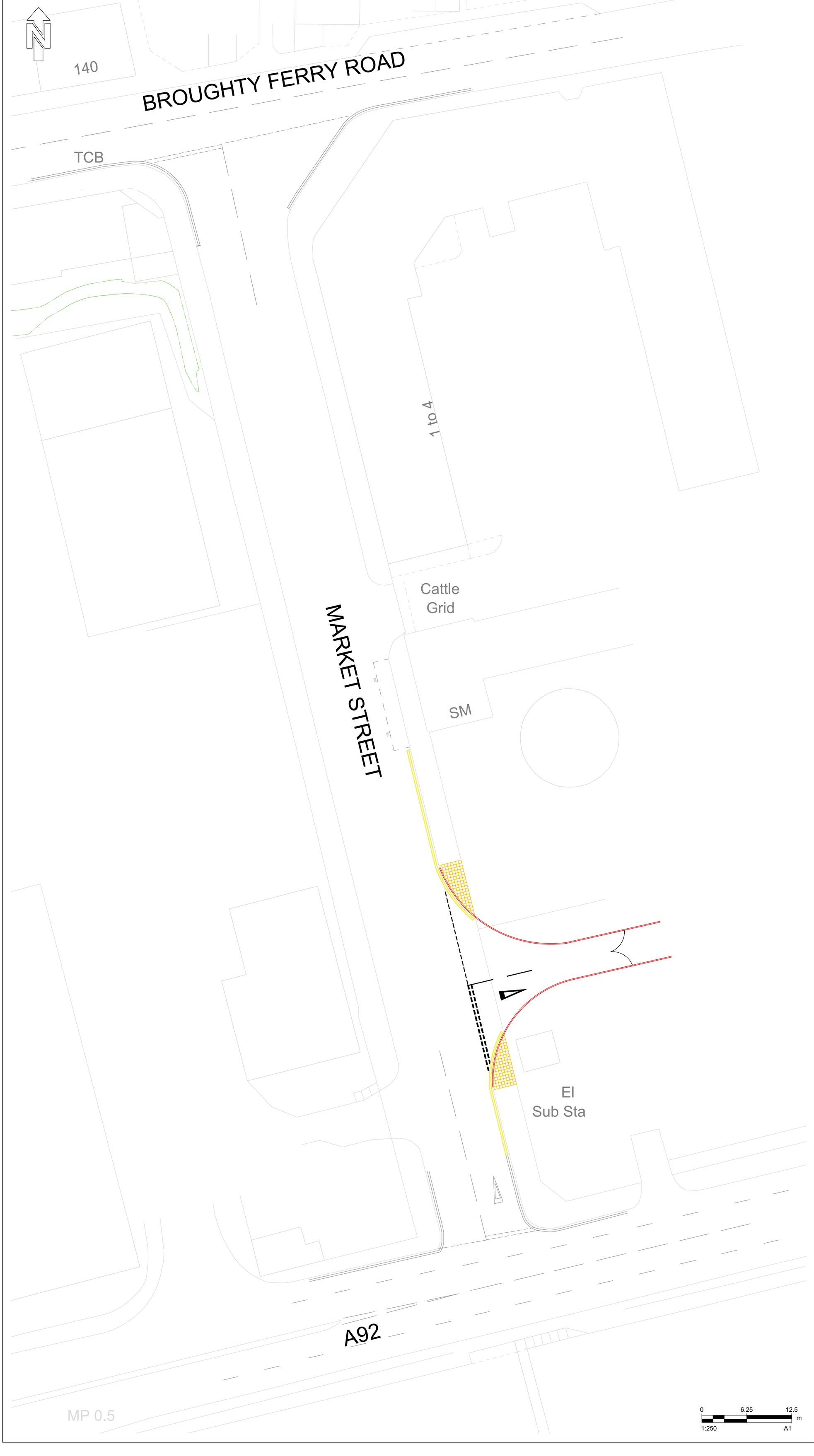
11.8.2 Signage would be in place prior to any works taking place which will advise of any temporary speed limits which are in force and all site workers or haulage sub-contractors would be made aware of the speed requirements as part of their site induction.

11.9 Statutory Consents

11.9.1 As well as planning obligations a range of statutory consents are likely to be required. Construction Consent and or Roads Opening Permits are likely requirements for road works associated with the development. The requirements for such will be established though engagement of the Local Roads Authority (Dundee City Council) and the trunk road authority (Transport Scotland).

11.9.2 The requirement for a Section 75 Agreement (improvements out with the development site deemed necessary by the Local Roads Authority) may be required.

Appendix A – AECOM Junction Drawings and AIL Swept Path Analysis



Project Management Initials:
Designer: CH
Checked: DD
Approved: ZM
ISO A1 594mm x 841mm

AECOM

PROJECT

DUNDEE
NETWORK RAIL
SUBSTATION

CLIENT

SSEN

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www.aecom.com

LEGEND

- Proposed kerbs
- Proposed tactile paving
- Proposed road markings
- Existing road markings

NOTES

Design based on drawing from
BakerHicks drawing number:
30004194-BHK-XX-XX-DR-HV-0004

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60727222

SHEET TITLE

SUBSTATION SITE ACCESS

FIGURE NUMBER

FIGURE 8.4

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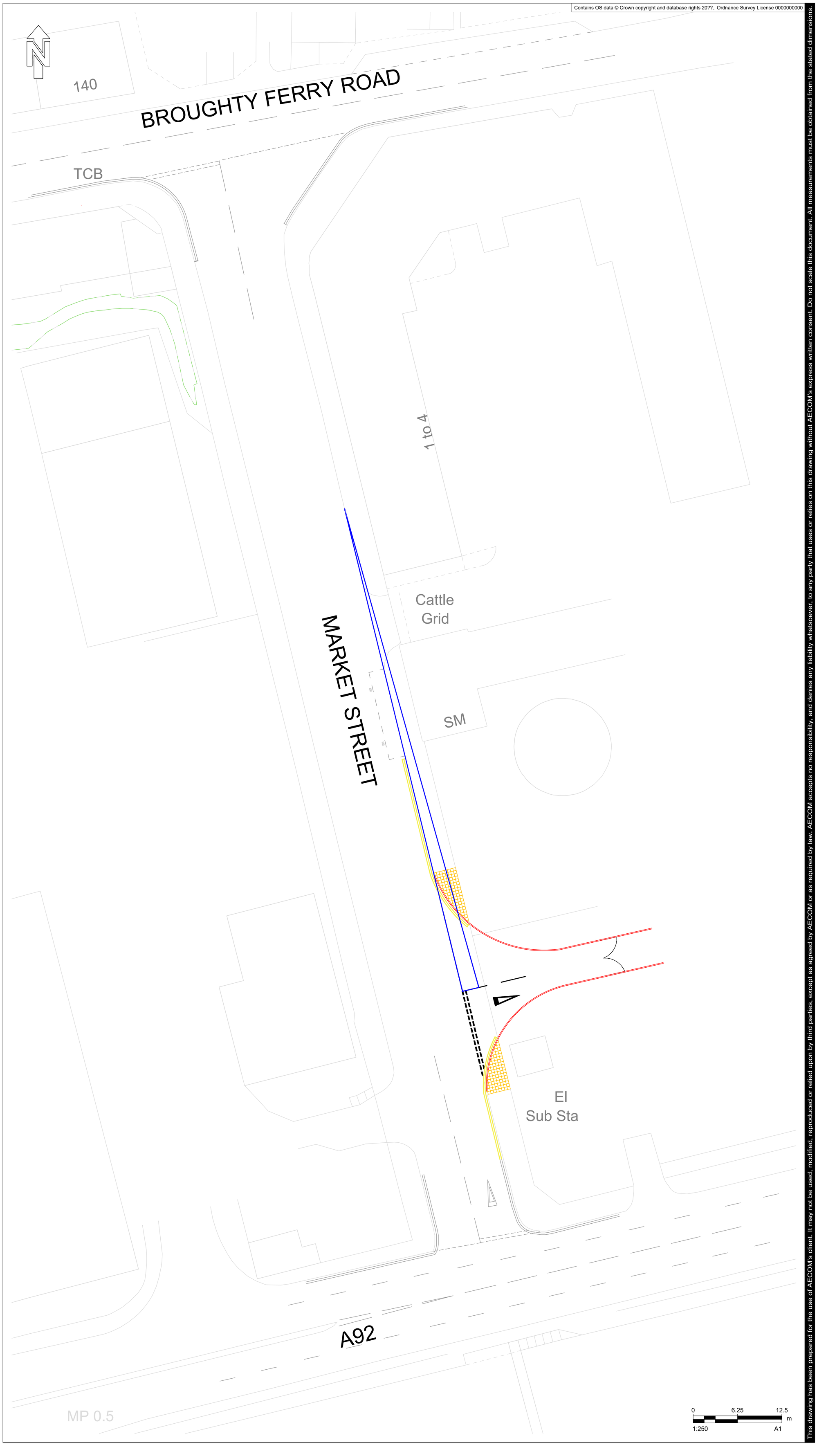
Project Management Initials: Designer: CH Checked: DD Approved: ZM ISO A1 594mm x 841mm



AECOM

PROJECT

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LEGEND

2.4mx 70m Jumnction visibility splay

NOTES

Design based on drawing from
BakerHicks drawing number:
30004194-BHK-XX-XX-DR-HV-0004

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60727222

SHEET TITLE

SUBSTATION SITE ACCESS

FIGURE NUMBER

FIGURE 8.4

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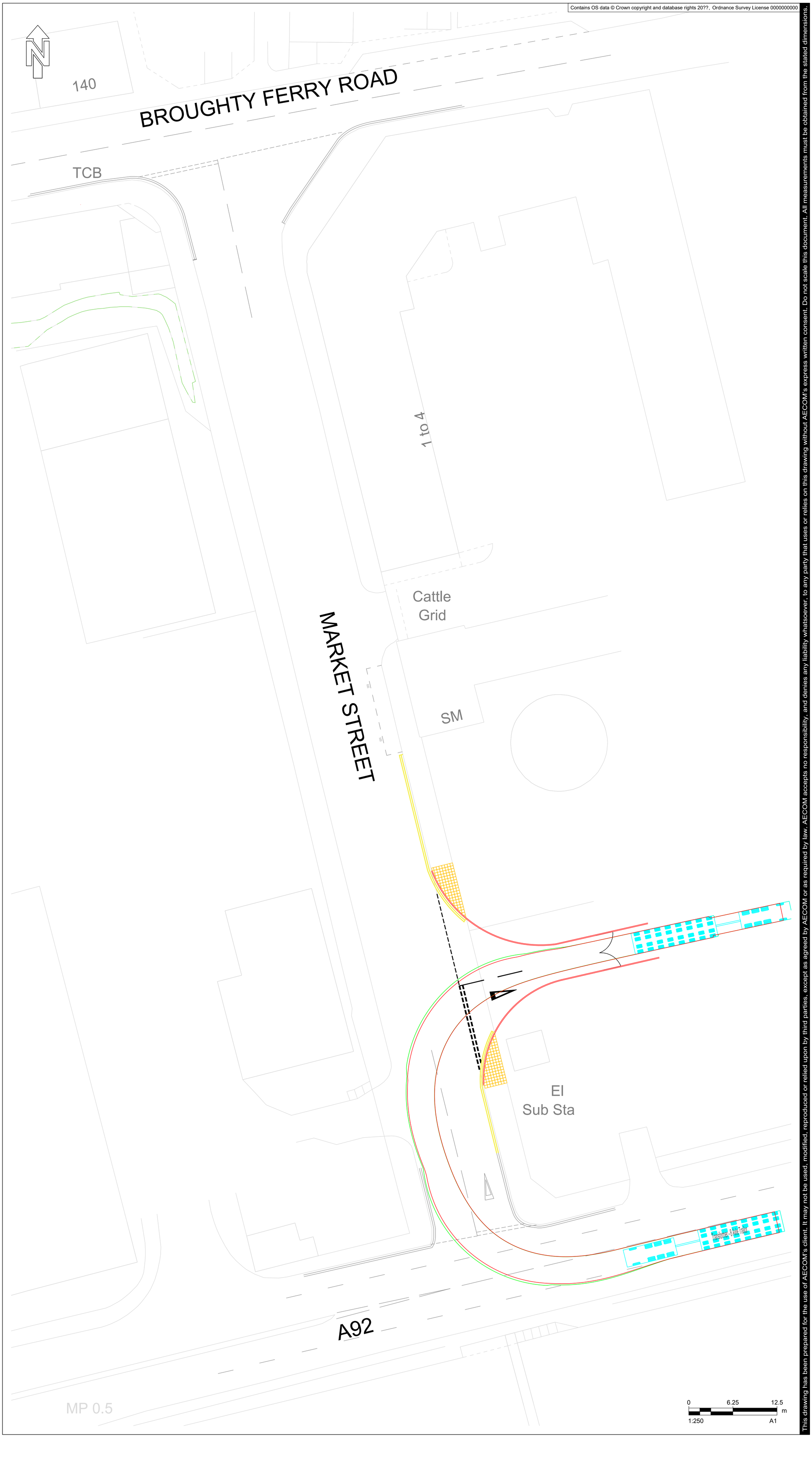

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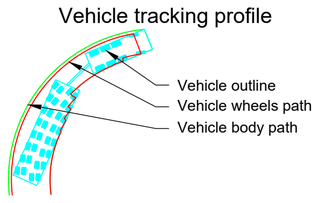
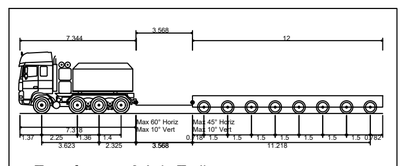
LEGEND

Vehicle tracking profile





Transformer - 8 Axle Trailor

Overall Length	22.886m
Overall Width	3.000m
Overall Body Height	3.876m
Min Body Ground Clearance	0.250m
Max Track Width	2.490m
Lock to lock time	5.00s
Max Steering Angle (Virtual)	65.00°

NOTES

Design based on drawing from BakerHicks drawing number:
30004194-BHK-XX-XX-DR-HV-0004

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60727222

SHEET TITLE

SUBSTATION SITE ACCESS

FIGURE NUMBER

FIGURE 8.4

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Appendix B – Scoping Correspondence

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27th August 2024

[redacted]

Dundee 132kV Substation

[redacted]

AECOM has been commissioned by Scottish and Southern Electricity Networks (SSEN) to prepare a Transport Assessment (TA) in support of a planning application for the provision of a 132kV substation site to the north of the A92 (East Dock Street) in Dundee. The proposed methodology set out in this correspondence takes cognisance of comments from Dundee City Council and Transport Scotland in the Pre-application Advice Response (PREAPP/019/2024) which is contained within Appendix A.

Site Location

The site is on brownfield land, approximately 1.5km east of Dundee city centre. The site is bounded by East Dock Street (A92 Trunk Road) to the south, Market Street to the west and Broughty Ferry Road to the north. Within the red line boundary of the site, the unclassified Roodyards Road routes north to south between Broughty Ferry Road and the A92. The redline boundary of the site is shown in Figure 1.

Figure 1: Redline Boundary of Site

Site Access

Figure 2 shows the access points that are proposed for the Development, including access from the A92, Broughty Ferry Road and Market Street.

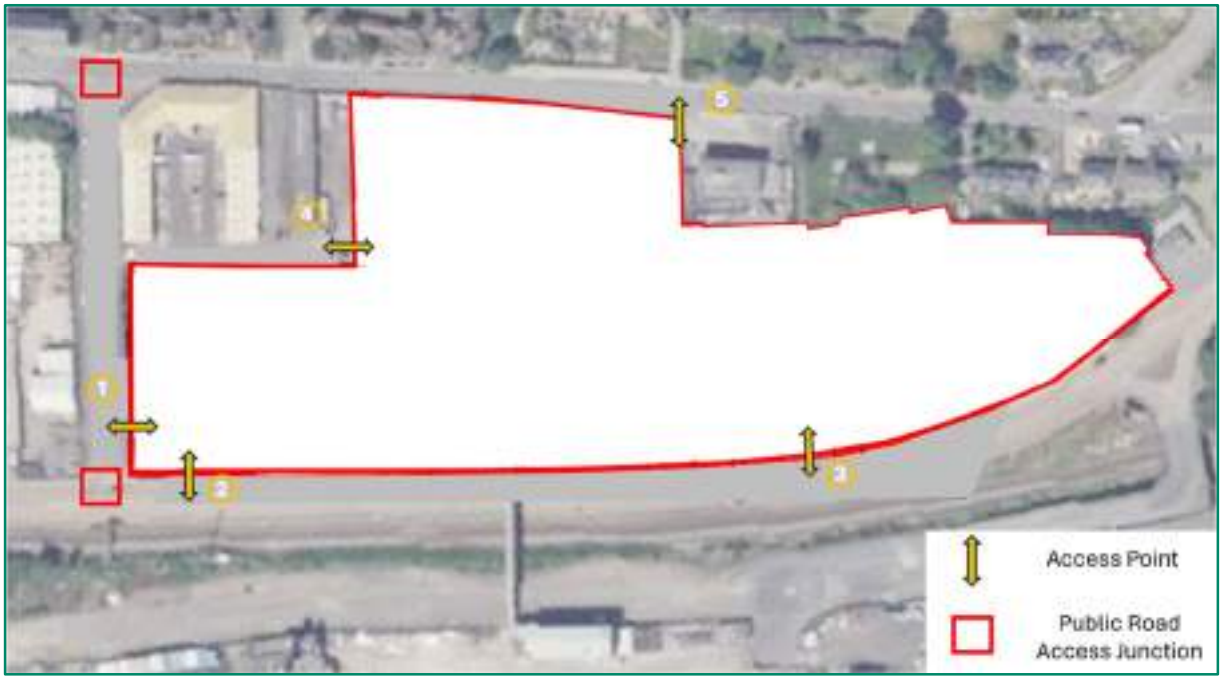


Figure 2: Proposed Site Access Points

Table 1 presents the intended function and operational characteristics of each of the proposed site access points. Site access points 2, 3 and 5 are existing access points within the site boundary. AECOM welcome Roads Authority comments on the type of access under consideration at each of the identified site access points.

Table 1: Function and Characteristics of Site Access Points

Access Point	Construction Traffic	Operational Traffic	Type of Access
Access Point 1 – Market Street	HGV and Car / LGV	HGV and Car / LGV	• All Movements? • Left-In / Left-Out? • In-Only?
Access Point 2 – A92	None	SSE Distribution Compound.	Transport Scotland preference is Left-In / Left-Out.
Access Point 3 – A92	HGV and Car / LGV	HGV and Car / LGV	Transport Scotland preference is Left-In / Left-Out.
Access Point 4 – Market Mews	HGV and Car / LGV	None	• All Movements? • Left-In / Left-Out? • In-Only?
Access Point 5 – Broughty Ferry Road	HGV and Car / LGV	None	• All Movements? • Left-In / Left-Out? • In-Only?

Dundee City Council and Transport Scotland comments on the proposed site access points will inform vehicle turning movements to and from public roads for both the construction stage, and the final operational layout of the development.

Related to the site access points are vehicle turning movements on public roads. The A92 East Dock Street / Market Street junction is likely to play a particularly important role in terms of site access. AECOM need to understand if the roads authorities would consider all movement access for construction traffic to and from the A92 at this junction? Or would right-turning traffic at this junction likely introduce road safety concerns of such significance that consideration should be given to limiting A92 turning movements to Left-In / Left-Out at this junction?

Study Area Roads

Dundee City Council is the local roads authority throughout the study area and Transport Scotland is the roads authority for the A92, which is part of the trunk road network. Figure 3 shows study area roads which would be assessed as part of the TA and would include:

- East Dock Street (A92)
- Broughty Ferry Road
- Market Street
- Market Mews
- East Camperdown Street

Figure 3: Study Area Roads to be Assessed

Traffic Data Collection

It is proposed to collect traffic data on study area roads as follows:

<u>8 Automatic Traffic Counts (ATCs)</u>

- A92 (East Dock Street) – 4 counters
- Broughty Ferry Road – 2 counters
- Market Street – 1 counter

- East Camperdown Street – 1 counter

4 Junction Turning Counts (JTCs)

- A92 (East Dock Street) / Market Street junction
- Broughty Ferry Road / Market Street junction
- A92 (East Dock Street) / East Camperdown Street junction
- A92 (East Dock Street) / Broughty Ferry Road junction

Figure 4 shows the proposed ATC and JTC locations.

