Riverside Energy Park

Environmental Statement Technical Appendices

APPENDIX:

B.1

PLANNING INSPECTORATE REFERENCE NUMBER:

EN010093

DOCUMENT REFERENCE:

TRANSPORT ASSESSMENT

November 2018 | Revision 0 | APFP Regulation 5(2)(a)

Planning Act 2008 | Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

CORY
RIVERSIDE ENERGY

Document Control Sheet

Project Name: **Riverside Energy Park**

Project Ref: 42166/5501

Report Title: Appendix B.1 Transport Assessment

Doc Ref:

Date: **November 2018**

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For and on behalf of Peter Brett Associates LLP				

Revision	Date	Description	Prepared	Reviewed	Approved

This report has been prepared by Peter Brett Associates LLP (‘PBA’) on behalf of Cory Riverside Energy to whom this report is addressed (‘Client’) in connection with the project described in this report and takes into account the Client's particular instructions and requirements. This report was prepared in accordance with the professional services appointment under which PBA was appointed by its Client. This report is not intended for and should not be relied on by any third party (i.e. parties other than the Client). PBA accepts no duty or responsibility (including in negligence) to any party other than the Client and disclaims all liability of any nature whatsoever to any such party in respect of this report.

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1 Background

1.1 Introduction

1.1.1 Cory Environmental Holdings Limited (trading as Cory Riverside Energy (Cory or “the Applicant”)) is applying to the Secretary of State under the Planning Act 2008 (PA 2008) for powers to construct, operate and maintain an integrated Energy Park, to be known as Riverside Energy Park (REP). The principal elements of REP comprise complementary energy generating development and an associated Electrical Connection (together referred to as the ‘Proposed Development’). As the generating capacity of REP will be in excess of 50 MWe capacity it is classified as a Nationally Significant Infrastructure Project (NSIP) under section 14 and 15 of the PA 2008 and therefore requires a Development Consent Order (DCO) to authorise its construction and operation.

1.1.2 The two principal elements of the Proposed Development are: the Energy Park, which would be located adjacent to an existing Energy Recovery Facility (ERF) operated by Cory (referred to as Riverside Resource Recovery Facility (RRRF)) situated at Norman Road in Belvedere within the London Borough of Bexley (LBB). The underground Electrical Connection would run from the REP site and terminate at the Littlebrook substation in Dartford. Plans showing the location (Application Boundary/Order Limits) and indicative zoning for the Proposed Development are provided in **Figures 1.1-1.3** of the Environmental Statement (ES) for these proposals. A glossary of terms and definitions is provided in **Chapter 18** of the ES.

1.2 The Development Consent Order Process

1.2.1 Cory must submit a DCO application to the Planning Inspectorate (PINS) who will first decide whether to accept the application. If accepted, PINS will examine the application in accordance with the relevant National Policy Statements (NPSs) which outline the need for energy infrastructure and the issues to be considered in applications. The relevant NPSs include: NPS EN-1 (Overarching Energy Policy), NPS EN-3 (Renewable Energy Supply from Waste) and NPS EN-5 (Electricity Networks Infrastructure).

1.2.2 Following the examination, PINS will make a recommendation to the relevant Secretary of State (SoS) and, should the SoS approve the application, the DCO will be made authorising the construction, commissioning and operation of REP.

1.3 The Applicant and Study Team

1.3.1 Cory is registered in England (Company Number 05360864) and is the Applicant for the Proposed Development. Cory’s registered address is 2 Coldbath Square, London, United Kingdom, EC1R 5HL.

1.3.2 Cory is a leading recycling, energy recovery and resource management company, with an extensive river logistics network in London. Cory secured consent for, constructed and now operates the existing RRRF adjacent to the Proposed Development.

1.3.3 Cory is now progressing these plans for REP to maximise the use of its existing infrastructure and land holding and to further meet the needs for resource recovery and energy generation in UK and in London.

1.3.4 Further information on REP is provided on the dedicated project website at http://www.riversideenergypark.com/.

1.3.5 Preparation of the Application has been managed by Cory with support from the following consultancy team:

- Ardent Management Ltd – land referencing;
- Camargue Group Ltd – community engagement services;
- Fichtner Consulting Engineers Limited – engineering services;
- Hitachi Zosen Inova AG – proposed technology provider and engineering, procurement and construction services;
- Marico Marine - marine navigation specialists;
- Peter Brett Associates LLP – environmental and planning services; and
- Pinsent Masons LLP – legal services.

Note: Weedons Architects have provided architectural design services on behalf of Hitachi Zosen Inova AG.

1.3.6 Peter Brett Associates LLP (PBA) has been commissioned by Cory, the Applicant, to prepare a Transport Assessment (TA) which provides transport and highway advice to support an application for an integrated Energy Park as outlined at Section 1.4. **Appendix A.2** of the ES provides information on the expertise of key people involved in the preparation of the ES, of which this TA is a part.

1.4 Project Description

1.4.1 The Proposed Development comprises REP and the associated Electrical Connection. These are described in turn, together with the anticipated REP operations, below. **Chapter 3** of the Environmental Statement (ES) (**Document Reference 6.1**) provides further details of the Proposed Development.

REP

1.4.2 REP would be constructed on land immediately adjacent to Cory's existing RRRF, within the London Borough of Bexley and would complement the operation of the existing facility. It would comprise an integrated range of technologies including: waste energy recovery, anaerobic digestion, solar panels and battery storage. The main elements of REP would be as follows:

- Energy Recovery Facility (ERF): to provide thermal treatment of Commercial and Industrial (C&I) residual (non-recyclable) waste with the potential for treatment of Municipal Solid Waste (MSW);
- Anaerobic Digestion facility: to process food and green waste. Outputs from the Anaerobic Digestion facility would be transferred off-site for use in the agricultural sector as fertiliser or as an alternative, where appropriate, used as a fuel in the ERF to generate electricity;
- Solar Photovoltaic Installation: to generate electricity. To be installed across a wide extent of the roof of the Main REP Building;
- Battery Storage: to store and supply additional power to the local distribution network at times of peak electrical demand. This facility would be integrated into the Main REP Building;
- On-site Combined Heat and Power ('CHP') Infrastructure: to provide an opportunity for local district heating for nearby residential development and businesses. REP would be CHP Enabled with necessary on site infrastructure included within the REP site.

Electrical Connection

1.4.3 REP would be connected to the electricity distribution network via a new 132 kilovolt (kV) underground electricity cable connection. The route options for the Electrical Connection are shown in the Works Plans (**Document Reference 2.4**).

1.4.4 In consultation with UK Power Networks ('UKPN'), Cory is considering Electrical Connection route options to connect to the existing National Grid Littlebrook substation located south east of the REP site, in Dartford. The route options are located within the LBB and Dartford Borough, and would run from a new substation proposed to be constructed within the REP site.

REP operations

1.4.5 Delivery of waste to REP: the majority of waste will be delivered to REP by barge from Waste Transfer Stations (WTS) along the River Thames, utilising the existing jetty which is located immediately to the north of RRRF and the REP site. The remainder would be delivered by road. Whilst CRE is a river-based operator, the application includes flexibility to allow deliveries by road where commercially and environmentally appropriate to do so, e.g. for local waste deliveries from the Bexley area or for food/green waste.

1.4.6 Removal of by-products from REP: Incinerator Bottom Ash (IBA) would be transported by river to the existing IBA Facility at the Port of Tilbury for treatment/recycling, and then for onward use as secondary aggregate in the construction sector. Air Pollution Control Residues (APCR) would be taken off-site by road in sealed tankers to be treated/recycled for use as a construction material.

1.5 Overview and Structure of the Transport Assessment

1.5.1 The Energy Recovery Facility (ERF) is envisaged to have a nominal throughput of approximately 655,000 tonnes per annum (tpa). For the purpose of the Environmental Impact Assessment (EIA) and the TA, an annual maximum throughput of 805,920 tpa will be assumed. The Anaerobic Digestion Facility is sized to process approximately 40,000 tpa of food and green waste, predominantly sourced from within the LBB and transferred by road.

1.5.2 A location plan and Application Boundary are provided in **Appendix A** .

1.5.3 It is proposed to deliver the majority of waste to REP by barge from Waste Transfer Stations (WTS) along the River Thames, utilising the existing jetty as per the existing RRRF. The remainder would be delivered by road. The proportions of the total to be delivered by road and river will be determined through further assessment work.

1.5.4 By-products including Incinerator Bottom Ash (IBA) (approximately 25% of throughput) would be transported by river to the existing IBA facility at the Port of Tilbury for treatment/recycling, and then onward use as secondary aggregate in the construction sector.

1.5.5 Air Pollution Control Residues (APCR) (approximately 3% of throughput) would be taken off site by road in sealed tankers to be recycled.

1.5.6 For the purposes of the TA, a ‘100% by road’ scenario is being assessed to represent a robust review in the instance of all imported waste being moved by road.

1.5.7 This TA forms one part of the documentation that informs the DCO application process and has been prepared to assess the impact of the construction, maintenance and operation phases of the REP.

1.5.8 As required by NPS-EN1 ‘Overarching National Policy Statement for Energy’, July 2011, this TA complies with the processes for assessment of travel impact as identified within the Department for Transport’s (DfT’s) ‘Transport Analysis Guidance’ January 2014 (WebTAG) methodology. A comprehensive scoping exercise has been carried out with the Local Highway Authorities, Highways England and the Local Planning Authorities, as set out at paragraph

2.2.9 of this TA. That scoping exercise has guided the focus and coverage of the transport evidence for this DCO. In addition, the stakeholder engagement and consultation exercise has helped to refine the scope.

1.5.9 The TA reviews the location of the Proposed Development in relation to the transport network, noting the juxtaposition to the River Thames and the strategic road network. An assessment is provided of the construction and operational reasonable worst case scenarios and determines the likely travel impacts. Concluding that there is no requirement for physical mitigation, it is proposed that demand management techniques are used to manage construction traffic and emphasise options for workers to travel by sustainable modes of transport. These would be promoted through the adoption of an Operational Worker Travel Plan for the operational phase and a Construction Traffic Management Plan (CTMP) during construction.

1.5.10 It is shown through this assessment that the Proposed Development, would be well located to benefit from river based transport options and that, during construction and once operational, REP would have no significant residual transport impacts when accompanied by the CTMP and an Operational Worker Travel Plan.

1.5.11 Further to complying with the assessment of traffic and transport impacts as outlined in NPS-EN1 and WebTAG, this TA has been prepared in accordance with guidance provided by:

- the Department for Communities and Local Government: 'Travel Plans, Transport Assessments and Statements' (6 March 2014);
- Transport for London’s (TfL) Best Practice Guidance and Guidance for Planning Applicants -Transport Assessment Inputs;
- Department for Transport (DfT) Circular 02/2013 ‘The Strategic Road Network and the Delivery of Sustainable Development (Sept 2013)’; and
- ‘Planning for the future – A guide to working with Highways England on planning matters’ (Sept 2015).

1.5.12 The TA is divided into the following chapters:

- **Chapter 2** outlines baseline conditions on-site and the existing accessibility by all modes of transport;
- **Chapter 3** summarises the existing national, regional and local planning policy that informs the approach and methodology of this Transport Assessment;
- **Chapter 4** details the methodology and results of the trip generation and distribution assessment for the Construction Period;

- **Chapter 5** details the methodology and results of the trip generation and distribution assessment for the Operational Period;
- **Chapter 6** presents the approach taken and results of the highway impact assessment;
- **Chapter 7** outlines the strategy for managing the proposed development's travel demand by all modes of transport; and
- **Chapter 8** summarises and concludes the TA.

2 Baseline Conditions in the Vicinity of REP

2.1 Site Location and Description

2.1.1 The REP site comprises approximately 7 hectares (ha) of land accessed off Norman Road, Belvedere, London DA17 6JY in LBB, immediately to the west of the existing RRRF. A Location Plan and an Application Boundary are detailed in **Appendix A** .

2.1.2 The REP site is irregular in shape and is predominantly used by Cory as an ancillary area for the existing RRRF located at the same address as outlined above.

2.1.3 The REP site includes the existing jetty in the River Thames which is currently used for delivery of waste and despatch of some by-products at the existing RRRF. The jetty will be used for the same purpose for the operation of REP.

2.1.4 Existing land uses of the REP site include:

- Ash storage containers;
- Boundary fencing and associated lighting;
- Circulation roads;
- Compounds for the maintenance of operational plant machinery;
- Car parking; and
- On-site non-designated Wasteland Habitat Area (WHA).

2.1.5 The REP site is accessed from Norman Road which extends south from the site to the A2016/Eastern Way which forms part of London's Strategic Road Network (SRN) and runs in an east/west orientation. As sought through NPS EN-1 and section 2.5.25 of NPS EN-3 'National Policy Statement for Renewable Energy Infrastructure', July 2011, and the London Plan, the site has direct connectivity to existing marine infrastructure and high standard roads. The Proposed Development would therefore be suitably located as the existing marine infrastructure and surrounding road network are used for current industrial and heavy commercial operations. The strategic roads surrounding the REP site would provide similarly good access for the construction period for the movement of materials, plant and equipment as well as workforce travel.

2.1.6 Immediately to the east of the REP site lies the existing RRRF, an ERF with a maximum consented waste throughput of 785,000 tpa generating up to 72 MWe.

2.1.7 Approximately 270 m to the west of REP is the Thames Water Crossness Sewage Treatment Works (STW).

2.1.8 To the east, beyond RRRF, lies the Crabtree Industrial Estate. This estate covers an area of approximately 150 ha and is bordered to the north and east by the River Thames. Serviced by the same road network as the REP site, the Crabtree Industrial Estate consists of multiple units, the largest being the Lidl Distribution Depot.

2.1.9 The Crossness Nature Reserve, which forms part of the Erith Marshes, abuts the REP site's southern and western boundaries, covering an area of approximately 25.5 ha.

2.1.10 Cory uses a full time 24 hour operation at the existing RRRF, with waste inputs being received from both municipal sources and commercial waste streams. It is proposed that REP would operate on a similar basis.

2.1.11 For the purposes of the assessment of traffic impacts for: the operational reasonable worst case (100% by road) scenario; the operational nominal (25% by road) scenario; and the construction reasonable worst case (Month 13) scenario, the following key assumptions have been used for the Proposed Development:

<u>Buildings</u>

Main process building:	10,108 m^2
Turbine Hall:	1,326 m^2
ACC	1,675 m^2
Processing Total:	**13,109 m^2**
Admin Building (five storeys):	
Ground Floor:	470 m^2
First Floor:	462 m^2
Second Floor:	462 m^2
Third Floor:	462 m^2
Fourth Floor:	462 m^2
Admin Building Total:	**2,318 m^2**
TOTAL AREA:	**15,427 m^2**

<u>Operational Materials and Vehicle Numbers</u>

Primary waste RCVs (7 t/load):	315.0 loads/day	365 day operation
Green waste RCVs (7 t/load):	15.5 loads/day	260 day operation
Green waste artics (20 t/load):	1.6 loads/day	260 day operation
APCR tankers (20 t/load):	4.0 loads/day	365 day operation
Compost export tankers (20 t/load):	2.7 loads/day	365 day operation
Liquid digestate tankers (20 t/load):	2.7 loads/day	365 day operation
Consumable tankers (20 t/load):	1.2 loads/day	365 day operation
Total:	**342.7 (343 rounded) loads/day**	

<u>Construction Vehicle Numbers</u>

REP Peak at Month 13 all loads:	22.0 loads/day
Electrical Connection (24 month programme)	30.0 loads/day
<u>or</u> Electrical Connection (15 month programme)	*60.0 loads/day*

<u>REP Workforce</u>

Construction (Labour+Technical+Specialist)	1097 persons/day (at peak)
Operational and Management	83 persons/day

2.1.12 Temporary laydown areas and the Main Temporary Construction Compound are proposed on land to the immediate west of Norman Road, which links the REP site with A2016, and on land to the south-east of REP and west of Crabtree Manorway North. These areas are shown on the Illustrative Works Plans at **Appendix A** . These areas will form the worksite compounds for the construction phase of REP. They will be returned to their current form once REP is fully commissioned.

2.1.13 The Electrical Connection, as described at Sections 1.4 and 2.8, would be constructed by way of sections of temporary works across a 15 or 24 month programme. Those works would be transient, and it is estimated that between 8 to 16 people would be employed on the construction of the cable route with between 30 to 60 materials and equipment visits generated at the works areas, depending on the period and rate of construction. The Electrical Connection includes a main route (largely along the A2016 and A206 corridors) with route options being considered. An indication of the possible impact of the construction of the Electrical Connection is provided at Section 4.5.

2.2 Highway Network

2.2.1 Norman Road is approximately 650 m in length; providing vehicle access to the REP site and is aligned north-south between the REP site and the A2016 Picardy Manorway. It is subject to a 30 mph speed limit and has streetlights on the eastern side. The junction of Norman Road and Picardy Manorway is a left-in left-out signal controlled junction.

2.2.2 Picardy Manorway is a dual-carriageway aligned east-west with a 50 mph speed limit. It connects with the A2016 Eastern Way/Clydesdale Way/Yarnton Way 100 m to the south-west and with Anderson Way/A2016 Bronze Age Way/Picardy Manorway 330 m to the south-east; both in the form of large priority roundabouts.

2.2.3 The A2016 forms part of the SRN in the LBB and connects to the A206 at its east and west ends. In the west, the route connects with South Circular at Plumstead, close to the Woolwich Ferry access road and the A102 Blackwall

Tunnel further to the west. At its eastern end the A2016 connects with the A206 at Bexley Road, Erith.

2.2.4 The A2016 is a dual carriageway route with at-grade interchanges, except at the A2041 at Thamesmead which is a grade separated roundabout and Lower Road, which is a grade separated priority interchange. Other junctions along A2016 are a combination of roundabout, priority and traffic signal-controlled junctions.

2.2.5 The A206 forms part of the Transport for London Road Network (TLRN) and is approximately 3.5 km from the REP site, at the Erith roundabout. The A206 is a single carriage road with largely residential frontage.

2.2.6 To the east, the A2016 and A206 corridor passes through Erith and into Dartford Borough connecting to the A282/M25 at the Dartford Crossing approach approximately 10.5 km to the south-east of REP. Bob Dunn Way (A206) crosses the Kent/Bexley border and provides a dual carriageway link between Thames Road (A206) and A282/M25 junction 1a. The link has two at-grade roundabout junctions at Central Road / Joyce Green Lane and Marsh Street. The route has no direct frontage access.

2.2.7 The A2016 is excluded from the London Lorry Control Scheme to the east of Norman Road but restrictions are in place on the A2016 Eastern Way to the west of Picardy Manorway. These require that vehicles with a Gross Vehicle Weight (GVW) over 18 t are only permitted to use the road at the following times, unless they are exempt:

- Weekdays 07:00-21:00; and
- Saturdays 07:00-13:00.

2.2.8 Therefore, all vehicles over 18 t GVW accessing RRRF and the REP site outside of these times must route from the east via the A206 at Slade Green in accordance with these restrictions.

Existing Traffic Flows

2.2.9 To inform the focus of the TA, a scoping exercise was undertaken with adjoining Local Highway Authorities, Highways England and Local Planning Authorities. A formal Scoping Note was issued in March 2018 and responses assimilated. The scoping report and responses are copied at Appendix B .

2.2.10 Traffic surveys were conducted in accordance with the agreed scope with the extent of surveys confirmed by LBB, Kent County Council (KCC), Dartford Borough Council (DBC) and TfL. The survey locations are shown at **Figure 2.1** with the type of survey, location and survey period given in Table 2.1. Data was collected at three points along Norman Road (north of Picardy Manorway), as indicated within Table 2.1.

2.2.11 Highways England has been consulted on the scope of the TA and has commented that they will review it alongside the submitted ES. Traffic data has not been collected at the A282/M25 junction 1a but a commentary is made of the anticipated level of development impact informed by data from the DfT data base collected on the Dartford Crossing Approach and on traffic data collected at Bob Dunn Way (A206).

2.2.12 Summary details of the data are given at **Appendix D**

Figure 2.1: Traffic Survey Locations

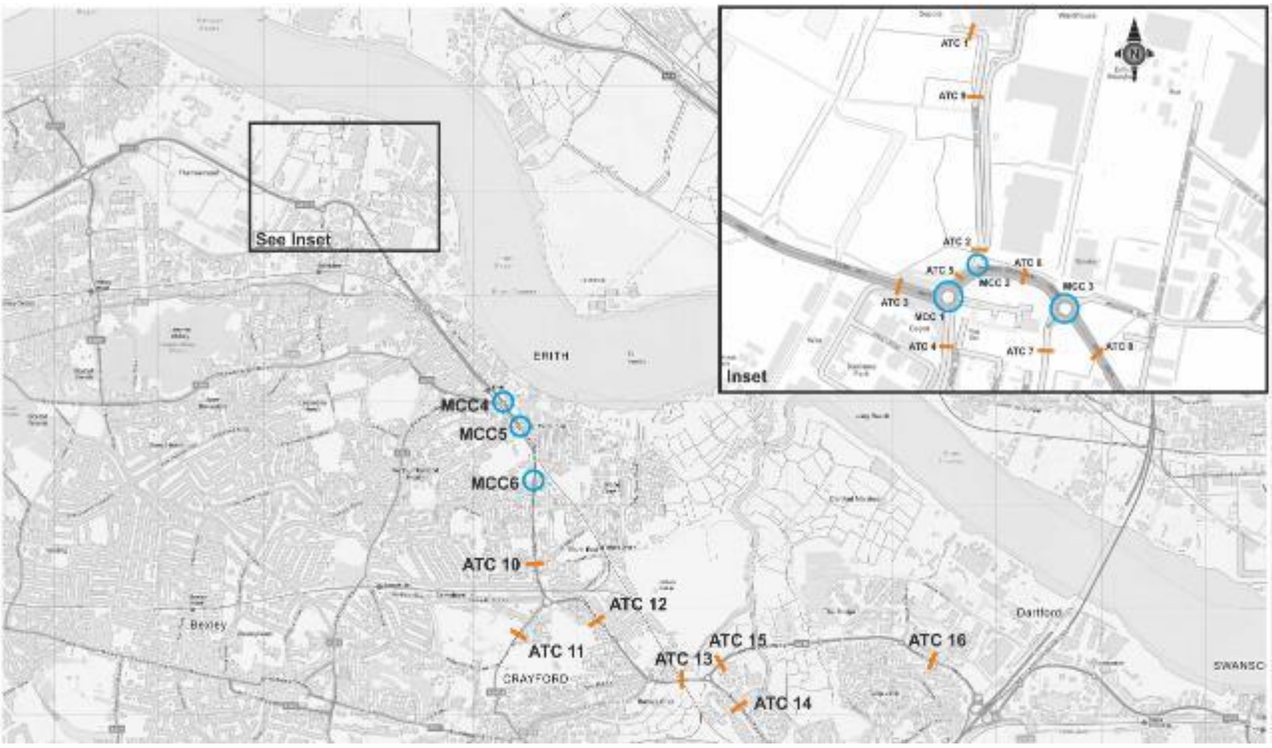


Table 2.1: Traffic Survey Scope

Survey Type	Reference	Location	Time Period
Automatic Traffic Counter	ATC1	Norman Road (north of Picardy Manorway) – northern end, at RRRF access	Saturday 14th April to Friday 27th April 2018
	ATC9	Norman Road (north of Picardy Manorway) – central, north of access to Isis Reach (Asda depot access)	
	ATC2	Norman Road (north of Picardy Manorway) – southern end, immediately north of A2016	

Survey Type	Reference	Location	Time Period
	ATC3	A2016 Eastern Way	
	ATC4	Yarnton Way	
	ATC5	A2016 Picardy Manorway (west of Norman Road)	
	ATC6	A2016 Picardy Manorway (east of Norman Road)	
	ATC7	B253 Picardy Manorway	
	ATC8	A2016 Bronze Age Way	
	ATC10	A206 Northend Road	
	ATC11	A2000 Perry Street	
	ATC12	A206 Thames Road (between Howbury Lane and Crayford Way)	
	ATC13	A206 Thames Road (between Crayford Way and Burnham Road)	
	ATC14	A2026 Burnham Road	
	ATC15	*A206 Bob Dunn Way (between Burnham Road and Central Road)*	
SDR (Radar ATC)	ATC16	A206 Bob Dunn Way (between Marsh Street North and A282 J1a)	Tuesday 17th April 2018 to Monday 30th April 2018
Manual Classified Count	MCC1	A2016 Picardy Manorway/ Clydesdale Way/ Yarnton Way/ A2016 Eastern Way	06:00-10:00 and 16:00-19:00 Thursday 19th April 2018
	MCC2	A2016 Picardy Manorway/ Norman Road	
	MCC3	A2016 Picardy Manorway/ Anderson Way/ A2016 Bronze Age Way/ B253 Picardy Manorway	
	MCC4	A2016 Bronze Age Way/ A206 Queens Road / A206 Bexley Road/ Bexley Road/ Walnut Tree	

Survey Type	Reference	Location	Time Period
		Road	
	MCC5	A206 Queens Road/ James Watt Way	06:00-10:00 and 16:00-19:00 Thursday 24th May 2018
	MCC6	A206 South Road/ Boundary Road/ A206 Northend Road/ Larner Road	

Note: ATC15 – Data partially corrupt. Used in part only.

2.3 Public Transport Network

Public Transport Accessibility Level

2.3.1 Public Transport Accessibility Levels (PTALs) are a measure of the accessibility of a site to the public transport network, taking into account: walking access times; and public transport service availability; frequency and reliability. A PTAL can range from zero to 6b, where a score of zero is the worst case but typically the lowest rate of 1 indicates a “very poor” level of accessibility and 6b indicates “excellent” provision. PTALs are used to inform both the density of a proposed development as well as required car parking provision.

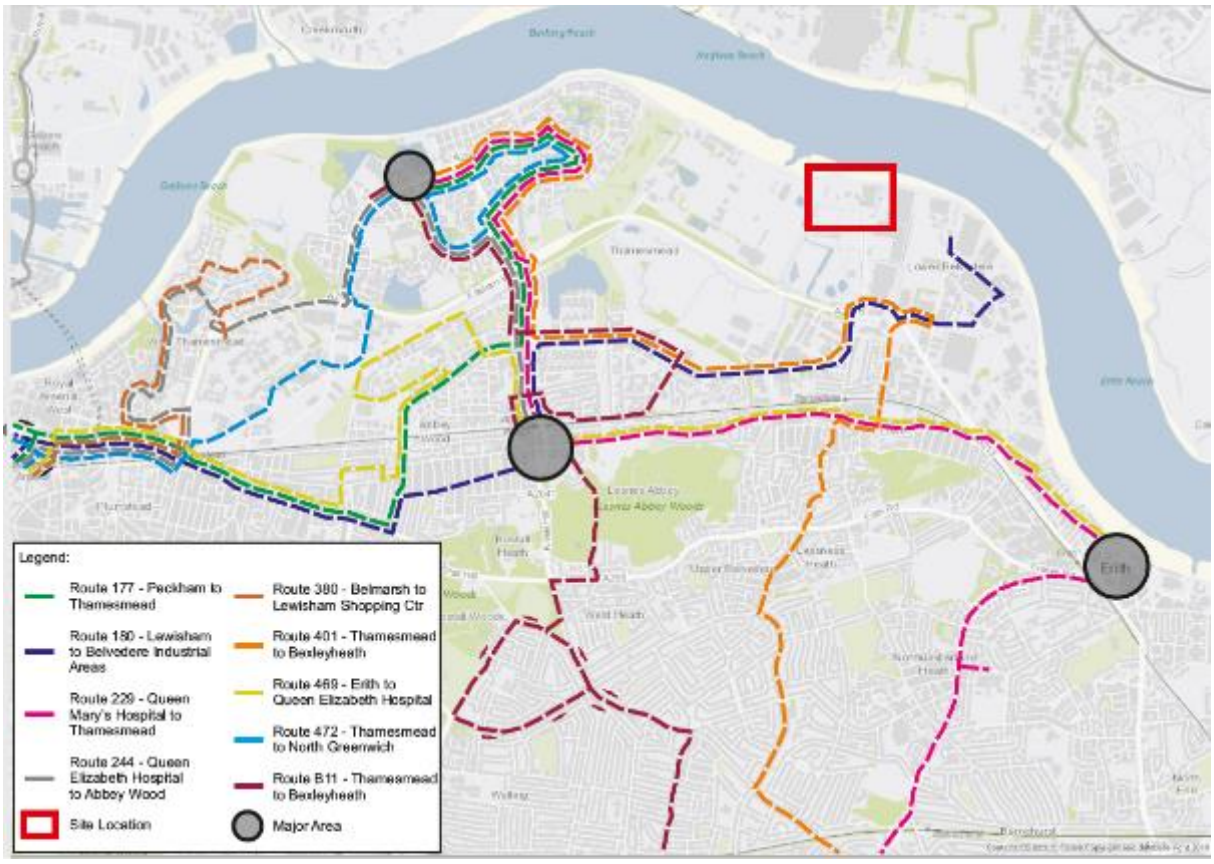
2.3.2 According to TfL’s online WebCAT toolkit, the REP site has a PTAL of 0 as a result of the bus stops on Picardy Manorway being situated over 640 m from the site. The area around the Norman Road / Picardy Manorway junction is graded at PTAL1b/2. The complete PTAL report is included in **Appendix E** .

2.3.3 The bus stops on Picardy Manorway are served by bus routes 180, 401 and 601 (school service). These services are summaries later in this section. Belvedere station is 1.4 km to the south of REP with direct walking and cycling access. Both distances are beyond the recognised connection length within the PTAL assessment (i.e. 940 m to the closest interchange/station), however, the distances are considered to be within commonly acceptable walking distances for London. The PTAL rating is considered under-representative of the public transport connectivity in the area. It is considered that the REP site is located within a reasonable distance for workers to access bus and rail services (approximately 650 m and 1.4 km respectively) and cycling and walking options – whilst balancing the need for REP to be located with good access to water freight opportunities.

Bus Network

2.3.4 A number of bus services operate in the local area, as set out in Figure 2.2, with a larger copy of this figure at **Appendix C** . There are two general bus services which operate on Picardy Manorway from which Norman Road, the primary access into the REP site, routes north. Both routes offer frequent services to local residential areas and a viable alternative to the private car for employees at RRRF and REP.

Figure 2.2: Bus Services



2.3.5 The eastbound bus stop is on the northern side of Picardy Manorway approximately 130m east of Norman Road and the westbound bus stop is on the southern side of Picardy Manorway. A signal controlled toucan crossing is provided on Picardy Manorway to cross between the southern side of the road and Norman Road. A summary of the two bus services is provided in **Table 2.2**.

Table 2.2: Bus Service Summary

Bus No.	Route	Headway (mins)			Weekday – first and last bus
		Weekday (07:00-19:00)	Saturday (07:00-19:00)	Sunday (07:00-19:00)	
180	Belvedere Industrial Area – Abbey Wood – Plumstead – Woolwich – Charlton – Greenwich – Lewisham	8-12	8-11	15	04:43 23:57

401	Bexleyheath – Belvedere – Thamesmead	15	15	30	05:40 23:55

2.3.6 A further school service, 601, also calls at the bus stops on Picardy Manorway.

2.3.7 Extracts from TfL's bus timetable information are provided at **Appendix C** of the 180, 401 and 601 bus route maps. TfL are currently reviewing and developing the local bus routes as part of the North Greenwich to Slade Green Transit Corridor to coordinate with the opening of the Elizabeth Line in 2019.

Rail Network

2.3.8 Belvedere station is located approximately 1.4 km to the south, a 17-minute walk, serving London Cannon Street, London Charing Cross; London Bridge; Dartford, Gravesend and Gillingham. The 401 bus has a journey time to Belvedere station of three minutes.

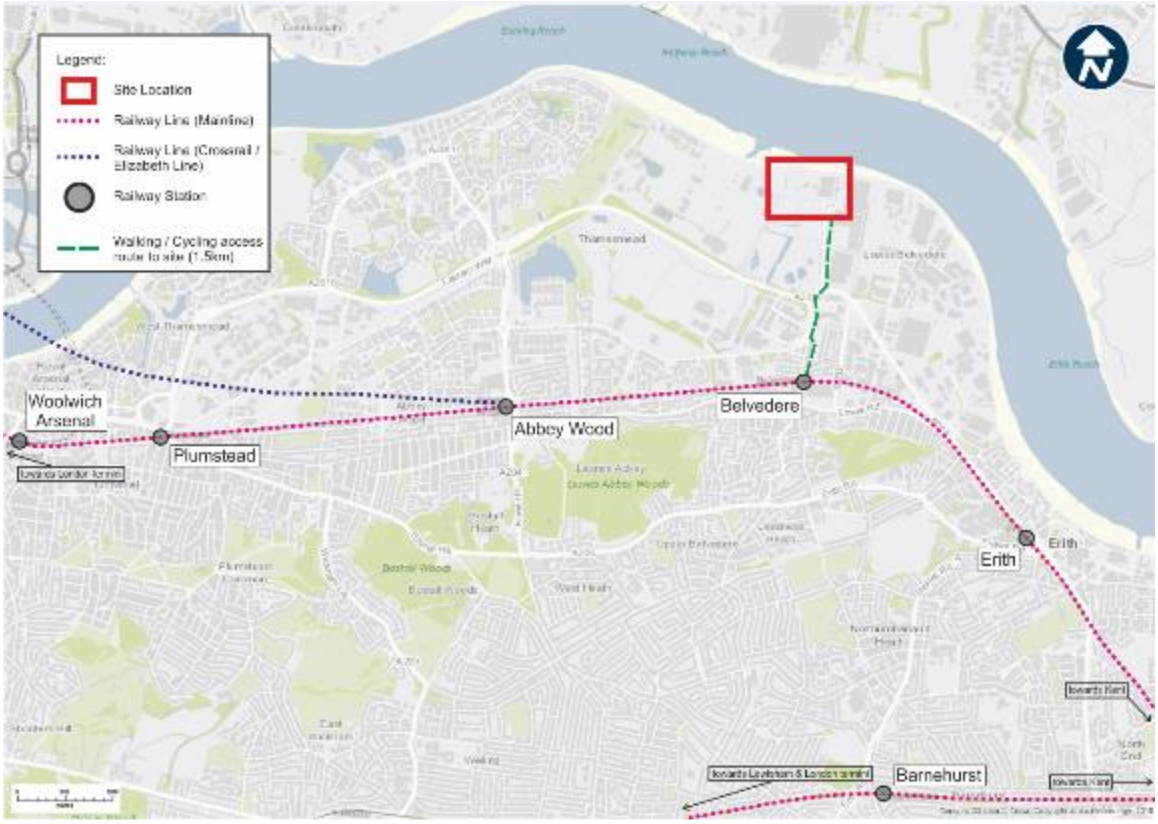
2.3.9 The station has several peak hour services to/from London Charing Cross and has the following typical off-peak services:

- 6 trains per hour (tph) to London Cannon Street calling at stops including Abbey Wood, Plumstead, Woolwich Arsenal;
- 2 tph to Dartford calling at Erith and Slade Green;
- 2 tph to Slade Green calling at Erith; and
- 2 tph to Hither Green calling at stops including Erith, Slade Green, Bexley and Sidcup.

2.3.10 Abbey Wood Rail Station is approximately 11 minutes on the 180 bus service or one stop west on the same line as Belvedere station. Elizabeth Line services will commence from Abbey Wood during 2019 (subject to completion dates) and the station also benefits from 2 tph to London Charing Cross via Lewisham, and 2 tph in each direction between the Medway Towns and Luton via central London on Thameslink.

2.3.11 **Figure 2.3** illustrates the rail network within the vicinity of REP. The diagram indicates the route of the Elizabeth Line at Abbey Wood and the North Kent Line from Dartford through Greenwich to London Bridge and on to London Charing Cross and Cannon Street. At London Bridge, passengers can now interchange with the Thameslink services to the south coast and into Luton and Bedford.

Figure 2.3: Surrounding Rail Network



2.4 Pedestrian Network

2.4.1 The network of Public Rights of Way (PRoW) FP2, FP3 and FP4 surround the REP site and the Main Temporary Construction Compounds, linking Norman Road with the Thames Path to the north – which follows the route of FP3 in the vicinity of RRRF. The FP2 PRoW originates at the junction of Norman Road and the A2016, which extends west then northwest through the Crossness Nature Reserve to its border with the Thames Water Crossness STW. From here this PRoW extends north to the Thames Path, and south to the A2016. FP1 joins the southern end of FP2 along the northern side of Eastern Way. An extract from the Definitive Public Rights of Way Map for Bexley is provided at **Figure 2.4.**

2.4.2 The England Coast Path, a new national trail around England's coast, in the vicinity of the proposed development, is to be confirmed but is expected to follow the route of the Thames Path (i.e. footpath FP3) and is scheduled for completion by 2020. The construction and operation of REP will have no direct impact on the operation of the Thames Path, and hence the anticipated route of the England Coast Path.

2.4.3 Norman Road has a footway on its eastern side which runs between the RRRF in the north and Picardy Manorway to the south. A three-stage toucan crossing of Norman Road and Picardy Manorway provides connection with the southern footway of Picardy Manorway including the eastbound bus stop.

2.4.4 Via the toucan crossing on Picardy Manorway, pedestrians can access Belvedere station via Clydesdale Way and the southern section of Norman Road. The station has level access to the eastbound platform. Access to the westbound (London) platform is via a footbridge.

Figure 2.4: Extract from PRoW Definitive Map for Bexley north [courtesy LBB]

Pedestrian Environmental Review System Audit

2.4.5 TfL requested that an abridged Pedestrian Environmental Review System (PERS) audit was carried out on footways immediately outside the site and routes towards local bus stops. An audit has been conducted of Norman Road and routes from Norman Road to the westbound and eastbound bus stops of the A2016 Picardy Manorway. The full results of the PERS audit can be found at **Appendix G** and a summary is provided below.

2.4.6 The following table indicates the scores for each of the three links assessed. This includes the individual score and RAG rating given to each of the three links.

ID	Link Name	RAG	RAG index	Overall Score
L1	Norman Road	Green	3	83
L2	Picardy Manorway EB	Green	3	92
L3	Picardy Manorway WB	Amber	2	35

2.4.7 Norman Road scored highly on most criteria, such as lack of obstructions and conflicts, but scored negatively on personal security. Picardy Manorway eastbound scored well for the quality of footway on this link; the footway is wide and accommodates the more vulnerable users with high levels of tactile paving and tonal contrast between road, cycleway and footway. The link scored negatively on permeability and quality of environment as a result of high traffic levels as well as the lack of sense of place. Picardy Manorway westbound scored lower than the other links due to a narrower footway and a perceived lower level of maintenance.

2.4.8 There are no major inclines in the area and footways are all bitumen bound wide surfaced corridors. At the junction of Norman Road with Picardy Manorway there are connections to the wider footway and PRoW network and controlled crossings are provided to assist with access to bus services. Street lighting is provided along the corridors, including Norman Road and Picardy Manorway. Signs and markings indicate the segregation between cycle and pedestrian corridors along the routes.

2.5 Cycle Network

2.5.1 Norman Road has a mixture of on-carriageway advisory cycle lanes and off-carriageway shared use paths providing a cycle route to the cycle path on the north side of Picardy Manorway and the three-stage toucan crossing of Norman Road and Picardy Manorway. There are elements of cycle infrastructure to provide a route to Belvedere station, also using the residential street of the southern section of Norman Road.

2.5.2 The Thames Path, which forms part of Route 1 of the National Cycle Network, provides a good traffic-free route between the REP site, Thamesmead to the west and Erith to the east.

Cycling Level of Service Assessment

2.5.3 Figure 2.5 shows cycle routes in proximity to the site. National Cycle Network 1 runs along the Thames Path, due north of the REP site, with a further local cycle route connecting to this east of RRRF.

2.5.4 A Cycling Level of Service (CLoS) assessment of the Norman Road / A2016 Picardy Manorway junction was requested by TfL during the pre-application process. The results of the CLoS assessment can be found at Appendix H .

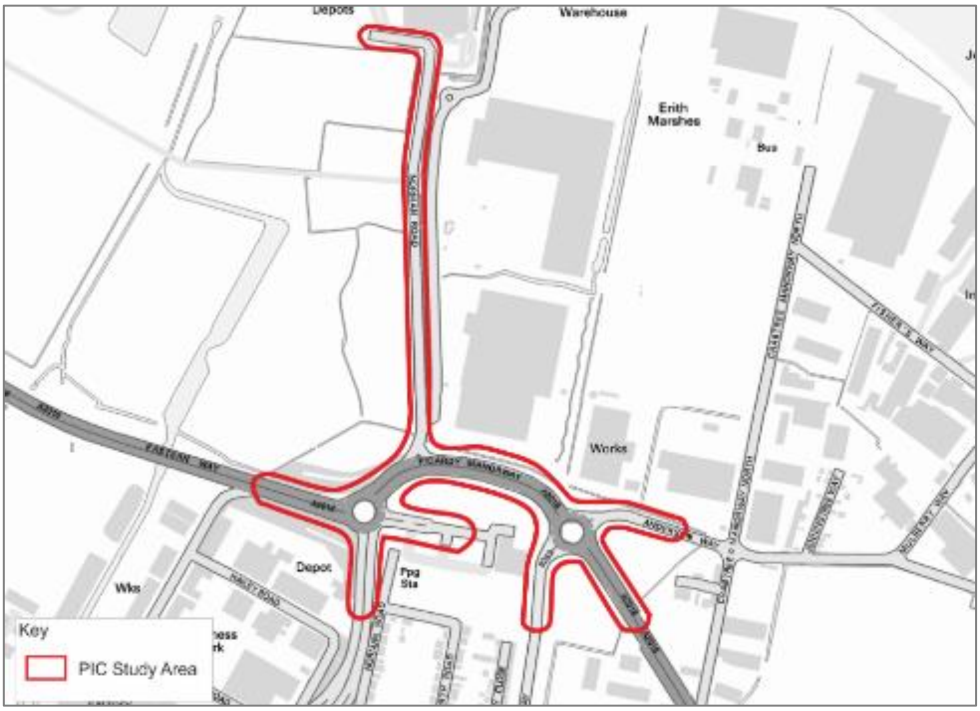
The majority of movements on the assessed junctions scored 'green' movements. This is due to the provision of off-carriageway cycle lanes and advisory on-carriageway cycle lanes along the eastern side of Norman Road, along both sides of the A2016 (east of Norman Road), and a shared pedestrian / cycle route between the A2016 south side and Clydesdale Way. However, there were some 'amber' scoring movements as a result of unclear road markings to indicate whether routes were bi-directional or uni-directional.

Figure 2.5: Cycle routes in proximity to the site

2.6 Personal Injury Collision Review (London Borough of Bexley Area)

2.6.1 A personal injury collision (PIC) review has been conducted of the three-year period of data from 1st January 2015 to 31st December 2017 within the study area indicated in **Figure 2.6** for the section of network in London Borough of Bexley, as agreed with TfL through the TA scoping. The raw data, including a plan of the PIC locations, as issued by TfL, can be found in **Appendix F** .

Figure 2.6: PIC Study Area [LBB Area]



2.6.2 The collision data on Norman Road and in the vicinity of its junction with Picardy Manorway was obtained from TfL and analysed to determine if any specific road safety issues, trends or patterns are evident. Some of the data provided was provisional data.

2.6.3 The following junctions and roads have been analysed:

a. Roundabout – Yarnton Way/Eastern Way/Picardy Manorway;
b. Roundabout – Anderson Way/Picardy Manorway/Bronze Age Way;
c. Junction – Norman Road/Picardy Manorway; and
d. Links - Picardy Manorway and Norman Road.

2.6.4 Collision analysis has been grouped into seven location zones:

Table 2.3: Collision Zone Location Reference Key

Location Ref.	Description
LBB1	Roundabout – Yarnton Way/Eastern Way/Picardy Manorway
LBB2	Roundabout – Anderson Way/Picardy Manorway/Bronze Age Way
LBB3	Junction – Norman Road/Picardy Manorway
LBB4	Link - Picardy Manorway
LBB5	Link - Norman Road
LBB6	Link - Eastern Way
LBB7	Link – Yarnton Way

2.6.5 **Table 2.4** indicates the collision severities that have occurred within the study area. **Table 2.5** considers reports those collisions which included vulnerable users.

Table 2.4: Summary of PICs by Severity [LBB area]

Location Ref.	Slight	Serious	Fatal	Total
LBB1	2	0	0	2
LBB2	6	1	0	7
LBB3	0	0	0	0
LBB4	0	0	1	1
LBB5	2	0	0	2
LBB6	1	0	0	1
LBB7	1	0	0	1
Total	**12**	**1**	**1**	**14**

Table 2.5: Summary of PICs by Vulnerable User [LBB area]

Location Ref.	Pedestrian	Cyclist	Motorcycle
LBB1	0	0	0
LBB2	0	1	2
LBB3	0	0	0
LBB4	0	0	1
LBB5	1	0	0
LBB6	0	0	0
LBB7	0	0	0
Total	**1**	**1**	**3**

2.6.6 **Table 2.6** indicates the contributing factors involved with collisions that have occurred within the study area.

Table 2.6: Summary of PIC Contributing Factors [LBB area]

Location Ref	Dark	Wet	Single vehicle	Drugs/Alcohol	Exceeding Speed	Aggressive Driving	Following to close	Failed to look	Failed to judge path and speed	Loss of control	Careless/Reckless	Disobeyed road sign	Nervous/uncertain	Distraction	Failed to signal/misleading	Stolen vehicle	Road layout	Other factor	Illegal turn or direction of travel
LBB1									■										■
LBB2	■							■			■	■							
								■					■	■					
	■	■			■	■				■									
									■				■		■				
	■	■							■										
								■	■										
	■							■											
LBB4			■		■					■	■						■		
LBB5																		■	
	■				■						■								
LBB6	■		■	■						■									
							■	■											
LBB7	■			■		■										■			
No.	**7**	**2**	**2**	**2**	**3**	**2**	**1**	**5**	**4**	**3**	**3**	**1**	**2**	**1**	**1**	**1**	**1**	**1**	**1**

2.6.7 A total of 14 personal injury collisions were recorded in the assessment area over the three years of collision data analysed. The severity of these collisions resulted in: 12 slight; one serious; and one fatality. These predominantly resulted from failure to look properly and drivers failing to judge another person's path or speed of which 6 resulted in vehicle-to-vehicle shunts and 3 involved side swipe incidents.

2.6.8 Motorised vehicles involved in the 14 collisions are cars; Light Goods Vehicles and motor cycles. One collision involved a pedal cyclist and one collision involved a pedestrian. Four of the 12 collisions involved motor cycles, 3 of which were conflicts between motor cycles (2 of the motorcycle incidents involved 2 motorcycles and 1 was a single vehicle incident. One collision involved a foreign registered goods vehicle under 3.5 T. No collisions involved Heavy Goods Vehicles (HGVs).

2.6.9 The fatality occurred on Picardy Manorway at approximately 19:30hrs. The reported contributory factor was excess speed. No other vehicles were shown to be involved.

2.6.10 Half of the collisions, 7 out of the 14 recorded, occurred during periods of darkness. There is no apparent pattern to the collisions in the dark – with them occurring between 19:00 to 02:00hrs and at different times of the year.

2.6.11 When reviewing the three year PIC trend in the study area it would appear to be increasing, as illustrated at **Table 2.7**. This is not attributed to any defined factors as the PIC location and contributing factors are not consistent. The publicly available PIC statistics [source: CrashMap.co.uk] indicate that the annual figures vary year to year between 1 PIC in 2013 to 9 PICs in 2009, set out in **Table 2.8**.

Table 2.7: PICs By Year [LBB area]

Year	No of accidents
2015	2
2016	5
2017	7

[source TfL data]

Table 2.8: Trend PICs By Year [LBB area]

Year	No of accidents
2007	2
2008	3
2009	9
2010	6
2011	7
2012	4
2013	1
2014	3
2015	2
2016	5
2017	7

[source CrashMap.co.uk database]

2.7 Personal Injury Collision Review (Dartford Area)

2.7.1 Personal Injury Collision (PIC) data on the A206 Bob Dunn Way corridor between its junction with A206 Thames Road/A2026 Burnham Road and its junction with the A282 Dartford Crossing Approach was obtained from KCC and analysed to determine if any specific road safety issues, trends or patterns are evident.

2.7.2 The data obtained covers the three year period from 01 October 2014 to 30 September 2017.

2.7.3 The following junctions and roads have been analysed:

a. Roundabout (Node 1) – Thames Road/Bob Dunn Way/Burnham Road;

b. Roundabout (Node 2)– Bob Dunn Way/Joyce Green Lane/ Central Road;

c. Roundabout (Node 3) - Bob Dunn Way/Marsh Street North;

d. Roundabout (Node 4) - Bob Dunn Way/Littlebrook Interchange/Rennie Drive;

e. Roundabout (Node 5) -Littlebrook Interchange/Cotton Lane;

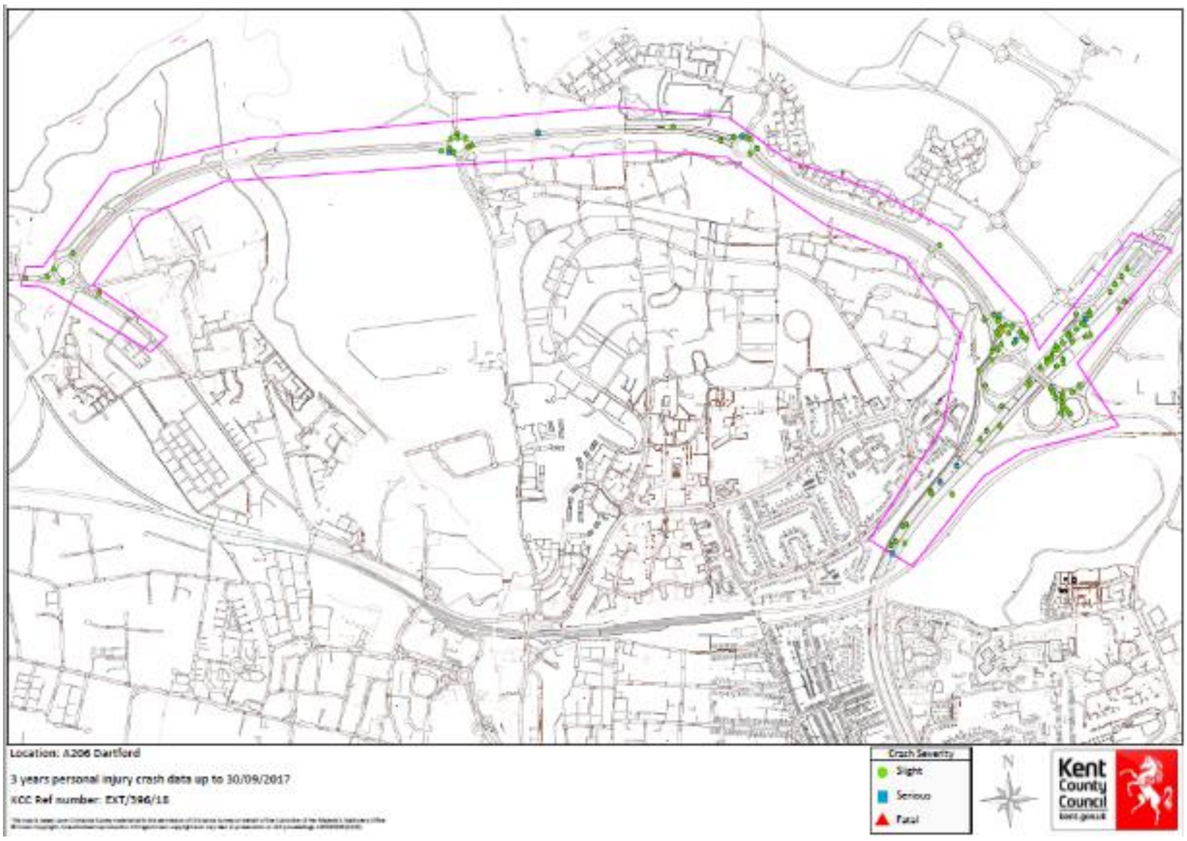
f. Link - Bob Dunn Way (Node 1 to Node 2);

g. Link - Bob Dunn Way (Node 2 to Node 3);

h. Link - Bob Dunn Way (Node 3 to Node 4); and

i. Link – A282 Dartford crossing approach.

Figure 2.7: PIC Study Area [Dartford Area]



2.7.4 A total of 107 PICs were recorded in the assessment area during the three year period. These were distributed across the network as indicated in Figure 2.7. The severity of these PICs resulted in: 99 slight injury PICs; 8 serious; and no fatalities. The PIC descriptions have been reviewed and the following collision causation factors have been estimated. The review of PIC data has been grouped into nine zones, as set out at **Table 2.9**.

Table 2.9: Collision Zone Location Reference Key [Dartford area]

Location Ref.	Description
DBC-1	Roundabout (Node 1) – Thames Road/Bob Dunn Way/Burnham Road
DBC-2	Roundabout (Node 2)– Bob Dunn Way/Joyce Green Lane/ Central Road
DBC-3	Roundabout (Node 3) - Bob Dunn Way/Marsh Street North
DBC-4	Roundabout (Node 4) - Bob Dunn Way/Littlebrook Interchange/Rennie Drv
DBC-5	Roundabout (Node 5) -Littlebrook Interchange/Cotton Lane
DBC-6	Link - Bob Dunn Way (Node 1 to Node 2)
DBC-7	Link - Bob Dunn Way (Node 2 to Node 3)
DBC-8	Link - Bob Dunn Way (Node 3 to Node 4)
DBC-9	Link – A282 Dartford crossing approach

2.7.5 The predominant collisions are shunt and side impact incidents which accounted for 83 of the 107 PICs. These collisions are mainly concentrated on the A282 Dartford Crossing approach and involved merging and main line traffic. The severity is recorded as primarily slight which reflects that these are low speed impacts, which was recorded on many of the collision descriptions. The severity of PICs by zone are shown in **Table 2.10**.

2.7.6 Bob Dunn Way/Joyce Green Lane, has 10 recorded PICs of which: 7 are single vehicle incidents, 3 involved motor cycles and 4 involved cars. There were no recorded PICs involving pedestrians or cycles.

2.7.7 The PICs in the study area for vulnerable road users consisted of: 1 pedestrian injury collision; 2 pedal cyclists; and 15 motorcyclists. The pedestrian collision involved the person walking across the signal controlled junction of the Littlebrook interchange. This junction has limited footways and no formal crossing facilities. The cycle related collisions occurred at the Littlebrook interchange and the Marsh Street North roundabouts. The collisions involving motorcycles where spread across a number of junctions and on the Dartford crossing approach. A summary of the number of PICs involving vulnerable users is provided at **Table 2.11** with a report of contributing factors set out in **Table 2.12**.

Table 2.10: Summary of PICs by Severity [Dartford area]

Location Ref	Slight	Serious	Fatal	Total
DBC1	6	0	0	6
DBC 2	9	1	0	10
DBC 3	5	1	0	6
DBC 4	21	1	0	22
DBC 5	13	0	0	13
DBC 6	0	0	0	0
DBC 7	1	1	0	2
DBC 8	1	0	0	1
DBC 9	43	4	0	47
Total	**99**	**8**	**0**	

Table 2.11: Summary of PICs by Vulnerable User [Dartford area]

Location Ref.	Pedestrian	Cyclist	M/C	Good vehicles
DBC1	0	0	0	1
DBC2	0	0	4	2
DBC3	0	1	1	1
DBC4	1	1	2	7
DBC5	0	0	3	8

Location Ref.	Pedestrian	Cyclist	M/C	Good vehicles
DBC6	0	0	0	0
DBC7	0	0	0	2
DBC8	0	0	0	1
DBC9	0	0	5	25
Total	**1**	**2**	**15**	**47**

Table 2.12: Summary of PIC Contributing Factors [Dartford area]

Location Ref.	Total Recorded	Wet Road	Dark	Single vehicle	Los of control	Shunt	Sie swipe /Merge
DBC1	6	3	3	0	1	2	1
DBC2	10	2	4	7	0	0	1
DBC3	6	3	3	0	1	3	2
DBC4	22	6	3	1	1	7	10
DBC5	13	5	3	1	0	2	10
DBC6	0	0	0	0	0	0	0
DBC7	2	2	0	0	0	1	1
DBC8	1	1	0	0	0	0	1
DBC9	47	15	12	1	1	24	18
Total	**107**	**37**	**28**	**10**	**4**	**39**	**44**

2.7.8 It is not considered that there is any clustering of PICs within the study areas (with the exception of A282 junction 1a) that represent inherent, abnormal collision rates for junctions and links of such nature. Therefore, there are not anticipated to be issues that could be intensified through the introduction of the proposed development.

2.8 Electrical Connection Route

2.8.1 The Electrical Connection would connect REP to the electrical distribution network at the existing Littlebrook substation. This would generate temporary impacts on the highway network during the construction phase when it is anticipated that the cables would generally be laid at approximately 1.2 m below the ground surface except where there is potential for directional drilling, or localised deeper trenches to be required to pass below a specific constraint.

2.8.2 The preferred route from Picardy Manorway follows the line of the A2016 Bronze Age Way, onto the A206 Northend Road / Thames Road / Bob Dunn

Way, before turning north toward Littlebrook substation via a series of alternative routes including Joyce Green Lane/Dunlop Close, or Halcrow Avenue/Rennie Drive. This corridor is part of the SRN in LBB and continues as a local strategic road within Dartford Borough. The corridor is primarily dual carriageway roads with limited frontage access.

2.8.3 The final route for the Electrical Connection will be confirmed following further detailed design work by UKPN and is anticipated to be adjacent to the start / end of a number of PRoWs with two crossing the route. The route is anticipated to cross the alignment of footpaths DB1 and DB5.

2.8.4 In the case of DB5, the PRoW passes under the A206 as well as crossing the road at grade. Footpath DB1 currently crosses the A206 dual carriageway at grade via a break in the central reservation and dropped kerbs from the footways running along that road.

2.8.5 An option for the Electrical Connection route from Bob Dunn Way to the Littlebrook substation would follow the Fastrack dedicated busway – between Binnie Road and Rennie Drive. That section of the route crosses the line of DB3 close to Marsh Street North.

2.8.6 Extracts from the PRoW definitive maps for LBB and DBC are provided at **Figure 2.8 and Figure 2.9**. The affected PRoWs are to be confirmed once the route is finalised. The management of potential impacts on PRoWs during construction of the Electrical Connection would be set out in a CTMP, which would be secured as a DCO requirement, in liaison with the relevant local authority.

Figure 2.8: Extract from PRoW Definitive Map for Bexley south [courtesy LBB]

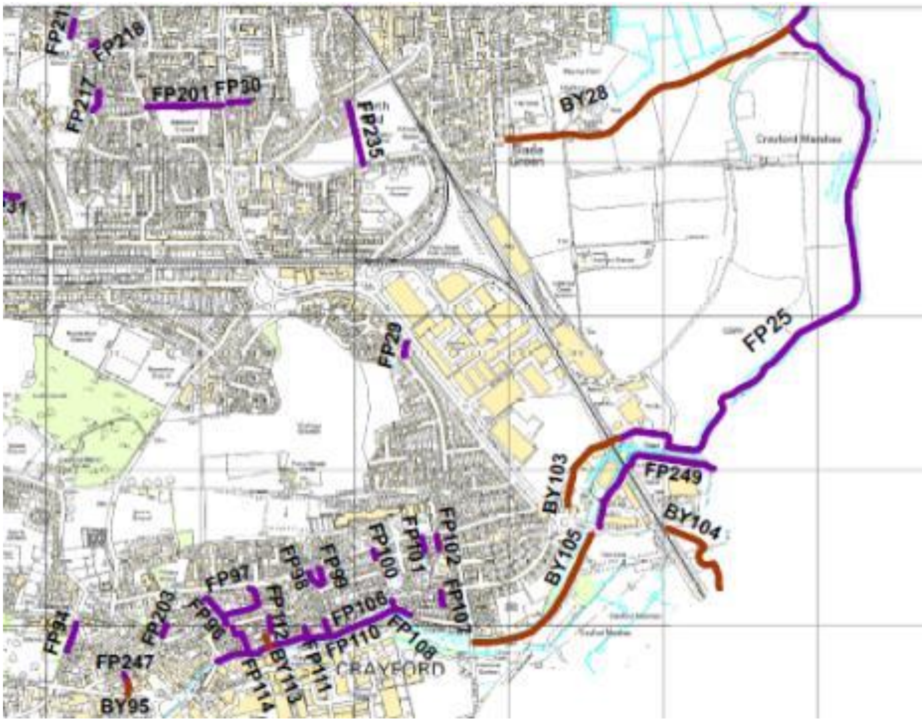
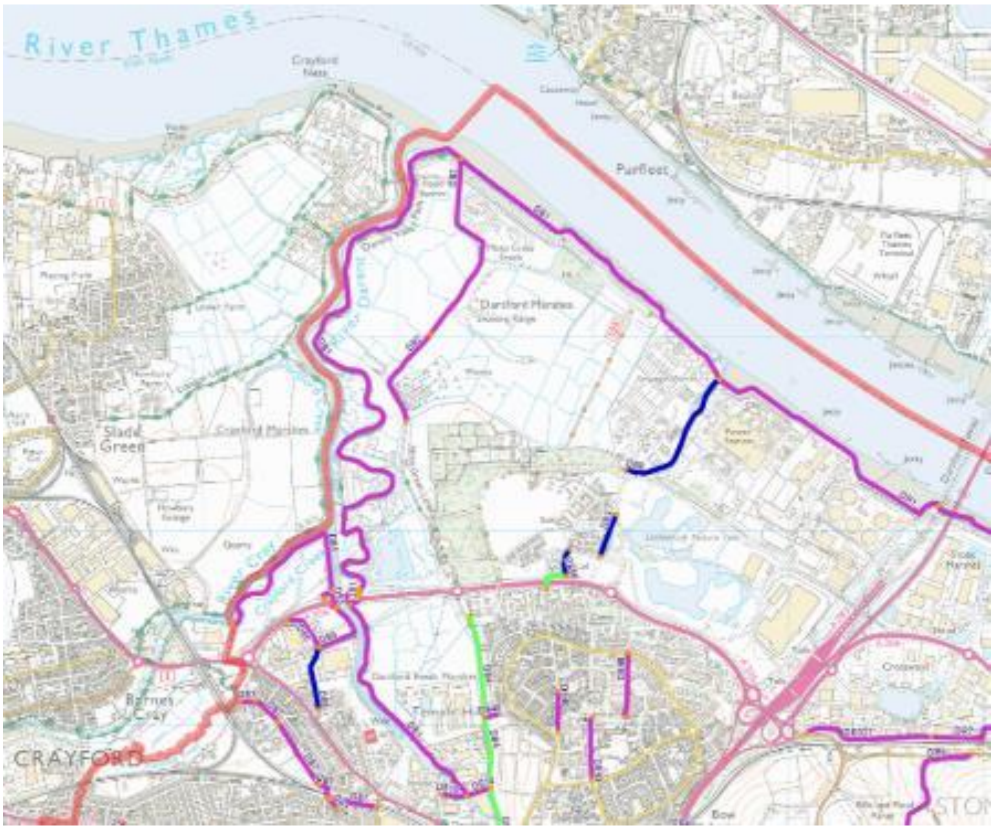


Figure 2.9: Extract from PRoW Definitive Map for Dartford [courtesy KCC]



2.8.7 A route option for the Electrical Connection from Picardy Manorway would follow the line of Anderson Way to Church Manorway, Lower Road and West Street and Erith High Street before following Manor Road and Slade Green Road when it joins the main route alignment at Thames Road via Howbury Lane.

2.8.8 This section of the route would follow local roads with mixed frontage including residential, retail, education and leisure. The northern end of the route at Anderson Way and Church Manorway passes industrial units.

2.8.9 Two general public bus routes and two school services operate along the option corridor. Services 229 and 469 provide high frequency day and evening services whilst routes 602 and 669 provide one service in either direction each day as school services. The routes of these services are indicated by extracts from TfL's bus information maps at **Appendix C** .

2.8.10 Within Dartford Borough, the preferred route would follow the alignment of the Fastrack bus service route A, from Binnie Road and across Marsh Street connecting with Rennie Drive. The Fastrack busway is a bus only corridors with six stops along the affected section of the route. Service frequency is timetabled as one bus in each direction every 10 minutes. The service is promoted as a high quality modern service and as such bus headway is retained with good spacing.

2.9 Baseline Conditions Summary

2.9.1 This TA has given the broad description of the proposals, relevant to the assessment of Transport impacts.

2.9.2 The scope of the TA has been agreed with the Local Authorities and recognises that there are sensitive points on the road network, for vulnerable road users and those sensitive to traffic volumes. The network sensitivity is generally during the morning peak period and primarily towards Erith and junction 1a of A282/M25, which are appraised through the TA. The geographic coverage of the TA has been identified and the data analysis process is outlined.

2.9.3 It has been shown that the REP site is suitably located adjacent to the River Thames and RRRF to maximise water freight opportunities for the key operational materials. The setting has good access to the local London SRN and the national network for complementary road movements. During construction, options to move materials by river would be reviewed, where they can feasibly and economically be aligned with the on-going operations at RRRF.

2.9.4 Opportunities would be available for workers to travel safely and conveniently to REP by a variety of existing transport modes with those facilities typically available when people are expected to need to travel – including early mornings and late evenings. The opening of the Elizabeth Line in 2019 increases the options for travel.

2.9.5 The Electrical Connection has been described and an outline given of the preferred route and where there are options to be refined.

3 Policy and Guidance Review

3.1 Introduction

3.1.1 A review of the relevant national, regional and local policy and guidance forms part of the ES chapter which has guided the approach adopted for this TA, and has also been used to shape the Proposed Development.

3.1.2 The following policy and guidance documents have been identified as relevant to this Transport Assessment:

- Overarching National Policy Statement for Energy (EN-1) (2011)
- National Policy Statement for Renewable Energy Infrastructure (EN-3) (2011)
- National Planning Policy Framework (2018);
- Planning Practice Guidance (online resource);
- Department for Transport Circular 02/2013 – The Strategic Road Network and the Delivery of Sustainable Development
- Planning for the future – A guide to working with Highways England on planning matters (2015)
- London Plan (2016);
- Draft New London Plan showing Minor Suggested Changes (2018);
- Mayor’s Transport Strategy (2018);
- Bexley Core Strategy (2012);
- Bexley Unitary Development Plan Saved Policies (2004) Saved Policies (2012);
- Dartford Development Policies Plan and Policies Map (2017); and
- Kent Local Transport Plan 4: Delivering Growth without Gridlock 2016–2031 (2017).

3.2 National Policy and Guidance

Overarching National Policy Statement for Energy – EN1 July 2011

3.2.1 Section 5.13 of the NPS includes the following points which have helped to form the methodology used for this Transport Assessment and guided on the focus for the report:

3.2.2 "*The consideration and mitigation of transport impacts is an essential part of Government's wider policy objectives for sustainable development as set out in Section 2.2 of this NPS.*"

3.2.3 "*If a project is likely to have significant transport implications, the applicant's ES (see Section 4.2) should include a transport assessment, using the NATA/WebTAG methodology stipulated in Department for Transport Guidance, or any successor to such methodology. Applicants should consult the Highways Agency and Highways Authorities as appropriate on the assessment and mitigation.*"

3.2.4 "*Where appropriate, the applicant should prepare a travel plan including demand management measures to mitigate transport impacts. The applicant should also provide details of proposed measures to improve access by public transport, walking and cycling, to reduce the need for parking associated with the proposal and to mitigate transport impacts.*"

3.2.5 "*A new energy NSIP may give rise to substantial impacts on the surrounding transport infrastructure and the [Secretary of State] should therefore ensure that the applicant has sought to mitigate these impacts, including during the construction phase of the development.*"

3.2.6 "*Water-borne or rail transport is preferred over road transport at all stages of the project, where cost-effective.*"

National Policy Statement for Renewable Energy Infrastructure – EN3 July 2011

3.2.1 Section 2.5.25 of NPS EN-3 seeks that "*Government policy encourages multi-modal transport and the [Secretary of State] should expect materials (fuel and residues) to be transported by water or rail routes where possible…….Applicants should locate new biomass or waste combustion generating stations in the vicinity of existing transport routes wherever possible.*"

National Planning Policy Framework (2018)

3.2.2 The National Planning Policy Framework (NPPF) was published in July 2018 and sets out the Government's environmental, economic and social policies for England. Section 9: Promoting Sustainable Transport, of the NPPF, paragraph 102 states that;

"transport issues should be considered from the earliest stages of plan-making and development proposals, so that:

a) the potential impacts of development on transport networks can be addressed;
b) opportunities from existing or proposed transport infrastructure, and changing transport technology and usage, are realised – for example in

relation to the scale, location or density of development that can be accommodated;

c) *opportunities to promote walking, cycling and public transport use are identified and pursued;…."*

3.2.3 In assessing sites that may be allocated for development in plans, or specific applications for development, paragraph 108 states that;

"*…it should be ensured that:*

a) *appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location;*
b) *safe and suitable access to the site can be achieved for all users; and*
c) *any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree."*

3.2.4 Paragraph 109-110 goes on to state that;

"Development should only be prevented or refused on highways grounds if the residual cumulative impacts on the road network or road safety would be severe.

Within this context, applications for development should:

a) *give priority first to pedestrian and cycle movements, both within the scheme and with neighbouring areas; and second – so far as possible – to facilitating access to high quality public transport, with layouts that maximise the catchment area for bus or other public transport services, and appropriate facilities that encourage public transport use;*
b) *address the needs of people with disabilities and reduced mobility in relation to all modes of transport;*
c) *create places that are safe, secure and attractive – which minimise the scope for conflicts between pedestrians, cyclists and vehicles, avoid unnecessary street clutter, and respond to local character and design standards;*
d) *allow for the efficient delivery of goods, and access by service and emergency vehicles; and*
e) *be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations."*

Planning Practice Guidance (online resource)

3.2.5 The supporting Planning Practice Guidance provides a section on 'travel plans, transport assessments and statements in decision-taking'. This states that a TA can positively contribute to:

- "*encouraging sustainable travel;*
- *lessening traffic generation and its detrimental impacts;*

- *reducing carbon emissions and climate impacts;*
- *creating accessible, connected, inclusive communities;*
- *improving health outcomes and quality of life;*
- *improving road safety; and*
- *reducing the need for new development to increase existing road capacity or provide new roads."* (DCLG, 2014, Paragraph: 006 Reference ID: 42-006-20140306)

3.2.6 The guidance also states that the TA should be:

- "*proportionate to the size and scope of the proposed development to which they relate and build on existing information wherever possible;*
- *established at the earliest practicable possible stage of a development proposal;*
- *be tailored to particular local circumstances (other locally-determined factors and information beyond those which are set out in this guidance may need to be considered in these studies provided there is robust evidence for doing so locally); and*
- *be brought forward through collaborative ongoing working between the local planning authority/transport authority. Engaging communities and local businesses in transport assessments and statements can be beneficial in positively supporting higher levels of walking and cycling (which in turn can encourage greater social inclusion, community cohesion and healthier communities)."* (DCLG, 2014, Paragraph: 007 Reference ID: 42-007-20140306).

Department for Transport Circular 02/2013 – The Strategic Road Network and the Delivery of Sustainable Development

3.2.7 Circular 02/2013 provided the policy base for the strategic road network within England under the jurisdiction of Highways England (formerly the Highways Agency). The document sets out the way in which Highways England engages with communities and developers to deliver sustainable development.

3.2.8 Paragraph 9 of that document states: "*Development proposals are likely to be acceptable if they can be accommodated within the existing capacity of a section (link or junction) of the strategic road network, or they do not increased demand for use of a section that is already operating at over-capacity levels, taking account of any travel plan, traffic management and/or capacity enhancement measures that may be agreed. However, development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe*."

3.2.9 Paragraphs 25 and 26 require that forecast demand for the development "*should be compared to the ability of the existing network to accommodate traffic over a period up to ten years after the date of registration of a planning application…."* and that developers *"put forward initiatives that manage down the traffic impacts of proposals to support the promotion of sustainable transport".*

3.2.10 The circular recognises that the use of a robust travel plan is "*an effective means of managing the impact of development*".

Planning for the future – A guide to working with Highways England on planning matters (Sept 2015)

3.2.11 Highways England sets out in 'Planning for the Future' its policy and approach to assessing development impact on the route network and how they will engage in the development proposals process. The paper documents Highway England's role and responsibilities and aspirations.

3.2.12 At paragraphs 33 and 34, the document emphasises the guidance and policy basis of Circular 02/2013 and introduces that if the test in the Circular are not met "*additional assessments will be required*", such as to:

- "*demonstrate how the proposals will reduce the need to travel, especially by car;*
- *demonstrate how the proposals will improve accessibility by all modes of travel and influence travel behaviours;*
- *assess the likely impact of residual trips (i.e. after measures above have been considered);*
- *identify appropriate and proportionate mitigation measures and ensure that what is proposed promotes sustainable transport outcomes and avoids unnecessary works to the SRN.*"

3.2.13 The guidance expresses, at paragraph 35, that Highways England would only advise refusal or the placing of conditions on development only where the residual cumulative impacts of development on the capacity of the SRN, following proposed mitigation, are still assessed as severe.

3.3 Regional Policy and Guidance

London Plan (2016)

3.3.1 The sixth objective of the plan, described in paragraph 6.1, states that London should be:

"*A city where it is easy, safe and convenient for everyone to access jobs, opportunities and facilities with an efficient and effective transport system* *which actively encourages more walking and cycling, makes better use of the Thames and supports delivery of all objectives of this Plan.*"

3.3.2 Chapter 6 of the London Plan identifies policies to support integration of transport and development, connecting London and ensuring better streets. It also sets out car and cycle parking standards.