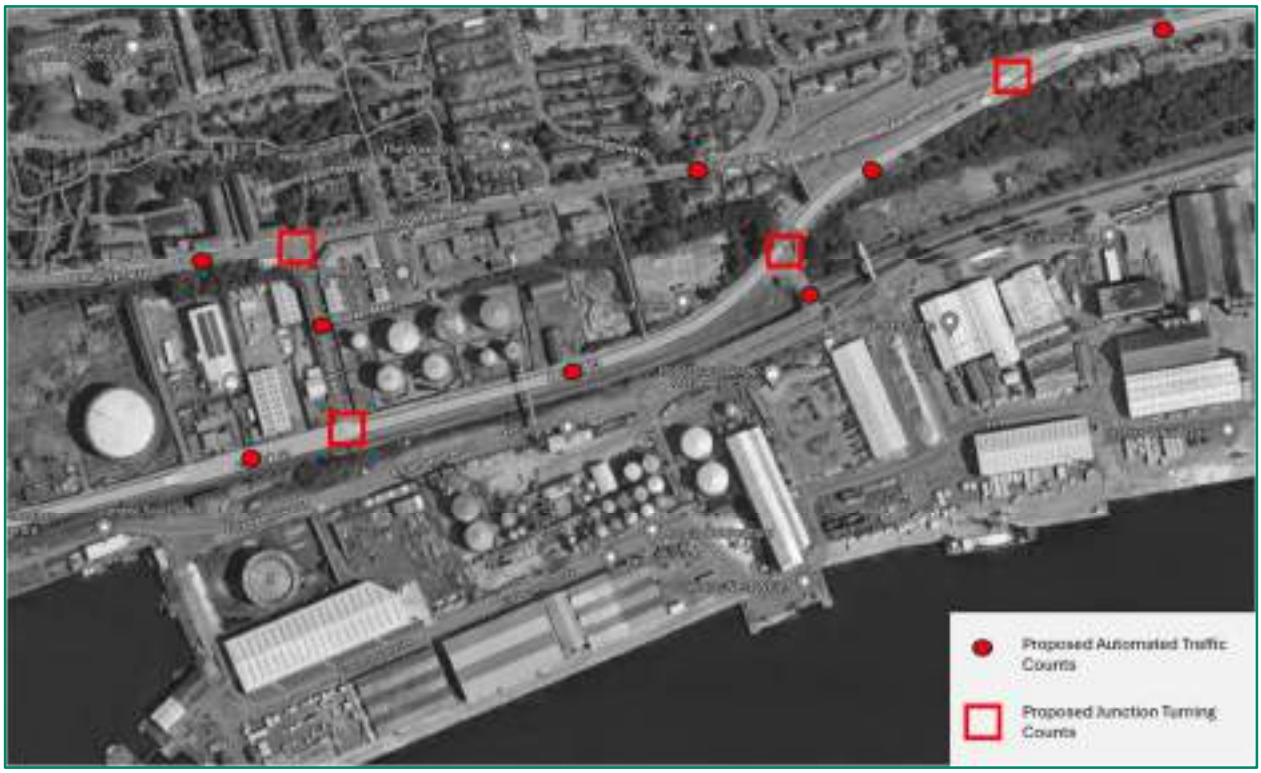


Figure 4: Locations of Proposed ATCs and JTCs

Transport Assessment

It is proposed that a Transport Assessment (TA) ultimately be undertaken to support the planning application of this proposed development. The content of the TA is outlined below and will include the following:

- Review of relevant policy and guidance
- Review of baseline traffic conditions
- Description of the proposed development and transport infrastructure
- Forecasts of development traffic
- A traffic impact assessment
- A Stage 1 Road Safety Audit
- A Framework Construction Traffic Management Plan
- Traffic and Movement Environmental Assessment

Relevant Policy

The TA will include a review of all transport policy and guidance relevant to the proposed development including those produced by Dundee City Council as well as Transport Scotland / The Scottish Government. This will include the Adopted 2019 LDP, Scotland's National Transport Strategy (NTS2), National Planning Framework 4, Transport Assessment Guidance (2012) and Planning Advice Note – 75 (2005).

Baseline Traffic Conditions

Baseline traffic conditions would be initially reviewed through desktop research and a site visit. This review would observe transport infrastructure including for pedestrians, cyclists, public transport and vehicles. Traffic data would then be used, in combination with an appropriate growth factor to reach a baseline traffic position on study area roads.

Proposed Development

A full description of the proposed development including all associated access and transport infrastructure will be provided. Parking will be provided within the site and therefore it is not expected that any on-street parking will occur out with the site. Six parking spaces are proposed in the south west of the site and a further six parking spaces are proposed at the laydown area in the north of the site. The section will present an access strategy for construction traffic.

Forecast Development Traffic

The applicant will provide a forecast of development construction traffic. This will be split by vehicle classification, including HGV, Car / LGV and abnormal indivisible load (AIL) types based on plant and material requirements for construction. The forecast will also include staff movements, assumed to use Car / LGV.

Traffic Impact Assessment

It is proposed to assess the impact on construction traffic on the local and trunk road networks in the environs of the site. This will be undertaken by considering the percentage uplift in both HGV and total traffic on study area roads. An assessment will be undertaken in line with DMRB of the capacity of study area roads and how this will be impacted during the construction period.

It is proposed to undertake a junction modelling exercise at the A92 / Market Street junction to ensure the continued function of the junction during the peak construction period. The junction modelling will be undertaken to determine operational performance under the additional weight of development traffic. Modelling will be done in accordance with turning movements and an access strategy agreed with Dundee City Council and Transport Scotland.

Swept path analysis will also be undertaken to ensure construction traffic can access the site in a safe and efficient manner. It is likely that the majority of construction traffic will take the form of standard 20-tonne HGVs however there will be the requirement for a number of AIL deliveries. These will likely be associated with the transport of transformers and swept path analysis will also be undertaken to ensure these can enter and exit the site safely.

It is assumed that AIL deliveries will arrive from the Port of Dundee and use Stannergate Road and Broughty Ferry Road to access A92 East Dock Street. To reach the main site access point (Access Point 1) AIL deliveries will use East Dock Street before turning onto Market Street, this movement being fully escorted and subject to relevant AIL protocols and temporary traffic management measures.

It is likely that there will be some operational traffic associated with the site. Once constructed, there would be expected to be some on-site staff on a daily basis. It would not be expected that these staff movements would have a material impact on the A92 or Broughty Ferry Road, however there may be a small impact on Market Street as staff access the site at shift start / end times. The impact of these staff trips will be discussed in the TA.

Stage 1 Road Safety Audit

A Stage 1 Road Safety Audit will be undertaken separately in accordance with DMRB GG119. This will be done by an Audit team and to a brief agreed with Transport Scotland.

Framework Construction Traffic Management Plan

A Framework Construction Traffic Management Plan (CTMP) will be provided within the TA. This will provide potential arrangements for how the site and the local transport network could be managed during the construction. A full CTMP will be the responsibility of an appointed contractor once selected, however high level issues and mitigations will be identified within the framework CTMP.

Traffic and Movement Environmental Assessment

An Environmental Assessment chapter will be produced in accordance with the Institute of Environmental Management and Assessment (IEMA) Guideline. Environmental effects of the forecast development construction traffic on the study area roads will be assed for the following:

- Severance of communities
- Road vehicle driver and passenger delay
- Non-motorised user delay
- Non-motorised amenity
- Fear and intimidation on and by road users
- Road user and pedestrian safety
- Hazardous/large loads

Conclusions

I trust that you find the content of this letter satisfactory and that we can proceed with the TA on the basis set out above. AECOM would also welcome the arrangement of a MS Teams call to discuss any of the questions posed in the above. Please feel free to contact me on the below details and I look forward to hearing from you in due course.

Yours sincerely**,**

Dear Sir,

PREAPP/019/2024

Thank you for your request for pre-application advice. The response has been formulated on the basis of the information provided with the enquiry, taking account of planning policy, guidance and legislation, input from internal consultees where possible as well as other material considerations.

I can confirm that the Council supports the principle of development subject to the satisfactory resolution of a number of issues to be addressed within any formal planning application.

This response does not comprise a formal decision by Dundee City Council. It is advice only and is not intended to provide confirmation that a planning application will or will not be approved. It should be considered and taken into account for preparing an application for planning permission.

The advice contained in this response is given without prejudice to the determination of any future planning application. It is based on planning legislation, policy and guidance in force at the time of this response.

Please contact me if you have any queries regarding the content of the response.
Yours faithfully

[redacted]

Pre-application Advice Response

PREAPP/019/2024

A: Site and Proposal

The Pre-Application seeks advice on redeveloping brownfield land to the north of East Dock Street in Dundee. The main portion of the existing site contains industrial apparatus, buildings and equipment for fuel and material storage. The area on the east side of the site is currently used as a motorcycle training school.

The proposal is for the provision of a 132Kv busbar substation, with a minimum of 11 bays (one bus section, two bus couplers and eight feeder bays). The site layout includes provision of 2No 120MVA 132/33KV Transformers and new 132/25 kV feeder station for Network Rail. The main vehicular access is to be taken from new access junction off Market Street, with secondary access junction to be created on East Dock Street. No elevation drawings have been provided at this stage, however it is advised that the maximum height of the proposed buildings will be between 10-15m.

The site is located directly to the north of East Dock Street (A92 Trunk Road) and to the east of Market Street. To the north the site is partially bound by the Market Mews industrial unit complex, Dundee Museum of Transport, a building once in use as a hotel, and Broughty Ferry Road. To the east lies residential properties, an office unit and an area of woodland. The site also incorporates the partial length of Roodyards Road, an unclassified adopted road which runs from Broughty Ferry Road down to East Dock Street. The site is bound by a mixture of enclosures, including stone and brick walling, and metal and wood fencing.

This site slopes toward north toward Broughty Ferry Road which sits well elevated above the site with a high retaining wall at the back of the site. There are trees within the site which appear to be self-seeded as the majority of the site has not been in use for several years.

B: Planning Context

Relevant Planning History

24/00003/EIASCR and 24/00282/PAN- Construction of 132kV Substation and Network Rail Feeder Station and associated undertakings including of earthworks, Formation of Platform, Landscaping, means of access, means of enclosure, site drainage, temporary construction compounds and other associated operations.

Relevant Planning Policy

National Planning Framework 4

Policy 1 – Tackling the climate and nature crises
Policy 2 – Climate change and adaptation
Policy 3 – Biodiversity
Policy 9 – Brownfield, vacant and derelict land and empty buildings
Policy 11– Energy
Policy 12 – Zero waste
Policy 13 – Sustainable Transport
Policy 14 – Design, quality and place
Policy 22 – Flood risk and water management
Policy 23 – Health and safety
Policy 26 – Business and Industry

Dundee Local Development Plan 2019

Policy 1 – High Quality Design and Placemaking
Policy 2 – Public Art Contribution
Policy 3 – Principal Economic Development Areas
Policy 35 – Trees and Urban Woodland
Policy 36 – Flood Risk Management
Policy 37 – Sustainable Drainage Systems
Policy 39 – Environmental Protection
Policy 41 – Land Contamination
Policy 42 – Development of or next to Major Hazard Sites
Policy 44 – Waste Management Requirements for Development
Policy 48 – Low and Zero Carbon Technology in New Development
Policy 54 – Safe and Sustainable Transport
Policy 56 – Parking

C: Site Constraints/Consultee Comments

SEPA

Although not usually consulted at preapplication stage, SEPA would be a statutory Consultee for any formal application given the proposals would be a National Development as defined in National Planning Framework 4.

SEPA's Flood Maps do not show any fluvial or coastal flood risk in the proximity of the site, however, a risk of surface water flooding is identified over the majority of the site, with some areas identified as high likelihood of flooding.

SEPA Flood Maps are available to view via the following link;
https://www.sepa.org.uk/environment/water/flooding/flood-maps/

Transport/ access/ parking

Transport Scotland would be a statutory consultee for any formal planning application. TS commented as follows:

The description of the development indicates it relates to electricity apparatus such as sub-stations, transformers and feeder station. As such, it is not anticipated that the development would result in significant levels of generated traffic once operational. The site clearance and construction phase may, however, result in significant levels of construction traffic. A Transport Statement will therefore be required detailing the likely trip generation, distribution and type of vehicles during both the construction and operational phase. This should be undertaken in accordance with Transport Scotland's 'Transport Assessment Guidance' and the scope of this should be discussed and agreed with both Transport Scotland and Dundee City Council in advance of submission.

A Construction Traffic Management Plan (CTMP) will be required as a condition of any development setting out a clear methodology for how construction traffic will be managed. This should address such issues as routing, any temporary traffic management requirements and measures for the environmental control of vehicles and transported materials, such as wheel washing and dust suppression. Specific consideration will require to be given to the transportation of any Abnormal Indivisible Loads(AILs), should these be necessary, and a route assessment should be included to demonstrate how AILs would be transported to the site. The CTMP will require to be agreed with Transport Scotland, Dundee City Council and Police Scotland.

The supporting information indicates that the principal access is to be formed on Market Street, with a secondary access on the A92 trunk road. As Market Street is a local road, the form of this access will primarily be a matter for Dundee City Council to agree, however given the proximity of the proposed access to the junction of the A92 /Market Street junction it will be essential to demonstrate that traffic entering and exiting the site at this location would not impact on or block traffic on the trunk road or interfere with the necessary visibility splays at the junction. Swept path assessment is likely to be required.

With regards to the secondary access, the proposed layout drawing appears to indicate this would be located in the vicinity of the existing access to the former motorcycle training centre. Any necessary upgrades to the A92 junction will require to be designed in accordance with the relevant guidance contained within the Design Manual for Roads and Bridges (DMRB), which would be CD123 for at grade priority junctions. Details of the internal road layout connecting to this access will be required and again swept path assessments may be required. Whilst it is accepted that this is an existing access, it is poorly formed with no defined kerb lines and it is also situated on the inside of a bend which may be restricting the available visibility from the

junction, particularly to the right. This may require consideration to be given to moving the access westwards away from the bend or realigning the existing site boundary. Given the high traffic volumes on the A92, it would be preferable for this secondary access to be formed as a left in / left out access if that is would be possible. Transport Scotland would welcome any proposals to permanently close the other redundant direct access points along the A92 site frontage if these are no longer required.

The design proposals for both site accesses should be accompanied by a Stage 1 Road Safety Audit, undertaken in accordance with DMRB GG119, along with a Designers Response, before Transport Scotland would be able to respond on a planning application. Both the Brief and Audit team will require to be approved by Transport Scotland prior to the audit being undertaken.

As the site is directly adjacent to the trunk road along the southern boundary, consideration of boundary fencing, landscaping and any external site lighting will be required. Also, no connection to the trunk road drainage network would be permitted.

To summarise, Transport Scotland's requirements would be:

A Transport Statement, detailing traffic generation by volume, type and distribution for the proposals, during both construction and operation.

Design details for the proposed site access points confirming compliance with DMRB requirements including visibility splays.

A Stage 1 Road Safety Audit covering these access proposals.

Construction Traffic Management Plan (CTMP).

Assessment of any abnormal loads and the likely routes for the proposals.

Transport Scotland would be happy to scope the detailed requirements for this supporting information should the applicant intend submitting a planning application.

[redacted]

The Council's Sustainable Transport & Roads Division has also provided the following comments;

The following must be carried out in advance of the submission of a formal application;

1. Transport Scotland must be consulted as the site is adjacent to the Trunk Road.

2. A Transport Assessment/Transport Statement is required. The level of the assessment/statement shall be agreed with both DCC Transportation and Transport Scotland.
3. Details of all proposed parking within the site.
4. Details of all proposed new/altered accesses.

[redacted]

Archaeology

The Council's Archaeological Consultant has been consulted on the proposals, however at the time of writing a full response has not been received. This will be forwarded as soon as available.

Greenspace/Landscaping

The Council's Greenspace Officer advises that prior to full application a full ecological assessment should be carried out on site. This should then be used to inform a landscape plan showing how positive gains for biodiversity will be incorporated in line with the requirements of NPF4.

[redacted]

Noise

Environmental Health advise that there is limited information provided as part of the preapplication submission, however, there is the potential for noise to be generated from the plant and equipment to be provided on the site. Therefore, the following condition is requested to be attached to any consent.

"*The received noise from the electrical substation(s) shall not exceed NR30 as measured 1 metre external to the facade of residential property."*

Further to the Environmental Health Service comments above, the Planning Authority advise that the application should be supported by a Construction Environmental Management Plan to mitigate impacts to nearby residents. This shall require clarification of construction hours, the need for any dust suppression, lighting impacts and detail any operations which would cause vibration to properties. This document could also clarify where site compounds/laydown areas are to be located, preferably away from the residential side of

the site to help mitigate against adverse impacts to residential amenity.

[redacted]

Contaminated Land

Due to the industrial history of the site, including chemical storage, the Environmental Health Service advise that they will require a preliminary risk assessment for contaminated land to be submitted for approval prior to determination of any formal application.

For further clarification, please contact Fiona Welch

[redacted]

The proposed development would require to demonstrate that the proposals could be satisfactorily drained in a sustainable manner, and that the development would not either be at risk of flooding or increase the flood risk at surrounding property. Full details of a proposed on-site sustainable drainage solution would require to be provided with any application, including drainage statement, detailed drainage proposals and associated calculations.

The Council's Drainage Engineer has been consulted on the proposals, however at the time of writing a full response has not been received. This will be forwarded as soon as available.

[redacted]

Access

The site incorporates the partial length of Roodyards Road, an unclassified adopted road which runs from Broughty Ferry Road down to East Dock Street. Roodyards Road is currently used more as a path than a road. The Council's Outdoor Access Officer may have comments to make on this aspect of the proposals.

[redacted]

[redacted]

D: Consideration of Proposal (Principle of Development)

NPF4 identifies 18 national developments that are significant developments of national importance.

National development 3 of NPF4

National development 3 of NPF4 (Strategic Renewable Electricity Generation and Transmission Infrastructure) supports renewable electricity generation, repowering, and expansion of the electricity grid. National development 3 informs that the electricity transmission grid will need substantial reinforcement including the addition of new infrastructure to connect and transmit the output from new on and offshore capacity to consumers in Scotland, the rest of the UK and beyond.

This current proposal forms part of SSEN's strategic investment in its electricity networks to support a green economic recovery and accelerate key low-carbon projects across the north of Scotland and central southern England. The infrastructure to be delivered as part of the proposed development is a key element in the substantial reinforcement of the electricity transmission grid, and will ensure progress towards achieving net zero and a decarbonised economy.

The proposed substation and associated works is infrastructure that will directly support onshore high voltage electricity lines, cables and interconnectors, and is thus a development contributing to Strategic Renewable Electricity Generation and Transmission. As such, the proposal forms part of National Development 3 and is thus supported by NPF4.

National Development 10 of NPF4

National Development 10 of NPF4 (Dundee Waterfront) supports the redevelopment of the Dundee Waterfront Zones including: the Central Waterfront, Seabraes, City Quay, Dundee Port, Riverside Business Area and Nature Park, and the Michelin Scotland Innovation Parc.

As noted above, the proposal would be located on a site within Dundee Waterfront, and would be for the provision of new and/or upgraded utilities. As such, the proposal also forms part of National Development 10 and is thus supported by NPF4.

This national development designation means that the principle of development does not need to be agreed through this planning application process. The detailed aspects of the proposal still require to be assessed against relevant development plan policies and any material considerations.

Principal Economic Development Area

The majority of the site is allocated as a Principal Economic Development Area within Dundee LDP. Policy 3 states that proposals for Class 4 "Business", Class 5 "General Industry" and Class 6 "Storage and Distribution" uses will be supported. Uses other than these will be resisted. The proposal is for an energy transmission, which falls under the industrial use classes supported in these locations. The proposal is therefore supported by this policy.

Brownfield site

As a brownfield site Policy 9 – Brownfield, vacant and derelict land and empty buildings of NPF4 is relevant. There is a presumption in favour of developing such sites.

Part a) states that development proposals that will result in the sustainable reuse of brownfield land including vacant and derelict land and buildings, whether permanent or temporary, will be supported. In determining whether the reuse is sustainable, the biodiversity value of brownfield land which has naturalised should be taken into account.