3.3.3 Policy 6.1 'Strategic Approach' sets out how the Mayor will work with key parties to encourage integrated transport systems through:

- Encouraging patterns and nodes of development that reduce the need to travel, especially by car
- Supporting development with a high trip generation at locations where there is good public transport accessibility and capacity
- Supporting measures that encourage shifts to more sustainable modes and appropriate demand management
- Promoting greater use of low-carbon technology to reduce carbon dioxide emissions and other global warming contributions
- Promoting walking by ensuring an improved public realm
- Facilitating the efficient distribution of freight whilst minimising its impacts on the transport network

3.3.4 Policy 6.3 'Assessing Transport Capacity' requires that development proposals ensure that the impacts of the transport capacity and the transport network are considered, and that TAs will be required in accordance with TfL 'Transport Assessment Best Practice Guidance'.

3.3.5 Policy 6.9 'Cycling' and Policy 6.10 'Walking' explain how the Mayor will seek to increase cycling and walking prevalence in London through ensuring development provides appropriate cycle parking, creating high quality pedestrian environments and simplified, decluttered streetscapes that provide access for all.

3.3.6 Policy 6.13 'Parking' presents the approach to parking provision for both cars and cycles, with maximum standards for the former, and minimum for the latter.

3.3.7 Policy 6.14 'Freight' states that the Mayor will work to improve freight distribution and promote movement of freight by rail and waterway in order to help relieve congestion within London. The policy encourages the increased the use of the Blue Ribbon Network for freight transport and the uptake of construction logistics plans, delivery and servicing plans and more innovative freight solutions in order to minimise congestion and improve safety.

Draft New London Plan showing Minor Suggested Changes (2018)

3.3.8 The Draft New London Plan showing Minor Suggested Changes, published in August 2018, outlines the Mayor's environmental, economic, social and transport strategic policy framework which aims to improve London as a region over the next 20-25 years. Chapter 10 of the Draft London Plan subsumes the following transport policy areas. The most relevant policies included within this Chapter are outlined below:

3.3.9 Policy T1 'Strategic Approach to Transport' requires all Borough Development Plans to support and facilitate the "*strategic target of 80% of all trips in London to be made by foot, cycle or public transport by 2041*", with an outer London target of 75%. This should be sought through:

- Encouraging greater integration of land use and transport as well as further improvements to the public transport which creates greater connectivity
- Reducing congestion by encouraging a modal shift from car use to public transport
- Promoting consolidation of deliveries in order to minimise the delivery trips
- Investing in high quality interchanges and rebalancing the public transport network to make active methods of travel more attractive

3.3.10 Policy T2 'Healthy Streets' is a key aspect of the Draft London Plan. It seeks to encourage Development Plans to facilitate more trips by walking and cycling through improving street environments – seeking to allow people to undertake daily active travel to stay healthy. The Policy further seeks "better management of freight" to lessen their impact on London's streets.

3.3.11 Policy T3 'Transport Capacity, Connectivity and Safeguarding' aims to inform Development Plans and proposals to support the sustainable development of London's public transport network. This includes safeguarding existing buildings and land used for transport. This will enable expansion in the near future and includes a number of possible transport schemes across the short, medium and long-term.

3.3.12 Policy T4 'Assessing and Mitigating Transport Impacts' highlights the importance of an integrated approach to current and planned transport access, capacity and connectivity. Transport assessments should be submitted where development proposals may negatively and irreversibly impact the local transport network, with mitigation provided where necessary; particularly walking, cycling and public transport mitigation.

3.3.13 The Policy sets out the requirement for complementary evidence to Transport Assessments, including: Travel Plans; Construction Logistics Plans (CLPs), Delivery and Servicing Plans (DSP) and Parking Design and Management Plans.

3.3.14 Policy T5 'Cycling' sets out the approach to removing barriers to cycling and creating environments in which people choose to cycle. It sets out the minimum cycle parking standards and the Mayor's aspirations for improvements to the strategic cycle network across London. Developers should demonstrate how they will cater for larger cycles and adapted cycles for disabled people.

3.3.15 Policy T6 'Car Parking' encompasses residential, office, retail, hotel, leisure and disabled person parking standards; with differing standards applied to the Central Activities Zone, Inner London, Outer London and other parts. REP is a Sui Generis land use, however, Policy T6.2 is the most applicable sub-policy and states that provision should be made for "electric or other Ultra-Low Emission vehicles".

3.3.16 Policy T7 'Deliveries, Servicing and Construction' aims to reduce the number of freight and servicing trips and emissions from these movements across London through, for example; provision of electric vehicle charging points for freight vehicles, hydrogen refuelling stations and encouraging out-of-peak deliveries by operating 24-hour consolidation and distribution sites.

3.3.17 The Policy requires CLPs and DSPs, developed in accordance with TfL's guidance. Management and design of facilities in encouraged which allow off peak and night time deliveries and servicing. The use of water and rail transport are to be considered as part of development proposals.

3.3.18 Designing in safe access for people walking and cycling during the construction phase is expressed.

Mayor's Transport Strategy (2018)

3.3.19 The MTS was published in March 2018 and sets out the Mayor's policies and proposals to reshape transport in London over the next 25 years.

3.3.20 The MTS places an emphasis on healthy streets and promoting sustainable travel. Its three main themes comprise:

- Healthy streets and healthy people;
- A good public transport experience; and
- New homes and jobs.

3.3.21 'Healthy streets and healthy people' is about creating streets and routes that encourage walking, cycling and public transport use to reduce car dependency and the resultant adverse health effects it has. Streets and neighbourhoods should be designed to make them pleasant places, with walking and cycling prioritised. Road danger will be reduced to help make people feel safer and more comfortable when walking and cycling. A shift away from car use will be pursued to help London's streets work more efficiently and reduce congestion.

3.3.22 'A good public transport experience' ensures that public transport is the most efficient way for people to travel distances that are too long to walk or cycle and enables a shift from private car which could reduce the number of vehicles on London's streets. The whole journey will be made more attractive, including the station experience and onward journeys.

3.3.23 'New homes and jobs' is about ensuring that the ever-increasing number of people living and working in London are well-connected. The growth must be 'good growth', which provides more opportunities, delivers affordable homes and improves the quality of life. People should be able to live in areas where many of the places they want to go to are within walking and cycling distance, and good public transport connections are available for longer trips.

3.4 Local Policy and Guidance

Bexley Core Strategy (2012)

3.4.1 Policy CS15 'Achieving an integrated and sustainable transport system' provides detail on the transport-specific actions that primarily seek to "*achieve a comprehensive, high quality, safe, integrated and sustainable transport system*" through the following actions which are of relevance to the proposed development:

- *"adopting a parking policy that addresses the need for appropriate controls to secure a sustainable environment within the Borough, whilst recognising the need to help viable development in town centres and major employment areas",* and
- *"encouraging walking and cycling within the borough through implementation of local and strategic walking and cycling programmes, school travel plans, local safety schemes and the provision of facilities within development proposals and environmental improvement projects."*

3.4.2 Paragraph 4.7.14 states that *"the Council's Parking Strategy seeks to contribute to the competitiveness, regeneration and environmental quality of the Borough through the appropriate amount, location and design of parking facilities*."

3.4.3 Appendix C of the Core Strategy sets out a table of all saved Unitary Development Plan (UDP) policies (2007) and states whether the policies have been replaced in full or in part by the Core Strategy and/or the London Plan (2011). Saved 2007 UDP Annex 1 regarding parking policy standards was identified to be replaced with London Plan (2011) standards.

Bexley Unitary Development Plan (2004) Saved Policies (2012)

3.4.4 The 2012 Addendum to the London Borough of Bexley's (LBB's) 2004 Unitary Development Plan states that, in relation to parking, the main intent of Policy G23 of the Saved 2007 UDP remains, as well as objectives around the shared use of parking, the protection and enhancement of the local environment and amenity.

3.4.5 Policy T17 states that off-street parking spaces should be provided in new developments and located so as to discourage on-street parking and respect the amenity of nearby residents. The policy goes on to state that "*A balance has to be struck between providing adequate levels of parking to meet economic and regeneration objectives and encouraging people to walk, cycle or use public transport to avoid the environmentally damaging effects of traffic. Government policy encourages a reduction in the amount of parking in new development as part of a package of planning and transport measures to promote sustainable travel choices*."

Dartford Development Policies Plan and Policies Map (2017)

3.4.6 DP3 'transport impacts of development' states that development will only be permitted where it is appropriately located and makes suitable provision to minimise and manage the arising transport impacts.

3.4.7 Development will not be permitted where the localised residual impacts result in severe impacts on one or more of the following:

- Road traffic congestion and air quality;
- Safety of pedestrians, cyclists and other road-users; and
- Excessive pressure for on-street parking.

Kent Local Transport Plan 4: Delivering Growth without Gridlock 2016–2031

3.4.8 Kent County Council's Local Transport Plan brings together their proposed transport policies including local schemes and issues as well as those of countywide and national significance.

3.4.9 Though the REP site is located in LBB, it is anticipated that some vehicles travelling to and from the REP site will do so via the A206, a strategic traffic route within DBC, and the A282/Junction 1a of the M25 at the Dartford Crossing. Additionally, the Electrical Connection route runs between the REP site and the Littlebrook substation, Dartford.

3.4.10 The plan identifies Dartford Borough Council (DBC) as an area in need of improvements to its local transport network, stating the main problems within the area, which are summarised as:

- The M25, A2 and A282 (Dartford Crossing) suffer from congestion at peak times and when there are traffic incidents which leads to reduced performance of the highway network within the town centre and its surrounds.

- Congestion from rat-running through the town centre directly affects pedestrians, cyclist and public transport provision. Impacts on these users are exacerbated by the presence of the ring road around the town centre.

- Parts of the local road network are reaching capacity due to the scale of development in surrounding the area, and significant modal shift is necessary to accommodate further growth.

3.4.11 A number of improvements are suggested within the Plan in order to alleviate these main problems. Possible solutions include improvements or a new bridge at A282 Junction 1a and other unnamed measures to address the impacts of the Dartford Crossing on Dartford town centre.

3.5 How the Proposals Respond to Policy and Guidance

3.5.1 As stated at paragraph 1.5.8 and required by NPS-EN1, this TA complies with the processes for assessment of travel impact as identified within the January 2014 (WebTAG) methodology. A comprehensive scoping exercise has been carried out with the Local Highway Authorities, Highways England and the Local Planning Authorities, as set out at paragraph 2.2.9 of this TA. That scoping exercise has guided the focus and coverage of the transport evidence for this DCO. In addition, the stakeholder engagement and consultation exercise has helped to refine the scope.

3.5.2 The TA reviews the location of the Proposed Development in relation to the transport network, noting the juxtaposition to the river Thames and the strategic road network. An assessment is provided of the construction and operational reasonable worst case scenarios and determines the likely travel impacts.

3.5.3 The Proposed Development benefits from the existing jetty infrastructure at the REP site which has appropriate available capacity for the projected marine vessel movements of both RRRF and REP. This will ensure that, under normal operation, a significant proportion of the materials transported to and from REP would be moved by barge, without further infrastructure being built in the River Thames. This would help to minimise road movements and help to reduce the environmental impact of transport associated with the operation of REP.

3.5.4 As detailed at Sections 5 and 6, this TA assesses scenarios for the operation of REP, including the reasonable worst case scenario which assume all imported waste materials being moved by road (i.e. ‘100% by road’ scenario). It is demonstrated and detailed that the percentage impact of operational traffic on the network would cause minimal impact and under typical operations (i.e. the ‘nominal’ scenario) the traffic impact would be extremely small – the scale of which would be wholly within daily network variations.

3.5.5 Once operational REP would be supported by an Operational Worker Travel Plan which will guide the workforce to adopt environmentally sound methods of travel. Workforce movement would be a small proportion of the transport picture for REP during operation, and the importance of the proximity of the river to the site is key, however, access by bus, train, walking and cycling would be highly feasible for workers. Car parking will be provided for some drivers, in accordance with policy, there will be facilities available for electric charging and potentially for alternative fuel vehicles where there is demand. Cycle parking for staff and visitors will be provided in sheltered and secure locations and pedestrians will be able safely to access REP and local bus and rail services. The Proposed Development therefore will respond to the aspirations for environmentally friendly travel. On-site welfare facilities will provide showers, lockers and drying areas.

3.5.6 Road movements associated with the construction period are anticipated to be focused away from the network peak periods. Workers would arrive before the morning peak and depart after the afternoon peak. Construction vehicles would be profiled across the working day, reflecting the nature of the tasks in which they are involved and the programme of works. Where appropriate, deliveries and extractions would also be scheduled to arrive and depart outside network peak periods – within the controls at the start or end points of those journeys and allowing for initiatives such as the London Lorry Control Scheme. CTMPs would co-ordinate plant, materials and equipment deliveries with the intension to reduce the overall numbers and to retime them where feasible. Travel planning initiatives will help to manage down workforce travel impacts by encouraging sustainable travel options.

3.5.7 The quantitative network analysis that has been carried out on the construction period is presented at Section 4 and is based on the reasonable worst case assessment of the peak month during construction (i.e. Month 13), with the assessment outcome reviewed at Section 6. Taking account of mitigation, through the use of CTMP measures, there are projected to be some residual impacts at points across the local SRN. These would be temporary during the peak hours during the peak construction period and evidence is provided to show that this would be for a relatively contained period of around 5-6 months, as illustrated by indicative work programme at **Appendix I** .

4 Construction Trip Generation, Distribution and Assignment

4.1 Introduction

4.1.1 This chapter summarises the expected construction programme, how it has informed trip generation, and the resultant distribution and assignment of trips onto the local transport networks.

4.1.2 The assessment primarily focuses on the 'reasonable worst-case' scenario which represents the peak month of construction in terms of trip generation. This is expected to be Month 13 of the construction programme as outlined in the subsequent sections.

4.2 Construction Programme

4.2.1 The overall construction programme, including the commissioning phase, is expected to span approximately 45 months.

4.3 Construction Trip Generation

Construction Staff Trip Generation

4.3.1 A first principles approach has been adopted in determining the staff trip generation based on the expected number of personnel and onsite parking provision over the construction period.

4.3.2 The expected maximum number of personnel onsite, including sub-contractors, during each month of the construction period, along with the level of parking provision, has been set out in **Table 4.1**.

4.3.3 As can be seen, it is envisaged that the reasonable worst case scenario would be Month 13 during which the highest construction workforce is operating onsite.

Table 4.1: Maximum Number of Personnel Onsite and Level of Parking Provision During the Construction period

Month	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*
Personnel	0	0	49	50	143	147	156	202	205	377	556	989	1097	696	549
Parking	0	0	43	44	96	99	107	123	126	209	297	501	552	359	291
Month	*16*	*17*	*18*	*19*	*20*	*21*	*22*	*23*	*24*	*25*	*26*	*27*	*28*	*29*	*30*
Personnel	497	575	441	413	341	330	334	289	291	234	207	179	96	91	85
Parking	267	305	244	231	198	194	196	171	171	147	130	110	74	71	67
Month	*31*	*32*	*33*	*34*	*35*	*36*	*37*	*38*	*39*	*40*	*41*	*42*	*43*	*44*	*45*
Personnel	78	108	106	103	99	98	169	83	83	83	83	83	83	83	83
Parking	63	95	93	91	87	86	76	0	0	0	0	0	0	0	0

4.3.4 It is estimated that approximately 14% (157) of workers during Month 13 would be from the EU and other areas outside the UK, while approximately 33% (361) workers would be from within Greater London and 53% (579) from the UK (excluding Greater London).

4.3.5 The following assumptions have been made in determining the construction staff trip generation for the assessment of transport scenarios:

- one parking space equates to one arrival and one departure movement per day (1,104 movements per day on Month 13);
- Construction workers are to work between 08:00 – 18:00, with arrivals taking place between 07:00 – 08:00 and departures between 18:00 – 19:00. This assumption is considered a reasonable worst case as, in practice, the Applicant's contractor could adopt a construction working day of 07:00 to 19:00, which would reduce construction related travel impacts during the morning highway network peak periods and delay departure until after the evening network peak period; and
- the workforce operates on a single shift during the working day and there would be no turnover of parking spaces. If a different working pattern were used, parking space turnover would occur outside of peak arrival or departure times and are not anticipated to add significantly to the total number of daily workforce trips.

4.3.6 Based on the above, during Month 13, there would be 1,104 movements per day of which 552 movements would occur between 07:00 - 08:00 and 552 would occur between 18:00 – 19:00.

4.3.7 The vehicle trip generation would equate to a car/van driver mode share of 50% during that month, which is lower than the Census 2011 method of travel to work mode share of 63% for Bexley (MSOA 003). This level of car/van driver mode share reduction is expected based on the following factors:

- many of the construction workers from abroad and further afield within the UK would stay nearby in hotels or rented accommodation where it would be possible to car share or use public transport or other non-car modes to access to REP site;
- Workers from within Greater London would be encouraged to travel by non-car modes wherever reasonably possible;
- The limited parking provision for construction workers will restrict driving and encourage access by non-car modes. Illegal parking on the public highway would be monitored; and
- The workforce travel plan initiatives included as part of the CTMP will further encourage travel by sustainable modes.

Construction Material Trip Generation

4.3.8 Construction materials would be transported both by river, where feasible, and road. All abnormal loads would be delivered by road. It would not be proposed to carry out works within the River Thames and so the movement of large plant and equipment would be focussed on movement by road. Abnormal Indivisible Loads (AILs) would be transported as directed by the police, LHAs and structures owners as required – established through the standard notification procedures. Movements would often be overnight and would be guided by a convoy escort if required. Advanced notice would be given depending on the load to be moved to appropriate authorities, such as the police, highway authorities and bridge and structure owners like Network Rail. The number of AILs would be few and distributed across a series of tasks through the construction period. AILs would include items such as generators, turbines, boiler infrastructure and large plant.

4.3.9 A breakdown of expected construction vehicle trips by each month of the construction programme for REP and the Main Temporary Construction Compounds for the movement of materials has been estimated based on waste disposal trips, delivery and transportation of materials and abnormal deliveries. The expected construction vehicle trips have been shown in **Table 4.2**.

4.3.10 As can be seen, during Month 13, a total of 22 construction material one-way trips per day would be generated on average (44 movements per day).

Table 4.2: Construction Material Vehicle Trips

Month	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*
Material Trips	32	132	41	0	2	171	40	3	7	13	15	19	22	13	12
Month	*16*	*17*	*18*	*19*	*20*	*21*	*22*	*23*	*24*	*25*	*26*	*27*	*28*	*29*	*30*
Material Trips	11	12	6	5	4	3	4	3	3	2	1	1	1	1	1
Month	*31*	*32*	*33*	*34*	*35*	*36*	*37*	*38*	*39*	*40*	*41*	*42*	*43*	*44*	*45*
Material Trips	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

4.4 Construction Trip Distribution

Staff Trip Distribution

4.4.1 At this stage, the travel pattern of construction workers is not known and therefore journeys have been distributed along the highway network based on Census 2011 Origin-Destination data for travel to work for car drivers working in Bexley 003 middle layer super output area (MSOA).

4.4.2 Census 2011 data has been used to determine the car driver distribution for MSOAs generating 10 or more trips to a workplace in Bexley 003 MSOA. The resultant distribution onto the local highway network is indicated in **Table 4.3**, which has been applied to the car driver trip generation associated with the construction workforce.

Table 4.3: Staff Vehicle Trip Distribution

Link	Distribution (%)
Yarnton Way	10%
Picardy Manorway	37%
Bronze Age Way	47%
Eastern Way	6%

Construction Material Trip Distribution

4.4.3 As no construction contractor has been appointed at the time of writing, the origins and destinations of construction materials are unknown and so an even distribution has been applied of 50% west to Eastern Way and 50% east to Bronze Age Way and onto the M25. A fuller breakdown of the construction supply chain and associated vehicle trip origins would be provided through the detailed CTMP, the preparation of which would be secured as a requirement of the DCO.

Construction Trip Distribution Assignment

4.4.4 **Table 4.4** presents the daily trip generation distributed along the highway network based on the above outlined trip generation and distribution assumptions for the construction staff and the material trips anticipated to take place in Month 13 of the outline construction programme.

Table 4.4: REP Construction Traffic (Month 13)

Link	Total Daily Movements
Norman Road (north of Picardy Manorway)	1148
A2016 Eastern Way (west of Yarnton Way)	88
Yarnton Way (south of A2016 Eastern Way)	110
A2016 Picardy Manorway (between Eastern Way and Norman Road)	1148
A2016 Picardy Manorway (east of Norman Road)	1148
B253 Picardy Manorway (south of Horse Roundabout)	408

Link	Total Daily Movements
A2016 Bronze Age Way (south of Horse Roundabout)	540
A206 Northend Road (north of A2000 Perry Street)	540
A2000 Perry Street (south of A206 Thames Road)	0
A206 Thames Road (south of Howbury Lane Roundabout)	540
A206 Thames Road (west of A2026 Burnham Road Roundabout)	540
A2026 Burnham Road (south of A206 Thames Road Roundabout)	0
A206 Bob Dunn Way (north of A2026 Burnham Road Roundabout)	540
A206 Bob Dunn Way (east of Marsh Street N)	540

4.5 The Electrical Connection

4.5.1 The Electrical Connection would connect REP to the electrical distribution network at the existing Littlebrook substation. This is described at Section 2.8 and would generate temporary impacts on the highway network during the construction phase.

4.5.2 It is anticipated that, regardless of whether the cable is installed in the highway, verge or footway, that a single lane highway closure would normally be required. A programme and methodology for the construction of the route and options would be undertaken by the Applicant and UKPN to assess the most favourable route in collaboration with the Local Authorities to seek to reduce the impact of its delivery and co-ordinate with other operations, such as bus services and frontage access.

4.5.3 As a method of applying a reasonable worst case scenario for the purposes of a transport impact assessment for Electrical Connection construction worker trip generation to the network, the assumption has been taken that those workers would all visit a singular point along the proposed Electrical Connection route. A hypothetical position has been identified for this purpose along Bob Dunn Way close to the River Darent. In practice the movements for the Electrical Connection would be more widely distributed across the Electrical Connection depending on the location of the works at that time.

4.5.4 No information was available at the time of writing relating to the likely location of the Electrical Connection works during Month 13. Cable Route Temporary Construction Compounds would be required to provide small scale localised storage of materials and mobile welfare whilst the Electrical Connection route is being constructed. These would be required where materials cannot be delivered direct to the working area. Due to the potential route options, working arrangements (in terms of ducted lengths, joint pit location and number of operational gangs) and extent of direct-to-site deliveries, it is not possible at this stage to identify the specific location of the Cable Route Temporary Construction Compounds, however the Application Boundary has been drawn with the expectation that the compounds can be encompassed within these limits. In the absence of detailed distribution information, it has been assumed that all traffic to the primary compound would be split between 50% from the east and 50% from the west.

4.5.5 The Electrical Connection works are proposed to be undertaken within a 24- or 15-month timeframe. The 15-month programme would require a workforce of 16 people per day and is forecast to generate 10 Light Good Vehicle (LGV) and 50 HGV trips per day while the 24-month programme would require a workforce of 8 people per day and is forecast to generate 5 LGV and 25 HGV trips per day.

4.5.6 Based on the forecast trip generation and distribution assumptions set out above, **Table 4.5** presents the assumed construction trip distribution associated with the Electrical Connection works.

Table 4.5: Electrical Connection Construction Daily Traffic for each Programme

Link	Total Daily Movements	
	15-Month Programme	24-Month Programme
A206 Thames Road (west of A2026 Burnham Road Roundabout)	76	38
A2026 Burnham Road (south of A206 Thames Road Roundabout)	0	0
A206 Bob Dunn Way (north of A2026 Burnham Road Roundabout)	152	76
A206 Bob Dunn Way (east of Marsh Street N)	76	38

4.6 Construction Trip Generation and Distribution Summary

4.6.1 The expected construction programme has been outlined and has shown that Month 13 of that period is used to represent the reasonable worst case for assessment purposes, when the movement of material and people is at a cumulative peak.

4.6.2 The assessment has assigned those movements to the agreed network in accordance with 2011 Census data and potential origins and destinations for construction trips.

4.6.3 The assessment criteria have been outlined for the construction of the Electrical Connection and the associated movement of material and people has been applied to the affected network for appraisal in **Chapter 6** of this TA.

5 Operational Trip Generation, Distribution and Assignment

5.1 Introduction

5.1.1 This chapter sets out the trip generation and distribution associated with the operational phase of the development. The assessments primarily focus on a 'reasonable worst-case' scenario as set out in the subsequent sections.

5.2 Scenarios Assessed

Reasonable Worst Case Scenario

5.2.1 The existing RRRF typically operates with a minimum of 75% of waste input delivered by river and it is expected that REP would normally operate with a similar ratio of 75% by river and 25% by road. Waste input transported on the river to the ERF would be transported in containers on barges from riparian waste transfer stations (WTSs) along the River Thames in Central London. This scenario (75% by river / 25% by road) is referred to as the 'nominal' scenario and represents how REP would likely operate day-to-day. The assessment of the 'nominal' scenario, however, assumes all imported waste is transported in 7 t loads by RCVs, when in practice the vehicles used would be large capacity articulated vehicles. The assumption of road movements is therefore robust for that scenario.

5.2.2 In addition to the 'nominal' scenario, 'reasonable worst case' scenarios have been assessed for the operational phase which include 100% of waste delivered by road and, separately, 100% of waste delivered by river. The '100% by road' scenario ensures the assessment is robust and considers the likely impacts where all the waste input is transported by road. As with the 'nominal' scenario, it is assumed all imported waste is transported in 7 t loads by RCVs, adding further to the robustness of the scenario.

5.2.3 The '100% by road' scenario was presented within the TA Scoping Report and has been agreed with all relevant consultees, with details of the organisations involved set out at Section 6.3 and responses given to their comments during the process set out at **Table 6.2**. The responses received to the scoping exercise are contained at **Appendix B** . As such, the assessments undertaken within this TA primarily focus on this reasonable worst case.

5.2.4 The '100% by river' scenario involves the transport of waste from various WTS along the River Thames to REP, and IBA from REP to Tilbury. That scenario has been assessed through a separate Navigational Risk Assessment which is provided as **Appendix B.2** to **Chapter 6** – Transport of the ES.

5.2.5 A summary of the scenarios assessed as part of the operational assessment is shown in **Table 5.1**.

Table 5.1: Operational Assessment Scenario Summary

Scenario	RRRF (baseline)	REP ERF	REP Anaerobic Digestion Facility
Nominal	Based on ATC traffic count data for the links described in Section 6.5.3	75% of waste input transported by river from riparian WTS at Smugglers Way, Cringle Dock, Walbrook Wharf and Northumberland Wharf. 25% of waste input transported by road in refuse collection vehicles (RCVs) from local area including LBB, RBG and DBC. Consumables transported by road from various locations. By-product Incinerator Bottom Ash (IBA) transported by river to Tilbury, Essex. By-product APCR transported by road to Brandon, Suffolk.	70% of green/food waste input transported by road in LBB RCVs from across Bexley borough. 30% of green/food waste input transported by road in articulated vehicles from Central London and M25. By-product compost transported by road to various locations. By-product liquid digestate transported by road to various locations.

Reasonable Worst Case – road	As per REP ERF 'Reasonable Worst Case' scenario but within limits determined by existing planning conditions (LBB planning ref.: 16/02167/FUL) which assume the maximum permittable amount of waste delivered by road.	100% of waste input transported by road with 65% from Central London (Wandsworth, City of London, Tower Hamlets) and 35% from Tilbury. By-products transported as per REP ERF 'Nominal' scenario by river (IBA) and road (APCR).	As per REP Anaerobic Digestion facility 'Nominal' scenario.
Reasonable Worst Case - river	As per REP ERF 'Reasonable Worst Case' scenario but within limits determined by existing planning conditions (LBB planning ref.: 16/02167/FUL) which assume the maximum permittable amount of waste delivered by road.	100% of waste input transported by river from riparian WTS at Smugglers Way, Cringle Dock, Walbrook Wharf and Northumberland Wharf. By-products transported as per REP ERF 'Nominal' Scenario	As per REP Anaerobic Digestion facility 'Nominal' scenario.

5.3 Operational Vehicle Trip Generation

ERF Assumptions

5.3.1 The principal assumptions associated with REP's operational trip generation, are set out below.

- The solar photovoltaic installation and battery storage would not generate any regular trips whilst operational, with the exception of maintenance, and would therefore not be incorporated into the trip generation assessment.
- The ERF operates year-round, 24 hours a day with inputs and by-products transported 24 hours a day, 7 days a week.
  - RCVs transporting 70% of the total waste input would occur only during working days (assumed 260 days per year excluding weekends and bank holidays) between 06:00 and 18:00.
  - Articulated vehicles transporting 30% of the total waste input would occur 24 hours a day, 7 days a week.
- The Anaerobic Digestion facility operates year-round, 24 hours a day.
- The routeing of vehicles delivering waste would be based on the likely expected origins of waste, appreciating that this may change depending on a number of circumstances such as contract agreements.
- Vehicle routeing to/from REP would adhere to the London Lorry Control Scheme.

5.3.2 The operational '100% by road' scenario assessed incorporates the following assumptions for the two main trip-generating components of REP; the ERF and Anaerobic Digestion facility.

- 100% of waste input transported by road
  - 65% from Central London (Wandsworth, City of London, Tower Hamlets) in 7 t loads within RCVs
  - 35% from Tilbury in 7 t loads within RCVs
- Consumables (fuel oil, PAC, lime, ammonia) transported by road from various locations
- By-product IBA transported by river to Tilbury, Essex
- By-product APCR transported by road to Brandon, Suffolk

Anaerobic Digestion Facility Assumptions

- 100% of green/food waste input transported by road
  - 70% from across LBB via 7 t loads in RCVs
  - 30% of waste from other locations (assuming 50% Central London and 50% via the M25 at J1a) in 20 t loads on articulated vehicles
- By-product compost transported by road to various locations
- By-product liquid digestate transported by road to various locations

5.3.3 For the purposes of this assessment, the RRRF, which is operated by the Applicant, is assumed to operate within the maximum limits determined by its existing planning conditions and subsequent amendments.

Operational Materials Trip Generation - Energy Recovery Facility

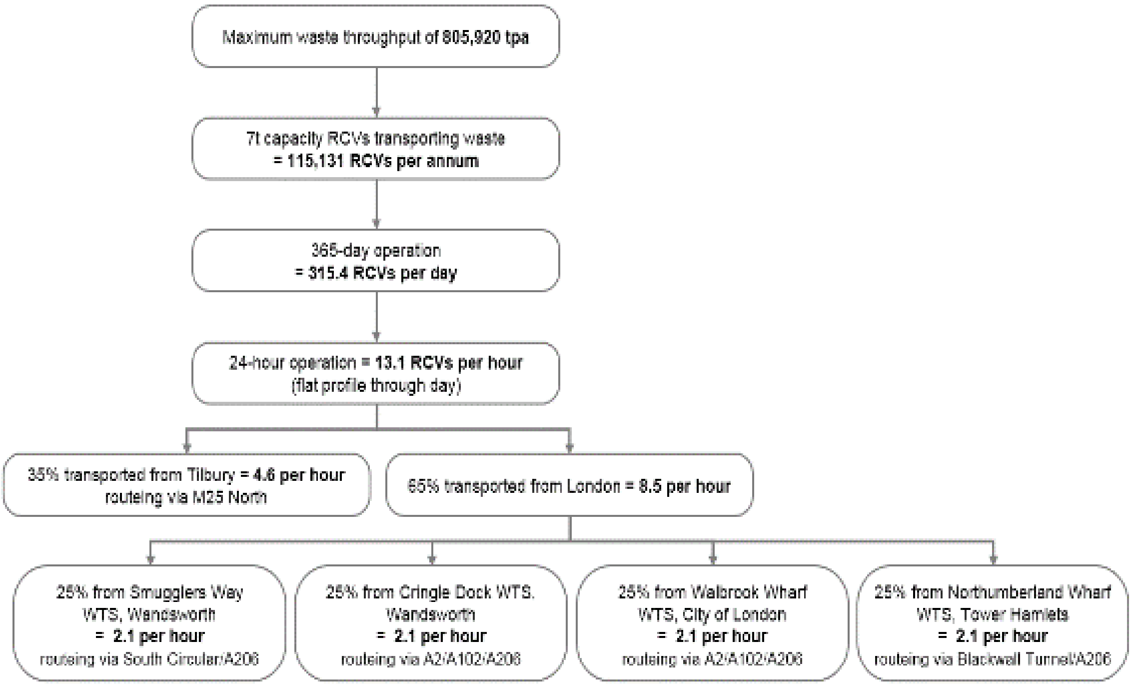
5.3.4 The process for determining the trip generation for the '100% by road' scenario associated with the ERF is identified in Figure 5.1. The REP ERF would normally receive commercial and industrial waste which is transported in 20 t containers carried on barges. When traveling by road these would be on articulated vehicles. However, the '100% by road' scenario assumes that all waste is delivered in RCVs which are used for municipal waste and transport less waste than when travelling on articulated tipper vehicles. The scenario therefore assesses more movements than would occur in practice.

5.3.5 The split between Tilbury and Central London adopts a likely arrangement, based on the Applicant's previous experience, the location of existing WTSs and taking into account the nature of the commercial agreements that are in place currently or which may be in place in the future.

5.3.6 There is a difference in distribution and hence a resulting difference in the assignment of trips between the 'nominal' 25% road and '100% by road' scenarios. The difference occurs as there could be a requirement to get waste from closer locations and hence have flexibility in routeing. By having control over where the waste originates and selecting sites close to REP, the length of trips being made can be reduced. As a result of this difference, the details included within **Figure 5.1** and **Figure 5.2** indicate a difference in the origins of traffic.

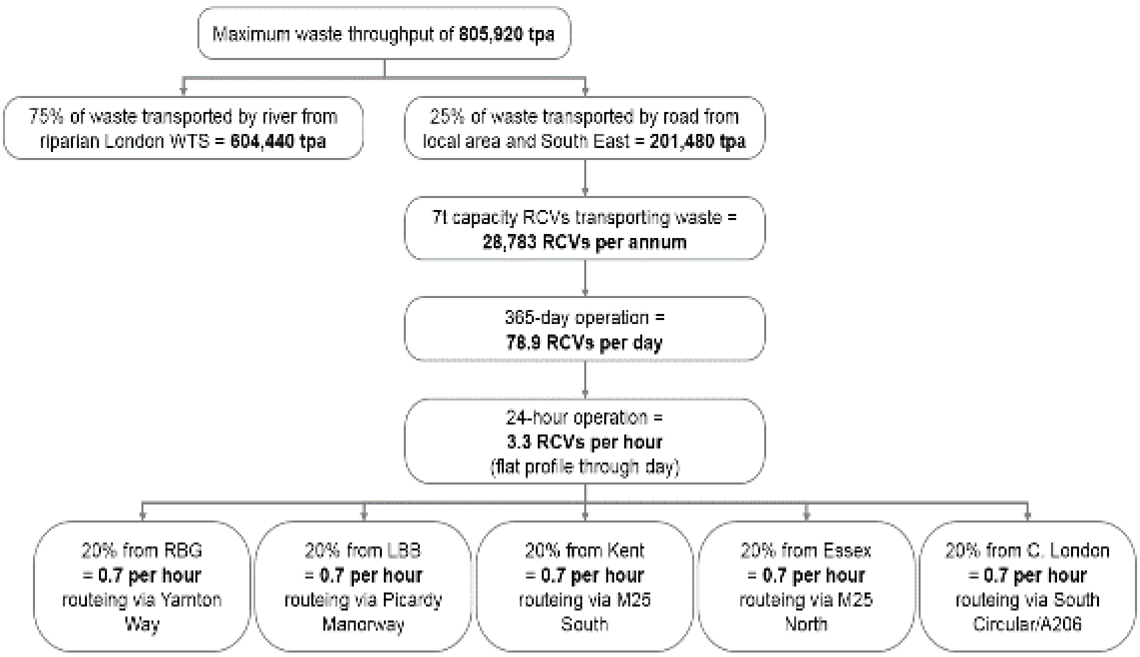
5.3.7 Across all scenarios, the APCR would be transported in 20 t tankers to Brandon, Suffolk. Based on DEFRA guidance, discussed further at Section 6.5, this is considered to be a hazardous load. It is expected that there would be a maximum of four vehicles departing per day with APCR.

Figure 5.1: ERF 100% Road Scenario Trip Generation Methodology



5.3.8 The process for determining the trip generation for the ‘nominal’ scenario, which would see 25% of the waste transported by road and 75% by river, is identified in **Figure 5.2**. As with the ‘100% by road’ scenario, the proportions from the local area and south east are based on a likely arrangement given the nature of the commercial agreements that are in place currently or may be in place in the future.

Figure 5.2: ERF 25% Road Scenario Trip Generation Methodology



5.3.9 As set out above, a reasonable worst-case assessment has been made assuming all waste is transported by road.

5.3.10 In addition to the transportation of materials to the ERF, consumables and by-products would need to be transported to and from REP comprising:

- Hydrated lime (x2 HGVs per day);
- Air Pollution Control residue (x3 HGVs per day);
- Oversize scrap (x3 HGVs per day);
- Aqueous ammonia (x2 HGV per week);
- Activated carbon (x1 HGV per month);
- Hydrochloric acid (x2 HGVs per month);
- Caustic soda (x2 HGVs per month); and
- Diesel fuel (x1 HGV per month).

5.3.11 In both the 'nominal' and '100% by road' scenarios, it is expected that up to 11 daily vehicle movements would be generated by the transportation of consumables and by-products.

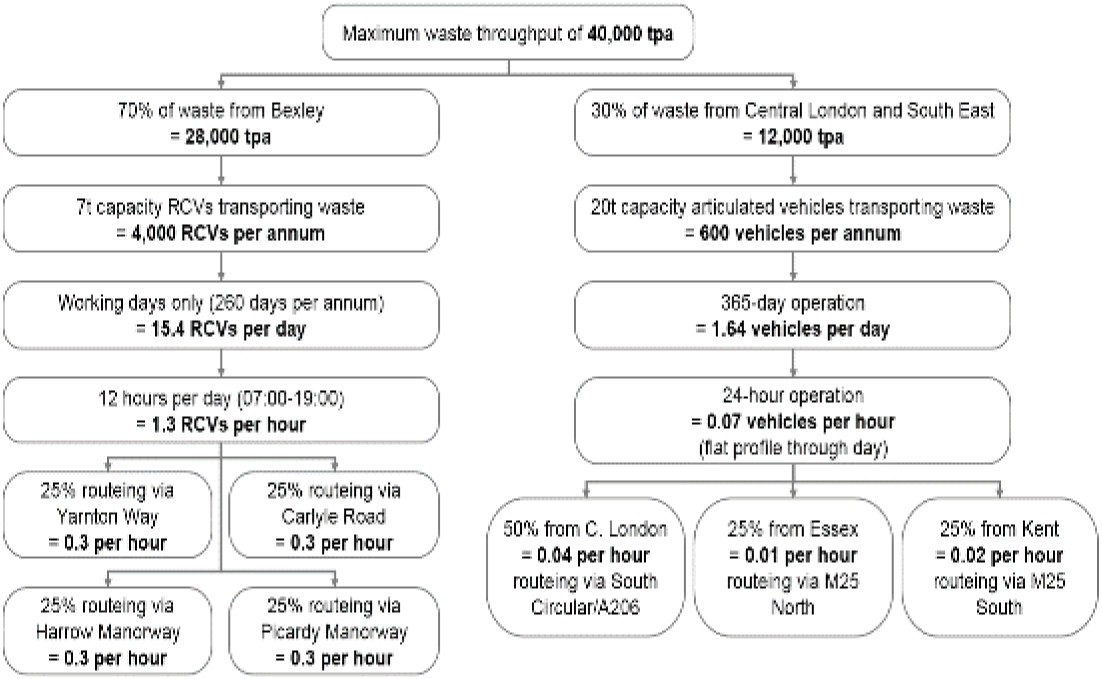
Operational Materials Trip Generation - Anaerobic Digestion Facility

5.3.12 The trip generation for the Anaerobic Digestion facility is the same in both the '100% by road' and 'nominal' scenarios.

5.3.13 For the purpose of this '100% by road' assessment, RCVs would transport the majority (70%) of the waste from within Bexley, whilst articulated vehicles would transport the remaining 30% of waste from elsewhere in London and the south east.

5.3.14 The number of vehicle trips is lower than those associated with both scenarios for the ERF.

Figure 5.3: Anaerobic Digestion Facility Trip Generation Methodology



5.3.15 In addition to the transportation of materials to the Anaerobic Digestion facility, by-products comprising of compost and liquid digestate would need to be transported from REP. In both, the ‘nominal’ and ‘100% by road’ scenarios, it is expected that the transportation of by-products would generate up to 11 movements per day.

5.4 Operational Staff Trip Generation

5.4.1 It is anticipated that c. 83 staff would be based at REP (during a peak day) of which c. 5 would be management staff working standard working hours (09:00 – 17:00), with the remainder working day and night-time 12-hour shifts (06:00 – 18:00 and 18:00 – 06:00).

5.4.2 The operational staff mode share is assumed to reflect the 2011 Census data for method of travel to work for workplaces in the Bexley 003 MSOA, presented in **Table 5.2**. The table furthermore presents the multi-modal trip generation of staff during the operational phase of the Proposed Development. It is important to note that the Census method of travel to work data captures the mode by furthest distance travelled, rather than the final access mode, which is why the ‘Underground’ mode is expected to be used by some operational staff.

5.4.3 It should be noted that only the management staff trip generation would occur during AM and PM peak hours. Based on the 2011 Census data, this would result in 3 movements in the AM peak hour and 3 movements in the PM peak hour.

Table 5.2: Bexley 003 MSOA Method of Travel to Work (2011 Census) and Operational Staff Trips

Mode of Transport	Census 2011 Mode Share	Daily Operational Staff Movements		
		Arrival	Departure	Two-Way
Underground, metro, light rail or tram	1%	1	1	2
Train	5%	4	4	8
Bus, minibus or coach	12%	10	10	20
Taxi	0%	0	0	0
Motorcycle, scooter or moped	2%	2	2	4
Driving a car or van	63%	52	52	104
Passenger in a car or van	5%	4	4	8
Bicycle	2%	2	2	4
On foot	9%	8	8	16
Other method of travel to work	0%	0	0	0
Total	**100%**	**83**	**83**	**166**

5.5 General Deliveries, Servicing and Maintenance Trip Generation

5.5.1 It is expected that a small number of delivery and servicing trips would occur, including postal deliveries and intermittent maintenance associated with the various elements of REP. These would be minimal on a daily basis and are therefore assumed to have been included within the predictions for other development flows.

5.5.2 It should be noted that trips associated with maintenance activities would be infrequent and thus fall within the daily fluctuation of traffic flows along the network and therefore are considered to have no material impact on the operation of the highway network surrounding REP

5.6 Cumulative Operational Trip Generation

5.6.1 A summary of the vehicle trip generation by each component has been set out in **Figure 5.3**.

Table 5.3: Summary Trip Generation (Movements)

Trip Generation Component	Nominal Scenario			Reasonable Worst-Case		
	Daily	AM Peak	PM Peak	Daily	AM Peak	PM Peak
ERF	168	7	7	641	27	27
Anaerobic Digestion	45	3	3	45	3	3
Staff	104	3	3	104	3	3
Total	317	13	13	790	33	33

5.7 Operational Materials Trip Distribution

5.7.1 Based on the above assumptions and the expectation of operation, the following vehicle trip distribution has been determined as shown in **Table 5.4**, which include all streams of activity – waste streams in and by-products out.

Table 5.4: Expected 'Nominal Scenario' and '100% Road Scenario' REP HGV Traffic Generation (Movements)

Link	Nominal Scenario			100% by Road Scenario		
	Daily	AM Peak	PM Peak	Daily	AM Peak	PM Peak
Norman Road (north of Picardy Manorway)	213	10	10	686	30	30
A2016 Eastern Way (west of Yarnton Way)	49	2	2	427	18	18
Yarnton Way (south of A2016 Eastern Way)	39	2	2	8	1	1
A2016 Picardy Manorway (between Eastern Way and Norman Road)	213	10	10	686	30	30
A2016 Picardy Manorway (east of Norman Road)	213	10	10	686	30	30
B253 Picardy Manorway (south of Horse Roundabout)	39	2	2	8	1	1
A2016 Bronze Age Way (south of Horse Roundabout)	86	4	4	244	10	10

Link	Nominal Scenario			100% by Road Scenario		
	Daily	AM Peak	PM Peak	Daily	AM Peak	PM Peak
A206 Northend Road (north of A2000 Perry Street)	86	4	4	244	10	10
A2000 Perry Street (south of A206 Thames Road)	0	0	0	0	0	0
A206 Thames Road (south of Howbury Lane Roundabout)	86	4	4	244	10	10
A206 Thames Road (west of A2026 Burnham Road Roundabout)	86	4	4	244	10	10
A2026 Burnham Road (south of A206 Thames Road Roundabout)	0	0	0	0	0	0
A206 Bob Dunn Way (north of A2026 Burnham Road Roundabout)	86	4	4	244	10	10
A206 Bob Dunn Way (east of Marsh Street N)	86	4	4	244	10	10

**discrepancies due to rounding*

5.8 Operational Staff Trip Distribution

5.8.1 As with determining the multi-modal trip generation discussed above, 2011 Census data has been used to determine car driver distribution. The distribution onto the local highway network is indicated in **Table 4.3** above, which has been applied to the car driver trip generation.

5.8.2 **Table 5.5** shows the resultant daily car driver trip distribution of operational staff along the highway network.

Table 5.5: Daily Operational Staff Vehicle Movements

Link	Operational Staff		
	Daily	AM Peak	PM Peak
Norman Road (north of Picardy Manorway)	104	3	3

Link	Operational Staff		
	Daily	AM Peak	PM Peak
A2016 Eastern Way (west of Yarnton Way)	27	1	1
Yarnton Way (south of A2016 Eastern Way)	0	0	0
A2016 Picardy Manorway (between Eastern Way and Norman Road)	66	3	1
A2016 Picardy Manorway (east of Norman Road)	66	2	3
B253 Picardy Manorway (south of Horse Roundabout)	30	1	1
A2016 Bronze Age Way (south of Horse Roundabout)	48	1	1
A206 Northend Road (north of A2000 Perry Street)	33	1	1
A2000 Perry Street (south of A206 Thames Road)	7	0	0
A206 Thames Road (south of Howbury Lane Roundabout)	26	1	1
A206 Thames Road (west of A2026 Burnham Road Roundabout)	23	1	1
A2026 Burnham Road (south of A206 Thames Road Roundabout)	4	0	0
A206 Bob Dunn Way (north of A2026 Burnham Road Roundabout)	19	1	1
A206 Bob Dunn Way (east of Marsh Street N)	19	1	1

**discrepancies due to rounding*

5.9 Operational Trip Distribution Assignment

5.9.1 A summary of the total vehicle trip distribution has been set out in **Table 5.6**.

Table 5.6: Total Vehicle Trip Distribution (Movements)

Link	Nominal Scenario			100% by Road Scenario		
	Daily	AM Peak	PM Peak	Daily	AM Peak	PM Peak
Norman Road (north of Picardy Manorway)	317	13	13	790	33	33
A2016 Eastern Way (west of Yarnton Way)	76	3	3	454	19	19
Yarnton Way (south of A2016 Eastern Way)	39	2	2	8	1	1
A2016 Picardy Manorway (between Eastern Way and Norman Road)	279	13	11	752	33	31
A2016 Picardy Manorway (east of Norman Road)	279	12	13	752	32	33
B253 Picardy Manorway (south of Horse Roundabout)	69	3	3	38	2	2
A2016 Bronze Age Way (south of Horse Roundabout)	134	5	5	292	11	11
A206 Northend Road (north of A2000 Perry Street)	119	5	5	277	11	11
A2000 Perry Street (south of A206 Thames Road)	7	0	0	7	0	0
A206 Thames Road (south of Howbury Lane Roundabout)	112	5	5	270	11	11
A206 Thames Road (west of A2026 Burnham Road Roundabout)	109	5	5	267	11	11
A2026 Burnham Road (south of A206 Thames Road Roundabout)	4	0	0	4	0	0
A206 Bob Dunn Way (north of A2026 Burnham Road	105	5	5	263	11	11

Link	Nominal Scenario			100% by Road Scenario		
	Daily	AM Peak	PM Peak	Daily	AM Peak	PM Peak
Roundabout)						
A206 Bob Dunn Way (east of Marsh Street N)	105	5	5	263	11	11

**discrepancies due to rounding*

5.10 Operational Trip Generation and Distribution Summary

5.10.1 The expected movement generation for the operation of REP has been outlined for the reasonable worst case scenario, '100% by road', where waste import and residual exports are transported by road. The predicted operational workforce has been applied to the transport network in accordance with local applicable 2011 Census information. An equivalent '100% by river' scenario has been assessed through a Navigational Risk Assessment which is provided as **Appendix B2** to **Chapter 6** of the ES.

5.10.2 A nominal scenario has also been set out which could represent typical operating conditions at REP, where 25% of waste material is imported by road along with other complementary road movements.

5.10.3 This section has set out the transport criteria for each element of REP, including the Energy Recovery Facility, the Anaerobic Digestion process; complementary movement of materials and an indication of the likely workforce movements.

5.10.4 The assessment has assigned those movements to the agreed network in accordance with the stated assumptions in preparation for appraisal in **Chapter 6** of this TA.

6 Highway Impact Assessment

6.1 Introduction

6.1.1 This section sets out the methodology and results of the highway impact assessment. The scope of works, methodology and principles of assessment for this TA have been determined through ongoing engagement and pre-application discussions with LBB, DBC, KCC and TfL. This approach has ensured that this assessment accords with relevant national, regional and local guidance and policy, as set out at Section 1.5.11 and through Section 3.

6.2 Assessment Methodology

Construction Phase Assessment

6.2.1 For the construction phase of REP, percentage impact assessments have been undertaken for the peak period of construction (Month 13) which is predicted to be in 2022. This compares the expected uplift in traffic flows in Month 13 of the construction programme against the background traffic levels without any construction traffic. The indicative profile for the movement of materials, plant and people during the construction period is illustrated at **Appendix I** . The graph shows that Month 13 represents a marked peak during construction and that the assessment represents a robust reasonable worst case.

6.2.2 The background traffic for Month 13 of the construction programme has been forecasted by applying a growth factor, using TEMPro, to the 2018 baseline traffic counts and subsequently including traffic flows associated with committed developments.

Operational Phase Assessment

6.2.3 For the operational phase of REP, the following scenarios have been assessed:

- 2018 Baseline – Based on traffic survey data and used to set out existing conditions and model validation;
- 2028 Do Minimum – 10 years post-application. Includes uplifted baseline flows based on background traffic growth and committed developments; and
- 2028 Do Something – Includes the operational phase development flows based on the ‘100% by road’ scenario in addition to the 2028 Do Minimum flows.

6.2.4 The network AM peak and PM peak hours of 07:45-08:45 and 16:30-17:30 have been assessed for each scenario.

6.2.5 Percentage impact assessments have been undertaken to assess the effects of REP on the highway network. The percentage impact assessment results have subsequently been used to inform the extent of local junction modelling. The results have also been used to provide a qualitative assessment of likely effects on traffic re-routeing along the A2026 and other alternative routes should there be incidents causing delay on the A206 and at Junction 1a of the A282/M25.

6.3 Do Minimum Scenario Flows and Highway Network

Background Traffic Growth

6.3.1 Background traffic growth between 2018-2028 has been determined using TEMPro v7.2, the software through which Department for Transport's (DfT) National Trip End Model (NTEM) forecasts are made available.

6.3.2 The resulting growth factors which have been applied to the observed 2018 baseline counts have been presented in **Table 6.1**.

Table 6.1: 2018-2028 TEMPro Adjusted Local Growth Factors (urban area, principal road type)

Area Definition	AM peak	PM peak
Bexley	1.0693	1.071
Dartford	1.1356	1.1384

Committed Developments

6.3.3 LBB and KCC highways officers and DBC officers have requested that committed developments are fully incorporated into the future year assessment and have both provided details on the relevant committed and allocated developments to be assessed.

6.3.4 Furthermore, DBC/KCC have raised concerns as to the suitability of growth rates for roads around Dartford obtained through TEMPro, the Department for Transport's modelling tool for determining traffic growth.

6.3.5 KCC's response to the Transport Assessment (TA) Scoping Report advised that both committed and allocated developments be incorporated into the assessment in addition to applying TEMPro growth factors. This has not been requested by LBB. At a review meeting with TfL, on 09 October 2017, it was further requested that committed developments are included in junction modelling where they are judged to have an impact on the three junctions of Picardy Manorway, closest to REP.

6.3.6 TEMPro's growth projections are based on various factors of which future dwelling trajectories is one. TEMPro's source of dwelling trajectory for LBB is the Authority Monitoring Report 2012 to 2013 which includes a five-year managed dwelling supply of 1,890 between 2018 to 2023. However, it has been stated in LBB's Five Year Housing Land Supply Annual Assessment 2018 to 2023 that 3,207 net new dwellings are likely to be supplied in the borough which exceeds LBB's London Plan housing requirements. As such, it is expected that the TEMPro growth factors for LBB are likely to under-estimate the level of background growth.

6.3.7 Consequently, the traffic associated with committed and allocated developments, as indicated by LBB and DBC, has been included in the future baseline flows in addition to the TEMPro growth factors

6.3.8 The flows and distributions for each committed development has been obtained from the respective Transport Assessments or other transport documents submitted as part of the planning application. For developments without information on traffic distribution, the distribution has been based on ATC proportions and/or engineering judgement. Additionally, it has been assumed that the reported AM and PM peak hour trip generation for all committed development would coincide with the surveyed highway network peak hours.

6.3.9 The list of committed developments which have been assessed (as requested by LBB and DBC), and those included in the future year assessments, are shown in **Table 6.2**.

Table 6.2: Committed Developments Assessed

Committed/ Allocated Development	Trip Generation		Included in Future Year Assessments
	AM Peak	PM Peak	
LBB			
13/01492/OUTM01 - Proposed Ocado Regional Distribution Centre	149	309	Yes
14/02155/OUTM - Erith Quarry	792	394	Yes
14/02120/FULM - Larner Road Estate (Phase 2)	71	105	Yes
15/00370/OUTM - former Linpac Site	139	147	Yes
15/01084/FULM - Former Riverside Swimming Centre	31	24	No
17/00029/OUTM - Burts Wharf	49	102	Yes
16/02951/FULM - Land At Junction Of Bronze Age Way/Anderson Way	40	26	Yes
17/01016/FULM - Land between Bronze Age Way and Picardy Manorway	20	19	Yes
16/01386/FULM - Former Nufarm UK Ltd	35	38	Yes
11/01932/OUTM - Land adjacent to former Nufarm UK Ltd *	152	153	Yes

Committed/ Allocated Development	Trip Generation		Included in Future Year Assessments
	AM Peak	PM Peak	
DBC			
17/01477/FUL - Land at Victoria Road	45	38	No
17/01793/FUL - Northern Gateway North	47	40	No
18/00457/FUL - Land at Littlebrook Power Station *	123	103	Yes
11/01207/OUT - The Bridge	121	159	Yes
11/00295/OUT - Northern Gateway East (GSK) and Millpond **	-	-	No
16/01601/FUL - Northern Gateway West Abbott Murex	111	136	Yes

* Information on HGV proportions or PCU numbers not provided therefore ATC 2 HGV proportions used to estimate PCU factors for local junction modelling
** Based on Google satellite imagery and Google Street View images dated August 2017, it appears as though the vast majority of the development has been built out. It has been assumed that any remaining units to be built will be accounted for in the TEMPro growth factors

6.3.10 The illustrative locations of the committed developments are shown by **Figure 6.1** and **Figure 6.2** for those local applicable sites within LBB and Dartford Borough, respectively.

Figure 6.1: Bexley Borough Local Committed Developments

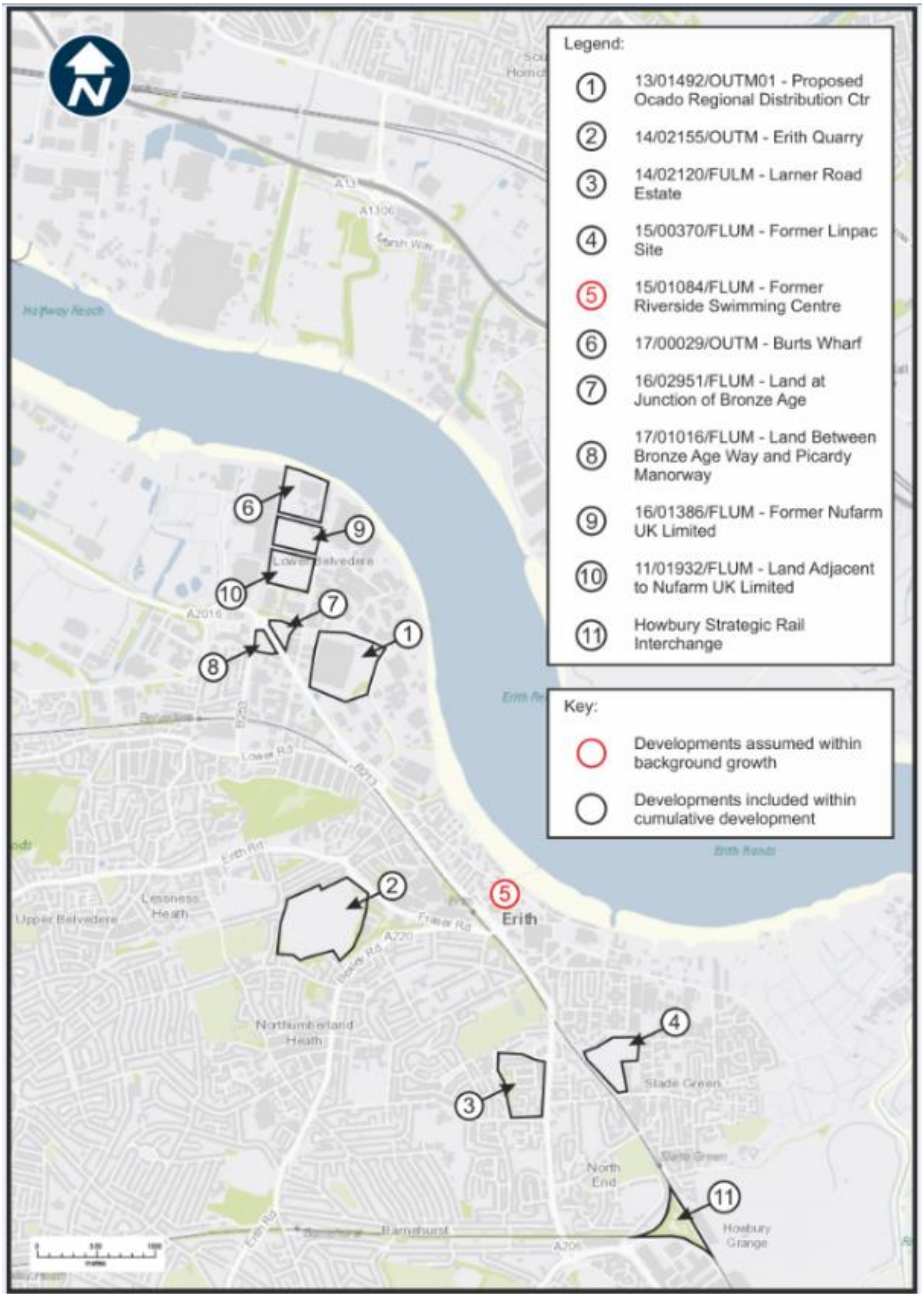
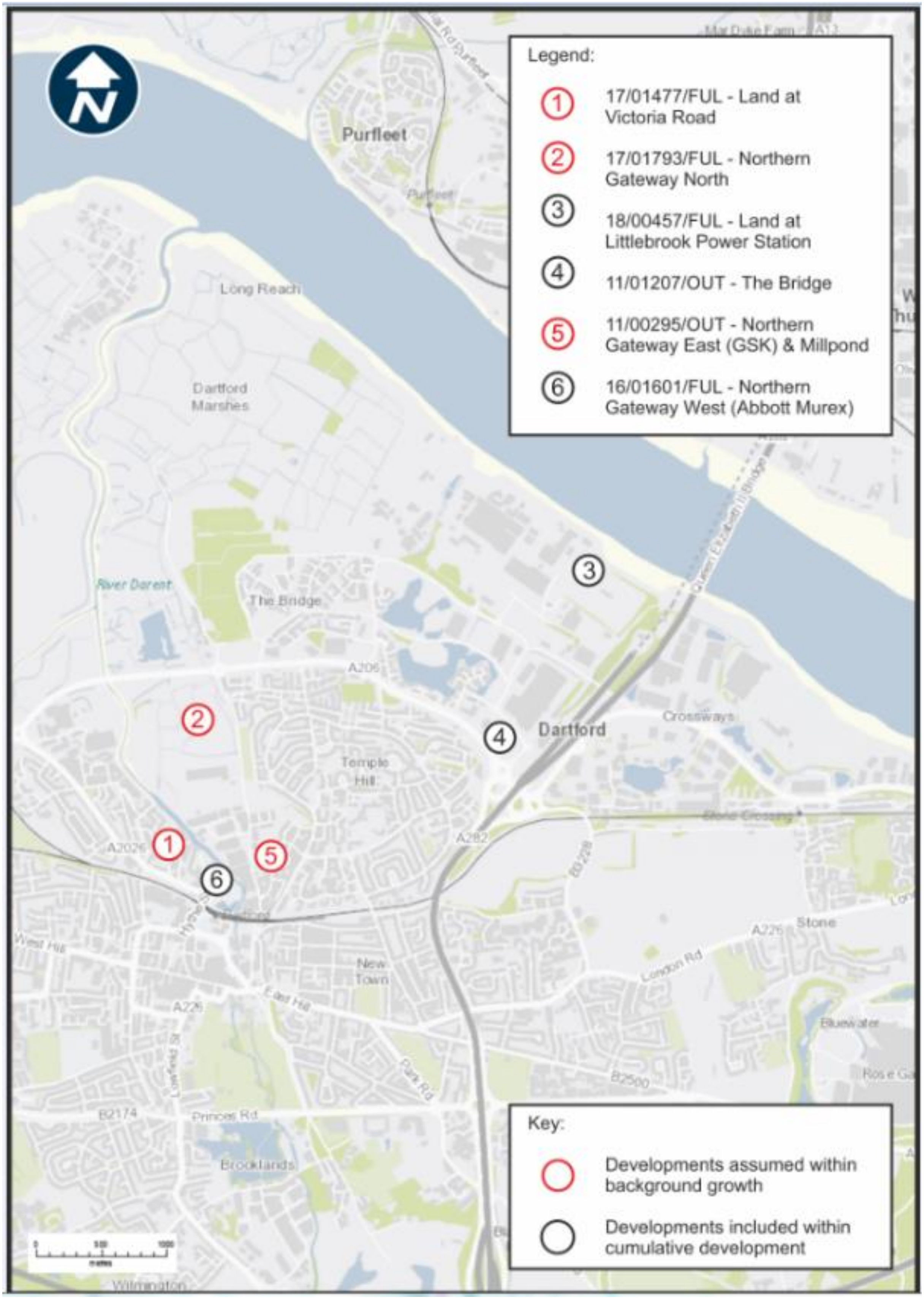


Figure 6.2: Dartford Borough Local Committed Developments



6.3.11 The combined and distributed highway network flows associated with the selected committed developments, as per **Table 6.2**, have been included in **Appendix J** .

Committed Highway Improvements

6.3.12 The Applicant has not been made aware any relevant committed highway improvements by LBB, DBC, KCC or TfL.

Summary 2022 and 2028 Do Minimum Flows

6.3.13 The 2028 Do Minimum traffic flows for the AM and PM peak hours have been included in **Appendix I** . In addition, the 2022 Do Minimum flows for the AM peak hour have been included in **Appendix J** . The 2022 PM peak hour has not been included as it does not coincide with the construction worker departure time.

6.4 Construction Percentage Impact Assessment

6.4.1 A Percentage impacts assessment for the construction phase has been undertaken which provides a comparison between the 2022 Do Minimum flows and the Reasonable Worst Case 'Month 13' scenario at the predicted peak construction month. The construction phase assumption includes 50% of the workforce arriving during the network AM peak hour (07:45-08:45) and Electrical Connection being constructed over a 15 month period. A flat profile has been assumed for the Electrical Connection construction vehicle movements across the day and 100% of the Electrical Connection workforce are assumed to arrive during the AM peak hour.

6.4.2 A summary of the percentage impacts at the junctions and links surveyed have been provided in **Table 6.3**. Only the percentage impacts for the AM Peak hour have been shown as this is the peak hour with the greatest impacts due to the workforce arrivals. The full set of results showing percentage impacts by each junction arm and movement have been included in **Appendix K** .

Table 6.3: Junction Percentage Impacts for Construction Workforce Arrivals

Junction	AM Peak Trip Generation (Vehicles)	AM Peak % Imp compared to 2022 Future base
A2016/ Clydesdale Way/ Yarnton Way roundabout	290	9.8%
A2016 Picardy Manorway	216	13.3%
Clydesdale Way	0	0.0%

Junction	AM Peak Trip Generation (Vehicles)	AM Peak % Imp compared to 2022 Future base
Yarnton Way roundabout	0	0.0%
A2016 Eastern Way	74	9.6%
A2016/ Norman Road	503	17.9%
Norman Road	4	14.9%
A2016 Picardy Manorway (East)	213	13.2%
A2016 Picardy Manorway (West)	285	24.6%
A2016/ Anderson Way/ B253	224	6.6%
A2016 Picardy Manorway	7	0.7%
Anderson Way	0	0.0%
A2016 Bronze Age Way	131	9.6%
B253 Picardy Manorway	85	13.8%
A2016/ Bexley Rd/ A206	143	3.7%
A2016 Bronze Age way	10	1.0%
Bexley Road	0	0.0%
A206 Queens Road	0	6.2%
A206 Bexley Road	32	3.5%
A206/ James Watt Way	114	3.5%
A206 Queens Road (North)	12	1.0%
James Watt Way	10	1.8%
A206 Queens Road (South)	91	6.8%
A206/ Boundary St/ Dell View Rd	104	3.7%
A206 South Road	13	1.2%
Boundary Street	0	0.0%
A206 Northend Road	91	6.6%
Dell View Road	0	0.0%

Table 6.4: Link Percentage Impacts for Construction Workforce Arrivals

Link	Direction	AM Peak Trip Generation (Vehicles)	AM Peak % Imp compared to 2028 Future base
Norman Road (ATC 2)	NB	282	370.5%
	SB	4	9.6%
A2016 Eastern Way (ATC 3)	EB	74	9.7%
	WB	4	0.4%
Yarnton Way (ATC 4)	NB	0	0.0%
	SB	0	0.0%
A2016 Picardy Manorway west of Norman Road (ATC 5)	NB	285	24.6%
A2016 Picardy Manorway (east of Norman Road) (ATC 6)	EB	7	0.7%
	WB	213	13.9%
B253 Picardy Manorway (ATC 7)	EB	85	13.9%
	WB	0	0.0%
A2016 Bronze Age Way (ATC 8)	NB	131	9.9%
	SB	10	1.2%
A206 Northend Road (ATC 10)	NB	91	6.5%
	SB	13	1.1%
A2000 Perry Street (ATC 11)	NB	22	3.6%
	SB	3	0.5%
A206 Thames Road (west) (ATC 12)	NB	76	4.9%
	SB	17	1.3%
A206 Thames Road (east) (ATC 13)	EB	18	1.1%
	WB	66	3.7%
A2026 Burnham Road (ATC 14)	NB	11	1.3%
	SB	0	0.0%
A206 Bob Dunn Way (west) (ATC 15)	EB	19	1.6%
	WB	56	5.2%

6.4.3 As can be seen from above, with the exception of the final approach to REP on Norman Road and Picardy Manorway, percentage impacts of the peak construction flows on the junctions and links only exceed 5% at the A2016/ Anderson Way/ B253. The link flows are generally less than 10%, with the exception of Norman Road, Picardy Manorway and close to 10% on Bronze Age Way and Eastern Way.

6.4.4 The percentage impact at the A206 / James Watt Way junction is 3.5% (with a 6.8% impact on the Queens Road south arm). This level of impact would be anticipated to be within the standard daily variation of flow at the junction, but it is known that the junction is currently a congested node in the morning peak period. The Applicant has engaged with TfL on this point and it has been recognised that the operation of the James Watt Way junction is influenced by the operation of the A206 / Bexley Road roundabout and adjacent A206/A220 junction. There are no proposals from LBB or TfL to ameliorate the operation of this junction.

6.4.5 The REP construction period will have a temporary impact on the network and the assessment within the TA is robust – with comprehensive growth added to the base traffic and with a reasonable worst case assumption for REP work force traffic.

6.4.6 The Applicant is to continue to work with TfL and LBB to seek to reduce the impact of work force traffic on the affected junctions. Applying travelling measures through the CTMP will assist in reducing work force travel impacts during the morning peak period as well as taking opportunities to spread work force arrivals either outside the network peak period or over a longer period.

6.4.7 Junction modelling has not been undertaken for the construction period due to the low level of impact at most points on the network and because the impact would be temporary.

6.5 Operational Percentage Impact Assessment

6.5.1 A percentage impacts assessment for the operational phase of the development has been undertaken which provides a comparison between the 2028 Do Something (with development) flows and the 2028 Do Minimum (no development) flows.

6.5.2 A summary of the percentage impacts at the junctions and links surveyed have been provided in **Table 6.5** and **Table 6.6**. The full set of results showing percentage impacts by each junction arm and movement have been included in **Appendix K** .

Table 6.5: Junction Peak Hour Percentage Impacts compared to 2028 Do Minimum Scenario

Junction	AM Peak Trip Generation	AM Peak % Impact	PM Peak Trip Generation	PM Peak % Impact
A2016/ Clydesdale Way/ Yarnton Way	28	0.9%	25	0.8%
A2016 Picardy Manorway	17	1.0%	16	1.2%
Clydesdale Way	0	0.0%	0	0.0%
Yarnton Way roundabout	0	0.1%	0	0.0%
A2016 Eastern Way	10	1.3%	9	0.8%

Junction	AM Peak Trip Generation	AM Peak % Impact	PM Peak Trip Generation	PM Peak % Impact
A2016/ Norman Road	50	1.7%	49	1.6%
Norman Road	15	48.2%	18	24.1%
A2016 Picardy Manorway (East)	17	1.0%	16	1.2%
A2016 Picardy Manorway (West)	18	1.5%	15	0.9%
A2016/ Anderson Way/ B253	23	0.7%	23	0.6%
A2016 Picardy Manorway	15	1.3%	18	1.1%
Anderson Way	0	0.0%	0	0.0%
A2016 Bronze Age Way	7	0.5%	5	0.5%
B253 Picardy Manorway	1	0.2%	0	0.1%
A2016/ Bexley Rd/ A206	12	0.3%	12	0.3%
A2016 Bronze Age way	5	0.5%	7	0.4%
Bexley Road	0	0.0%	0	0.0%
A206 Queens Road	6	0.4%	5	0.3%
A206 Bexley Road	0	0.0%	0	0.0%
A206/ James Watt Way	11	0.3%	11	0.3%
A206 Queens Road (North)	5	0.4%	6	0.4%
James Watt Way	0	0.0%	0	0.0%
A206 Queens Road (South)	6	0.4%	5	0.4%
A206/ Boundary St/ Dell View Rd	11	0.4%	11	0.4%
A206 South Road	5	0.5%	6	0.4%
Boundary Street	0	0.0%	0	0.0%
A206 Northend Road	6	0.4%	5	0.3%
Dell View Road	0	0.0%	0	0.0%

Table 6.6: Link Peak Hour Percentage Impacts compared to 2028 Do Minimum Scenario

Link	Direction	AM Peak Trip Generation	AM Peak % Impact	PM Peak Trip Generation	PM Peak % Impact
Norman Road (ATC 2)	NB	18	23.0%	15	32.9%
	SB	15	31.2%	18	21.3%
A2016 Eastern Way (ATC 3)	EB	10	1.3%	9	0.8%
	WB	9	0.7%	10	1.0%
Yarnton Way (ATC 4)	NB	0	0.0%	0	0.0%
	SB	0	0.0%	0	0.0%
A2016 Picardy Manorway - west of Norman Road (ATC 5)	NB	18	1.5%	15	0.9%
A2016 Picardy Manorway- east of Norman Road (ATC 6)	EB	15	1.4%	18	1.1%
	WB	17	1.1%	16	1.2%
B253 Picardy Manorway (ATC 7)	EB	0	0.2%	0	0.1%
	WB	0	0.1%	0	0.0%
A2016 Bronze Age Way (ATC 8)	NB	7	0.5%	5	0.5%
	SB	5	0.6%	6	0.5%
A206 Northend Road (ATC 10)	NB	6	0.4%	5	0.3%
	SB	5	0.4%	6	0.4%
A2000 Perry Street (ATC 11)	NB	0	0.0%	0	0.0%
	SB	0	0.0%	0	0.0%
A206 Thames Road (west) (ATC 12)	NB	6	0.4%	5	0.3%
	SB	5	0.4%	6	0.4%
A206 Thames Road (east) (ATC 13)	EB	5	0.3%	6	0.3%
	WB	6	0.3%	5	0.3%
A2026 Burnham Road (ATC 14)	NB	0	0.0%	0	0.0%
	SB	0	0.0%	0	0.0%
A206 Bob Dunn Way (west) (ATC 15)	EB	5	0.4%	6	0.4%
	WB	6	0.5%	6	0.5%

6.5.3 As can be seen from above, the overall impacts of the development on the highway network are negligible. As expected, the highest impact occurs at the A2016 Picardy Manorway/ Norman Road junction and the Norman Road link which form the access route from the A2016 Picardy Manorway.

6.5.4 It is evident that the impacts at the A2016 Picardy Manorway/ Norman Road junction and the Norman Road link appear high compared to other junctions and links even though the level of trip generation is low. This is due to the fact that the 2018 baseline and hence 2028 Do Minimum Scenario flows are generally low at this junction and link.

6.5.5 Based on the above, it is evident that the total junction impacts are generally low or negligible. Notwithstanding this, local junction modelling has been undertaken at the three junctions closest to the site and with the highest percentage impacts, as set out in Section 6.6.

6.5.6 Furthermore, it is evident that the development does not have an impact on DBC's highway network as the percentage impacts are 0.5% or less on all Dartford links assessed. Based on the trip generation and percentage impacts shown, there will be no impacts on the A2026 as a result of re-routeing due to potential congestion on the A206 and Junction 1a of the A282/M25.

6.5.7 The 'nominal' scenario has not been reported as the level of impact would be substantially lower than that of the '100% by road' scenario, which in itself demonstrates minimal impacts.

6.6 Local Junction Modelling

6.6.1 Local junction models have been created to assess the impact of the proposed development at the following junctions which are discussed in turn below:

i. A2016 Picardy Manorway/ Norman Road;

ii. A2016 Picardy Manorway/ Clydesdale Way/ Yarnton Way/ A2016 Eastern Way; and

iii. A2016 Picardy Manorway/ Anderson Way/ A2016 Bronze Age Way/ B253 Picardy Manorway.

6.6.2 LinSig V3 has been used for signal controlled junctions and Junctions 9 ARCADY for priority roundabouts. Given the expected trip generation for the Proposed Development (Sections 5.3, 5.4 and 5.5), and the percentage impacts on the highway network (**Table 6.5**), it is expected that local junction modelling provides a sufficient assessment of REP's operational phase impacts on the highway network.

6.6.3 For the LinSig models, saturation flows/ queues/ cycle times have been established from video data and timing information supplied by TfL.

6.6.4 For the ARCADY models, observed and modelled queue lengths have been compared and are within similar ranges.

A2016 Picardy Manorway/ Norman Road

6.6.5 The A2016 Picardy Manorway/ Norman Road junction has been modelled on LinSig in accordance with its TfL timing sheet. The junction is a non-UTC junction and so a cycle time of approximately 60s has been observed from the traffic survey video footage. Saturation flows for the Picardy Manorway (EB) arm (ahead movements) have been based on video footage recording. The saturation flows for the remaining arms have been based on RR67 due to either restricted video footage or insufficient saturated conditions for readings. Furthermore, MMQs for the Picardy Manorway (EB) arm are consistent with what is observed on-site.

6.6.6 **Table 6.7** sets out the modelling results for the junction. The results indicate that the junction operates with significant spare capacity in both the 2028 Do Minimum (no development) and 2028 Do Something (with ‘100% by road’) scenarios across both peak periods. Except for Norman Road, the changes in queuing, delays and degree of saturation between the 2028 Do Minimum and 2028 Do Something Scenario are nominal. The DOS for Norman Road increases from 17.6% to 24.3% in the AM peak hour and from 30.5% to 38.1% in the PM peak hour between the 2028 Do Minimum and 2028 Do Something Scenarios. As such, the development does not have a significant impact at this junction and highway mitigation measures are not warranted.

Table 6.7: LinSig Results for A2016 Picardy Manorway/ Norman Road

Arm	AM Peak			PM Peak		
	MMQ	Delay	DOS	MMQ	Delay	DOS
2018 Baseline						
Norman Road	0.9	27.0	16.7%	1.6	28.5	28.4%
Picardy Manorway (WB)	7.3	7.5	57.2%	3.9	5.8	38.5%
Picardy Manorway (EB)	1.4	4.4	31.5%	3.7	5.1	42.9%
2028 Do Minimum						
Norman Road	0.9	27.1	17.6%	1.7	28.8	30.5%
Picardy Manorway (WB)	9.3	8.7	65.2%	5.5	6.6	48.6%
Picardy Manorway (EB)	4.9	6.4	45.7%	8.1	7.9	60.4%
2028 Do Something (100%)						
Norman Road	1.3	27.9	24.3%	2.2	30.0	38.1%
Picardy Manorway (WB)	9.4	8.8	66.1%	5.7	6.7	49.5%
Picardy Manorway (EB)	4.9	6.4	46.8%	8.1	8.0	61.2%

A2016 Picardy Manorway/ Clydesdale Way/ Yarnton Way/ A2016 Eastern Way

6.6.7 **Table 6.8** sets out the modelling results for the A2016 Picardy Manorway/ Clydesdale Way/ Yarnton Way roundabout. As can be seen, the junction operates with spare capacity across all scenarios tested with the Ratio of Flow to Capacity (RFC) being below the desirable value of 0.85. There is also minimal queuing and delays across the junction. In comparing the 2028 Do Minimum and 2028 Do Something scenarios, queuing, delays and RFC values have only increased marginally and it can be concluded that the development does not have a significant impact at this junction.

Table 6.8: ARCADY Results for A2016 Picardy Manorway/ Clydesdale Way/ Yarnton Way/ A2016 Eastern Way

Arm	AM Peak			PM Peak		
	Queue	Delay (S)	RFC	Queue	Delay (S)	RFC
2018 Baseline						
A2016 Picardy Manorway	1.7	3.39	0.6	0.8	2.31	0.41
Clydesdale Way	0.2	8.84	0.13	0.1	5.24	0.08
Yarnton Way	0.4	2.41	0.25	0.4	2.13	0.28
A2016 Eastern Way	0.6	2.99	0.37	1.5	4.61	0.57
2028 Do Minimum						
A2016 Picardy Manorway	2.4	4.32	0.69	1.2	2.83	0.52
Clydesdale Way	0.3	12.55	0.19	0.1	6.68	0.11
Yarnton Way	0.5	2.85	0.31	0.6	2.54	0.34
A2016 Eastern Way	0.9	3.58	0.46	2.3	6.31	0.68
2028 Do Something (100% by Road)						
A2016 Picardy Manorway	2.5	4.46	0.7	1.2	2.89	0.53
Clydesdale Way	0.3	13.15	0.2	0.1	6.83	0.11
Yarnton Way	0.5	2.9	0.31	0.6	2.58	0.34
A2016 Eastern Way	1	3.66	0.47	2.4	6.54	0.69

A2016 Picardy Manorway/ Anderson Way/ A2016 Bronze Age Way/ B253 Picardy Manorway

6.6.8 **Table 6.9** sets out the modelling results for the A2016 Picardy Manorway/ Anderson Way/ A2016 Bronze Age Way roundabout. As can be seen, the junction operates with spare capacity across all scenarios tested with the RFC being below the desirable value of 0.85. Overall, the changes in queuing, delay and RFC between the 2028 Do Minimum and 2028 Do Something scenarios are minimal and so the development does not have a significant impact at this junction.

Table 6.9: ARCADY Results for A2016 Picardy Manorway/ Anderson Way/ A2016 Bronze Age Way/ B253 Picardy Manorway

Arm	AM Peak			PM Peak		
	Queue	Delay (S)	RFC	Queue	Delay (S)	RFC
2018 Baseline						
A2016 Picardy Manorway	1.00	2.89	0.47	2.10	4.33	0.66
Clydesdale Way	0.20	2.19	0.15	0.40	3.28	0.29
Yarnton Way	1.50	3.92	0.58	1.00	3.42	0.46
A2016 Eastern Way	0.80	4.54	0.41	0.30	2.73	0.20
2028 Do Minimum						
A2016 Picardy Manorway	1.60	4.13	0.60	3.70	6.71	0.77
Clydesdale Way	0.30	2.48	0.21	1.40	6.05	0.57
Yarnton Way	3.00	6.27	0.73	1.70	5.19	0.61
A2016 Eastern Way	1.50	7.77	0.59	0.40	3.47	0.27
2028 Do Something (100%)						
A2016 Picardy Manorway	1.70	4.25	0.61	3.90	7.05	0.78
Clydesdale Way	0.30	2.51	0.21	1.50	6.26	0.58
Yarnton Way	3.10	6.51	0.74	1.70	5.35	0.61
A2016 Eastern Way	1.60	8.08	0.60	0.40	3.52	0.28

6.7 Summary

6.7.1 Overall, it has been shown that the operational phase of the development does not have a significant impact on the highway network when considering the ‘100% by road’ reasonable worst case scenario based on the following:

- The percentage impacts on all junctions assessed, except for the A2016/ Norman Road junction, is less than 1%. The percentage impacts on the A2016/ Norman Road junction is 1.7% and 1.6% in the AM and PM peak hours respectively;
- The percentage impacts on all links assessed, except for Norman Road is 1% or less;
- The percentage impact of the development on Dartford’s links are 0.5% or less and so the development will have no impacts on the A2026 as a result of re-routeing due to potential congestion on the A206 and Junction 1a of the M25; and
- Local junction modelling of the three main junctions closest to the site indicate that the junctions would operate within capacity and that there will be negligible to minor increases to queues, delays and operating capacity of the junctions with the addition of development traffic.

6.7.2 The ‘nominal’ scenario (i.e. 25% by road) would have a much lower network impact and so has not been reported in this TA.

6.7.3 The peak construction period has been shown to have predicted significant network impacts in the morning, primarily due to the large number of work force journeys during the morning network peak. The results are based on worst case assumptions regarding both the construction programme and the construction worker arrival pattern coinciding with the network AM peak hour. The measures proposed as part of the CTMP will assist in reducing the impacts and the Applicant will continue to work with TfL and LBB to seek ways to refine predictions and mitigate impacts, where feasible.

7 Mitigation and Travel Demand Management Strategy

7.1 Introduction

7.1.1 The assessment of transport impact has shown that there is no requirement to propose physical mitigation to address the impact of the construction or operational phases.

7.1.2 It is anticipated that during the peak construction period (Month 13) worker travel could generate temporary significant impacts on local roads during the network peak. The operational phase, however, is predicted not to generate significant impacts.

7.1.3 Demand management measures would be promoted through the CTMP for the construction phase and an Operational Worker Travel Plan to minimise residual impacts. Furthermore, the programming and control of works will assist with mitigating the effects on affected infrastructure – such as PRoWs and bus services.

7.2 Construction of the Electrical Connection

7.2.1 The Electrical Connection cable would be constructed by way of transient works with associated temporary traffic management. The details of the programme and sequence of works; the length of time within a location and the location of the active works would be agreed and co-ordinated with the Local Highway Authorities (LHAs) through the provision of a CTMP for those works.

7.2.2 It is proposed that the length of works would be up to approximately 300m in any one location, depending on the circumstance and location of the works. Each working area could last up to 7 days before they move on. Where trenchless installation techniques are required, the typical working period for a given length of road would increase. Details of the phasing and programme for the delivery of the Electrical Connection would be submitted to the local authorities closer to the time of the works and coordinated through a Streetworks process set out in the DCO.

7.2.3 The method of temporary traffic management would be set out within the CTMP for that phase and reflect on-going engagement with the appropriate Streetworks team.

7.2.4 It is anticipated that, regardless of whether the cable is installed in the highway, verge or footway, that a single lane closure would normally be required during construction. A review of the main route and route options is currently being undertaken by the Applicant and UKPN to assess the most appropriate route.

7.2.5 This strategy would ensure drivers do not experience delays greater than would be typically expected at road works of this type.

7.3 PRoW Interfaces

7.3.1 The options for the route of the Electrical Connection include a corridor which crosses the Crossness Nature Reserve. It is expected that footpath FP2 could be closed for a number of weeks during construction (subject to detailed programme). A diversion route for FP2 could be promoted using Norman Road and FP4. The impact on FP1 would be determined through the detailed design for the Electrical Route. This could require a closure or temporary diversion.

7.3.2 The impact on FP1, BY104 and BY105 would be determined through the detailed design for the Electrical Route. This could require a closure or temporary diversion. There are no other plans to close PRoWs during the construction works.

7.3.3 Footpath DB3 crosses the route of the Fastrack busway for Route A and, as such, crosses the alignment of one of the options for the Electrical Connection. The works area at that point would be configured to allow the temporary diversion of the footpath around the working zone. Where necessary crossing facilities would be incorporated into the temporary traffic management. This could include a controlled crossing within temporary traffic signals.

7.3.4 Access to footpath DB5 during construction would be maintained along the river and under the road bridge for the route along the embankment. At grade across A206, access would be incorporated around the temporary works compound and any active works area in that location for the Electrical Connection. Where possible this would maintain the current route of the PRoW. Diversions would be kept to a minimum – whilst maintaining safe and efficient operation of the works areas.

7.3.5 The route of footpath DB1 would be allowed for within the temporary traffic management for the works areas around the Electrical Connection.

7.3.6 Access from FP243, FP249 and FP29 to the public highway within the Order Limits would be maintained.

7.3.7 FP20 passes underneath the Electrical Connection in a subway and would be unaffected. DB50 crosses the route of the Electrical Connection using an overbridge and would be unaffected.

7.3.8 As the Electrical Connection is predominantly underground, any potential impacts on PRoW would only be associated with the temporary construction phase. There would be no operational impacts to PRoW from the Electrical Connection – with the exception of infrequent maintenance requirements.

7.3.9 FP4 would lie outside the works to reconfigure the entrance and would not therefore be affected as would the alignment of FP3 (Thames Path).

7.3.10 There would be no impacts on the footpath network during the operational phase.

7.4 Management of Bus Service and Fastrack Interface

7.4.1 The option for the Electrical Connection route following Anderson Way and Church Manorway, Lower Road and West Street would impact on the local bus routes 229, 469, 602, and 669 (the latter being school transport services). The interaction with these services during construction of the Electrical Connection would be managed and co-ordinated in accordance with details of the programme and engagement with the bus operating companies and the appropriate Streetworks teams. This programme for construction would seek to minimise the impact on bus services and access to them, limiting or eliminating the need for route diversions or suspensions.

7.4.2 Where the Electrical Connection route option coincides with Fastrack Route A, suitable temporary traffic management exemptions would be applied along the bus corridor to allow safe access for construction vehicles within the bus-only section of the route. The sections of work and associated temporary traffic management would be programmed with the bus company, DBC and KCC. Where the works interface with passenger boarding or alighting, suitable alternative bus stops and waiting areas would be provided and notified to the operator. Safe crossing facilities would be incorporated into the temporary traffic management as necessary.

7.5 Mitigation of Network Impacts

7.5.1 The Proposed Development would be supported by a series of Travel Demand Management strategies for the construction period and the operational period.

7.5.2 Separate Construction Traffic Management Plans (CTMPs) would be prepared for stages of the construction process, reflecting the different requirements of each stage. It is envisaged the staged plans could include:

- Site Establishment and Preliminary Works;
- REP construction; and
- Electrical Connection construction.

7.5.3 To complement operations at REP, an Operational Worker Travel Plan would be developed and maintained.

7.5.4 These documents are outlined below and frameworks are provided as appendices to this TA as identified later in this section. The preparation of detailed documents by the Applicant will be secured through a DCO requirement.

7.6 Outline Construction Traffic Management Plan

7.6.1 An outline Construction Traffic Management Plan (CTMP) is included at **Appendix L** to this TA. That document sets the basis for detailed CTMPs to be developed and approved as requirements of the DCO. The outline CTMP provides a headline review of the REP site and Electrical Connection route from the point of view of the management of construction traffic; a logistics overview; and construction worker travel planning.

7.6.2 The preliminary objectives for managing construction traffic are identified at Section 1 of the document. These would be refined as the proposals for REP and the construction processes are detailed.

7.6.3 Indicative measures are identified which could be considered in order to ensure that construction is undertaken in an efficient and sustainable manner. This has been produced in accordance with TfL's 'Construction Logistics Plan Guidance' document (July 2017).

7.6.4 Managing construction traffic in accordance with CTMPs would assist in mitigating its impact on the neighbouring businesses and meeting the LHA processes with regards to temporary traffic management.

7.6.5 The construction of the Electrical Connection would similarly be managed to optimise retaining access to adjoining development – such as minimising the impact on servicing for retail and residential properties; facilitating regular deliveries and collections (e.g. Royal Mail and refuse collections); and ensuring emergency access is maintained (e.g. emergency services and Statutory Utility companies).

7.6.6 A preliminary projection is provided of the likely peak month average daily construction traffic. The detailed CTMPs for each stage of the project would provide information on:

- the anticipated construction tasks;
- the programme for that stage of the project;
- the predicted number of construction vehicle visits for the period of that CTMP;
- the likely types of vehicles, plant and equipment; and
- measures and initiatives that would be adopted at that time.

7.7 Outline Operational Worker Travel Plan

7.7.1 The TfL Travel Planning Guidance describes a Travel Plan as "*a long term management strategy which encourages sustainable travel for new and existing developments. It sets out transport impacts, establishes targets and identifies a package of measures to encourage sustainable travel*". A Travel Plan is intended to be a 'living' document that incorporates the flexibility to respond and adapt to changing conditions, such as:

- New or amended transport services in the vicinity of the site;
- Transport network operations as a result of changing background travel demand over time; and
- Initiatives employed through the travel plan drawing on experience of its implementation.

7.7.2 An outline Operational Worker Travel Plan has been prepared for the operational REP development, providing a travel demand management strategy to address the travel behaviour of staff and visitors travelling to and from REP. The document is attached at **Appendix M** .

7.7.3 The nature of REP requires the plant to be operated and staffed 24 hours per day. Staff shifts would be set to be able to benefit from opportunities for to use public transport or walk or cycle to work. The indicative shift pattern is for the day time shift to be 06:00-18:00hrs and 18:00-06:00hrs. This being the case workers would arrive between 05:00-06:00 and 17:00-18:00 and depart between 18:00-19:00 and 06:00-07:00. The Operational Worker Travel Plan would not relate to the construction period nor the operational vehicle movements associated with the waste and by-products.

7.7.4 The outline Operational Worker Travel Plan offers an overall strategy for the adoption of sustainable transport measures. A Travel Plan Coordinator (TPC) would be appointed by the Applicant prior to first commissioning and will be responsible for finalising an Operational Worker Travel Plan for approval by LBB. The TPC would then be responsible for the ongoing implementation and review of the Travel Plan.

7.7.5 Once the site is operational and a TPC appointed, there should be the opportunity to develop further the document to reflect the specific needs of the site users, whilst meeting the key objectives and planning commitments. The proposed approach embeds measures from the outset, through good physical infrastructure and plans for management and monitoring, as discussed and outlined in this document.

7.7.6 There is an existing Travel Plan for RRRF and the appointed TPC for REP would seek to align the Travel Plan measures with those for RRRF, such as undertaking joint events promoting sustainable travel, undertaking travel plan monitoring on a consistent basis and 'joined-up thinking' when considering travel to both RRRF and REP.

7.7.7 The role and responsibilities envisaged for the TPC are set out below and will be kept under review, in keeping with the evolving nature of the 'living document' nature of the Travel Plan:

- Establishing contacts within the local community including public transport operators, cycle shop owners, local planning and highway authorities;
- Leading on the implementation of measures, including preparing Travel Information Packs for issue to staff;
- Obtaining baseline mode share data for employees and agreeing final baseline mode share and final targets with LBB; and
- Conducting Staff Travel Surveys in Years 1, 3 and 5 following the baseline survey and submission of a Monitoring Report to LBB on each occasion.

7.7.8 The outline Operational Worker Travel Plan sets indicative mode share targets are for Year 1, Year 3 and Year 5 following occupation of the development's buildings, these are set out in **Table 7.1**. These indicative targets prioritise a shift to sustainable modes of travel from single occupancy car use. Given the processing and manual nature of the work, encouraging reduction in the 'need to travel' does not make practical sense for REP.

7.7.9 The Year 1 target is deliberately challenging to encourage more sustainable travel from the outset than the Census Journey to Work for the surrounding area and to ensure that there is no excess parking over that provided, even taking account of shift changeover times, when both shifts' staff may be present.

Table 7.1: Indicative Travel Plan Targets, Years 1, 3 and 5

Mode	Baseline Mode Share (%)	Year 1		Year 3		Year 5	
		Staff by Mode	Mode Share (%)	Staff by Mode	Mode Share (%)	Staff by Mode	Mode Share (%)
Underground	1%	-	0%	-	0%	-	0%
Train	5%	5	7%	5	7%	5	7%
Bus, minibus or	12%	11	15%	11	15%	12	16%
Taxi	0%	-	0%	-	0%	-	0%
Motorcycle	2%	2	3%	2	3%	2	3%
Driving a car or	63%	37	49%	34	45%	31	41%
Passenger in a car	5%	6	8%	7	9%	7	9%
Bicycle	2%	4	5%	5	7%	6	8%
On foot	9%	10	13%	11	15%	12	16%

Mode	Baseline Mode Share (%)	Year 1		Year 3		Year 5	
		Staff by Mode	Mode Share (%)	Staff by Mode	Mode Share (%)	Staff by Mode	Mode Share (%)
Other	0%	-	0%	-	0%	-	0%
Total		75	100.0%	75	100.0%	75	100.0%

7.7.10 Measures are set out in the Operational Worker Travel Plan to:

- encourage walking and cycling;
- encourage Public Transport use; and
- encourage sustainable car use (such as car sharing and provision of electric vehicle charging points).

7.7.11 The outline Operational Worker Travel Plan describes: the proposed marketing and promotional strategy, including Travel Information Packs for employees and information for visitors; the monitoring and review framework; ownership, duration and handover; securing and enforcing the Travel Plan; and an Action Plan.

8 Summary and Conclusion

8.1 Summary

8.1.1 Cory Environmental Holdings Limited (trading as Cory Riverside Energy (Cory or “the Applicant”)) is applying to the Secretary of State under the Planning Act 2008 (PA 2008) for powers to construct, operate and maintain an integrated Energy Park, to be known as Riverside Energy Park (REP). The principal elements of REP comprise complementary energy generating development and an associated Electrical Connection (together referred to as the ‘Proposed Development’). As the generating capacity of REP will be in excess of 50 MWe capacity it is classified as a Nationally Significant Infrastructure Project (NSIP) under section 14 and 15 of the PA 2008 and therefore requires a Development Consent Order (DCO) to authorise its construction and operation.

8.1.2 The two principal elements of the Proposed Development are: the Energy Park, which would be located adjacent to an existing Energy Recovery Facility (ERF) operated by Cory (referred to as Riverside Resource Recovery Facility (RRRF)) situated at Norman Road in Belvedere within the London Borough of Bexley (LBB). The underground Electrical Connection would run from the REP site and terminate at the Littlebrook substation in Dartford. **Figure 1.1** of the ES shows the site location, and **Figure 1.2** shows the Application Boundary and Assessment Areas.

8.1.3 This Transport Assessment (TA) has been prepared in accordance NPS EN-1 and with local and national guidance and reflects the agreed scoping, as developed through engagement with the Local Highway Authorities, Highways England and the Local Planning Authorities. Section 2 has presented details of the Proposed Development with specific relevance to transport and movement and that section reviewed the existing and future baseline setting around the Proposed Development. Section 3 has considered applicable national, regional and local policy and guidance and demonstrates how the Proposed Development responds to that guidance and policy. It has been shown that REP would benefit from the existing jetty facilities on the Thames and is well located to the existing strategic road network. This juxtaposition will be of benefit for the construction and operational phases. Opportunities for workforce movement by non-car means of travel are available within reasonable proximity, albeit the formal PTAL assessment does not represent this.

8.1.4 Through Sections 4, 5 and 6 the implications of the predicted vehicle impacts on the assessment area are appraised for construction traffic and operational traffic. A baseline ‘Do Minimum’ network for 2022 and 2028 (aligning with the construction phase assessment and 10 years post-submission, respectively) has been prepared for the assessments, which includes background growth using the Department for Transport’s TEMPro v7.2 forecasting model and a series of local committed development.

8.1.5 To assess the transport impact of construction traffic on the local road network, a 'reasonable worst case' scenario has been appraised for Month 13 of the construction period. That month is predicted to be the period during which the highest cumulative number of construction vehicles and worker vehicles attend the construction site. The largest proportion of movements during the peak construction phase is anticipated to be by workers, and an assessment is provided of those movements based on a working day starting at 08:00hrs and ending at 18:00hrs.

8.1.6 The peak construction period has been shown to have predicted significant network impacts in the morning, primarily due to the large number of work force journeys during the morning network peak. The results are based on reasonable worst case assumptions regarding both the construction programme and the construction worker arrival pattern coinciding with the network AM peak hour. The measures proposed as part of the CTMP will assist in reducing the impacts and the Applicant will continue to work with TfL and LBB to seek ways to refine predictions and mitigate impacts, where feasible.

8.1.7 Construction of the Electrical Connection would be by way of sections of temporary road works, up to 200 m in length (with a 300 m working section fenced off). A preferred route is identified within the TA, primarily following strategic dual-carriageway roads. A quantitative assessment has not been provided of the likely traffic impacts due to the transient and temporary nature of the works. A detailed programme for the construction of the Electrical Connection would be determined in collaboration with the relevant Local Authorities.

8.1.8 The assessment of development impact then considered a reasonable worst case scenario for the operations at REP, where 100% of waste imports would be delivered by road using Refuse Collection Vehicles. To complement this, a nominal '75% by river and 25% by road' scenario for waste imports has been appraised to understand likely road impacts. A 100% of waste imports by river scenario has been assessed with the Navigational River Assessment which is attached to the ES at **Appendix B.2**.

8.1.9 The summary findings at **Table 6.5**, of the '100% by road' scenario, indicate that the level of impact during the operational phase would be generally less than a 1% change in vehicle flows at junctions or links on the assessed network and not greater than a 2% change in vehicle flows, except for the access to REP at Norman Road. The 'nominal' scenario (i.e. 25% by road) would have a much lower network impact and so has not been reported in this TA.

8.1.10 Construction of the preferred route for the Electrical Connection would coincide with the corridor used for the Fastrack Route A bus services within Dartford. The works areas would be configured to minimise impacts during construction. Future maintenance would be via inspection chambers and access to these would be managed in collaboration with the bus operator.

8.1.11 Alternative Electrical Connection routes are identified which could similarly impact on local bus services, as detailed within Section 2, during construction. The implications of the works would be further explored as part of a detailed Construction Traffic Management Plan for that work.

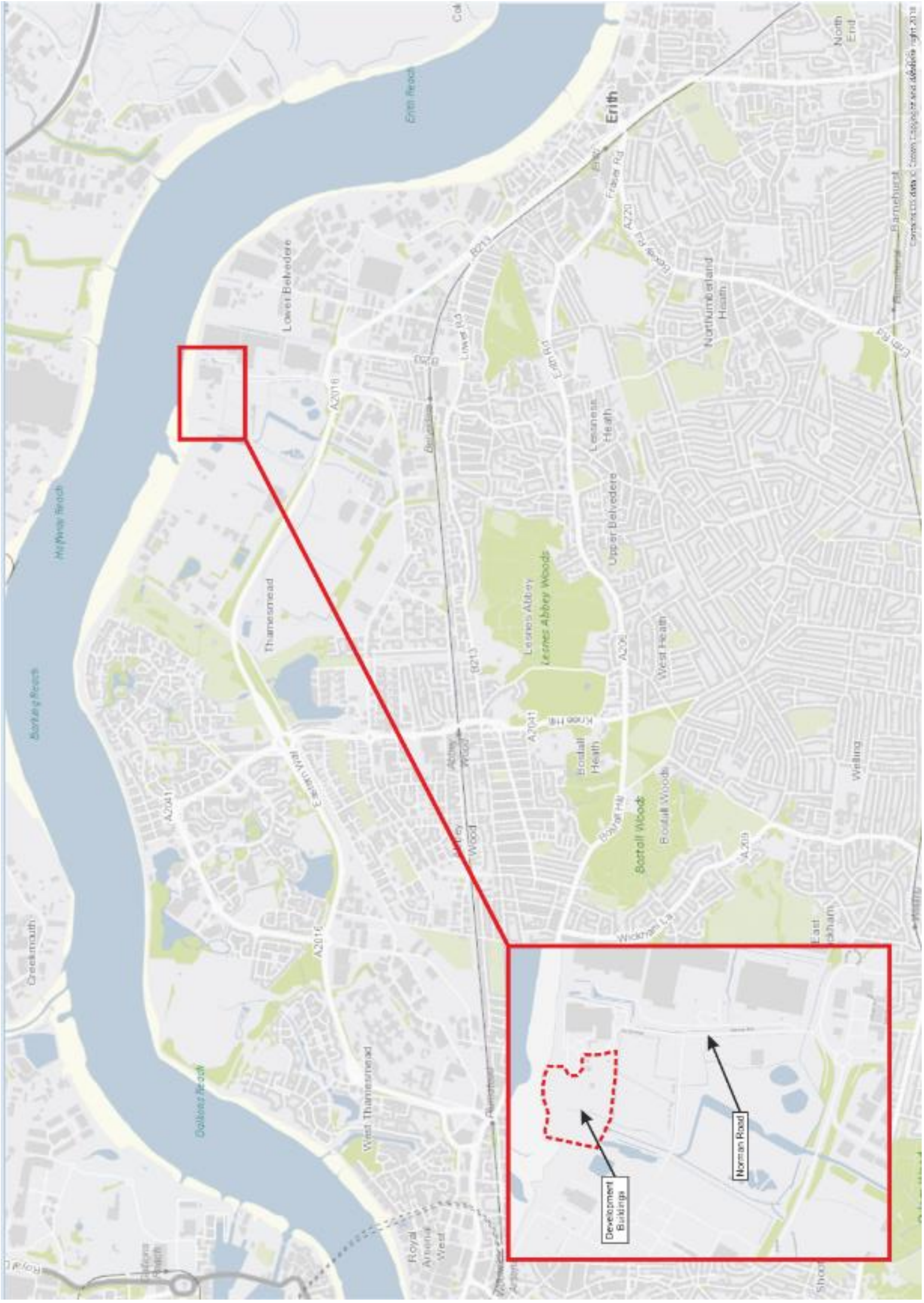
8.1.12 Local junction modelling of the three main junctions closest to the site indicate that the junctions would operate within capacity and that there will be negligible to minor increases to queues, delays and operating capacity of the junctions with the addition of development traffic.

8.1.13 An outline Construction Traffic Management Plan and Operational Worker Travel Plan are appended to this TA (**Appendices L** and **M** respectively), indicating the likely strategies that could be adopted to help to mitigate the impacts of the construction phase movements and operational phase worker travel.

8.2 Conclusion

8.2.1 It has been shown that the Proposed Development would not have materially significant residual impacts on the transport network either during construction or once REP would be operational. REP would be suitably located to maximise the benefits of the proximity of the River Thames and has good connectivity to the strategic road network. Temporary impacts would be ameliorated by applying Construction Traffic Management Plans and Operational Worker Travel Plan, further reducing the impacts of the Proposed Development.

Appendix A REP Site location, Application Boundary and Illustrative REP layout


Erith
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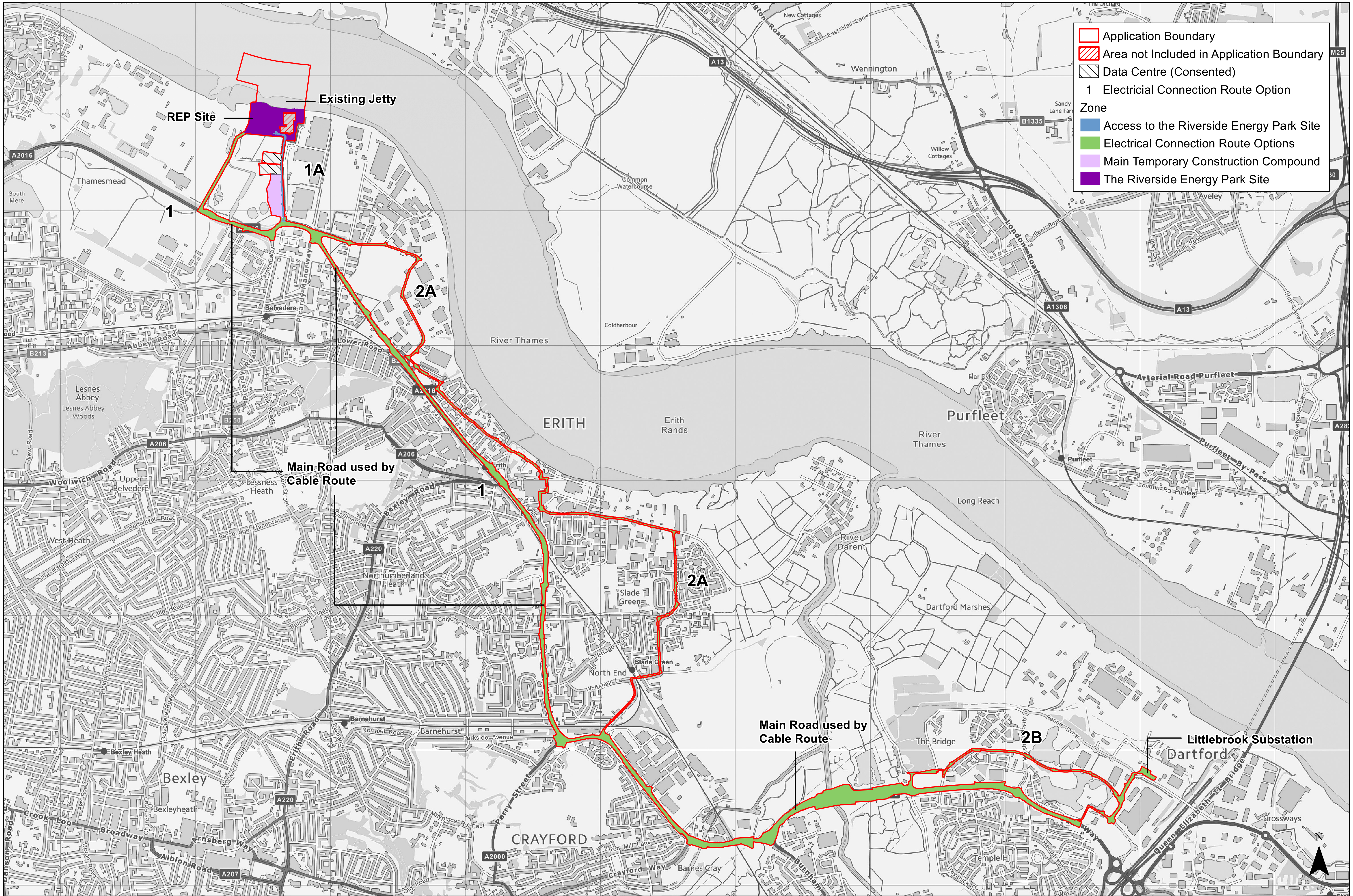
West Thamesmead
Lesnes Abbey Woods
Bostall Woods
Development Buildings
Norman Road



RIVERSIDE ENERGY PARK

0 0.5 1 km

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Based on Babcok/EDF plan - RRRL Cable Route Landowners - 2-01-2010 - Drawing NO. Cable Route Plan

pba peterbrett

Client

CORY RIVERSIDE ENERGY

1:25,000 @ A3
08/11/18
Drawn: HG/CM
Checked: JM

Application Boundary and Assessment Areas

Figure 1.2 | Rev 0

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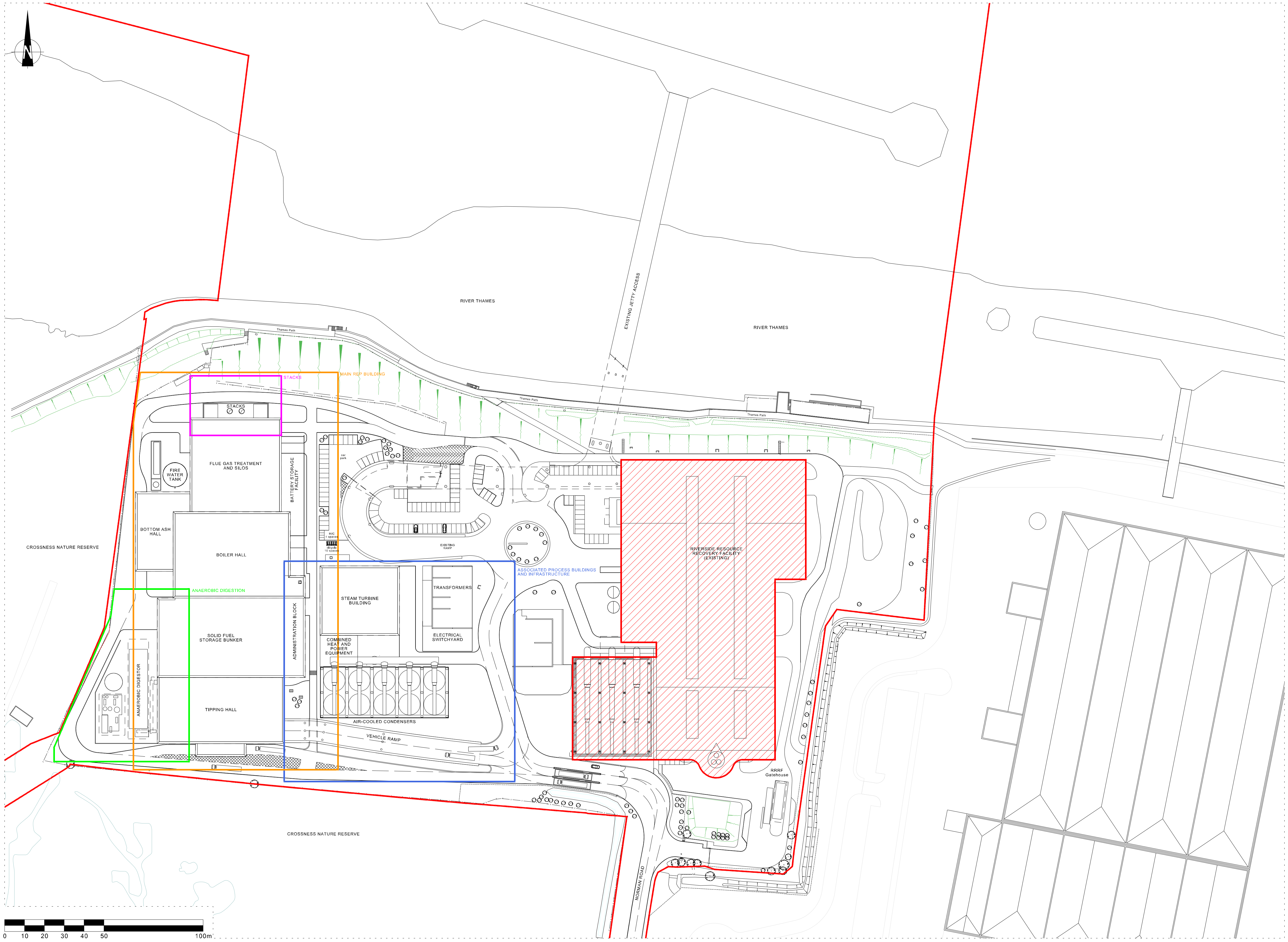

KEY:

APPLICATION BOUNDARY

AREA NOT INCLUDED IN APPLICATION BOUNDARY

PARAMETERS KEY:

MAIN REP BUILDING

ANAEROBIC DIGESTION

ASSOCIATED PROCESS BUILDINGS AND INFRASTRUCTURE

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CORY RIVERSIDE ENERGY

RIVERSIDE ENERGY PARK

NORMAN ROAD BELVEDERE LONDON

ILLUSTRATIVE SITE LAYOUT AND PARAMETERS PLAN

THE RIVERSIDE ENERGY PARK SITE LONDON

Date	31.10.18
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Drawing Number	Figure 1.3a

Appendix B TA Scoping and Responses

Document Control Sheet

Project Name: Riverside Energy Park, Belvedere

Project Ref: 42166/5501

Report Title: Transport Assessment Scoping Report

Doc Ref: Final

Date: 01st March 2018

	Name	Position	Signature	Date
Prepared by:	Charlie Lusty	Senior Transport Planner	Charlie Lusty	March 2018
Reviewed by:	Manu Dwivedi	Senior Associate	Manu Dwivedi	March 2018
Approved by:	Robert Parker	Director	Robert Parker	March 2018
For and on behalf of Peter Brett Associates LLP				

Revision	Date	Description	Prepared	Reviewed	Approved

Contents

Figures

Tables

Appendices

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1 Introduction

1.1 Overview

1.1.1 Peter Brett Associates LLP (PBA) has been commissioned by Cory Environmental Holdings Limited (trading as Cory Riverside Energy) (Cory)), the Applicant, to provide transport and highway advice to support an application for an integrated Energy Park consisting of complementary energy-generating development together with a new connection to the existing electricity network and provision for the Proposed Development to be Combined Heat and Power (CHP)-ready.

1.1.2 The Proposed Development constitutes a project falling within the definition of a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008 by virtue of building, commissioning and operating an onshore generating station with an energy generating capacity of greater than 50 MWe. Consent for the Proposed Development would therefore require a Development Consent Order (DCO).

1.1.3 The Proposed Development, located in Belvedere in the London Borough of Bexley (LBB), would be known as ‘Riverside Energy Park’ (REP) and would be sited adjacent to an existing Energy Recovery Facility (ERF) (referred to as Riverside Resource Recovery Facility (RRRF)) also currently operated by Cory. The Indicative Application Boundary plan is provided at **Appendix A**.

1.2 Proposed Development – Summary

1.2.1 REP will comprise the following elements:

- **Energy Recovery Facility** undertaking incineration of commercial and industrial waste, with the potential for municipal waste. Envisaged to have a throughput of approximately 655,000 tonnes per annum (tpa). For the purpose of the Environmental Impact Assessment (EIA) and the Transport Assessment (TA) an annual maximum throughput of 805,920 tpa will be assumed.

- **Solar Photovoltaic Installation** provision integrated across a wide extent of the roof.

- **Battery Storage** supplying additional power to the local distribution network at times of peak electrical demand. This facility would be integrated into the Main REP Building.

- **Anaerobic Digestion Facility** sized to process approximately 40,000 tpa of food and green waste, predominantly sourced from within LBB and transferred by road. Solid digestate, an output of the anaerobic digestion process will be transferred off-site for use in the agricultural sector as fertiliser.

- **Combined Heat and Power Connection** readiness, enabled with necessary infrastructure within the REP site (heat exchangers, pumps, pressurisation systems included).

- **Electrical Connection** to the existing National Electrical Transmission System (NETS) via a new 132 kV distribution network connection (‘the Electrical Connection’). It is proposed that an Electrical Connection would be routed predominantly via the existing road network and would be underground except for the connection point with REP itself and at the connection point to the NETS at Littlebrook Power Station substation.

1.2.2 It is proposed to deliver the majority of waste to REP by barge from riparian Waste Transfer Stations (WTS) along the River Thames, utilising the existing jetty which forms part of the RRRF. The full description of inputs and by-products of REP is set out in Chapter 4.

1.2.3 It is proposed that car parking and cycle parking are provided in accordance with the standards set out within the Draft London Plan, including those relating to electric vehicle charging points and disabled parking.

1.2.4 Appropriate swept-path analysis will be conducted to ensure that the site layout can accommodate the movements of the vehicles serving REP.

1.3 Consultation

1.3.1 An EIA Scoping Report was submitted to the Planning Inspectorate (PINS) on 27th November 2017 and the Scoping Opinion was received 5th January 2018. This provided responses from the following consultees (inter alia), which have been reflected in the contents of this TA Scoping Report:

- PINS
- LBB
- Dartford Borough Council (DBC)
- Royal Borough of Greenwich (RBG)
- Transport for London (TfL)
- Kent County Council (KCC)
- Highways England (HE)
- Port of London Authority (PLA)
- Royal Mail
- Surrey County Council

1.3.2 No subsequent discussions have yet been held in relation to transport matters with any of the above.

1.4 Transport Assessment Outputs

1.4.1 The TA will form one part of the documentation that informs the REP DCO and will be prepared to assess the impact of the construction, maintenance and operational and decommissioning phases of REP. This document forms the scope and key aspects of the assessment on which agreement is sought with the various consultees listed above prior to submitting as part of the REP DCO later in 2018.

1.4.2 The indicative scope of works, by chapter, for the TA is as follows:

- Chapter 1: Introduction
- Chapter 2: Existing Conditions
- Chapter 3: Policy and Guidance Review
- Chapter 4: Development Proposals
- Chapter 5: Trip Generation and Distribution
- Chapter 6: Transport Network Impact Assessment
- Chapter 7: Detailed Modelling Assessment
- Chapter 8: Travel Demand Management Strategy
- Chapter 9: Summary and Conclusion

1.4.3 Key components of this scope are set out in the remainder of this Scoping Report.

2 Existing Conditions

2.1 Site Location and Description

2.1.1 REP comprises approximately 7.73 ha of land accessed off Norman Road, Belvedere, London DA17 6JY in LBB, immediately to the west of the existing RRRF. The Indicative Application Boundary is detailed in **Appendix A**.

2.1.2 REP is irregular in shape, and is predominantly used by Cory as an ancillary area for the existing RRRF located at the same address as outlined above.

2.1.3 REP includes the existing jetty in the River Thames which is currently used for delivery of waste and despatch of some by-products at the RRRF. The jetty will be used for the same purpose for the operation of REP.

2.1.4 Existing land uses of REP include:

- Ash storage containers
- Boundary fencing and associated lighting
- Circulation roads
- Compounds for the maintenance of operational plant machinery
- Car parking
- On-site non-designated Wasteland Habitat Area

2.1.5 REP is accessed from Norman Road which extends south from REP to the A2016 Eastern Way which forms part of the Strategic Road Network (SRN) and runs in an east/west orientation.

2.1.6 Immediately to the east of REP lies the RRRF, an ERF with a maximum consented residual waste throughput of 785,000 tpa generating up to 72 MWe. RRRF operates 24 hours a day and seven days per week throughout the year.

2.1.7 Approximately 270 m to the west of REP is the Thames Water Crossness Sewage Treatment Works (STW).

2.1.8 To the east, beyond RRRF, lies the Crabtree Industrial Estate. This estate covers an area of approximately 150 ha and is bordered to the north and east by the River Thames. Serviced by the same road network as REP, the Crabtree Industrial Estate consists of multiple units, the largest being the Lidl distribution depot and a new Ocado depot.

2.1.9 The Crossness Nature Reserve, which forms part of the Erith Marshes, abuts REP's southern and western boundaries, covering an area of approximately 25.5 ha.

2.2 RRRF Planning Conditions

2.2.1 RRRF operates under several planning conditions relating to how waste and by-products must be transported. Some conditions apply when a jetty outage occurs; which is described as circumstances caused by factors beyond Cory's control which mean waste cannot be received at the jetty or ash containers cannot be despatched from the jetty for a period in excess of 4 consecutive days.

2.2.2 The various transport-related conditions are set out below as they will be incorporated into some of the assessment work for the REP TA, although it is emphasised that, at this stage, these conditions are not expected to be duplicated for REP:

"4: The total tonnage of waste received at the site shall not exceed 785,000 tonnes in any calendar year.

5: The plant shall process only waste transported to it from a riparian waste transfer station in Greater London and the Port of Tilbury, other than the waste specified in Condition 26.

6: No more than 115,000 tonnes of waste arising from outside Greater London shall be delivered to the plant from the Port of Tilbury in any calendar year.

7: Except during periods of jetty outage or emergency the jetty and pier shall remain available at all times for tugs and barges transporting waste, residual materials following incineration, and consumables necessary for the operation of the development and for no other purpose unless with the prior written consent of the Council.

8: Bottom ash and co-mingled metals shall be taken from the site only via the jetty and the River Thames except in an emergency, following a jetty outage or with the prior written consent of the Council.

26: Except in the case of jetty outage:

(a) not more than 195,000 tonnes of waste shall be delivered to the development by road in any calendar year; and

(b) no more than 85,000 tonnes of the waste transported to the development by road in any calendar year shall be transported from outside Greater London.

27: In the case of jetty outage, the number of heavy commercial vehicles carrying waste in peak hours along Norman Road shall be restricted as follows: between 0730-0900 hours a maximum of 30 heavy commercial vehicle movements two-ways; between 1630-1800 hours a maximum of 30 heavy commercial vehicle movements two-ways and subject to there being a maximum of 300 heavy commercial vehicle movements two-ways between 0000 hours and 2400 hours on any day.

28: Except in the case of jetty outage or with the prior written consent of the Council, the number of two-way vehicle movements (one vehicle in and one vehicle out) made by heavy commercial vehicles delivering waste to the plant shall be limited to a maximum of 90 per day.

29: A documentary record of the movements of all heavy commercial vehicles to and from the site shall be made and retained for inspection by nominated officers of the Council in a form (paper or electronic) to be agreed by the Council."

2.3 Highway Network

2.3.1 Norman Road is approximately 650 m in length; providing the vehicular access to REP and is aligned north-south between REP and the A2016 Picardy Manorway. It is subject to a 30 mph speed limit and has streetlights on the eastern side. The junction of Norman Road and Picardy Manorway is a left-in left-out signalised junction.

2.3.2 Picardy Manorway is a dual-carriageway aligned east-west with a 50 mph speed limit. It connects with A2016 Eastern Way/Clydesdale Way/Yarnton Way 100 m to the south-west and with Anderson Way/A2016 Bronze Age Way/Picardy Manorway 330 m to the south-east; both in the form of large priority roundabouts.

2.3.3 The A2016 forms part of the SRN and connects to the A206 South Circular at the Woolwich Ferry and the A102 Blackwall Tunnel to the west. Both of these roads form part of the TfL Road Network (TLRN) and the latter is approximately 11.5 km from REP.

2.3.4 To the east, the A2016 passes through Erith and Dartford connecting to the A282 at the Dartford Crossing approximately 10.5 km to the south-east of REP.

2.3.5 London Lorry Control Scheme restrictions are in place on the A2016 Eastern Way to the west of Picardy Manorway. These require that vehicles over 18t are permitted to use the road at the following times only:

- Weekdays 07:00-21:00
- Saturdays 07:00-13:00

2.3.6 Therefore, all vehicles accessing RRRF and REP outside of these times must route from the east via the A206 at Slade Green.

Existing Traffic Flows

2.3.7 Given the expected level of highway impact associated with the Proposed Development (to be discussed in Chapter 4), the following traffic data will be collected on the local highway network. It is expected that this would be undertaken in April 2018 outside of school holidays.

2.3.8 14-day automatic traffic counters (ATCs) and single weekday manual classified counts (MCCs) between 06:00-10:00 and 16:00-19:00 will be in place as shown in **Appendix D** and listed below.

2.3.9 A number of ATCs are proposed on dual-carriageways which may present safety issues beyond the level of acceptability for the commissioned traffic survey company. Therefore, it may not be possible to collect all of the desired data and alternative sources, such as Department for Transport permanent traffic counters, could be used instead.

2.3.10 It is noted that KCC requested pedestrian counters be put in place on key PRoWs that may be affected by the Electrical Connection Route. Greater detail regarding the impact and construction approach of the Route is now understood and it is not considered necessary to implement such counters. Further detail on the Route can be found at Chapter 6.

Automatic Traffic Counters (ATCs)

i. Norman Road (north)

ii. Norman Road (central)

iii. Norman Road (south)

iv. A2016 Eastern Way

v. Yarnton Way

vi. A2016 Picardy Manorway (west of Norman Road)

vii. A2016 Picardy Manorway (east of Norman Road)

viii. B253 Picardy Manorway

ix. A2016 Bronze Age Way

x. A206 Northend Road

xi. A2000 Perry Street

xii. A206 Thames Road (between Howbury Lane and Crayford Way)

xiii. A206 Thames Road (between Crayford Way and Burnham Road)

xiv. A2026 Burnham Road

xv. A206 Bob Dunn Way (between Burnham Road and Central Road)

xvi. A206 Bob Dunn Way (between Marsh Street North and M25 J1a)

Manual Classified Counts (MCCs)

i. A2016 Picardy Manorway/ Clydesdale Way/ Yarnton Way/ A2016 Eastern Way

ii. A2016 Picardy Manorway/ Norman Road

iii. A2016 Picardy Manorway/ Anderson Way/ A2016 Bronze Age Way/ B253 Picardy Manorway

2.4 Public Transport Network

Public Transport Accessibility Level

2.4.1 Public Transport Accessibility Levels (PTALs) are a detailed measure of the accessibility of a site to the public transport network, taking into account walk access times and service availability, frequency and reliability. A PTAL can range from 1a to 6b, where a score of 1 indicates a “very poor” level of accessibility and 6b indicates “excellent” provision.

2.4.2 According to TfL’s online WebCAT toolkit, REP has a PTAL of 0 as a result of the bus stops on Picardy Manorway being situated approximately 100 m beyond the 640 m maximum walking distance threshold. In reality, there is some level of public transport provision for REP which is not captured in the PTAL assessment. The complete PTAL report, as obtained from TfL’s WebCAT online toolkit, is included in **Appendix B**.

Bus Network

2.4.3 There are two bus services which operate on Picardy Manorway from which Norman Road, the primary access into REP, routes north. Both routes offer frequent services to local residential areas and a viable alternative to the private car for employees at RRRF and REP.

2.4.4 The eastbound bus stop is on the northern side of Picardy Manorway approximately 130 m east of Norman Road and the westbound bus stop is on the southern side of Picardy Manorway. A summary of the two bus services is provided in Table 2.1.

Table 2.1: Bus Service Summary

Bus No.	Route	Headway (mins)		
		Weekday (07:00-19:00)	Saturday (07:00-19:00)	Sunday (07:00-19:00)
180	Belvedere Industrial Area – Abbey Wood – Plumstead – Woolwich – Charlton – Greenwich – Lewisham	9-12	8-11	15
401	Bexleyheath – Belvedere – Thamesmead	15	15	30

2.4.5 The first bus on weekdays for the 180 bus is 05:45 and the last bus is 01:30. The first bus on weekdays for the 401 bus is 05:50 and the last bus is 00:05. There are no night bus services.

Rail Network

2.4.6 Belvedere station is located approximately 1.3 km to the south, a 17-minute walk, serving London Cannon Street, Dartford, Gravesend and Gillingham. The 401 bus has a journey time to Belvedere station of three minutes.

2.4.7 The station has several peak hour services to/from London Charing Cross and has the following typical off-peak services:

- 6 trains per hour (tph) to London Cannon Street calling at stops including Abbey Wood, Plumstead, Woolwich Arsenal
- 2tph to Dartford calling at Erith and Slade Green
- 2tph to Slade Green calling at Erith
- 2tph to Hither Green calling at stops including Erith, Slade Green, Bexley and Sidcup

2.4.8 The first services in weekday mornings arrive at approximately 05:10 with last services departing at 01:05.

2.4.9 Abbey Wood station is approximately 11 minutes on the aforementioned 180 bus service or one stop west on the same line as Belvedere station. Elizabeth line services will commence from Abbey Wood in December 2018 and the station also benefits from 2tph to London Charing Cross via Lewisham.

2.5 Pedestrian Network

2.5.1 A network of Public Rights of Way (PRoW) surround REP, linking Norman Road with the Thames Path to the north. A PRoW originates at the junction of Norman Road and the A2016, which extends west then northwest through the Crossness Nature Reserve to its border with the Thames Water Crossness STW. From here this PRoW extends north to the Thames Path, and south to the A2016.

2.5.2 The England Coast Path, a new National Trail around England's coast, in the vicinity of the Proposed Development, takes the route of the Thames Path.

2.5.3 Norman Road has a footway on its eastern side which runs between the RRRF in the north with Picardy Manorway to the south. A three-stage toucan crossing of Norman Road and Picardy Manorway provides connection with the southern footway of Picardy Manorway including the eastbound bus stop.

2.5.4 The Electrical Connection route is adjacent to and crosses a number of PRoW. Further detail on these will be provided in the TA and management of impacts on PRoW during construction will be set out.

2.6 Cycle Network

2.6.1 From REP, Norman Road has a mixture of advisory cycle lanes and shared use paths providing a cycle route to the cycle path on the north side of Picardy Manorway and the three-stage toucan crossing of Norman Road and Picardy Manorway. There are various elements of cycle infrastructure providing a route to Belvedere station.

2.6.2 The Thames Path, which forms part of Route 1 of the National Cycle Network, provides a good traffic-free route between REP, Thamesmead to the west and Erith to the east.

2.7 Personal Injury Collision Review

2.7.1 A review of the most recent three-year period of collision data within the study area indicated in Figure 2.1 will be undertaken as part of the TA.

2.7.2 Agreement on the extent of this study area is sought with LBB as part of pre-application discussions.

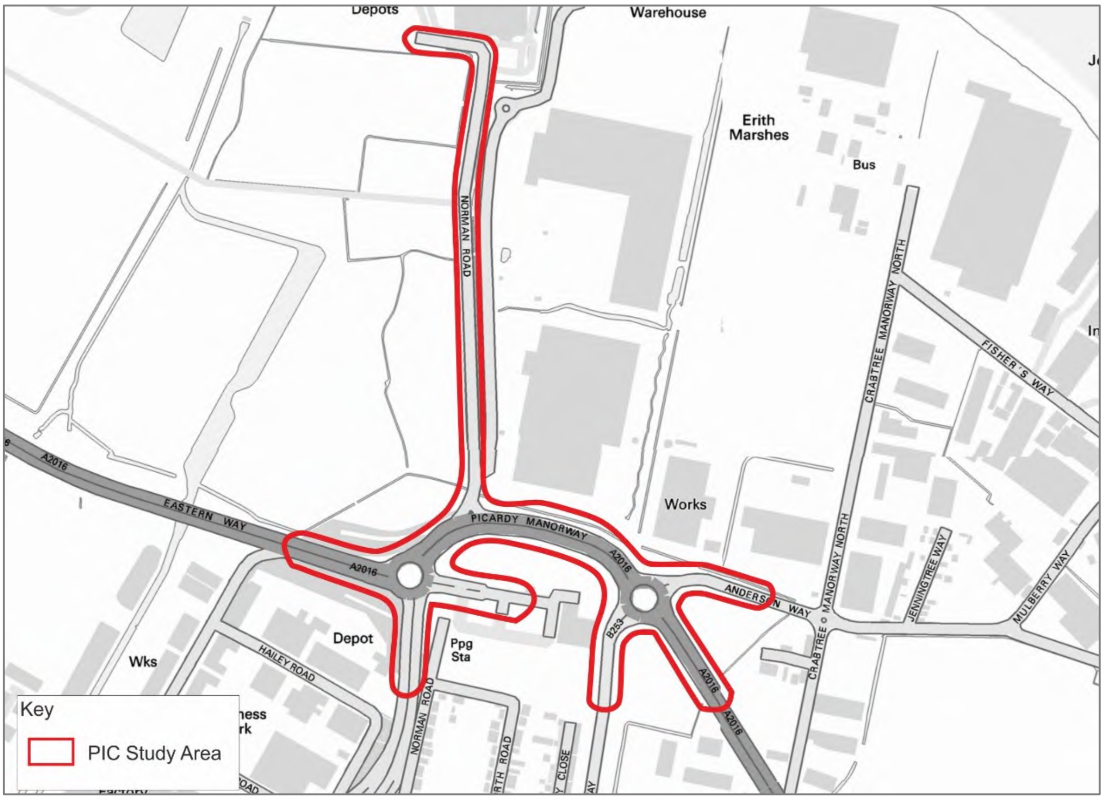


Figure 2.1: Proposed PIC Study Area

3 Policy and Guidance Review

3.1.1 The Proposed Development will be progressed taking account of policy and guidance at the national, regional and local level as set out under the below headings.

3.1.2 Given the expected level of impacts of the Proposed Development, as will be discussed in Chapter 4, policy and guidance associated with LBB's neighbouring authorities will not be included in the TA.

National Policy and Guidance

- National Planning Policy Framework (DCLG, 2012)
- Planning Practice Guidance (DCLG, 2016)

Regional Policy and Guidance

- London Plan (GLA, 2016)
- Mayor's Transport Strategy (GLA, 2010)
- TfL Transport Assessment Best Practice (TfL, 2014)
- Draft London Plan (GLA, 2017)
- Draft Mayor's Transport Strategy (GLA, 2017)

Local Policy and Guidance

- Bexley Core Strategy (LBB, 2012)
- London Borough of Bexley Unitary Development Plan Saved Policies (LBB, 2012)
- London Borough of Bexley Draft Local Plan (LBB, 2017)

4 Proposed Trip Generation and Distribution

4.1 Introduction

4.1.1 There are two components of REP that would generate trips, the aspects of which are set out below for the purposes of the trip generation and distribution assessment.

4.1.2 The impact of REP on river capacity and safety will be covered by a separate document, a Navigational Risk Assessment, as requested by the PLA.

4.1.3 The local highway network peaks are to be confirmed through traffic surveys, discussed in Chapter 5; however, they have been assumed to be 08:00-09:00 and 17:00-18:00 at this stage.

4.2 Construction Vehicle Trip Generation and Distribution

4.2.1 Cory and their technical advisers have provided PBA with a complete breakdown of expected construction vehicle trips by each month of the construction programme for REP for the movement of materials. Detail has also been provided on the number of construction workers on-site by month.

4.2.2 Construction materials will be transported by both river and road. All abnormal deliveries will be by road.

4.2.3 For those transported by road, given the stage of the planning process, the origins and destinations are unknown and a vehicle distribution will be applied of 50% west to Eastern Way and 50% east to Bronze Age Way and onto the M25. Should this distribution become more certain, it would be set out within the TA.

4.2.4 The peak month for vehicle trip generation during the construction phase will be Month 13 during which there are the most construction workers expected on-site (1,097 workers). The most construction material daily vehicle movements occur in Month 6 (342 two-way movements). The Transport chapter of the Environmental Statement (ES) will assess the combined peak which is currently expected to be Month 13.

4.2.5 A full breakdown of construction vehicle trip generation will be provided in the Outline Construction Logistics Plan (CLP) which will be appended to the TA and is discussed further in Chapter 6.

4.2.6 Parking for construction workers will be kept to a minimum and alternative modes of transport will be encouraged and incentivised. Illegal parking on the public highway will be monitored and controlled.

4.2.7 Construction of the Electrical Connection Route is separate to the above and is expected to generate an immaterial number of vehicle trips associated with movement of materials and labour. These will not be incorporated into the assessments; however, a separate review will be carried out of expected temporary impacts associated with any necessary lane closures required for the Electrical Connection Route.

4.3 Operational Assessment Scenarios

4.3.1 Two scenarios will be assessed as part of the TA, which are summarised in Table 4.1. These broadly reflect differing modal split assumptions. The 'normal' scenario is how REP will likely operate day-to-day; however, the 'worst-case' scenario ensures that REP has flexibility to operate with the majority of materials transported by road should this be necessary.

Table 4.1: Assessment Scenario Summary

Scenario	RRRF	REP ERF	REP Anaerobic Digestion Facility
Normal	Based on observed data to be collected in March/April 2018 (see Section 2.2 above).	75% of waste input transported by river from riparian WTS at Wandsworth, City of London and Tower Hamlets. 25% of waste input transported by road in refuse collection vehicles (RCVs) from local area including LBB, RBG and DBC. Consumables transported by road from various locations. By-product (incinerator bottom ash) IBA transported by river to Tilbury, Essex. By-product (air pollution control residue) APCR transported by road to Brandon, Suffolk.	70% of green/food waste input transported by road in LBB RCVs from across the borough. 30% of green/food waste input transported by road in articulated vehicles from Central London and M25. By-product compost transported by road to various locations. By-product liquid digestate transported by road to various locations.
Worst-Case	As per REP ERF 'Worst-Case' scenario but within limits determined by existing planning conditions (LBB planning ref.: 16/02167/FUL) – set out in Chapter 2.	100% of waste input transported by road with 65% from Central London (Wandsworth, City of London, Tower Hamlets) and 35% from Tilbury. By-products transported as per REP ERF 'Normal' scenario.	As per REP Anaerobic Digestion Facility 'Normal' scenario.

4.4 Operational Trip-Generating Assumptions

4.4.1 Cory has provided detailed, robust assumptions to PBA based on their experience and knowledge of how RRRF operates.

4.4.2 Important assumptions associated with REP's operational trip generation, have been set out below.

i. The other uses comprising the solar photovoltaic installation and battery storage would not generate any regular trips whilst operational, with the exception of infrequent maintenance, and will therefore not be incorporated into the trip generation assessment.

ii. The ERF operates year-round, 24 hours a day with inputs and by-products transported 24 hours a day, 7 days a week.

iii. The Anaerobic Digestion Facility operates year-round, 24 hours a day with LBB RCVs transporting waste only during working days (assumed 260 days per year excluding weekends and bank holidays) between 06:00 and 18:00.

iv. The routing of vehicles delivering waste will be based on the likely expected origins of waste, appreciating that this may change depending on a number of circumstances such as contract agreements.

v. The articulated vehicles transporting waste to the Anaerobic Digestion Facility would occur 24 hours a day, 7 days a week.

vi. Vehicles routing to/from REP would adhere to the London Lorry Control Scheme, as discussed in Section 2.2.

vii. In cases of jetty outage, ERF by-product IBA would be stored on-site and transferred by river to Tilbury when jetty becomes operational.

4.5 Operational Trip Generation and Distribution

4.5.1 The operational trip generation is split between the transport of materials to and from REP in addition to the expected travel patterns of staff at REP. This are discussed in turn below.

Operational Materials

4.5.2 Based on the above assumptions and the information that has been provided by Cory, the following peak hour vehicle flows have been determined. Further detail on how these values have been derived can be found at **Appendix C**.

Table 4.2: Expected 'Normal Conditions' REP Traffic Generation

Route	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)			Daily (00:00-00:00)		
	Arr	Dep	Tot	Arr	Dep	Tot	Arr	Dep	Tot
M25 North	1	1	2	1	1	2	24	24	48
Yarnton Way	1	1	2	1	1	2	20	20	39
Carlyle Road	0	0	1	0	0	1	4	4	8
Harrow Manorway	0	0	1	0	0	1	4	4	8
Picardy Manorway	1	1	2	1	1	2	20	20	39
South Circular	1	1	1	1	1	1	16	16	32
Blackwall Tunnel	0	0	0	0	0	0	0	0	0
M25 South	1	1	2	1	1	2	19	19	37
Total	**5**	**5**	**10**	**5**	**5**	**10**	**105**	**105**	**211**

Table 4.3: Expected 'Worst-Case' REP Traffic Generation

Route	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)			Daily (00:00-00:00)		
	Arr	Dep	Tot	Arr	Dep	Tot	Arr	Dep	Tot
M25 North	5	5	10	5	5	10	118	118	237
Yarnton Way	0	0	1	0	0	1	4	4	8
Carlyle Road	0	0	1	0	0	1	4	4	8
Harrow Manorway	0	0	1	0	0	1	4	4	8
Picardy Manorway	0	0	1	0	0	1	4	4	8
South Circular	4	4	9	4	4	9	103	103	205
Blackwall Tunnel	4	4	9	4	4	9	103	103	205
M25 South	0	0	0	0	0	0	3	3	6
Total	**15**	**15**	**30**	**15**	**15**	**30**	**342**	**342**	**684**

4.5.3 Plans presenting the expected peak hour vehicle traffic flows on the local highway network can be found at **Appendix C**.

Operational Staff

4.5.4 There are expected to be 83 staff based at REP who will be assumed reflect the 2011 Census method of travel to work for workplaces in the Bexley 003 middle layer super output area (MSOA), presented in Table 4.4. As discussed below, REP staff will operate in shifts which are to be confirmed. The shift timings would affect mode choice (e.g. if public transport was not available) which will be incorporated into the TA.

4.5.5 The number of staff and mode share does not change between the two assessment scenarios.

Table 4.4: Bexley 003 MSOA Method of Travel to Work (2011 Census)

Mode	Mode Share
Underground	1%
Train	5%
Bus	12%
Taxi	0%
Motorcycle	2%
Driving a Car or Van	63%
Passenger in a Car or Van	5%
Bicycle	2%
On Foot	9%
Other	0%
Total	**100%**

4.5.6 It is assumed that a significant majority of staff would live locally to REP. As with determining multi-modal trip generation discussed above, 2011 Census data has been used to determine car driver distribution for MSOAs generating 10 or more trips to a workplace in Bexley 003 MSOA. The resultant distribution onto the local highway network is indicated in Table 4.5, which will be applied to the car driver trip generation.

Table 4.5: Staff Vehicle Trip Distribution

Link	Distribution (%)
Yarnton Way	10%
Picardy Manorway	37%
Bronze Age Way	47%
Eastern Way	6%

4.5.7 The operational staff person trip generation will incorporate the shift working nature of the Proposed Development. It is assumed that the shift changeover will occur during the AM and PM peak periods as a worst-case assessment. This will be confirmed within the TA.

Table 4.6: Operational Staff Person Trip Generation (based on two-shift pattern)

AM Peak (08:00-09:00)			PM Peak (17:00-18:00)			Daily (00:00-00:00)		
Arr	Dep	Tot	Arr	Dep	Tot	Arr	Dep	Tot
41	41	83	41	41	83	83	83	165

4.5.8 Combining Table 4.4 and Table 4.6 results in a full multi-modal trip generation for REP staff, as presented in Table 4.7.

Table 4.7: Operational Staff Trip Generation by Mode

Mode	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)			Daily (00:00-00:00)		
	Arr	Dep	Tot	Arr	Dep	Tot	Arr	Dep	Tot
Underground	1	1	1	1	1	1	1	1	2
Train	2	2	4	2	2	4	4	4	8
Bus, minibus or coach	5	5	10	5	5	10	10	10	21
Taxi	0	0	0	0	0	0	0	0	0
Motorcycle	1	1	1	1	1	1	1	1	3
Driving a car or van	26	26	52	26	26	52	52	52	104
Passenger in a car or van	2	2	5	2	2	5	5	5	9
Bicycle	1	1	1	1	1	1	1	1	3
On foot	4	4	7	4	4	7	7	7	15
Other	0	0	0	0	0	0	0	0	0
Total	**41**	**41**	**83**	**41**	**41**	**83**	**83**	**83**	**165**

4.5.9 Plans can be found at **Appendix C** which present the expected staff car traffic generation on the local highway network during both peak hours.

Delivery and Servicing Trips

4.5.10 It is expected that a small number of delivery and servicing trips would occur, including postal deliveries and intermittent maintenance associated with the various elements of REP. The former will already be incorporated into the assessment as part of traffic surveys of RRRF and the latter will be so infrequent as to have an immaterial effect on the assessment, and so will not be incorporated.

Operational Trip Generation and Distribution Summary

4.5.11 The level of impact associated with REP during its operational phase is not considered to generate any significant impacts on the capacity or safety of the local highway network. However, local junction capacity modelling will be undertaken as set out in Chapter 5.

5 Highway Impact Assessment

5.1 Introduction

5.1.1 This chapter sets out the proposed data collection and assessment approach to determine the highway impact of the Proposed Development; the vehicle trip generation of which is presented in Chapter 4.

5.2 Construction Phase Assessment

5.2.1 It is proposed that no highway modelling will be undertaken for the construction phase given that these impacts will be temporary and car parking for construction workers will be kept to a practical minimum. Car sharing amongst construction workers will be encouraged and illegal parking by construction workers will be controlled.

5.2.2 It is accepted that there may be some impacts associated with the construction of the Electrical Connection Route. However, it is important to understand that the trench required for the cable would be approximately 900 mm deep and 450 mm wide, requiring a 3.0 m wide working corridor. This is similar to the work carried out by telecommunications companies for the installation of internet and telephone cabling.

5.2.3 UK Power Networks (UKPN), who would carry out the works, are undertaking a study to determine the Route in greater detail. It will be a priority to minimise routing under the carriageway, with a preference for it being beneath footways and verges.

5.2.4 Although not typically determined at this stage of the planning process, given the concerns of DBC and KCC regarding traffic impacts associated with the Electrical Connection's installation, a detailed understanding of the necessary works will be generated and presented within the TA.

5.3 Operational Phase Assessment

Local Junction Modelling

5.3.1 Given the expected trip generation for the Proposed Development, it is expected that local modelling provides a reasonable assessment methodology for REP's impacts on the local highway network.

5.3.2 Local junction models will be created to assess the impact of the Proposed Development at the following junctions, all of which will be subject to MCC surveys:

i. A2016 Picardy Manorway/ Clydesdale Way/ Yarnton Way/ A2016 Eastern Way

ii. A2016 Picardy Manorway/ Norman Road

iii. A2016 Picardy Manorway/ Anderson Way/ A2016 Bronze Age Way/ B253 Picardy Manorway

5.3.3 Traffic signal data will be acquired from TfL for the Picardy Manorway/ Norman Road junction and the traffic models will be supported by observed video footage of driver behaviour.

Percentage Impact Assessment

5.3.4 It is proposed that percentage impact assessments are undertaken, rather than any modelling, of REP's effects on flows along the A206 corridor towards the M25. This would incorporate a qualitative assessment of likely effects on traffic re-routing along the A2026 and other alternative routes should there be incidents causing delay on the A206 and at Junction 1a of the M25.

Assessment Scenarios

5.3.5 For each of the 'normal' and 'worst-case' modal split scenarios, both a 'without' (Do Minimum) and 'with' (Do Something) scenario will be assessed to determine the impacts of the Proposed Development on the local highway network.