Part c states that where land is known or suspected to be unstable or contaminated, development proposals will demonstrate that the land is, or can be made, safe and suitable for the proposed new use.

The proposal involves the re-use of brownfield land. Given the historic industrial use of the site it is considered to be of low biodiversity value with little naturalisation at present. The site has the potential to be contaminated given the previous uses. With this in mind, the Council's Environment Service have provided further comments which are included above.

Generally, the proposal would be in compliance with Policy 9 of NPF4.

Other considerations

Natural Environment and Protected Species

There are no natural heritage designations directly on site.

Firth of Tay and Eden Estuary Special Area of Conservation

The Firth of Tay and Eden Estuary SAC is located approx. 300m away and is separated from the site by a trunk road, railway line and other industrial and commercial uses. Direct operational impacts are not likely however the application should be supported by Construction Environmental Management Plans which should detail on site practices and way in which events from accidents would be mitigated to minimise impacts.

Protected Species – Bats

Due to the presence of structures on site there is potential for bats. As such, a bat survey should be submitted with any formal planning application. Should bats be found on site a Species Protection Plan should be submitted in order to mitigate the loss of any habitat. A condition would be recommended to secure mitigation within the Species Protection Plan for the avoidance of any doubt and a Works Affecting Bats License will be required from NatureScot.

Trees

It appears that there are young self-seeded trees within the site. As per the recommendations of the Councils Greenspace Officer above, a full ecological assessment should be carried out on site. This should then be used to inform a landscape plan showing how positive gains for biodiversity will be incorporated in line with the requirements of NPF4.

Design and Layout

Part a of policy 14 – Design, quality and place of NPF4 states that development proposals will be designed to improve the quality of an area whether in urban or rural location and regardless of scale. Part b requires proposals to be consistent with the six qualities of successful places.

Part c of policy 14 states that development proposals that are poorly designed, detrimental to the amenity of the surrounding area or inconsistent with the six qualities of places, will not be supported.

The six qualities of successful places align with the principles of Policy 1 – High Quality Design and Placemaking of the Dundee LDP. This requires that all development proposals should follow a design-led approach to sustainable, high quality placemaking. Development should contribute positively to the quality of the surrounding built and natural environment.

The proposed substation is an essential component in enabling the substantial reinforcement of the electricity transmission grid, and will ensure progress towards achieving net zero and a decarbonised economy.

The application site is within the East Dock Street Principal Economic Development Area, and lies directly to the north of Dundee Port which is within the Stannergate Principal Economic Development Area. As such, the proposed substation would be within a wider area that remains characterised by industrial infrastructure. The proposed site plan shows that the infrastructure/ buildings would be set back from East Dock Street, thereby avoiding structures projecting closer to that road. The application submission advises that the maximum height of the buildings/ infrastructure would be 10-15m in height. When seen in this context, and given the extensive size of the site, the proposed infrastructure would not appear as an incongruous or alien features. It is unlikely that the proposed infrastructure would harm the landscape

character and visual amenity of this part of East Dock Street. Cross sectional drawings of the site demonstrating the infrastructure in the context of housing and views from Broughty ferry road should be included with any formal application.

Based on the limited information currently submitted it would appear that proposals would be broadly consistent with the six qualities of successful place and therefore compliant with policy 14 – Design, quality and place of NPF4 and policy 1 – High Quality Design and Placemaking of the Dundee LDP.

Development of or next to Major Hazard Sites

Part g of Policy 23 – Health and Safety of NPF4 states that development proposals that are within the vicinity of a major hazard site or major accident hazard pipeline (because of the presence of toxic, highly reactive, explosive or inflammable substances) will consider the associated risks and potential impacts of the proposal and the major accident hazard site/pipeline of being located in proximity to one another.

Policy 42 – Development of or next to Major Hazard Sites of the Dundee LDP states that the siting of new or extensions to existing major hazard sites or sites which operate under SEPA authorisation will not be permitted in close proximity to residential areas/area of public use or interest, where the risk to people or the environment is likely to be significantly increased.

The site is around 160m east of a former gas holding tank site which was subject to a Hazardous Substances Consent. The Hazardous Substances Consent was revoked on 5 November 2021 and the Health & Safety Executive has indicated that it does not advise against, on safety grounds, the granting of planning permission in this case.

E: Consultees

Parties Likely to be Consulted on Application

The following will likely be consulted on any application submitted for this proposal. You may wish to contact consultees for additional pre-application advice prior to the formal submission of an application.

Dundee City Council Consultees

Access Officer
Greenspace Officer
Archaeology Consultancy
Community Safety and Protection - Contaminated Land
Community Safety and Protection - Environmental Health
Sustainable Transport & Roads Division

City Engineers – Surface Water and Flooding

External Consultees

SEPA
Scottish Water
Transport Scotland
Health and Safety Executive
Network Rail

F: Making a Planning Application

Planning applications can be made online, via Scotland's national planning portal: www.eplanning.scot/

Major & National Application Process

The proposal is a National Development - Proposal of Application Notice has already been submitted to the Council.

The application will require to be supported by a 'PAC' report. We would refer the applicants to Appendices B and C of Planning Circular 3/2022 Development Management Procedures for details on the required content of the Pre Application Consultation Report.

https://www.gov.scot/publications/planning-circular-3-2022-development-managementprocedures/
documents/

The Council would also seek to enter into a Processing Agreement with the developer to set out key dates and processes involved in determining the application. A timeframe for the submission of the application would be welcomed in order a future planning committee date can be identified.

Supporting Information Required with Application

The following information should be submitted with a planning application. Failure to include the information may lead to delays to the validation and determination of the application.
Heritage Statement including Photographic Records of structures on site

Contaminated Land Assessment
Design and Access Statement
Drainage Statement
Ecological Survey
Species Protection Plan (if any affected)

Biodiversity Statement
Flood Risk Assessment
Landscape and Planting Plan
Construction Environmental Management Plan
Transport Assessment
Travel Plan
Construction Traffic Management Plan
Construction and Operational Waste Management Plans

A screening opinion was sought from the Planning Authority. It was concluded that an Environmental Impact Assessment was not required because it does not constitute Schedule 1 development under the Regulations and while the proposal does falls within the definition of 'Schedule 2 development' having screened it against the selection criteria outlined in Schedule 3 of the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017; including the characteristics of the development, location, sensitivities and characteristics of the potential impacts, any adverse impact on the receiving environment, whilst possible, is not considered likely to be significant.

Disclaimer

While we make every effort to ensure that the pre-application advice is accurate and comprehensive as possible, any advice given by officers in response to a pre-application advice request does not constitute a formal decision of Dundee City Council as Planning Authority and it cannot be held to bind us in terms of the validation or determination of a subsequent statutory application.

In particular, any advice provided under this service constitutes the professional opinion of the officer(s) concerned and is based on the information provided by the applicant and the planning policies and site constraints prevailing at the time. While every effort will be made to identify all relevant policies and all issues material to the proposal, pre-application advice issued by us in relation to local developments will not normally include input from external organisations or consultees, such as SEPA or Transport Scotland, or from local residents, neighbours or community groups.

Such input during the assessment of any formal application may raise new issues or areas of concern and therefore the ultimate determination of any future statutory application could differ from the conclusions reached in this preliminary assessment. We will, however, endeavour to highlight any consultees, external bodies or parties that may be involved in any future application so that applicants can make contact themselves to discuss their proposals.

Transport Scotland Scoping Response

Thank you again for your email last week and scoping letter setting out your proposed approach for preparing the supporting transport assessment for the SSEN sub-station proposals on the former NYNAS site off the A92 East Dock Street, Dundee.

Having now had the opportunity to review this, I would confirm that the proposed methodology and parameters set out in your letter are generally considered acceptable. Given the anticipated levels of traffic during the operational stage, I would confirm that there would be no requirement for junction capacity assessment for this phase of the development, only geometric and operational considerations. Assessment of the construction phase will be dependent on the anticipated volumes of traffic being generated, but it is considered that there would still be no requirement for capacity assessments.

The preparation of drawings for the proposed access arrangements and the undertaking of swept path assessments is considered appropriate, as is the undertaking of a Stage 1 Road Safety Audit. As you note, the Audit Team and Brief for this will require to be agreed with Transport Scotland and in the first instance I would act as liaison with appropriate colleagues in Network Management.

In terms of the access proposals, I would provide the following specific comments:

- Figure 2 of your letter indicates two potential access points directly onto the A92 East Dock Street, and Table 2 indicates the anticipated function of these for construction and/or operational traffic.
- The A92 East Dock Street is a four lane urban carriageway with a 40mph speed limit over this section and carries significant traffic volumes, particularly at peak times. There are no right turn facilities provided for traffic at the access points or into Market Street. The introduction of additional right turn traffic at these points would therefore be considered as an impediment to free flow traffic conditions and therefore both a safety and operational concern. As indicated in the pre-app advice provided, Transport Scotland would therefore require site access from the A92 (directly or indirectly via Market Street) to be restricted to left-in / left-out operation only.
- It is acknowledged that the A92 East Dock Street / Market Street junction currently allows all-ways movements in and out of the junction. Formally prohibiting right turns at this location would require the promotion / implementation of TROs (either temporary for just the construction phase or permanent for operational use). Therefore, and so as not to impact on existing users of Market Street during a relatively short construction period, it would be considered appropriate to address the routing of conventional construction traffic through the proposed Construction Traffic Management Plan (CTMP). This will identify an agreed routing and measures for enforcing this. An appropriate planning condition requiring a CTMP would therefore be requested. It is anticipated that for any direct access point into the site from the A92, the layout can be formed to enforce left-in / left-out movements.
- Access Point 2 – This access point wasn't included in the pre-application information. It is noted that the access point would not be used during the construction phase and only during the operational phase. It would provide access to the SSE Distribution Compound. This would, however, suggest that it could be used by HGV traffic. Whilst it is recognised that that there is an existing gated access located at Point 2, with a set back gate, this would only have been used very infrequently. It is, however, very close to the existing A92 East Dock Street / Market Street junction and the proximity of this access, and the high walls bounding the East Dock Street frontage would cause concerns in terms of potentially encroaching on junction visibility and inter-visibility. A site layout is not provided, and we would therefore question why this area of the site could not be adequately served from Access Point 1 off Market Street, rather than a separate access off the trunk road? Our preference would not to have Access Point 2 if access can be adequately achieved from Access Point 1.
- Access Point 3 – This access point appears to relate to the existing Roodyards Road, an adopted unclassified, but apparently little used, road that is currently open to the public. The use and treatment of this road, and whether it is to remain open to the public, would be a matter for Dundee City Council. However, provided the junction can be upgraded to an appropriate standard for the proposed vehicles using it, as per CD123 of the DMRB, and adequate visibility can be achieved, taking cognisance of the existing constraints from boundary walls and advertising hoardings, Transport Scotland would not object to site access at this location. This, however, should be formed as a left-in / left-out junction.
- As it is not specifically mentioned as a potential point of access, it is assume that there is no proposal to use the existing access to the former 'Scotriders' motor cycle training site at the east end of the site? If this is the case, Transport Scotland would therefore request that this access be closed off along with any other redundant access points along East Dock Street.
- It is noted that there would be a requirement for the delivery of AILs to the site, and that these would likely use the A92 East Dock Street / Market Street junction. It would therefore be preferable to also manage these through left-in movements. It is acknowledged that this may not be feasible depending on the wider routing to the site and any swept path requirements. As stated in the scoping letter, however, the transportation of any AILs would follow normal protocols and be subject to police escort and would be scheduled to avoid peak traffic times on the network. I am therefore content that specific routing of these loads can be adequately controlled through the CTMP.

I trust these comments are helpful and will enable you to progress with the Transport Assessment. However if you require any further clarification or advice please do not hesitate to contact me.

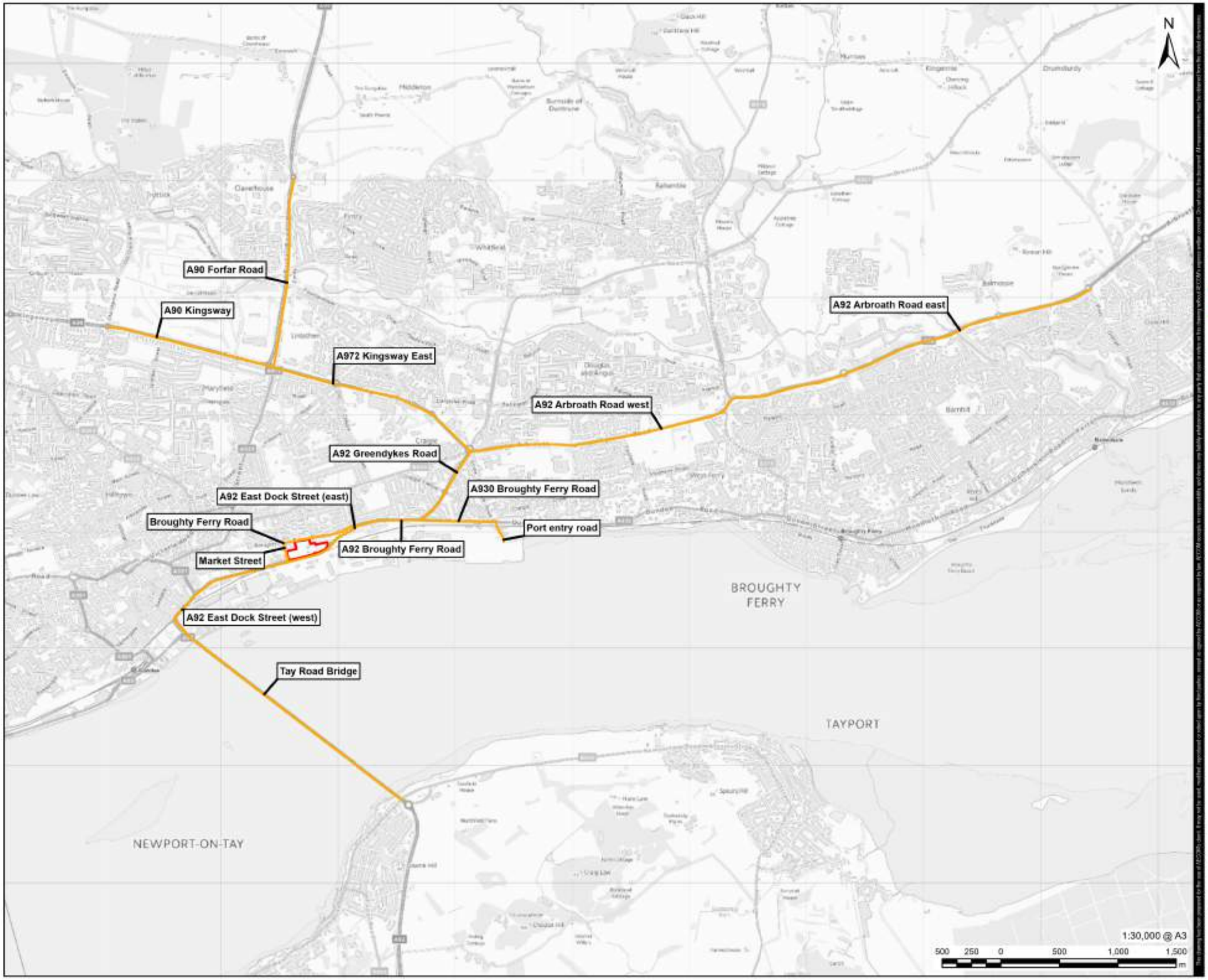
Dundee City Council Scoping Response

I have reviewed your scoping letter and have the following initial comments:

1. Transport Scotland will comment on access points 2 and 3 but there may be implications on the local road network that may require further assessment following their comments.
2. Access point 1 – DCC has no preference on the movements at this access point but this should be set back from the East Dock Street at a distance to allow an HGV to sit fully on Market Street and not block other traffic using Market Street. Further details are required if this access is to be used during construction.
3. Access Point 4 – This may not be suitable due to visibility restrictions to the north. While it is accepted that this is an existing access, this should be fully assessed if this is to be promoted as an access/egress. Further details are required if this access is to be used during construction.
4. Access Point 5 – There is a level difference between Broughty Ferry Road and the site which may make this location not suitable as an access. As a minimum, a right turn harbourage on Broughty Ferry Road, which allows for HGVs to safely sit while waiting and not blocking other traffic, should be provided. Further details are required if this access is to be used during construction.
5. Roodyards Road is a public road. If there are any proposed alterations to this, orders may be required.

Appendix C – Study Area Roads, Traffic Survey Locations and Injury Accident Locations

Revision: 0 Drawn: AR Checked: JB Approved: LW Date: 2025-04-25



AECOM

PROJECT

Dundee Network Rail Substation

CLIENT

SSEN

CONSULTANT

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Edinburgh
Scotland
EH3 5DA
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LEGEND