5.3.6 It is expected that REP will be operational by 2024 and so this will form the first assessment year. A second assessment year encompassing 10 years after submission of the REP DCO.

5.3.7 For the assessment within LBB, committed development and general background traffic growth will be accounted for through the application of growth factors discussed below.

5.3.8 TEMPro adjusted local growth factors (v7.2, NTM AF15 Dataset) have been determined for the two assessment periods for the Bexley 003 MSOA. The growth factors are shown in Table 5.1 and will be applied where relevant to the assessments.

Table 5.1: Bexley 003 MSOA TEMPro Growth Factors (urban area, principal road type)

Time Period	AM peak	PM peak	Average Weekday	Average Day
2018-2024	1.0558	1.0547	1.0593	1.0584
2018-2028	1.0716	1.0720	1.0802	1.0793

5.3.9 TEMPro growth factors for other areas to inform percentage impact assessments of links beyond Bexley 003 MSOA would be derived where necessary.

5.3.10 KCC indicated in the response to the EIA Scoping Report that TEMPro is considered to underestimate expected development in DBC. Therefore, for the percentage impact assessments being undertaken within DBC, KCC should advise on an appropriate means to determine future baseline traffic.

5.3.11 Howbury Strategic Rail Freight Interchange (SRFI) is going to Public Inquiry in June 2018, with the Planning Inspector's verdict expected approximately several months after. Until that verdict is made, REP's assessment would incorporate the expected traffic flows of Howbury SRFI.

6 Supporting Technical Work Streams

6.1 Introduction

6.1.1 There will be a number of other reports produced as part of the REP DCO process that will either be appended to the TA or submitted as standalone documents. These are discussed below.

6.1.2 A Delivery and Servicing Plan will not be produced to support the TA.

6.2 Temporary Closures/ Diversions of Footpaths, Bridleways or Restricted Byways

6.2.1 During the construction phase, whilst avoiding temporary closures of PRoWs will be preferred, it is expected that there would be some requirement to do so in certain circumstances. Should closures be required, appropriate diversions would be agreed with the relevant local authority and implemented.

6.2.2 Given the stage of the planning process, it is not expected that there would be sufficient detail to set out necessary closures and diversions for the REP DCO and so these would form requirements attached to the DCO for agreement prior to commencement of construction. Where it is known what closures/diversions would be necessary, these will be set out in the TA.

6.3 Draft Construction Traffic Management Plans

6.3.1 Given the stage of the planning process, it is not expected that there would be sufficient detail to set out traffic management plans requiring implementation for the REP DCO. Therefore, it is anticipated that these would form requirements attached to the DCO for agreement prior to commencement of construction.

6.4 Outline Construction Logistics Plans

6.4.1 An Outline CLP will set down the measures that will be considered in order to ensure that the construction of REP is undertaken in an efficient and sustainable manner. Furthermore, it will ensure that there is a negligible impact on the neighbouring residents and businesses from construction traffic.

6.4.2 A single CLP will be produced in accordance with TfL's 'Construction Logistics Plan Guidance' document (July 2017). This will provide principles and the general approach for all phases. Upon appointment of a contractor, the CLP will be 'detailed', which would be subject to requirements attached to the DCO.

6.5 Staff Travel Plan

6.5.1 There is an existing Travel Plan for RRRF which is proposed to encompass REP. Therefore, the existing Travel Plan will be updated and submitted as part of the REP DCO.

6.5.2 This will set out objectives, targets and measures to minimise the number of single occupancy vehicle trips to REP and RRRF by staff and visitors. It would not relate to the operational vehicle movements associated with the waste and by-products.

7 Next Steps

7.1 Programme

7.1.1 An EIA Scoping Report was submitted to PINS in November 2017 and a response was received in early January 2018.

7.1.2 A Preliminary Environmental Information Report is anticipated to be submitted to PINS in Quarter 2 2018 for which a relatively detailed assessment of impacts will be necessary, which would need to be supported by traffic data and full trip generation/distribution.

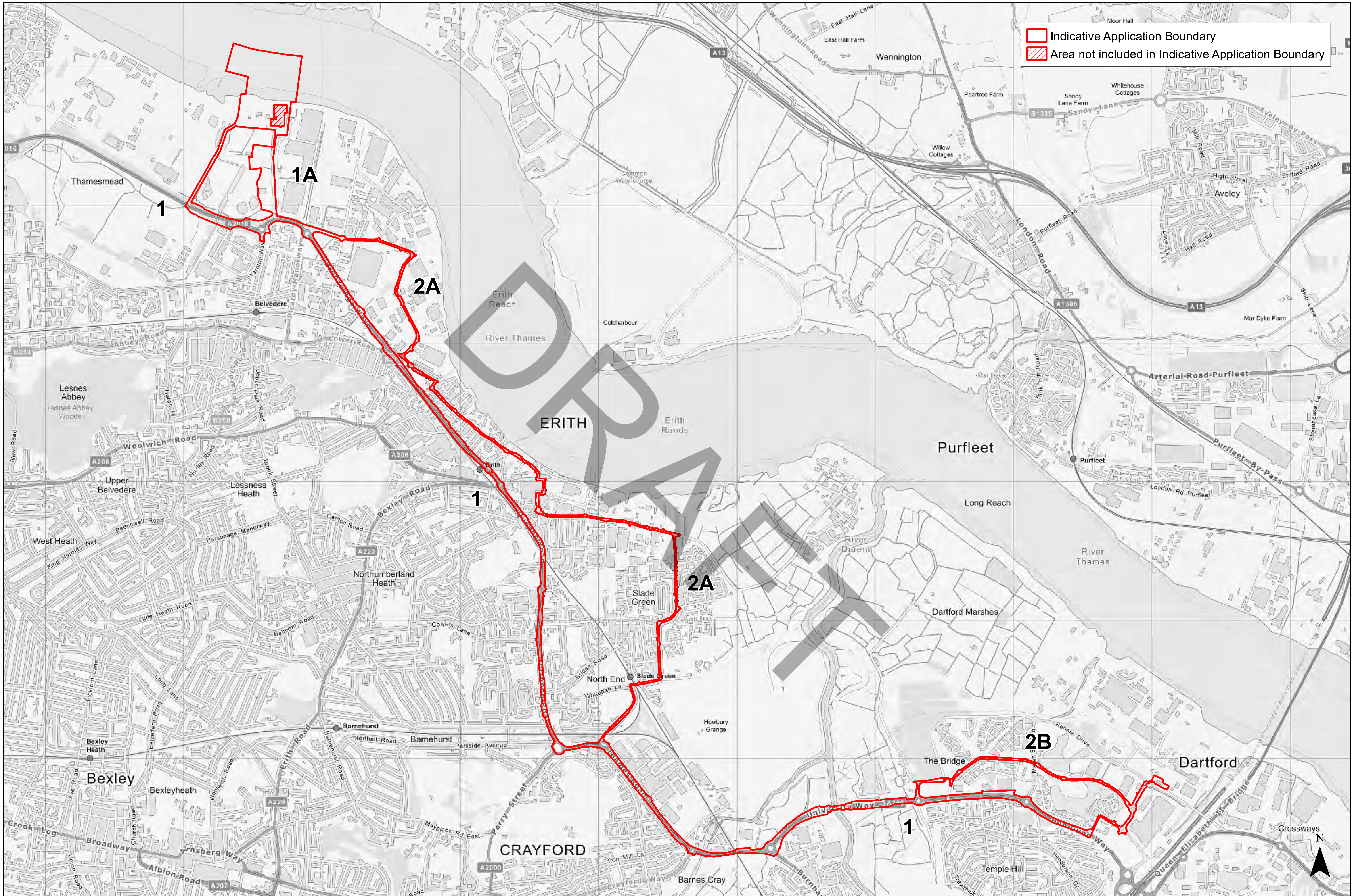
7.1.3 The current intended programme of works for the project allows for the REP DCO to be submitted in Quarter 4 2018 with an ES to which the TA will be appended.

7.2 Confirmation

7.2.1 PBA would appreciate agreement on the following key aspects of the TA methodology with LBB, TfL, DBC, KCC and RBG at their earliest opportunity. The following key aspects are summarised as follows:

- Scope of traffic surveys – data to be collected March/April 2018 outside of the school holidays
- Extent of PIC study area
- Trip generation based on first-principles approach
- Future assessment year of 2024 and 2028 with committed development and background traffic growth accounted for through application of TEMPRo growth factors
- Weekday AM and PM peak time periods to be assessed (hours to be confirmed following traffic surveys)
- Local junction modelling carried out for operational phase only at:
  - A2016 Picardy Manorway/ Clydesdale Way/ Yarnton Way/ A2016 Eastern Way
  - A2016 Picardy Manorway/ Norman Road
  - A2016 Picardy Manorway/ Anderson Way/ A2016 Bronze Age Way/ B253 Picardy Manorway

Appendix A Indicative Application Boundary



RIVERSIDE ENERGY PARK

0 0.5 1 Kilometers

Based on Babcock/EDF plan - RRRL Cable Route Landowners - 2-01-2010 - Drawing NO. Cable Route Plan

pba peterbrett

Client

CORY RIVERSIDE ENERGY

1:24,422 @ A3	Indicative Application Boundary
05/03/18	
Drawn: CM	DRAFT
Checked: JM	Figure 1 Rev D

Document Path: Z:\Projects\42166\02_mxd\42166_01_IndicativeRedlineBoundaryE.mxd

Appendix B WebCAT PTAL Report

TRANSPORT FOR LONDON

PTAL output for Base Year

0

Norman Rd, Belvedere DA17 6JY, UK
Easting: 549502, Northing: 180472

Grid Cell: 80509

Report generated: 04/12/2017

Map key - PTAL

0 (Worst), 1a, 1b, 2, 3, 4, 5, 6a, 6b (Best)

Map layers

PTAL (cell size: 100m)

Calculation Parameters

Day of Week	M-F
Time Period	AM Peak
Walk Speed	4.8 kph
Bus Node Max. Walk Access Time (mins)	8
Bus Reliability Factor	2.0
LU Station Max. Walk Access Time (mins)	12
LU Reliability Factor	0.75
National Rail Station Max. Walk Access Time (mins)	12
National Rail Reliability Factor	0.75

Calculation data

Appendix C Expected Traffic Generation

REP Trip Generation - Normal

DAILY TRAFFIC FLOWS WILL DIFFER TO PEAK HOUR DUE TO LONDON LORRY CONTROL ROUTING - TO BE UPDATED FOR TRANSPORT ASSESSME

REP ERF

Material		Origin/ Destination	Routing	Mode	AM peak (08:00-09:00)		PM peak (17:00-18:00)		Daily (00:00-00:00)	
					Arr	Dep	Arr	Dep	Arr	Dep
Inputs	Commercial and industrial/municipal waste	Central London WTS	M25 North	Road	0.7	0.7	0.7	0.7	15.8	15.8
			M25 South	Road	0.7	0.7	0.7	0.7	15.8	15.8
			South Circular	Road	0.7	0.7	0.7	0.7	15.8	15.8
			Yarnton Way	Road	0.7	0.7	0.7	0.7	15.8	15.8
			Picardy Manorway	Road	0.7	0.7	0.7	0.7	15.8	15.8
			River west	River	0.2	0.2	0.2	0.2	5.1	5.1
	PAC	Ashton in Makerfield, Lincs.	M25 North	Road	0.0	0.0	0.0	0.0	0.0	0.0
	Lime	Barnetby, North Lincs.	M25 North	Road	0.0	0.0	0.0	0.0	1.2	1.2
	Ammonia	Billingham, County Durham	M25 North	Road	0.0	0.0	0.0	0.0	0.1	0.1
	Fuel Oil	Edenbridge, Kent	M25 South	Road	TBC	TBC	TBC	TBC	TBC	TBC
By-Products	IBA	Tilbury, Thurrock	River east	River	0.1	0.1	0.1	0.1	1.5	1.5
	APCR	Brandon, Suffolk	M25 North	Road	0.2	0.2	0.2	0.2	4.0	4.0

Notes

Assumed 24 hour operation
Divided by 5 based on number of origins

Summary

	AM peak (08:00-09:00)		PM peak (17:00-18:00)		Daily (00:00-00:00)	
	Arr	Dep	Arr	Dep	Arr	Dep
River	0.3	0.3	0.3	0.3	6.6	6.6
Road	3.5	3.5	3.5	3.5	84.2	84.2
Total	3.8	3.8	3.8	3.8	90.7	90.7

Vehicle routing summary

	AM peak (08:00-09:00)		PM peak (17:00-18:00)		Daily (00:00-00:00)	
	Arr	Dep	Arr	Dep	Arr	Dep
M25 North	0.9	0.9	0.9	0.9	21.1	21.1
M25 South	0.7	0.7	0.7	0.7	15.8	15.8
South Circular	0.7	0.7	0.7	0.7	15.8	15.8
Yarnton Way	0.7	0.7	0.7	0.7	15.8	15.8
Picardy Manorway	0.7	0.7	0.7	0.7	15.8	15.8

REP AD Facility

Material		Origin/ Destination	Routing	Mode	AM peak (08:00-09:00)		PM peak (17:00-18:00)		Daily (00:00-00:00)	
					Arr	Dep	Arr	Dep	Arr	Dep
Inputs	Food and green waste	LBB	Yarnton Way	Road	0.3	0.3	0.3	0.3	3.8	3.8
			Carlyle Road	Road	0.3	0.3	0.3	0.3	3.8	3.8
			Harrow Manorway	Road	0.3	0.3	0.3	0.3	3.8	3.8
			Picardy Manorway	Road	0.3	0.3	0.3	0.3	3.8	3.8
		Other boroughs	South Circular	Road	0.0	0.0	0.0	0.0	0.1	0.1
			Blackwall Tunnel	Road	0.0	0.0	0.0	0.0	0.1	0.1
			M25 North	Road	0.0	0.0	0.0	0.0	0.1	0.1
			M25 South	Road	0.0	0.0	0.0	0.0	0.1	0.1
By-Products	Compost	Essex, Kent, Norfolk	M25 North	Road	0.1	0.1	0.1	0.1	2.7	2.7
	Liquid digestate		M25 South	Road	0.1	0.1	0.1	0.1	2.7	2.7

Notes

Assumed LBB RCVs operate only 5 days per week (=260 days per year) and 12 hours per day
Divided by 4 based on number of origins
LBB RCVs have capacity for 7t of material

'Other borough' AD trips are 20t articulated vehicles and are carried out 24/7

Assumed compost vehicles route M25 North and liquid digestate M25 South, reality is that may be split.

Summary

	AM peak (08:00-09:00)		PM peak (17:00-18:00)		Daily (00:00-00:00)	
	Arr	Dep	Arr	Dep	Arr	Dep
River	0.0	0.0	0.0	0.0	0.0	0.0
Road	1.5	1.5	1.5	1.5	21.2	21.2
Total	1.5	1.5	1.5	1.5	21.2	21.2

Vehicle routing summary

	AM peak (08:00-09:00)		PM peak (17:00-18:00)		Daily (00:00-00:00)	
	Arr	Dep	Arr	Dep	Arr	Dep
M25 North	0.1	0.1	0.1	0.1	2.8	2.8
Yarnton Way	0.3	0.3	0.3	0.3	3.8	3.8
Carlyle Road	0.3	0.3	0.3	0.3	3.8	3.8
Harrow Manorway	0.3	0.3	0.3	0.3	3.8	3.8
Picardy Manorway	0.3	0.3	0.3	0.3	3.8	3.8
South Circular	0.0	0.0	0.0	0.0	0.1	0.1
Blackwall Tunnel	0.0	0.0	0.0	0.0	0.1	0.1
M25 South	0.1	0.1	0.1	0.1	2.8	2.8

REP Summary

	AM peak (08:00-09:00)		PM peak (17:00-18:00)		Daily (00:00-00:00)	
	Arr	Dep	Arr	Dep	Arr	Dep
River	0.3	0.3	0.3	0.3	6.6	6.6
Road	5.0	5.0	5.0	5.0	105.3	105.3
Total	5.3	5.3	5.3	5.3	111.9	111.9

Vehicle routing summary

	Route	AM peak (08:00-09:00)			PM peak (17:00-18:00)			Daily (00:00-00:00)		
		Arr	Dep	Tot	Arr	Dep	Tot	Arr	Dep	Tot
Bronze Age Way	M25 North	1.0	1.0	2.0	1.0	1.0	2.0	23.8	23.8	47.7
Yarnton Way	Yarnton Way	1.0	1.0	2.0	1.0	1.0	2.0	19.6	19.6	39.2
Eastern Way	Carlyle Road	0.3	0.3	0.6	0.3	0.3	0.6	3.8	3.8	7.7
Eastern Way	Harrow Manorway	0.3	0.3	0.6	0.3	0.3	0.6	3.8	3.8	7.7
Picardy Manorway	Picardy Manorway	1.0	1.0	2.0	1.0	1.0	2.0	19.6	19.6	39.2
Eastern Way	South Circular	0.7	0.7	1.3	0.7	0.7	1.3	15.9	15.9	31.8
Eastern Way	Blackwall Tunnel	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2
Bronze Age Way	M25 South	0.8	0.8	1.5	0.8	0.8	1.5	18.5	18.5	37.1
	Total	5.0	5.0	10.1	5.0	5.0	10.1	105.3	105.3	210.7

REP Trip Generation - Worst-Case

DAILY TRAFFIC FLOWS WILL DIFFER TO PEAK HOUR DUE TO LONDON LORRY CONTROL ROUTING - TO BE UPDATED FOR TRANSPORT ASSESSMENT

REP ERF

Material		Origin/ Destination	Routing	Mode	AM peak (08:00-09:00)		PM peak (17:00-18:00)		Daily (00:00-00:00)		Notes
					Arr	Dep	Arr	Dep	Arr	Dep	
Inputs	Commercial and industrial/municipal waste	Central London WTS	South Circular	Road	4.3	4.3	4.3	4.3	102.5	102.5	Assumes half of the 65% routes from Wandsworth
			Blackwall Tunnel	Road	4.3	4.3	4.3	4.3	102.5	102.5	Assumes half of the 65% routes from central
		Tilbury, Thurrock	M25 North	Road	4.6	4.6	4.6	4.6	110.4	110.4	
	PAC	Ashton in Makerfield, Lincs.	M25 North	Road	0.0	0.0	0.0	0.0	0.0	0.0	
	Lime	Barnetby, North Lincs.	M25 North	Road	0.0	0.0	0.0	0.0	1.2	1.2	
	Ammonia	Billingham, County Durham	M25 North	Road	0.0	0.0	0.0	0.0	0.1	0.1	
	Fuel Oil	Edenbridge, Kent	M25 South	Road	TBC	TBC	TBC	TBC	TBC	TBC	
By-Products	IBA	Tilbury, Thurrock	River east	River	0.1	0.1	0.1	0.1	1.5	1.5	Stored on-site in cases of jetty outage, then transported by river when possible
	APCR	Brandon, Suffolk	M25 North	Road	0.2	0.2	0.2	0.2	4.0	4.0	

Summary

	AM peak (08:00-09:00)		PM peak (17:00-18:00)		Daily (00:00-00:00)	
	Arr	Dep	Arr	Dep	Arr	Dep
River	0.1	0.1	0.1	0.1	1.5	1.5
Road	13.4	13.4	13.4	13.4	320.7	320.7
Total	13.4	13.4	13.4	13.4	322.2	322.2

Vehicle routing summary

	AM peak (08:00-09:00)		PM peak (17:00-18:00)		Daily (00:00-00:00)	
	Arr	Dep	Arr	Dep	Arr	Dep
M25 North	4.8	4.8	4.8	4.8	115.7	115.7
South Circular	4.3	4.3	4.3	4.3	102.5	102.5
Blackwall Tunnel	4.3	4.3	4.3	4.3	102.5	102.5
M25 South	0.0	0.0	0.0	0.0	0.0	0.0

REP AD Facility

Material		Origin/ Destination	Routing	Mode	AM peak (08:00-09:00)		PM peak (17:00-18:00)		Daily (00:00-00:00)		Notes
					Arr	Dep	Arr	Dep	Arr	Dep	
Inputs	Food and green waste	LBB	Yarnton Way	Road	0.3	0.3	0.3	0.3	3.8	3.8	Assumed LBB RCVs operate only 5 days per week (=260 days per year) and 12 hours per day
			Carlyle Road	Road	0.3	0.3	0.3	0.3	3.8	3.8	Divided by 4 based on number of origins
			Harrow Manorway	Road	0.3	0.3	0.3	0.3	3.8	3.8	LBB RCVs have capacity for 7t of material
			Picardy Manorway	Road	0.3	0.3	0.3	0.3	3.8	3.8	
		Other boroughs	South Circular	Road	0.0	0.0	0.0	0.0	0.1	0.1	'Other borough' AD trips are 20t articulated vehicles and are carried out 24/7
			Blackwall Tunnel	Road	0.0	0.0	0.0	0.0	0.1	0.1	
			M25 North	Road	0.0	0.0	0.0	0.0	0.1	0.1	
			M25 South	Road	0.0	0.0	0.0	0.0	0.1	0.1	
By-Products	Compost	Essex, Kent, Norfolk	M25 North	Road	0.1	0.1	0.1	0.1	2.7	2.7	Assumed compost vehicles route M25 North and liquid digestate M25 South, reality is that may be split.
	Liquid digestate		M25 South	Road	0.1	0.1	0.1	0.1	2.7	2.7	

Summary

	AM peak (08:00-09:00)		PM peak (17:00-18:00)		Daily (00:00-00:00)	
	Arr	Dep	Arr	Dep	Arr	Dep
River	0.0	0.0	0.0	0.0	0.0	0.0
Road	1.5	1.5	1.5	1.5	21.2	21.2
Total	1.5	1.5	1.5	1.5	21.2	21.2

Vehicle routing summary

	AM peak (08:00-09:00)		PM peak (17:00-18:00)		Daily (00:00-00:00)	
	Arr	Dep	Arr	Dep	Arr	Dep
M25 North	0.1	0.1	0.1	0.1	2.8	2.8
Yarnton Way	0.3	0.3	0.3	0.3	3.8	3.8
Carlyle Road	0.3	0.3	0.3	0.3	3.8	3.8
Harrow Manorway	0.3	0.3	0.3	0.3	3.8	3.8
Picardy Manorway	0.3	0.3	0.3	0.3	3.8	3.8
South Circular	0.0	0.0	0.0	0.0	0.1	0.1
Blackwall Tunnel	0.0	0.0	0.0	0.0	0.1	0.1
M25 South	0.1	0.1	0.1	0.1	2.8	2.8

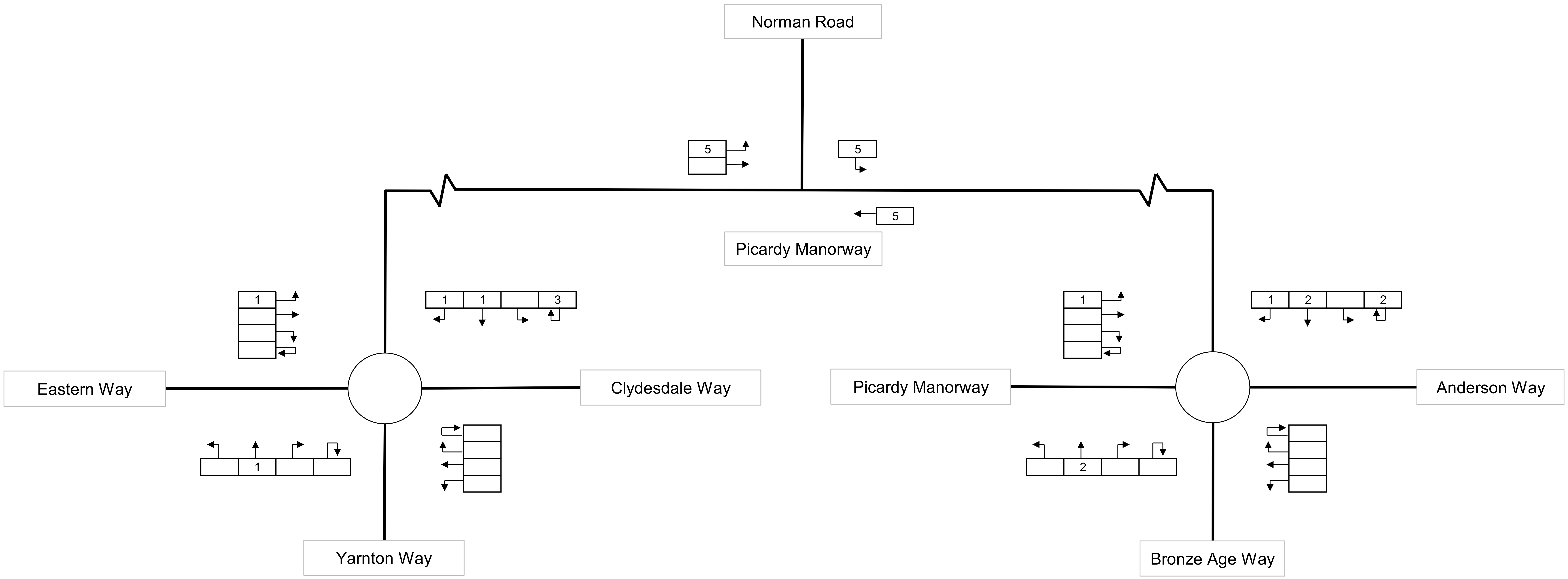
REP Summary

	AM peak (08:00-09:00)		PM peak (17:00-18:00)		Daily (00:00-00:00)	
	Arr	Dep	Arr	Dep	Arr	Dep
River	0.1	0.1	0.1	0.1	1.5	1.5
Road	14.9	14.9	14.9	14.9	341.9	341.9
Total	14.9	14.9	14.9	14.9	343.4	343.4

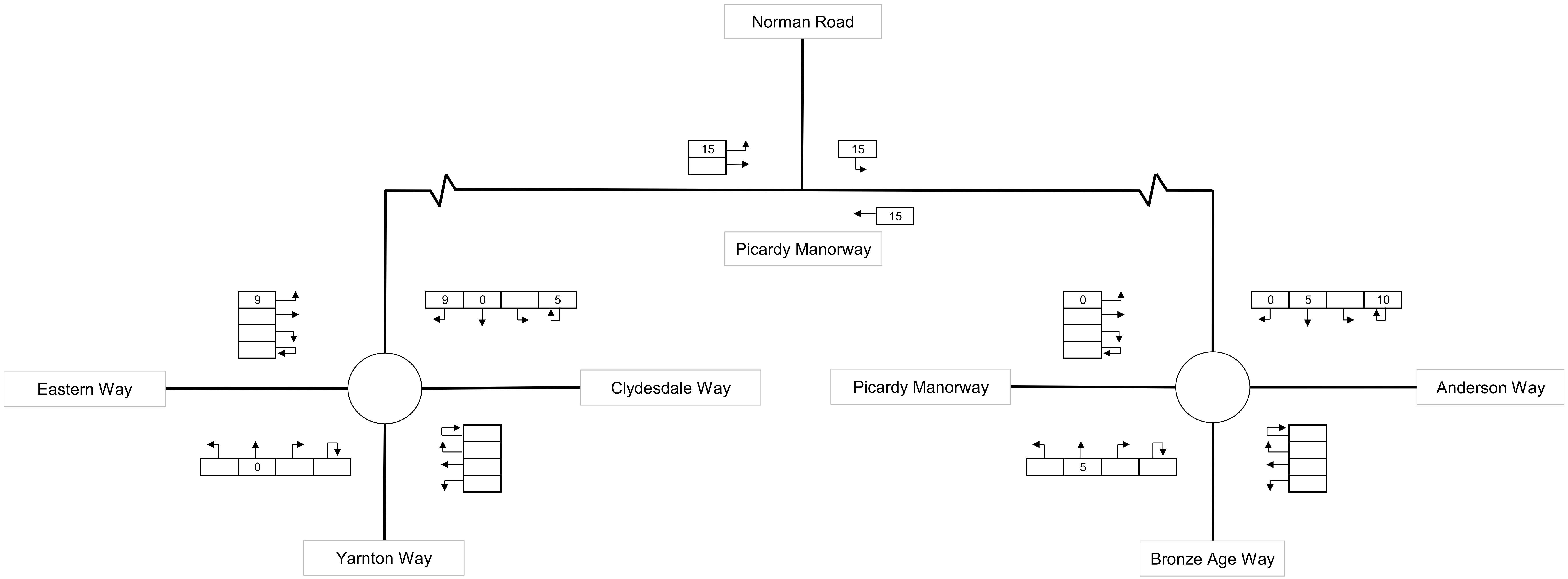
Vehicle routing summary

	Route	AM peak (08:00-09:00)			PM peak (17:00-18:00)			Daily (00:00-00:00)		
		Arr	Dep	Tot	Arr	Dep	Tot	Arr	Dep	Tot
Bronze Age Way	M25 North	4.9	4.9	9.9	4.9	4.9	9.9	118.5	118.5	236.9
Yarnton Way	Yarnton Way	0.3	0.3	0.6	0.3	0.3	0.6	3.8	3.8	7.7
Eastern Way	Carlyle Road	0.3	0.3	0.6	0.3	0.3	0.6	3.8	3.8	7.7
Eastern Way	Harrow Manorway	0.3	0.3	0.6	0.3	0.3	0.6	3.8	3.8	7.7
Picardy Manorway	Picardy Manorway	0.3	0.3	0.6	0.3	0.3	0.6	3.8	3.8	7.7
Eastern Way	South Circular	4.3	4.3	8.6	4.3	4.3	8.6	102.6	102.6	205.3
Eastern Way	Blackwall Tunnel	4.3	4.3	8.6	4.3	4.3	8.6	102.6	102.6	205.3
Bronze Age Way	M25 South	0.1	0.1	0.2	0.1	0.1	0.2	2.8	2.8	5.5
	Total	14.9	14.9	29.8	14.9	14.9	29.8	341.9	341.9	683.8

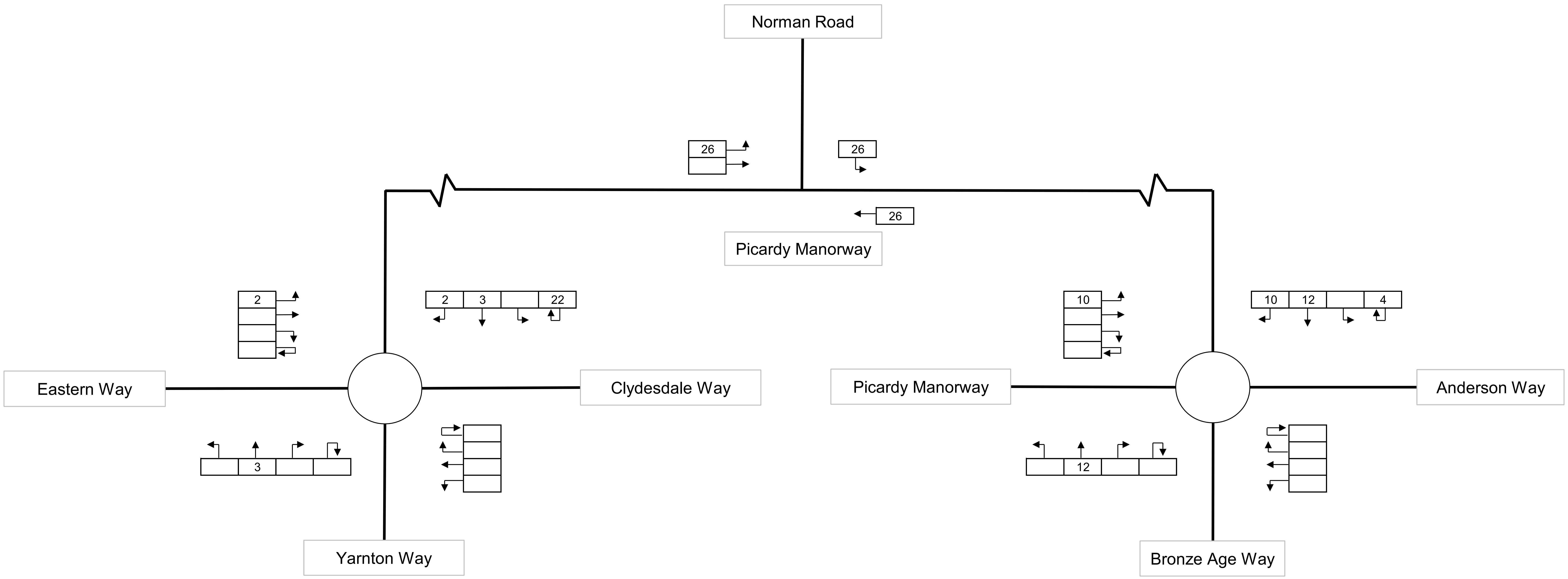
Normal Scenario Peak Hour Vehicle Trip Generation (excluding staff)



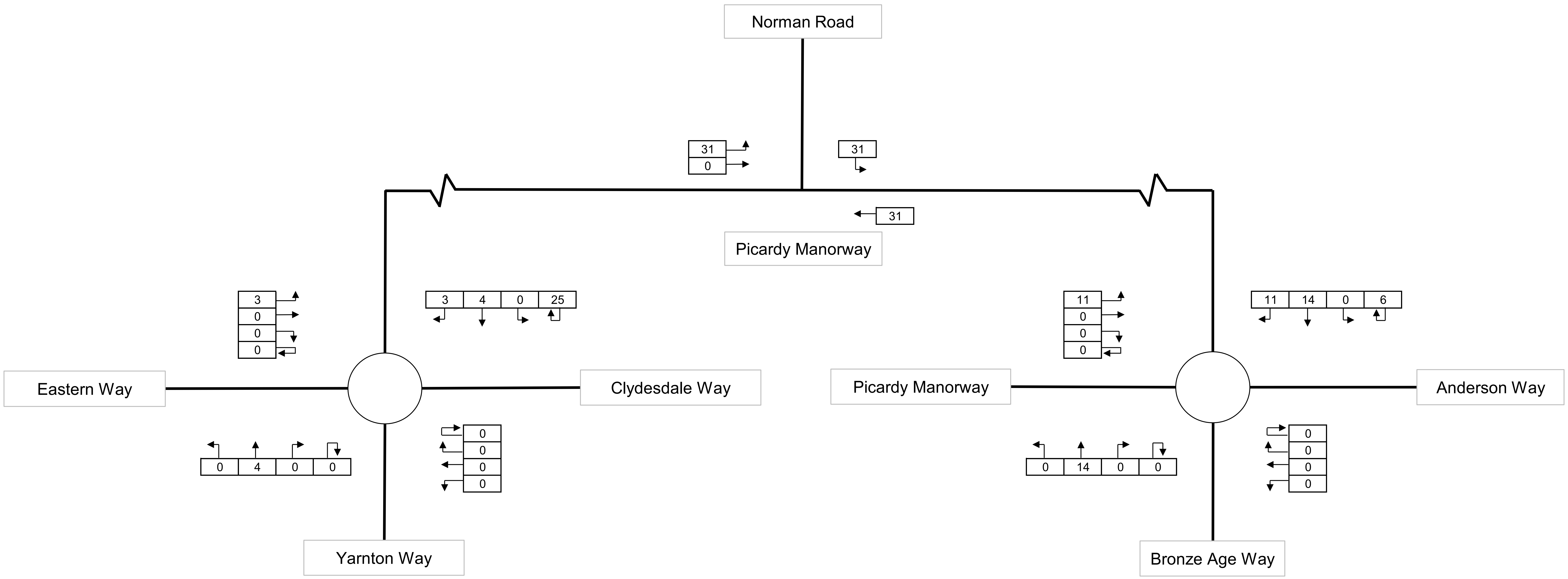
Worst-Case Scenario Peak Hour Vehicle Trip Generation (excluding staff)



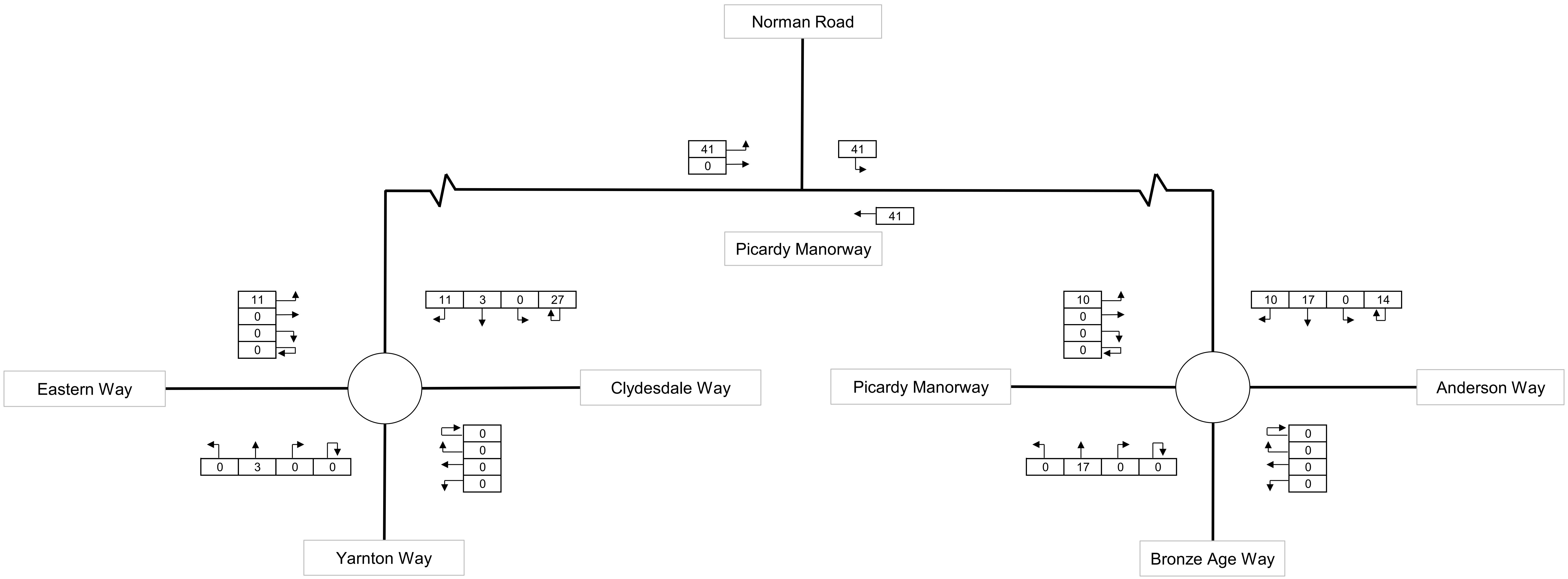
Staff Peak Hour Vehicle Trip Generation



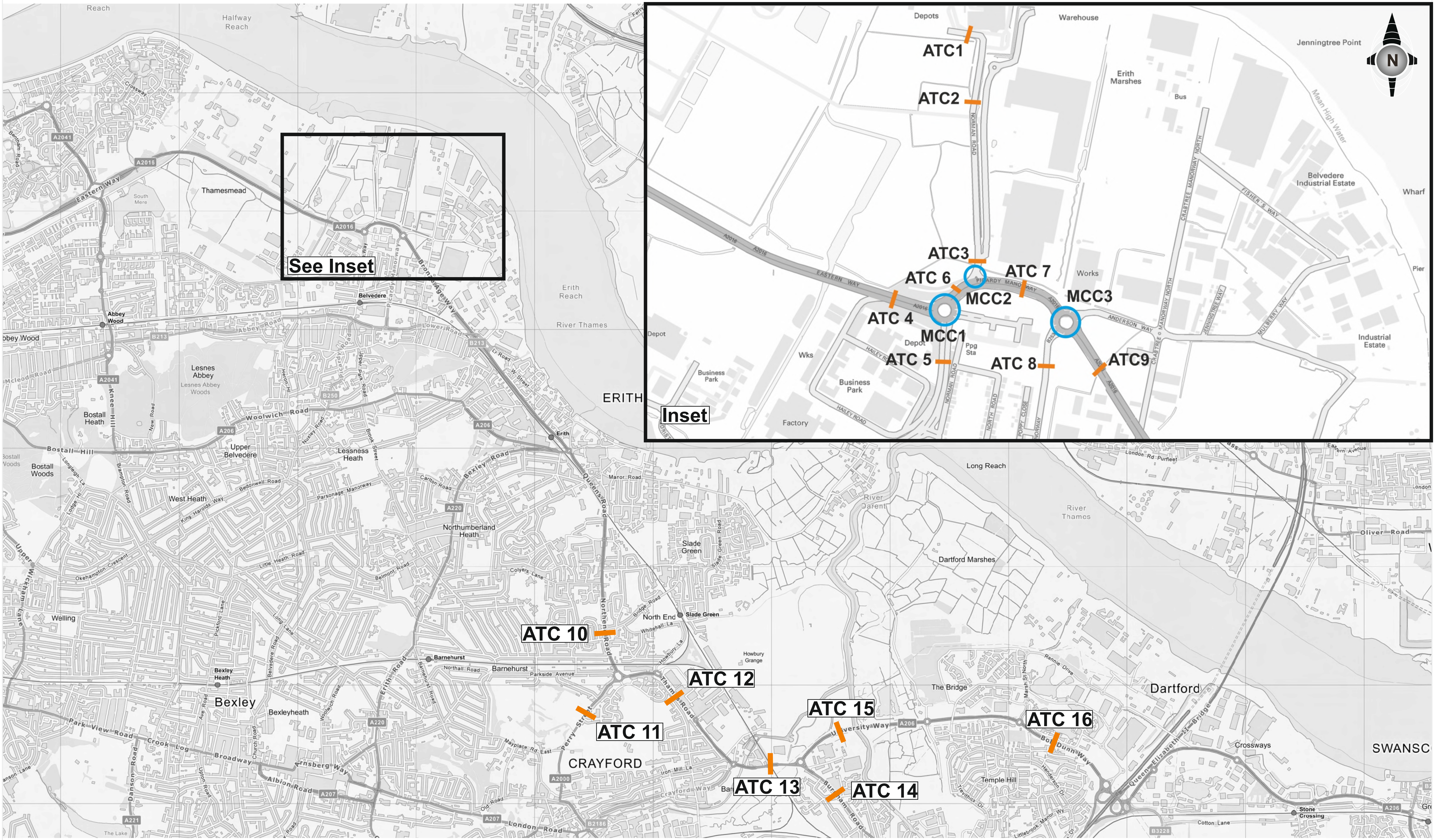
Normal Scenario Peak Hour Vehicle Trip Generation (including staff)



Worst-Case Scenario Peak Hour Vehicle Trip Generation (including staff)



Appendix D Proposed Traffic Survey Scope



Client

CORY RIVERSIDE ENERGY

pba peterbrett

Offices throughout the UK and Europe
www.peterbrett.com

Riverside Energy Park - Proposed Traffic Survey Locations

Date	23/02/2018
Scale	NTS
Drawn by	JS
Checked by	CL
Revision	-

-

File Location:\\pba.int\cbh\Projects\42166 Riverside 2\Transport\5. Drawings & Models\Maps

Transport for London

TfL ref: 18/1487

Transport for London
City Planning

5 Endeavour Square
Westfield Avenue
Stratford
London E20 1JN

Phone 020 7222 5600
www.tfl.gov.uk

-by email only-

Manu Dwivedi
Peter Brett Associates LLP

18 May 2018

Dear Manu,

Riverside Energy Park, Belvedere, LB Bexley – TfL's pre-application advice letter

Please note that these comments represent the views of Transport for London (TfL) officers and are made entirely on a "without prejudice" basis. They should not be taken to represent an indication of any subsequent Mayoral decision in relation to a planning application based on the proposed scheme. These comments also do not necessarily represent the views of the Greater London Authority (GLA).

The draft London Plan was published on 29 November 2017 and sets out an integrated economic, environmental, transport and social framework for the development of London over the next 20-25 years. We will be expecting all new planning applications to give material consideration to the policies set out within this document, noting that the decision-maker is to determine the balance of weight to be given to adopted and draft policies.

Firstly, I would take this opportunity to thank you for taking advantage of the TfL pre-application service, the aim of which is to ensure that development is successful in transport terms and in accordance with relevant London Plan policies. This letter follows the pre-application meeting held on the 1st May 2018 to discuss the development proposals. Prior to the meeting, the applicant provided TfL with a Transport Assessment Scoping.

Table 1 set outs the attendees at the meeting on 1st May 2018. Prior to the meeting, the case material was circulated to TfL colleagues to inform the meeting. A site visit was undertaken by Victoria Rees on Friday 13th April 2018.

Table 1: Meeting Attendees

Attendee	Organisation
Victoria Rees	TfL Spatial Planning (Case Officer)
Fraser Wylie	TfL Spatial Planning
Michal Miklasz	TfL Network Performance
Richard Wilkinson	Cory (Applicant)

Manu Dwivedi	Peter Brett Associates (Transport Consultants)
Matt Bolshaw	Peter Brett Associates (Transport Consultants)
Peter Boulden	London Borough of Bexley
Apologies with Comments Provided	
John Courtney	TfL Road Space Management Outcomes
Aidan Daly	TfL Bus Network Development

Site Conditions
The site is located within the Belvedere Industrial area and is bounded to the north by the River Thames and to the south by the A2016, Picady Manorway. The A2016, Picady Manorway, forms part of the Strategic Road Network (SRN) for which TfL has a duty under the Traffic Management Act 2004 to ensure that any development does not have an adverse impact on its operation. The nearest section of the Transport for London Road Network (TLRN) is the A2 Rochester Way, located over 5km south from the site.

Three bus routes (180, 401, 601), providing services into Lewisham, Thamesmead and Bexleyheath, serve the area with bus stops located within 150 metres of the Norman Road / Picardy Manorway junction. Belvedere rail station, on the Dartford to London line, is located approximately 1km to the south of the site on Station Road. Abbey Wood station is located approximately 3.5km to the southwest of the site. The site currently records a variation in Public Transport Accessibility Level (PTAL) according to TfL's WEBCAT service, with the southeast of the site recording a PTAL 2. However, on average the majority of the site records a very poor PTAL of 0 (on a scale of 1-6, where 6 is excellent).

Belvedere falls within the Bexley Riverside Opportunity Area and forms a key growth area. The draft London Plan anticipates an indicative employment capacity of 19,000 jobs and 6,000 new homes across Bexley Riverside Opportunity Area and an Opportunity Area Planning Framework is currently being developed by LB Bexley, the GLA and TfL.

Development Overview and Operation
The proposed development comprises an integrated Energy Park consisting of complementary energy-generating development together with a new connection to the existing electricity network. Given the scheme seeks to build, commission and operate an onshore generating station with an energy generating capacity of greater than 50 MWe, it constitutes a project falling within the definition of a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008 and therefore will require a Development Consent Order (DCO).

The proposed development, is referred to as the 'Riverside Energy Park' (REP) and is sited adjacent to an existing Energy Recovery Facility (ERF) (referred to as Riverside Resource Recovery Facility (RRRF)) which has been operational since 2012 and is currently operated by Cory Riverside Energy (CRE).

It is proposed to deliver the majority of waste to the REP by barge from riparian Waste Transfer Stations (WTS) along the River Thames, utilising the existing jetty which forms part of the RRRF. REP includes the existing jetty in the River Thames which is currently used for delivery of waste and despatch of some by-products at the RRRF. The jetty will be used for the same purpose for the operation of REP. The jetty is currently used on a 12hr basis for the operation of the RRRF but consent has been secured to increase the operation of jetty to a 24hr basis in order to serve the REP.

The RRRF operates under several planning conditions relating to how waste and by-products must be transported. Some conditions apply when a jetty outage occurs; in circumstances caused by factors beyond CRE's control which mean waste cannot be received at the jetty or ash containers cannot be despatched from the jetty for a period in excess of 4 consecutive days. It is important to note that since the RRRF has been operating there have been no instances of a jetty outage.

The transport-related conditions applied to the RRRF have been used to assess a worst case scenario for the REP TA, based on a jetty outage scenario. For the purposes of the REP TA, it is anticipated that the REP will generate a maximum waste throughput of 805,920 tonnes per annum (tpa) and will operate 24 hours a day and
seven days per week throughout the year. By comparison the RRRF as a maximum consented residual waste throughput of 785,000 tpa.

Approach to Transport Assessment
A comprehensive TA will need to be undertaken in line with TfL's Best Practice Guidance. This can be found on TfL's website here: [https://tfl.gov.uk/info-for/urban-planning-and-construction/transport-assessment-guidance.](https://tfl.gov.uk/info-for/urban-planning-and-construction/transport-assessment-guidance)

Prior to the meeting, the applicant circulated a transport assessment scoping note which set out the approach to assessment, the proposed trip generation methodology and the assumptions involved in the assessment. This note has been reviewed and considered in this letter. Comments on this are provided below.

Baseline Surveys
Prior to the meeting the applicant circulated a plan outlining multiple locations for baseline highway surveys to be undertaken. These proposals have been reviewed and additional junction surveys were requested to cover:

- A2016 / A206 / Bexley Road Roundabout (TfL request);
- James Watt Way / Queens Road signalised junction (TfL request); and
- Larner Road / Northend Road / Boundary Street roundabout (LBB request).

Trip Generation
Having reviewed the proposed trip generation as set out in the scoping note, TfL can confirm that the approach appears reasonable however, there a number of comments that TfL has that were discussed at the meeting and are set out below.

The use of two assessment scenarios to cover normal operation and a worst case scenario during jetty outage are considered appropriate. Further details should be provided with the TA regarding the routing and distribution of these operational vehicles as it is understood there are different assignment patterns based on the two scenarios.

A subsequent technical note was circulated by PBA after the TfL pre-app meeting in response to comments raised by consultees on the TA Scoping Report. The note provides more detail on the trip generation and assignment and distribution of vehicles during normal conditions (25% Road Scenario) and worst case (100% road scenario). It is understood the assignment of vehicle routes and distribution has been provided by CRE based on their experience, location of waste plants and existing commercial agreements that are in place. This approach is considered acceptable and should be fully documented within the TA. It would also be useful to provide graphical route maps to aid the understanding of the vehicle movements between the two scenarios.

The proposed mode share for the operational staff is based on 2011 Census, Journey to Work data however given the adjacent and comparable RRRF facility, it would be more appropriate to survey existing staff to understand their current travel patterns and mode share. An understanding for where staff live would also provide a more accurate account of trip distribution for assignment purposes. This information should be available from the RRRF travel plan monitoring.

Highway and Public Transport Impact Assessment
The scale and extent of highway modelling can be confirmed once the baseline surveys have been undertaken and presented alongside the agreed proposed trip generation for the site. TfL are happy to continue pre-application advice subsequent to the meeting and will happily review any further information submitted.

Where areas are highlighted from the baseline surveys and impact assessment, mitigation may well then be required. Improvements could potentially comprise possible junction improvements, such as new signals or signal alterations in order to optimise their operation. LINSIG models would therefore be required to be produced for these specific junctions as well as ARCADY models for the roundabouts surveyed. As stated above, TfL welcomes further discussions subsequent to the initial impact assessment being undertaken.

Crucially, the cumulative development in the area will be a key consideration and all development sites in the immediate locality will need to be considered and taken into account. The applicant is advised to contact Peter Boulden (London Borough of Bexley Highways) to obtain a detailed list of sites to include in the assessment. TfL are happy to review this list to ensure it is comprehensive.

As discussed there is no requirement for the applicant to assess the predicted number of bus trips against capacity. If the information on the likely origin or destination by bi-directional route is provided within the TA, TfL will review and respond with any potential capacity issues that may occur.

Further to the discussions in the meeting regarding potential changes to local bus routes, plans are still currently being considered as part of our continuous bus review and development of the North Greenwich to Slade Green Transit Corridor. Nevertheless, for clarification, the changes proposed to the 180 bus route include a change in the terminus points, with the 180 routing from North Greenwich to Erith. Further details of the proposed changes can be found on the TfL website - https://consultations.tfl.gov.uk/buses/83558683/. There are no proposed changes to the frequency of the 180 service.

Site Access and Design
During the meeting TfL stressed the need for good quality pedestrian and cyclist access into the site. As part of this, TfL request that the applicant undertakes an assessment of the local cycle infrastructure and routes, particularly to the closest stations. A Cycle Level of Service (CLOS) assessment should be completed for the junction of A2016 Picardy Manorway / Norman Road as a minimum and should deficiencies be found, mitigations / improvements should be suggested.

As discussed, there is little need for a full PERS audit, however TfL requests that an assessment is undertaken for footways immediately outside of the site and routes towards local bus stops.

Car and Operational Parking
The scoping note provided does not set out the proposed car and operational parking provision, however, due to the potential future improvements to public transport and the pressures on the local highway network, TfL would encourage the applicant to provide a low level of car parking, aiming for lower than the maximum standards allowed within the draft London Plan. A review of parking including provision and usage for the adjacent and comparable RRRF site should form part of this evidence base in justifying appropriate parking levels for the REP. As discussed in the meeting, 10% of the overall parking spaces should be provided as Blue Badge compliant parking spaces. The details of the management of car parking spaces should be included in the TA as part of a Car Park Design and Management Plan.

In accordance with draft London Plan standards, TfL requests that all car parking spaces be fitted with Electric Vehicle Charging Points (EVCPs).

Cycle Parking
Short distance cycle trips in this area are key to linking this development to public transport interchanges at Belvedere and Abbey Wood stations and surrounding

residential areas and the Belvedere growth area. Cycle parking should be provided to draft London Plan standards and the applicant is encouraged to design the cycle parking to make it as easy, safe and convenient to use.

All cycle parking should be designed in accordance with the London Cycling Design Standards (LCDS) and the location described in the TA. The LCDS recommends that at least 5 per cent of all spaces should be capable of accommodating a larger cycle. There should also be provision for showers and storage facilities as part of the development.

Construction
TfL has concerns regarding the level of potential disruption caused by the construction of the proposed development including the construction of the Electrical Connection Route (ECR). It is likely that the volume of construction vehicles and number of construction workers will be far in excess of what is anticipated during the normal operating conditions of the REP. Although the construction phase is temporary, it could cause significant impacts to the local highway network and public transport capacities. Further work is required as part of the TA to assess the full impact of construction on the local transport network. It is encouraging that formal parking for construction workers is going to be minimal however it is unclear how the 1,097 construction workers are going to travel to the site on a daily basis and further assessment work of impacts is required. Additional information should also be provided on specific measures to restrict informal parking and encourage sustainable travel such as the provision of a dedicated mini bus service and other shared transport initiatives. Evidence from the construction of the adjacent RRRP should be considered together with 'lessons learnt' from the process to improve the construction process at the REP and minimise impacts.

It was requested at the meeting that the applicant should share with TfL at an early stage the UKPN assessment of the ECR to understand what road closures may be required as part of this construction and the anticipated duration of these closures. As both the construction of the REP and ECR is envisaged to be undertaken simultaneously, the construction impact assessment should consider any road closures and route diversions.

Once the UKPN programme and location of highway closures and diversions are known, further modelling analysis maybe required to determine the level of impact and potential mitigation on the local network. Depending on the scale, length of closures and construction phasing details, it may be essential to undertake microsimulation analysis of the impacted area. This will not only allow TfL to understand and prepare for potential disruption but also to advise on required changes to the construction programme and construction worker travel patterns to minimise the impact on the surrounding network. This could mean limitation on construction traffic volume during standard peak periods, or during the most disruptive ECR phases.

The applicant should provide a draft Construction Logistics Plan (CLP) and while a final CLP should be secured by condition, the draft should still contain some information on how construction impacts are intended to be dealt with. This is in order to minimise the potential impact on the surrounding highway network and how the number of vehicles generated will be accessing the site. The CLP should include the likely construction trips generated and mitigation proposed. Details should include; site access arrangements and minimising conflict with pedestrians and cyclists, booking systems, construction phasing, vehicular routes and scope for load consolidation in order to reduce the total number of road trips generated. Specific TfL advice can be found here: https://tfl.gov.uk/info-for/freight/planning/construction-logistics-plans.

Delivery and Servicing Planning
We would expect the application to include a draft Delivery and Servicing Plan (DSP). The purpose of a DSP is to effectively manage the impact of servicing and delivery vehicles accessing the development site and one of the key elements to a DSP is to identify where safe and legal loading can take place. The TA should show the location of loading bays provided for loading and deliveries. The DSP should set out the estimated number of servicing and delivery vehicles expecting to access the site and any measures that can be implemented to try and improve the efficiency of the site and reduce vehicle numbers. It should provide detail about how the site accords with best practice published by TfL and others, please see this link: https://tfl.gov.uk/info-for/freight/planning/delivery-and-servicing-plans and here: http://www.fors-online.org.uk/. TfL suggests that a combined DSP is produced taking account of the adjacent and comparable RRRP site, which is also operated by CRE.

Travel Plan
We would expect an Employee Travel Plan to be provided. This should set out measures to encourage mode shift from car use to other modes. There should be baseline mode of travel assessment as well as targets for one year, three years and five years. The TA should include a summary of the targets and measures. There need to be measures to discourage car use as well as positive measures to encourage more sustainable and active modes such as walking and cycling. Likewise with the DSP, TfL suggests that a combined Employee Travel Plan is produced taking account of the adjacent and comparable RRRP site, which is also operated by CRE. TfL will require the travel plan to be secured, managed, monitored and enforced through the s106 agreement

TfL guidance on Travel Plans can be found here: https://tfl.gov.uk/info-for/urban-planning-and-construction/travel-plans/the-travel-plan

Contributions and Community Infrastructure Levy (CIL)
Once the TA has been further advanced, the likely impacts of the proposals on the transport network and other detailed mitigation measures can then be further discussed and subsequently agreed with ourselves and Bexley Council. We would expect to seek provisions within a legal agreement to support the mitigation of impact on public transport, walking and cycling arising from the site.

The exact amounts that will be requested through the S106 will need to be detailed at a later date once the full impact of the proposed development is understood from the completed TA. The applicant should expect that the following may be included in the S106, in a S278 or as condition on the development:

- Contributions towards highway improvements required as identified through any traffic modelling.
- Contributions towards feasibility studies and/or off-site cycle improvements (e.g. to connect to the Thames path and other local cycle networks) and pedestrian improvements.
- Levels of Blue Badge spaces, EVCP provision and cycle parking to be compliant with the standards of the draft new London Plan.
- Car Park Design and Management Plan.
- Travel Plans, Delivery and Servicing Plans and Construction Logistics Plans..
- Potential improvements to the local bus network and infrastructure or towards future improvements in public transport identified through the emerging OAPF, such as the North Greenwich to Slade Green Transit Corridor.

A review of the TA and assessment of the impacts of the development will determine the requirement for mitigation improvements and the appropriate mechanism for securing these improvements will be discussed with the applicant.

In accordance with Policy 8.3 of the London Plan, this development is applicable for contributions towards the Mayoral Community Infrastructure Levy (CIL) that is paid by most new development in Greater London. Three charging bands with variable rates based on the per square metre net increase of floor space apply, in the London Borough of Bexley the charge is £20 per square metre of development (indexed). More details are available via the GLA website www.london.gov.uk.

London boroughs are also able to introduce CIL charges which are payable in addition to the Mayor's CIL. Bexley Council have introduced their scheme. TfL and Bexley Council will therefore review the use of CIL and S106 payments to mitigate the impacts of the development.

Summary
In summary, there are a number of strategic issues which need to be adequately addressed as part of the submission for TfL to fully confirm its 'in principle' support.

- A comprehensive Transport Assessment submitted in line with TfL's best practice guidance, which includes:
  - Identification of cycle and car parking numbers, allocations and locations
  - A review of the pedestrian and cycling environment, highlighting issues and potential mitigation
  - Use of employee data from the adjacent RRRP site to assess mode share and distribution of employee trips

- Further details on the construction programme, construction vehicle and construction worker trips, distribution and assignment of these trip and mitigation measures
- Identification of potential road closures required and duration of closures associated with the upgrading of electrical infrastructure.

- Demand management through Travel Plan, Construction Logistics Plans and Delivery and Servicing Plans.
- Agreement on level of contributions towards external highway improvements, public transport improvements and funding for pedestrian and cycle improvements.

If you have any queries, further questions or seek clarification please contact the case officer Victoria Rees (020 3054 3680 or email victoriarees@tfl.gov.uk) or myself.

Yours sincerely

Lucinda Turner
Director of Spatial Planning
Email: lucindaturner@tfl.gov.uk
Direct line: 020 3054 7133

Charlie Lusty

From:	Boulden, Peter <>
Sent:	12 April 2018 12:11
To:	Charlie Lusty
Cc:	Able, Martin; VictoriaRees@tfl.gov.uk
Subject:	FW: RIVERSIDE ENERGY PARK BELVEDERE

Charlie,

I have reviewed your Transport Assessment Scoping Report on behalf of the Highway Authority at Bexley and have the following comments:-

1) It is noted that that the proposed manual classified counts are to run between 0600 – 1000 and 1600 – 1900. Be aware that other recent traffic studies of the local highway network have indicated the daily weekday peaks as 0745 – 0845 and 1645 – 1745. You therefore may wish to consider commencing the PM count earlier. This of course is not any issue if you intend to collect the MCC data via -high mast surveys are running between 0600 – 1900 which I believe is the case – can you confirm this?

2) When the recent application by Cory for an increase in road tonnage for the RRRF was presented to our planning committee there was considerable concern from members regarding the increase in lorry movements along the A206 Northend Road particularly in the vicinity of the Larner Road/Northend Road/Boundary Street roundabout, where there is significant new residential development under construction and further planned. Manual classified counts should therefore be undertaken at this junction as well. I am aware that TfL have already requested counts at the A2016 / A206 / Bexley Road Roundabout in Erith and the James Watt Way / Queens Road signalised junction, which I understand Martin has also mentioned to you.

3) Reference is made to the LBB Draft Local Plan 2017 on page 11. However this does not exist.

4) I can find no details of the duration of the construction phase or detailed breakdown of vehicle movements so cannot dismiss the need junction modelling at his stage.

5) The composition of the types of vehicles used to transport operational materials needs to be explained in full and justified in the traffic assessments. The fact that there will be part loads and waste materials of different densities arriving must be taken account in the predicted traffic movements. The arbitrary assumption of 20 tonnes of material being transported on each vehicle is not acceptable.

6) There is a mode share in table 4.7 for staff arriving by underground. There is off course no underground service in Bexley and I would suggest these trips are added to the train mode.

7) Details of the committed development in Bexley will need to be agreed.

8) Tables 4.2 and 4.3 are confusing and/or inaccurate as there appears to be less traffic movements along some routes under the 'worst case' than 'normal conditions'.

9) The current access into Norman Road (left in/left out) results in vehicles arriving and departing from/to destinations in either direction having to perform u-turns at either the A2016 Picardy Manorway/Clydesdale Way/Eastern Way roundabout or the A2016 Picardy Manorway /Anderson Way/A2016 Bronze Age Way/B254 Picardy Manorway roundabout. This increases road mileage and pollution, has a negative impact on the capacity of these two junctions and potentially increases journey time. Consideration should be given to revising the current access

arrangements into Norman Road by either creating an all movement signal controlled junction including pedestrian/cyclist crossing stages or possible constructing a roundabout with controlled crossings at the approaches. The TA should therefore include indicative designs for each option supported by traffic modelling both for the new and existing two roundabout junctions.

10) An operational Delivery and Transport Management Plan will be required which should include but not be specifically limited to details of lorry routeing.

11) The scope appears to only cover the likely road transport-related impacts, An assessment of impacts during construction and operation on the river's capacity (in terms of levels of service and safety) and the ability of the jetty to adequately support the increases in volumes of waste is also required. The need for this was identified when the previous EIA scoping report was submitted. The river-transport assessments should be consistent with the road assessments.

12) A construction/operatives Travel Plan is required demonstrating how the travel needs of the work force will be accommodated and encouraging sustainable travel.

Regards

Peter Boulden
Deputy Transport and Development Manager
London Borough of Bexley
Strategic Planning & Growth, 2nd Floor East, Civic Offices, Watling Street, Bexleyheath, Kent DA6 7AT
Tel: 020 3045 5804
E Mail:

_ _

Highways and Transportation
Ashford Highway Depot
4 Javelin Way
Ashford
TN24 8AD
Tel: 03000 418181
Date: 29 March 2018

Charlie Lusty
Senior Transport Planner
Peter Brett Associates

Application -	**PAP/2017/201**
Location -	**Land north west of Norman Road, Belvedere, London, DA17 6JY**
Proposal -	**Pre -application advice from App under Planning act 2008 for powers to operate, construct and commission an integrated energy park, to be known as riverside energy park.**

Dear Charlie,

Thank you for providing us with the opportunity to comment on the Transport Assessment Scoping Report, dated March 2018. I have the following comments to make with respect to highway matters :-

Context

The County Council in its capacity as local highway authority is concerned about the impacts during both the construction and operational phases on the A206 Bob Dunn Way and junction 1A of the M25.

The A206 Bob Dunn Way is a key east-west route in Dartford Borough, providing a connection between the strategic road network at M25 Junction 1A and South East London. Not only does it cater for longer distance journeys between North Kent and London, but it also carries a significant quantum of local traffic for journeys to / from the Dartford urban area. During peak periods it suffers from congestion and delays.

In addition, the A206 Bob Dunn Way is particularly vulnerable to the impact of incidents at M25 Junction 1A and on the M25 / A282 mainline approach to the Dartford Crossing. Such incidents cause traffic to find alternative routes across the Dartford road network with severe queuing and delays resulting on the A206 Bob Dunn Way and at M25 Junction 1A. Therefore, the County Council is concerned about the impact this application could have on the A206 Bob Dunn Way during peak periods but also when there are delays caused by incidents.

Policy Review

The Policy and Guidance Review section should also refer to the Kent Local Transport Plan 4: Delivering Growth without Gridlock (2016-2031). The link to this is:-

https://www.kent.gov.uk/about-the-council/strategies-and-policies/transport-and-highways-policies/local-transport-plan

Trip Generation and Distribution

The proposed first principles approach to trip generation is accepted. However, details underpinning the calculations including the volume of material, rate of output and type of HGV should be clearly set out in the Transport Assessment. Evidence, where relevant, from the existing facility would assist in supporting the assumptions.

Similarly, the County Council would expect the number of vehicle movements along the A206 Bob Dunn Way during the construction phase to be set out within the Transport Assessment.

With regards the distribution of vehicles trips, it is noted that in the worst-case scenario (which is the basis for assessment) 35% of trips are routed towards Tillbury via the M25 North and the A206 Bob Dunn Way.

Highway Impact

Subject to closer scrutiny of the assumptions on trip generation and distribution, the scope of the traffic surveys is considered acceptable. However, further sensitivity testing may be required if the County Council considers it likely that the impact on the A206 Bob Dunn Way and M25 Junction 1A may be higher.

I would further advise you to contact Highways England to discuss the impact on M25 Junction1A and the M25 / A282 mainline north towards Tillbury.

The proposed 14-day ATC surveys that will be undertaken are supported by the County Council as it is likely to highlight the variation in traffic conditions and frequency of incidents within the survey period.

It is expected that the assessment will consider the change in both daily and peak hour traffic flows.

The Transport Assessment should also provide a qualitative assessment of the impacts of the proposals when traffic conditions are affected by incidents on the strategic road network.

With reference to Sections 4.2 and 5.2 of your report, it is accepted that there is no need to model transport impacts for the construction period although I support the submission of a Construction Logistics Plan. This would need to include details of traffic management measures on the A206 Bob Dunn Way for the period involving construction of the Electrical Connection Route.

It is important that the assessment of the highway network takes account of the high levels of development planned within Dartford Borough. As previously advised, TEMPRO often underestimates traffic growth rates in Dartford when compared against the high levels of development that have taken place and are anticipated to continue to do so in the future. I would therefore advise that the forecast traffic from committed and allocated developments in the vicinity of the A206 Bob Dunn Way are considered individually and that TEMPRO traffic growth factors are also applied to take account of journeys which are routed through Dartford Borough. I recommend consulting with Dartford Borough Council to obtain a list of relevant developments.

Important Notes

Any advice given by Council officers for pre-application enquiries does not indicate a formal decision by the Council as the Highway Authority. Any views or opinions are given in good faith, and to the best of ability, without prejudice to the formal consideration of any planning application.

You should therefore be aware that officers cannot guarantee the final formal decision that will be made on your application(s).

Any pre-application advice that has been provided will be carefully considered in reaching a decision or recommendation on an application; subject to the proviso that circumstances and information may change or come to light that could alter that position.

It should be noted that the weight given to pre-application advice will decline over time.

Yours faithfully

Nick Baldwin
Senior Development Planner

Charlie Lusty

From: Tania Smith <>
Sent: 29 March 2018 17:53
To: Charlie Lusty
Cc: [redacted]
Subject: RE: Riverside Energy Park - Transport Assessment Scoping Report

Dear Charlie

Sonia has asked me to respond with Dartford Borough Council's comments on the TA scoping report.

Having received a copy of KCC's comments this morning I would like to concur with the concerns and comments raised with regard to:

1. The impacts of both the construction and operational phases on the A206 Bob Dunn Way and Junction 1A of the A282 (part of the M25 orbital). This is an extremely sensitive part of the local and SR network which is often subject to high volumes of traffic, congestion and significant travel delays. It should be noted that during times of severe congestion, impacts can spread into a wider area including Dartford Town Centre due to vehicles seeking alternative routes to avoid delays.
2. The transparency of details underpinning the calculations used. A robust assessment, supported by relevant evidence, will provide a more realistic understanding of potential impacts and subsequent confidence as to whether proposed mitigations are sufficient.
3. Taking account of existing traffic issues that arise at the A206 Bob Dunn Way, Junction 1A and the north bound Dartford tunnels, further sensitivity testing should be carried out where potential concerns are indicated through the TA, . However, as set out by KCC, testing of the impact when traffic conditions are affected by incidents on the SRN should be carried out as part of the main study.
4. The potential for the construction phase to result in impacts should be considered and suitable mitigations provided in the Construction Logistics Plan.
5. The approach to individually considering trips for committed and allocated development with Tempro growth being applied to journeys through Dartford. The Council can provide a list, location and details of relevant developments upon request.

Additionally our specific comments are:

- Para 2.3.4 – the para should reference the A206 not the A2016. In addition the para should additionally note that the A282 forms part of the M25 London Orbital Motorway, at the Dartford river crossing section of the orbital route.
- Para 2.1.2 – Local policy and Guidance should include Dartford Core Strategy 2011 and Dartford Development Policies Plan 2017.
- Para 4.2.3 - …. Onto the M25 orbital via the A282 at the Dartford Crossing.
- Para 4.5.2 table 4.2 – taking into account that peak flows are shown for M25 north and south it would be useful to understand the combined flows along the A206. Generally some of the figures don't seem to add up in this table. Table 4.3 - why is there assumption that no peak and extremely limited 24 hour vehicle flows on the M25 south route?

Regards
Tania Smith

Infrastructure Delivery Officer
Planning Services
Dartford Borough Council
Civic Centre
DA1 1DR
01322 343103

From: Charlie Lusty <>
Sent: 21 March 2018 09:19
To: Sonia Bunn
Cc: [redacted]
Subject: RE: Riverside Energy Park - Transport Assessment Scoping Report

Hi Sonia,

I'm not sure whether you were planning to provide comments on our TA Scoping Report or whether you were co-ordinating a response with Emma at KCC?

Either way, I thought I would let you know that our schedule is for traffic surveys to go down after Easter and so we'd like to agree our proposed scope such that we can proceed with our assessment as soon as possible.

Kind regards,

Charlie Lusty
Peter Brett Associates LLP
020 3824 6644

From: Charlie Lusty
Sent: 06 March 2018 17:06
To: 'sonia.bunn@dartford.gov.uk' <[redacted]
Cc: [redacted]
Subject: Riverside Energy Park - Transport Assessment Scoping Report

Hi Sonia,

I hope you found the meeting on the 22nd February beneficial. As discussed, please find attached a Transport Assessment Scoping Report for your review and comment.

Should you have any queries then please do not hesitate to contact either myself or Manu (cc'd).

Kind regards,

Charlie Lusty
Senior Transport Planner
For and on behalf of Peter Brett Associates LLP - London

t 02038246644
e c
w peterbrett.com

From:	Louise Thayre <L>
Sent:	20 March 2018 15:03
To:	Charlie Lusty
Cc:	[redacted]
Subject:	RE: Riverside Energy Park - Transport Assessment Scoping Report

Charlie,

Please see below comments from the Council's Transport and Highways section in regards to the above site.

Generally the scoping study is adequate.

It does however assume that all refuse collection vehicles will operate a 12 hour shift and refuse from other organisations will be on a 24hr basis. The duration of operation is therefore queried and it should be demonstrated that these hours of operation will be available. Shorter times available for vehicle deliveries will obviously result in more vehicle movements at other times of the day.

It is also considered that there will be fluctuations in daily flow and analysis should be undertaken of peak hour movements.

Given the importance of the use of the River to transport waste, it should be demonstrated that the jetty is suitable to accommodate the volumes expected.

On days when use of the River cannot be guaranteed, there could be an additional 200 plus vehicles a day using the A206 from the west. This number of vehicles could have a significant effect on the operation of the Woolwich Ferry roundabout if all vehicles use this route. Investigation of the routes likely to be used from Wandsworth and Westminster etc. should be explored especially as these could vary at different times of the day.

Should you require any further assistance, please do not hesitate to contact me.

Kind Regards
Louise

Louise Thayre
Senior Principal Planning Officer – Development Team
Directorate of Regeneration, Enterprise and Skills
Royal Borough of Greenwich

☏ 020 8921 5894
✉ The Woolwich Centre, 35 Wellington Street, London SE18 6HQ
www.royalgreenwich.gov.uk

From: Charlie Lusty [mailto:cl]
Sent: 06 March 2018 17:05
To: Beth Lancaster
Cc: [redacted]
Subject: Riverside Energy Park - Transport Assessment Scoping Report

Dear Beth,

In relation to the proposed Riverside Energy Park at Belvedere in the London Borough of Bexley (your ref.: 17/3823/K), on which you were consulted in November 2018 by the Planning Inspectorate, please find attached a Transport Assessment Scoping Report for your review and comment.

Should you have any queries then please do not hesitate to contact me.

Kind regards,

Charlie Lusty
Senior Transport Planner
For and on behalf of Peter Brett Associates LLP - London

t 02038246644
e cl
w peterbrett.com

Riverside Energy Park – Proposed development by Cory Riverside Energy

Section 42 consultation response by Royal Mail Group Limited – July 2018

Introduction

Reference the letter from Peter Brett Associates to Royal Mail dated 18 June 2018, Royal Mail's section 42 consultation response is set out below.

Royal Mail– relevant information

Under section 35 of the Postal Services Act 2011 (the "Act"), Royal Mail has been designated by Ofcom (the independent communications regulator) as a provider of the Universal Postal Service. Royal Mail is the only such provider in the United Kingdom. Its services are regulated by the Communications Industry Regulator, Ofcom.

In respect of its postal services functions, section 29 of the Act provides that Ofcom's primary regulatory duty is to secure the provision of the Universal Postal Service. Ofcom discharges this duty by imposing regulatory conditions on Royal Mail, requiring it to provide the Universal Postal Service.

By sections 30 and 31 of the Act (read with sections 32 and 33) there is a set of minimum standards for Universal Service Providers, which Ofcom must secure. The conditions imposed by Ofcom reflect those standards. There is, in effect, a statutory obligation on Royal Mail to provide at least one collection from letterboxes and post offices six days a week and one delivery of letters to all 29 million homes and businesses in the UK six days a week (five days a week for parcels). Royal Mail must also provide a range of "end to end" services meeting users' needs, e.g. First Class, Second Class, Special Delivery by 1 p.m., International and Redirections services.

Royal Mail is under some of the highest specification performance obligations for quality of service in Europe. Its performance of the Universal Service Provider obligations is in the public interest and should not be affected detrimentally by any statutorily authorised project.

Royal Mail's postal sorting and delivery operations rely heavily on road communications. Royal Mail's ability to provide efficient mail collection, sorting and delivery to the public is sensitive to changes in the capacity of the highway network.

Royal Mail is a major road user nationally. Disruption to the highway network and traffic delays can have direct consequences on Royal Mail's operations, its ability to meet the Universal Service Obligation and comply with the regulatory regime for postal services thereby presenting a significant risk to Royal Mail's business.

Royal Mail's has nine operational properties within eight miles of the proposed Riverside Energy Park as listed and shown on plan below:

Abbey Wood Delivery Office	Nathan Way, London SE28 0AW	3.1 miles
London South East Parcelforce Depot	Unit 3 Optima Park, Thames Road, Dartford DA1 4QX	3.5 miles
Bexleyheath Delivery Office	2 Glengall Road, Bexleyheath DA7 4BS	3.5 miles

Woolwich Delivery Office	Pettman Crescent, London SE28 0FE	4.7 miles
Sidcup Delivery Office	19 Halfway Street, Sidcup DA15 8LG	5.5 miles
Dartford Delivery Office	50 West Hill, Dartford DA1 1AA	5.6 miles
Eltham + Lee Delivery Office	31-33 Court Yard, London SE9 5DD	6.7 miles
Eltham + Lee Vehicle Park	31-33 Court Yard, London SE9 5DD	6.7 miles
Blackheath Delivery Office	41 Blackheath Grove, London SE3 0AT	8.0 miles

In exercising its statutory duties Royal Mail vehicles use on a daily basis all of the local roads that may potentially be affected by additional traffic arising from the construction of the proposed Riverside Energy Park. Consequently, Royal Mail is concerned about the potential for disruption to its operations during its construction phase. In particular, Royal Mail requires more information and certainty about traffic management measures that will be put in place to mitigate construction impacts on traffic flows within the surrounding highways network.

Royal Mail is concerned that its future ability to provide an efficient mail sorting and delivery service to the public in accordance with its statutory obligations may be adversely affected by the construction of this proposed energy park.

Royal Mail's comments / requests

Royal Mail's consultant BNP Paribas Real Estate has reviewed the section 42 consultation documents, including the PEIR and its Non Technical Summary. It is noted that further traffic surveys have been undertaken, the data from which will be included within a detailed Transportation Assessment which will accompany the Environmental Statement to be submitted with the DCO application.

The ES should formally acknowledge the need to ensure that major road users such as Royal Mail are not disrupted though full advance consultation by the applicant at the appropriate time in the development process.

In order to address this, Royal Mail requests that:

1. The forthcoming DCO application offers a requirement that Royal Mail is pre-consulted by Cory Riverside Energy on any proposed road closures/ diversions/ alternative access arrangements, hours of working and the content of the final Constriction Traffic Management Plan (CTMP).

2. The forthcoming DCO application offers a requirement that the final CTMP includes provision for a mechanism to inform major road users about works affecting the local network (with particular regard to Royal Mail's distribution facilities in the vicinity of the DCO application site).

The above requests, made by Royal Mail at section 42 consultation stage, have been agreed and actioned by the developer of another NSIP proposal, to the satisfaction of Royal Mail and resulting in no further action by Royal Mail as a statutory consultee.

Royal Mail is able to supply Cory Riverside Energy with information on its road usage / trips if required.

Should Cory Riverside Energy have any queries in relation to the above then in the first instance please contact Holly Trotman ***(holly.trotman@royalmail.com)*** of Royal Mail's Legal Services Team or Daniel Parry-Jones ***(daniel.parry-jones@bnpparibas.com)*** of BNP Paribas Real Estate.

Appendix C Bus Route Maps

Bus Route 180

Source: https://tfl.gov.uk/bus/timetable/180/

Bus Route 401

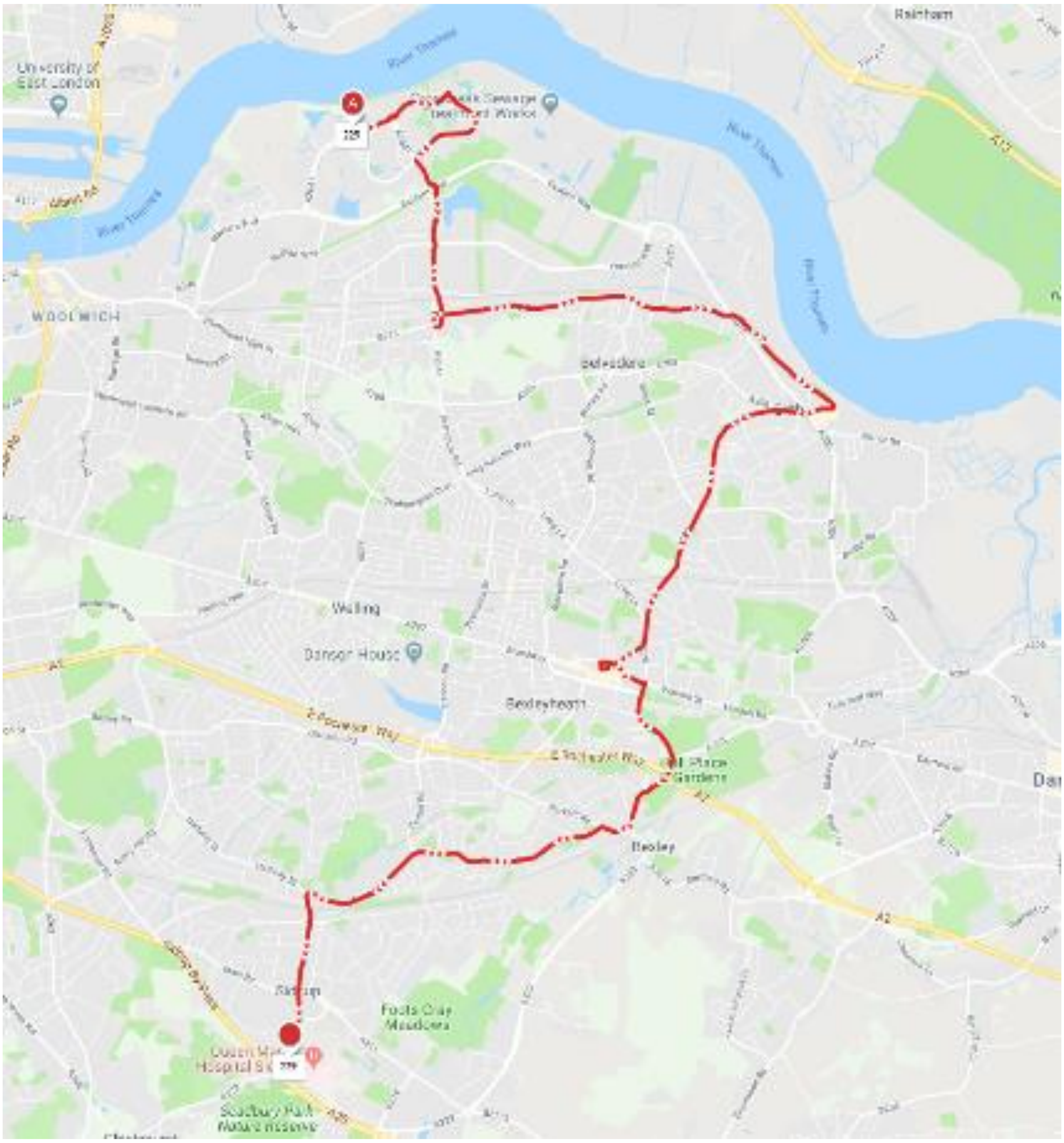
Source: https://tfl.gov.uk/bus/timetable/401/

Bus Route 601 (School Service)

Source: https://tfl.gov.uk/bus/timetable/601/

Routes along Electrical Connection Route options

Bus Route 229



Source: https://tfl.gov.uk/bus/timetable/229/

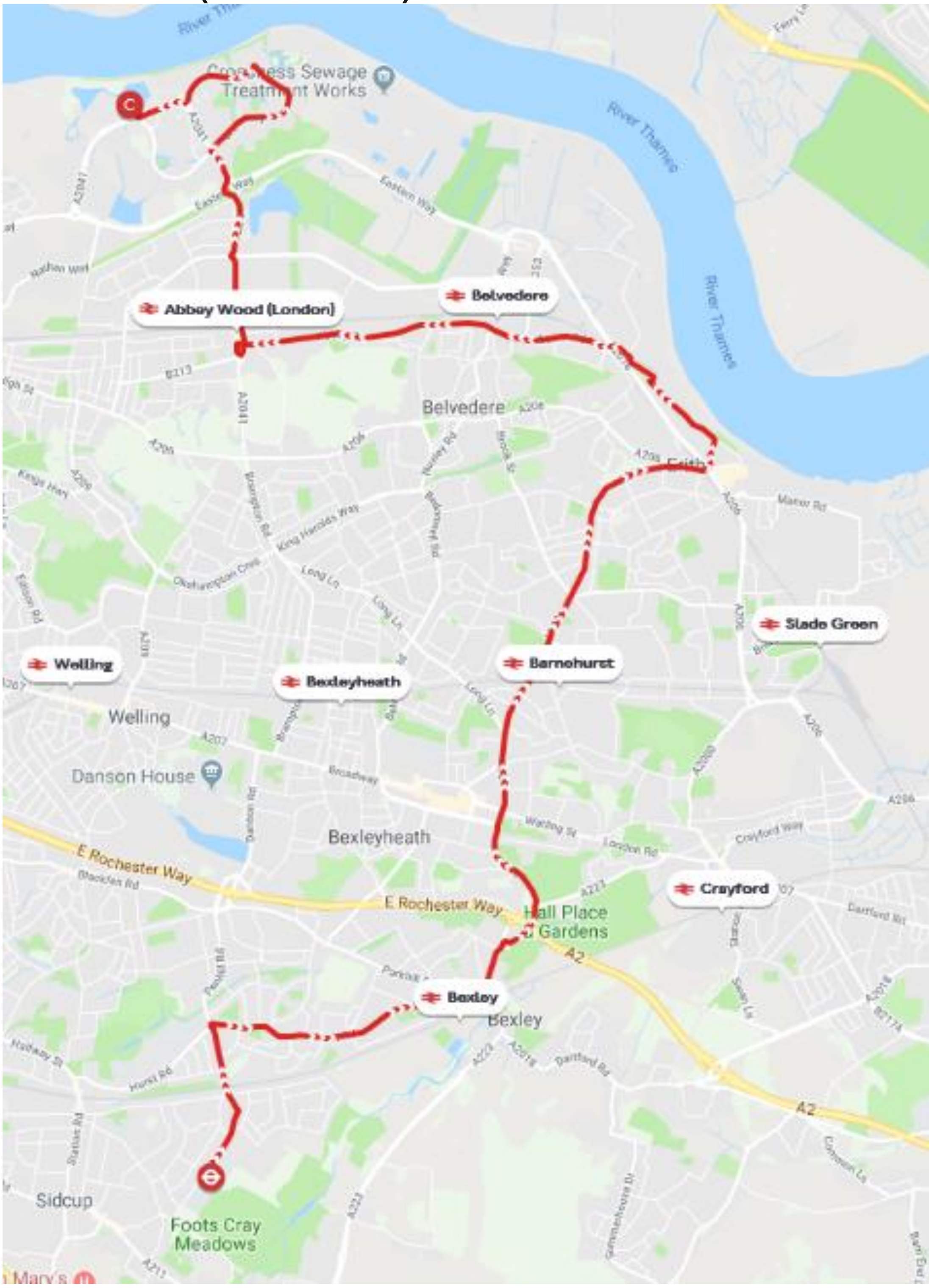
Bus Route 469

Source: https://tfl.gov.uk/bus/timetable/469/

Bus Route 602 (School Service)

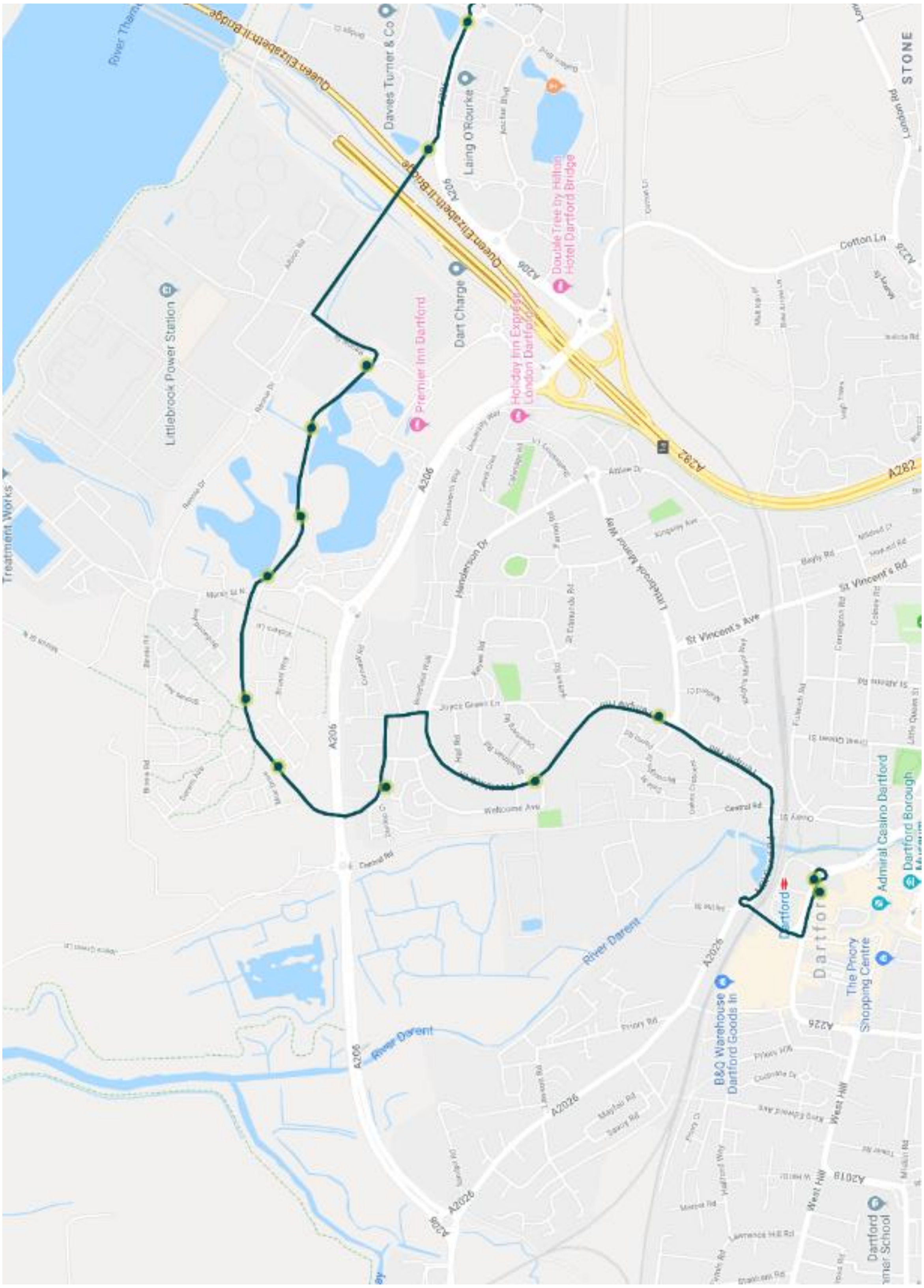
Source: https://tfl.gov.uk/bus/timetable/602/

Bus Route 669 (School Service)



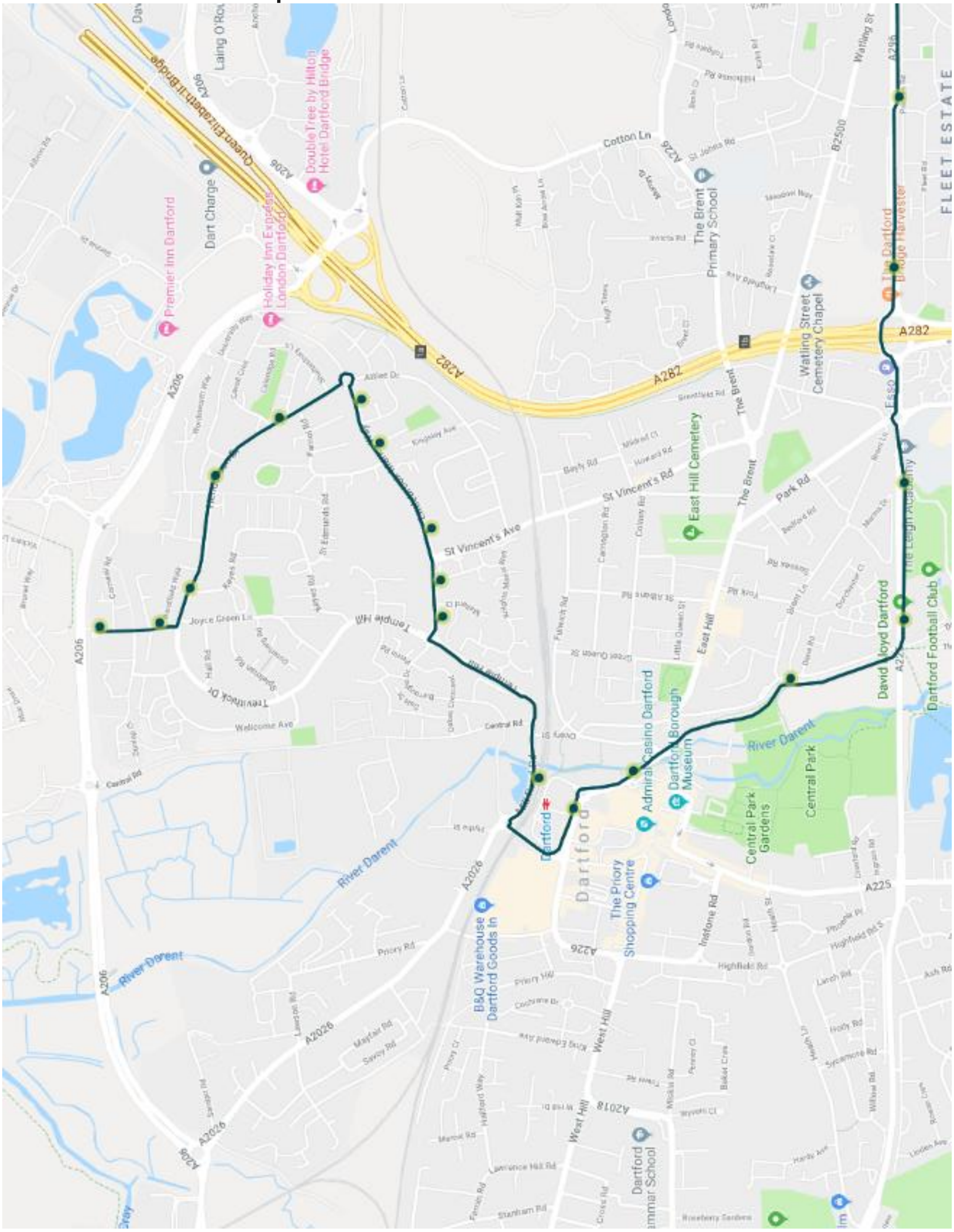
Source: https://tfl.gov.uk/bus/timetable/669/

Fastrack Bus Route A - Dartford to Bluewater



source: https://www.arrivabus.co.uk/kent-and-surrey/a---dartford-to-bluewater/?direction=outbound

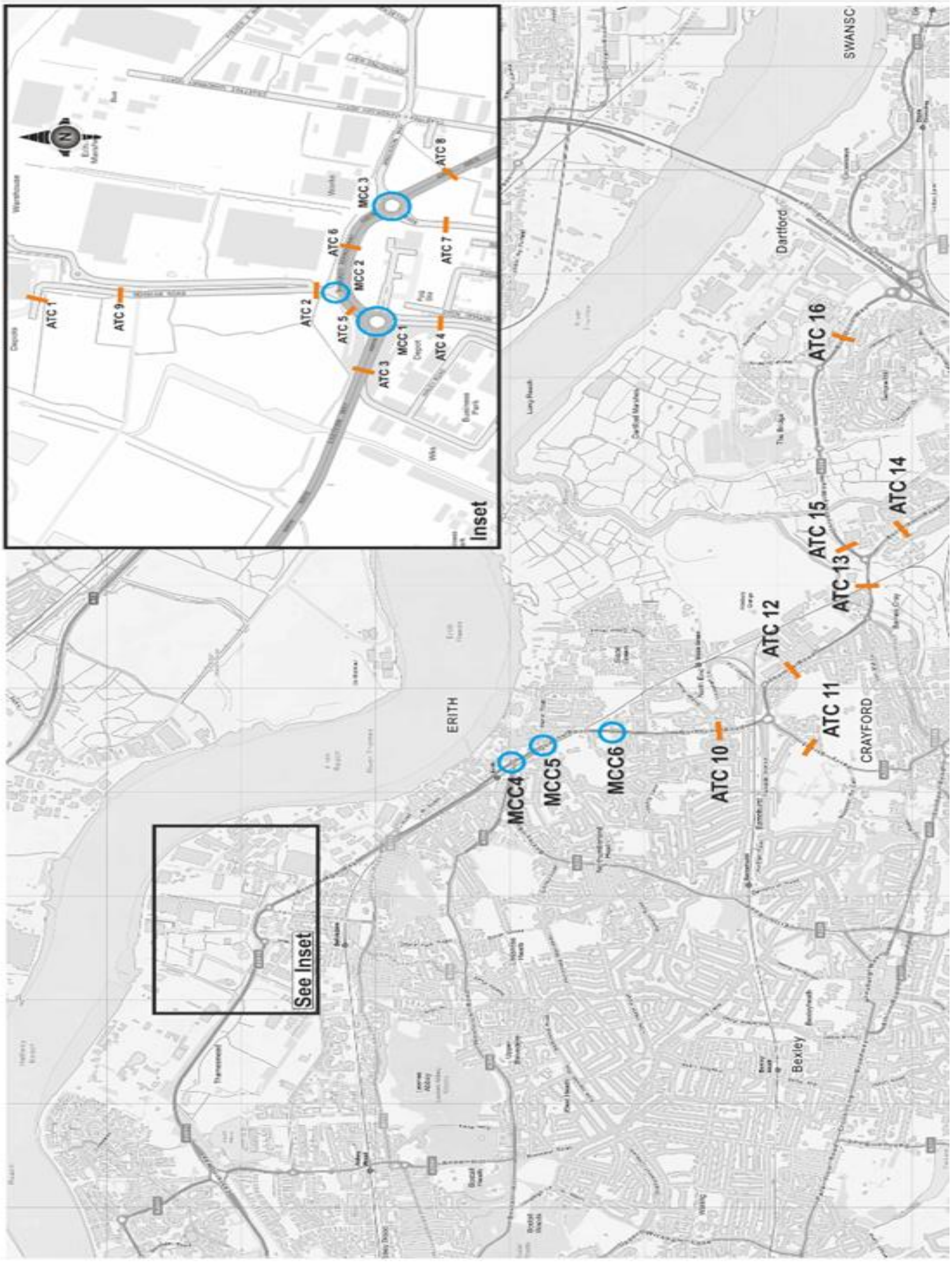
Fastrack Route B – Temple Hill to Gravesend



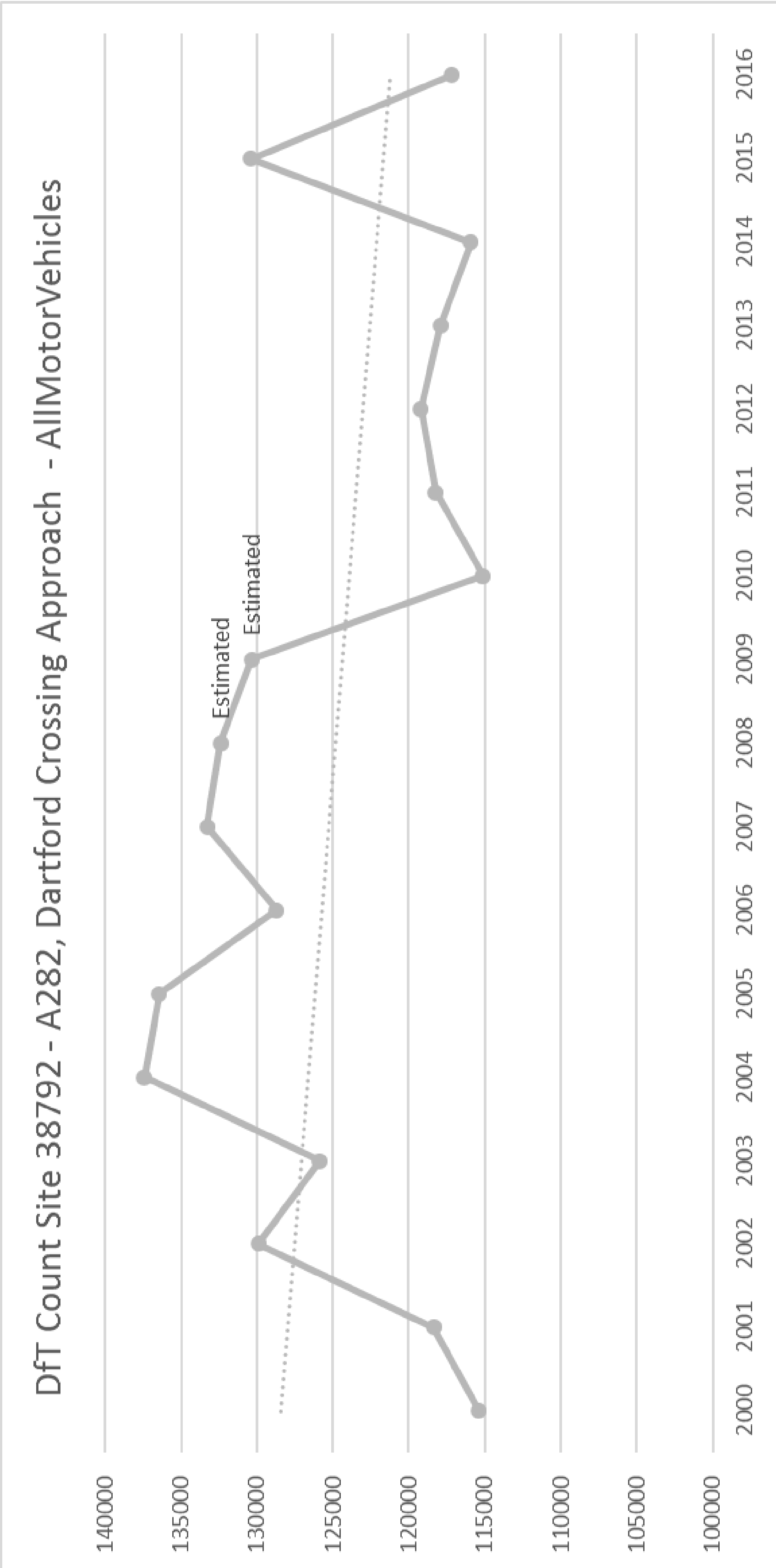
source: https://www.arrivabus.co.uk/kent-and-surrey/services/b---temple-hill-to-gravesend/?direction=outbound

Appendix D Traffic Survey Summaries

Traffic Surveys Location Plan

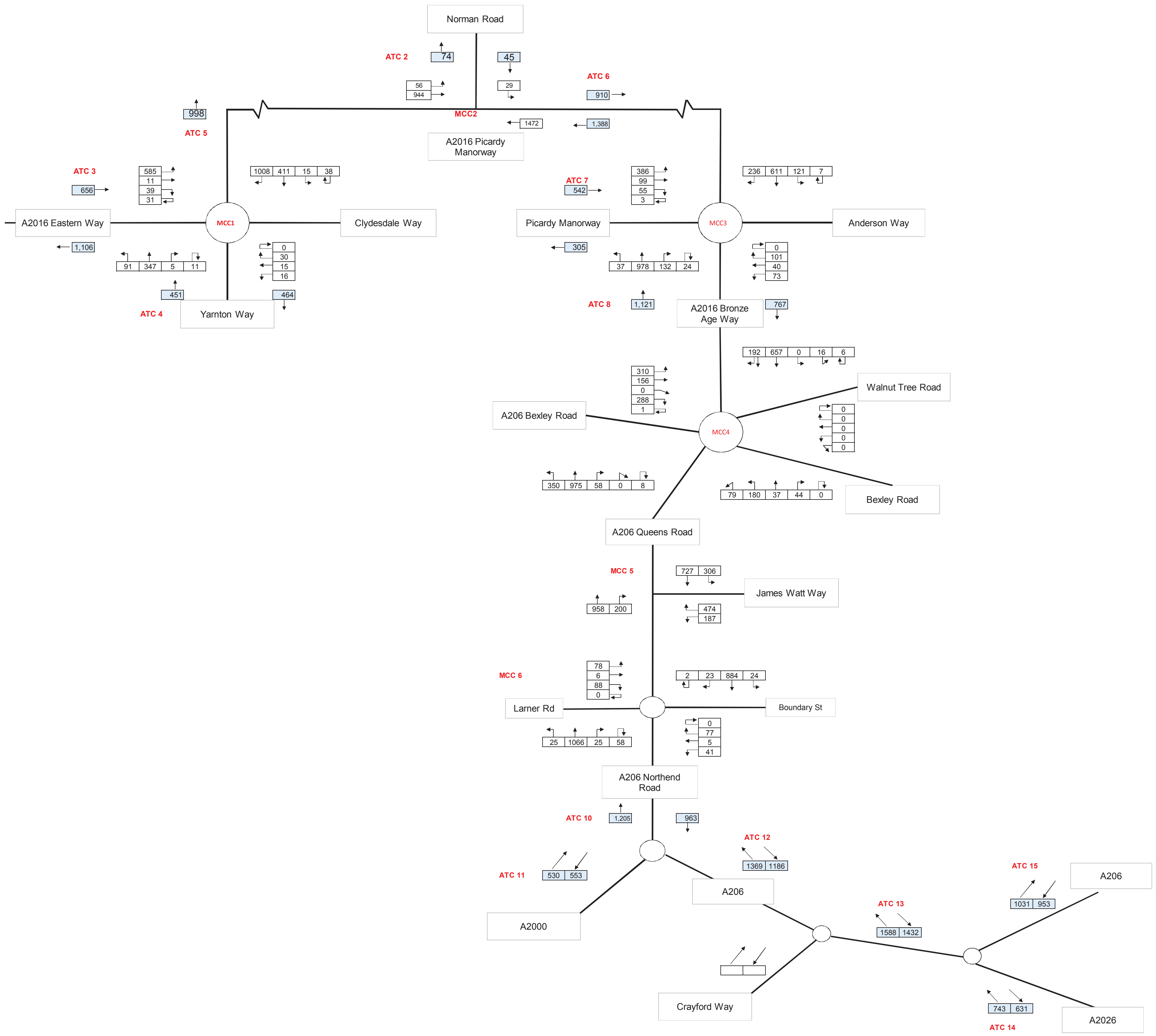


DfT Traffic Counts Site 38792 – A282 Dartford Crossing Approach

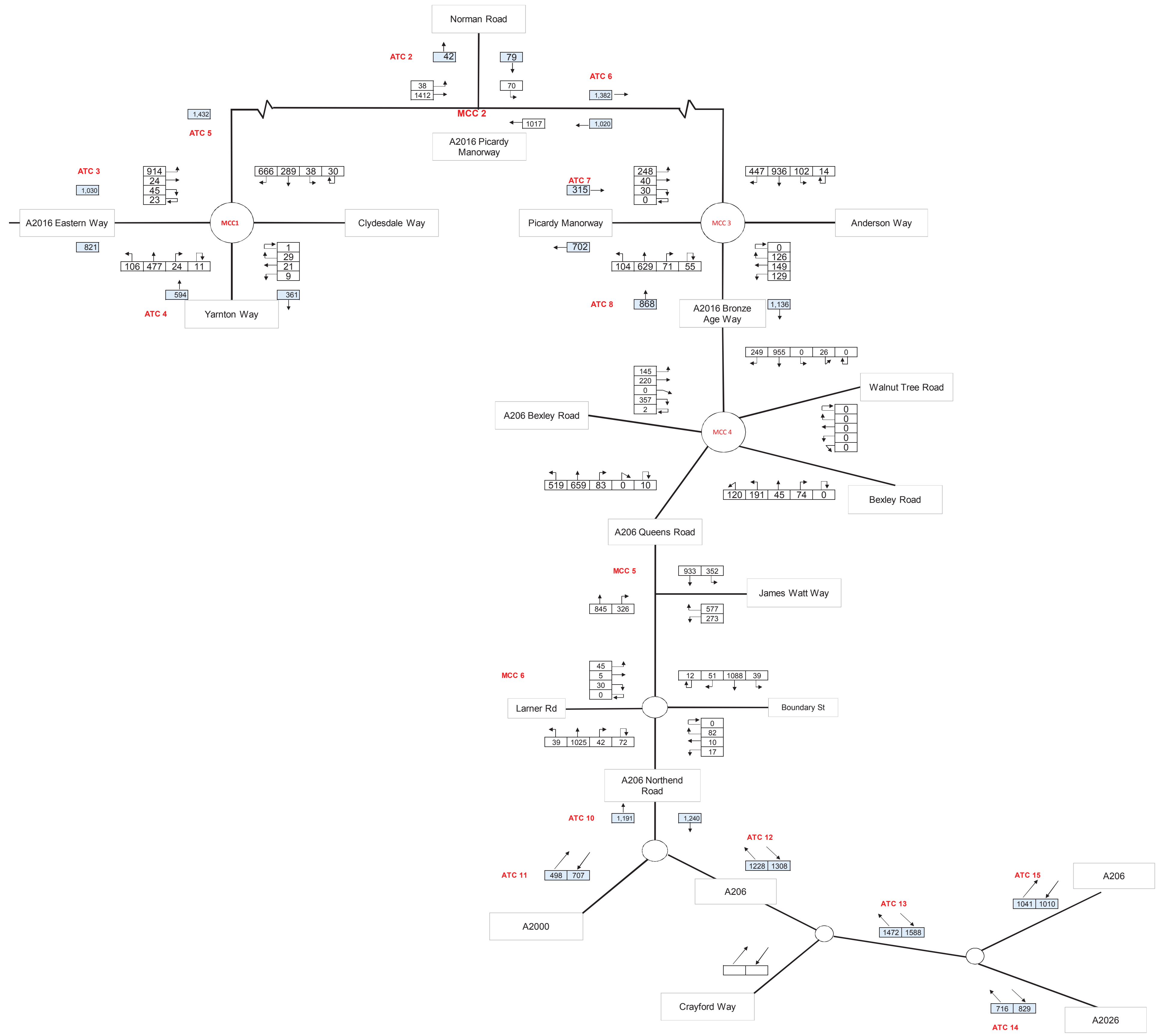


DFYear	dalCycles	otorcycles	rsTaxis	sesCoaches	htGoodsVehicles	AxleRigidHGV	AxleRigidHGV	or5AxleRigidHGV	or4AxleArticHGV	AxleArticHGV	orMoreAxleArticHGV	HGVs	MotorVehicles
2000	3	542	83446	435	13423	4316	436	809	1845	7140	3025	17571	115417
2001	3	598	86033	448	14175	4256	505	813	1677	6341	3512	17104	118358
2002	0	610	95250	642	15669	4005	642	868	1545	6987	3718	17765	129936
2003	1	1365	88512	456	15641	4368	698	1020	1500	7925	4415	19926	125900
2004	3	1060	101164	1086	16469	4224	568	744	1544	6752	3799	17631	137410
2005	0	957	95802	672	17296	4962	737	950	1658	8893	4548	21748	136475
2006	0	1160	90516	596	18386	4246	756	911	1302	6331	4540	18086	128744
2007	0	1207	94510	494	18399	3950	629	791	1472	7217	4641	18700	133310
2008	0	1172	93848	502	18436	3848	691	819	1383	6835	4882	18458	132416
2009	0	1226	92628	525	19045	3563	695	789	1281	5891	4736	16955	130379
2010	2	962	78627	314	17316	3771	661	908	906	7404	4268	17918	115137
2011	0	860	81388	214	16907	3594	745	656	725	4095	9051	18866	118235
2012	0	913	82245	152	18207	3262	700	925	568	3082	9162	17698	119216
2013	9	946	81824	238	16540	3336	741	851	491	3086	9874	18378	117927
2014	0	924	77432	324	18668	3136	489	773	865	5314	8000	18578	115926
2015	0	1237	87783	338	20838	4382	640	928	918	5571	7765	20205	130400
2016	0	968	76641	166	20823	3233	699	1098	709	4944	7951	18634	117233

Summary 2018 ATC and MCC Traffic Counts (AM Peak Hour 07:45-08:45)



Summary 2018 ATC and MCC Traffic Counts (PM Peak Hour 16:30-17:30)



Appendix E WebCAT PTAL Report

PTAL output for Base Year

0

Norman Rd, Belvedere DA17 6JY, UK
Easting: 549502, Northing: 180472

Grid Cell: 80509

Report generated: 04/12/2017

Map key - PTAL

- 0 (Worst)
- 1a
- 1b
- 2
- 3
- 4
- 5
- 6a
- 6b (Best)

Map layers

PTAL (cell size: 100m)

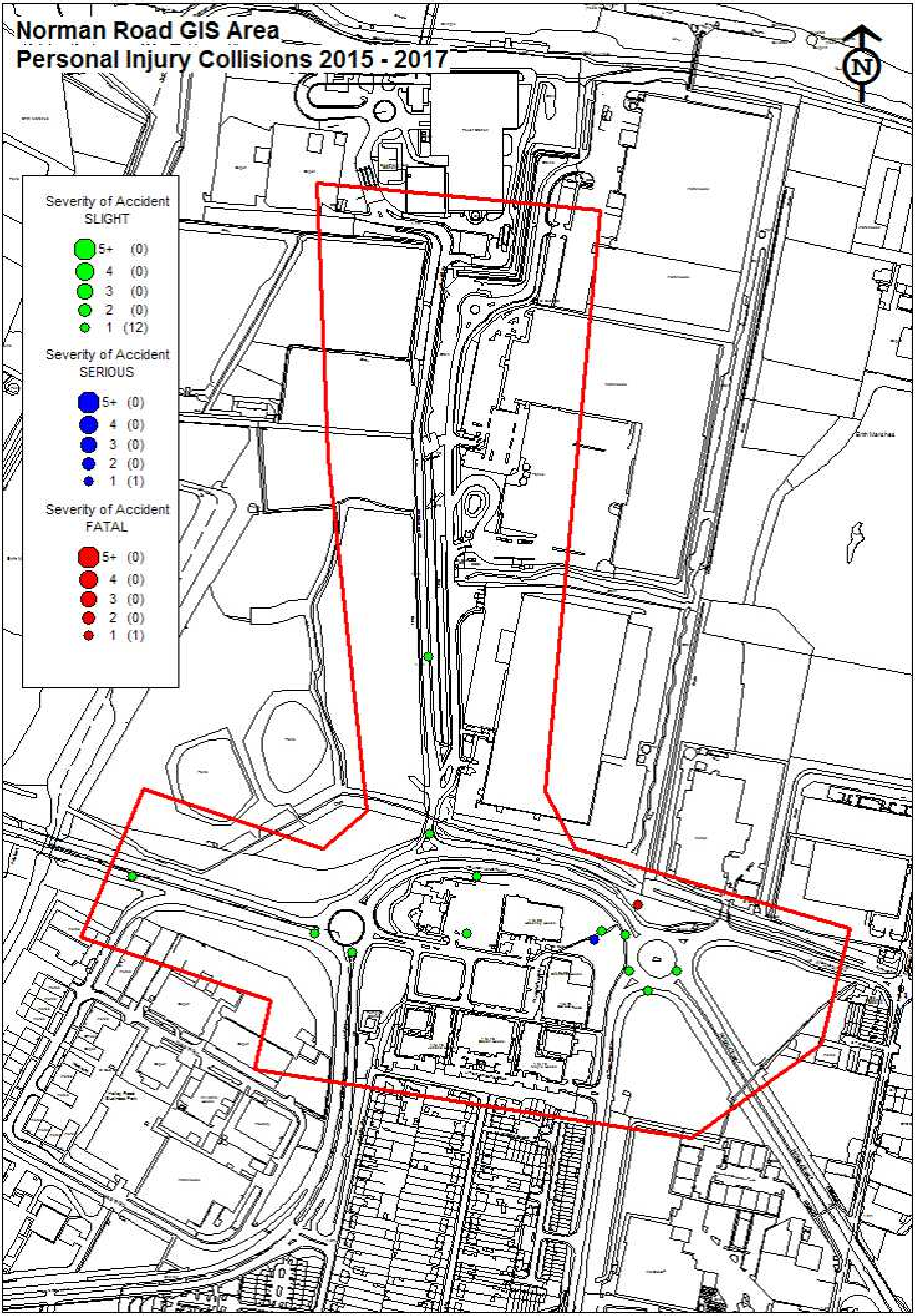
Calculation Parameters

Day of Week	M-F
Time Period	AM Peak
Walk Speed	4.8 kph
Bus Node Max. Walk Access Time (mins)	8
Bus Reliability Factor	2.0
LU Station Max. Walk Access Time (mins)	12
LU Reliability Factor	0.75
National Rail Station Max. Walk Access Time (mins)	12
National Rail Reliability Factor	0.75

Calculation data

Appendix F PIC Data

Norman Road GIS Area
Personal Injury Collisions 2015 - 2017



Scale : 1:5000

Created: 03-OCT-2018

Norman Road GIS Area Collisions - 2015 - 2017

Summary of Accidents Selected

Site Reference and Description (zero accident counts shown in bold)	Date Period	Accidents
MD01 GIS AREA B18_Norman_Rd (P)	36 MTS TO DEC-2017	14

The description of how the accident occurred and the contributory factors are the reporting officer's opinion at the time of reporting and may not be the result of extensive investigation

Norman Road GIS Area Collisions - 2015 - 2017

MD01 GIS AREA B18_Norman_Rd (P) 36 MTS TO DEC-2017 SORTED BY DATE

1 0115RY10065 SUN 22/02/15 01:55 DARK EASTERN WAY J/W YARNTON WAY 18 NODE 239 549530 / 179820
POLICE - AT SCENE ROAD-DRY WEATHER-FINE ROUNDABOUT ROUNDABOUT GIVE WAY/UNCONT NO XING FACILITY IN 50M
V1 WAS DRINK DRIVING, LOST CONTROL AND HIT THE ROUNDABOUT, KERB, ROAD SIGN AND KERB

CASUALTY 001 (001) (35 Yrs - M DA1) SLIGHT DRIVER/RIDER

VEHICLE 001 (000) CAR (35 Yrs - M DA1) GOING AHEAD OTHER NW TO SE JCT MID
BT - POSITIVE FRONT HIT FIRST
LEFT CWY NEARSIDE HIT ROUNDABOUT HIT RD SIGN/ATS

V001 A 410 (LOSS OF CONTROL) V001 A 501 (IMPAIRED BY ALCOHOL)

---

2 0115TD00087 WED 08/07/15 19:35 LIGHT PICARDY MANORWAY 54M NW OF J/W ANDERSON WAY 18 LINK 189-238 549870 / 179850
POLICE - AT SCENE ROAD-DRY WEATHER-FINE DUAL CWY NO JUN IN 20M NO XING FACILITY IN 50M
V1 EXCEEDING SPEED AND LOST CONTROL

CASUALTY 001 (001) (34 Yrs - M SE18) FATAL DRIVER/RIDER

VEHICLE 001 (000) M/C > 500CC (34 Yrs - M SE18) GOING AHEAD RIGHT BEND W TO SE
BT - NOT PROVD (MEDCL REASONS) SKIDDED N/S HIT FIRST
LEFT CWY NEARSIDE HIT KERB HIT RD SIGN/ATS

V001 A 410 (LOSS OF CONTROL) V001 A 306 (EXCEEDING SPEED LIMIT)
V001 A 108 (ROAD LAYOUT (EG BEND, HILL, NARROW CARRIAGEWAY)) V001 A 602 (CARELESS/RECKLESS/IN A HURRY)

---

3 0116RY10125 MON 11/01/16 19:01 DARK BRONZE AGE WAY J/W PICARDY MANOR WAY 18 LINK 189-238 549880 / 179760
POLICE - AT SCENE ROAD-DRY WEATHER-FINE ROUNDABOUT ROUNDABOUT GIVE WAY/UNCONT NO XING FACILITY IN 50M
V2 PULLED OUT NOT GIVING WAY AND HIT V1

CASUALTY 001 (002) (28 Yrs - M W7) SLIGHT DRIVER/RIDER

VEHICLE 001 (002) CAR (41 Yrs - F DA8) GOING AHEAD OTHER SW TO NE JCT MID
BT - NEGATIVE O/S HIT FIRST

VEHICLE 002 (001) PEDAL CYCLE (28 Yrs - M W7) GOING AHEAD OTHER SE TO NW JCT MID
BT - NOT APPLICABLE FRONT HIT FIRST

V001 A 302 (DISOBEYED GIVE WAY OR STOP SIGN OR MARKINGS) V001 A 405 (FAILED TO LOOK PROPERLY)
V001 A 602 (CARELESS/RECKLESS/IN A HURRY)

Norman Road GIS Area Collisions - 2015 - 2017

MD01 GIS AREA B18_Norman_Rd (P) 36 MTS TO DEC-2017 SORTED BY DATE

4 0116RY10046 THU 11/02/16 13:46 LIGHT PICARDY MANORWAY J/W BRONZE AGE WAY 18 LINK 189-238 549860 / 179780
POLICE - AT SCENE ROAD-DRY WEATHER-FINE ROUNDABOUT ROUNDABOUT GIVE WAY/UNCONT NO XING FACILITY IN 50M
V1 WAS DISTRACTED AND RODE INTO V2

CASUALTY 001 (002) (49 Yrs - M SE1) SLIGHT DRIVER/RIDER

VEHICLE 001 (002) M/C 50-125CC (27 Yrs - M) GOING AHEAD OTHER SW TO NE JCT MID
BT - NEGATIVE O/S HIT FIRST

VEHICLE 002 (001) M/C 50-125CC (49 Yrs - M SE1) GOING AHEAD OTHER SW TO NE JCT MID
BT - NEGATIVE N/S HIT FIRST

V001 A 405 (FAILED TO LOOK PROPERLY) V001 A 510 (DISTRACTION OUTSIDE VEHICLE)
V001 A 603 (NERVOUS/UNCERTAIN/ PANIC)

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5 0116RY10303 MON 25/07/16 10:41 LIGHT NFL EASTERN WAY 200 M NW J/W YARNTON WAY 18 LINK 239-725 549340 / 179880
POLICE - AT SCENE ROAD-DRY WEATHER-FINE DUAL CWY NO JUN IN 20M NO XING FACILITY IN 50M
V2 WASN'T LOOKING AND HIT THE REAR OF V1

CASUALTY 001 (001) (30 Yrs - F SE28) SLIGHT DRIVER/RIDER

VEHICLE 001 (002) CAR (30 Yrs - F SE28) GOING AHEAD OTHER NW TO SE
BT - NOT REQUESTED BACK HIT FIRST

VEHICLE 002 (001) CAR (? Yrs - M) GOING AHEAD OTHER NW TO SE
BT - DRV NOT CONTACTED FRONT HIT FIRST

V002 A 308 (FOLLOWING TOO CLOSE) V002 A 405 (FAILED TO LOOK PROPERLY)

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6 01160018192 SAT 03/09/16 21:14 DARK ON PICARDY MANORWAY, NEAR THE JUNCTION WITH BRONZE AGE WAY. 18 NODE 238 549823 / 179813
POLICE - AT SCENE ROAD-WET WEATHER-FINE ROUNDABOUT ROUNDABOUT GIVE WAY/UNCONT NO XING FACILITY IN 50M
V1 WAS SPEEDING, LOST CONTROL OF VEHICLE

CASUALTY 001 (001) (61 Yrs - M DA76) SERIOUS DRIVER/RIDER

VEHICLE 001 (000) CAR (61 Yrs - M DA76) GOING AHEAD OTHER SW TO NE JCT MID
BT - NOT REQUESTED SKID/OVER FRONT HIT FIRST
LEFT CWY OFFSIDE/REBOUND HIT ROUNDABOUT HIT OTH OBJECT

V001 A 306 (EXCEEDING SPEED LIMIT) V001 A 601 (AGGRESSIVE DRIVING)
V001 A 410 (LOSS OF CONTROL)

Norman Road GIS Area Collisions - 2015 - 2017

MD01 GIS AREA B18_Norman_Rd (P) 36 MTS TO DEC-2017 SORTED BY DATE

7 01160030627 THU 27/10/16 19:40 DARK PICARDY MANORWAY J/W BRONZE AGE WAY 18 NODE 238 549832 / 179822
POLICE - AT SCENE ROAD-DRY WEATHER-FINE ROUNDABOUT ROUNDABOUT GIVE WAY/UNCONT NO XING FACILITY IN 50M
V2 IN LEFT HAND LANE TURNING RIGHT, V1 WAS DRIVING AHEAD AND HIT V2

CASUALTY 001 (001) (20 Yrs - M SE18) SLIGHT DRIVER/RIDER

VEHICLE 001 (000) CAR (20 Yrs - M SE18) GOING AHEAD OTHER SW TO NE JCT MID
BT - NOT REQUESTED N/S HIT FIRST

VEHICLE 002 (000) OTH MOT VEH (48 Yrs - M UNKN) TURNING RIGHT SW TO SE JNY PART OF WORK JCT MID
BT - NOT REQUESTED O/S HIT FIRST

V002 B 404 (FAILED TO SIGNAL/ MISLEADING SIGNAL) V001 A 406 (FAILED TO JUDGE OTHER PERSON'S PATH OR SPEED)
V002 A 603 (NERVOUS/UNCERTAIN/ PANIC)

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8 01170021067 SAT 25/02/17 20:45 DARK PICARDY MANORWAY 10M S OF J/W ANDERSON WAY 18 LINK 238-239 549700 / 179880
POLICE - AT SCENE ROAD-WET RAINING DUAL CWY ROUNDABOUT GIVE WAY/UNCONT NO XING FACILITY IN 50M
OTHER OBJECT IN CWY

NOT KNOWN HOW COLLISION OCCURRED

CASUALTY 001 (001) (17 Yrs - M DA8) SLIGHT DRIVER/RIDER

VEHICLE 001 (000) M/C 50-125CC (17 Yrs - M DA8) GOING AHEAD OTHER S TO N JCT APP
BT - NOT REQUESTED SKID/OVER BACK HIT FIRST
HIT OTH OBJECT

VEHICLE 002 (000) M/C <= 50CC (? Yrs - U) GOING AHEAD OTHER S TO N JCT APP
BT - DRV NOT CONTACTED FRONT HIT FIRST

V001 A 103 (SLIPPERY ROAD (DUE TO WEATHER)) V002 A 406 (FAILED TO JUDGE OTHER PERSON'S PATH OR SPEED)

Norman Road GIS Area Collisions - 2015 - 2017

MD01 GIS AREA B18_Norman_Rd (P) — 36 MTS TO DEC-2017 SORTED BY DATE

9 01170024569 SAT 11/03/17 23:02 DARK YARNTON WAY 100M N OF J/W NORMAN ROAD 18 CELL 549500/179500 549690 / 179820
POLICE - AT SCENE ROAD-DRY WEATHER-FINE DUAL CWY NO JUN IN 20M PELICAN OR SIMILAR
NOT KNOWN HOW COLLISION OCCURRED

CASUALTY 001 (001) (29 Yrs - F SE10) SLIGHT PASSENGER BACK SEAT

VEHICLE 001 (000) CAR (19 Yrs - M E9) GOING AHEAD OTHER E TO W
BT - NOT REQUESTED N/S HIT FIRST

VEHICLE 002 (000) CAR (32 Yrs - M SE18) GOING AHEAD OTHER E TO W
BT - NOT REQUESTED O/S HIT FIRST

V001 A 601 (AGGRESSIVE DRIVING)
V001 A 902 (VEHICLE IN COURSE OF CRIME)
V001 A 901 (STOLEN VEHICLE)
V001 B 502 (IMPAIRED BY DRUGS (ILLICIT OR MEDICINAL))

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10 01170043386 FRI 16/06/17 16:35 LIGHT BRONZE AGE WAY J/W PICARDY MANORWAY 18 LINK 189-238 549910 / 179780
POLICE - AT SCENE ROAD-DRY WEATHER-FINE ROUNDABOUT ROUNDABOUT GIVE WAY/UNCONT NO XING FACILITY IN 50M
NOT KNOWN HOW COLLISION OCCURRED

CASUALTY 001 (001) (48 Yrs - F BR3) SLIGHT DRIVER/RIDER

VEHICLE 001 (000) CAR (48 Yrs - F BR3) TURNING RIGHT SE TO NW JCT APP
BT - NEGATIVE FRONT HIT FIRST

VEHICLE 002 (000) CAR (45 Yrs - M ME8) GOING AHEAD OTHER NW TO SE LEAVING R'ABOUT
BT - NEGATIVE N/S HIT FIRST

V001 B 405 (FAILED TO LOOK PROPERLY)
V001 A 406 (FAILED TO JUDGE OTHER PERSON'S PATH OR SPEED)
V002 B 405 (FAILED TO LOOK PROPERLY)
V002 A 406 (FAILED TO JUDGE OTHER PERSON'S PATH OR SPEED)

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11 01170050392 TUE 25/07/17 11:19 LIGHT NORMAN ROAD 20M N OF J/W A2016 18 LINK 238-239 549651 / 179925
POLICE - AT SCENE ROAD-DRY WEATHER-FINE SINGLE CWY T/STAG JUN GIVE WAY/UNCONT NO XING FACILITY IN 50M
NOT KNOWN HOW COLLISION OCCURRED

CASUALTY 001 (001) (28 Yrs - M E5) SLIGHT PEDESTRIAN IN ROAD - NOT CROSSING STANDING IN RD NOT CROSSING

VEHICLE 001 (000) CAR (47 Yrs - F SE6) TURNING LEFT N TO S JCT MID
BT - DRV NOT CONTACTED N/S HIT FIRST

C001 A 999 (OTHER FACTOR)

Norman Road GIS Area Collisions - 2015 - 2017

MD01 GIS AREA B18_Norman_Rd (P) 36 MTS TO DEC-2017 SORTED BY DATE

12 01170056995 SAT 02/09/17 23:17 DARK BRONZE AGE WAY J/W PICARDY MANOR WAY 18 NODE 238 549856 / 179819
POLICE - AT SCENE ROAD-DRY WEATHER-FINE ROUNDABOUT ROUNDABOUT GIVE WAY/UNCONT NO XING FACILITY IN 50M
NOT KNOWN HOW COLLISION OCCURRED

CASUALTY 001 (001) (40 Yrs - M SE28) SLIGHT DRIVER/RIDER
CASUALTY 002 (001) (9 Yrs - M SE28) SLIGHT PASSENGER FRONT SEAT
CASUALTY 003 (002) (57 Yrs - M DA7) SLIGHT DRIVER/RIDER
CASUALTY 004 (002) (41 Yrs - M DA7) SLIGHT PASSENGER FRONT SEAT

VEHICLE 001 (000) CAR (40 Yrs - M SE28) SLOWING OR STOPPING SW TO NW
BT - NEGATIVE FRONT HIT FIRST

VEHICLE 002 (000) CAR (57 Yrs - M DA7) TURNING RIGHT NE TO W JNY PART OF WORK LEAVING R'ABOUT
BT - NEGATIVE N/S HIT FIRST
LEFT CWY NEARSIDE HIT ROUNDABOUT HIT OTH OBJECT
V001 A 405 (FAILED TO LOOK PROPERLY)

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13 01170060029 WED 20/09/17 22:15 DARK NORMAN ROAD 200M N OF J/W PICARDY MANORWAY 18 CELL 549500/180000 549650 / 180110
POLICE - AT SCENE ROAD-DRY WEATHER-FINE SINGLE CWY NO JUN IN 20M NO XING FACILITY IN 50M
NOT KNOWN HOW COLLISION OCCURRED

CASUALTY 001 (001) (26 Yrs - M DA18) SLIGHT DRIVER/RIDER
CASUALTY 002 (001) (24 Yrs - M SE3) SLIGHT PASSENGER FRONT SEAT

VEHICLE 001 (000) CAR (26 Yrs - M DA18) GOING AHEAD RIGHT BEND N TO N
BT - NEGATIVE OVERTURN FRONT HIT FIRST
LEFT CWY OFFSIDE/REBOUND HIT KERB HIT OTH OBJECT
V001 A 602 (CARELESS/RECKLESS/IN A HURRY) V001 A 410 (LOSS OF CONTROL)
V001 A 306 (EXCEEDING SPEED LIMIT)

Norman Road GIS Area Collisions - 2015 - 2017

MD01 GIS AREA B18_Norman_Rd (P) 36 MTS TO DEC-2017 SORTED BY DATE

14 01170066326 WED 25/10/17 07:48 LIGHT YARNTON WAY J/W A2016 18 NODE 239 549570 / 179800

POLICE - AT SCENE ROAD-WET WEATHER-FINE ROUNDABOUT ROUNDABOUT GIVE WAY/UNCONT NO XING FACILITY IN 50M

NOT KNOWN HOW COLLISION OCCURRED

CASUALTY 001 (001) (22 Yrs - F ME2) SLIGHT DRIVER/RIDER

VEHICLE 001 (000) CAR (22 Yrs - F ME2) GOING AHEAD OTHER N TO S COMM TO/FROM WORK LEAVING R'ABOUT
BT - NOT REQUESTED SKIDDED N/S HIT FIRST

VEHICLE 002 (000) GDS =< 3.5T (? Yrs - M UNKN) CHANGE LANE TO RIGHT N TO S LEAVING R'ABOUT
BT - NOT REQUESTED O/S HIT FIRST
FOREIGN REG LHD

V002 A 403 (POOR TURN OR MANOEUVRE) V002 A 305 (ILLEGAL TURN OR DIRECTION OF TRAVEL)
V002 A 406 (FAILED TO JUDGE OTHER PERSON'S PATH OR SPEED)

End of Accidents for MD01 GIS AREA B18_Norman_Rd (P)

End of Report

Norman Road GIS Area Collisions - 2015 - 2017

Summary of Accidents Selected

Site Reference and Description (zero accident counts shown in bold)	Date Period	Accidents
MD01 GIS AREA B18_Norman_Rd (P)	36 MTS TO DEC-2017	14

The description of how the accident occurred and the contributory factors are the reporting officer's opinion at the time of reporting and may not be the result of extensive investigation

Norman Road GIS Area Collisions - 2015 - 2017

MD01 GIS AREA B18_Norman_Rd (P) — 36 MTS TO DEC-2017 SORTED BY DATE

	1	2	3	4	5	6	7	8	9	10
Accident Reference	0115RY10065	0115TD00087	0116RY10125	0116RY10046	0116RY10303	01160018192	01160030627	01170021067	01170024569	01170043386
Day	SUNDAY	WEDNESDAY	MONDAY	THURSDAY	MONDAY	SATURDAY	THURSDAY	SATURDAY	SATURDAY	FRIDAY
Date	22/02/2015	08/07/2015	11/01/2016	11/02/2016	25/07/2016	03/09/2016	27/10/2016	25/02/2017	11/03/2017	16/06/2017
Time	01:55	19:35	19:01	13:46	10:41	21:14	19:40	20:45	23:02	16:35
Light Conditions	DARK	LIGHT	DARK	LIGHT	LIGHT	DARK	DARK	DARK	DARK	LIGHT
Road Surface	DRY	DRY	DRY	DRY	DRY	WET	DRY	WET	DRY	DRY
Severity	SLIGHT	FATAL	SLIGHT	SLIGHT	SLIGHT	SERIOUS	SLIGHT	SLIGHT	SLIGHT	SLIGHT
Conflict										
Pedestrian Location										
Contributory Factors (* denotes pre 2005)	410 V001 A 501 V001 A	410 V001 A 306 V001 A 108 V001 A 602 V001 A	302 V001 A 405 V001 A 602 V001 A	405 V001 A 510 V001 A 603 V001 A	308 V002 A 405 V002 A	306 V001 A 601 V001 A 410 V001 A	404 V002 B 406 V001 A 603 V002 A	103 V001 A 406 V002 A	601 V001 A 901 V001 A 902 V001 A 502 V001 B	405 V001 B 405 V002 B 406 V001 A 406 V002 A
Easting/Northing	549530 179820	549870 179850	549880 179760	549860 179780	549340 179880	549823 179813	549832 179822	549700 179880	549690 179820	549910 179780

Pedestrian	1	7 %
Wet	3	21 %
Dark	8	57 %

Site Diagram

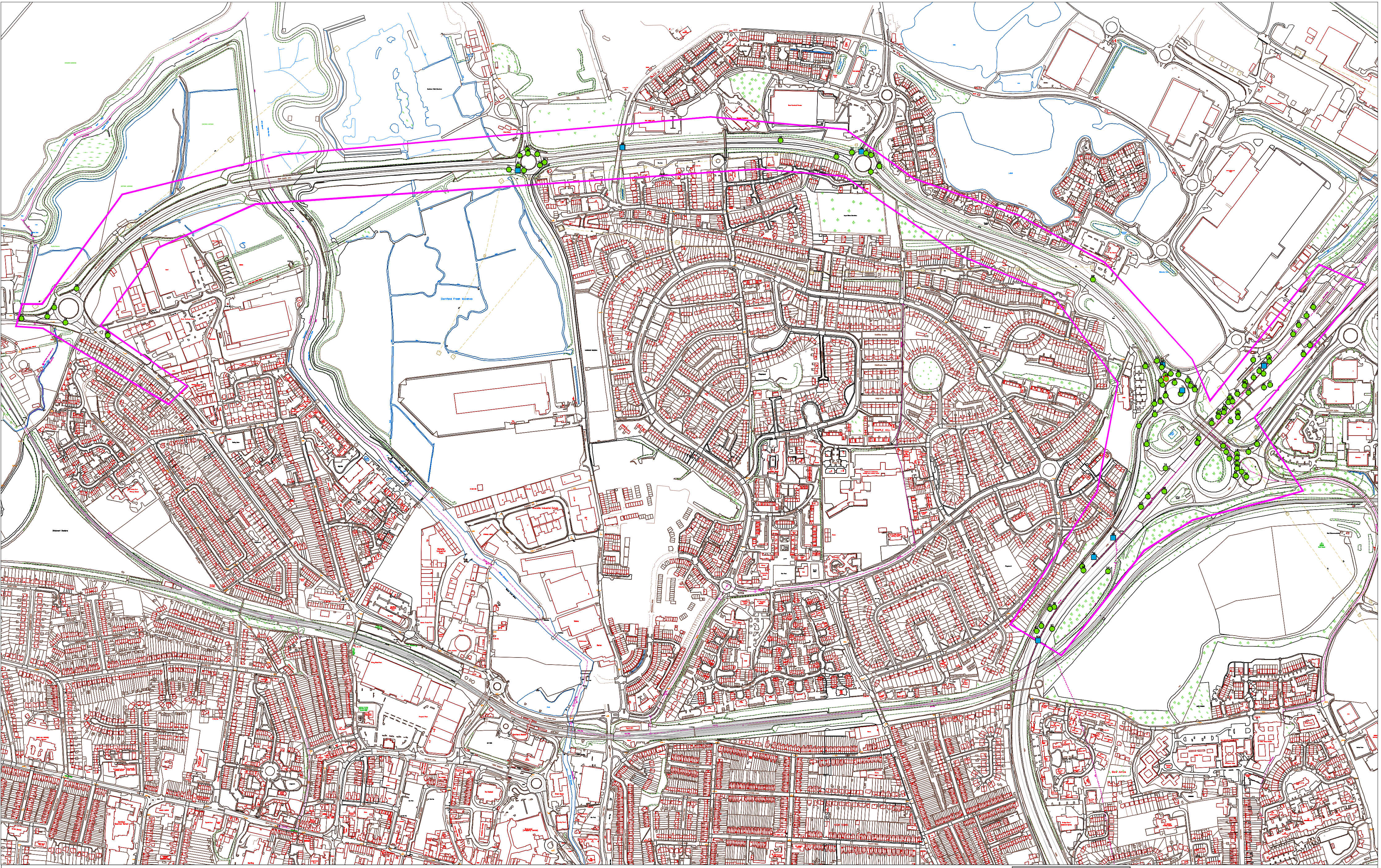
N

Severity / Months To	12 12/2015	12 12/2016	12 12/2017	Total	Pct
Fatal	1	0	0	**1**	**7.1 %**
Serious	0	1	0	**1**	**7.1 %**
Slight	1	4	7	**12**	**85.7 %**
Total	**2**	**5**	**7**	**14**	
Pct	**14.3 %**	**35.7 %**	**50.0 %**		

Norman Road GIS Area Collisions - 2015 - 2017

MD01 GIS AREA B18_Norman_Rd (P) — 36 MTS TO DEC-2017 SORTED BY DATE

	11	12	13	14
Accident Reference	01170050392	01170056995	01170060029	01170066326
Day	TUESDAY	SATURDAY	WEDNESDAY	WEDNESDAY
Date	25/07/2017	02/09/2017	20/09/2017	25/10/2017
Time	11:19	23:17	22:15	07:48
Light Conditions	LIGHT	DARK	DARK	LIGHT
Road Surface	DRY	DRY	DRY	WET
Severity	SLIGHT	SLIGHT	SLIGHT	SLIGHT
Conflict				
Pedestrian Location	0			
Contributory Factors (* denotes pre 2005)	999 C001 A	405 V001 A	602 V001 A 410 V001 A 306 V001 A	403 V002 A 305 V002 A 406 V002 A
Easting/Northing	549651 179925	549856 179819	549650 180110	549570 179800



Location: A206 Dartford

3 years personal injury crash data up to 30/09/2017

KCC Ref number: EXT/396/18

Crash Severity

- Slight
- Serious
- Fatal

N

Kent County Council
kent.gov.uk

Title: **A206 Dartford**

Requested output:**D - Print Crash Report**

Date: 24-August-2018

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

There were 107 reported crashes resulting in injury

D-PRINT CRASH REPORT

24-Aug-2018
10:14:51

A206 Dartford

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
1	**Road No A206 Grid 554293E** **Section 031 Ref 175706N**	SLIGHT	07/10/2014	3	17:15	L	Dry	Fine		S.VEH +VE	
	A206 Bob Dunn Way Jw Joyce Green Lane, Dartford, Kent								Dartford		
	V1 Driving Along Bob Dunn Way Approaches Roundabout Mounts the Roundabout, Vehicle then Rolls and Ends up on its Side on Grass Bank						Veh1, car, W -> E				Casualties 1 Vehicles 1
2	**Road No A282 Grid 556024E** **Section 010 Ref 175198N**	SLIGHT	08/10/2014	4	13:05	L	Wet/Damp	Fine			
	A282 Dartford Tunnel Toll Bridge, Lane 27, Dartford Kent								Dartford		
	V2 was in Lane 27 in Queue for Dartford Tunnel. V1 Reversed to Check Coins in Tray and then Hit the Accelerator and Reversed into V2.						Veh1, car, SW -> NE Veh2, car, NE -> SW				Casualties 1 Vehicles 2
3	**Road No A206 Grid 555110E** **Section 034 Ref 175668N**	SLIGHT	02/11/2014	1	16:00	L	Wet/Damp	Rain			
	Bob Dunn Way Jw Marsh Street, Dartford								Dartford		
	V2 on Roundabout in left Hand Lane. V1 in right Hand Lane. V1 Swerved into V2's Lane Causing V2 to Turn Sharply Away into the Kerb and then to Central Reservation. V1 Not Hit Non Stop, no Details						Veh1, car, E -> W Veh2, car, E -> W				Casualties 2 Vehicles 2
4	**Road No A282 Grid 555981E** **Section 010 Ref 175179N**	SLIGHT	04/11/2014	3	17:45	DRK STL	Wet/Damp	Rain			GV
	A282, Dartford, Kent (Mapped to 555980/175170)								Dartford		
	V1 was Joining from Slip Road Towards Tunnel Approach. V2 was in Lane 2. V1 Expected V2 to Give Way to Allow it to Join the Main Carriageway but V2 Did Not Give Way and both Vehicles Made Contact Causing Minor Damage as Very Low Speed Due to Heavy Traffic.						Veh1, goods < 3.5t, SW -> NE Veh2, car, SW -> NE				Casualties 2 Vehicles 2

Key

Involved
- *PED* — *Pedestrian*
- *HGV* — *Heavy Goods Vehicle*
- *GV* — *Goods Vehicle*
- *M/C* — *Motor Cycle*
- *P/C* — *Pedal Cycle*
- *PSV* — *Bus/Coach*

Street Lighting
- *L* — *Daylight*
- *STL* — *Street Lights*
- *USL* — *Street LIghts Unlit*
- *NSL* — *No Street Lights*
- *STU* — *Street Lights Unknown*

FACTORS
- *+VE* — *Positive Breath Test*
- *R.TURN* — *Right Turn Manoeuvre*
- *O/TAKE* — *Overtaking Manoeuvre*
- *S.VEH* — *Single Vehicle*

Special Conditions
- *ATS OUT* — *Traffic Lights Not Working*
- *ATS DEF* — *Traffic Lights Defective*
- *SIGNS* — *Road Signs Defective or Obscurred*
- *RD WRKS* — *Road Works*
- *Surface* — *Road Surface Defective*

D-PRINT CRASH REPORT

24-Aug-2018
10:14:51

A206 Dartford
Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
5	**Road No A282 Grid 556037E Section 010 Ref 175232N**	SLIGHT	05/11/2014	4	06:45	L	Wet/Damp	Fine			GV
	A282, B C/Way, Tunnel Approach, Dartford, Kent (Mapped to 556030/175230)								Dartford		
	Veh 1 Travelling in Lane 4 (Of 4) A282 B C/Way Approx 200M Prior to Toll Booths, Tunnel Approach. Vehs 2 & 3 which Were Travelling in Front of Veh 1 Slowed/Stopped Due to Queueing Traffic Ahead. Veh 1 was Unable to Stop and Collided with Rear of Veh 2, Pushing it Forwards into Rear of Veh 3.						Veh1, goods < 3.5t, SW -> NE Veh2, car, S -> N Veh3, car, S -> N				Casualties 1 Vehicles 3
6	**Road No A206 Grid 555989E Section 266 Ref 175016N**	SLIGHT	07/11/2014	6	08:33	L	Wet/Damp	Rain Wind			M/C
	A206, Roundabout Jw A206, Crossways Boulevard, Dartford								Dartford		
	V1 and V2 Were on the Roundabout Junction with Cotton Lane and Crossways Boulevard. V2 Pulled off from the right and Filtered into the left Hand Lane to Go Back on to A206 Crossways Boulevard. V1 Has then Pulled Along Side the Van in the Same Lane Colliding with Front Offside of Vehicle.						Veh1, m/cycle 50 - 125cc, S -> NE Veh2, car, S -> NE				Casualties 1 Vehicles 2
7	**Road No A206 Grid 555973E Section 266 Ref 174970N**	SLIGHT	13/11/2014	5	16:15	L	Dry	Fine			HGV
	A282 Roundabout, Jct with A206 and B3228, Dartford, Kent								Dartford		
	the Lights Turned Green & All Lanes Began Entering the Roundabout. V1 was in the Correct Lane for Their Exit. V2 Came from Behind on the Inside and Drove into the Back right of V1 into the Path of Traffic on the Left. After V2 Had Collided with V1 V2 Kept Driving and Pushing V1 out of the Way. V2 then Got Past V1 in Front of V1 and Drove off and left the Roundbout as Soon and V2 Could.						Veh1, car, S -> E Veh2, goods > 7.5t, S -> E				Casualties 1 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