- Site Boundary
- Study Area Roads

NOTES

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60727222

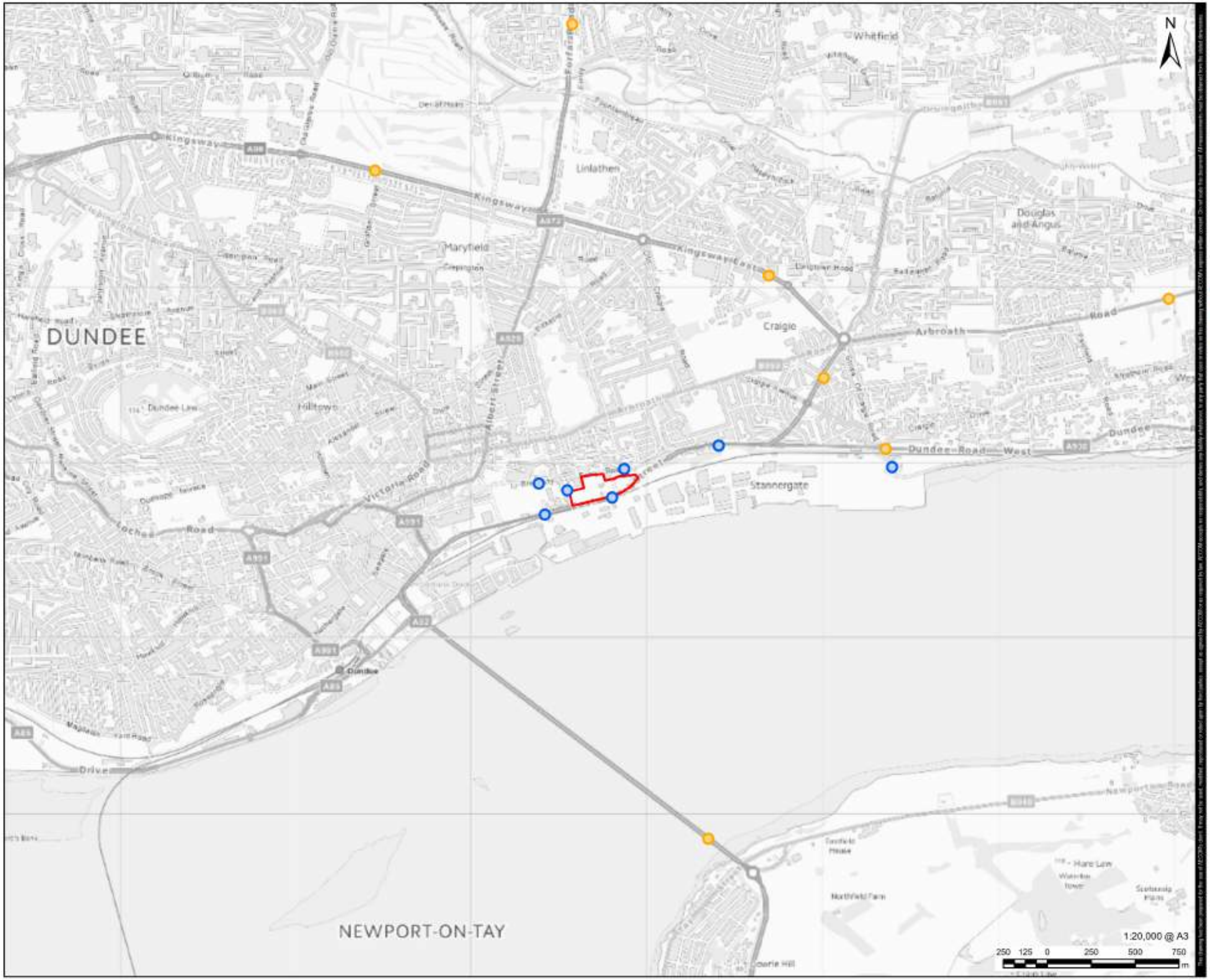
FIGURE TITLE

Study Area Roads

FIGURE NUMBER

Figure 8.1

Revision: 0 Drawn: AR Checked: JB Approved: LW Date: 2025-04-25



AECOM

PROJECT

Dundee Network Rail Substation

CLIENT

SSEN

CONSULTANT

1 Tanfield, Inverleith Row
Edinburgh
Scotland
EH3 5DA
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LEGEND

- Red Line Boundary
- ATC's
- DFT Traffic Counts

NOTES

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60727222

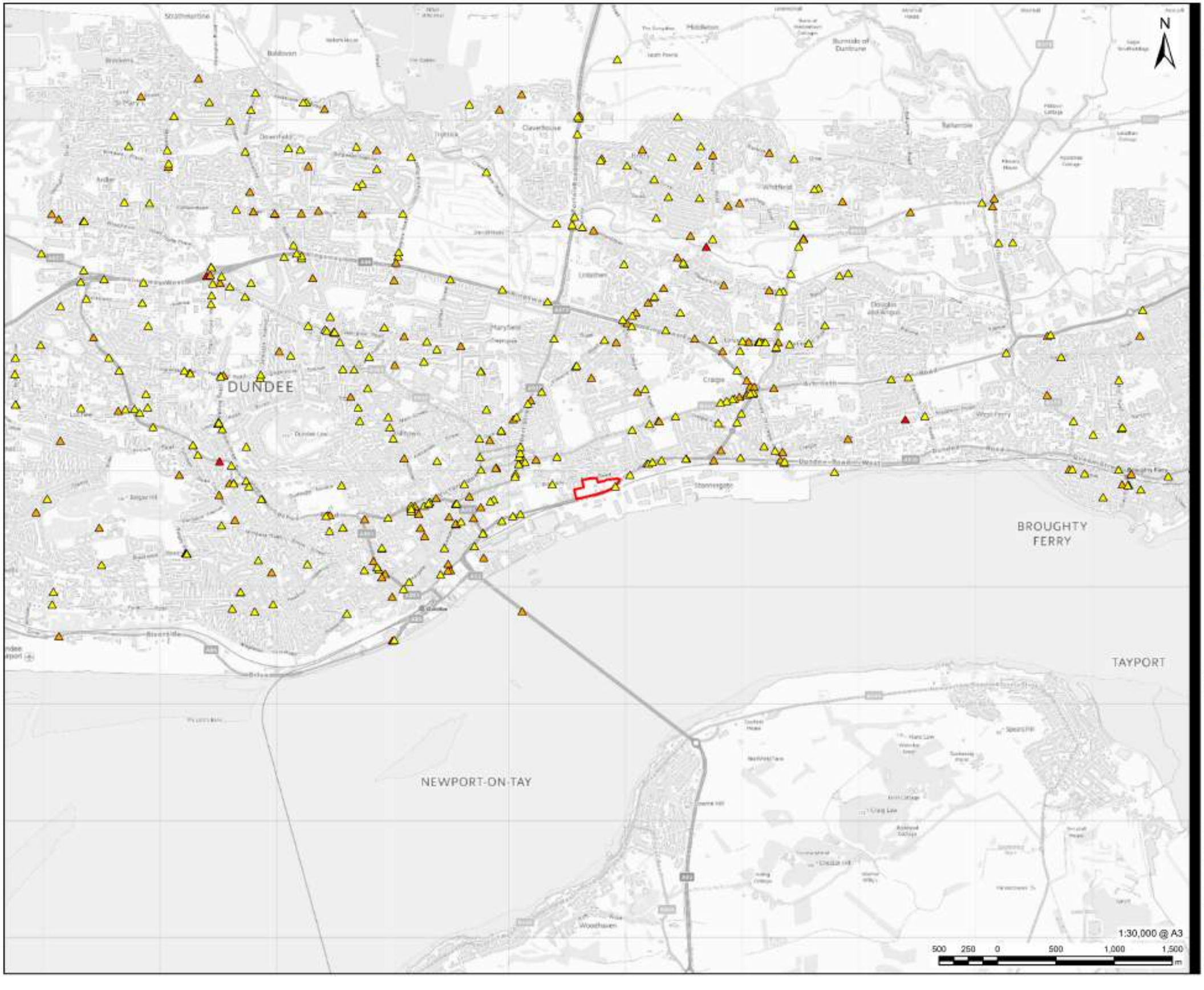
FIGURE TITLE

Traffic Survey Locations

FIGURE NUMBER

Figure 8.2

Revision: 0 Drawn: AR Checked: JB Approved: LW Date: 2025-04-25



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LEGEND

- Red Line Boundary

Injury Accident Data

- Fatal
- Serious
- Slight

NOTES

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60727222

FIGURE TITLE

Injury Accident Locations (2020-2023)

FIGURE NUMBER

Figure 8.3

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Appendix D – 2027 Baseline Traffic Data

IEMA Guidelines Environmental Assessment of Traffic & Movement - Traffic Data & Rules

Study Area Roads				Daily Traffic (24hr)							Development Traffic						Forecast Daily Traffic						IEMA Rules
Road	Between		Data Source	Surveyed			Baseline		Growth 1.033	Average Speed (mph)	Daily			Hourly		Hours 10	Total (Baseline + Development)			Percentage Increase			IEMA
				Car / LGV	HGV	Total	Car / LGV	HGV	Total		Car / LGV	HGV	Total	Car / LGV	HGV	Total	Car / LGV	HGV	Total	Car / LGV	HGV	Total	
Tay Road Bridge	Tay Bridge Roundabout	Tay Road Bridge / Dock Street Junction	DfT Survey	28,382	730	29,112	29,310	754	30,064	50.0	78	0	78	8	0	8	29,388	754	30,142	0%	0%	0%	No
A92 East Dock Street (west)	Tay Road Bridge / Dock Street Junction	A92 East Dock Street / Market Street Junction	AECOM Survey	23,654	761	24,415	24,427	786	25,213	39.6	78	28	106	8	3	11	24,505	814	25,319	0%	4%	0%	No
A92 East Dock Street (east)	A92 East Dock Street / Market Street Junction	A92 East Dock Street / Broughty Ferry Road Junction	AECOM Survey	22,982	769	23,751	23,734	794	24,528	42.4	78	97	175	8	10	18	23,812	891	24,703	0%	12%	1%	No
Market Street	Junction with A92 East Dock Street	Junction with Broughty Ferry Road	AECOM Survey	643	16	659	664	17	681	23.7	78	97	175	8	10	18	742	114	856	12%	587%	26%	Yes
Broughty Ferry Road	Broughty Ferry Road / Market Street Junction	A92 East Dock Street / Broughty Ferry Road Junction	AECOM Survey	6,101	26	6,127	6,301	27	6,327	31.1	78	97	175	8	10	18	6,379	124	6,502	1%	361%	3%	Yes
A92 Broughty Ferry Road	A92 East Dock Street / Broughty Ferry Road Junction	Broughty Ferry Road / Greendykes Road Junction	AECOM Survey	27,183	805	27,988	28,072	831	28,903	36.2	78	194	272	8	19	27	28,150	1,025	29,175	0%	23%	1%	No
A930 Broughty Ferry Road	Broughty Ferry Road / Greendykes Road Junction	A930 roundabout at Port Entry road	DfT Survey	13,412	93	13,505	13,851	96	13,947	40.0	0	0	0	0	0	0	13,851	96	13,947	0%	0%	0%	No
Port Entry road	A930 roundabout at Port Entry road	Stannergate Road	AECOM Survey	1,077	112	1,189	1,112	116	1,228	23.3	0	0	0	0	0	0	1,112	116	1,228	0%	0%	0%	No
A92 Greendykes Road	A92 Broughty Ferry Road / A92 Greendykes Road Junction	Scott Fyffe Roundabout	DfT Survey	12,289	432	12,721	12,691	446	13,137	30.0	78	194	272	8	19	27	12,769	640	13,409	1%	43%	2%	Yes
A92 Arbroath Road west	Scott Fyffe Roundabout	A92 Arbroath Road / Claypotts Road Junction	DfT Survey	22,235	797	23,032	22,962	823	23,785	40.0	78	192	270	8	19	27	23,040	1,015	24,055	0%	23%	1%	No
A92 Arbroath Road east	A92 Arbroath Road / Claypotts Road Junction	Grange Junction	DfT Survey	22,391	955	23,346	23,123	986	24,109	40.0	78	192	270	8	19	27	23,201	1,178	24,379	0%	19%	1%	No
A972 Kingsway East	Scott Fyffe Roundabout	Junction with the A90 Forfar Road	DfT Survey	26,015	919	26,934	26,866	949	27,815	40.0	78	2	80	8	0	8	26,944	951	27,895	0%	0%	0%	No
A90 Kingsway	Junction with the A90 Forfar Road	Kingsway / Old Glamis Road Junction	DfT Survey	39,433	3,043	42,476	40,722	3,143	43,865	40.0	78	2	80	8	0	8	40,800	3,145	43,945	0%	0%	0%	No
A90 Forfar Road	Junction with A972 Kingsway	Emmock Roundabout	DfT Survey	27,189	2,187	29,376	28,078	2,259	30,337	40.0	78	0	78	8	0	8	28,156	2,259	30,415	0%	0%	0%	No

Appendix E – Construction Traffic Programme

Construction Traffic Movements

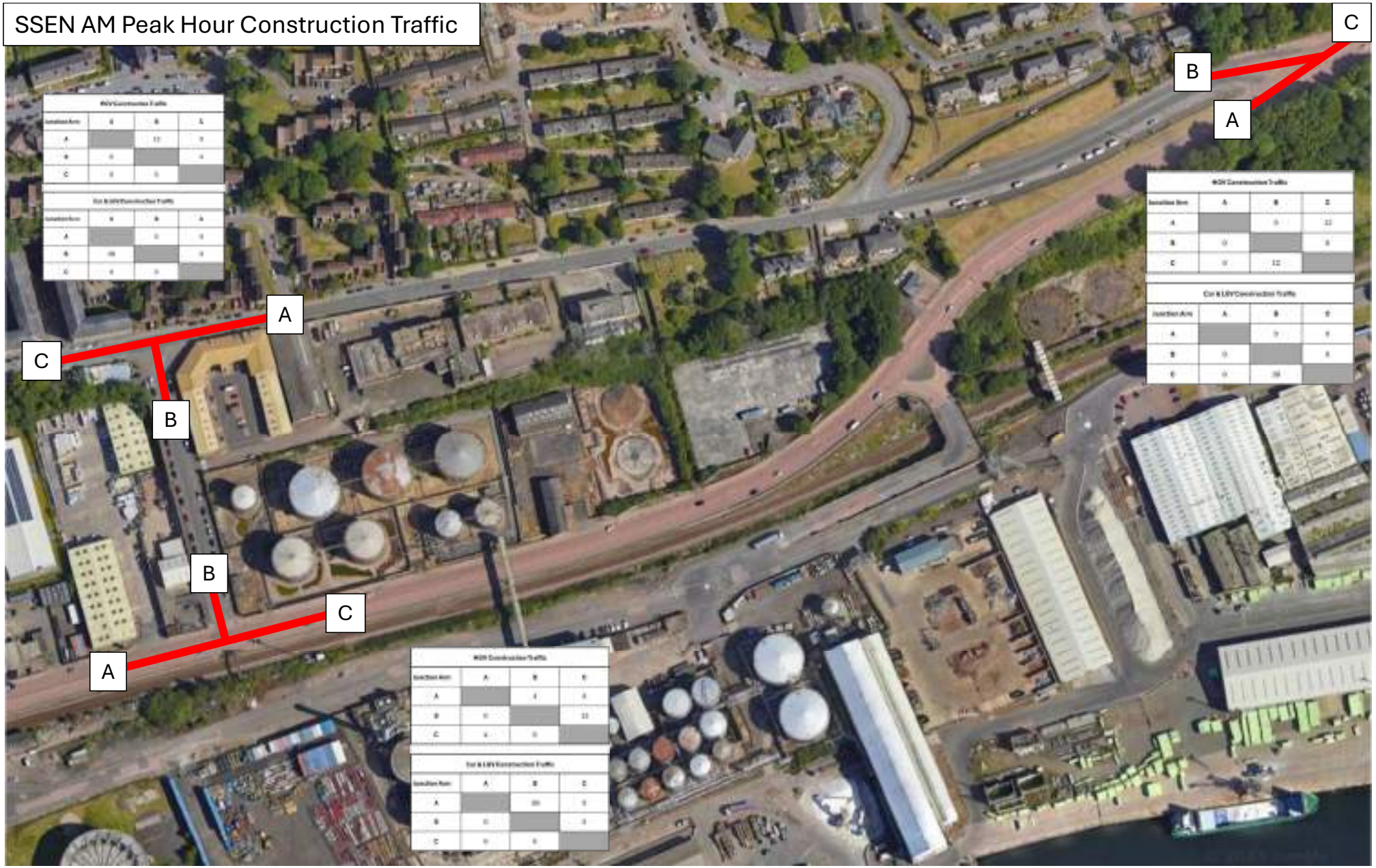
Activity	2026 Jun	Jul	Aug	Sep	Oct	Nov	Dec	2027 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2028 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2029 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Site Access / Site Demolition / Site Preparation	56	56	56	56	56	56	56																																				
Platform Construction								164	164	164	164	164	164																																
Platform Concrete													28	28	28	28																												
Platform Concrete Steel													2	2	2	2																												
Platform Finishing																	LGV	LGV	LGV																										
Buildings Steel																							4	4																				
Buildings Cladding																									4	4																		
Equipment																											6	6																
AIL																											4	4																
Fitout and Commissioning																													LGV	LGV	LGV	LGV	LGV	LGV	LGV	LGV	LGV	LGV	LGV	LGV				
HGV	56	56	56	56	56	56	56	164	164	164	164	164	194	30	30	30	0	0	0	4	4	4	4	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Car / LGV	52	52	52	52	52	52	52	78	78	78	78	78	78	78	78	78	78	78	78	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
Total	108	108	108	108	108	108	108	242	242	242	242	242	272	108	108	108	78	78	78	56	56	56	56	62	62	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52

Study Area Road	HGV Agg	Con	Steel	TotI	LGV	Tot
Tay Road Bridge	0	0	0	0	78	78
A92 East Dock Street (west)	0	28	0	28	78	106
A92 East Dock Street (east)	82	14	1	97	78	175
Market Street	82	14	1	97	78	175
Broughty Ferry Road	82	14	1	97	78	175
A92 Broughty Ferry Road	164	28	2	194	78	272
A930 Broughty Ferry Road	0	0	0	0	0	0
Port Entry road	0	0	0	0	0	0
A92 Greendykes Road	164	28	2	194	78	272
A92 Arbroath Road west	164	28	0	192	78	270
A92 Arbroath Road east	164	28	0	192	78	270
A972 Kingsway East	0	0	2	2	78	80
A90 Kingsway	0	0	2	2	78	80
A90 Forfar Road	0	0	0	0	78	78

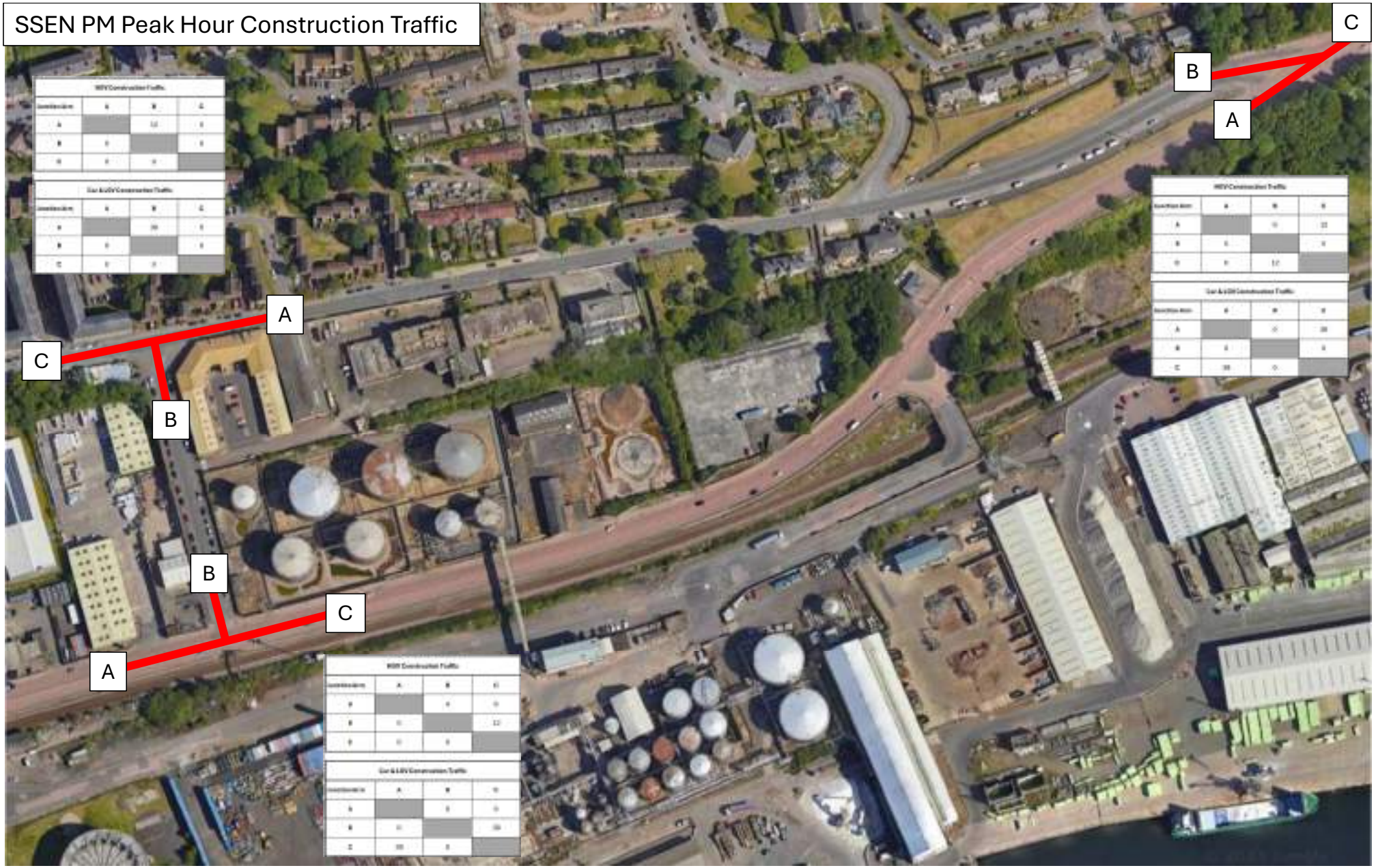
Appendix F – Daily and Peak Hour Construction Traffic Flows

SSEN Daily Construction Traffic (Study Area Roads for EA)

SSEN AM Peak Hour Construction Traffic



SSEN PM Peak Hour Construction Traffic



Appendix G – Fear and Intimidation Magnitude of Change Assessment

IEMA Environmental Assessment of Traffic and Movement - Fear and Intimidation

Study Area Roads Existing Traffic						Existing Fear and Intimidation Level				
Road	Between		18-Hour Average Traffic (Veh/s / Hour)	Total 18-Hour HGV Traffic	Average Vehicle Speed (mph)	18-Hour Average Traffic (Veh/s / Hour)	Total 18-Hour HGV Traffic	Average Vehicle Speed (mph)	Degree of Hazard Score	Fear and Intimidation Level
Tay Road Bridge	Tay Bridge Roundabout	Tay Road Bridge / Dock Street Junction	1,581	714	50	1,200-1,800 20	<1,000 0	40+ 30	50	Great
A92 East Dock Street (west)	Tay Road Bridge / Dock Street Junction	A92 East Dock Street / Market Street Junction	1,325	737	40	1,200-1,800 20	<1,000 0	30-40 20	40	Moderate
A92 East Dock Street (east)	A92 East Dock Street / Market Street Junction	A92 East Dock Street / Broughty Ferry Road Junction	1,289	748	42	1,200-1,800 20	<1,000 0	40+ 30	50	Great
Market Street	Junction with A92 East Dock Street	Junction with Broughty Ferry Road	36	16	24	<600 0	<1,000 0	20-30 10	10	Small
Broughty Ferry Road	Broughty Ferry Road / Market Street Junction	A92 East Dock Street / Broughty Ferry Road Junction	333	26	31	<600 0	<1,000 0	30-40 20	20	Small
A92 Broughty Ferry Road	A92 East Dock Street / Broughty Ferry Road Junction	Broughty Ferry Road / Greendykes Road Junction	1,519	782	36	1,200-1,800 20	<1,000 0	30-40 20	40	Moderate
A930 Broughty Ferry Road	Broughty Ferry Road / Greendykes Road Junction	A930 roundabout at Port Entry road	734	91	40	600-1,200 10	<1,000 0	30-40 20	30	Moderate
Port Entry road	A930 roundabout at Port Entry road	Stannergate Road	66	111	23	<600 0	<1,000 0	20-30 10	10	Small
A92 Greendykes Road	A92 Broughty Ferry Road / A92 Greendykes Road Junction	Scott Fyffe Roundabout	691	422	30	600-1,200 10	<1,000 0	20-30 10	20	Small
A92 Arbroath Road west	Scott Fyffe Roundabout	A92 Arbroath Road / Claypotts Road Junction	1,251	779	40	1,200-1,800 20	<1,000 0	30-40 20	40	Moderate
A92 Arbroath Road east	A92 Arbroath Road / Claypotts Road Junction	Grange Junction	1,268	934	40	1,200-1,800 20	<1,000 0	30-40 20	40	Moderate
A972 Kingsway East	Scott Fyffe Roundabout	Junction with the A90 Forfar Road	1,463	898	40	1,200-1,800 20	<1,000 0	30-40 20	40	Moderate
A90 Kingsway	Junction with the A90 Forfar Road	Kingsway / Old Glamis Road Junction	2,307	2,975	40	1,800+ 30	2,000-3,000 20	30-40 20	70	Great
A90 Forfar Road	Junction with A972 Kingsway	Emmock Roundabout	1,596	2,138	40	1,200-1,800 20	2,000-3,000 20	30-40 20	60	Great

IEMA Environmental Assessment of Traffic and Movement - Fear and Intimidation

Study Area Roads Existing Traffic + Development Traffic				Forecast Fear and Intimidation Level				
Road	18-Hour Average Traffic (Veh/s / Hour)	Total 18-Hour HGV Traffic	Average Vehicle Speed (mph)	18-Hour Average Traffic (Veh/s / Hour)	Total 18-Hour HGV Traffic	Average Vehicle Speed (mph)	Degree of Hazard Score	Fear and Intimidation Level
Tay Road Bridge	1,589	714	50	1,200-1,800 20	<1,000 0	40+ 30	50	Great
A92 East Dock Street (west)	1,335	765	40	1,200-1,800 20	<1,000 0	30-40 20	40	Moderate
A92 East Dock Street (east)	1,307	845	42	1,200-1,800 20	<1,000 0	40+ 30	50	Great
Market Street	53	113	24	<600 0	<1,000 0	20-30 10	10	Small
Broughty Ferry Road	351	123	31	<600 0	<1,000 0	30-40 20	20	Small
A92 Broughty Ferry Road	1,546	976	36	1,200-1,800 20	<1,000 0	30-40 20	40	Moderate
A930 Broughty Ferry Road	734	91	40	<600 0	<1,000 0	30-40 20	20	Small
Port Entry road	66	111	23	<600 0	<1,000 0	20-30 10	10	Small
A92 Greendykes Road	718	616	30	<600 0	<1,000 0	20-30 10	10	Small
A92 Arbroath Road west	1,278	971	40	1,200-1,800 20	<1,000 0	30-40 20	40	Moderate
A92 Arbroath Road east	1,295	1,126	40	1,200-1,800 20	1,000-2,000 10	30-40 20	50	Great
A972 Kingsway East	1,471	900	40	1,200-1,800 20	<1,000 0	30-40 20	40	Moderate
A90 Kingsway	2,315	2,977	40	1,800+ 30	2,000-3,000 20	30-40 20	70	Great
A90 Forfar Road	1,603	2,138	40	1,200-1,800 20	2,000-3,000 20	30-40 20	60	Great

IEMA Environmental Assessment of Traffic and Movement - Fear and Intimidation Magnitude of Change

Road	Existing Fear and Intimidation Level	Forecast Fear and Intimidation Level	Step Change in Fear and Intimidation Level	Increase in Average Hourly Traffic (All Vehicles)	Increase in Daily HGV Traffic	Condition for Medium Increase in Magnitude of Change	Fear and Intimidation Magnitude of Change
Tay Road Bridge	Great	Great	0	8	0	FALSE	Negligible
A92 East Dock Street (west)	Moderate	Moderate	0	11	28	FALSE	Negligible
A92 East Dock Street (east)	Great	Great	0	18	97	FALSE	Negligible
Market Street	Small	Small	0	18	97	FALSE	Negligible
Broughty Ferry Road	Small	Small	0	18	97	FALSE	Negligible
A92 Broughty Ferry Road	Moderate	Moderate	0	27	194	FALSE	Negligible
A930 Broughty Ferry Road	Moderate	Small	0	0	0	FALSE	Negligible
Port Entry road	Small	Small	0	0	0	FALSE	Negligible
A92 Greendykes Road	Small	Small	0	27	194	FALSE	Negligible
A92 Arbroath Road west	Moderate	Moderate	0	27	192	FALSE	Negligible
A92 Arbroath Road east	Moderate	Great	1	27	192	FALSE	Low
A972 Kingsway East	Moderate	Moderate	0	8	2	FALSE	Negligible
A90 Kingsway	Great	Great	0	8	2	FALSE	Negligible
A90 Forfar Road	Great	Great	0	8	0	FALSE	Negligible

IEMA Environmental Assessment of Traffic and Movement - Fear and Intimidation

Study Area Roads Existing Traffic						Existing Fear and Intimidation Level				
Road	Between		18-Hour Average Traffic (Veh/s / Hour)	Total 18-Hour HGV Traffic	Average Vehicle Speed (mph)	18-Hour Average Traffic (Veh/s / Hour)	Total 18-Hour HGV Traffic	Average Vehicle Speed (mph)	Degree of Hazard Score	Fear and Intimidation Level
Tay Road Bridge	Tay Bridge Roundabout	Tay Road Bridge / Dock Street Junction	1,581	714	50	1,200-1,800 20	<1,000 0	40+ 30	50	Great
A92 East Dock Street (west)	Tay Road Bridge / Dock Street Junction	A92 East Dock Street / Market Street Junction	1,325	737	40	1,200-1,800 20	<1,000 0	30-40 20	40	Moderate
A92 East Dock Street (east)	A92 East Dock Street / Market Street Junction	A92 East Dock Street / Broughty Ferry Road Junction	1,289	748	42	1,200-1,800 20	<1,000 0	40+ 30	50	Great
Market Street	Junction with A92 East Dock Street	Junction with Broughty Ferry Road	36	16	24	<600 0	<1,000 0	20-30 10	10	Small
Broughty Ferry Road	Broughty Ferry Road / Market Street Junction	A92 East Dock Street / Broughty Ferry Road Junction	333	26	31	<600 0	<1,000 0	30-40 20	20	Small
A92 Broughty Ferry Road	A92 East Dock Street / Broughty Ferry Road Junction	Broughty Ferry Road / Greendykes Road Junction	1,519	782	36	1,200-1,800 20	<1,000 0	30-40 20	40	Moderate
A930 Broughty Ferry Road	Broughty Ferry Road / Greendykes Road Junction	A930 roundabout at Port Entry road	734	91	40	600-1,200 10	<1,000 0	30-40 20	30	Moderate
Port Entry road	A930 roundabout at Port Entry road	Stannergate Road	66	111	23	<600 0	<1,000 0	20-30 10	10	Small
A92 Greendykes Road	A92 Broughty Ferry Road / A92 Greendykes Road Junction	Scott Fyffe Roundabout	691	422	30	600-1,200 10	<1,000 0	20-30 10	20	Small
A92 Arbroath Road west	Scott Fyffe Roundabout	A92 Arbroath Road / Claypotts Road Junction	1,251	779	40	1,200-1,800 20	<1,000 0	30-40 20	40	Moderate
A92 Arbroath Road east	A92 Arbroath Road / Claypotts Road Junction	Grange Junction	1,268	934	40	1,200-1,800 20	<1,000 0	30-40 20	40	Moderate
A972 Kingsway East	Scott Fyffe Roundabout	Junction with the A90 Forfar Road	1,463	898	40	1,200-1,800 20	<1,000 0	30-40 20	40	Moderate
A90 Kingsway	Junction with the A90 Forfar Road	Kingsway / Old Glamis Road Junction	2,307	2,975	40	1,800+ 30	2,000-3,000 20	30-40 20	70	Great
A90 Forfar Road	Junction with A972 Kingsway	Emmock Roundabout	1,596	2,138	40	1,200-1,800 20	2,000-3,000 20	30-40 20	60	Great

IEMA Environmental Assessment of Traffic and Movement - Fear and Intimidation

Study Area Roads Existing Traffic + Development Traffic + Cumulative Traffic				Forecast Fear and Intimidation Level				
Road	18-Hour Average Traffic (Veh/s / Hour)	Total 18-Hour HGV Traffic	Average Vehicle Speed (mph)	18-Hour Average Traffic (Veh/s / Hour)	Total 18-Hour HGV Traffic	Average Vehicle Speed (mph)	Degree of Hazard Score	Fear and Intimidation Level
Tay Road Bridge	1,597	714	50	1,200-1,800 20	<1,000 0	40+ 30	50	Great
A92 East Dock Street (west)	1,346	793	40	1,200-1,800 20	<1,000 0	30-40 20	40	Moderate
A92 East Dock Street (east)	1,324	942	42	1,200-1,800 20	<1,000 0	40+ 30	50	Great
Market Street	71	210	24	<600 0	<1,000 0	20-30 10	10	Small
Broughty Ferry Road	368	220	31	<600 0	<1,000 0	30-40 20	20	Small
A92 Broughty Ferry Road	1,573	1,170	36	1,200-1,800 20	1,000-2,000 10	30-40 20	50	Great
A930 Broughty Ferry Road	734	91	40	<600 0	<1,000 0	30-40 20	20	Small
Port Entry road	66	111	23	<600 0	<1,000 0	20-30 10	10	Small
A92 Greendykes Road	745	810	30	<600 0	<1,000 0	20-30 10	10	Small
A92 Arbroath Road west	1,305	1,163	40	1,200-1,800 20	1,000-2,000 10	30-40 20	50	Great
A92 Arbroath Road east	1,322	1,318	40	1,200-1,800 20	1,000-2,000 10	30-40 20	50	Great
A972 Kingsway East	1,479	902	40	1,200-1,800 20	<1,000 0	30-40 20	40	Moderate
A90 Kingsway	2,323	2,979	40	1,800+ 30	2,000-3,000 20	30-40 20	70	Great
A90 Forfar Road	1,611	2,138	40	1,200-1,800 20	2,000-3,000 20	30-40 20	60	Great

IEMA Environmental Assessment of Traffic and Movement - Fear and Intimidation Magnitude of Change

Road	Existing Fear and Intimidation Level	Forecast Fear and Intimidation Level	Step Change in Fear and Intimidation Level	Increase in Average Hourly Traffic (All Vehicles)	Increase in Daily HGV Traffic	Condition for Medium Increase in Magnitude of Change	Fear and Intimidation Magnitude of Change
Tay Road Bridge	Great	Great	0	16	0	FALSE	Negligible
A92 East Dock Street (west)	Moderate	Moderate	0	21	56	FALSE	Negligible
A92 East Dock Street (east)	Great	Great	0	35	194	FALSE	Negligible
Market Street	Small	Small	0	35	194	FALSE	Negligible
Broughty Ferry Road	Small	Small	0	35	194	FALSE	Negligible
A92 Broughty Ferry Road	Moderate	Great	1	54	388	FALSE	Low
A930 Broughty Ferry Road	Moderate	Small	0	0	0	FALSE	Negligible
Port Entry road	Small	Small	0	0	0	FALSE	Negligible
A92 Greendykes Road	Small	Small	0	54	388	FALSE	Negligible
A92 Arbroath Road west	Moderate	Great	1	54	384	FALSE	Low
A92 Arbroath Road east	Moderate	Great	1	54	384	FALSE	Low
A972 Kingsway East	Moderate	Moderate	0	16	4	FALSE	Negligible
A90 Kingsway	Great	Great	0	16	4	FALSE	Negligible
A90 Forfar Road	Great	Great	0	16	0	FALSE	Negligible

Appendix H – Accident Severity Assessment

Study Area Roads			Baseline Accident Rates per 1 Million Vehicle Kilometres									Forecast Development Traffic Accidents				
Road	Between		Length of Road (Km)	Baseline Total Vehicles	Baseline Vehicle Km	Recorded Injury Accidents			Recorded Injury Accidents per 1 Million Vehicle Km			Development Total Vehicles	Development Vehicle Km	Forecast Injusy Accidents		
						Slight	Serious	Fatal	Slight	Serious	Fatal			Slight	Serious	Fatal
Tay Road Bridge	Tay Bridge Roundabout	Tay Road Bridge / Dock Street Junction	3	42,503,520	106,258,800	0	1	0	0.000E+00	9.411E-03	0.000E+00	82,368	205,920	0.00	0.00	0.00
A92 East Dock Street (west)	Tay Road Bridge / Dock Street Junction	A92 East Dock Street / Market Street Junction	1	35,645,900	39,210,490	6	0	0	1.530E-01	0.000E+00	0.000E+00	111,936	123,130	0.02	0.00	0.00
A92 East Dock Street (east)	A92 East Dock Street / Market Street Junction	A92 East Dock Street / Broughty Ferry Road Junction	1	34,676,460	34,676,460	2	0	0	5.768E-02	0.000E+00	0.000E+00	184,800	184,800	0.01	0.00	0.00
Market Street	Junction with A92 East Dock Street	Junction with Broughty Ferry Road	1	962,140	962,140	0	0	0	0.000E+00	0.000E+00	0.000E+00	184,800	184,800	0.00	0.00	0.00
Broughty Ferry Road	Broughty Ferry Road / Market Street Junction	A92 East Dock Street / Broughty Ferry Road Junction	1	8,945,420	8,945,420	0	0	0	0.000E+00	0.000E+00	0.000E+00	184,800	184,800	0.00	0.00	0.00
A92 Broughty Ferry Road	A92 East Dock Street / Broughty Ferry Road Junction	Broughty Ferry Road / Greendykes Road Junction	1	40,862,480	40,862,480	7	0	0	1.713E-01	0.000E+00	0.000E+00	287,232	287,232	0.05	0.00	0.00
A930 Broughty Ferry Road	Broughty Ferry Road / Greendykes Road Junction	A930 roundabout at Port Entry road	1	19,717,300	19,717,300	1	3	0	5.072E-02	1.522E-01	0.000E+00	0	0	0.00	0.00	0.00
Port Entry road	A930 roundabout at Port Entry road	Stannergate Road	1	1,735,940	1,735,940	0	0	0	0.000E+00	0.000E+00	0.000E+00	0	0	0.00	0.00	0.00
A92 Greendykes Road	A92 Broughty Ferry Road / A92 Greendykes Road Junction	Scott Fyffe Roundabout	1	18,572,660	18,572,660	2	1	0	1.077E-01	5.384E-02	0.000E+00	287,232	287,232	0.03	0.02	0.00
A92 Arbroath Road west	Scott Fyffe Roundabout	A92 Arbroath Road / Claypotts Road Junction	2	33,626,720	67,253,440	3	1	0	4.461E-02	1.487E-02	0.000E+00	285,120	570,240	0.03	0.01	0.00
A92 Arbroath Road east	A92 Arbroath Road / Claypotts Road Junction	Grange Junction	3	34,085,160	112,481,028	3	2	0	2.667E-02	1.778E-02	0.000E+00	285,120	940,896	0.03	0.02	0.00
A972 Kingsway East	Scott Fyffe Roundabout	Junction with the A90 Forfar Road	2	39,323,640	78,647,280	2	4	0	2.543E-02	5.086E-02	0.000E+00	84,480	168,960	0.00	0.01	0.00
A90 Kingsway	Junction with the A90 Forfar Road	Kingsway / Old Glamis Road Junction	1	62,014,960	86,820,944	3	0	0	3.455E-02	0.000E+00	0.000E+00	84,480	118,272	0.00	0.00	0.00
A90 Forfar Road	Junction with A972 Kingsway	Emmock Roundabout	2	42,888,960	85,777,920	5	1	0	5.829E-02	1.166E-02	0.000E+00	82,368	164,736	0.01	0.00	0.00

Study Area Roads Total Forecast Development Accidents	Slight	Serious	Fatal
	0.18	0.05	0.00

Forecast Development Traffic Average Accidents per Study Area Road	Slight	Serious	Fatal
	0.01	0.00	0.00

Road	Average Daily Traffic	Days Per Year	Traffic per Annum	Recorded Accident Period (Years)	Total Traffic for Accident Period
Tay Road Bridge	29,112	365	10,625,880	4	42,503,520
A92 East Dock Street (west)	24,415	365	8,911,475	4	35,645,900
A92 East Dock Street (east)	23,751	365	8,669,115	4	34,676,460
Market Street	659	365	240,535	4	962,140
Broughty Ferry Road	6,127	365	2,236,355	4	8,945,420
A92 Broughty Ferry Road	27,988	365	10,215,620	4	40,862,480
A930 Broughty Ferry Road	13,505	365	4,929,325	4	19,717,300
Port Entry road	1,189	365	433,985	4	1,735,940
A92 Greendykes Road	12,721	365	4,643,165	4	18,572,660
A92 Arbroath Road west	23,032	365	8,406,680	4	33,626,720
A92 Arbroath Road east	23,346	365	8,521,290	4	34,085,160
A972 Kingsway East	26,934	365	9,830,910	4	39,323,640
A90 Kingsway	42,476	365	15,503,740	4	62,014,960
A90 Forfar Road	29,376	365	10,722,240	4	42,888,960

Number of Stdy Area Roads	14

Road	Average Daily Traffic	Days Per Year	Traffic per Annum	Recorded Accident Period (Years)	Total Development Traffic for Accident Period
Tay Road Bridge	78	264	20,592	4	82,368
A92 East Dock Street (west)	106	264	27,984	4	111,936
A92 East Dock Street (east)	175	264	46,200	4	184,800
Market Street	175	264	46,200	4	184,800
Broughty Ferry Road	175	264	46,200	4	184,800
A92 Broughty Ferry Road	272	264	71,808	4	287,232
A930 Broughty Ferry Road	0	264	0	4	0
Port Entry road	0	264	0	4	0
A92 Greendykes Road	272	264	71,808	4	287,232
A92 Arbroath Road west	270	264	71,280	4	285,120
A92 Arbroath Road east	270	264	71,280	4	285,120
A972 Kingsway East	80	264	21,120	4	84,480
A90 Kingsway	80	264	21,120	4	84,480
A90 Forfar Road	78	264	20,592	4	82,368