24-Aug-2018
10:14:51

A206 Dartford

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
8	**Road No A282 Grid 555869E** **Section 010 Ref 175037N**	SLIGHT	24/11/2014	2	06:33	L	Wet/Damp	Fine			
	A282 'B' Carriageway, Marker Post 5/6, Dartford, Kent								Dartford		
	Veh 1 Collided with Rear of Veh 2 in Slowing Traffic Causing Veh 2 to Collide with Rear of Veh 3.						Veh1, car, SW -> NE Veh2, car, SW -> NE Veh3, car, SW -> NE				Casualties 3 Vehicles 3
9	**Road No A206 Grid 555789E** **Section 010 Ref 175172N**	SLIGHT	02/12/2014	3	09:10	L	Wet/Damp	Rain			
	A206, Bob Dunn Way, Roundabout Jw A282, Dartford, Kent								Dartford		
	Veh 2 Came off at A282 and was on the Roundabout Ready to Go Along Bob Dunn Way when Veh 1 Came Speeding Round the Roundabout and Hit Veh 2. both Stopped then when Driver 2 Asked for Details Driver 1 Said 'I'm Calling the Police' and Drove Off. Driver 2 Has Pain in Back and Neck 170 Not Complied With.						Veh1, car, SE -> NW Veh2, car, SE -> NW				Casualties 1 Vehicles 2
10	**Road No A206 Grid 555962E** **Section 010 Ref 174999N**	SLIGHT	03/12/2014	4	18:08	DRK STL	Dry	Fine			HGV
	A206 Jw A282 Crossways Boulevard, Roundabout, Dartford								Dartford		
	V1 was on the Main Roundabout and Changed Lanes to the Nearside, V1 Collided with V2 Whilst on the Roundabout Causing Minor Damage to V1 Nearside Front Wing. V2 Failed to Stop at the Scene. Driver of V1 Suffered Minor Shock but Secas Declined. no Details of V2 Acquired Only Described as an Hgv.						Veh1, car, SW -> SE Veh2, goods 3.5 - 7.5t, SW -> NE				Casualties 1 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

24-Aug-2018
10:14:51

A206 Dartford
Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
11	**Road No A282 Grid 556000E Section 010 Ref 175230N**	SLIGHT	03/12/2014	4	16:29	DRK STL	Dry	Fine			GV
	A282, Dartford Tunnel Approach								Dartford		
	this is a Three Vehicle Minor Injury Rtc Where All Vehicles Are Queuing for the Toll Booths at the Drc. Vehicle One Hits Vehicle Two which in Turn Hits Vehicle Three. Injuries Are Minor Seat Belt Aches, Not in the Public Interest to Support a Prosecution for Careless.					Veh1, goods < 3.5t, SW -> NE Veh2, car, SW -> NE Veh3, car, SW -> NE					Casualties 3 Vehicles 3
12	**Road No A206 Grid 555930E Section 266 Ref 175030N**	SLIGHT	15/12/2014	2	18:50	DRK STL	Wet/Damp	Fine		S.VEH	M/C
	A206 Bridge at Junction 1A, Dartford, Kent								Dartford		
	Veh 1 Has Come Round the Roundabout Heading for Bob Dunn Way and Has Collided with the Kerb Causing the Bike to Fall and Caused the Rider Injury.					Veh1, m/cycle > 500cc, E -> W					Casualties 1 Vehicles 1
13	**Road No A206 Grid 555965E Section 266 Ref 175011N**	SLIGHT	18/12/2014	5	13:50	L	Dry	Fine			HGV
	A206 Bob Dunn Way at J/W Crossways Boulevard (Crossways Roundabout) Dartford Kent								Dartford		
	from A206 Bob Dunn Way to Crossways Roundabout on 18/12/14 at About 13:50 Hours, V1 Hit the Front right Hand Side of V2. V1 Driver Stopped and Exchanged Details. There is a Lot of Damage to the Front Bodywork but the Car was Driveable from the Scene. V2 Driver Suffered Pain in Back and Shoulder from the Incident Once at Home.					Veh1, goods > 7.5t, NW -> SE Veh2, car, NW -> SE					Casualties 1 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

A206 Dartford

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
14	**Road No A206 Grid 555817E Section 010 Ref 175177N**	SLIGHT	08/01/2015	5	20:30	DRK STL	Dry	Fine		O/TAKE	
	A206 Bob Dunn Way, Crossways, Near Dartford Crossing, Dartford, Kent								Dartford		
	V2 was Driving Towards Roundabout when V1 Overtook from Inside Lane, Cutting in Front of V2, Collided and Failed to Stop.						Veh1, car, NW -> NE Veh2, car, NW -> SE				Casualties 1 Vehicles 2
15	**Road No A206 Grid 553210E Section 026 Ref 175352N**	SLIGHT	11/01/2015	1	20:30	DRK STL	Dry	Fine			
	A206, Thames Road Jw A206 Bob Dunn Way, Dartford, Kent								Dartford		
	V1 Following Behind V2, Approaching R/A/B, V2 Stopped in Feeder Lane, V1 Failed to Stop in Time and Went into Rear of V2.						Veh1, car, W -> NE Veh2, car, W -> NE				Casualties 1 Vehicles 2
16	**Road No A282 Grid 556124E Section 010 Ref 175333N**	SLIGHT	23/01/2015	6	18:49	DRK STL	Wet/Damp	Fine		O/TAKE	HGV
	A282, Mp 5/2 Dartford River Crossing Tolls, Dartford								Dartford		
	V1 and V2 Heading Towards Tolls Towards Essex (G) Drv. V2 Passed V1 on V1's left (Slowly Undertook). as V2 Passed, V1 Indicated left and Went to Change Lane, Hitting Rear Offside Corner Causing V2 to Spin and Front of V1 Pushing V2 Sidewards down Carriageway for Approx 30 Metres						Veh1, goods > 7.5t, SW -> NE Veh2, car, SW -> NE				Casualties 1 Vehicles 2
17	**Road No A282 Grid 555727E Section 010 Ref 175077N**	SLIGHT	27/01/2015	3	19:01	DRK STL	Dry	Fine			
	A282 Slip Road to Bob Dunn Way, Dartford (Mapped to Grid Ref)								Dartford		
	V1 Approaching Red Light for Roundabout on Fast Slip Road. V1 Came to an Abrupt a Halt in Front of V2. V2 was Coming up Fast on the Slip Road and Due to V1's Abrupt Stop Hit Rear of V1. Sec 170 Complied with at Scene.						Veh1, car, SW -> NE Veh2, car, SW -> NE				Casualties 1 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

24-Aug-2018
10:14:51

A206 Dartford
Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
18	**Road No A206 Section 010** **Grid 555937E Ref 175016N**	SLIGHT	16/02/2015	2	17:28	DRK STL	Wet/Damp	Rain			HGV
	A206 Close to Jw with A282 A, Dartford Kent (Mapped to Grid Ref)								Dartford		
	V2 on Main A206 Travelling Towards Crayford. V1 Has Come on from Roundabout, in Heavy Slow Moving Traffic . V2 Not Seen Under O/S Mirror of V1 and They Have Collided. Allegations That V2 Had no Lights on at the Time of Impact.						Veh1, goods > 7.5t, SE -> NW Veh2, car, SE -> NW				Casualties 1 Vehicles 2
19	**Road No A282 Section 010** **Grid 556132E Ref 175264N**	SLIGHT	16/02/2015	2	19:06	DRK STL	Wet/Damp	Rain			HGV
	A282 Coast Bound, Dartford, Kent. (Mp Not Available, Mapped to 556130,175270)								Dartford		
	Vehicles 1, 2 and 3 Travelling South West Along the A282 (A). V1 Changes Lane from (Believed) Lane 1 to Right, Colliding with V2 which in Turn Collides with V3. V3 Also Collides with Central Reservation.						Veh1, goods > 7.5t, NE -> SW Veh2, car, NE -> SW Veh3, car, NE -> SW				Casualties 1 Vehicles 3
20	**Road No A282 Section 010** **Grid 555946E Ref 175131N**	SLIGHT	19/02/2015	5	19:55	L	Dry	Fine			HGV
	A282, Slip Road, Junction 1A								Dartford		
	****Details Taken by South Yorkshire Police ***** Veh 2 is Crawling in Traffic on Slip Road to Merge onto A282 Jct 1A Veh 1 is Behind Veh 2 and Pushes it Along. Veh 1 Shunts Veh 2 a Total of 4 Times. Veh 1 Manages to Pull out of the Way of Veh 1 onto the Hatchings/Roadworks on the Offside. as Veh 2 Pulls to the Side Veh 1 Clips the Nearside of Veh 2. Veh 1 Continues on Without Stopping.						Veh1, goods > 7.5t, SW -> NE Veh2, car, SW -> NE				Casualties 2 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

A206 Dartford

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
21	**Road No A206 Grid 553130E Section 026 Ref 175326N**	SLIGHT	21/02/2015	7	20:10	DRK STL	Wet/Damp	Fine			
	A206 Thames Road 100 M West Jw Bob Dunn Way, Dartford, Kent								Dartford		
	V1 Travelling East Along 1St Rd. V2 Travelling West Along 1St Rd. V1 Loses Control Due to Diesel Spillage on Road and Veers across Carriageway into Path of V2						Veh1, car, W -> E Veh2, car, E -> W				Casualties 1 Vehicles 2
22	**Road No A282 Grid 555530E Section 008 Ref 174651N**	SLIGHT	06/03/2015	6	16:10	L	Dry	Fine			
	A282 B, Mp 6/1 Dartford, Kent								Dartford		
	V1 Travelling in Lane 1 Alongside V2 which was Travelling in Lane 2. V1 Collided with Front Nearside of V2 Causing V1 to Spin and Lose Control, Whilst Doing So V1 Collided with Vehs 3 + 4. D1 Vehicle Seized, Dl Record Shows Revoked by Dvla. Reported at Scene and Tor Issued						Veh1, car, SW -> NE Veh2, car, SW -> NE Veh3, car, SW -> NE Veh4, car, SW -> NE				Casualties 1 Vehicles 4
23	**Road No A282 Grid 555873E Section 010 Ref 175047N**	SLIGHT	08/03/2015	1	00:20	DRK STL	Dry	Fine			M/C
	A282, B C/Way, Mp 5/3, Dartford, Kent (Mapped to 555870/175040)								Dartford		
	V2 Braked and V1 Collided with Rear of V2.						Veh1, car, SW -> NE Veh2, m/cycle > 500cc, SW -> NE				Casualties 1 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

24-Aug-2018
10:14:51

A206 Dartford

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
24	**Road No A282 Grid 555919E Section 010 Ref 175103N**	SLIGHT	23/03/2015	2	07:10	L	Dry	Fine			HGV
	A282 Leading to Queen Elizabeth Bridge Tolls, Dartford, Kent								Dartford		
	X2 Vehicle Rta. Very Minor Damage to both Vehicles. X1 Very Minor Injury to Driver of V2 Taken as a Precaution. V1 was Changing Lanes from the right to the Left. V2 was in the Blind Spot. V1 Clipped V2 Causing Very Minor Damage. both Vehicles Driven to the Ab-Load Bay at the River Corssing to Exchange Details. Hgv Blind Spot Rta.						Veh1, goods > 7.5t, NE -> SW Veh2, car, NE -> SW				Casualties 1 Vehicles 2
25	**Road No A282 Grid 555944E Section 010 Ref 175130N**	SLIGHT	24/03/2015	3	07:36	L	Wet/Damp	Rain			HGV
	A282 200 Metres North of A206, Dartford, Kent								Dartford		
	V2 was Travelling in Lane 3 of 4. a Lorry Has Struck V2 on the Nearside Causing V2 to Spin across Lanes and Go over Barrier on Nearside. V1 Failed to Stop. V2 Came to Rest off the Carriageway on its Side.						Veh1, goods > 7.5t, NE -> SW Veh2, car, NE -> SW				Casualties 1 Vehicles 2
26	**Road No A206 Grid 553262E Section 026 Ref 175396N**	SLIGHT	28/03/2015	7	13:30	L	Dry	Fine Wind			
	A206 Bob Dunn Way, 10M East of Roundabout Jw A2026 Burnham Road, Dartford, Kent								Dartford		
	V2 was Positioned on Lane 1 of 2 Filtering from the Roundabout onto Bob Dunn Way. V1 was Positioned in Lane 2 of 2 Filtering Also onto Bob Dunn Way. it Has Been Alleged That V1 was Filtered onto Bob Dunn Way then Changed Lanes onto Lane 1 of 2, Causing V2 to Brake, Lose Control and Collide with the Central Barrier. V1 Failed to Stop, no Contact Made with V2. V2 Passenger and Driver Checked by Secas, Vehicle Recovered and Highways Notified of Damage to Barrier. Patrol Came across Incident.						Veh1, car, SW -> NE Veh2, car, SW -> NE				Casualties 1 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

A206 Dartford

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
27	**Road No A206 Grid 555110E** **Section 034 Ref 175707N**	SLIGHT	10/04/2015	6	13:35	L	Dry	Fine			HGV
	University Way Jw Marsh Street, Dartford, Kent								Dartford		
	V2 was Stationary at the Junction. V1 was Travelling Along University Way but was Stationary. an Uninvolved Vehicle Pulls out in Front of V1 and then V2 Follows. with this V1 Moves Forward and Collides with Driver's Side of V2. V2 is then Pulled Along in the Direction V1 is Travelling, Approximately 2-3 Metres. Driver of V2 Has Suffered a Minor Hand Injury in the Process.					Veh1, goods 3.5 - 7.5t, W -> E Veh2, car, N -> S					Casualties 1 Vehicles 2
28	**Road No A282 Grid 555966E** **Section 010 Ref 175096N**	SLIGHT	17/04/2015	6	15:55	L	Dry	Unknown			
	A282 Junction 1A Jw A206 Dartford, Kent								Dartford		
	V2 Stationary in Traffic Waiting to Leave A282 at Junct 1A when V1 Hit V2 from Behind. Highways Agency Officer Approached and Advised Drivers to Find Suitable Place to Stop and Exchange Details but V1 Drove Off.					Veh1, car, NE -> SW Veh2, car, NE -> SW					Casualties 1 Vehicles 2
29	**Road No A282 Grid 555933E** **Section 010 Ref 175116N**	SLIGHT	17/04/2015	6	12:05	L	Dry	Fine			HGV
	A282 Tunnel Approach J/W A206, Dartford								Dartford		
	V1,2 and 3 Travelling in Slow Moving Stop-Start Traffic. V1 Hit V2 in the Rear and V2 Hit the Rear of V3.					Veh1, goods > 7.5t, SW -> NE Veh2, car, SW -> NE Veh3, car, SW -> NE					Casualties 1 Vehicles 3

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

A206 Dartford
Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
30	**Road No A282 Grid 555602E Section 008 Ref 174749N**	SLIGHT	22/04/2015	4	11:05	L	Dry	Fine			HGV
	A282 Approaching Tunnel, Dartford								Dartford		
	X2 Vehicle Rta X1. Minor Injury V1, a left Hand Drive Hgv was Trying to Change Lane's. V2 , a left Hand Drive Small Car - was in V1's Blind Spot. V1 Collided with V2. Very Minor Damage to both Vehicles. the Casualty was Taken to Hospital as a Precaution.						Veh1, goods > 7.5t, SW -> NE Veh2, car, SW -> NE				Casualties 1 Vehicles 2
31	**Road No F2661 Grid 555848E Section 266 Ref 175182N**	SLIGHT	16/05/2015	7	18:00	L	Dry	Fine			
	Bob Dunn Way Jw Littlebrook Interchange, Dartford, Kent (Mapped to Grid Ref)								Dartford		
	V1 and V2 Travelling on University Way Towards M25 at Roundabout with Bob Dunn Way and Littlebrook Interchange. V1 was in Lane 2 at Roundabout and V2 was in Lane 3 on Roundabout. V1 Realised They Were in Wrong Lane and Tried to Move to Their Right, Caused to Stop by Red Traffic Light and Collided with Side of V2.						Veh1, car, NW -> SE Veh2, car, NW -> SE				Casualties 1 Vehicles 2
32	**Road No A282 Grid 556025E Section 010 Ref 175166N**	SLIGHT	22/05/2015	6	13:55	L	Dry	Fine			
	A282 Dartford Tunnel Crossing Toll Booth Approach								Dartford		
	Whilst Queuing for the Tolls V2 Has Been Struck to the Rear by V1 Causing V2 Driver to Have Slight Back Pain. Drivers Talked to Each Other but Did Not Swap Details						Veh1, car, NE -> SW Veh2, car, NE -> SW				Casualties 1 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

24-Aug-2018
10:14:51

A206 Dartford
Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
33	**Road No A206 Grid 555066E** **Section 034 Ref 175713N**	SLIGHT	28/06/2015	1	16:15	L	Dry	Fine			P/C
	A206, University Way Roundabout Jw Marsh Street, Dartford, Kent								Dartford		
	V2 was at A206 Roundabout Waiting to Move off in the right Hand Lane when V1 Has Come from Behind and Hit V2 Knocking Cyclist off and into the Road						Veh1, car, NW -> SE Veh2, pedal cycle, NW -> SE				Casualties 1 Vehicles 2
34	**Road No A206 Grid 555094E** **Section 034 Ref 175712N**	SERIOUS	09/07/2015	5	16:50	DRK NSL	Dry	Fine		S.VEH	M/C
	A206 Bob Dunn Way j/w Marsh Street, Dartford, Kent								Dartford		
	V1 Driving Eastbound Along Bob Dunn Way Dartford Approached Roundabout j/w Marsh Street. Slips on Oil/Diesel on Roundabout, Comes off and Injured. no Other Vehicles Involved						Veh1, m/cycle > 500cc, W -> E				Casualties 1 Vehicles 1
35	**Road No A282 Grid 555629E** **Section 008 Ref 174771N**	SERIOUS	25/07/2015	7	00:20	DRK STL	Frost/Ice	Fine		S.VEH	
	A282, Carriageway, Dartford, Kent (Mapped to 555620/174730)								Dartford		
	Single Vehicle Rtc. Injury Sustained. During Torrential Rain & Night Time V1 Travelling in Lane 2 or 3. V1 Attempted to Change Direction and Aquaplaned, Losing Control, Striking the Off-Side Armco Barrier. no Air Bags Activated.						Veh1, car, SW -> NE				Casualties 2 Vehicles 1
36	**Road No A282 Grid 556036E** **Section 010 Ref 175236N**	SLIGHT	29/07/2015	4	02:50	DRK STU	Dry	Fine		+VE	HGV
	A282 Dartford Tunnel Approach (Mapped to 555960,175310)								Dartford		
	D1 was Eba. V1 Collided with Parked Stationary V2 Motorway Maintenance Vehicle.						Veh1, car, SW -> NE Veh2, goods > 7.5t, P -> P				Casualties 1 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

24-Aug-2018
10:14:51

A206 Dartford

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
37	**Road No A282 Grid 556001E** **Section 010 Ref 175189N**	SLIGHT	22/08/2015	7	23:14	DRK STL	Dry	Fine			M/C
	A282, Dartford, Kent (Mapped to 556000/175180)								Dartford		
	V1 Has Been Sat in Static Traffic on A282 Towards Essex. Driver Notes People Are out of Their Cars Walking About in the Carriageway, So Without Looking or Checking Mirrors Driver Opens Drivers Door into the Path of V2 , a Filtering M/C Causing V2 to Crash into V3.						Veh1, car, SW -> NE Veh2, m/cycle > 500cc, SW -> NE Veh3, car, SW -> NE				Casualties 1 Vehicles 3
38	**Road No A282 Grid 555537E** **Section 008 Ref 174655N**	SLIGHT	28/08/2015	6	07:55	L	Dry	Fine			
	A282, Near Mp 6/1, Dartford, Kent								Dartford		
	V2 Has Been Struck on the Rear Nearside Corner and then Spun by V1 which Made off from Scene Without Exchanging Details						Veh1, car, SW -> NE Veh2, car, SW -> NE				Casualties 1 Vehicles 2
39	**Road No A206 Grid 555785E** **Section 037 Ref 175182N**	SLIGHT	19/09/2015	7	20:20	DRK STL	Dry	Fine			HGV
	A206 Bob Dunn Way Littlebrook Interchange Rdbt, Dartford								Dartford		
	V1 is a Foreign Registered Freight Lorry. as V2 Has Indicated to Leave the Roundabout from the A282 Exit V1 Has Cut across into Lane 1 and Has Not Seen V2 and Has Dragged V2 Along the Road Causing it to Turn and Face Backwards. V2 was Heading Straight over the Roundabout and Possibly was in the Wrong Lane However this is Based on What the Driver of V1 States.						Veh1, goods > 7.5t, SW -> NW Veh2, car, SW -> NE				Casualties 1 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

24-Aug-2018
10:14:51

A206 Dartford
Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
40	**Road No A206 Grid 555784E** **Section 266 Ref 175133N**	SLIGHT	29/09/2015	3	14:15	L	Dry	Fine			
	A206, Dartford, Kent								Dartford		
	V1 Has Been Travelling Behind an Unidentified Car as left M25 Dartford River Crossing. V2 Has Been Driving Behind V1 as All Three Vehicles Wait at Automatic Traffic Light Controlled Junction. as Traffic Moved ahead with Green Light, Unidentified Car Has Braked Suddenly Causing V1 to Take Evasive Action. V1 Has Pulled Slightly out of Lane and Been Hit by V2 Travelling Behind. no Contact or Damage with Unidentified Car .						Veh1, car, SW -> NE Veh2, car, SW -> NE				Casualties 1 Vehicles 2
41	**Road No A206 Grid 555808E** **Section 266 Ref 175198N**	SLIGHT	10/12/2015	5	13:05	L	Dry	Fine			
	A206 Littlebrook Interchange Roundabout, Holiday Inn, Dartford, Kent								Dartford		
	V1 and 2 on Bob Dunn Way Heading Towards M25. V2 at Traffic Lights Level with Holiday Inn in Middle Lane, V1 Stationary Behind. Lights Turned Green, V1 Shunted Forward Colliding with the Rear of V2 Causing Minor Damage to Front of V1 and Damage to Rear of V2. Passenger in V2 Had Previously Had Major Op which was Aggravated.						Veh1, car, NW -> SE Veh2, car, NW -> SE				Casualties 1 Vehicles 2
42	**Road No A206 Grid 555797E** **Section 001 Ref 175187N**	SLIGHT	22/12/2015	3	12:30	L	Wet/Damp	Fine	N	S.VEH	HGV
	A206, Bob Dunn Way, Greenhithe, Kent								Dartford		PED
	C1 was Walking Their Dog, Crossed the Carriageway at a Set of Traffic Lights. Halfway across the Road.... (Full Description Not Provided Mapped with Limited Details).						Veh1, goods > 7.5t, W -> E				Casualties 1 Vehicles 1

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

A206 Dartford

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
43	**Road No A282 Grid 555964E** **Section 010 Ref 175107N**	SLIGHT	04/01/2016	2	08:21	L	Wet/Damp	Fine			HGV GV
	A282 Jw A206 , Junction 1A, Dartford, Kent								Dartford		
	V1 & V2 Have Travelled over Drc from Essex. V1 in Lane 4 , V2 in Lane 1. as Vehs Have Approached Junction 1A of A262, V1 Has Braked Heavily in Lane 4, Driven across Lanes 1,2,3 to Exit A262, Colliding with V2 at Junction Exit.						Veh1, goods < 3.5t, NE -> SE Veh2, goods > 7.5t, NE -> SW				Casualties 1 Vehicles 2
44	**Road No A206 Grid 554310E** **Section 031 Ref 175716N**	SLIGHT	09/01/2016	7	14:07	L	Wet/Damp	Rain		S.VEH	M/C
	A206 Bob Dunn Way 5 Metres South Joyce Green Lane, Dartford, Kent								Dartford		
	V1 was Travelling Along Bob Dunn Way, Dartford. D1 States That They Went Around the Roundabout when the Back Wheel Skidded and They Lost Control. no Other Vehicles Were Involved and They Received an Injury to Their Shoulder as Well as Damage to Their Motorbike. no Damage to Roadside Furniture.						Veh1, m/cycle > 500cc, W -> E				Casualties 1 Vehicles 1
45	**Road No A206 Grid 554315E** **Section 031 Ref 175709N**	SLIGHT	15/01/2016	6	02:13	DRK STL	Dry	Fine		S.VEH	M/C
	A206 Joyce Green Lane Jw Bob Dunn Way, Dartford, Kent								Dartford		
	V1 Has Collided with the Bob Dunn Way Roundabout Before Coming to a Halt on the Grass Verge. no Other Vehicle Involved.						Veh1, m/cycle 50 - 125cc, N -> S				Casualties 1 Vehicles 1

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

A206 Dartford

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
46	**Road No A282 Grid 555605E Section 008 Ref 174740N**	SLIGHT	21/03/2016	2	19:50	L	Dry	Fine			
	A282 JUNCTION ,MP 6/0 DARTFORD								Dartford		
	V1 - A282 TOWARDS DRC, CLIPS KERB R/O/S DAMAGED R/O/S WHEEL + TYRE AND SPINS ANTI CLOCKWISE. V2 SWERVES BUT HIT V1 ON MID N/S. BOTH VEHICLES SPIN, AIRBAG DEPLOYED AND STOP IN J1B SLIP ROAD NORTH.						Veh1, car, SW -> NE Veh2, car, SW -> NE				Casualties 1 Vehicles 2
47	**Road No A282 Grid 555947E Section 097 Ref 175087N**	SLIGHT	23/03/2016	4	20:20	DRK STL	Dry	Fine			
	A282 J1A SLIP OFF, LONDONBOUND MP5/5								Dartford		
	3 VEHICLE RTC - V1 COLLIDED INTO REAR OF V3 AND THEN V2 WENT INTO REAR OF V1.						Veh1, car, N -> S Veh2, car, N -> S Veh3, car, N -> S				Casualties 2 Vehicles 3
48	**Road No A206 Grid 555789E Section 037 Ref 175219N**	SERIOUS	24/03/2016	5	12:59	L	Wet/Damp	Rain			HGV
	A206, BOB DUNN WAY JW LITTLEBROOK MANOR WAY, DARTFORD								Dartford		
	V2 WAS ON THE ROUNDABOUT AT LITTLEBROOK INTERCHANGE ON THE A206. V1 HAS TRAVELLED AROUND THE OUTSIDE AND IT APPEARS THE DRIVER HAS ATTEMPTED TO JOIN THE QUEUE OF TRAFFIC BY COLLIDING IN FRONT OF V2. V1 BEING A LORRY MAY NOT HAVE SEEN VEHICLE AND CONTINUED ON ITS WAY WITHOUT REALISING IT HAD COLLIDED WITH V2. S170 COMPLIED WITH.						Veh1, goods > 7.5t, NW -> SE Veh2, car, NW -> SE				Casualties 1 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

A206 Dartford

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
49	**Road No A282 Grid 556014E** **Section Ref 175204N**	SLIGHT	01/04/2016	6	16:45	L	Dry	Fine			HGV
	A282, B, MARKER POST 5/4								Dartford		
	It appears both V1 and 2 were in heavy traffic approaching the Dartford Tunnel. V1 was behind V2 when vehicles manoeuvred and collided with each other causing very minor scratch on o/s/r wrap around section of the bumper of V2. V1 did not stop at the scene but registration was noted.						Veh1, goods > 7.5t, SW -> NE Veh2, car, SW -> NE				Casualties 2 Vehicles 2
50	**Road No A2026 Grid 553341E** **Section Ref 175288N**	SLIGHT	03/04/2016	1	00:11	DRK STL	Wet/Damp	Rain		R.TURN	
	A2026 BURNHAM ROAD JW SANDPIT ROAD, DARTFORD								Dartford		
	V2 TRAVELLING FROM BOB DUNN WAY TOWARDS DARTFORD CENTRE. V1 PULLED OUT OF SANDPIT ROAD INTO THE PATH OF V2.						Veh1, car, E -> SE Veh2, car, NW -> SE				Casualties 1 Vehicles 2
51	**Road No A206 Grid 554290E** **Section 31 Ref 175681N**	SLIGHT	20/04/2016	4	17:31	L	Dry	Fine		R.TURN	HGV
	A206, BOB DUNN WAY JW JOYCE GREEN LANE, DARTFORD								Dartford		
	V1 WAS IN THE NEARSIDE LANE OF THE A206 TRAVELLING WEST AS THEY APPROACHED THE ROUNDABOUT AND V2 WAS IN THE OFFSIDE LANE. AT THE ROUNDABOUT V2 INTENDED TO EXIT THE ROUNDABOUT TOWARDS CRAYFORD AND ALTHOUGH V1 WAS I THE NEARSIDE LANE AND APPEARED TO BE HEADING THERE ALSO IT CONTINUED ON THE ROUNDABOUT TO EXIT AT JOYCE GREEN LANE. THE COLLISION OCCURRED AS V1 CONTINUED RIGHT ROUND THE ROUNDABOUT AND V2 ATTEMPTED TO LEAVE IT TOWARDS CRAYFORD FROM THE OFFSIDE LANE/POSITION.						Veh1, goods > 7.5t, E -> NW Veh2, car, E -> W				Casualties 1 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

24-Aug-2018
10:14:51

A206 Dartford
Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
52	**Road No A206 Grid 555787E** **Section 037 Ref 175217N**	SLIGHT	21/04/2016	5	15:00	L	Dry	Fine			GV
	A206, BOB DUNN WAY JW LITTLEBROOK INTERCHANGE ROUNDABOUT, DARTFORD								Dartford		
	V2 stationary sitting in traffic on A206 Bob Dunn Way when V1 hit V2 in the rear. V2 then hit V3. Details not exchanged						Veh1, car, NW -> SE Veh2, goods < 3.5t, NW -> SE Veh3, car, NW -> SE				Casualties 1 Vehicles 3
53	**Road No A282 Grid 555928E** **Section 010 Ref 175113N**	SLIGHT	09/05/2016	2	17:20	L	Wet/Damp	Rain			GV
	A282 (CANTERBURY WAY), DARTFORD (MAPPED TO 555980,175051)								Dartford		
	V3 WAITING IN TRAFFIC HIT BY V2 WHICH WAS HIT BY V1.						Veh1, goods < 3.5t, SW -> NE Veh2, car, SW -> NE Veh3, car, SW -> NE				Casualties 4 Vehicles 3
54	**Road No A282 Grid 555662E** **Section 008 Ref 174738N**	SLIGHT	24/05/2016	3	07:24	L	Dry	Fine			HGV
	A282, CANTERBURY WAY, MP 6/0, DARTFORD								Dartford		
	VEHICLES WERE ALL TRAVELLING IN HEAVY TRAFFIC WHEN TRAFFIC CAME TO A STOP. V2 STOPPED IN RESPONSE TO OTHER TRAFFIC, V1 COLLIDED INTO THE REAR OF V2						Veh1, goods 3.5 - 7.5t, NE -> SW Veh2, goods > 7.5t, NE -> SW				Casualties 1 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

24-Aug-2018
10:14:51

A206 Dartford
Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
55	**Road No A206 Grid 555749E** **Section Ref 175215N**	SLIGHT	10/06/2016	6	10:03	L	Dry	Fine			HGV
	A206 BOB DUNN WAY, DARTFORD								Dartford		
	V1 IS JOINING A206 FROM LITTLEBROOK INTERCHANGE, V2 IS JOINING A206 FROM A282 SLIP. V2 HAS PRIORITY IN NEARSIDE LANE AND V1 HAS MOVED INTO NEARSIDE LANE, WITHOUT CHECKING ROAD, V1 STRIKES V2 CAUSING V2 TO SPIN AND HIT KERB						Veh1, goods > 7.5t, SE -> NW Veh2, car, SE -> NW				Casualties 2 Vehicles 2
56	**Road No A206 Grid 555984E** **Section 266 Ref 174958N**	SLIGHT	25/06/2016	7	12:44	L	Dry	Fine			HGV
	A206, LITTLEBROOK INTERCHANGE J/W COTTON LANE, DARTFORD								Dartford		
	V.1 HGV was in lane 3 or the main road waiting to take the second exit at the roundabout V.1 pulled away from the traffic lights went to manoeuvre into lane 2 to take the second exit and collided with V.2 on the n/s causing V.2 to spin in the road. Minor damage to both vehicles minor injury to driver of V.2						Veh1, goods 3.5 - 7.5t, SE -> NW Veh2, car, SE -> NW				Casualties 1 Vehicles 2
57	**Road No A206 Grid 555796E** **Section 37 Ref 175195N**	SLIGHT	16/07/2016	7	23:15	DRK STL	Dry	Fine			
	A206 BOB DUNN WAY J/W A206 ROUNDABOUT, DARTFORD								Dartford		
	V2 stationary at red light on roundabout at end of A206. V1 came up behind and went straight into back of V2.						Veh1, car, W -> E Veh2, car, W -> E				Casualties 2 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

24-Aug-2018
10:14:51

A206 Dartford

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
58	**Road No A282 Grid 555752E** **Section 010 Ref 175034N**	SLIGHT	17/07/2016	1	13:15	L	Dry	Fine		S.VEH	
	A282 SLIP ON, DARTFORD (MAPPED TO DESCR)								Dartford		
	It appears that whilst V1 was descending a left hand bend on a slip road to join the A282, the vehicle has continued straight ahead for reasons unknown. V1 has then collided with a off-side Armco & Crash cushion breaking them away from its mountings. Damage sustained to V1 and Armco. Injuries sustained to V1 occupants.						Veh1, car, NE -> SW				Casualties 3 Vehicles 1
59	**Road No A282 Grid 555946E** **Section 010 Ref 175142N**	SLIGHT	06/08/2016	7	14:27	L	Dry	Fine			
	A282, DARTFORD TUNNEL (MAPPED TO 555946,175142)								Dartford		
	V1 went down the side of V2 -V1 took the turning to wide or too fast and drove into the side of V2, V1 driver refused to exchange details.						Veh1, car, S -> N Veh2, car, S -> N				Casualties 1 Vehicles 2
60	**Road No M25 Grid 556039E** **Section 010 Ref 175172N**	SLIGHT	15/08/2016	2	12:55	L	Dry	Fine			HGV
	M25, BY OLD TOLL LOCATIONS, DARTFORD (MAPPED TO 556065,175450)								Dartford		
	V1 was in lane 2, V2 was overtaking in lane 3, V1 started to move into lane 3, V1 did not see V2 and hit V2, first point of contact ns door, V2 then span round in front of V1 V2 then hit V2 a second time. Second point of contact was nearside front of V1 and rear panel of V2.						Veh1, goods > 7.5t, NE -> SW Veh2, car, NE -> SW				Casualties 1 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

A206 Dartford

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
61	**Road No A206 Grid 555963E** **Section 266 Ref 174988N**	SLIGHT	28/08/2016	1	23:45	DRK STL	Dry	Fine			
	A206 LITTLEBRROOK INTERCHANGE ROUNDABOUT FROM JUNCTION 1A A282 SLIP, DARTFORD (MAPPED TO DESCRIPTION)								Dartford		
	Both vehicles unfamiliar with area, crossed lanes on roundabout.						Veh1, car, SE -> W Veh2, car, SE -> W				Casualties 2 Vehicles 2
62	**Road No A206 Grid 555831E** **Section Ref 175151N**	SLIGHT	09/09/2016	6	14:56	L	Dry	Fine			HGV
	A206, BOB DUNN WAY, J/W LITTLEBROOK INTERCHANGE ROUNDABOUT, DARTFORD								Dartford		
	Both V1 & V2 were at the junction at the roundabout waiting to move off. The lights have turned green and both vehicles have accelerated forward. It is alleged by both parties that an unknown vehicle (suspected to be a foreign articulated lorry) has come from offside, moving through the traffic at the roundabout and has caused V2 to brake suddenly, and V1 has subsequently crashed into the back of V2 as a result of not being able to brake in time.						Veh1, goods > 7.5t, NE -> S Veh2, car, NE -> S				Casualties 1 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

24-Aug-2018
10:14:51

A206 Dartford

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
63	**Road No A206 Grid 555776E Section 037 Ref 175228N**	SLIGHT	14/09/2016	4	16:10	L	Dry	Rain			HGV
	A206, BOB DUNN WAY, RDBT WITH LITTLEBROOK MANOR WAY, DARTFORD (MAPPED TO 555776,175228)								Dartford		
	V2 driving along A206 heading towards the Dartford Crossing heading north bound. Traffic was heavy and slow. It was sunny and clear. D2 was behind V1 a low loader. Approaching the first roundabout - V1 in lane closet to roundabout, V2 in the second lane closet to roundabout with two lanes of traffic to the left. V1 went around another vehicle and then collided with V2 pushing V2 into the next lane. D1 of V1 failed to stop and tried to drive away, V2 accelerated to catch V1 and V2 pulled in front of V1 to stop them. D2 explained D1 hit V2 some 8m (approximately) back from this position. Pictures were taken by both sides. D2 asked D1 for their details. D2 went to V2 to grab a pen and paper and with that...Continued in Additional Notes the D1 drove off whilst cutting up 3 lanes of traffic.						Veh1, goods > 7.5t, E -> W Veh2, car, E -> W				Casualties 1 Vehicles 2
64	**Road No A282 Grid 555771E Section 010 Ref 175103N**	SLIGHT	15/09/2016	5	19:53	DRK STL	Dry	Fine			M/C
	A282 SLIP ON FROM BOB DUNN WAY RNDBT, DARTFORD								Dartford		
	V2 A MOTORBIKE WAS TRAVELLING ON A206, BOB DUNN WAY LOOKING TO ENTER A282 TO ESSEX VIA DARTFORD CROSSING. ON SLIP TO A282. V2 WAS STRUCK BY V1 BLACK VEHICLE AS THE TRAFFIC MERGED INTO ONE LANE ON SLIP ROAD. THIS WAS AT LOW SPEED BY KNOCKED RIDER OFF V2 OFF THEIR MOTORBIKE.						Veh1, car, E -> SW Veh2, m/cycle 125 - 500cc, E -> SW				Casualties 1 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

A206 Dartford

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
65	**Road No A206 Grid 555130E** **Section 034 Ref 175681N**	SLIGHT	04/10/2016	3	18:05	L	Dry	Fine			
	A206 UNIVERSITY WAY J/W A206 BOB DUNN WAY, DARTFORD								Dartford		
	V1 was travelling from University Way going straight over the roundabout to continue along Bob Dunn Way. The driver lost control on the roundabout due to suspected oil on the ground and hit into nearside kerb. V2 was also travelling in the same direction on the roundabout and the back of the vehicle has spun out due to suspected oil on the ground and collided with V1. A lorry later also collided into V1 however no damage was caused to either vehicle from this later incident.						Veh1, car, NW -> SE Veh2, car, NW -> SE				Casualties 1 Vehicles 2
66	**Road No A282 Grid 555978E** **Section 010 Ref 175174N**	SLIGHT	06/10/2016	5	04:35	DRK STL	Dry	Fine			HGV
	A282, DARTFORD TUNNEL APPROACH NORTH OF J/W A206, BOB DUNN WAY, DARTFORD								Dartford		
	V2 ENTERED M25 FROM J1A BEING LET IN BY V3. TRAFFIC AT SLOW CRAWL. V1 ATTEMPTED INITIALLY TO ENTER M25 FROM J1A. V1 THEN CHANGED THEIR MINDS DRIVING TO OTHER END OF JUNCTION. HAS MISJUDGED SPEED / CRAWL OF V2 AND DRIVEN INTO PASSENGER SIDE OF V2.						Veh1, car, S -> N Veh2, goods > 7.5t, S -> N Veh3, goods > 7.5t, S -> N				Casualties 1 Vehicles 3

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

A206 Dartford

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location		Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
67	**Road No A206** **Section**	**Grid 556009E** **Ref 175034N**	SLIGHT	09/11/2016	4	18:00	DRK STL	Dry	Fine			HGV
	A206, RDBT LITTLEBROOK INTERCHANGE J/W B2228 COTTON LANE, DARTFORD									Dartford		
	V1 & V2 were both manoeuvring on roundabout, which was busy due to heavy traffic. V1 is HGV and driver was attempting to locate suitable location to stop for a rest period. D1 was doing laps of roundabout trying to select suitable route. D1 was in outside lane. V2 was attempting to take slip road off roundabout. V1 hit V2 as paths crossed. Minor injury sustained to D2.							Veh1, goods > 7.5t, S -> W Veh2, car, S -> W				Casualties 1 Vehicles 2
68	**Road No A282** **Section 010**	**Grid 555793E** **Ref 174924N**	SLIGHT	10/11/2016	5	07:25	L	Dry	Fine			HGV GV
	A282, DARTFORD									Dartford		
	V2 WAS TRAVELLING ALONG IN LANE 2 AND WAS BEING OVERTAKEN BY V1 THAT WAS IN LANE 3. V1 INDICATED TO RETURN TO LANE 2 BUT V2 HAD NO WHERE TO GO. V1 COLLIDED WITH V2 CAUSING V2 TO LOSE CONTROL AND COLLIDE WITH V3/ ALL DRIVERS HAD LEFT SCENE PRIOR TO POLICE ARRIVAL AS INITIALLY REPORTED AS NON INJURY. HATOS ENSURED S170 WAS COMPLIED WITH AND HAD COMMENCED VEHICLE RECOVERY.							Veh1, goods > 7.5t, NE -> SW Veh2, car, NE -> SW Veh3, goods < 3.5t, NE -> SW				Casualties 1 Vehicles 3
69	**Road No A206** **Section 036**	**Grid 555627E** **Ref 175417N**	SLIGHT	16/11/2016	4	17:41	DRK STL	Dry	Fine			HGV
	A206, BOB DUNN WAY, DARTFORD (MAPPED TO 555627,175417)									Dartford		
	V2 was in traffic on the road that connect the A206 to A282, v2 was in the first lane, V1 was in the second lane, when V2 started to move with the traffic V1 tried to change lanes and get in lane 1, but v2 hadn't completed moved yet so V1 collided with the drivers side of v2. V1 did not stop.							Veh1, goods > 7.5t, E -> W Veh2, car, E -> W				Casualties 1 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

A206 Dartford

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
70	**Road No A206 Grid 554900E** **Section 033 Ref 175741N**	SLIGHT	24/11/2016	5	17:15	DRK STL	Dry	Fine			GV
	A206 BOB DUNN WAY A206 100 METRES WEST OF J/W MARSH STREET, DARTFORD (MAPPED TO 554794,175748)								Dartford		
	V1 has changed lane from 1 to lane 2, due to the sudden nature of the manoeuvre V2 has had to take evasive action to avoid or attempt to avoid a collision. V2 has collided with the osf quarter of V1 causing it to swerve into the osr quarter of V3. V2 has rolled out its offside as a consequence of the evasive manoeuvre.						Veh1, car, W -> E Veh2, car, W -> E Veh3, goods < 3.5t, W -> E				Casualties 1 Vehicles 3
71	**Road No A206 Grid 555835E** **Section Ref 175159N**	SERIOUS	21/12/2016	4	15:30	L	Dry	Fine			HGV M/C
	A206, LITTLEBROOK INTERCHANGE RDBT, 100 METRES SOUTH OF J/W A206 BOB DUNN WAY, DARTFORD								Dartford		
	V1 AND V2 WERE SIDE BY SIDE IN THE MIDDLE LANE OF 3, HELD AT TRAFFIC LIGHTS AT THE JUNCTION OF THE A206, HAVING APPROACHED FROM THE SERVICE ROAD, LEADING TO TUNNEL CONTROL. AS THE LIGHTS CHANGED TO GREEN, BOTH VEHICLES MOVED OFF. V1 INTENDED TO CONTINUE AHEAD, V2 TURNED LEFT ACROSS THE FRONT OF V1, WHO FELL FROM V1 AND WENT UNDER THE NEAR SIDE WHEELS OF V2, SUSTAINING INJURY.						Veh1, m/cycle 50 - 125cc, NW -> SW Veh2, goods > 7.5t, NW -> SE				Casualties 1 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

24-Aug-2018
10:14:51

A206 Dartford
Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
72	**Road No A206 Grid 554303E** **Section 031 Ref 175671N**	SLIGHT	08/01/2017	1	23:05	L	Wet/Damp	Rain		S.VEH	
	A206, BOB DUNN WAY, RDBT WITH JOYCE GREEN LANE, DARTFORD								Dartford		
	Veh 1 travelling along Bob Dunn way from DRC towards Erith. Entered roundabout losing the back end and tried correcting it but slid off road into a ditch.						Veh1, car, E -> W				Casualties 1 Vehicles 1
73	**Road No A206 Grid 555099E** **Section 034 Ref 175711N**	SLIGHT	09/01/2017	2	19:26	DRK STL	Wet/Damp	Fine			
	A206 BOB DUNN WAY UNSPECIFIED ROAD OR LOCATION MARSH STREET, DARTFORD								Dartford		
	V2 had stopped at junction of roundabout. V1 was following too closely and struck V2 in the rear. V1 had damage to front of their car. Passenger in rear of V2 sustained back pain injury.Taken by car to Darenth Valley Hospital.						Veh1, car, W -> E Veh2, car, W -> E				Casualties 1 Vehicles 2
74	**Road No A282 Grid 555796E** **Section 010 Ref 174978N**	SLIGHT	18/01/2017	4	16:53	DRK STU	Dry	Unknown			
	A282, M/P 5/7 'B', DARTFORD								Dartford		
	V2 brakes and stops for traffic jam. V1 hits back of V2. Driver of V1 admits liability and driver of V2 is happy to let insurance companies deal.						Veh1, car, SW -> NE Veh2, car, SW -> NE				Casualties 2 Vehicles 2
75	**Road No A206 Grid 554289E** **Section 031 Ref 175671N**	SERIOUS	08/02/2017	4	19:51	DRK STL	Wet/Damp	Rain		S.VEH	
	A206, BOB DUNN WAY JOYCE AT ROUNDABOUT WITH CENTRAL ROAD, DARTFORD								Dartford		
	V1 has collided with a roundabout causing it to somersault resulting in the driver being ejected from the vehicle.						Veh1, car, E -> W				Casualties 1 Vehicles 1

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

24-Aug-2018
10:14:51

A206 Dartford

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
76	**Road No A282 Grid 555755E** **Section 010 Ref 174912N**	SLIGHT	09/02/2017	5	20:50	DRK STL	Dry	Fine			HGV
	A282, DARTFORD (MAPPED TO DESCRIPTION - MP UNKNOWN)								Dartford		
	V1 in lane 1. V2 in lane 2 overtaking V1. V1 pulled into lane 2 not seeing V2, colliding with the nearside of V2. D1 (V1) made full admission of guilt.						Veh1, goods > 7.5t, NW -> SE Veh2, car, NW -> SE				Casualties 1 Vehicles 2
77	**Road No A206 Grid 554268E** **Section 031 Ref 175673N**	SLIGHT	11/02/2017	7	13:40	L	Wet/Damp	Fine		S.VEH	
	A206 UNIVERSITY WAY, 25 METRES WEST OF J/W JOYCE GREEN, DARTFORD								Dartford		
	V1 was travelling along the A206 towards Crayford. As V1 negotiated the roundabout it appears to have slid on a diesel spill and then slid down the bank adjacent to the A206. On police arrival a small diesel spill was seen along the verge of the roundabout. Highways were contacted to provide an anti spill kit.						Veh1, car, E -> W				Casualties 1 Vehicles 1
78	**Road No A2026 Grid 553236E** **Section 026 Ref 175317N**	SLIGHT	12/02/2017	1	15:34	L	Wet/Damp	Fine			PSV
	A2026 BURNHAM ROAD AT J/W A206 THAMES ROAD, DARTFORD								Dartford		
	V3 broken down, V2 behind V3, V2 contained C1 and C2. V2 casualties were repairing V3. V1 collided into V2.						Veh1, car, E -> W Veh2, car, P -> P Veh3, bus or coach, P -> P				Casualties 2 Vehicles 3

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

A206 Dartford

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
79	**Road No A206 Grid 554334E Section 031 Ref 175709N**	SLIGHT	04/03/2017	7	13:45	L	Dry	Fine		R.TURN	M/C
	A206, BOB DUNN WAY, AT ROUNDABOUT WITH JOYCE GREEN LANE, DARTFORD (MAPPED TO DESCRIPTION. ORIGINAL CO-ORDINATES: 554502,175710)								Dartford		
	V1 was approaching the roundabout in the left lane. V2 (motorbike) was in the right lane. V2 intended to go straight over but V1 was turning right. In attempting to turn right, V1 has cut across the path of V2 and struck its nearside, causing D2 to fall to their left side, temporarily becoming trapped beneath V2. Both vehicles and their drivers/riders moved on to Joyce Green Lane to await police.						Veh1, car, W -> S Veh2, m/cycle > 500cc, W -> E				Casualties 1 Vehicles 2
80	**Road No A206 Grid 554351E Section 031 Ref 175690N**	SLIGHT	06/03/2017	2	08:30	L	Dry	Fine			GV
	A206 BOB DUNN WAY AT ROUNDABOUT WITH CENTRAL ROAD, DARTFORD								Dartford		
	V2 approaching the roundabout at a slow speed and moved into the outside lane followed by V1 (lorry). V1 sped up and smashed into the side of V2. V2 became caught on the front of the lorry but eventually managed to free itself. V2 drove very slowly onto Thames Road, followed by the lorry, and attempted to pull over at a set of traffic lights. V1 failed to stop.						Veh1, goods < 3.5t, E -> W Veh2, car, E -> W				Casualties 1 Vehicles 2
81	**Road No A282 Grid 555770E Section Ref 175128N**	SLIGHT	08/03/2017	4	18:45	DRK USL	Dry	Fine			GV
	A282, SLIP OFF/ROUNDABOUT FOR A206 BOB DUNN WAY, DARTFORD								Dartford		
	V1 has stopped at a red traffic light, however this was for the middle and offside lanes of A282 slip road; the nearside lane has no traffic signal. V2 has stopped, realising driver 1's misjudgement. V3 has not seen V2 slow and has hit V2 in the rear which sent V2 into V1.						Veh1, car, S -> N Veh2, goods < 3.5t, S -> N Veh3, goods < 3.5t, S -> N				Casualties 1 Vehicles 3

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

A206 Dartford

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
82	**Road No A282 Grid 555499E Section 266 Ref 174577N**	SERIOUS	25/03/2017	7	13:35	L	Dry	Fine			M/C
	A282, MARKER POST 62/2, B CARRIAGEWAY, DARTFORD								Dartford		
	V1 (motorcycle) was in traffic following V2 in lane 4 at approx 40-50 mph towards the Dartford River Crossing. Traffic in front of V2 has slowed to a stop. V2 has braked and V1 has collided with rear of V2. Collision has caused D1 to fall off their bike.						Veh1, m/cycle > 500cc, SW -> NE Veh2, car, SW -> NE				Casualties 1 Vehicles 2
83	**Road No A282 Grid 555496E Section 007 Ref 174599N**	SLIGHT	27/03/2017	2	16:35	L	Dry	Fine			GV
	A282, SLIP OFF JUNCTION 1A 'B', DARTFORD (MAPPED TO NEW CO-ORDINATES)								Dartford		
	V1 had been involved in an earlier collision on the main carriageway and was making its way to a safer location on the slip road when having crossed the verge entered the slip road in front of V2 who was exiting the main carriageway using the slip. The vehicles collided and suffered damage. Driver of V1 was left with shock and chest pain, driver of v2 suffered back pain.						Veh1, goods < 3.5t, SW -> NE Veh2, car, SW -> NE				Casualties 2 Vehicles 2
84	**Road No A206 Grid 553194E Section 026 Ref 175331N**	SLIGHT	28/03/2017	3	12:57	L	Dry	Fine			GV
	A206 THAMES ROAD, DARTFORD								Dartford		
	V1 AND V2 TRAVELLING ON THAMES WAY TOWARDS J/W BURNHAM ROAD. V1 PULLED ACROSS INTO THE PATH OF V2 CAUSING V2 TO GO INTO THE BACK OF V1.						Veh1, goods < 3.5t, W -> E Veh2, car, W -> E				Casualties 1 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

A206 Dartford

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
85	**Road No A282 Grid 556106E Section 011 Ref 175311N**	SLIGHT	27/04/2017	5	01:20	DRK STL	Wet/Damp	Fine		+VE	HGV
	A282, MP 4/4 DARTFORD TUNNEL APPROACH, DARTFORD								Dartford		
	V2 travelling on A282 approaching west tunnel at Dartford Crossing. V2 stopped at a red traffic lights. V1 collided with rear of V2.						Veh1, goods > 7.5t, SW -> NE Veh2, car, SW -> NE				Casualties 1 Vehicles 2
86	**Road No A206 Grid 555826E Section 266 Ref 175196N**	SLIGHT	11/05/2017	5	21:15	L	Dry	Fine			P/C
	A206 BOB DUNN WAY LITTLEBROOK INTERCHANGE ROUNDABOUT, DARTFORD								Dartford		
	V2 (push bike) travelling down A206 near Bob Dunn Way roundabout. V2 was signalling to turn left when V1 pulled out of the previous junction and didn't see V2 and knocked him off bike. V1 failed to stop until he realised he had hit him. V2 was over roundabout continuing down dual carriageway V1 entered carriageway.						Veh1, car, SW -> SE Veh2, pedal cycle, NW -> E				Casualties 1 Vehicles 2
87	**Road No A282 Grid 556140E Section 010 Ref 175353N**	SLIGHT	10/06/2017	7	12:30	L	Dry	Fine			
	A282, DARTFORD TUNNEL APPROACH, MARKER POST 5/7, DARTFORD								Dartford		
	V2 was approaching toll barrier of the entrance to the Dartford river crossing A282. V1 was following behind V2. The traffic came to a stop V1 was unable to stop and collided with the rear of V2.						Veh1, car, SW -> NE Veh2, car, SW -> NE				Casualties 2 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

A206 Dartford

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
88	**Road No A282 Grid 555674E** **Section 010 Ref 174816N**	SERIOUS	12/06/2017	2	07:34	L	Dry	Fine		O/TAKE	GV M/C
	A282 5/9 B CANTERBURY WAY, DARTFORD								Dartford		
	V1 (motorbike) filtering though slow traffic in lane 2. V2 in front has indicated to right. V1 has then moved over to right hand side of V2. V2 has then slowed. V1 has not slowed sufficiently and clipped near offside of V2. This has caused the rider to lose control and hit V3 as well.						Veh1, m/cycle > 500cc, SW -> NE Veh2, car, SW -> NE Veh3, goods < 3.5t, SW -> NE				Casualties 1 Vehicles 3
89	**Road No A206 Grid 555960E** **Section 266 Ref 174972N**	SLIGHT	20/06/2017	3	13:21	L	Dry	Fine			HGV
	A206, LITTLEBROOK INTERCHANGE RNDBT J/W A282 J1A SLIP OFF, DARTFORD.								Dartford		
	V1 WAS HAS TAKEN LANE 1 AND HAS GONE STRAIGHT OVER AT THE RNDBT, V2 HAS BRAKED HARD TO AVOID COLLISION AND HAS STRUCK V1, V3 HAS COLLIDED V2.						Veh1, goods > 7.5t, SW -> NE Veh2, car, SE -> NW Veh3, car, SE -> NW				Casualties 1 Vehicles 3

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

A206 Dartford

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
90	**Road No A282 Grid 556117E Section 010 Ref 175243N**	SLIGHT	28/06/2017	4	09:14	L	Dry	Fine			
	A282, QN ELIZABETH II BRIDGE J/W SLIP RD, DARTFORD.								Dartford		
	V2 was driving in a Southerly direction, over the Dartford Bridge and was in lane 2. As V2 approached the slip off for junction 1A, D2 indicated and began moving over to their left to exit onto the slip rd. D2 became aware of V1 which was behind and appeared to be doing the same manouver, however V1 collided with V2's rear nearside bumper and then scraped along V2's nearside before continuing on the M25. V2 exited onto the slip road and pulled onto the hard shoulder where they sought advice from a patrol who directed them to contact the FCR to report this. D2 can only describe V1 as a dark green smallish vehicle with just the driver inside. Footage shows V2 hitting Dartford bridge cameras just prior to the collision. the same ANPR camera footage has been searched for hits around the same time, 30 secs on either side of V2's hit for all green vehs - threw up one possible match which has hit the same camera 5 seconds prior to V2 (recorded in veh details).					Veh1, car, NE -> SW Veh2, car, NE -> SW					Casualties 1 Vehicles 2
91	**Road No A282 Grid 555507E Section 007 Ref 174611N**	SLIGHT	14/07/2017	6	13:20	L	Dry	Fine			
	A282, DARTFORD (MAPPED TO CO-ORDS AS MARKER POST NOT AVAILABLE)								Dartford		
	V2 stationary in 2nd lane, facing North, waiting for traffic to move on when struck from behind by V1.					Veh1, car, SW -> NE Veh2, car, SW -> NE					Casualties 1 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

A206 Dartford

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
92	**Road No A282 Grid 555532E Section 008 Ref 174604N**	SLIGHT	21/07/2017	6	21:50	DRK STL	Wet/Damp	Rain			HGV
	A282, JUNCTION 1B SLIP ON, B2228, DARTFORD								Dartford		
	V2 was driving in lane 1 at the location when they were side swiped by the trailer of V1, (foreign lorry) as it manoeuvred at the location causing damage and injuries.						Veh1, goods > 7.5t, NE -> SW Veh2, car, NE -> SW				Casualties 1 Vehicles 2
93	**Road No A282 Grid 555963E Section 010 Ref 175151N**	SLIGHT	24/07/2017	2	14:17	L	Dry	Fine			
	A282, DARTFORD, (MAPPED TO COORDS).								Dartford		
	3 vehicle minor injury RTC in slow moving traffic. The traffic has stopped in front of V1 and D1 has been unable to react and stop in time. V2 then hit V3. (NO MARKER POST NUMBER PROVIDED).						Veh1, car, SW -> NE Veh2, car, SW -> NE Veh3, car, SW -> NE				Casualties 1 Vehicles 3
94	**Road No A206 Grid 555030E Section 033 Ref 175703N**	SLIGHT	29/07/2017	7	13:00	L	Wet/Damp	Rain			
	A206, RNDBT J/W BOB DUNN WAY, DARTFORD.								Dartford		
	V2 was travelling around the rndbt, came from Bob Dunn way. Whilst travelling around the rndbt, a vehicle (unknown details) was driving in the inside lane of the rndbt. However this vehicle was close to V2 and forced V2 out wide. V2 then lost control when turning onto University Way and mounted grass.						Veh1, car, SE -> NW Veh2, car, SE -> NW				Casualties 1 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

A206 Dartford

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
95	**Road No A206 Section 010** **Grid 555960E Ref 174978N**	SLIGHT	01/08/2017	3	08:26	L	Dry	Fine		R.TURN	M/C
	A206 LITTLEBROOK INTERCHANGE J/W COTTON LANE, DARTFORD								Dartford		
	V1 AND V2 HAVE COME FROM COTTON LANE. V1 WAS IN LANE 2 OF 3 AND V2 WAS IN LANE 1 OF 3. BOTH VEHICLES CAME ACROSS EACH OTHERS PATHS CAUSING A COLLISION DUE TO BOTH BEING IN THE WRONG LANES.					Veh1, car, S -> NW Veh2, m/cycle 50 - 125cc, S -> NE					Casualties 1 Vehicles 2
96	**Road No A206 Section 226** **Grid 555796E Ref 175147N**	SLIGHT	01/08/2017	3	11:21	L	Dry	Fine			HGV
	A206 LITTLEBROOK INTERCHANGE, DARTFORD (MAPPED TO DESCRIPTION)								Dartford		
	VEH 2 HAS GONE TO MOVE THROUGH JUNCTION BUT BEEN CUT UP BY UNKNOWN VEHICLE AND HAS STOPPED TO AVOID COLLISION. VEH 1 HAS SLOWED HOWEVER UNABLE TO STOP IN TIME DUE TO BEING FULLY LOADED AND HAS COLLIDED WITH REAR OF VEH 2.					Veh1, goods > 7.5t, SE -> NW Veh2, car, SE -> NW					Casualties 1 Vehicles 2
97	**Road No A282 Section 010** **Grid 556093E Ref 175290N**	SLIGHT	02/08/2017	4	06:45	L	Dry	Fine			GV M/C
	A282, DARTFORD CROSSING, DARTFORD (MAPPED TO COORDS).								Dartford		
	V2 has joined the A282 from Erith slip on in a queue of slow moving traffic, has pulled into lane 1 , seen V1 behind and indicated and pulled into lane 2. V1 has not seen V2 slow down as they pulled into lane 2 and then had to brake suddenly, causing V1 to fall over and slide into rear of V2.					Veh1, m/cycle > 500cc, SW -> NE Veh2, goods < 3.5t, SW -> NE					Casualties 1 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

24-Aug-2018
10:14:51

A206 Dartford
Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
98	**Road No A206 Grid 554532E** **Section 032 Ref 175725N**	SERIOUS	03/08/2017	5	23:45	DRK NSL	Dry	Fine			HGV
	A206 UNIVERSITY WAY, DARTFORD (MAPPED TO 554532,175725)								Dartford		
	V2 STOPPED IN LANE 1 AS A RESULT OF A BREAKDOWN. D2 STEPPED INTO THE SPACE BETWEEN THE KERB AND THEIR TRAILER (HGV). V1 (ALSO HGV) STRUCK V2 FROM BEHIND. D2 SENT OVER THE CRASH BARRIER DUE TO THE FORCE OF THE IMPACT, SUFFERING INJURY.					Veh1, goods > 7.5t, W -> E Veh2, goods > 7.5t, P -> P					Casualties 1 Vehicles 2
99	**Road No A282 Grid 556025E** **Section 010 Ref 175216N**	SERIOUS	08/08/2017	3	11:00	L	Dry	Fine			HGV
	A282 DARTFORD TUNNEL APPROACH, NORTHBOUND B, DARTFORD (NO MP AVAILABLE)								Dartford		
	WHILE HEADING NORTHBOUND TOWARDS THE DARTFORD TUNNEL, A SILVER VEHICLE CAME ACROSS FROM V2 NEARSIDE SUDDENLY INTO THE MIDDLE LANE FORCING V2 TO BRAKE SHARPLY. V2 SUFFERED AN IMPACT FROM THE REAR FROM V1 (HGV). FOLLOWING THE IMPACT, V2 AND V1 PULLED TO THE NEARSIDE LANE. D1 AND D2 WERE THEN JOINED BY AN OFFICER FROM HIGHWAYS ENGLAND, WHO SHOWED BOTH PARTIES TO A WAITING AREA WHERE THEY EXCHANGED DETAILS. DRIVER 2 NEEDED TO GO TO THE HOSPITAL.					Veh1, goods > 7.5t, SW -> NE Veh2, car, SW -> NE					Casualties 1 Vehicles 2
100	**Road No A206 Grid 555864E** **Section 266 Ref 175161N**	SLIGHT	13/08/2017	1	10:00	L	Dry	Fine			
	A206, LITTLEBROOK INTERCHANGE RNDBT J/W A282, DARTFORD.								Dartford		
	V2 WAS PULLING AWAY FROM TRAFFIC LIGHTS WHEN V1 CAME THROUGH RED LIGHT AND HIT V2 ON N/S FRONT PASSENGER DOOR. BOTH PARTIES STOPPED AND EXCHANGED DETAILS, BUT PASSENGER IN V2 SUSTAINED INJURIES.					Veh1, car, NE -> SE Veh2, car, NE -> SE					Casualties 1 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

24-Aug-2018
10:14:51

A206 Dartford
Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
101	**Road No A206 Grid 555854E Section 266 Ref 175170N**	SLIGHT	18/08/2017	6	18:21	L	Dry	Fine			
	A206, BOB DUNN WAY J/W LITTLEBROOK INTERCHANGE RNDBT, DARTFORD.								Dartford		
	BASED UPON THE SCENE, HOW VEHICLES WERE POSITIONED AND ACCOUNTS TAKEN BY BOTH DRIVERS. IT WOULD APPEAR THAT V1 WAS TRAVELLING TOWARDS THE DARTFORD RIVER CROSSING. V1 HAD TRAVELLED ALONG UNIVERSITY WAY AND UPON REACHING THE FIRST SET OF TRAFFIC LIGHTS WAS IN LANE 1 OF 4. D1 INTENDED TO TAKE THE EXIT FOR THE DARTFORD TUNNEL. THE CORRECT LANE FOR THIS WAS LANE 4. AS D1 ENTERED THE RNDBT D1 HAS GONE INTO LANE 2 AND THEN INDICATED TO MOVE INTO LANE 3 WHILST ON THE RNDBT AND MOVED OVER INTO LANE 3 INTO THE PATH OF V2 AS THEY BOTH WERE MOVING AT LOW SPEED.						Veh1, car, NW -> NE Veh2, car, SE -> NE				Casualties 1 Vehicles 2
102	**Road No A282 Grid 555739E Section 010 Ref 174888N**	SLIGHT	27/08/2017	1	09:29	L	Dry	Fine		O/TAKE	HGV
	A282, MARKER POST 5/8, B CARRIAGEWAY, DARTFORD								Dartford		
	V1 WAS IN LANE 1, V2 WAS OVERTAKING IN LANE 2. V1 PULLED INTO LANE 2 HITTING V2. V1 DID NOT SEE V2 DUE TO BLIND SPOT. (D POSTCODE NOT KNOWN)						Veh1, goods > 7.5t, SW -> NE Veh2, car, SW -> NE				Casualties 1 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

D-PRINT CRASH REPORT

24-Aug-2018
10:14:51

A206 Dartford

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
103	**Road No A206 Grid 554340E** **Section 031 Ref 175683N**	SLIGHT	01/09/2017	6	17:45	L	Dry	Fine		S.VEH	M/C
	A206, BOB DUNN WAY RNDBT J/W A206, DARTFORD.								Dartford		
	D1 coming from Essex, over the QE2 bridge towards a friends house. Went down Bob Dunn Way, approached rndbt towards Erith. Saw a wet patch on the road & mistook it for water. Went around the rndbt and the bike skidded over onto it's side. It was obvious it was diesel. Bike slid across rndbt and stopped at the pavement. D1 slid across the road into the path of a van.						Veh1, m/cycle > 500cc, E -> W				Casualties 1 Vehicles 1
104	**Road No A282 Grid 555920E** **Section 010 Ref 175106N**	SLIGHT	03/09/2017	1	00:25	DRK STL	Dry	Fine			
	A282, DARTFORD TUNNEL APPROACH, DARTFORD.								Dartford		
	ON APPROACH TO DARTFORD TUNNEL. TRAFFIC HAS SLOWED AND V1 HAD NOT REACTED QUICKLY ENOUGH AND HIT REAR OF V2.						Veh1, car, SW -> NE Veh2, car, SW -> NE				Casualties 1 Vehicles 2
105	**Road No A282 Grid 555989E** **Section 010 Ref 175154N**	SLIGHT	14/09/2017	5	15:10	L	Dry	Fine			HGV
	A282, MARKERPOST 5/5, B CARRIAGEWAY, DARTFORD								Dartford		
	V1, Foreign HGV, approaching from behind in stop start heavily congested traffic towards the DRC 5-10 mph. V1 has collided with rear of V2 which has collided with V3 which has collided with V4 which has collided with V5. V2 upon being pushed into rear of V3, has started to smoulder, soon catching fire along with V3, both destroyed. Minor injury to drivers of V2, V3, V4. No hospital.						Veh1, goods > 7.5t, SW -> NE Veh2, car, SW -> NE Veh3, goods 3.5 - 7.5t, SW -> NE Veh4, car, SW -> NE Veh5, goods > 7.5t, SW -> NE				Casualties 3 Vehicles 5

Key

Involved
- *PED* — *Pedestrian*
- *HGV* — *Heavy Goods Vehicle*
- *GV* — *Goods Vehicle*
- *M/C* — *Motor Cycle*
- *P/C* — *Pedal Cycle*
- *PSV* — *Bus/Coach*

Street Lighting
- *L* — *Daylight*
- *STL* — *Street Lights*
- *USL* — *Street LIghts Unlit*
- *NSL* — *No Street Lights*
- *STU* — *Street Lights Unknown*

FACTORS
- *+VE* — *Positive Breath Test*
- *R.TURN* — *Right Turn Manoeuvre*
- *O/TAKE* — *Overtaking Manoeuvre*
- *S.VEH* — *Single Vehicle*

Special Conditions
- *ATS OUT* — *Traffic Lights Not Working*
- *ATS DEF* — *Traffic Lights Defective*
- *SIGNS* — *Road Signs Defective or Obscurred*
- *RD WRKS* — *Road Works*
- *Surface* — *Road Surface Defective*

D-PRINT CRASH REPORT

A206 Dartford

Accident Date BETWEEN '01-Oct-2014' AND '30-Sep-2017'

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
106	**Road No A282 Grid 555903E Section 010 Ref 175083N**	SLIGHT	24/09/2017	1	16:00	L	Dry	Fine			
	A282, DARTFORD, (MAPPED TO COORDS).								Dartford		
	Four vehicle RTC in slow moving traffic on A282 tunnel approach. V1 collided into V2 and pushed V2 into V3, which pushed V3 into V4.						Veh1, car, SW -> NE Veh2, car, SW -> NE Veh3, car, SW -> NE Veh4, car, SW -> NE				Casualties 2 Vehicles 4
107	**Road No A206 Grid 555945E Section 001 Ref 175007N**	SLIGHT	29/09/2017	6	20:30	L	Dry	Fine			
	A206 LITTLEBROOK INTERCHANGE, DARTFORD (MAPPED TO DESCRIPTION)								Dartford		
	V2 HAD JUST LEFT THE ROUNDABOUT AND HAD ENTERED A206 WHEN V1 CRASHED INTO THE DRIVER'S DOOR. V2 DRIVER AND PASSSENGER SUSTAINED INJURIES. V1 STATED THEY WOULD PULL OVER SOMEWHERE SAFE BUT DROVE OFF INSTEAD. HIGHWAYS ATTENDED AND MOVED VEH 2 TO SAFETY. HIGHWAYS TRIED TO TRACE VEH 1 FOR DETAILS BUT COULD NOT FIND THEM. V1 DROVE OFF TOWARDS BOB DUNN WAY.						Veh1, car, SE -> NW Veh2, car, SE -> NW				Casualties 2 Vehicles 2

Key

Involved		*Street Lighting*		*FACTORS*		*Special Conditions*	
PED	*Pedestrian*	*L*	*Daylight*	*+VE*	*Positive Breath Test*	*ATS OUT*	*Traffic Lights Not Working*
HGV	*Heavy Goods Vehicle*			*R.TURN*	*Right Turn Manoeuvre*	*ATS DEF*	*Traffic Lights Defective*
GV	*Goods Vehicle*	*STL*	*Street Lights*	*O/TAKE*	*Overtaking Manoeuvre*	*SIGNS*	*Road Signs Defective or Obscurred*
M/C	*Motor Cycle*	*USL*	*Street LIghts Unlit*	*S.VEH*	*Single Vehicle*	*RD WRKS*	*Road Works*
P/C	*Pedal Cycle*	*NSL*	*No Street Lights*			*Surface*	*Road Surface Defective*
PSV	*Bus/Coach*	*STU*	*Street Lights Unknown*				

Appendix G PERS Audit Results

Document Control Sheet

Project Name: **Riverside Energy Park**

Project Ref: **42166**

Report Title: **Pedestrian Environment Review System Audit**

Doc Ref: **001**

Date: **September 2018**

	Name	Position	Signature	Date
Prepared by:	Matt Bolshaw	Assistant Transport Planner	*M Bolshaw*	September 2018
Reviewed by:	Adrian Neve	Senior Associate	*A Neve*	September 2018
Approved by:	Manu Dwivedi	Senior Associate	*M Dwivedi*	September 2018
For and on behalf of Peter Brett Associates LLP				

Revision	Date	Description	Prepared	Reviewed	Approved

Contents

Figures

Tables

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1 Introduction

1.1 Overview

1.1.1 Peter Brett Associates LLP (PBA) has been commissioned by Cory Riverside Energy (Cory or "the Applicant")) to produce a Pedestrian Environmental Review System (PERS) audit in support of an application to the Secretary of State under the Planning Act 2008 (PA 2008) for powers to construct, operate and maintain an integrated Energy Park, to be known as Riverside Energy Park (REP or the Proposed Development).

1.1.2 Pedestrian links to local bus facilities and on key links adjacent to the site have been assessed as well as the relevant pedestrian crossing points. The audit was undertaken on Tuesday 18th September 2018 during daylight hours, the weather conditions were cloudy but dry. The audit team were:

- Matthew Bolshaw – PBA Assistant Transport Planner; and
- Ella Pafford – PBA Graduate Transport Planner.

1.2 Preparation of Audit

1.2.1 This PERS audit is prepared as part of the requirements requested by Transport for London (TfL) and supplements the main Transport Assessment (TA). The audit extents have been agreed with TfL through the TA scoping, which is reported and included within the TA for this application.

1.2.2 To inform preparation for the audit, the location of key facilities in relation to REP were confirmed i.e. location of schools and places of worship; as well as trip generators within walking distance of the site. The extent of the audit has been determined through a desktop study with the scope of works chosen as nearby road and footpath links and local bus stops. The facilities being appraised could be used by workers during the construction phase and by employees during the operational phase at REP.