Vehicle Km Metric
1,000,000

Study Area Roads			Baseline Accident Rates per 1 Million Vehicle Kilometres									Forecast Cumulative Development Traffic Accidents				
Road	Between		Length of Road (Km)	Baseline Total Vehicles	Baseline Vehicle Km	Recorded Injury Accidents			Recorded Injury Accidents per 1 Million Vehicle Km			Development Total Vehicles	Development Vehicle Km	Forecast Injusy Accidents		
						Slight	Serious	Fatal	Slight	Serious	Fatal			Slight	Serious	Fatal
Tay Road Bridge	Tay Bridge Roundabout	Tay Road Bridge / Dock Street Junction	3	42,503,520	106,258,800	0	1	0	0.000E+00	9.411E-03	0.000E+00	164,736	411,840	0.0	0.0	0.0
A92 East Dock Street (west)	Tay Road Bridge / Dock Street Junction	A92 East Dock Street / Market Street Junction	1	35,645,900	39,210,490	6	0	0	1.530E-01	0.000E+00	0.000E+00	223,872	246,259	0.0	0.0	0.0
A92 East Dock Street (east)	A92 East Dock Street / Market Street Junction	A92 East Dock Street / Broughty Ferry Road Junction	1	34,676,460	34,676,460	2	0	0	5.768E-02	0.000E+00	0.000E+00	369,600	369,600	0.0	0.0	0.0
Market Street	Junction with A92 East Dock Street	Junction with Broughty Ferry Road	1	962,140	962,140	0	0	0	0.000E+00	0.000E+00	0.000E+00	369,600	369,600	0.0	0.0	0.0
Broughty Ferry Road	Broughty Ferry Road / Market Street Junction	A92 East Dock Street / Broughty Ferry Road Junction	1	8,945,420	8,945,420	0	0	0	0.000E+00	0.000E+00	0.000E+00	369,600	369,600	0.0	0.0	0.0
A92 Broughty Ferry Road	A92 East Dock Street / Broughty Ferry Road Junction	Broughty Ferry Road / Greendykes Road Junction	1	40,862,480	40,862,480	7	0	0	1.713E-01	0.000E+00	0.000E+00	574,464	574,464	0.1	0.0	0.0
A930 Broughty Ferry Road	Broughty Ferry Road / Greendykes Road Junction	A930 roundabout at Port Entry road	1	19,717,300	19,717,300	1	3	0	5.072E-02	1.522E-01	0.000E+00	0	0	0.0	0.0	0.0
Port Entry road	A930 roundabout at Port Entry road	Stannergate Road	1	1,735,940	1,735,940	0	0	0	0.000E+00	0.000E+00	0.000E+00	0	0	0.0	0.0	0.0
A92 Greendykes Road	A92 Broughty Ferry Road / A92 Greendykes Road Junction	Scott Fyffe Roundabout	1	18,572,660	18,572,660	2	1	0	1.077E-01	5.384E-02	0.000E+00	574,464	574,464	0.1	0.0	0.0
A92 Arbroath Road west	Scott Fyffe Roundabout	A92 Arbroath Road / Claypotts Road Junction	2	33,626,720	67,253,440	3	1	0	4.461E-02	1.487E-02	0.000E+00	570,240	1,140,480	0.1	0.0	0.0
A92 Arbroath Road east	A92 Arbroath Road / Claypotts Road Junction	Grange Junction	3	34,085,160	112,481,028	3	2	0	2.667E-02	1.778E-02	0.000E+00	570,240	1,881,792	0.1	0.0	0.0
A972 Kingsway East	Scott Fyffe Roundabout	Junction with the A90 Forfar Road	2	39,323,640	78,647,280	2	4	0	2.543E-02	5.086E-02	0.000E+00	168,960	337,920	0.0	0.0	0.0
A90 Kingsway	Junction with the A90 Forfar Road	Kingsway / Old Glamis Road Junction	1	62,014,960	86,820,944	3	0	0	3.455E-02	0.000E+00	0.000E+00	168,960	236,544	0.0	0.0	0.0
A90 Forfar Road	Junction with A972 Kingsway	Emmock Roundabout	2	42,888,960	85,777,920	5	1	0	5.829E-02	1.166E-02	0.000E+00	164,736	329,472	0.0	0.0	0.0

Study Area Roads Total Forecast Development Accidents	Slight	Serious	Fatal
	0.36	0.11	0.00

Forecast Development Traffic Average Accidents per Study Area Road	Slight	Serious	Fatal
	0.03	0.01	0.00

Road	Average Daily Traffic	Days Per Year	Traffic per Annum	Recorded Accident Period (Years)	Total Traffic for Accident Period
Tay Road Bridge	29,112	365	10,625,880	4	42,503,520
A92 East Dock Street (west)	24,415	365	8,911,475	4	35,645,900
A92 East Dock Street (east)	23,751	365	8,669,115	4	34,676,460
Market Street	659	365	240,535	4	962,140
Broughty Ferry Road	6,127	365	2,236,355	4	8,945,420
A92 Broughty Ferry Road	27,988	365	10,215,620	4	40,862,480
A930 Broughty Ferry Road	13,505	365	4,929,325	4	19,717,300
Port Entry road	1,189	365	433,985	4	1,735,940
A92 Greendykes Road	12,721	365	4,643,165	4	18,572,660
A92 Arbroath Road west	23,032	365	8,406,680	4	33,626,720
A92 Arbroath Road east	23,346	365	8,521,290	4	34,085,160
A972 Kingsway East	26,934	365	9,830,910	4	39,323,640
A90 Kingsway	42,476	365	15,503,740	4	62,014,960
A90 Forfar Road	29,376	365	10,722,240	4	42,888,960

Number of Stdy Area Roads	14

Road	Average Daily Traffic	Days Per Year	Traffic per Annum	Recorded Accident Period (Years)	Total Development Traffic for Accident Period
Tay Road Bridge	156	264	41,184	4	164,736
A92 East Dock Street (west)	212	264	55,968	4	223,872
A92 East Dock Street (east)	350	264	92,400	4	369,600
Market Street	350	264	92,400	4	369,600
Broughty Ferry Road	350	264	92,400	4	369,600
A92 Broughty Ferry Road	544	264	143,616	4	574,464
A930 Broughty Ferry Road	0	264	0	4	0
Port Entry road	0	264	0	4	0
A92 Greendykes Road	544	264	143,616	4	574,464
A92 Arbroath Road west	540	264	142,560	4	570,240
A92 Arbroath Road east	540	264	142,560	4	570,240
A972 Kingsway East	160	264	42,240	4	168,960
A90 Kingsway	160	264	42,240	4	168,960
A90 Forfar Road	156	264	41,184	4	164,736

Vehicle Km Metric
1,000,000

Appendix I – Junction Modelling Outputs

Junctions 10

PICADY 10 - Priority Intersection Module

Version: 10.1.1.1905

Filename: A92 - Broughty Ferry Road.j10
Path: C:\Users\Jamie.Graham\OneDrive - AECOM\Documents\Dundee Substation\Junction Models
Report generation date: 25/04/2025 17:12:44

Summary of junction performance

	AM									PM								
	Set ID	Queue (PCU)	95% Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Set ID	Queue (PCU)	95% Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
	2027 Baseline - 2027 Baseline																	
Stream B-AC	A1 D1	0.5	2.2	9.60	0.33	A	6.19	A	0 % [Stream C-B]	A1 D2	6.4	31.6	75.44	0.90	F	8.24	A	-9 % [Stream B-AC]
Stream C-B		4.5	24.4	35.80	0.83	E					0.8	4.0	18.62	0.46	C			

	AM									PM								
	Set ID	Queue (PCU)	95% Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Set ID	Queue (PCU)	95% Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
	2027 with Development - 2027 with Development																	
Stream B-AC	A2 D3	0.5	2.2	9.67	0.33	A	12.20	B	-9 % [Stream C-B]	A2 D4	7.7	34.8	88.72	0.92	F	9.50	A	-11 % [Stream B-AC]
Stream C-B		9.5	45.5	67.96	0.93	F					1.1	5.3	22.68	0.51	C			

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. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	
Location	
Site number	
Date	24/04/2025
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	NA\Jamie.Graham
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

The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Show lane queues in feet / metres	Show all PICADY stream intercepts	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)	Use simulation for HCM roundabouts	Use iterations for HCM roundabouts
5.75	✓				✓	Delay	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	2027 Baseline	AM	ONE HOUR	07:45	09:15	15	✓
D2	2027 Baseline	PM	ONE HOUR	16:30	18:00	15	✓
D3	2027 with Development	AM	ONE HOUR	07:45	09:15	15	✓
D4	2027 with Development	PM	ONE HOUR	16:30	18:00	15	✓

2027 Baseline - 2027 Baseline, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	2027 Baseline	✓	✓	D1,D2	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		6.19	A

Junction Network

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold	Network delay (s)	Network LOS
Left	Normal/unknown	0	Stream C-B	6.19	A

Arms

Arms

Arm	Name	Description	Arm type
A	untitled		Major
B	untitled		Minor
C	untitled		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right-turn storage	Width for right-turn storage (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	12.85		✓	4.28	67.1		-

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 (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	4.10	146	47

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	609	0.081	0.205	0.129	0.293
B-C	726	0.075	0.189	-	-
C-B	752	0.204	0.204	-	-

The slopes and intercepts shown above include custom intercept adjustments only.
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	2027 Baseline	AM	ONE HOUR	07:45	09:15	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	756	100.000
B		ONE HOUR	✓	169	100.000
C		ONE HOUR	✓	1881	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	0	756
	B	0	0	169
	C	1441	440	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To		
		A	B	C
From	A	0	0	4
	B	0	0	2
	C	2	1	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max 95th percentile Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.33	9.60	0.5	2.2	A	155	233
C-A						1322	1983
C-B	0.83	35.80	4.5	24.4	E	404	606
A-B						0	0
A-C						694	1041

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-AC	127	32	618	0.206	126	0.0	0.3	7.448	A
C-A	1085	271			1085				
C-B	331	83	635	0.522	327	0.0	1.1	11.644	B
A-B	0	0			0				
A-C	569	142			569				

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-AC	152	38	597	0.254	152	0.3	0.3	8.232	A
C-A	1295	324			1295				
C-B	396	99	613	0.646	393	1.1	1.8	16.331	C
A-B	0	0			0				
A-C	680	170			680				

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-AC	186	47	568	0.327	185	0.3	0.5	9.574	A
C-A	1587	397			1587				
C-B	484	121	581	0.833	475	1.8	4.2	31.481	D
A-B	0	0			0				
A-C	832	208			832				

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-AC	186	47	568	0.327	186	0.5	0.5	9.602	A
C-A	1587	397			1587				
C-B	484	121	581	0.833	483	4.2	4.5	35.803	E
A-B	0	0			0				
A-C	832	208			832				

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-AC	152	38	597	0.254	152	0.5	0.4	8.266	A
C-A	1295	324			1295				
C-B	396	99	613	0.646	406	4.5	1.9	18.391	C
A-B	0	0			0				
A-C	680	170			680				

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-AC	127	32	618	0.206	128	0.4	0.3	7.488	A
C-A	1085	271			1085				
C-B	331	83	635	0.522	334	1.9	1.1	12.217	B
A-B	0	0			0				
A-C	569	142			569				

Queue Variation Results for each time segment

07:45 - 08:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.26	0.00	0.00	0.26	0.26			N/A	N/A
C-B	1.07	0.56	1.01	1.41	1.46			N/A	N/A

08:00 - 08:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.34	0.00	0.00	0.34	0.34			N/A	N/A
C-B	1.76	0.08	1.16	3.85	5.32			N/A	N/A

08:15 - 08:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.49	0.03	0.26	0.49	0.50			N/A	N/A
C-B	4.20	0.04	0.43	11.57	21.65			N/A	N/A

08:30 - 08:45

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.49	0.03	0.31	1.38	2.20			N/A	N/A
C-B	4.54	0.03	0.34	8.91	24.39			N/A	N/A

08:45 - 09:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.35	0.00	0.00	0.35	0.35			N/A	N/A
C-B	1.93	0.04	0.43	5.21	9.03			N/A	N/A

09:00 - 09:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.27	0.00	0.00	0.27	0.27			N/A	N/A
C-B	1.13	0.03	0.33	2.53	5.70			N/A	N/A

2027 Baseline - 2027 Baseline, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	2027 Baseline	✓	✓	D1,D2	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		8.24	A

Junction Network

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold	Network delay (s)	Network LOS
Left	Normal/unknown	-9	Stream B-AC	8.24	A

Arms

Arms

Arm	Name	Description	Arm type
A	untitled		Major
B	untitled		Minor
C	untitled		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right-turn storage	Width for right-turn storage (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	12.85		✓	4.28	67.1		-

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 (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	4.10	146	47

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	609	0.081	0.205	0.129	0.293
B-C	726	0.075	0.189	-	-
C-B	752	0.204	0.204	-	-

The slopes and intercepts shown above include custom intercept adjustments only.
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
D2	2027 Baseline	PM	ONE HOUR	16:30	18:00	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	1717	100.000
B		ONE HOUR	✓	302	100.000
C		ONE HOUR	✓	1089	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	14	1703
	B	0	0	302
	C	938	151	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

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

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max 95th percentile Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.90	75.44	6.4	31.6	F	277	416
C-A						861	1291
C-B	0.46	18.62	0.8	4.0	C	139	208
A-B						13	19
A-C						1563	2344

Main Results for each time segment

16:30 - 16:45

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-AC	227	57	483	0.471	224	0.0	0.9	13.876	B
C-A	706	177			706				
C-B	114	28	487	0.233	112	0.0	0.3	9.859	A
A-B	11	3			11				
A-C	1282	321			1282				

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-AC	271	68	435	0.624	269	0.9	1.6	21.441	C
C-A	843	211			843				
C-B	136	34	436	0.311	135	0.3	0.5	12.298	B
A-B	13	3			13				
A-C	1531	383			1531				

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-AC	333	83	370	0.898	317	1.6	5.4	56.996	F
C-A	1033	258			1033				
C-B	166	42	365	0.455	165	0.5	0.8	18.365	C
A-B	15	4			15				
A-C	1875	469			1875				

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-AC	333	83	370	0.898	328	5.4	6.4	75.441	F
C-A	1033	258			1033				
C-B	166	42	365	0.455	166	0.8	0.8	18.622	C
A-B	15	4			15				
A-C	1875	469			1875				

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-AC	271	68	435	0.624	290	6.4	1.8	27.736	D
C-A	843	211			843				
C-B	136	34	436	0.311	137	0.8	0.5	12.467	B
A-B	13	3			13				
A-C	1531	383			1531				

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-AC	227	57	483	0.471	231	1.8	0.9	14.628	B
C-A	706	177			706				
C-B	114	28	487	0.233	114	0.5	0.3	9.956	A
A-B	11	3			11				
A-C	1282	321			1282				

Queue Variation Results for each time segment

16:30 - 16:45

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.87	0.56	1.01	1.41	1.46			N/A	N/A
C-B	0.31	0.00	0.00	0.31	0.31			N/A	N/A

16:45 - 17:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	1.58	0.08	1.06	3.44	4.76			N/A	N/A
C-B	0.46	0.00	0.00	0.46	0.46			N/A	N/A

17:00 - 17:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	5.42	0.08	1.33	14.94	22.44			N/A	N/A
C-B	0.83	0.03	0.27	0.83	0.89			N/A	N/A

17:15 - 17:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	6.45	0.05	0.78	18.61	31.63			N/A	N/A
C-B	0.85	0.03	0.31	1.13	4.03			N/A	N/A

17:30 - 17:45

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	1.78	0.04	0.38	4.65	8.85			N/A	N/A
C-B	0.47	0.04	0.41	1.26	1.40			N/A	N/A

17:45 - 18:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.93	0.03	0.30	1.19	4.42			N/A	N/A
C-B	0.32	0.03	0.29	0.65	1.10			N/A	N/A

2027 with Development - 2027 with Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	2027 with Development	✓	✓	D3,D4	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		12.20	B

Junction Network

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold	Network delay (s)	Network LOS
Left	Normal/unknown	-9	Stream C-B	12.20	B

Arms

Arms

Arm	Name	Description	Arm type
A	untitled		Major
B	untitled		Minor
C	untitled		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right-turn storage	Width for right-turn storage (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	12.85		✓	4.28	67.1		-

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 (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	4.10	146	47

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	609	0.081	0.205	0.129	0.293
B-C	726	0.075	0.189	-	-
C-B	752	0.204	0.204	-	-

The slopes and intercepts shown above include custom intercept adjustments only.
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
D3	2027 with Development	AM	ONE HOUR	07:45	09:15	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	768	100.000
B		ONE HOUR	✓	169	100.000
C		ONE HOUR	✓	1932	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	0	768
	B	0	0	169
	C	1441	491	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To		
		A	B	C
From	A	0	0	5
	B	0	0	2
	C	2	3	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max 95th percentile Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.33	9.67	0.5	2.2	A	155	233
C-A						1322	1983
C-B	0.93	67.96	9.5	45.5	F	451	676
A-B						0	0
A-C						705	1057

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-AC	127	32	617	0.206	126	0.0	0.3	7.474	A
C-A	1085	271			1085				
C-B	370	92	633	0.584	364	0.0	1.4	13.511	B
A-B	0	0			0				
A-C	578	145			578				

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-AC	152	38	595	0.255	152	0.3	0.3	8.270	A
C-A	1295	324			1295				
C-B	441	110	610	0.723	437	1.4	2.5	20.843	C
A-B	0	0			0				
A-C	690	173			690				

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-AC	186	47	566	0.329	185	0.3	0.5	9.621	A
C-A	1587	397			1587				
C-B	541	135	579	0.934	519	2.5	7.8	49.983	E
A-B	0	0			0				
A-C	846	211			846				

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-AC	186	47	566	0.329	186	0.5	0.5	9.665	A
C-A	1587	397			1587				
C-B	541	135	579	0.934	534	7.8	9.5	67.957	F
A-B	0	0			0				
A-C	846	211			846				

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-AC	152	38	595	0.255	152	0.5	0.4	8.303	A
C-A	1295	324			1295				
C-B	441	110	610	0.723	468	9.5	2.9	29.703	D
A-B	0	0			0				
A-C	690	173			690				

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-AC	127	32	617	0.206	128	0.4	0.3	7.514	A
C-A	1085	271			1085				
C-B	370	92	633	0.584	375	2.9	1.5	14.673	B
A-B	0	0			0				
A-C	578	145			578				

Queue Variation Results for each time segment

07:45 - 08:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.26	0.00	0.00	0.26	0.26			N/A	N/A
C-B	1.39	0.59	1.26	1.74	1.90			N/A	N/A

08:00 - 08:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.35	0.00	0.00	0.35	0.35			N/A	N/A
C-B	2.49	0.08	1.37	5.98	8.44			N/A	N/A

08:15 - 08:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.49	0.03	0.26	0.49	0.50			N/A	N/A
C-B	7.84	0.10	2.47	21.41	31.49			N/A	N/A

08:30 - 08:45

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.50	0.03	0.31	1.38	2.22			N/A	N/A
C-B	9.53	0.07	1.49	27.80	45.46			N/A	N/A

08:45 - 09:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.35	0.00	0.00	0.35	0.35			N/A	N/A
C-B	2.93	0.04	0.42	7.94	14.88			N/A	N/A

09:00 - 09:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.27	0.00	0.00	0.27	0.27			N/A	N/A
C-B	1.50	0.03	0.32	2.48	7.59			N/A	N/A

2027 with Development - 2027 with Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	2027 with Development	✓	✓	D3,D4	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		9.50	A

Junction Network

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold	Network delay (s)	Network LOS
Left	Normal/unknown	-11	Stream B-AC	9.50	A

Arms

Arms

Arm	Name	Description	Arm type
A	untitled		Major
B	untitled		Minor
C	untitled		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right-turn storage	Width for right-turn storage (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	12.85		✓	4.28	67.1		-

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 (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	4.10	146	47

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	609	0.081	0.205	0.129	0.293
B-C	726	0.075	0.189	-	-
C-B	752	0.204	0.204	-	-

The slopes and intercepts shown above include custom intercept adjustments only.
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
D4	2027 with Development	PM	ONE HOUR	16:30	18:00	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	1768	100.000
B		ONE HOUR	✓	302	100.000
C		ONE HOUR	✓	1140	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	14	1754
	B	0	0	302
	C	977	163	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To		
		A	B	C
From	A	0	0	2
	B	0	0	1
	C	1	10	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max 95th percentile Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.92	88.72	7.7	34.8	F	277	416
C-A						897	1345
C-B	0.51	22.68	1.1	5.3	C	150	224
A-B						13	19
A-C						1610	2414

Main Results for each time segment

16:30 - 16:45

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-AC	227	57	475	0.478	224	0.0	0.9	14.260	B
C-A	736	184			736				
C-B	123	31	479	0.256	121	0.0	0.4	11.010	B
A-B	11	3			11				
A-C	1321	330			1321				

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-AC	271	68	427	0.636	268	0.9	1.7	22.536	C
C-A	878	220			878				
C-B	147	37	427	0.343	146	0.4	0.6	14.057	B
A-B	13	3			13				
A-C	1577	394			1577				

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-AC	333	83	360	0.925	314	1.7	6.2	64.015	F
C-A	1076	269			1076				
C-B	179	45	354	0.507	177	0.6	1.1	22.202	C
A-B	15	4			15				
A-C	1931	483			1931				

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-AC	333	83	360	0.925	327	6.2	7.7	88.719	F
C-A	1076	269			1076				
C-B	179	45	354	0.507	179	1.1	1.1	22.681	C
A-B	15	4			15				
A-C	1931	483			1931				

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-AC	271	68	427	0.636	295	7.7	1.9	31.434	D
C-A	878	220			878				
C-B	147	37	427	0.343	149	1.1	0.6	14.341	B
A-B	13	3			13				
A-C	1577	394			1577				

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-AC	227	57	475	0.478	231	1.9	1.0	15.109	C
C-A	736	184			736				
C-B	123	31	479	0.256	124	0.6	0.4	11.152	B
A-B	11	3			11				
A-C	1321	330			1321				

Queue Variation Results for each time segment

16:30 - 16:45

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.90	0.56	1.01	1.41	1.46			N/A	N/A
C-B	0.37	0.00	0.00	0.37	0.37			N/A	N/A

16:45 - 17:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	1.66	0.07	1.06	3.71	5.14			N/A	N/A
C-B	0.56	0.56	1.10	1.54	1.60			N/A	N/A

17:00 - 17:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	6.20	0.11	2.20	16.42	23.70			N/A	N/A
C-B	1.08	0.03	0.30	1.08	2.28			N/A	N/A

17:15 - 17:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	7.66	0.07	1.17	22.05	34.82			N/A	N/A
C-B	1.11	0.03	0.33	1.42	5.26			N/A	N/A

17:30 - 17:45

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	1.90	0.04	0.38	4.90	9.61			N/A	N/A
C-B	0.59	0.05	0.52	1.44	1.56			N/A	N/A

17:45 - 18:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.95	0.03	0.30	1.48	4.35			N/A	N/A
C-B	0.38	0.04	0.36	1.18	1.43			N/A	N/A

Junctions 10

PICADY 10 - Priority Intersection Module

Version: 10.1.1.1905

Filename: A92 - Market Street.j10
Path: C:\Users\Jamie.Graham\OneDrive - AECOM\Documents\Dundee Substation\Junction Models
Report generation date: 25/04/2025 17:14:05

Summary of junction performance

	AM									PM								
	Set ID	Queue (PCU)	95% Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Set ID	Queue (PCU)	95% Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
	2027 Baseline - 2027 Baseline																	
Stream B-AC	A1 D1	0.1	0.5	16.37	0.06	C	0.10	A	31 % [Stream B-AC]	A1 D2	0.2	0.9	29.47	0.17	D	0.26	A	2 % [Stream B-AC]
Stream C-B		0.0	0.5	6.69	0.01	A					0.0	0.5	11.42	0.02	B			

	AM									PM								
	Set ID	Queue (PCU)	95% Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Set ID	Queue (PCU)	95% Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
	2027 With Development - 2027 with Development																	
Stream B-AC	A2 D3	0.1	0.7	17.04	0.09	C	0.20	A	32 % [Stream B-AC]	A2 D4	0.7	2.9	33.17	0.35	D	0.89	A	1 % [Stream B-AC]
Stream C-B		0.0	0.5	6.81	0.01	A					0.0	0.5	11.44	0.02	B			

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. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

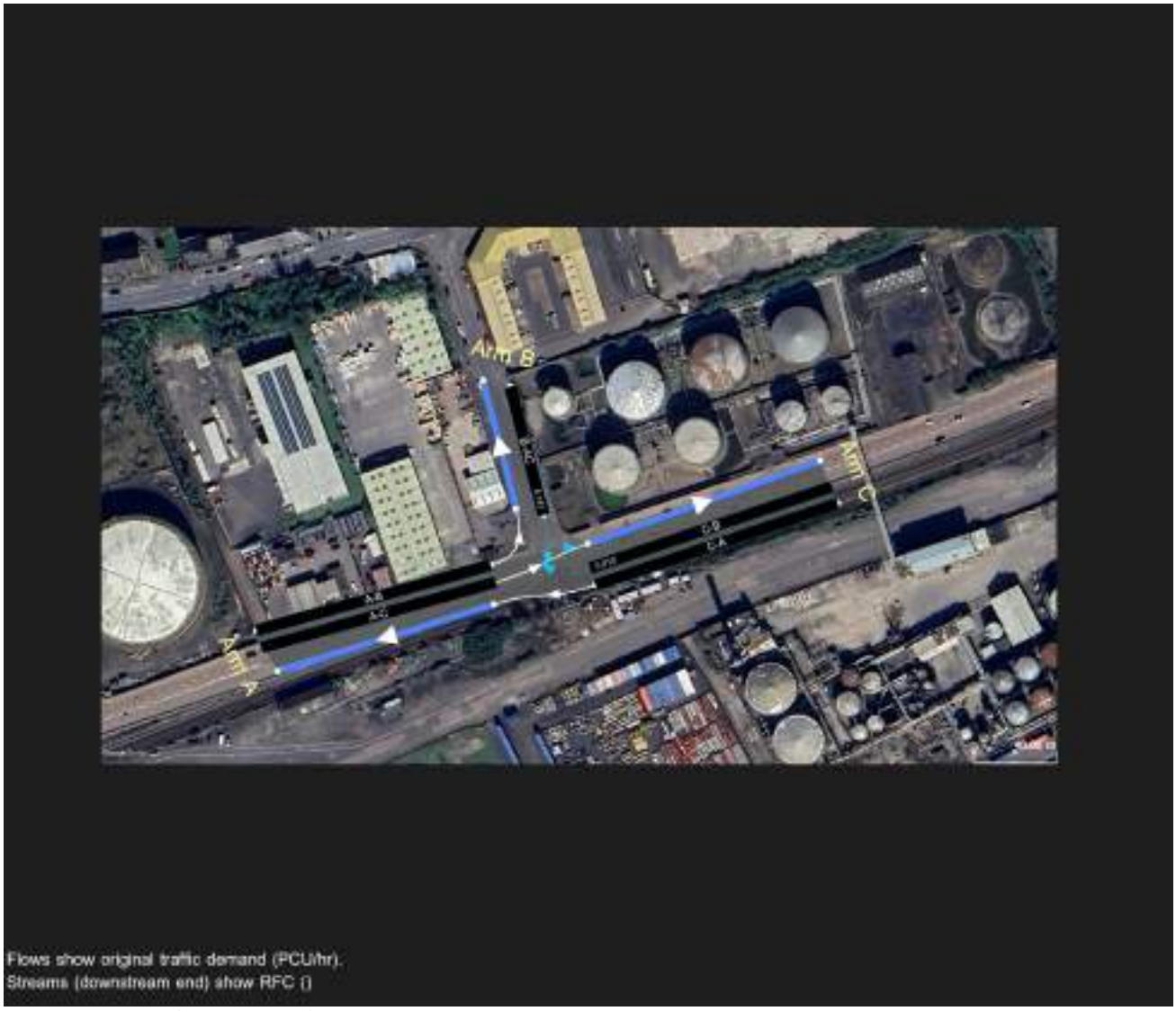
File summary

File Description

Title	
Location	
Site number	
Date	24/04/2025
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	NA\Jamie.Graham
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



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Show lane queues in feet / metres	Show all PICADY stream intercepts	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)	Use simulation for HCM roundabouts	Use iterations for HCM roundabouts
5.75	✓				✓	Delay	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	2027 Baseline	AM	ONE HOUR	07:45	09:15	15	✓
D2	2027 Baseline	PM	ONE HOUR	16:30	18:00	15	✓
D3	2027 with Development	AM	ONE HOUR	07:45	09:15	15	✓
D4	2027 with Development	PM	ONE HOUR	16:30	18:00	15	✓

2027 Baseline - 2027 Baseline, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	2027 Baseline	✓	✓	D1,D2	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		0.10	A

Junction Network

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold	Network delay (s)	Network LOS
Left	Normal/unknown	31	Stream B-AC	0.10	A

Arms

Arms

Arm	Name	Description	Arm type
A	untitled		Major
B	untitled		Minor
C	untitled		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right-turn storage	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	12.21			237.9		-

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 (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	3.72	31	23

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	535	0.072	0.182	0.114	0.260
B-C	685	0.076	0.192	-	-
C-B	712	0.201	0.201	-	-

The slopes and intercepts shown above include custom intercept adjustments only.
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	2027 Baseline	AM	ONE HOUR	07:45	09:15	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	768	100.000
B		ONE HOUR	✓	13	100.000
C		ONE HOUR	✓	1446	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	18	750
	B	10	0	3
	C	1443	3	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To		
		A	B	C
From	A	0	0	4
	B	0	0	0
	C	3	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max 95th percentile Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.06	16.37	0.1	0.5	C	12	18
C-A						1324	1986
C-B	0.01	6.69	0.0	0.5	A	3	4
A-B						17	25
A-C						688	1032

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-AC	10	2	344	0.028	10	0.0	0.0	10.779	B
C-A	1086	272			1086				
C-B	2	0.56	595	0.004	2	0.0	0.0	6.069	A
A-B	14	3			14				
A-C	565	141			565				

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-AC	12	3	298	0.039	12	0.0	0.0	12.550	B
C-A	1297	324			1297				
C-B	3	0.67	573	0.005	3	0.0	0.0	6.314	A
A-B	16	4			16				
A-C	674	169			674				

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-AC	14	4	234	0.061	14	0.0	0.1	16.356	C
C-A	1589	397			1589				
C-B	3	0.83	541	0.006	3	0.0	0.0	6.688	A
A-B	20	5			20				
A-C	826	206			826				

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-AC	14	4	234	0.061	14	0.1	0.1	16.369	C
C-A	1589	397			1589				
C-B	3	0.83	541	0.006	3	0.0	0.0	6.688	A
A-B	20	5			20				
A-C	826	206			826				

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-AC	12	3	298	0.039	12	0.1	0.0	12.563	B
C-A	1297	324			1297				
C-B	3	0.67	573	0.005	3	0.0	0.0	6.314	A
A-B	16	4			16				
A-C	674	169			674				

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-AC	10	2	344	0.028	10	0.0	0.0	10.790	B
C-A	1086	272			1086				
C-B	2	0.56	595	0.004	2	0.0	0.0	6.072	A
A-B	14	3			14				
A-C	565	141			565				

Queue Variation Results for each time segment

07:45 - 08:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.03	0.00	0.00	0.03	0.03			N/A	N/A
C-B	0.00	0.00	0.00	0.00	0.00			N/A	N/A

08:00 - 08:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.04	0.03	0.25	0.45	0.48			N/A	N/A
C-B	0.00	0.00	0.25	0.45	0.48			N/A	N/A

08:15 - 08:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.06	0.03	0.26	0.47	0.49			N/A	N/A
C-B	0.01	0.00	0.00	0.01	0.01			N/A	N/A

08:30 - 08:45

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.06	0.00	0.00	0.06	0.06			N/A	N/A
C-B	0.01	0.00	0.00	0.01	0.01			N/A	N/A

08:45 - 09:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.04	0.00	0.00	0.04	0.04			N/A	N/A
C-B	0.00	0.00	0.00	0.00	0.00			N/A	N/A

09:00 - 09:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.03	0.00	0.00	0.03	0.03			N/A	N/A
C-B	0.00	0.00	0.00	0.00	0.00			N/A	N/A

2027 Baseline - 2027 Baseline, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	2027 Baseline	✓	✓	D1,D2	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		0.26	A

Junction Network

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold	Network delay (s)	Network LOS
Left	Normal/unknown	2	Stream B-AC	0.26	A

Arms

Arms

Arm	Name	Description	Arm type
A	untitled		Major
B	untitled		Minor
C	untitled		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right-turn storage	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	12.21			237.9		-

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 (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	3.72	31	23

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	535	0.072	0.182	0.114	0.260
B-C	685	0.076	0.192	-	-
C-B	712	0.201	0.201	-	-

The slopes and intercepts shown above include custom intercept adjustments only.
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
D2	2027 Baseline	PM	ONE HOUR	16:30	18:00	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	1759	100.000
B		ONE HOUR	✓	22	100.000
C		ONE HOUR	✓	960	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	54	1705
	B	7	0	15
	C	954	6	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To		
		A	B	C
From	A	0	0	1
	B	0	0	0
	C	2	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max 95th percentile Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.17	29.47	0.2	0.9	D	20	30
C-A						875	1313
C-B	0.02	11.42	0.0	0.5	B	6	8
A-B						50	74
A-C						1565	2347

Main Results for each time segment

16:30 - 16:45

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-AC	17	4	329	0.050	16	0.0	0.1	11.518	B
C-A	718	180			718				
C-B	5	1	445	0.010	4	0.0	0.0	8.170	A
A-B	41	10			41				
A-C	1284	321			1284				

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-AC	20	5	261	0.076	20	0.1	0.1	14.926	B
C-A	858	214			858				
C-B	5	1	393	0.014	5	0.0	0.0	9.278	A
A-B	49	12			49				
A-C	1533	383			1533				

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-AC	24	6	146	0.166	24	0.1	0.2	29.275	D
C-A	1050	263			1050				
C-B	7	2	322	0.021	7	0.0	0.0	11.419	B
A-B	59	15			59				
A-C	1877	469			1877				

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-AC	24	6	146	0.166	24	0.2	0.2	29.474	D
C-A	1050	263			1050				
C-B	7	2	322	0.021	7	0.0	0.0	11.419	B
A-B	59	15			59				
A-C	1877	469			1877				

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-AC	20	5	261	0.076	20	0.2	0.1	14.995	B
C-A	858	214			858				
C-B	5	1	393	0.014	5	0.0	0.0	9.279	A
A-B	49	12			49				
A-C	1533	383			1533				

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-AC	17	4	329	0.050	17	0.1	0.1	11.543	B
C-A	718	180			718				
C-B	5	1	445	0.010	5	0.0	0.0	8.170	A
A-B	41	10			41				
A-C	1284	321			1284				

Queue Variation Results for each time segment

16:30 - 16:45

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.05	0.00	0.00	0.05	0.05			N/A	N/A
C-B	0.01	0.00	0.00	0.01	0.01			N/A	N/A

16:45 - 17:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.08	0.00	0.00	0.08	0.08			N/A	N/A
C-B	0.01	0.01	0.25	0.45	0.48			N/A	N/A

17:00 - 17:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.19	0.03	0.27	0.48	0.88			N/A	N/A
C-B	0.02	0.00	0.00	0.02	0.02			N/A	N/A

17:15 - 17:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.19	0.03	0.26	0.46	0.49			N/A	N/A
C-B	0.02	0.00	0.00	0.02	0.02			N/A	N/A

17:30 - 17:45

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.08	0.00	0.00	0.08	0.08			N/A	N/A
C-B	0.01	0.00	0.00	0.01	0.01			N/A	N/A

17:45 - 18:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.05	0.00	0.00	0.05	0.05			N/A	N/A
C-B	0.01	0.00	0.00	0.01	0.01			N/A	N/A

2027 With Development - 2027 with Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	2027 With Development	✓	✓	D3,D4	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		0.20	A

Junction Network

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold	Network delay (s)	Network LOS
Left	Normal/unknown	32	Stream B-AC	0.20	A

Arms

Arms

Arm	Name	Description	Arm type
A	untitled		Major
B	untitled		Minor
C	untitled		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right-turn storage	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	12.21			237.9		-

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 (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	3.72	31	23

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	535	0.072	0.182	0.114	0.260
B-C	685	0.076	0.192	-	-
C-B	712	0.201	0.201	-	-

The slopes and intercepts shown above include custom intercept adjustments only.
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
D3	2027 with Development	AM	ONE HOUR	07:45	09:15	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	810	100.000
B		ONE HOUR	✓	25	100.000
C		ONE HOUR	✓	1446	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	60	750
	B	10	0	15
	C	1443	3	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To		
		A	B	C
From	A	0	7	4
	B	0	0	79
	C	3	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max 95th percentile Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.09	17.04	0.1	0.7	C	23	34
C-A						1324	1986
C-B	0.01	6.81	0.0	0.5	A	3	4
A-B						55	83
A-C						688	1032

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-AC	19	5	423	0.044	19	0.0	0.1	12.088	B
C-A	1086	272			1086				
C-B	2	0.56	589	0.004	2	0.0	0.0	6.135	A
A-B	45	11			45				
A-C	565	141			565				

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-AC	22	6	380	0.059	22	0.1	0.1	13.680	B
C-A	1297	324			1297				
C-B	3	0.67	565	0.005	3	0.0	0.0	6.400	A
A-B	54	13			54				
A-C	674	169			674				

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-AC	28	7	315	0.087	27	0.1	0.1	17.018	C
C-A	1589	397			1589				
C-B	3	0.83	532	0.006	3	0.0	0.0	6.806	A
A-B	66	17			66				
A-C	826	206			826				

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-AC	28	7	315	0.087	28	0.1	0.1	17.038	C
C-A	1589	397			1589				
C-B	3	0.83	532	0.006	3	0.0	0.0	6.806	A
A-B	66	17			66				
A-C	826	206			826				

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-AC	22	6	380	0.059	23	0.1	0.1	13.698	B
C-A	1297	324			1297				
C-B	3	0.67	565	0.005	3	0.0	0.0	6.400	A
A-B	54	13			54				
A-C	674	169			674				

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-AC	19	5	423	0.044	19	0.1	0.1	12.107	B
C-A	1086	272			1086				
C-B	2	0.56	589	0.004	2	0.0	0.0	6.137	A
A-B	45	11			45				
A-C	565	141			565				

Queue Variation Results for each time segment

07:45 - 08:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.06	0.00	0.00	0.06	0.06			N/A	N/A
C-B	0.00	0.00	0.00	0.00	0.00			N/A	N/A

08:00 - 08:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.08	0.03	0.34	0.62	0.65			N/A	N/A
C-B	0.00	0.00	0.25	0.45	0.48			N/A	N/A

08:15 - 08:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.13	0.04	0.36	0.64	0.68			N/A	N/A
C-B	0.01	0.00	0.00	0.01	0.01			N/A	N/A

08:30 - 08:45

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.13	0.03	0.34	0.61	0.65			N/A	N/A
C-B	0.01	0.00	0.00	0.01	0.01			N/A	N/A

08:45 - 09:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.09	0.00	0.00	0.09	0.09			N/A	N/A
C-B	0.00	0.00	0.00	0.00	0.00			N/A	N/A

09:00 - 09:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.06	0.00	0.00	0.06	0.06			N/A	N/A
C-B	0.00	0.00	0.00	0.00	0.00			N/A	N/A

2027 With Development - 2027 with Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	2027 With Development	✓	✓	D3,D4	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		0.89	A

Junction Network

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold	Network delay (s)	Network LOS
Left	Normal/unknown	1	Stream B-AC	0.89	A

Arms

Arms

Arm	Name	Description	Arm type
A	untitled		Major
B	untitled		Minor
C	untitled		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right-turn storage	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	12.21			237.9		-

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 (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	3.72	31	23

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	535	0.072	0.182	0.114	0.260
B-C	685	0.076	0.192	-	-
C-B	712	0.201	0.201	-	-

The slopes and intercepts shown above include custom intercept adjustments only.
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
D4	2027 with Development	PM	ONE HOUR	16:30	18:00	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	1762	100.000
B		ONE HOUR	✓	74	100.000
C		ONE HOUR	✓	999	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	57	1705
	B	7	0	67
	C	993	6	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To		
		A	B	C
From	A	0	7	1
	B	0	0	43
	C	2	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max 95th percentile Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.35	33.17	0.7	2.9	D	68	102
C-A						911	1367
C-B	0.02	11.44	0.0	0.5	B	6	8
A-B						52	78
A-C						1565	2347

Main Results for each time segment

16:30 - 16:45

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-AC	56	14	396	0.141	55	0.0	0.2	14.466	B
C-A	748	187			748				
C-B	5	1	445	0.010	4	0.0	0.0	8.178	A
A-B	43	11			43				
A-C	1284	321			1284				

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-AC	67	17	336	0.198	66	0.2	0.3	18.270	C
C-A	893	223			893				
C-B	5	1	393	0.014	5	0.0	0.0	9.291	A
A-B	51	13			51				
A-C	1533	383			1533				

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-AC	81	20	230	0.354	80	0.3	0.7	32.565	D
C-A	1093	273			1093				
C-B	7	2	321	0.021	7	0.0	0.0	11.444	B
A-B	63	16			63				
A-C	1877	469			1877				