1.2.3 A map showing the extent of the audit was drawn up as shown in Figure 1.1. Facilities identified within the audit area include bus stops, crossings, links and routes. This extent was proposed by TfL. The audit includes three links, three crossing points, two public transport waiting areas and two routes.

1.2.4 When considering which public transport waiting areas to assess, only the bus stops that are closest to REP were included in the audit as it is assumed that employees would choose the closest bus stop if they are serviced by the same bus route. The pedestrian links as shown in the audit extent have also been combined to make two complete routes to demonstrate the environment across a number of links.

Figure 1.1 PERS Extent

1.3 Methodology

1.3.1 A PERS audit assesses the quality of an environment in terms of how it meets the needs of a pedestrian, with the "standard" pedestrian defined by Transport Research Laboratory (TRL) as *"towards the vulnerable end of the spectrum"*.

1.3.2 The PERS audit was conducted using the PERS Streetaudit software version 1.1.10.211. This software has been devised by the TRL for TfL.

1.3.3 All links, crossings and public transport waiting areas were assessed by review parameters as detailed in Table 1.1.

1.3.4 Each of these parameters is made up of a number of sub-factors which are given an individual score on a scale of -3 (very poor) to +3 (very good). A score of 0 represents an average score, whilst N/A indicates that a particular factor was not assessed or was not relevant. The reviewer uses these sub-factor scores to assign an overall score for each review parameter, again on a scale from -3 (very poor) to +3 (very good).

1.3.5 The scores for all parameters are entered into the TfL Streetaudit programme which weights all the parameters and assigns them a Red, Amber or Green (RAG) band. Each link; crossing; public transport waiting area; and interchange then has a RAG band assigned for each parameter assessed. Green represents good or very good provision. Amber represents average provision, with some features that give cause for concern potentially. Red represents a facility or aspect that presents significant cause of concern.

1.3.6 The process then brings together all parameters assessed and assigns each link, crossing or public transport waiting area an overall score. This overall score again informs a RAG band. The banding is graded the same way as above.

Table 1.1 PERS Review Parameters

Links	Crossings	PT Waiting Areas
Effective width	Crossing provision	Information to the waiting area
Dropped kerbs	Deviation from desire line	Infrastructure to the waiting area
Gradient	Performance	Boarding public transport
Obstructions	Capacity	Information at the waiting area
Permeability	Delay	Safety perceptions
Legibility	Legibility	Security measures
Tactile information	Legibility for sensory impaired people	Quality of the environment
Colour contrast	Dropped kerbs	Maintenance and cleanliness
Personal security	Gradient	Waiting area comfort
Surface quality	Obstructions	
User conflict	Surface quality	
Maintenance	Maintenance	

1.3.7 Some photographs from the on-site audit are included within each review chapter.

1.4 Summary

1.4.1 This report presents the findings of the PERS audit which took place on 18th September 2018. The audit included three links, two public transport waiting areas and three crossings and two routes.

1.4.2 The audit was undertaken using the Streetaudit software and in line with the guidance given in the PERS handbook.

2 Links

2.1 Introduction

2.1.1 This chapter sets out the performance of the three links included within the audit. These links were selected as a result of discussions with TfL to assess the surrounding roads and their pedestrian facilities.

2.1.2 All links were audited during the site visit, with movements observed throughout the audit. Photos were also taken to support the conclusions of the audit.

2.2 Results

2.2.1 The following table indicates the scores for each of the three links. This includes the individual score and RAG rating given to each of the three links.

Table 2.1 Results of links audited

ID	Link Name	RAG	RAG index	Overall Score
L1	Norman Road (north of Picardy Manorway)	Green	3	83
L2	Picardy Manorway (eastbound side)	Green	3	92
L3	Picardy Manorway (westbound side)	Amber	2	35

2.2.2 As shown in the table above, both Picardy Manorway (eastbound side) and Norman Road (north of Picardy Manorway) have similar scores, with Norman Road scoring lower and achieving a lower RAG rating. Norman Road generally scores higher due to less traffic and Picardy Manorway (eastbound side) scores high as a result of the width of the footway. A more detailed review of the links is given below.

Norman Road (north of Picardy Manorway)

2.2.3 Norman Road routes north south and is approximately 600m in length when travelling north from Picardy Manorway. The main footway is adjacent to the southbound side of the carriageway which leads from the main highway network (Picardy Manorway) to REP.

2.2.4 The link scored highly on criteria such as lack of obstructions and conflicts but scored negatively on personal security. The pictures in Figure 2.1 show the footway at two locations on Norman Road. This indicates the lack of obstructions from street furniture and also the low number of conflicts as a result of the low pedestrian flows. They do, however, also highlight the isolated nature of the link and the lack of passive surveillance, which led to the lower personal security score.

Figure 2.1 Pictures of Norman Road (north of Picardy Manorway)

Picardy Manorway Eastbound

2.2.5 Picardy Manorway, on the eastbound side of the carriageway, as a link has been audited between the Picardy Manorway/Clydesdale Way/Yarnton Way/Eastern Way roundabout, to the west, and the Horse Roundabout, to the east. This audit result is relevant to the eastbound carriageway footway only. The westbound carriageway footway has been assessed separately.

2.2.6 The link has scored slightly higher than Norman Road as a consequence of the better quality footway on this link. The footway is wide and provides well for the more vulnerable users with high levels of tactile paving and tonal contrast between road, cycleway and footway, although the link still scores negatively on permeability and quality of environment. This is as a result of high traffic levels as well as the lack of sense of place.

Figure 2.2 Pictures of Picardy Manorway Eastbound

2.2.7 The pictures demonstrate the above, that whilst there is a wide footway in place and segregation from other modes, there is a lack of sense of place and permeability on the link.

Picardy Manorway Westbound

2.2.8 Picardy Manorway, on the westbound side of the carriageway, relates to the opposite carriageway to Picardy Manorway eastbound. The westbound link scores much lower and achieves an Amber rating compared to the Green ratings of the other links. This is because of a narrower footway and a perceived lower level of maintenance.

Figure 2.3 Pictures of Picardy Manorway Westbound

2.2.9 As can be seen from the photographs in Figure 2.3 the footway is narrower than in Figure 2.2 and this is exacerbated by the overhanging foliage which narrows the footway further. The worn markings and seasonal foliage also contribute to a lower score with the maintenance and quality of environment suffering as a result of this.

2.3 Summary

2.3.1 In summary the PERS assessment demonstrated that all three links assessed attained a positive score. Norman Road (north of Picardy Manorway) and Picardy Manorway (eastbound side) attained a 'Green' score with Picardy Manorway (westbound side) scoring 'Amber'.

2.3.2 The lowest score recorded was 35 which was given to Picardy Manorway (westbound side). However, this link is only anticipated to be used by employees up to the bus stop.

2.3.3 Overall, all links expected to be commonly used by future employees of the REP attained positive 'Green' or 'Amber' scores and no serious issues or concerns were raised.

3 Crossings

3.1 Introduction

3.1.1 This chapter sets out the performance of the three crossings included within the audit. These crossings are those located in the extent suggested by TfL that are likely to be used by those travelling to and from REP.

3.2 Results

3.2.1 The following table indicates the scores for each of the three crossings. This includes the individual score and RAG rating given to each of the three crossings.

Table 3.1 Results of crossings audited

ID	Link Name	RAG	RAG index	Overall Score
C1	Picardy Manorway	Green	3	87
C2	Norman Road/Picardy Manorway	Green	3	92
C3	Isis Reach / Asda Depot Access Road	Green	3	76

3.2.2 Further detail of the scores provided above is given below.

Picardy Manorway

3.2.3 The scores for this crossing relate to the staggered crossing across Picardy Manorway. The two crossings have been assessed as one due to their similarities and the fact that they act as a staggered crossing rather than two individual crossings.

3.2.4 The crossing pictured in Figure 3.1 scores 87, as a result of having high scores on performance and crossing provision. The only negative scores for the crossing were in relation to 'delay'. As the traffic flow is high on the A2016 there is considerable delay between calling the crossing and being able to cross.


Figure 3.1 Pictures of Picardy Manorway crossing

Norman Road to Picardy Manorway Crossing

3.2.5 This crossing facility is located close to the Picardy Manorway crossing. This facility relates to the crossing over the Norman Road connection to Picardy Manorway. This crossing has scored 92. The primary reasons for this scoring is due to high scores for ‘performance’ and ‘delay’ as well as the absence of any negative scores.

Figure 3.2 Pictures of Norman Road to Picardy Manorway crossing

Isis Reach / Asda Depot Access Road Crossing

3.2.6 This crossing is an uncontrolled crossing over the Isis Reach / Asda depot access road, which again scored all positive results. The crossing is staggered with a central reservation. The crossing is indicated by ‘elephant feet’ road marking which alert driver to the presence of the facility. The crossing also allows cyclists to cross here.

3.2.7 The crossing scored 71 and this is largely because of high scores for ‘crossing provision’, ‘maintenance’ and ‘surface quality’. The only negative scores were for ‘deviation from the desire line’. This is because when travelling northbound, the crossing is not located at the natural point to cross and has been located further round into the side road to reduce the crossing length.

Figure 3.3 Pictures of Isis Reach / Asda depot access road crossing

3.3 Summary

3.3.1 The PERS assessment demonstrated that all 3 crossings assessed attained a positive score, with all achieving ‘Green’ RAG scores.

3.3.2 The highest scoring crossing, Norman Road to Picardy Manorway, achieved a total score of 92 showing excellent provision. This is expected to be used by construction workers and employees walking from the bus stop on Picardy Manorway, westbound side, towards the construction site and REP, once completed.

3.3.3 The lowest score recorded was at the Isis Reach / Asda depot access crossing which was given a total score of 71. Though this link is expected to be a commonly used route by future employees, its ‘Green’ RAG score indicates good provision and no serious issues or concerns.

4 Public Transport Waiting Areas

4.1 Introduction

4.1.1 This chapter sets out the performance of the two public transport (PT) waiting areas included within the audit. These PT waiting areas are those located in the extent suggested by TfL that are likely to be used by those travelling to and from REP both when the facility is operational and during the construction period.

4.2 Results

4.2.1 The following table indicates the scores for each of the two PT waiting areas. This includes the individual score and RAG rating given to each of the two waiting areas.

Table 4.1 Results of PT waiting areas audited

ID	Link Name	RAG	RAG index	Overall Score
PT1	Eastern Way/Norman Road (westbound)	Amber	2	-19
PT2	Picardy Manorway/Eastern Way (eastbound)	Amber	2	-7

4.2.2 Further detail of the scores provided above is given below.

Eastern Way/Norman Road (Westbound)

4.2.3 Eastern Way/Norman Road (westbound) bus stop received a number of negative scores. These were attributed to the lack of perceived safety and security, the quality of environment and the waiting area comfort. The area around the bus stop is surrounded by trees which in most cases are overgrown into the footway. In particular, to the east of the bus stop, these block the sightline to oncoming buses and also encloses the bus stop so that there is almost no passive surveillance. The isolated nature of the bus stop is further exacerbated by any lighting being blocked out by trees.

4.2.4 In addition, there is no shelter or seating provided at the stop, with the only shelter provided by the overhanging foliage. Although under the cover of these trees, it is extremely difficult to be able to see the oncoming buses. The overgrown nature of the vegetation around the bus stop is shown in Figure 4.1.

Figure 4.1 Pictures of Eastern Way/Norman Road Bus Stop

Picardy Manorway/Eastern Way (EB)

4.2.5 The eastbound bus stop scores higher than the westbound bus stop although still receives a number of negative scores. Whilst there are no issues with foliage isolating the bus stop, it is still isolated from any passive surveillance other than from the road itself.

4.2.6 There is no seating or shelter provided, meaning anyone waiting at the stop is exposed to the weather conditions. Quality of environment also scored negatively, and this is due to there being no active frontage surrounding the bus stop, only the A2016. The fence surrounding the Asda depot further increases the feeling of enclosure. Pictures showing this bus stop are below in

4.2.7 Figure 4.2.

Figure 4.2 Pictures of Picardy Manorway/Eastern Way Bus Stop

4.3 Summary

4.3.1 The PERS assessment demonstrated that the two PT waiting areas assessed both scored negatively, receiving ‘Amber’ RAG ratings. This was due to the lack of: perceived safety and security; passive surveillance; waiting area comfort; and good visibility of waiting area due to overgrown trees.

4.3.2 Although these bus stops are expected to be commonly used by future employees of the proposed development and construction workers, the current bus stop provision is sufficient regarding the context of the site as workers are likely to leave in groups due to the shift work nature of the construction and operational phases.

5 Routes

5.1 Introduction

5.1.1 In order to assess the movement between all components of this PERS audit, two routes have been assessed. The two routes have been formed from key routes to and from REP.

5.1.2 The assessment of the routes is important as this provides an insight into the pedestrian environment over a longer distance and how different links, connect together. The two links selected in this audit are from REP, along Norman Road (north of Picardy Manorway) and then towards the two respective bus stops.

5.2 Results

5.2.1 The following table indicates the scores for each of the two routes. This includes the individual score and RAG rating given to each of the routes.

Table 5.1 Results of routes audited

ID	Link Name	RAG	RAG index	Overall Score
R1	REP to eastbound bus stop	Amber	2	25
R2	REP to westbound bus stop	Amber	2	3

5.2.2 Further detail of the scores provided above is given below.

Route 1 REP to Eastbound bus stop

5.2.3 This route is made up of the links Norman Road and Picardy Manorway, eastbound side, as well as the Isis Reach / Asda depot access road crossing. The route is one that would be used by those travelling to and from REP and the construction site and using the eastbound bus stop.

5.2.4 The route achieved mainly positive scores, with the 'directness of the route' and 'legibility of signing' being the highest scoring components. Negative scores were achieved, however, in regard to 'rest points' and 'perception of road safety'. This is as a result of the high levels of traffic on the second part of the route as it runs parallel to Picardy Manorway and the fact that there are no rest stops or sheltered areas on the route.

Route 2 REP to WB bus stop

5.2.5 This route is made up of the links of Norman Road and Picardy Manorway westbound as well as all three crossing points. The route is one that would be used by those travelling to and from REP and the construction site when using the westbound bus stop.

5.2.6 The route achieved similar scores to the previous route although with some scores being slightly lower. 'Personal security' and 'directness' were two of the criteria that scored lower, this is as a result of Picardy Manorway westbound having less surveillance caused by overgrown trees and the directness reduced by the number of crossing points required along the route. All other scores are the same with the exception of ‘permeability’. This was also marked slightly lower due to the need to cross Picardy Manorway on this route.

5.3 Summary

5.3.1 The PERS assessment demonstrated that although the two routes assessed both scored positively, they both received ‘Amber’ RAG ratings.

5.3.2 The reason for both routes having relatively low scores is due to lack of: rest points; apparent road safety and personal security due to overgrown trees and high levels of traffic on the routes.

5.3.3 Although these routes are expected to be commonly used by future REP employees and construction workers, the current route provisions are sufficient regarding the context of REP as it is not anticipated that vulnerable users such as children or the elderly will frequently use these routes.

6 Summary

6.1 Summary

6.1.1 This report details the findings of the PERS audit undertaken for the Proposed Development.

6.1.2 In total, 3 links, 3 crossings, 2 routes and 2 public transport waiting areas were audited. Two out of the three links and all three crossings achieved a Green RAG score overall showing a good standard of provision.

6.1.3 Both public transport waiting areas scored 'Amber' which was due to a lack of 'perceived safety and security' and 'waiting area comfort'.

6.1.4 Both routes scored 'Amber' due to lack of 'rest points', 'road safety' and 'personal security'. However, due to both routes having positive scores, the current existing provisions are deemed sufficient.

6.1.5 Despite public transport waiting areas having a relatively low score, this can be easily resolved through better maintenance. Our recommendation would be to engage with LBB and request that notice is served on the Isis Reach estate managers to cut-back the trees that over-hang the Highway. These trees are blocking views of oncoming buses and restrict the spread of street lighting.

6.1.6 No improvements are suggested for the surrounding links and crossings as existing infrastructure is deemed sufficient.

6.2 Conclusion

6.2.1 Overall, this PERS audit suggests that if the above recommendations are executed the current facilities and infrastructure are sufficient in the context of the construction and operation of REP. This conclusion reflects the positive Link and Crossing scores and is in spite of the negative public transport waiting areas scores.

Appendix H CLoS Assessment Results

Document Control Sheet

Project Name: **Riverside Energy Park**

Project Ref: **42166**

Report Title: **Cycling Level of Service (CLoS) Assessment**

Doc Ref:

Date: **September 2018**

	Name	Position	Signature	Date
Prepared by:	Ella Pafford	Graduate Transport Planner	E Pafford	September 2018
Reviewed by:	Adrian Neve	Senior Associate	A Neve	September 2018
Approved by:	Manu Dwivedi	Senior Associate	M Dwivedi	September 2018
For and on behalf of Peter Brett Associates LLP				

Revision	Date	Description	Prepared	Reviewed	Approved

Contents

Figures

Tables

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1.1 Cycle Environment Assessment

Cycling Level of Service (CLoS)

1.1.1 Cory Environmental Holdings Limited (trading as Cory Riverside Energy (Cory or “the Applicant”)) is applying to the Secretary of State under the Planning Act 2008 (PA 2008) for powers to construct, operate and maintain an integrated Energy Park, to be known as Riverside Energy Park (REP). Peter Brett Associates LLP (PBA) has been commissioned by Cory to produce a Cycling Level of Service (CLoS) assessment in support of that application.

1.1.2 The CLoS assessment has been developed by TfL in order to set a common standard for the performance of cycling infrastructure for routes / schemes and for individual junctions.

1.1.3 This CLoS assessment focuses solely on the Norman Road / Picardy Manorway junction, as requested by TfL during pre-application discussions. The assessment has been undertaken in accordance with guidance outlined in Chapter 2 of TfL’s London Cycling Design Standard (2016).

1.1.4 The most common type of cycle collision tends to involve movements at or around junctions. A supplementary process for assessing junctions has therefore been developed to give a broader assessment of a given location.

1.1.5 Rather than going through the entire CLoS assessment for each possible movement of a cyclist through a junction, an estimation of potential conflict can be done through briefly assessing each junction in turn. Junctions are identified in a study area and each movement at each junction is marked on a plan. Each movement can be rated and marked on the plan according to how safely and comfortably it can be made by cyclists:

- Red – where conditions exist that are most likely to give rise to the most common collision types;
- Amber – where the risk of those collisions has been reduced by design layout or traffic management interventions; and
- Green – where the potential for collisions has been removed entirely.

1.1.6 In order to help assess junction movements, Table 1.1 suggests typical scenarios that might lead to a ‘red’, ‘amber’ or ‘green’ rating. This has been taken from the London Cycling Design Standards (2016).

Table 1.1: Indicative Criteria for Scoring Junction Assessments

Factors needing Removal or Mitigation	Possible Improvements	Further Improvements
Red	Amber	Green
Heavy left turn movement with high HGV mix	Entry treatment at side road junction	Left turn ban for general traffic
Opposed right turns with general traffic accelerating quickly into opportunistic gaps	Continuation of lane across junction	Opposing right turn banned for general traffic
Left slip lane	Right-turn protected island	Physically protected turn

Guard-railing	Tight corner radii; pinch points removed (avoiding nearside lane of 3.2-4.0m)	Left bypass of signals
Large junction radii	Bus lane of 3.0-3.2m or of 4.5m or more	Segregation of cycle movements using dedicated cycle signals
High speed motor traffic through junction	2m wide central feeder lane	Raised tables
Uphill gradients	ASLs (preferably 5m+ deep)	Area-wide speed limit/ reduction
Wide junction crossings	Signal adjustments to cycle movement	
No clear nearside access		
Multiple lanes		

1.1.7 Figure 1-1 shows the various movements which can be undertaken by cyclists at the junction scored by colour.

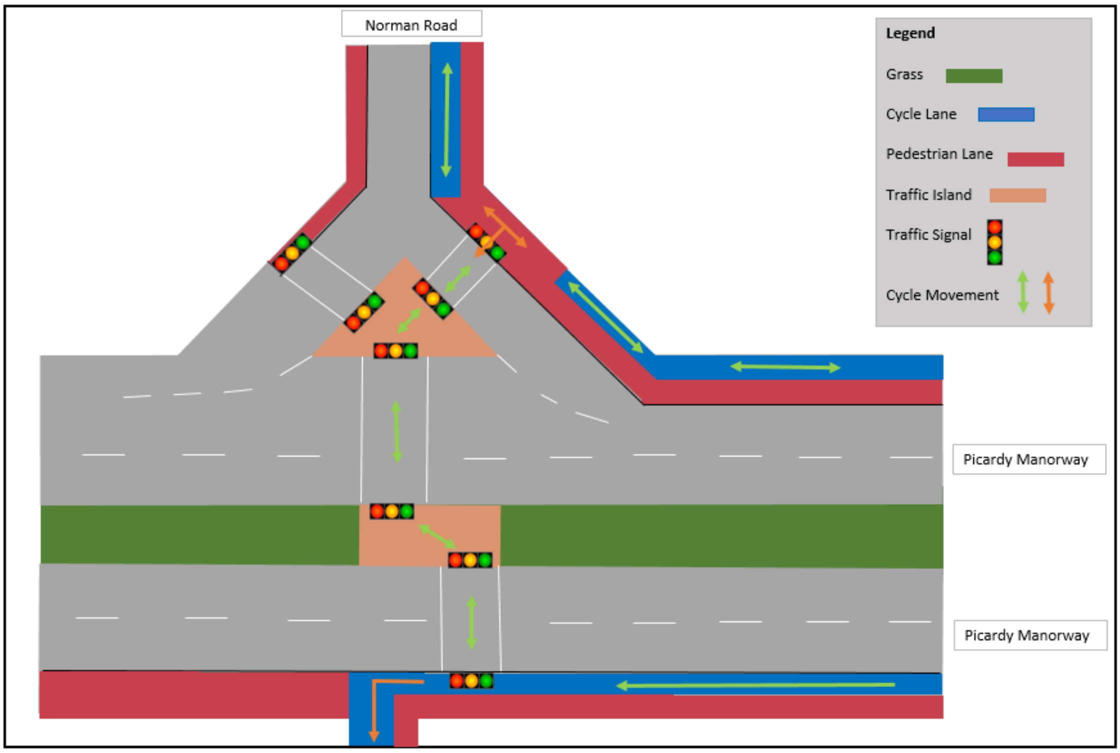


Figure 1-1: Norman Road / Picardy Manorway Junction – CLoS Assessment

1.1.8 As can be seen, the majority of movements on the assessed junctions were deemed to have a ‘green’ rating. This is due to the provision of off-carriageway cycle lanes along the eastern side of Norman Road, along both sides of Picardy Manorway (east of Norman Road), and a shared pedestrian / cycle route between the Picardy Manorway south side and Clydesdale Way.

1.1.9 The ‘amber’ cycle movements, shown in Figure 1-1, are due to the potential for pedestrian – cycle collisions where pedestrian and cycle routes intersect.

1.1.10 At the junction and on the eastern side of Norman Road, the cycle facility is located adjacent to the kerb. This stretch of cycle track is two-directional. On the northern side of Picardy Manorway, the cycle facility is alongside the Highway boundary. This latter section of cycle route is marked to imply it is for use westbound only, as a result of the ‘give-way’ markings.

1.1.11 On the southern side of Picardy Manorway, the cycle facility to the east of the crossing facility appears to be two-directional. Using the cycle route in the eastbound direction, however, would result in entering the carriageway against the flow of traffic. To the west of the crossing, on the southern side of Picardy Manorway, pedestrians are required to cross the cycle track to access the crossing, which provides potential for pedestrian – cycle collisions.

1.1.12 Overall, while it is considered that some minor improvements could be made to improve the cycle environment at this junction, it should be recognised that the PIC analysis, presented in Chapter 2, has identified no cycle incidents at this junction. The provision of off-carriageway cycle tracks in addition to crossing facilities, is considered to provide a safe environment for cyclists at the Norman Road / Picardy Manorway junction for access to the REP site.

Norman Road Cycle Environment

1.1.13 Norman Road, to the north of Picardy Manorway, provides on-street cycle lanes on both sides. The cycle lane on the western side of Norman Road stops approximately 150m to the south of the REP site. At this point, a ‘Cyclists Dismount’ sign is provided, and cyclists are directed to the cycle route on the eastern side of Norman Road which is provided as a shared off-carriageway cycle / pedestrian route.

1.1.14 Given the volume of HGV traffic along Norman Road, it is considered that on-street cycle lanes provide only minimal provision for cyclists. The facilities, however, reflect the probable low level of use and the constraints on the width of the corridor.

1.1.15 An alternative cycle route is running alongside Norman Road (using the Isis Reach access road). This cycle route is entirely off-carriageway and thus provides a safer alternative for cyclists to travel along Norman Road. However, the final connection to the north of this access road does not connect to Norman Road.

1.1.16 It would be beneficial for cycle access if the connection between the two existing cycle routes could be implemented, however, this is not currently viable due to the need for the public adoption of the Isis Reach access road and the land required to make the connection.

1.2 Conclusion

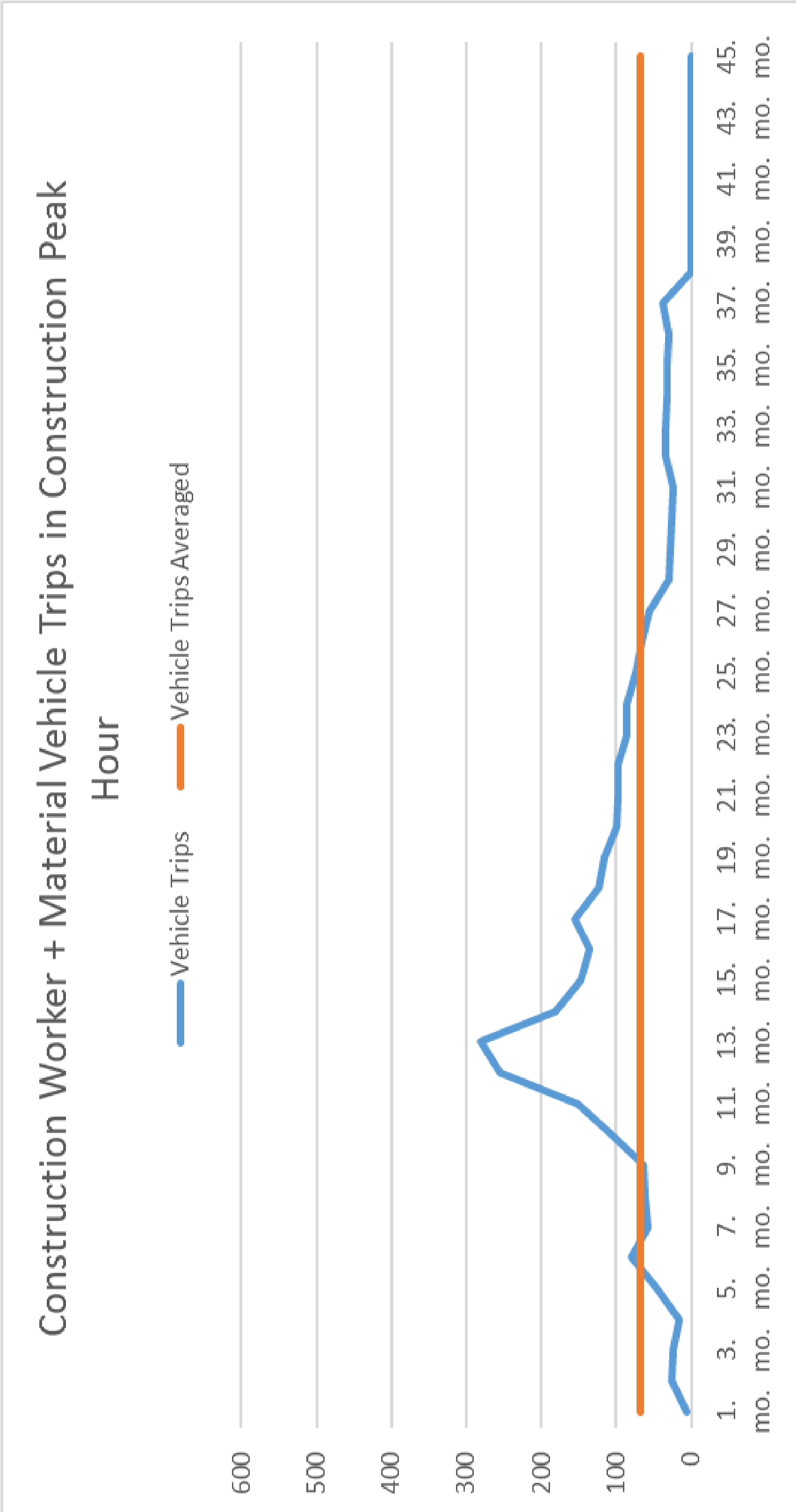
1.2.1 Off-carriageway cycle routes are clearly defined at the junction of Picardy Manorway with Norman Road which provide some connection to wider cycle facilities. These cycle lanes are generally well configured, indicating the areas of potential conflict.

1.2.2 The current signs, markings and lining shows some signs of age but are adequate to convey the messages to cyclists, pedestrians and motorists.

1.2.3 The on-carriageway facilities to the north of the Isis Reach access provides a minimal facility but reflect the corridor width constraints.

1.2.4 Whilst some improvements could be made to the local cycle infrastructure, the current facilities provide good crossing provision of Picardy Manorway and a connection to the proposed construction site compound, at the southern end of Norman Road (north of Picardy Manorway) and a connection to the operational REP.

Appendix I Indicative Construction Programme – Movement Profile


Construction Worker + Material Vehicle Trips in Construction Peak Hour
Vehicle Trips
Vehicle Trips Averaged
0
100
200
300
400
500
600
1. mo.
3. mo.
5. mo.
7. mo.
9. mo.
11. mo.
13. mo.
15. mo.
17. mo.
19. mo.
21. mo.
23. mo.
25. mo.
27. mo.
29. mo.
31. mo.
33. mo.
35. mo.
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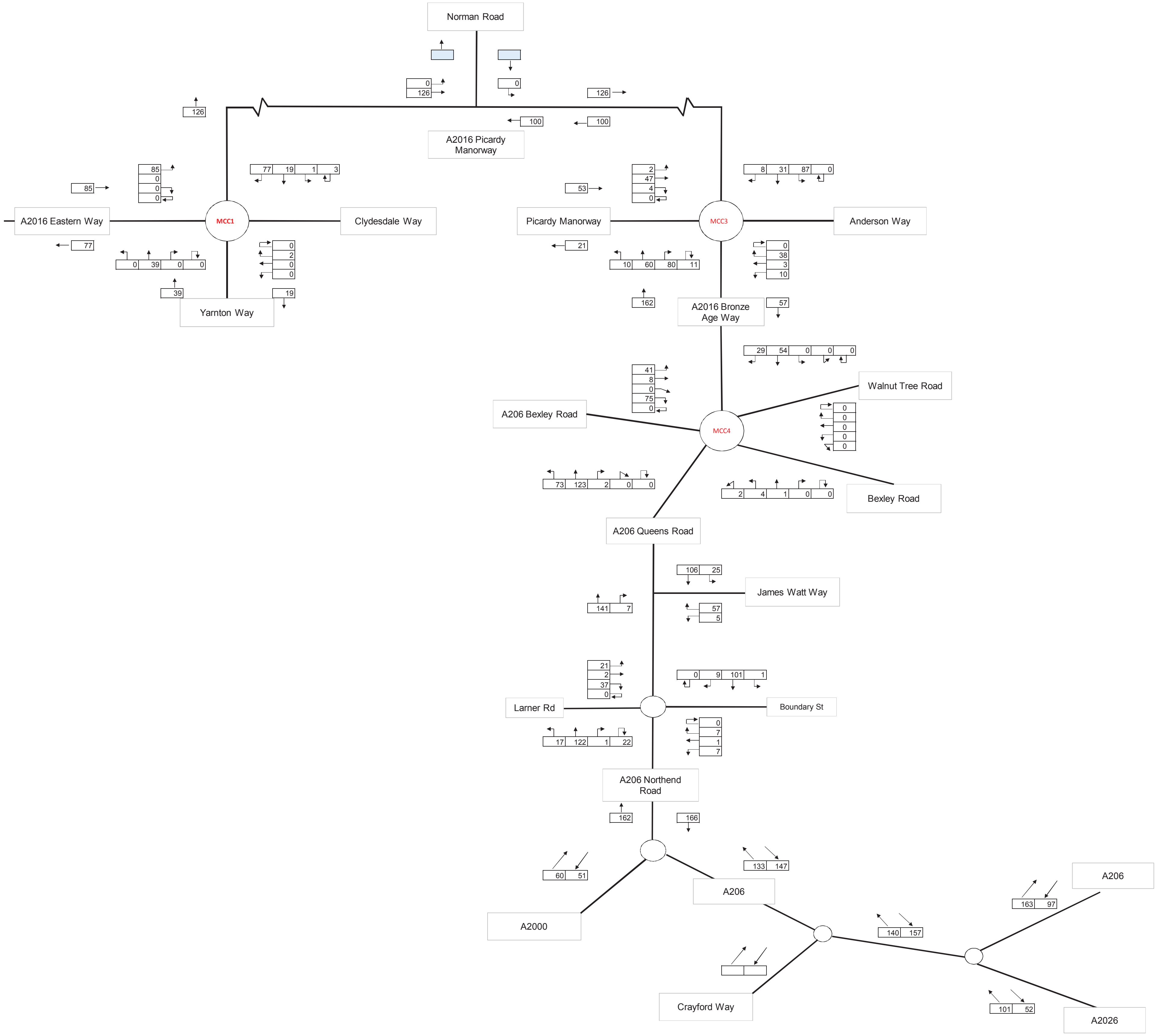
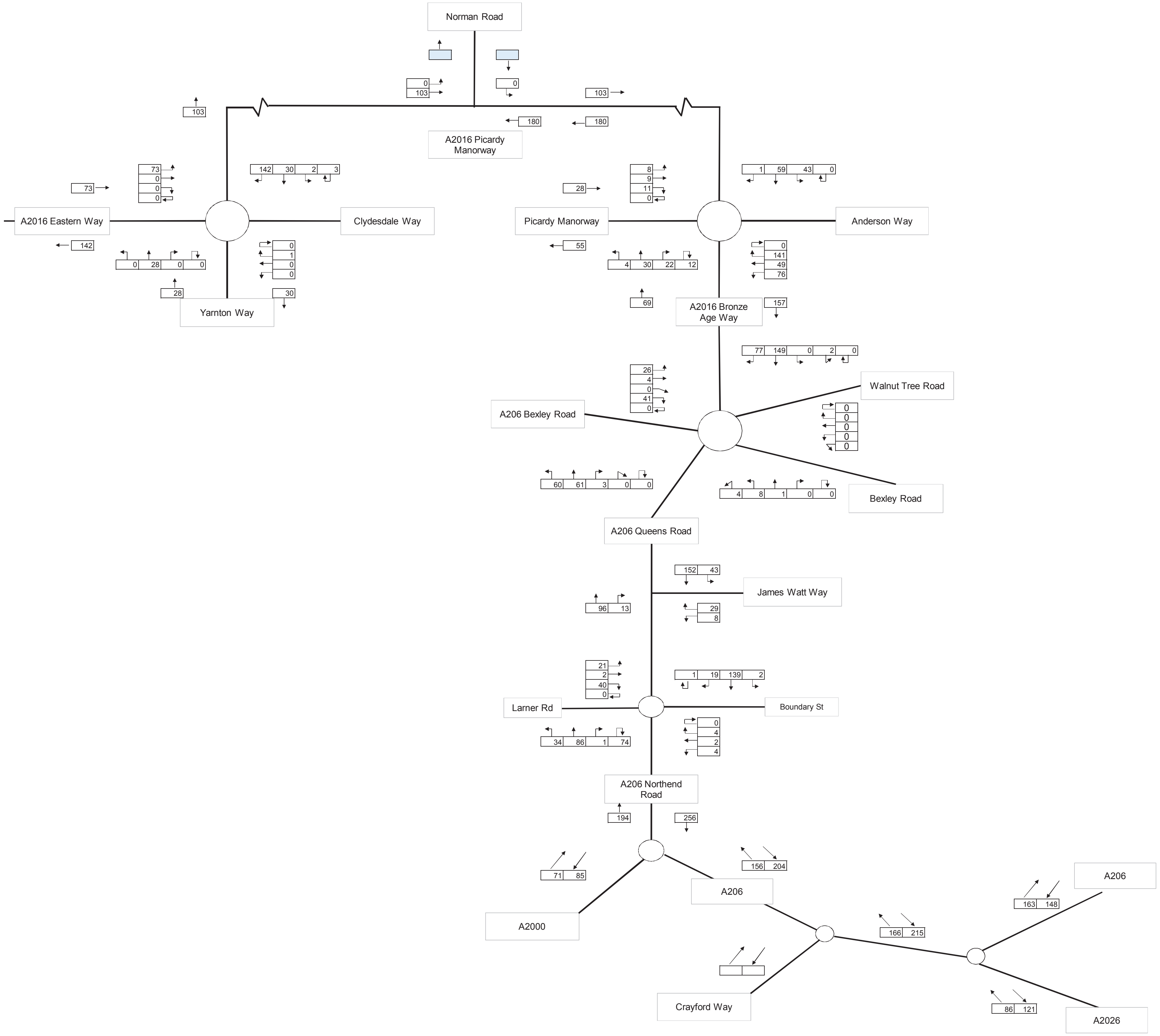
43. mo.
45. mo.

Appendix J Network Traffic Flows and Distribution

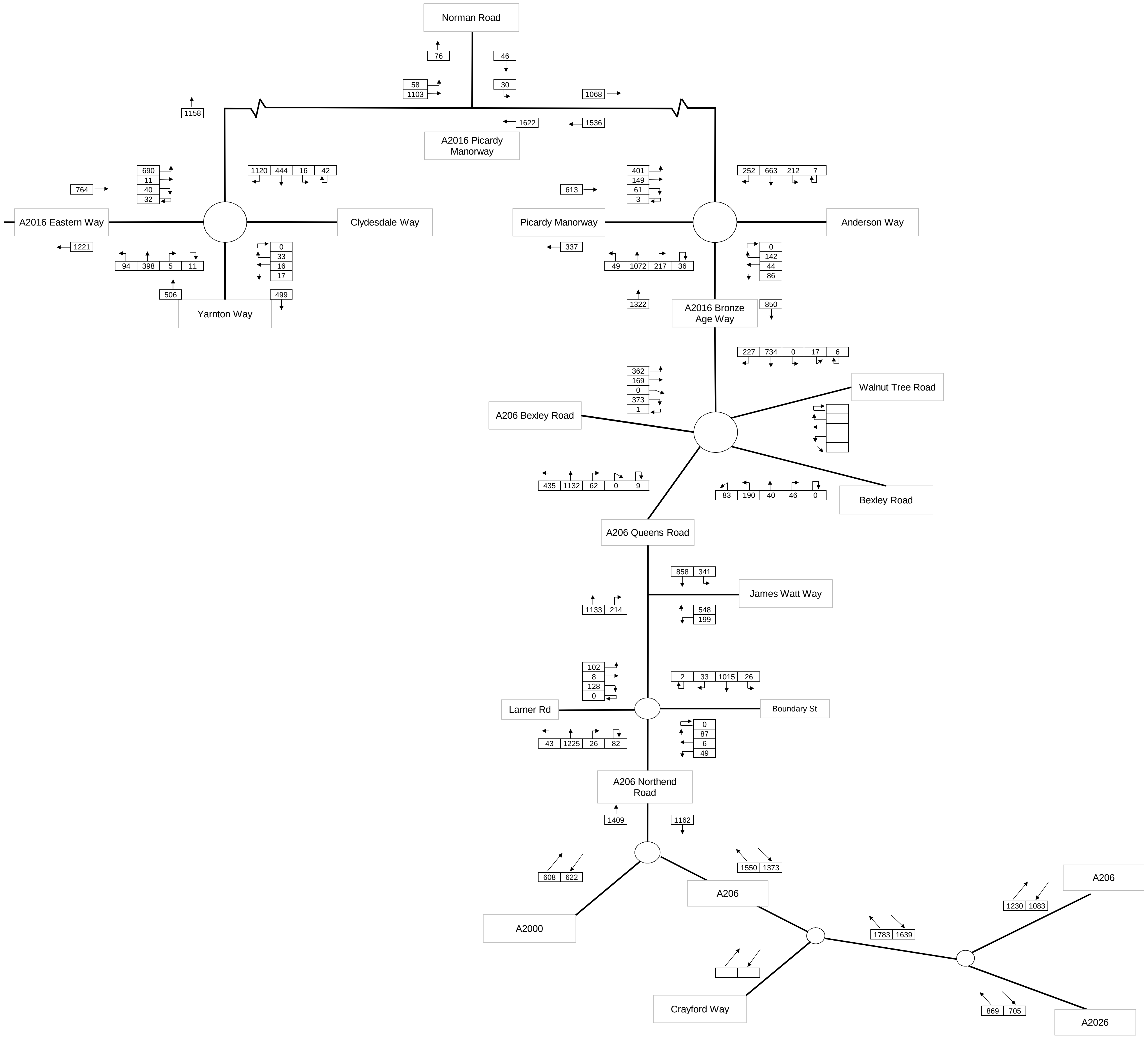
Combined Committed Development Flows - AM Peak Hour (in Vehicles)



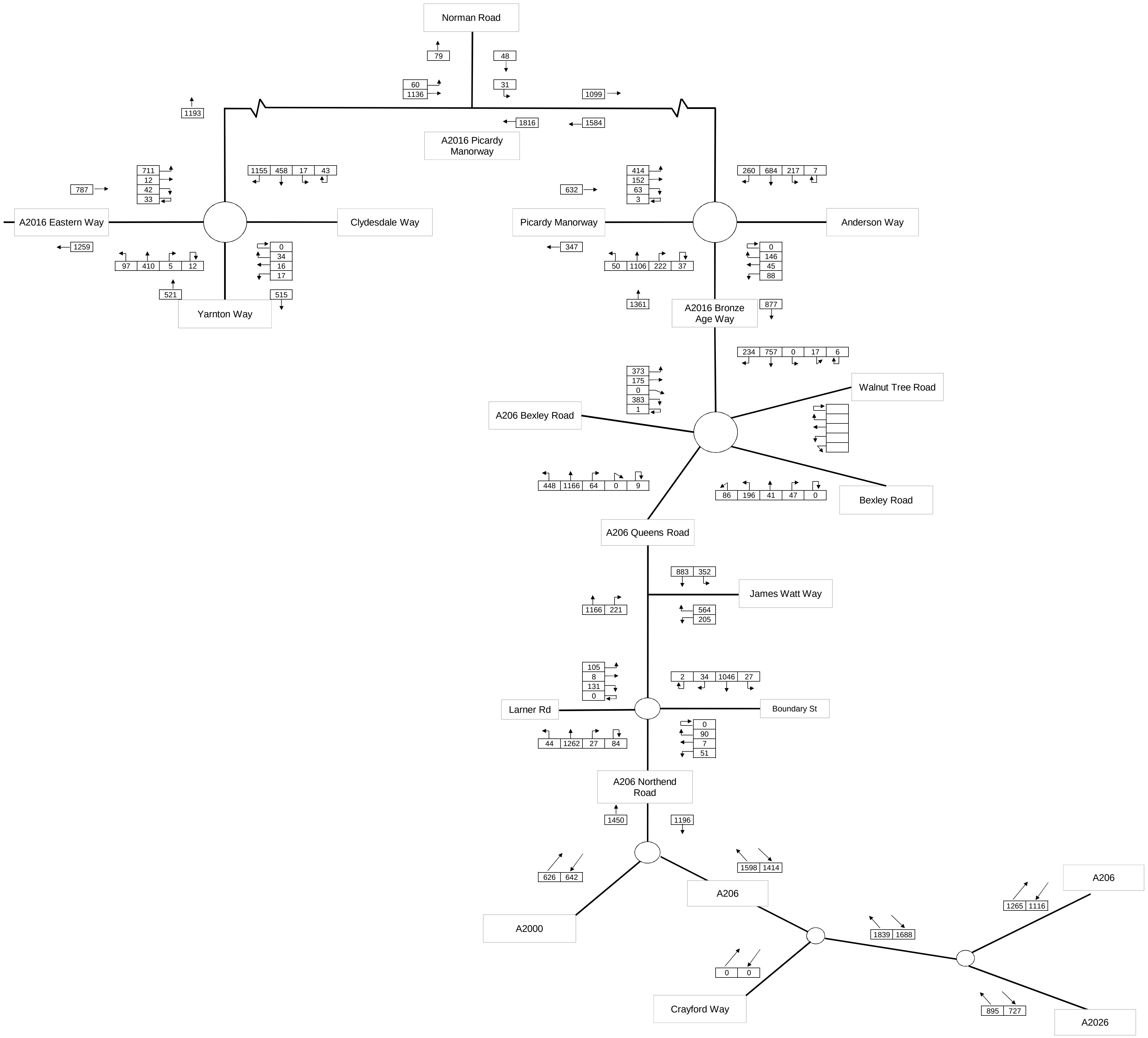
Combined Committed Development Flows - PM Peak Hour (in Vehicles)



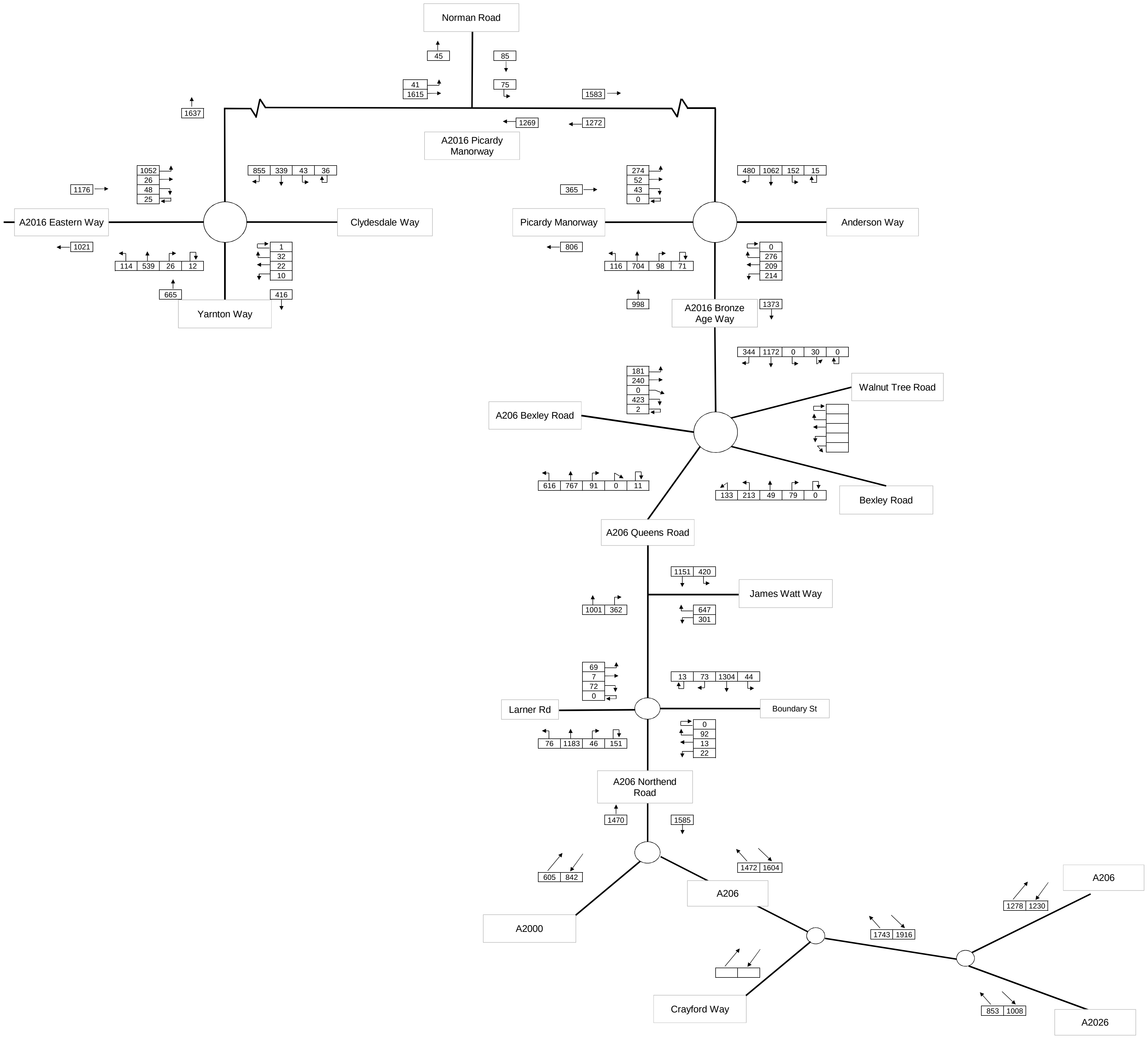
2028 Do Minimum Traffic Flows - AM Peak 07:45-08:45 (in Vehicles)



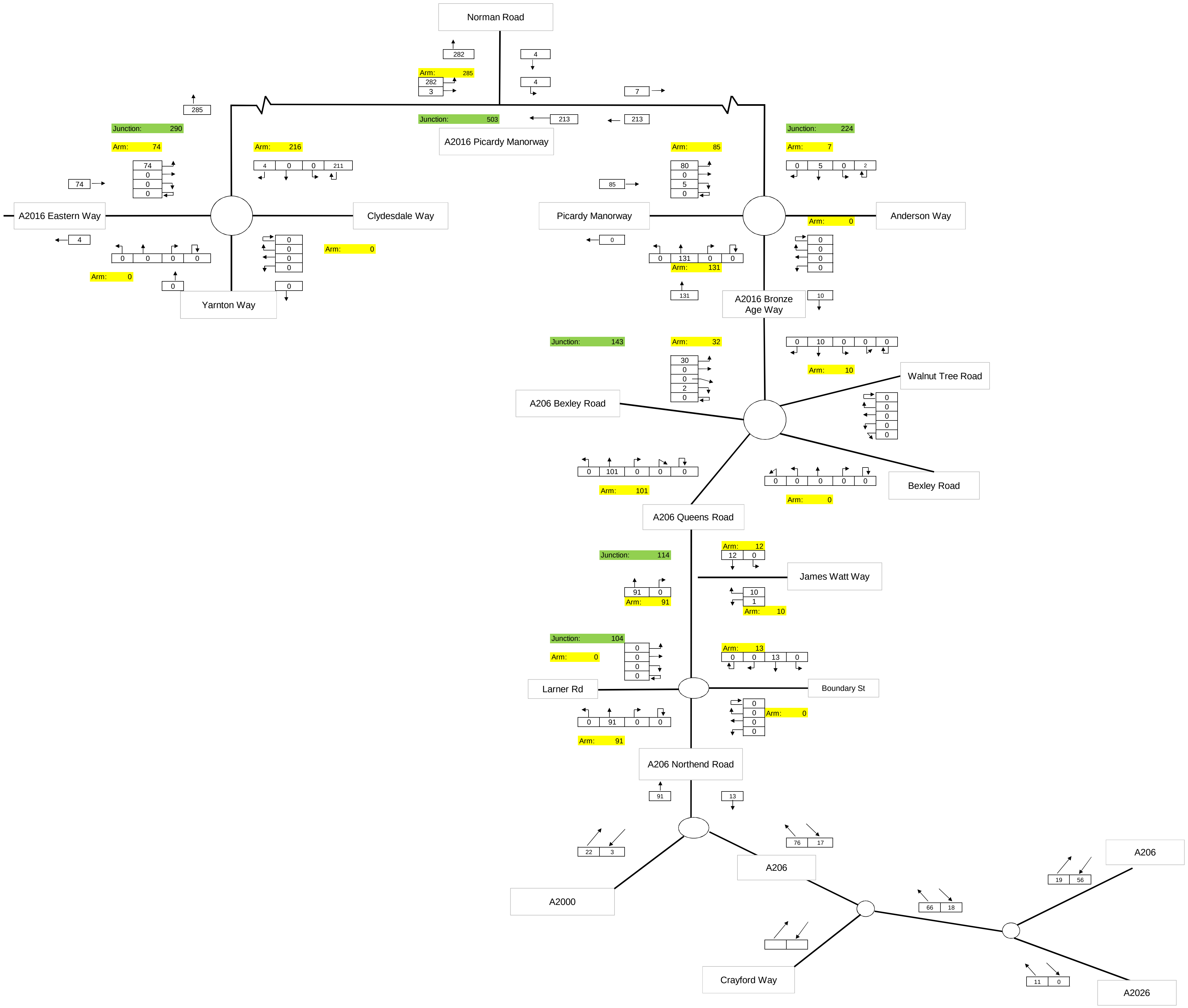
2028 Do Minimum Traffic Flows - AM Peak 07:45-08:45 (in Vehicles)



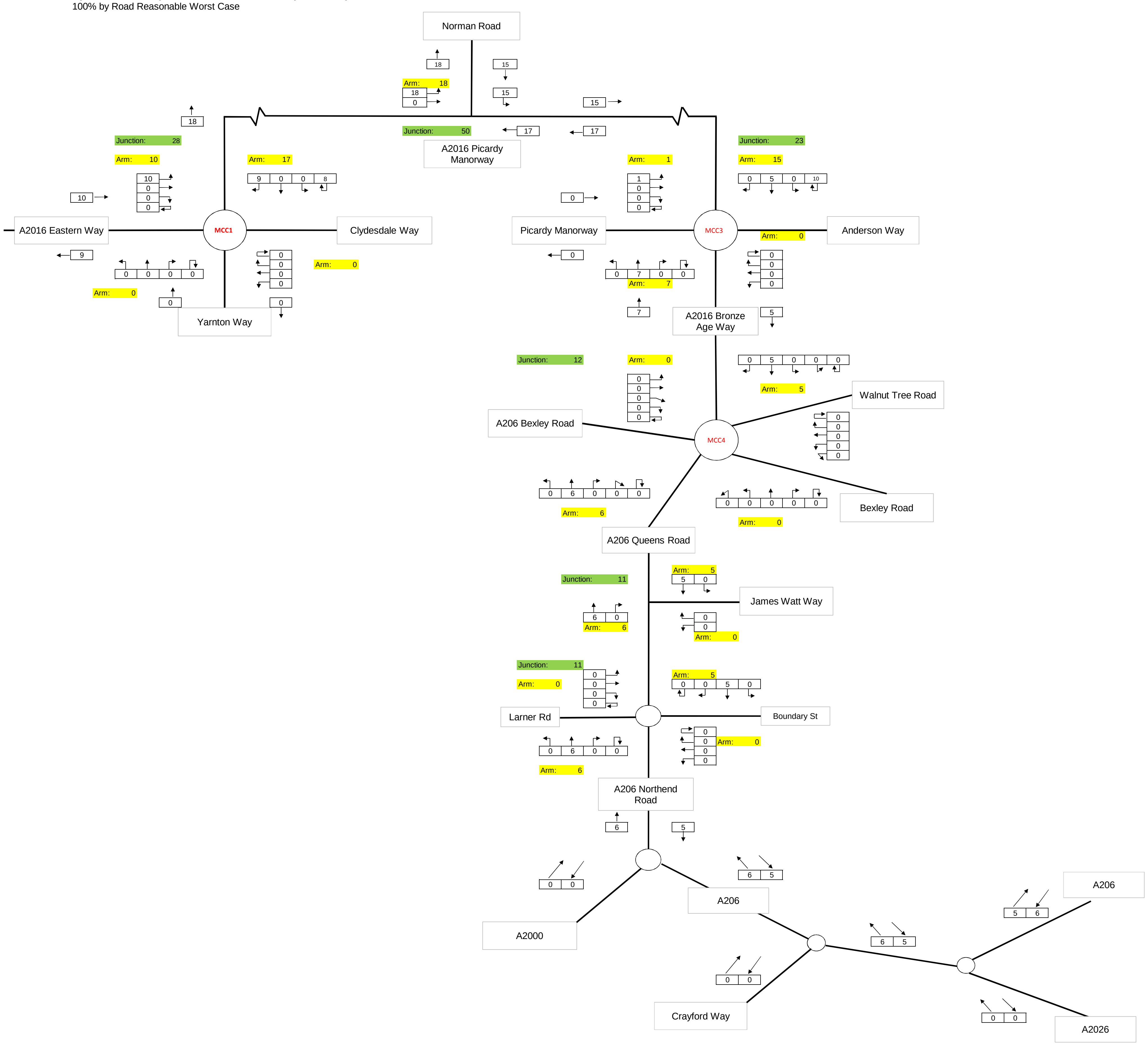
2028 Do Minimum Traffic Flows - PM Peak 16:30-17:30 (in Vehicles)



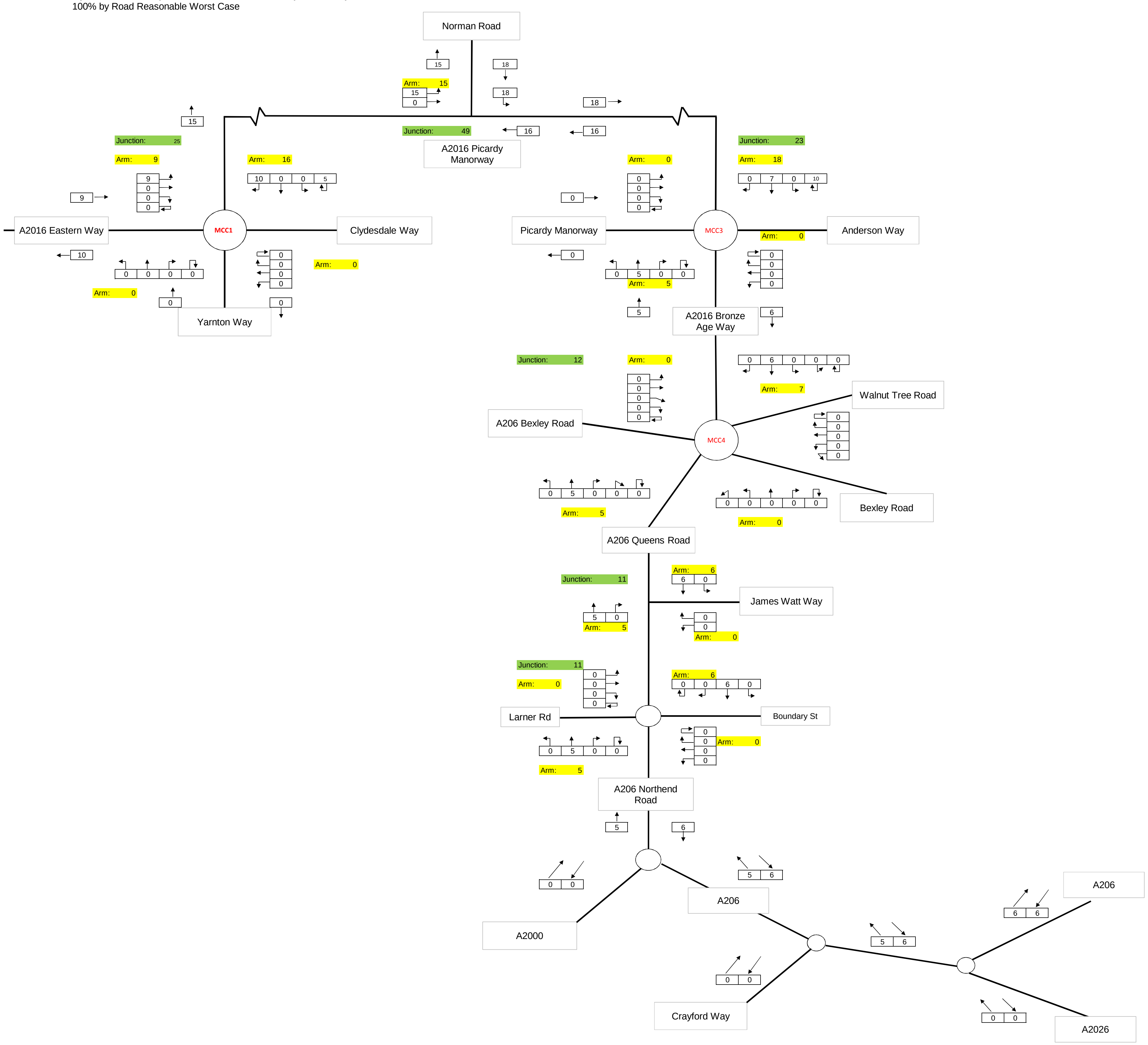
2022 Construction Traffic Flows - AM Peak 07:45-08:45 (in Vehicles)



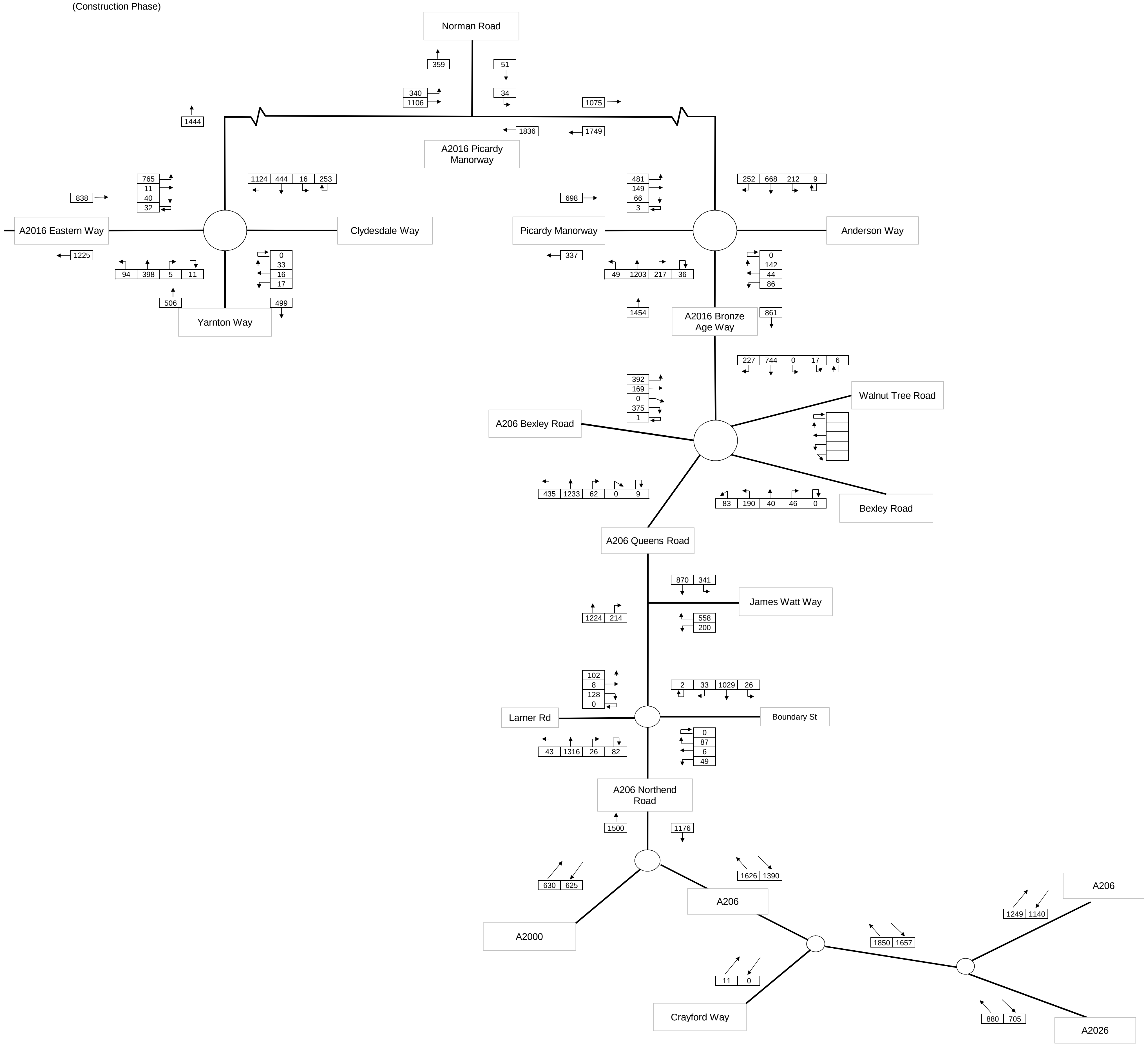
Operational Development Flows - AM Peak Hour (in Vehicles)
100% by Road Reasonable Worst Case



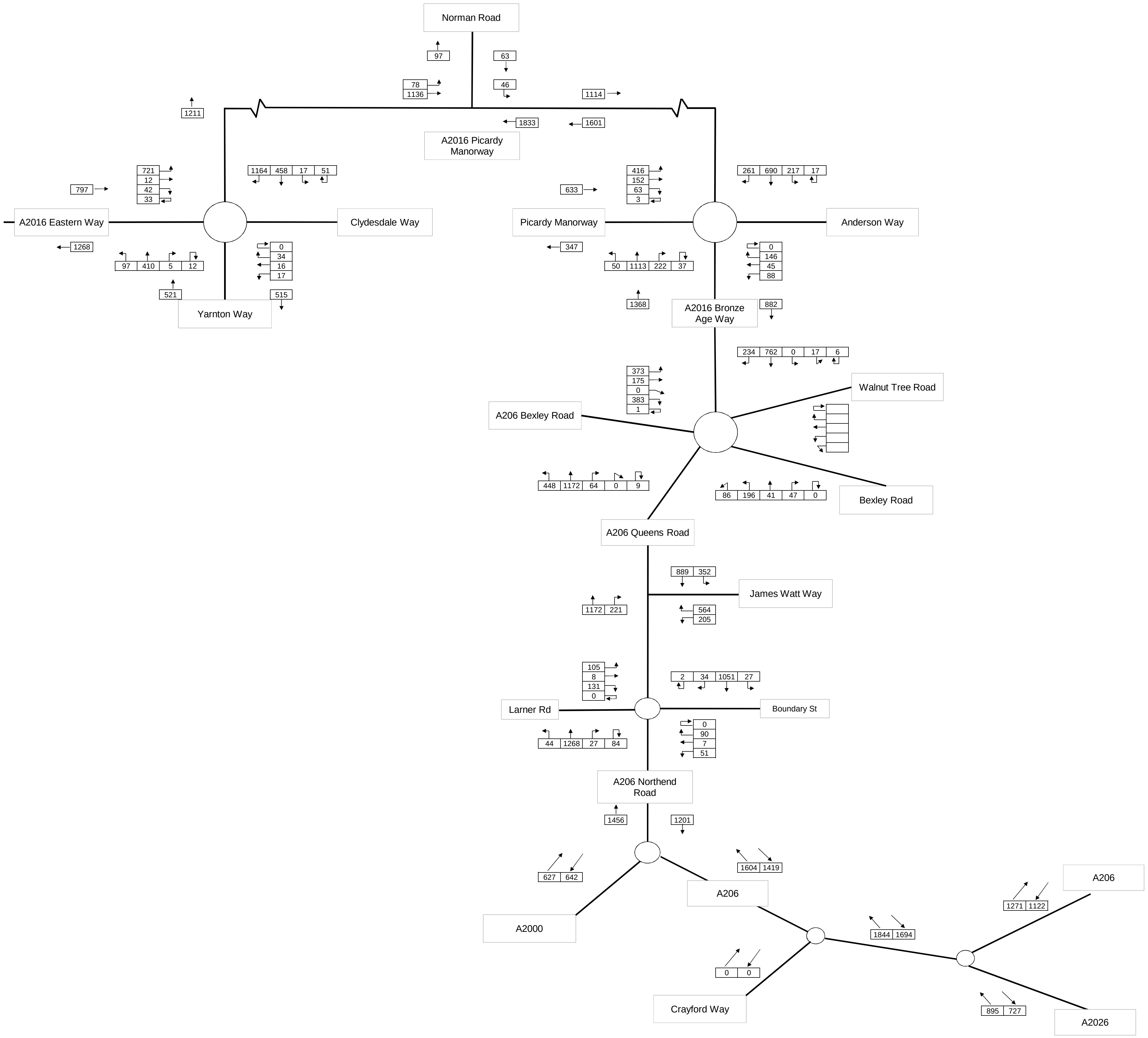
Operational Development Flows - PM Peak Hour (in Vehicles)
100% by Road Reasonable Worst Case



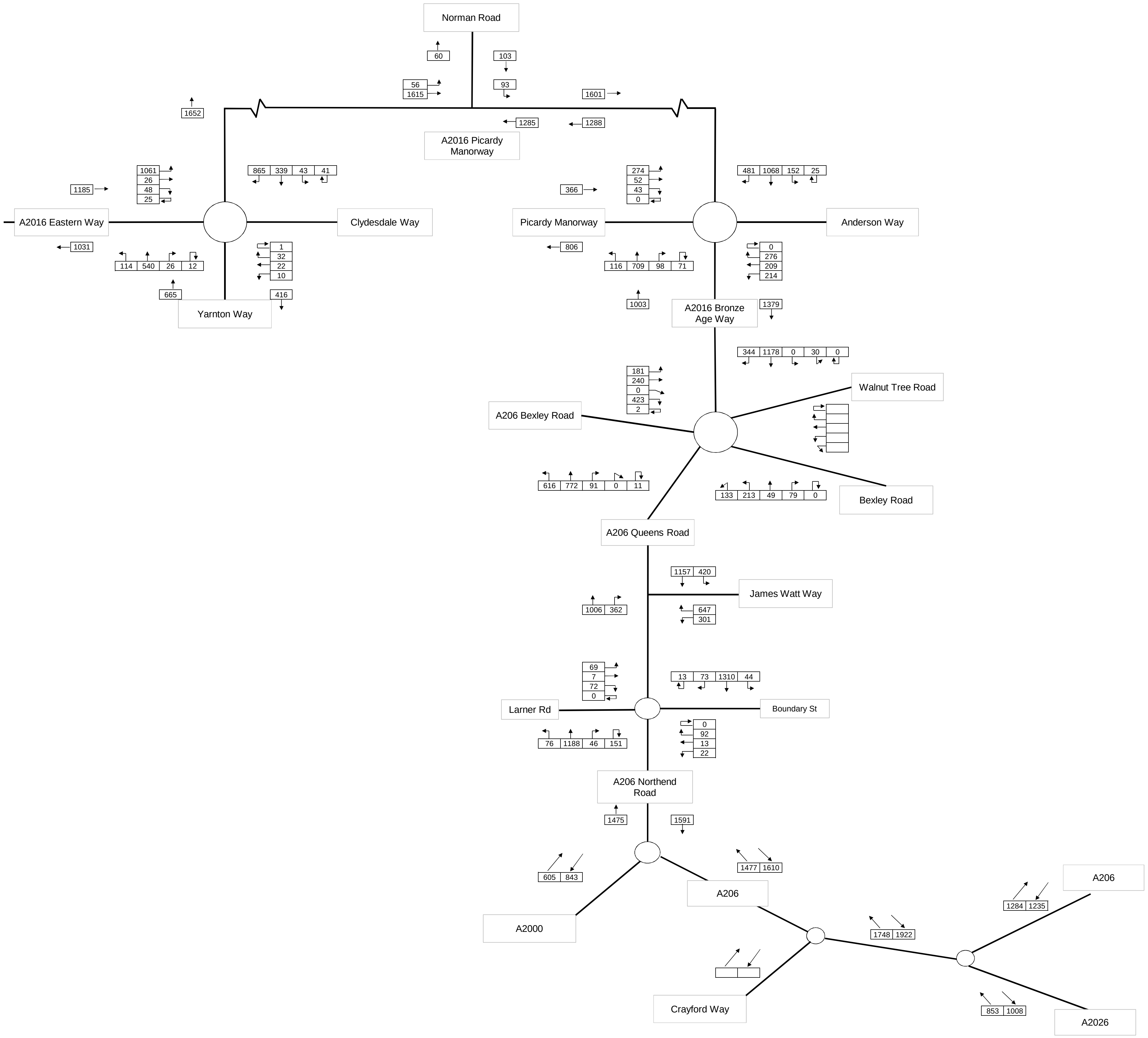
2022 Do Something Traffic Flows - AM Peak 07:45-08:45 (in Vehicles)
(Construction Phase)