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-AC	81	20	230	0.354	81	0.7	0.7	33.166	D
C-A	1093	273			1093				
C-B	7	2	321	0.021	7	0.0	0.0	11.444	B
A-B	63	16			63				
A-C	1877	469			1877				

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-AC	67	17	336	0.198	68	0.7	0.3	18.536	C
C-A	893	223			893				
C-B	5	1	393	0.014	5	0.0	0.0	9.292	A
A-B	51	13			51				
A-C	1533	383			1533				

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-AC	56	14	396	0.141	56	0.3	0.2	14.579	B
C-A	748	187			748				
C-B	5	1	445	0.010	5	0.0	0.0	8.180	A
A-B	43	11			43				
A-C	1284	321			1284				

Queue Variation Results for each time segment

16:30 - 16:45

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.22	0.00	0.00	0.22	0.22			N/A	N/A
C-B	0.01	0.00	0.00	0.01	0.01			N/A	N/A

16:45 - 17:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.33	0.00	0.00	0.33	0.33			N/A	N/A
C-B	0.01	0.01	0.25	0.45	0.48			N/A	N/A

17:00 - 17:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.71	0.04	0.37	0.71	1.71			N/A	N/A
C-B	0.02	0.00	0.00	0.02	0.02			N/A	N/A

17:15 - 17:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.73	0.05	0.45	1.49	2.93			N/A	N/A
C-B	0.02	0.00	0.00	0.02	0.02			N/A	N/A

17:30 - 17:45

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.35	0.03	0.34	0.62	0.65			N/A	N/A
C-B	0.01	0.00	0.00	0.01	0.01			N/A	N/A

17:45 - 18:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.23	0.03	0.34	0.62	0.65			N/A	N/A
C-B	0.01	0.00	0.00	0.01	0.01			N/A	N/A

Junctions 10

PICADY 10 - Priority Intersection Module

Version: 10.1.1.1905

Filename: Broughty Ferry Road - Market Street.j10
Path: C:\Users\Jamie.Graham\OneDrive - AECOM\Documents\Dundee Substation\Junction Models
Report generation date: 25/04/2025 17:14:46

Summary of junction performance

	AM									PM								
	Set ID	Queue (PCU)	95% Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Set ID	Queue (PCU)	95% Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
	2027 Baseline - 2027 Baseline																	
Stream B-AC	A1 D1	0.0	0.5	8.24	0.03	A	0.22	A	184 % [Stream B-AC]	A1 D2	0.2	0.5	8.34	0.15	A	0.99	A	180 % [Stream B-AC]
Stream C-AB		0.0	0.5	5.21	0.01	A					0.0	0.5	4.35	0.01	A			

	AM									PM								
	Set ID	Queue (PCU)	95% Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Set ID	Queue (PCU)	95% Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
	2027 with Development - 2027 with Development																	
Stream B-AC	A2 D3	0.2	0.5	10.22	0.14	B	0.79	A	112 % [Stream B-AC]	A2 D4	0.2	0.5	8.45	0.15	A	0.93	A	171 % [Stream B-AC]
Stream C-AB		0.0	0.5	5.23	0.01	A					0.0	0.5	4.40	0.01	A			

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. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	
Location	
Site number	
Date	24/04/2025
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	NA\Jamie.Graham
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

The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Show lane queues in feet / metres	Show all PICADY stream intercepts	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)	Use simulation for HCM roundabouts	Use iterations for HCM roundabouts
5.75	✓				✓	Delay	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	2027 Baseline	AM	ONE HOUR	07:45	09:15	15	✓
D2	2027 Baseline	PM	ONE HOUR	16:30	18:00	15	✓
D3	2027 with Development	AM	ONE HOUR	07:45	09:15	15	✓
D4	2027 with Development	PM	ONE HOUR	16:30	18:00	15	✓

2027 Baseline - 2027 Baseline, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	2027 Baseline	✓	✓	D1,D2	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		0.22	A

Junction Network

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold	Network delay (s)	Network LOS
Left	Normal/unknown	184	Stream B-AC	0.22	A

Arms

Arms

Arm	Name	Description	Arm type
A	untitled		Major
B	untitled		Minor
C	untitled		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right-turn storage	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	6.90			248.3	✓	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 (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	4.21	28	33

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	564	0.100	0.252	0.159	0.360
B-C	723	0.105	0.266	-	-
C-B	718	0.267	0.267	-	-

The slopes and intercepts shown above include custom intercept adjustments only.
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	2027 Baseline	AM	ONE HOUR	07:45	09:15	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	490	100.000
B		ONE HOUR	✓	15	100.000
C		ONE HOUR	✓	179	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	23	467
	B	7	0	8
	C	175	4	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To		
		A	B	C
From	A	0	0	1
	B	14	0	0
	C	4	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max 95th percentile Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.03	8.24	0.0	0.5	A	14	21
C-AB	0.01	5.21	0.0	0.5	A	5	7
C-A						159	239
A-B						21	32
A-C						429	643

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-AC	11	3	531	0.021	11	0.0	0.0	7.350	A
C-AB	4	0.93	706	0.005	4	0.0	0.0	5.165	A
C-A	131	33			131				
A-B	17	4			17				
A-C	352	88			352				

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-AC	13	3	510	0.026	13	0.0	0.0	7.697	A
C-AB	5	1	705	0.007	5	0.0	0.0	5.181	A
C-A	156	39			156				
A-B	21	5			21				
A-C	420	105			420				

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-AC	17	4	480	0.034	16	0.0	0.0	8.237	A
C-AB	6	2	705	0.009	6	0.0	0.0	5.201	A
C-A	191	48			191				
A-B	25	6			25				
A-C	514	129			514				

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-AC	17	4	480	0.034	17	0.0	0.0	8.237	A
C-AB	6	2	705	0.009	6	0.0	0.0	5.208	A
C-A	191	48			191				
A-B	25	6			25				
A-C	514	129			514				

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-AC	13	3	510	0.026	14	0.0	0.0	7.698	A
C-AB	5	1	705	0.007	5	0.0	0.0	5.192	A
C-A	156	39			156				
A-B	21	5			21				
A-C	420	105			420				

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-AC	11	3	531	0.021	11	0.0	0.0	7.351	A
C-AB	4	0.93	706	0.005	4	0.0	0.0	5.171	A
C-A	131	33			131				
A-B	17	4			17				
A-C	352	88			352				

Queue Variation Results for each time segment

07:45 - 08:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.02	0.00	0.00	0.02	0.02			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

08:00 - 08:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.03	0.03	0.27	0.48	0.51			N/A	N/A
C-AB	0.01	0.01	0.25	0.46	0.48			N/A	N/A

08:15 - 08:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.04	0.03	0.27	0.48	0.51			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

08:30 - 08:45

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.04	0.00	0.00	0.04	0.04			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

08:45 - 09:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.03	0.00	0.00	0.03	0.03			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

09:00 - 09:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.02	0.00	0.00	0.02	0.02			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

2027 Baseline - 2027 Baseline, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	2027 Baseline	✓	✓	D1,D2	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		0.99	A

Junction Network

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold	Network delay (s)	Network LOS
Left	Normal/unknown	180	Stream B-AC	0.99	A

Arms

Arms

Arm	Name	Description	Arm type
A	untitled		Major
B	untitled		Minor
C	untitled		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right-turn storage	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	6.90			248.3	✓	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 (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	4.21	28	33

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	564	0.100	0.252	0.159	0.360
B-C	723	0.105	0.266	-	-
C-B	718	0.267	0.267	-	-

The slopes and intercepts shown above include custom intercept adjustments only.
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
D2	2027 Baseline	PM	ONE HOUR	16:30	18:00	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	193	100.000
B		ONE HOUR	✓	67	100.000
C		ONE HOUR	✓	339	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	11	182
	B	45	0	22
	C	334	5	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		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 95th percentile Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.15	8.34	0.2	0.5	A	61	92
C-AB	0.01	4.35	0.0	0.5	A	7	11
C-A						304	456
A-B						10	15
A-C						167	251

Main Results for each time segment

16:30 - 16:45

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-AC	50	13	538	0.094	50	0.0	0.1	7.367	A
C-AB	5	1	836	0.006	5	0.0	0.0	4.349	A
C-A	250	62			250				
A-B	8	2			8				
A-C	137	34			137				

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-AC	60	15	525	0.115	60	0.1	0.1	7.750	A
C-AB	7	2	860	0.008	7	0.0	0.0	4.235	A
C-A	298	74			298				
A-B	10	2			10				
A-C	164	41			164				

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-AC	74	18	505	0.146	74	0.1	0.2	8.337	A
C-AB	9	2	894	0.010	9	0.0	0.0	4.086	A
C-A	364	91			364				
A-B	12	3			12				
A-C	200	50			200				

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-AC	74	18	505	0.146	74	0.2	0.2	8.340	A
C-AB	9	2	894	0.010	9	0.0	0.0	4.087	A
C-A	364	91			364				
A-B	12	3			12				
A-C	200	50			200				

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-AC	60	15	525	0.115	60	0.2	0.1	7.759	A
C-AB	7	2	860	0.008	7	0.0	0.0	4.239	A
C-A	298	74			298				
A-B	10	2			10				
A-C	164	41			164				

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-AC	50	13	538	0.094	51	0.1	0.1	7.382	A
C-AB	5	1	836	0.006	5	0.0	0.0	4.352	A
C-A	250	62			250				
A-B	8	2			8				
A-C	137	34			137				

Queue Variation Results for each time segment

16:30 - 16:45

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.10	0.00	0.00	0.10	0.10			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

16:45 - 17:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.13	0.00	0.00	0.13	0.13			N/A	N/A
C-AB	0.01	0.01	0.25	0.45	0.48			N/A	N/A

17:00 - 17:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.17	0.03	0.26	0.46	0.49			N/A	N/A
C-AB	0.01	0.01	0.25	0.45	0.48			N/A	N/A

17:15 - 17:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.17	0.03	0.25	0.45	0.48			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

17:30 - 17:45

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.13	0.00	0.00	0.13	0.13			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

17:45 - 18:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.10	0.00	0.00	0.10	0.10			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

2027 with Development - 2027 with Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	2027 with Development	✓	✓	D3,D4	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		0.79	A

Junction Network

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold	Network delay (s)	Network LOS
Left	Normal/unknown	112	Stream B-AC	0.79	A

Arms

Arms

Arm	Name	Description	Arm type
A	untitled		Major
B	untitled		Minor
C	untitled		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right-turn storage	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	6.90			248.3	✓	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 (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	4.21	28	33

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	564	0.100	0.252	0.159	0.360
B-C	723	0.105	0.266	-	-
C-B	718	0.267	0.267	-	-

The slopes and intercepts shown above include custom intercept adjustments only.
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
D3	2027 with Development	AM	ONE HOUR	07:45	09:15	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	502	100.000
B		ONE HOUR	✓	54	100.000
C		ONE HOUR	✓	179	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	35	467
	B	46	0	8
	C	175	4	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To		
		A	B	C
From	A	0	34	1
	B	2	0	0
	C	4	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max 95th percentile Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.14	10.22	0.2	0.5	B	50	74
C-AB	0.01	5.23	0.0	0.5	A	5	7
C-A						159	239
A-B						32	48
A-C						429	643

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-AC	41	10	470	0.087	40	0.0	0.1	8.513	A
C-AB	4	0.93	703	0.005	4	0.0	0.0	5.182	A
C-A	131	33			131				
A-B	26	7			26				
A-C	352	88			352				

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-AC	49	12	448	0.108	48	0.1	0.1	9.160	A
C-AB	5	1	702	0.007	5	0.0	0.0	5.201	A
C-A	156	39			156				
A-B	31	8			31				
A-C	420	105			420				

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-AC	59	15	418	0.142	59	0.1	0.2	10.212	B
C-AB	6	2	702	0.009	6	0.0	0.0	5.225	A
C-A	191	48			191				
A-B	39	10			39				
A-C	514	129			514				

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-AC	59	15	418	0.142	59	0.2	0.2	10.222	B
C-AB	6	2	702	0.009	6	0.0	0.0	5.231	A
C-A	191	48			191				
A-B	39	10			39				
A-C	514	129			514				

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-AC	49	12	448	0.108	49	0.2	0.1	9.172	A
C-AB	5	1	702	0.007	5	0.0	0.0	5.210	A
C-A	156	39			156				
A-B	31	8			31				
A-C	420	105			420				

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-AC	41	10	470	0.087	41	0.1	0.1	8.533	A
C-AB	4	0.93	703	0.005	4	0.0	0.0	5.188	A
C-A	131	33			131				
A-B	26	7			26				
A-C	352	88			352				

Queue Variation Results for each time segment

07:45 - 08:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.10	0.00	0.00	0.10	0.10			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

08:00 - 08:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.12	0.00	0.00	0.12	0.12			N/A	N/A
C-AB	0.01	0.01	0.25	0.46	0.48			N/A	N/A

08:15 - 08:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.17	0.03	0.26	0.47	0.50			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

08:30 - 08:45

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.17	0.03	0.26	0.46	0.49			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

08:45 - 09:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.12	0.00	0.00	0.12	0.12			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

09:00 - 09:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.10	0.00	0.00	0.10	0.10			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

2027 with Development - 2027 with Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	2027 with Development	✓	✓	D3,D4	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		0.93	A

Junction Network

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold	Network delay (s)	Network LOS
Left	Normal/unknown	171	Stream B-AC	0.93	A

Arms

Arms

Arm	Name	Description	Arm type
A	untitled		Major
B	untitled		Minor
C	untitled		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right-turn storage	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	6.90			248.3	✓	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 (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	4.21	28	33

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	564	0.100	0.252	0.159	0.360
B-C	723	0.105	0.266	-	-
C-B	718	0.267	0.267	-	-

The slopes and intercepts shown above include custom intercept adjustments only.
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
D4	2027 with Development	PM	ONE HOUR	16:30	18:00	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	244	100.000
B		ONE HOUR	✓	67	100.000
C		ONE HOUR	✓	339	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	62	182
	B	45	0	22
	C	334	5	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To		
		A	B	C
From	A	0	51	2
	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 95th percentile Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.15	8.45	0.2	0.5	A	61	92
C-AB	0.01	4.40	0.0	0.5	A	7	11
C-A						304	456
A-B						57	85
A-C						167	251

Main Results for each time segment

16:30 - 16:45

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-AC	50	13	534	0.094	50	0.0	0.1	7.428	A
C-AB	5	1	827	0.007	5	0.0	0.0	4.396	A
C-A	250	62			250				
A-B	47	12			47				
A-C	137	34			137				

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-AC	60	15	520	0.116	60	0.1	0.1	7.830	A
C-AB	7	2	849	0.008	7	0.0	0.0	4.286	A
C-A	298	74			298				
A-B	56	14			56				
A-C	164	41			164				

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-AC	74	18	500	0.148	74	0.1	0.2	8.444	A
C-AB	9	2	882	0.011	9	0.0	0.0	4.142	A
C-A	364	91			364				
A-B	68	17			68				
A-C	200	50			200				

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-AC	74	18	500	0.148	74	0.2	0.2	8.454	A
C-AB	9	2	882	0.011	9	0.0	0.0	4.145	A
C-A	364	91			364				
A-B	68	17			68				
A-C	200	50			200				

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-AC	60	15	520	0.116	60	0.2	0.1	7.840	A
C-AB	7	2	849	0.008	7	0.0	0.0	4.291	A
C-A	298	74			298				
A-B	56	14			56				
A-C	164	41			164				

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-AC	50	13	534	0.094	51	0.1	0.1	7.446	A
C-AB	5	1	827	0.007	5	0.0	0.0	4.397	A
C-A	250	62			250				
A-B	47	12			47				
A-C	137	34			137				

Queue Variation Results for each time segment

16:30 - 16:45

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.10	0.00	0.00	0.10	0.10			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

16:45 - 17:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.13	0.00	0.00	0.13	0.13			N/A	N/A
C-AB	0.01	0.01	0.25	0.45	0.48			N/A	N/A

17:00 - 17:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.17	0.03	0.26	0.46	0.49			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

17:15 - 17:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.17	0.03	0.25	0.45	0.48			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

17:30 - 17:45

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.13	0.00	0.00	0.13	0.13			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

17:45 - 18:00

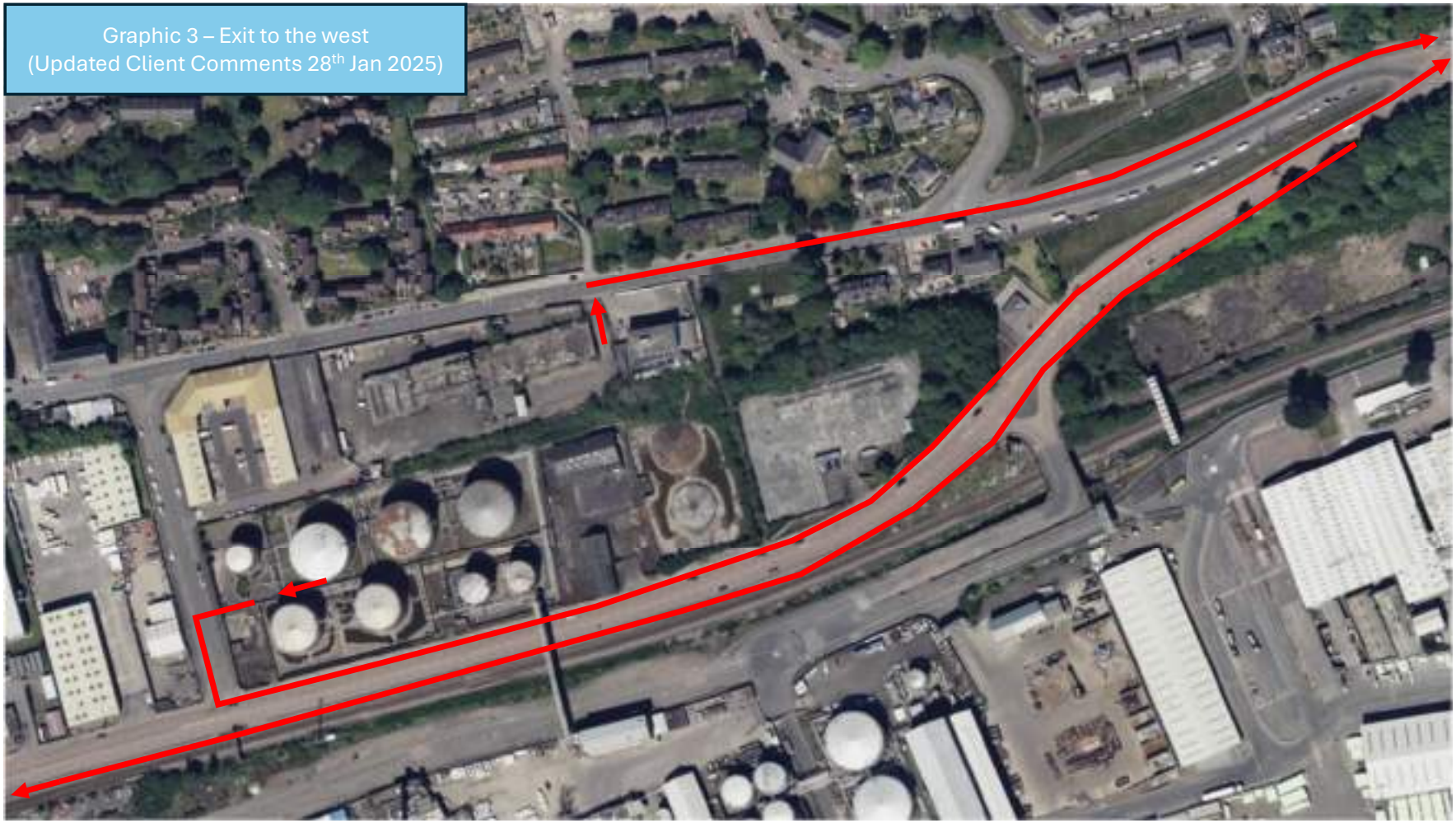
Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.11	0.00	0.00	0.11	0.11			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

Appendix J Construction Routing Strategy

Graphic 1 – Access from west
(Updated Client Comments 28th Jan 2025)

Graphic 2 – Access from east
(Updated Client Comments 28th Jan 2025)

Graphic 3 – Exit to the west
(Updated Client Comments 28th Jan 2025)



Graphic 4 – Exit to the east
(Updated Client Comments 28th Jan 2025)