2028 Do Something Traffic Flows - AM Peak 07:45-08:45 (in Vehicles)



2028 Do Something Traffic Flows - PM Peak 16:30-17:30 (in Vehicles)



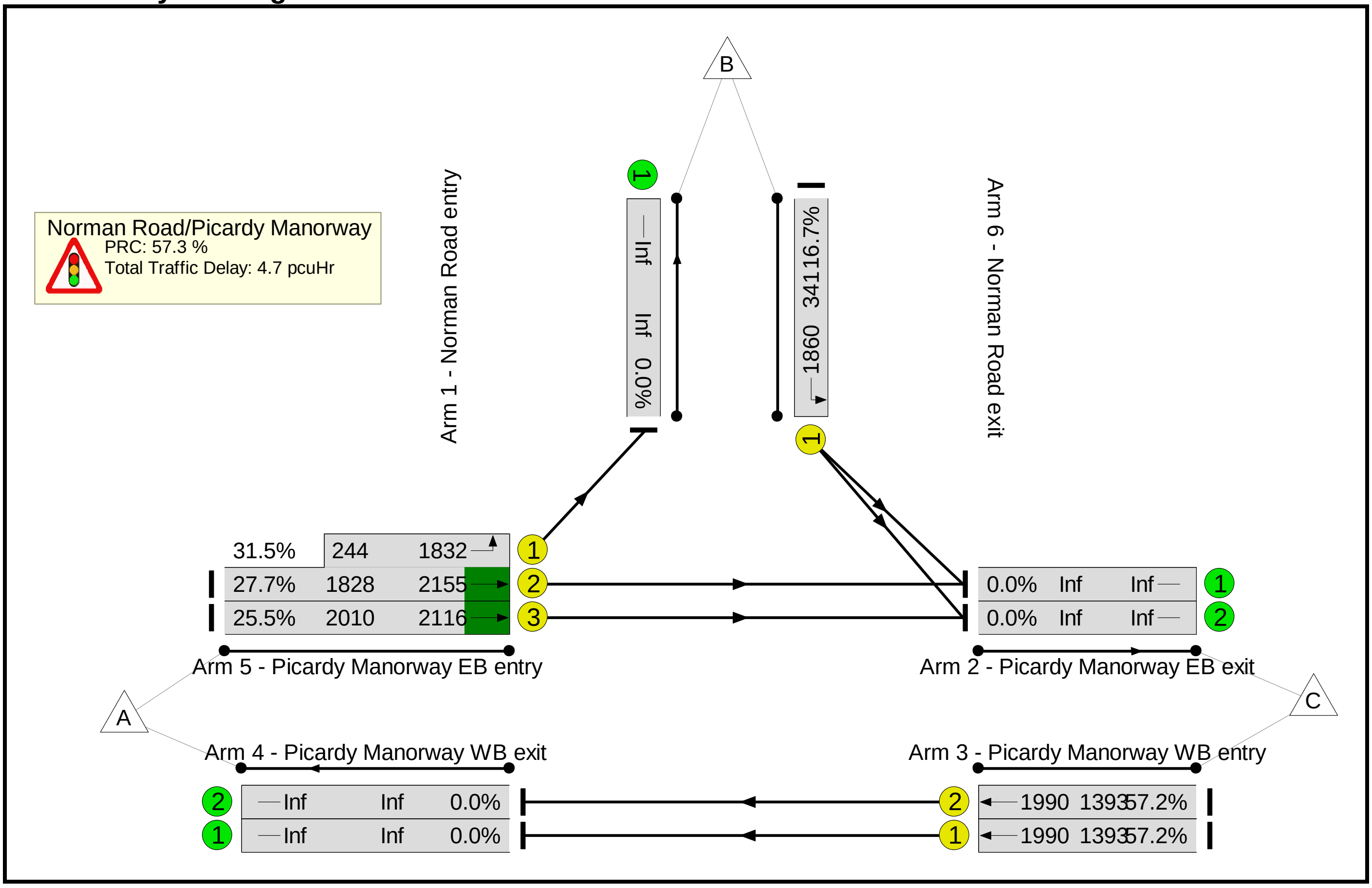
Appendix K Network Modelling Outputs

Basic Results Summary
Basic Results Summary

User and Project Details

Title:	
File name:	Norman Road_Picardy Manorway_v1.lsg3x

Scenario 1: '2018 Base AM' (FG1: '2018 Baseline AM', Plan 1: 'Network Control Plan 1')
Network Layout Diagram



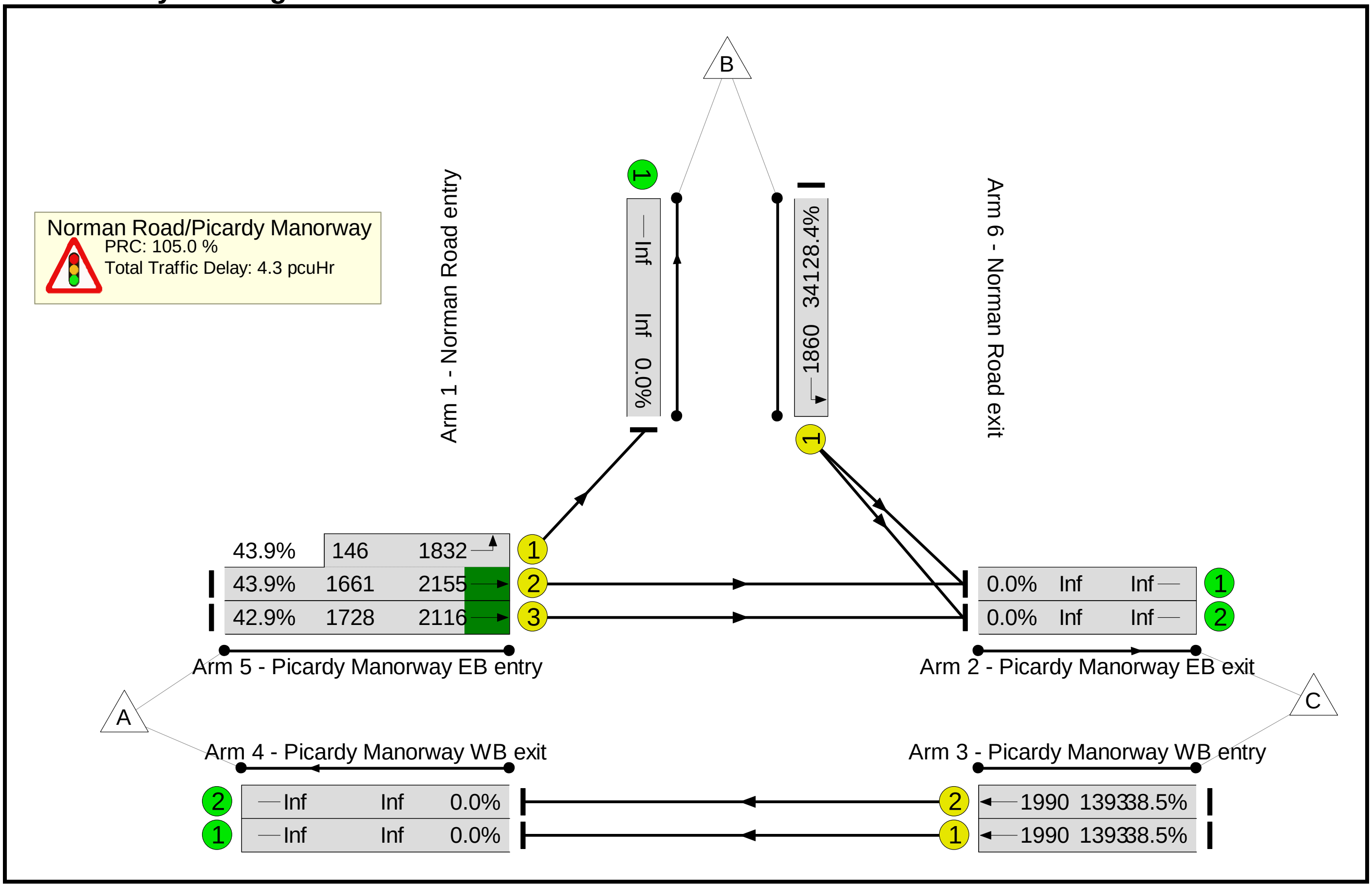
Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Controller Stream	Full Phase	Arrow Phase	Total Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**N/A**	**-**		**-**	**-**	**-**	**-**	**57.2%**	**4.7**	**-**	**-**
Norman Road/Picardy Manorway	**-**	**-**	**N/A**	**-**		**-**	**-**	**-**	**-**	**57.2%**	**4.7**	**-**	**-**
1/1	Norman Road entry Left	U	1	B		10	57	1860	341	16.7%	0.4	27.0	0.9
3/1	Picardy Manorway WB entry Ahead	U	3	G		41	797	1990	1393	57.2%	1.7	7.5	7.3
3/2	Picardy Manorway WB entry Ahead	U	3	G		41	797	1990	1393	57.2%	1.7	7.5	7.3
5/2+5/1	Picardy Manorway EB entry Ahead Left	U	1	A E		40:7	583	2155:1832	1828+244	27.7 : 31.5%	0.7	4.4	1.4
5/3	Picardy Manorway EB entry Ahead	U	1	A		40	513	2116	2010	25.5%	0.2	1.3	0.6

C1	Stream: 1	PRC for Signalled Lanes (%):	185.5	Total Delay for Signalled Lanes (pcuHr):	1.33	Cycle Time (s):	60
C1	Stream: 2	PRC for Signalled Lanes (%):	0.0	Total Delay for Signalled Lanes (pcuHr):	0.00	Cycle Time (s):	60
C1	Stream: 3	PRC for Signalled Lanes (%):	57.3	Total Delay for Signalled Lanes (pcuHr):	3.33	Cycle Time (s):	60
		PRC Over All Lanes (%):	57.3	Total Delay Over All Lanes(pcuHr):	4.66		

Basic Results Summary
Scenario 2: '2018 Base PM' (FG2: '2018 Baseline PM', Plan 1: 'Network Control Plan 1')
Network Layout Diagram



Basic Results Summary

Network Results

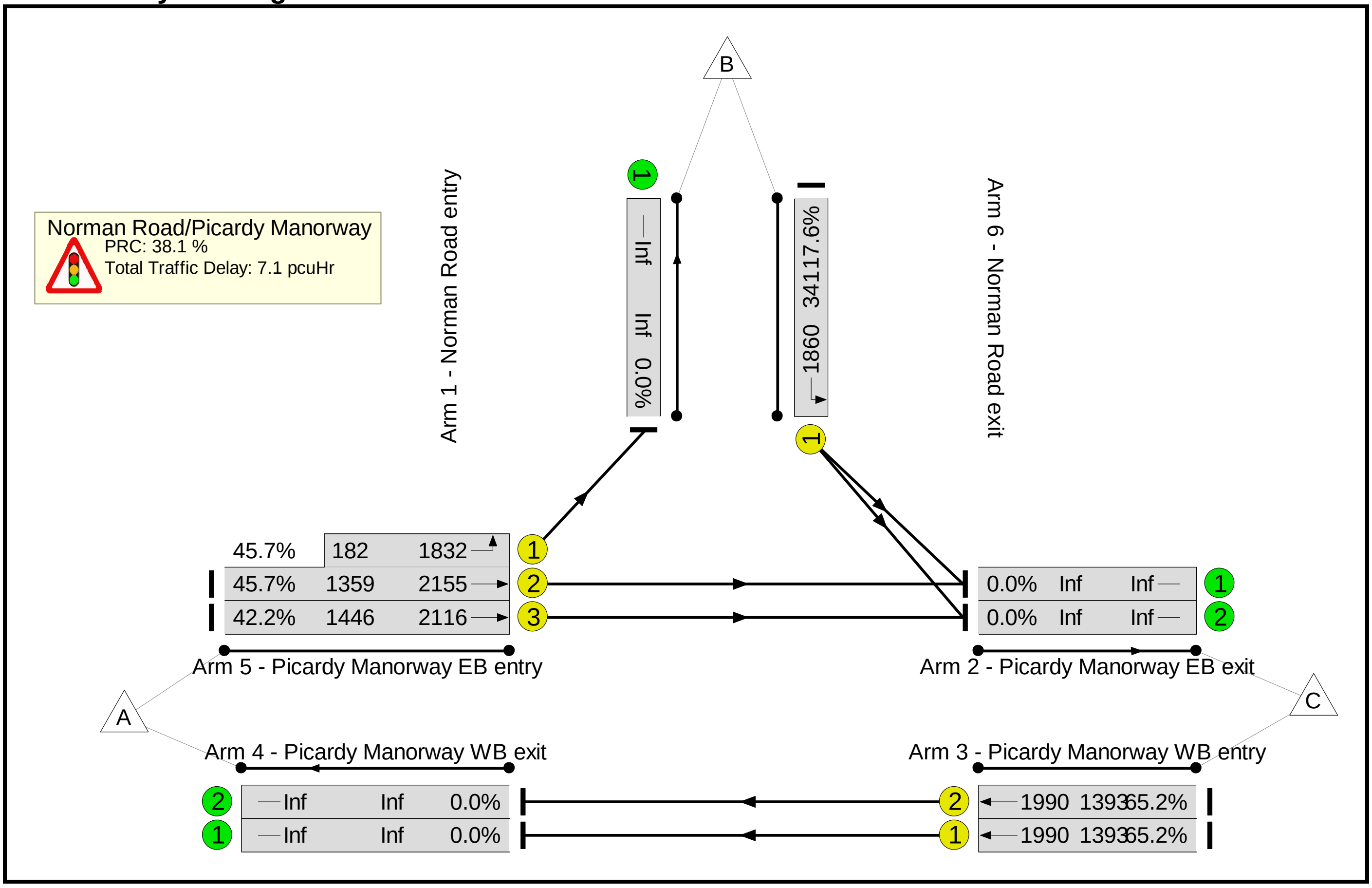
Item	Lane Description	Lane Type	Controller Stream	Full Phase	Arrow Phase	Total Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**N/A**	**-**		**-**	**-**	**-**	**-**	**43.9%**	**4.3**	**-**	**-**
Norman Road/Picardy Manorway	**-**	**-**	**N/A**	**-**		**-**	**-**	**-**	**-**	**43.9%**	**4.3**	**-**	**-**
1/1	Norman Road entry Left	U	1	B		10	97	1860	341	28.4%	0.8	28.5	1.6
3/1	Picardy Manorway WB entry Ahead	U	3	G		41	536	1990	1393	38.5%	0.9	5.8	3.9
3/2	Picardy Manorway WB entry Ahead	U	3	G		41	536	1990	1393	38.5%	0.9	5.8	3.9
5/2+5/1	Picardy Manorway EB entry Ahead Left	U	1	A E		40:7	793	2155:1832	1661+146	43.9 : 43.9%	1.1	5.1	3.6
5/3	Picardy Manorway EB entry Ahead	U	1	A		40	741	2116	1728	42.9%	0.7	3.4	3.7

C1	Stream: 1	PRC for Signalled Lanes (%):	105.0	Total Delay for Signalled Lanes (pcuHr):	2.58	Cycle Time (s):	60
C1	Stream: 2	PRC for Signalled Lanes (%):	0.0	Total Delay for Signalled Lanes (pcuHr):	0.00	Cycle Time (s):	60
C1	Stream: 3	PRC for Signalled Lanes (%):	133.9	Total Delay for Signalled Lanes (pcuHr):	1.73	Cycle Time (s):	60
		PRC Over All Lanes (%):	105.0	Total Delay Over All Lanes(pcuHr):	4.31		

Basic Results Summary

Scenario 3: '2028 DM AM' (FG3: '2028 DM AM', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

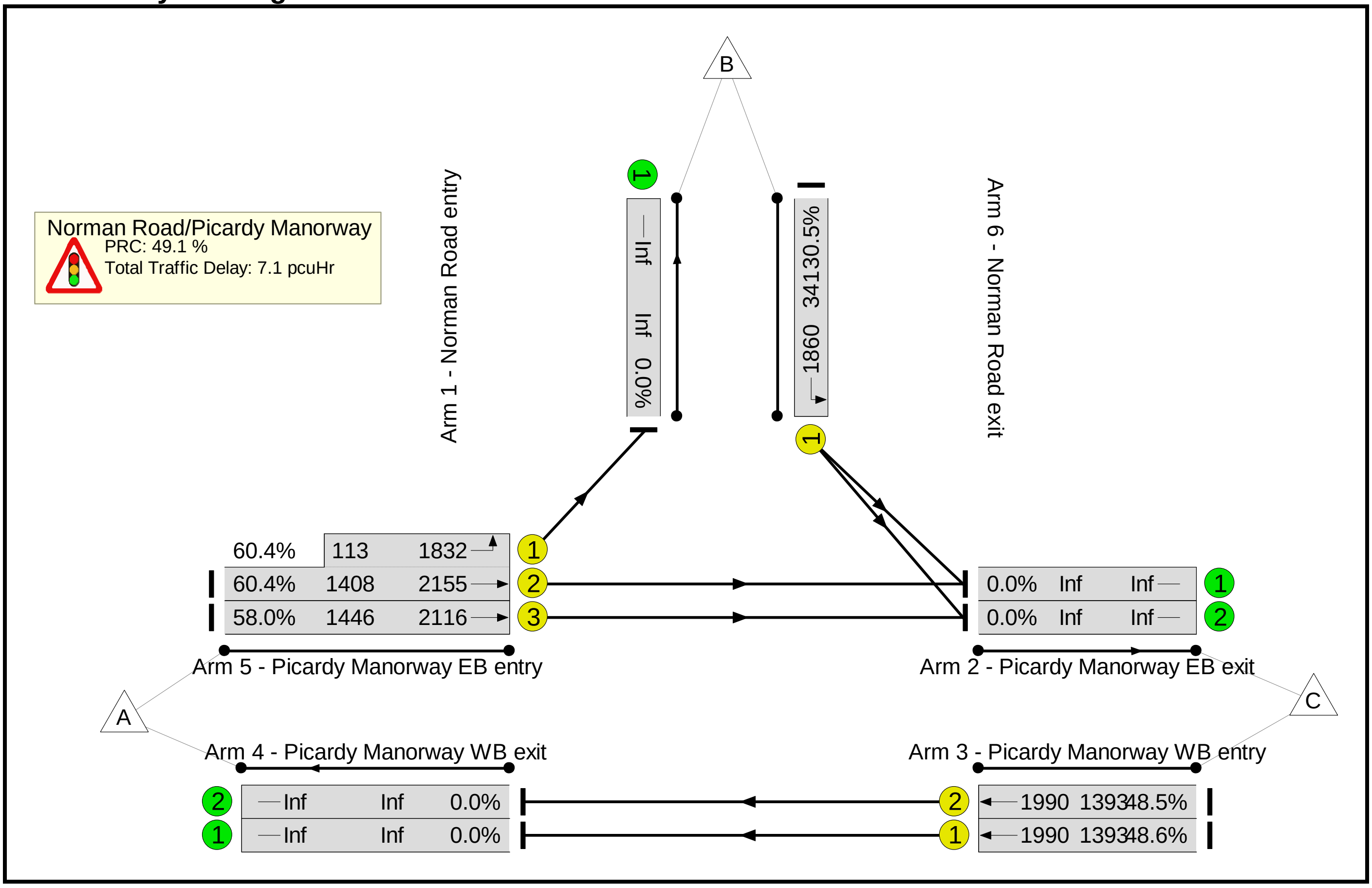
Item	Lane Description	Lane Type	Controller Stream	Full Phase	Arrow Phase	Total Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**N/A**	**-**		**-**	**-**	**-**	**-**	**65.2%**	**7.1**	**-**	**-**
Norman Road/Picardy Manorway	**-**	**-**	**N/A**	**-**		**-**	**-**	**-**	**-**	**65.2%**	**7.1**	**-**	**-**
1/1	Norman Road entry Left	U	1	B		10	60	1860	341	17.6%	0.5	27.1	0.9
3/1	Picardy Manorway WB entry Ahead	U	3	G		41	908	1990	1393	65.2%	2.2	8.7	9.3
3/2	Picardy Manorway WB entry Ahead	U	3	G		41	908	1990	1393	65.2%	2.2	8.7	9.3
5/2+5/1	Picardy Manorway EB entry Ahead Left	U	1	A E		40:42	704	2155:1832	1359+182	45.7 : 45.7%	1.2	6.2	4.9
5/3	Picardy Manorway EB entry Ahead	U	1	A		40	610	2116	1446	42.2%	1.1	6.4	4.8

C1	Stream: 1 PRC for Signalled Lanes (%):	96.9	Total Delay for Signalled Lanes (pcuHr):	2.74	Cycle Time (s):	60
C1	Stream: 2 PRC for Signalled Lanes (%):	0.0	Total Delay for Signalled Lanes (pcuHr):	0.00	Cycle Time (s):	60
C1	Stream: 3 PRC for Signalled Lanes (%):	38.1	Total Delay for Signalled Lanes (pcuHr):	4.37	Cycle Time (s):	60
	PRC Over All Lanes (%):	38.1	Total Delay Over All Lanes(pcuHr):	7.11		

Basic Results Summary

Scenario 4: '2028 DM PM' (FG4: '2028 DM PM', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

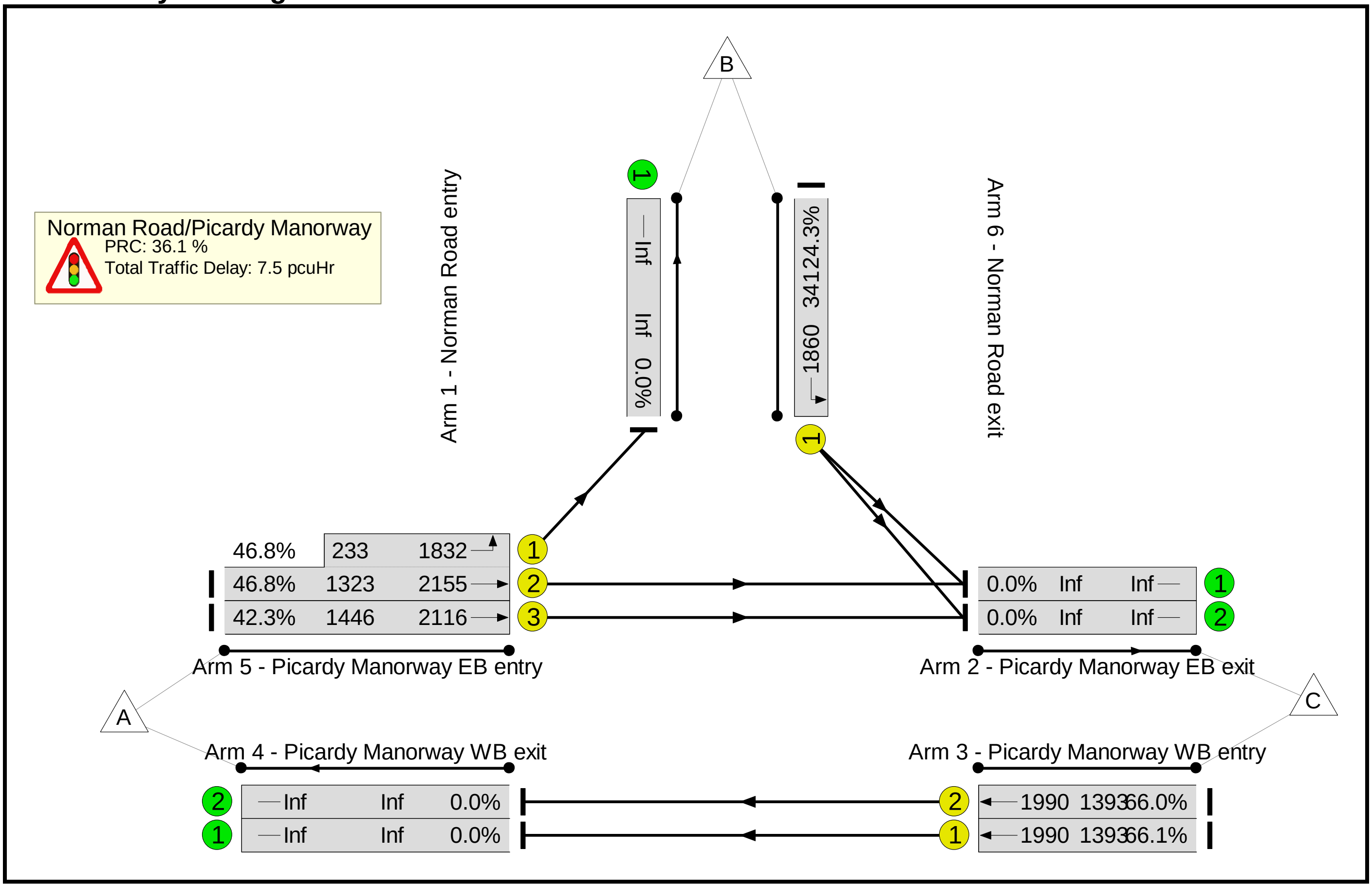
Item	Lane Description	Lane Type	Controller Stream	Full Phase	Arrow Phase	Total Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**N/A**	**-**		**-**	**-**	**-**	**-**	**60.4%**	**7.1**	**-**	**-**
Norman Road/Picardy Manorway	**-**	**-**	**N/A**	**-**		**-**	**-**	**-**	**-**	**60.4%**	**7.1**	**-**	**-**
1/1	Norman Road entry Left	U	1	B		10	104	1860	341	30.5%	0.8	28.8	1.7
3/1	Picardy Manorway WB entry Ahead	U	3	G		41	677	1990	1393	48.6%	1.2	6.6	5.5
3/2	Picardy Manorway WB entry Ahead	U	3	G		41	676	1990	1393	48.5%	1.2	6.6	5.5
5/2+5/1	Picardy Manorway EB entry Ahead Left	U	1	A E		40:42	918	2155:1832	1408+113	60.4 : 60.4%	2.0	7.8	8.1
5/3	Picardy Manorway EB entry Ahead	U	1	A		40	839	2116	1446	58.0%	1.9	7.9	7.9

C1	Stream: 1	PRC for Signalled Lanes (%):	49.1	Total Delay for Signalled Lanes (pcuHr):	4.67	Cycle Time (s):	60
C1	Stream: 2	PRC for Signalled Lanes (%):	0.0	Total Delay for Signalled Lanes (pcuHr):	0.00	Cycle Time (s):	60
C1	Stream: 3	PRC for Signalled Lanes (%):	85.2	Total Delay for Signalled Lanes (pcuHr):	2.48	Cycle Time (s):	60
		PRC Over All Lanes (%):	49.1	Total Delay Over All Lanes(pcuHr):	7.15		

Basic Results Summary

Scenario 5: '2028 DS AM (100% Rd)' (FG5: '2028 DS AM (100% Rd)', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

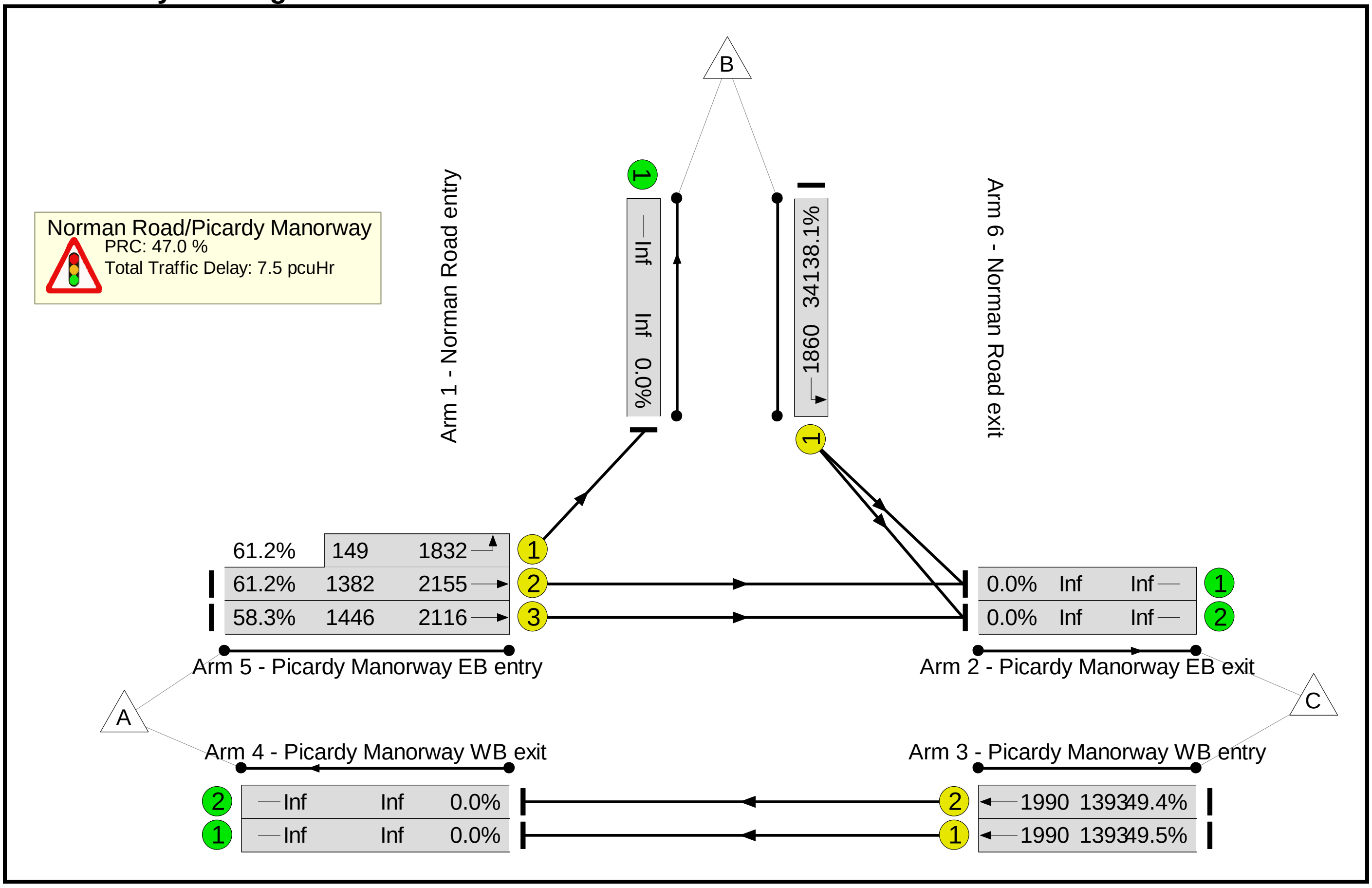
Item	Lane Description	Lane Type	Controller Stream	Full Phase	Arrow Phase	Total Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**N/A**	**-**		**-**	**-**	**-**	**-**	**66.1%**	**7.5**	**-**	**-**
Norman Road/Picardy Manorway	**-**	**-**	**N/A**	**-**		**-**	**-**	**-**	**-**	**66.1%**	**7.5**	**-**	**-**
1/1	Norman Road entry Left	U	1	B		10	83	1860	341	24.3%	0.6	27.9	1.3
3/1	Picardy Manorway WB entry Ahead	U	3	G		41	921	1990	1393	66.1%	2.3	8.8	9.4
3/2	Picardy Manorway WB entry Ahead	U	3	G		41	920	1990	1393	66.0%	2.3	8.8	9.4
5/2+5/1	Picardy Manorway EB entry Ahead Left	U	1	A E		40:42	728	2155:1832	1323+233	46.8 : 46.8%	1.2	6.1	4.9
5/3	Picardy Manorway EB entry Ahead	U	1	A		40	612	2116	1446	42.3%	1.1	6.4	4.8

C1 Stream: 1 PRC for Signalled Lanes (%): 92.4 Total Delay for Signalled Lanes (pcuHr): 2.97 Cycle Time (s): 60
C1 Stream: 2 PRC for Signalled Lanes (%): 0.0 Total Delay for Signalled Lanes (pcuHr): 0.00 Cycle Time (s): 60
C1 Stream: 3 PRC for Signalled Lanes (%): 36.1 Total Delay for Signalled Lanes (pcuHr): 4.51 Cycle Time (s): 60
PRC Over All Lanes (%): 36.1 Total Delay Over All Lanes(pcuHr): 7.49

Basic Results Summary

Scenario 6: '2028 DS PM (100% Rd)' (FG6: '2028 DS PM (100% Rd)', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Controller Stream	Full Phase	Arrow Phase	Total Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**N/A**	**-**		**-**	**-**	**-**	**-**	**61.2%**	**7.5**	**-**	**-**
Norman Road/Picardy Manorway	**-**	**-**	**N/A**	**-**		**-**	**-**	**-**	**-**	**61.2%**	**7.5**	**-**	**-**
1/1	Norman Road entry Left	U	1	B		10	130	1860	341	38.1%	1.1	30.0	2.2
3/1	Picardy Manorway WB entry Ahead	U	3	G		41	689	1990	1393	49.5%	1.3	6.7	5.7
3/2	Picardy Manorway WB entry Ahead	U	3	G		41	688	1990	1393	49.4%	1.3	6.7	5.6
5/2+5/1	Picardy Manorway EB entry Ahead Left	U	1	A E		40:42	937	2155:1832	1382+149	61.2 : 61.2%	2.0	7.7	8.1
5/3	Picardy Manorway EB entry Ahead	U	1	A		40	843	2116	1446	58.3%	1.9	8.0	8.0

C1	Stream: 1	PRC for Signalled Lanes (%):	47.0	Total Delay for Signalled Lanes (pcuHr):	4.97	Cycle Time (s):	60
C1	Stream: 2	PRC for Signalled Lanes (%):	0.0	Total Delay for Signalled Lanes (pcuHr):	0.00	Cycle Time (s):	60
C1	Stream: 3	PRC for Signalled Lanes (%):	82.0	Total Delay for Signalled Lanes (pcuHr):	2.56	Cycle Time (s):	60
		PRC Over All Lanes (%):	47.0	Total Delay Over All Lanes(pcuHr):	7.53		

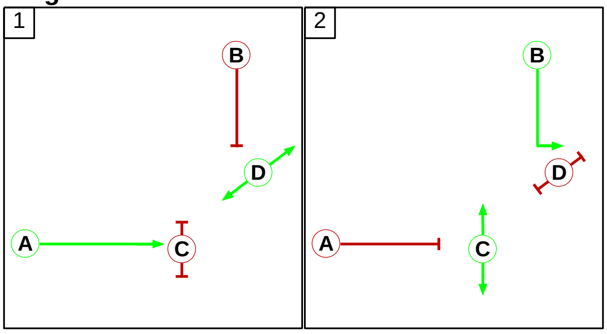
Basic Results Summary

Phase Intergreens Matrix

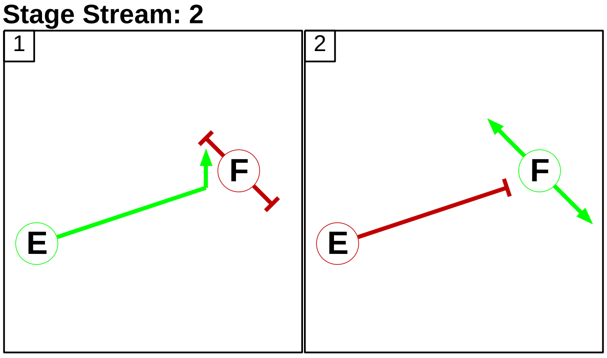
		Starting Phase							
		A	B	C	D	E	F	G	H
Terminating Phase	A		5	5	-	-	-	-	-
	B	5		-	5	-	-	-	-
	C	8	-		-	-	-	-	-
	D	-	8	-		-	-	-	-
	E	-	-	-	-		5	-	-
	F	-	-	-	-	8		-	-
	G	-	-	-	-	-	-		5
	H	-	-	-	-	-	-	9	

Stage Diagram

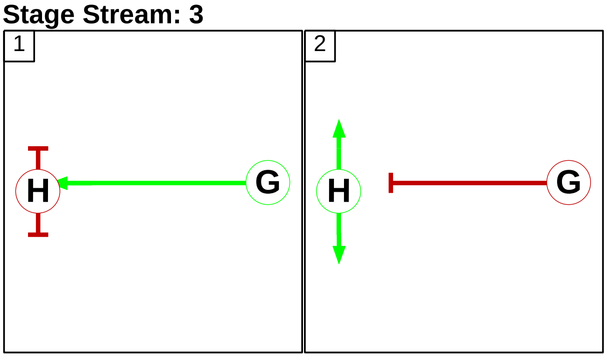
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.0.2.5947

For sales and distribution information, program advice and maintenance, contact TRL:
+44 (0)1344 770558 software@trl.co.uk www.trlsoftware.co.uk

Filename: A2016 Picardy Manorway/Anderson Way
Path: \\pba.int\cbh\Projects\42166 Riverside 2\Transport\5. Drawings & Models\Traffic Modelling\Operational Assessments
Report generation date: 27/09/2018 12:23:34

Summary of junction performance

	AM				PM				DM AM				DM PM				DS 100%Rd AM				DS
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)
	2018																				
Arm 1	1.0	2.89	0.47	A	2.1	4.33	0.66	A													
Arm 2	0.2	2.19	0.15	A	0.4	3.28	0.29	A													
Arm 3	1.5	3.92	0.58	A	1.0	3.42	0.46	A													
Arm 4	0.8	4.54	0.41	A	0.3	2.73	0.20	A													
	2028																				
Arm 1									1.5	3.89	0.58	A	3.5	6.36	0.76	A	1.6	3.99	0.59	A	3.7
Arm 2									0.3	2.41	0.19	A	1.3	5.58	0.54	A	0.3	2.44	0.19	A	1.3
Arm 3									2.7	5.77	0.71	A	1.6	4.95	0.59	A	2.8	5.97	0.72	A	1.6
Arm 4									1.4	7.11	0.56	A	0.4	3.35	0.25	A	1.4	7.37	0.57	A	0.4

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

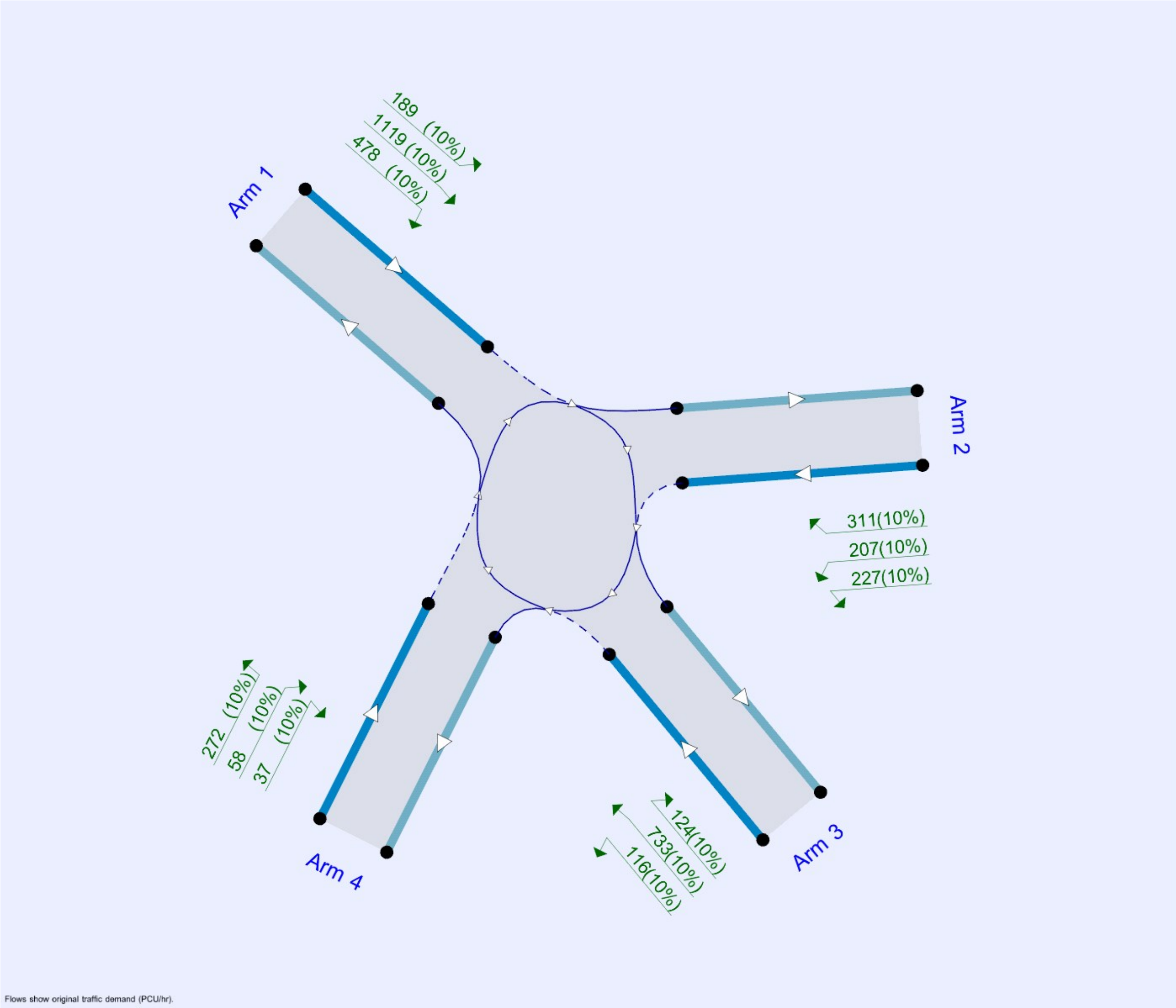
File summary

File Description

Title		A2016 Picardy Manorway/Anderson Way
Location		
Site number		
Date	09/07/2018	
Version		
Status	(new file)	
Identifier		
Client		
Jobnumber		
Enumerator	PBA\jtsmith	
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

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		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)
D1	2018	AM	ONE HOUR	07:30	09:00	15
D2	2018	PM	ONE HOUR	16:15	17:45	15
D3	2028	DM AM	ONE HOUR	07:30	09:00	15
D4	2028	DM PM	ONE HOUR	16:15	17:45	15
D5	2028	DS 100%Rd AM	ONE HOUR	07:30	09:00	15
D6	2028	DS 100%Rd PM	ONE HOUR	16:15	17:45	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2018, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	1, 2, 3, 4	3.53	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	A2016 Picardy Manorway	
2	Anderson Way	
3	A2016 Bronze Age Way	
4	B253 Picardy Manorway	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	7.70	10.50	4.9	35.0	62.0	11.5	
2	7.50	16.00	8.9	29.0	62.0	24.0	
3	7.50	10.50	6.7	35.0	62.0	20.5	
4	4.50	10.30	30.0	28.6	62.0	20.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.764	2857
2	0.778	3012
3	0.745	2789
4	0.706	2570

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

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2018	AM	ONE HOUR	07:30	09:00	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	1080	100.000
2		✓	292	100.000
3		✓	1289	100.000
4		✓	556	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	9	148	679	244
	2	137	0	109	46
	3	1056	158	36	39
	4	393	103	57	3

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	10	10	10	10
	2	10	10	10	10
	3	10	10	10	10
	4	10	10	10	10

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
07:30-07:45	1	813	813
	2	220	220
	3	970	970
	4	419	419
07:45-08:00	1	971	971
	2	263	263
	3	1159	1159
	4	500	500
08:00-08:15	1	1189	1189
	2	321	321
	3	1419	1419
	4	612	612
08:15-08:30	1	1189	1189
	2	321	321
	3	1419	1419
	4	612	612
08:30-08:45	1	971	971
	2	263	263
	3	1159	1159
	4	500	500
08:45-09:00	1	813	813
	2	220	220
	3	970	970
	4	419	419

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
1	0.47	2.89	1.0	A
2	0.15	2.19	0.2	A
3	0.58	3.92	1.5	A
4	0.41	4.54	0.8	A

Main Results for each time segment

07:30 - 07:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	813	268	2652	0.307	811	0.5	2.149	A
2	220	772	2411	0.091	219	0.1	1.805	A
3	970	330	2543	0.382	968	0.7	2.509	A
4	419	1048	1830	0.229	417	0.3	2.801	A

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	971	321	2612	0.372	970	0.6	2.410	A
2	263	923	2294	0.114	262	0.1	1.949	A
3	1159	394	2495	0.464	1158	0.9	2.958	A
4	500	1254	1684	0.297	499	0.5	3.339	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1189	392	2557	0.465	1188	1.0	2.889	A
2	321	1131	2132	0.151	321	0.2	2.186	A
3	1419	483	2429	0.584	1417	1.5	3.903	A
4	612	1535	1486	0.412	611	0.8	4.518	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1189	393	2557	0.465	1189	1.0	2.894	A
2	321	1132	2132	0.151	321	0.2	2.187	A
3	1419	483	2429	0.584	1419	1.5	3.921	A
4	612	1537	1484	0.412	612	0.8	4.539	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	971	322	2611	0.372	972	0.7	2.418	A
2	263	925	2292	0.115	263	0.1	1.952	A
3	1159	395	2495	0.465	1161	1.0	2.976	A
4	500	1257	1682	0.297	501	0.5	3.358	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	813	269	2652	0.307	814	0.5	2.156	A
2	220	775	2409	0.091	220	0.1	1.807	A
3	970	331	2543	0.382	972	0.7	2.524	A
4	419	1052	1827	0.229	419	0.3	2.815	A

2018, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	1, 2, 3, 4	3.77	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2018	PM	ONE HOUR	16:15	17:45	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	1589	100.000
2		✓	446	100.000
3		✓	914	100.000
4		✓	333	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	14	140	988	447
	2	148	0	146	152
	3	656	97	55	106
	4	254	47	32	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	10	10	10	10
	2	10	10	10	10
	3	10	10	10	10
	4	10	10	10	10

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
16:15-16:30	1	1196	1196
	2	336	336
	3	688	688
	4	251	251
16:30-16:45	1	1428	1428
	2	401	401
	3	822	822
	4	299	299
16:45-17:00	1	1750	1750
	2	491	491
	3	1006	1006
	4	367	367
17:00-17:15	1	1750	1750
	2	491	491
	3	1006	1006
	4	367	367
17:15-17:30	1	1428	1428
	2	401	401
	3	822	822
	4	299	299
17:30-17:45	1	1196	1196
	2	336	336
	3	688	688
	4	251	251

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
1	0.66	4.33	2.1	A
2	0.29	3.28	0.4	A
3	0.46	3.42	1.0	A
4	0.20	2.73	0.3	A

Main Results for each time segment

16:15 - 16:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1196	173	2725	0.439	1193	0.9	2.580	A
2	336	1153	2115	0.159	335	0.2	2.223	A
3	688	571	2363	0.291	686	0.5	2.359	A
4	251	728	2056	0.122	250	0.2	2.193	A

16:30 - 16:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1428	208	2699	0.529	1427	1.2	3.109	A
2	401	1379	1939	0.207	401	0.3	2.574	A
3	822	683	2280	0.360	821	0.6	2.713	A
4	299	871	1955	0.153	299	0.2	2.391	A

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1750	254	2663	0.657	1746	2.1	4.302	A
2	491	1688	1699	0.289	490	0.4	3.275	A
3	1006	836	2166	0.465	1005	0.9	3.408	A
4	367	1067	1817	0.202	366	0.3	2.730	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1750	254	2663	0.657	1749	2.1	4.335	A
2	491	1691	1696	0.289	491	0.4	3.284	A
3	1006	838	2165	0.465	1006	1.0	3.417	A
4	367	1068	1816	0.202	367	0.3	2.732	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1428	208	2698	0.529	1432	1.2	3.136	A
2	401	1384	1935	0.207	402	0.3	2.582	A
3	822	686	2278	0.361	823	0.6	2.722	A
4	299	873	1953	0.153	300	0.2	2.394	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1196	174	2724	0.439	1198	0.9	2.598	A
2	336	1158	2111	0.159	336	0.2	2.232	A
3	688	574	2362	0.291	689	0.5	2.369	A
4	251	731	2054	0.122	251	0.2	2.198	A

2028, DM AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	1, 2, 3, 4	5.06	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2028	DM AM	ONE HOUR	07:30	09:00	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	1270	100.000
2		✓	347	100.000
3		✓	1538	100.000
4		✓	640	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	9	242	758	261
	2	179	0	120	48
	3	1191	245	59	43
	4	420	154	63	3

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	10	10	10	10
	2	10	10	10	10
	3	10	10	10	10
	4	10	10	10	10

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
07:30-07:45	1	956	956
	2	261	261
	3	1158	1158
	4	482	482
07:45-08:00	1	1142	1142
	2	312	312
	3	1383	1383
	4	575	575
08:00-08:15	1	1398	1398
	2	382	382
	3	1693	1693
	4	705	705
08:15-08:30	1	1398	1398
	2	382	382
	3	1693	1693
	4	705	705
08:30-08:45	1	1142	1142
	2	312	312
	3	1383	1383
	4	575	575
08:45-09:00	1	956	956
	2	261	261
	3	1158	1158
	4	482	482

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
1	0.58	3.89	1.5	A
2	0.19	2.41	0.3	A
3	0.71	5.77	2.7	A
4	0.56	7.11	1.4	A

Main Results for each time segment

07:30 - 07:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	956	393	2557	0.374	954	0.7	2.465	A
2	261	866	2339	0.112	261	0.1	1.905	A
3	1158	376	2509	0.461	1154	0.9	2.913	A
4	482	1263	1678	0.287	480	0.4	3.302	A

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1142	470	2498	0.457	1141	0.9	2.915	A
2	312	1035	2206	0.141	312	0.2	2.089	A
3	1383	449	2454	0.563	1381	1.4	3.682	A
4	575	1511	1503	0.383	574	0.7	4.261	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1398	575	2418	0.578	1396	1.5	3.867	A
2	382	1267	2026	0.189	382	0.3	2.408	A
3	1693	550	2379	0.712	1688	2.7	5.690	A
4	705	1848	1265	0.557	702	1.4	7.003	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1398	577	2416	0.579	1398	1.5	3.889	A
2	382	1269	2024	0.189	382	0.3	2.410	A
3	1693	551	2379	0.712	1693	2.7	5.774	A
4	705	1853	1261	0.559	705	1.4	7.110	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1142	473	2496	0.457	1144	0.9	2.936	A
2	312	1039	2204	0.142	312	0.2	2.093	A
3	1383	450	2454	0.564	1388	1.4	3.731	A
4	575	1518	1498	0.384	578	0.7	4.317	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	956	395	2555	0.374	957	0.7	2.479	A
2	261	869	2336	0.112	261	0.1	1.908	A
3	1158	377	2508	0.462	1160	0.9	2.940	A
4	482	1269	1674	0.288	483	0.4	3.327	A

2028, DM PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	1, 2, 3, 4	5.56	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	2028	DM PM	ONE HOUR	16:15	17:45	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	1801	100.000
2		✓	745	100.000
3		✓	1054	100.000
4		✓	367	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	15	189	1119	478
	2	311	0	227	207
	3	733	124	81	116
	4	272	58	37	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	10	10	10	10
	2	10	10	10	10
	3	10	10	10	10
	4	10	10	10	10

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
16:15-16:30	1	1356	1356
	2	561	561
	3	794	794
	4	276	276
16:30-16:45	1	1619	1619
	2	670	670
	3	948	948
	4	330	330
16:45-17:00	1	1983	1983
	2	820	820
	3	1160	1160
	4	404	404
17:00-17:15	1	1983	1983
	2	820	820
	3	1160	1160
	4	404	404
17:15-17:30	1	1619	1619
	2	670	670
	3	948	948
	4	330	330
17:30-17:45	1	1356	1356
	2	561	561
	3	794	794
	4	276	276

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
1	0.76	6.36	3.5	A
2	0.54	5.58	1.3	A
3	0.59	4.95	1.6	A
4	0.25	3.35	0.4	A

Main Results for each time segment

16:15 - 16:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1356	225	2685	0.505	1351	1.1	2.959	A
2	561	1298	2002	0.280	559	0.4	2.740	A
3	794	759	2224	0.357	791	0.6	2.759	A
4	276	949	1900	0.145	276	0.2	2.436	A

16:30 - 16:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1619	269	2651	0.611	1617	1.7	3.820	A
2	670	1553	1804	0.371	669	0.6	3.489	A
3	948	908	2113	0.448	946	0.9	3.391	A
4	330	1135	1768	0.187	330	0.3	2.752	A

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1983	330	2605	0.761	1976	3.4	6.228	A
2	820	1898	1535	0.534	818	1.2	5.502	A
3	1160	1110	1962	0.591	1158	1.6	4.904	A
4	404	1388	1590	0.254	404	0.4	3.337	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1983	330	2605	0.761	1983	3.5	6.359	A
2	820	1905	1530	0.536	820	1.3	5.576	A
3	1160	1113	1960	0.592	1160	1.6	4.952	A
4	404	1392	1587	0.255	404	0.4	3.346	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1619	270	2651	0.611	1626	1.7	3.891	A
2	670	1562	1797	0.373	672	0.7	3.529	A
3	948	912	2109	0.449	950	0.9	3.426	A
4	330	1140	1765	0.187	330	0.3	2.760	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1356	226	2684	0.505	1358	1.1	2.991	A
2	561	1305	1997	0.281	562	0.4	2.760	A
3	794	762	2221	0.357	795	0.6	2.780	A
4	276	953	1897	0.146	277	0.2	2.443	A

2028, DS 100%Rd AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	1, 2, 3, 4	5.21	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D5	2028	DS 100%Rd AM	ONE HOUR	07:30	09:00	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	1293	100.000
2		✓	347	100.000
3		✓	1547	100.000
4		✓	641	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	24	242	766	261
	2	179	0	120	48
	3	1200	245	59	43
	4	421	154	63	3

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	10	10	10	10
	2	10	10	10	10
	3	10	10	10	10
	4	10	10	10	10

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
07:30-07:45	1	973	973
	2	261	261
	3	1165	1165
	4	483	483
07:45-08:00	1	1162	1162
	2	312	312
	3	1391	1391
	4	576	576
08:00-08:15	1	1424	1424
	2	382	382
	3	1703	1703
	4	706	706
08:15-08:30	1	1424	1424
	2	382	382
	3	1703	1703
	4	706	706
08:30-08:45	1	1162	1162
	2	312	312
	3	1391	1391
	4	576	576
08:45-09:00	1	973	973
	2	261	261
	3	1165	1165
	4	483	483

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
1	0.59	3.99	1.6	A
2	0.19	2.44	0.3	A
3	0.72	5.97	2.8	A
4	0.57	7.37	1.4	A

Main Results for each time segment

07:30 - 07:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	973	393	2557	0.381	971	0.7	2.492	A
2	261	883	2325	0.112	261	0.1	1.917	A
3	1165	387	2501	0.466	1161	1.0	2.946	A
4	483	1281	1665	0.290	481	0.4	3.339	A

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1162	470	2498	0.465	1161	1.0	2.960	A
2	312	1056	2190	0.142	312	0.2	2.107	A
3	1391	463	2444	0.569	1389	1.4	3.745	A
4	576	1533	1488	0.387	575	0.7	4.336	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1424	575	2418	0.589	1421	1.6	3.964	A
2	382	1292	2007	0.190	382	0.3	2.437	A
3	1703	566	2367	0.720	1698	2.8	5.871	A
4	706	1874	1246	0.566	703	1.4	7.250	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1424	577	2416	0.589	1424	1.6	3.988	A
2	382	1295	2005	0.191	382	0.3	2.439	A
3	1703	567	2367	0.720	1703	2.8	5.967	A
4	706	1879	1243	0.568	706	1.4	7.372	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1162	473	2496	0.466	1165	1.0	2.982	A
2	312	1060	2188	0.143	312	0.2	2.111	A
3	1391	464	2443	0.569	1396	1.5	3.801	A
4	576	1540	1482	0.389	579	0.7	4.399	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	973	395	2555	0.381	975	0.7	2.506	A
2	261	886	2322	0.112	261	0.1	1.921	A
3	1165	388	2500	0.466	1167	1.0	2.976	A
4	483	1287	1661	0.291	484	0.5	3.365	A

2028, DS 100%Rd PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	1, 2, 3, 4	5.78	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D6	2028	DS 100%Rd PM	ONE HOUR	16:15	17:45	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	1827	100.000
2		✓	745	100.000
3		✓	1062	100.000
4		✓	367	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	30	189	1128	480
	2	311	0	227	207
	3	741	124	81	116
	4	272	58	37	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	10	10	10	10
	2	10	10	10	10
	3	10	10	10	10
	4	10	10	10	10

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
16:15-16:30	1	1375	1375
	2	561	561
	3	800	800
	4	276	276
16:30-16:45	1	1642	1642
	2	670	670
	3	955	955
	4	330	330
16:45-17:00	1	2012	2012
	2	820	820
	3	1169	1169
	4	404	404
17:00-17:15	1	2012	2012
	2	820	820
	3	1169	1169
	4	404	404
17:15-17:30	1	1642	1642
	2	670	670
	3	955	955
	4	330	330
17:30-17:45	1	1375	1375
	2	561	561
	3	800	800
	4	276	276

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
1	0.77	6.67	3.7	A
2	0.54	5.76	1.3	A
3	0.60	5.10	1.6	A
4	0.26	3.40	0.4	A

Main Results for each time segment

16:15 - 16:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1375	225	2685	0.512	1371	1.1	3.004	A
2	561	1318	1987	0.282	559	0.4	2.769	A
3	800	771	2214	0.361	797	0.6	2.789	A
4	276	966	1888	0.146	276	0.2	2.454	A

16:30 - 16:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1642	269	2651	0.619	1640	1.8	3.906	A
2	670	1576	1786	0.375	669	0.7	3.541	A
3	955	923	2102	0.454	954	0.9	3.446	A
4	330	1156	1754	0.188	330	0.3	2.780	A

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	2012	330	2605	0.772	2004	3.6	6.509	A
2	820	1927	1513	0.542	818	1.3	5.673	A
3	1169	1128	1949	0.600	1166	1.6	5.044	A
4	404	1413	1572	0.257	404	0.4	3.387	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	2012	330	2605	0.772	2011	3.7	6.666	A
2	820	1933	1508	0.544	820	1.3	5.757	A
3	1169	1132	1946	0.601	1169	1.6	5.097	A
4	404	1417	1569	0.258	404	0.4	3.397	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1642	270	2651	0.620	1650	1.8	3.987	A
2	670	1586	1779	0.377	672	0.7	3.586	A
3	955	928	2098	0.455	958	0.9	3.481	A
4	330	1161	1750	0.189	330	0.3	2.789	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1375	226	2684	0.512	1378	1.2	3.039	A
2	561	1324	1982	0.283	562	0.4	2.790	A
3	800	775	2211	0.362	801	0.6	2.811	A
4	276	970	1885	0.147	277	0.2	2.464	A

Junctions 9

ARCADY 9 - Roundabout Module

Filename: A2016 Picardy Manorway/Yarnton Way
Path: \\pba.int\cbh\Projects\42166 Riverside 2\Transport\5. Drawings & Models\Traffic Modelling\Operational Assessments
Report generation date: 27/09/2018 12:42:32

Summary of junction performance

	AM				PM				DM AM				DM PM				DS 100%Rd AM				DS
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)
	2018																				
Arm 1	1.7	3.39	0.60	A	0.8	2.31	0.41	A													
Arm 2	0.2	8.84	0.13	A	0.1	5.24	0.08	A													
Arm 3	0.4	2.41	0.25	A	0.4	2.13	0.28	A													
Arm 4	0.6	2.99	0.37	A	1.5	4.61	0.57	A													
	2028																				
Arm 1									2.3	4.23	0.68	A	1.1	2.79	0.51	A	2.4	4.36	0.69	A	1.2
Arm 2									0.3	12.14	0.19	B	0.1	6.55	0.11	A	0.3	12.71	0.19	B	0.1
Arm 3									0.5	2.80	0.30	A	0.5	2.51	0.33	A	0.5	2.85	0.31	A	0.6
Arm 4									0.9	3.49	0.45	A	2.2	6.17	0.67	A	0.9	3.57	0.46	A	2.3

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

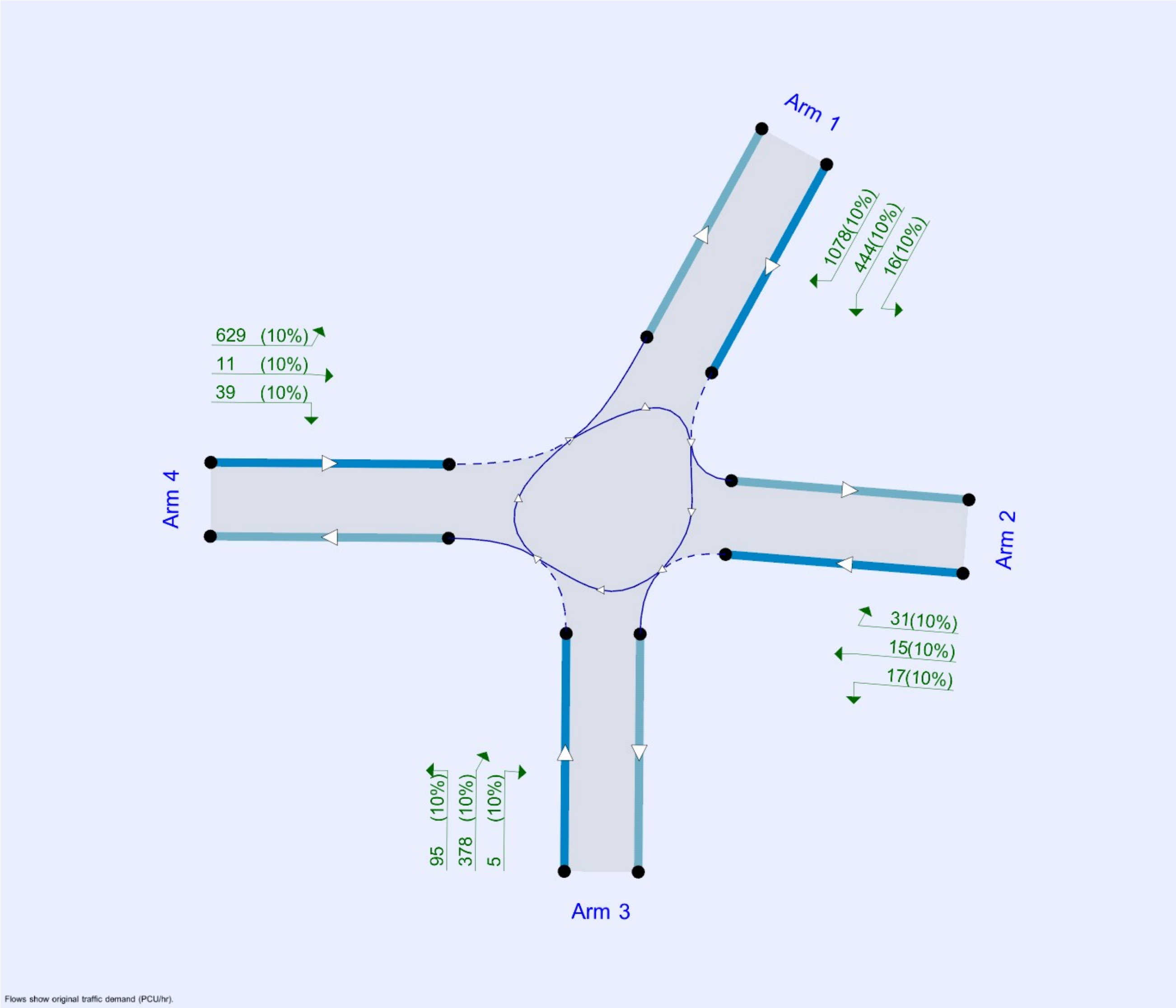
File summary

File Description

Title	A2016 Picardy Manorway/Yarnton Way
Location	
Site number	
Date	09/07/2018
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	PBA\jtsmith
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

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		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)
D1	2018	AM	ONE HOUR	07:30	09:00	15
D2	2018	PM	ONE HOUR	16:15	17:45	15
D3	2028	DM AM	ONE HOUR	07:30	09:00	15
D4	2028	DM PM	ONE HOUR	16:15	17:45	15
D5	2028	DS 100%Rd AM	ONE HOUR	07:30	09:00	15
D6	2028	DS 100%Rd PM	ONE HOUR	16:15	17:45	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2018, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	1, 2, 3, 4	3.24	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	A2016 Picardy Manorway	
2	Clydesdale Way	
3	Yarnton Way	
4	A2016 Eastern Way	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	8.00	11.00	19.0	21.0	59.0	32.0	
2	4.30	6.00	3.7	10.5	59.0	29.0	
3	10.60	10.60	0.0	23.0	59.0	21.0	
4	7.30	10.90	8.4	21.0	59.0	52.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.791	3014
2	0.508	1450
3	0.858	3333
4	0.678	2474

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

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2018	AM	ONE HOUR	07:30	09:00	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	1597	100.000
2		✓	63	100.000
3		✓	491	100.000
4		✓	713	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	59	16	444	1078
	2	31	0	17	15
	3	378	5	13	95
	4	629	11	39	34

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	10	10	10	10
	2	10	10	10	10
	3	10	10	10	10
	4	10	10	10	10

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
07:30-07:45	1	1202	1202
	2	47	47
	3	370	370
	4	537	537
07:45-08:00	1	1436	1436
	2	57	57
	3	441	441
	4	641	641
08:00-08:15	1	1758	1758
	2	69	69
	3	541	541
	4	785	785
08:15-08:30	1	1758	1758
	2	69	69
	3	541	541
	4	785	785
08:30-08:45	1	1436	1436
	2	57	57
	3	441	441
	4	641	641
08:45-09:00	1	1202	1202
	2	47	47
	3	370	370
	4	537	537

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
1	0.60	3.39	1.7	A
2	0.13	8.84	0.2	A
3	0.25	2.41	0.4	A
4	0.37	2.99	0.6	A

Main Results for each time segment

07:30 - 07:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1202	77	2953	0.407	1199	0.8	2.254	A
2	47	1252	814	0.058	47	0.1	5.164	A
3	370	914	2548	0.145	369	0.2	1.816	A
4	537	365	2226	0.241	535	0.3	2.339	A

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1436	92	2941	0.488	1435	1.0	2.628	A
2	57	1497	689	0.082	57	0.1	6.260	A
3	441	1093	2394	0.184	441	0.2	2.027	A
4	641	437	2178	0.294	641	0.5	2.576	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1758	112	2925	0.601	1756	1.6	3.379	A
2	69	1833	519	0.134	69	0.2	8.803	A
3	541	1338	2184	0.248	540	0.4	2.408	A
4	785	535	2111	0.372	784	0.6	2.982	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1758	112	2925	0.601	1758	1.7	3.393	A
2	69	1835	517	0.134	69	0.2	8.838	A
3	541	1340	2183	0.248	541	0.4	2.411	A
4	785	535	2111	0.372	785	0.6	2.985	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1436	92	2941	0.488	1438	1.1	2.640	A
2	57	1501	687	0.082	57	0.1	6.287	A
3	441	1096	2392	0.185	442	0.2	2.030	A
4	641	437	2177	0.294	642	0.5	2.579	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1202	77	2953	0.407	1203	0.8	2.264	A
2	47	1256	812	0.058	48	0.1	5.183	A
3	370	917	2545	0.145	370	0.2	1.822	A
4	537	366	2226	0.241	537	0.4	2.345	A

2018, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	1, 2, 3, 4	3.18	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2018	PM	ONE HOUR	16:15	17:45	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	1076	100.000
2		✓	60	100.000
3		✓	645	100.000
4		✓	1048	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	55	37	304	680
	2	29	1	9	21
	3	497	24	12	112
	4	953	23	47	25

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	10	10	10	10
	2	10	10	10	10
	3	10	10	10	10
	4	10	10	10	10

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
16:15-16:30	1	810	810
	2	45	45
	3	486	486
	4	789	789
16:30-16:45	1	967	967
	2	54	54
	3	580	580
	4	942	942
16:45-17:00	1	1185	1185
	2	66	66
	3	710	710
	4	1154	1154
17:00-17:15	1	1185	1185
	2	66	66
	3	710	710
	4	1154	1154
17:15-17:30	1	967	967
	2	54	54
	3	580	580
	4	942	942
17:30-17:45	1	810	810
	2	45	45
	3	486	486
	4	789	789

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
1	0.41	2.31	0.8	A
2	0.08	5.24	0.1	A
3	0.28	2.13	0.4	A
4	0.57	4.61	1.5	A

Main Results for each time segment

16:15 - 16:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	810	99	2936	0.276	808	0.4	1.859	A
2	45	844	1021	0.044	45	0.1	4.055	A
3	486	609	2810	0.173	485	0.2	1.703	A
4	789	464	2159	0.365	786	0.6	2.880	A

16:30 - 16:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	967	119	2920	0.331	967	0.5	2.027	A
2	54	1009	937	0.058	54	0.1	4.482	A
3	580	729	2707	0.214	580	0.3	1.860	A
4	942	555	2097	0.449	941	0.9	3.421	A

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1185	145	2899	0.409	1184	0.8	2.307	A
2	66	1235	822	0.080	66	0.1	5.236	A
3	710	892	2567	0.277	710	0.4	2.132	A
4	1154	680	2013	0.573	1152	1.5	4.586	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1185	145	2899	0.409	1185	0.8	2.309	A
2	66	1236	822	0.080	66	0.1	5.240	A
3	710	893	2566	0.277	710	0.4	2.133	A
4	1154	680	2012	0.573	1154	1.5	4.611	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	967	119	2920	0.331	968	0.5	2.029	A
2	54	1011	936	0.058	54	0.1	4.488	A
3	580	730	2706	0.214	580	0.3	1.862	A
4	942	556	2097	0.449	944	0.9	3.444	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	810	99	2935	0.276	811	0.4	1.863	A
2	45	846	1020	0.044	45	0.1	4.064	A
3	486	611	2808	0.173	486	0.2	1.707	A
4	789	466	2158	0.366	790	0.6	2.898	A

2028, DM AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	1, 2, 3, 4	3.96	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2028	DM AM	ONE HOUR	07:30	09:00	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	1801	100.000
2		✓	68	100.000
3		✓	559	100.000
4		✓	841	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	65	18	491	1227
	2	34	0	18	16
	3	438	5	14	102
	4	751	12	42	36

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	10	10	10	10
	2	10	10	10	10
	3	10	10	10	10
	4	10	10	10	10

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
07:30-07:45	1	1356	1356
	2	51	51
	3	421	421
	4	633	633
07:45-08:00	1	1619	1619
	2	61	61
	3	503	503
	4	756	756
08:00-08:15	1	1983	1983
	2	75	75
	3	615	615
	4	926	926
08:15-08:30	1	1983	1983
	2	75	75
	3	615	615
	4	926	926
08:30-08:45	1	1619	1619
	2	61	61
	3	503	503
	4	756	756
08:45-09:00	1	1356	1356
	2	51	51
	3	421	421
	4	633	633

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
1	0.68	4.23	2.3	A
2	0.19	12.14	0.3	B
3	0.30	2.80	0.5	A
4	0.45	3.49	0.9	A

Main Results for each time segment

07:30 - 07:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1356	82	2949	0.460	1352	0.9	2.475	A
2	51	1408	735	0.070	51	0.1	5.788	A
3	421	1034	2445	0.172	420	0.2	1.954	A
4	633	418	2191	0.289	631	0.4	2.537	A

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1619	98	2936	0.551	1617	1.3	2.998	A
2	61	1684	594	0.103	61	0.1	7.422	A
3	503	1237	2270	0.221	502	0.3	2.239	A
4	756	499	2135	0.354	755	0.6	2.868	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1983	120	2919	0.679	1979	2.3	4.196	A
2	75	2061	403	0.186	74	0.2	12.031	B
3	615	1514	2033	0.303	615	0.5	2.790	A
4	926	611	2059	0.450	925	0.9	3.487	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1983	120	2919	0.679	1983	2.3	4.230	A
2	75	2064	401	0.187	75	0.3	12.139	B
3	615	1517	2030	0.303	615	0.5	2.798	A
4	926	612	2059	0.450	926	0.9	3.494	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1619	98	2936	0.551	1623	1.4	3.023	A
2	61	1689	592	0.103	62	0.1	7.479	A
3	503	1242	2267	0.222	503	0.3	2.246	A
4	756	501	2134	0.354	757	0.6	2.877	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1356	82	2949	0.460	1358	0.9	2.492	A
2	51	1413	732	0.070	51	0.1	5.823	A
3	421	1039	2441	0.172	421	0.2	1.962	A
4	633	419	2190	0.289	634	0.4	2.545	A

2028, DM PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	1, 2, 3, 4	4.02	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	2028	DM PM	ONE HOUR	16:15	17:45	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	1336	100.000
2		✓	65	100.000
3		✓	717	100.000
4		✓	1195	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	62	42	354	878
	2	32	1	10	22
	3	559	26	12	120
	4	1093	25	50	27

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	10	10	10	10
	2	10	10	10	10
	3	10	10	10	10
	4	10	10	10	10

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
16:15-16:30	1	1006	1006
	2	49	49
	3	540	540
	4	900	900
16:30-16:45	1	1201	1201
	2	58	58
	3	645	645
	4	1074	1074
16:45-17:00	1	1471	1471
	2	72	72
	3	789	789
	4	1316	1316
17:00-17:15	1	1471	1471
	2	72	72
	3	789	789
	4	1316	1316
17:15-17:30	1	1201	1201
	2	58	58
	3	645	645
	4	1074	1074
17:30-17:45	1	1006	1006
	2	49	49
	3	540	540
	4	900	900

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
1	0.51	2.79	1.1	A
2	0.11	6.55	0.1	A
3	0.33	2.51	0.5	A
4	0.67	6.17	2.2	A

Main Results for each time segment

16:15 - 16:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1006	106	2930	0.343	1004	0.6	2.052	A
2	49	1039	922	0.053	49	0.1	4.533	A
3	540	768	2674	0.202	539	0.3	1.854	A
4	900	520	2121	0.424	896	0.8	3.225	A

16:30 - 16:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1201	127	2914	0.412	1200	0.8	2.309	A
2	58	1242	819	0.071	58	0.1	5.208	A
3	645	918	2545	0.253	644	0.4	2.083	A
4	1074	622	2052	0.523	1073	1.2	4.035	A

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1471	155	2891	0.509	1470	1.1	2.782	A
2	72	1521	677	0.106	71	0.1	6.536	A
3	789	1124	2368	0.333	789	0.5	2.506	A
4	1316	761	1958	0.672	1312	2.2	6.130	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1471	155	2891	0.509	1471	1.1	2.787	A
2	72	1523	676	0.106	72	0.1	6.548	A
3	789	1125	2367	0.334	789	0.5	2.510	A
4	1316	762	1957	0.672	1316	2.2	6.170	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1201	127	2913	0.412	1202	0.8	2.316	A
2	58	1245	817	0.071	59	0.1	5.220	A
3	645	920	2543	0.253	645	0.4	2.088	A
4	1074	623	2052	0.524	1078	1.2	4.085	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1006	106	2930	0.343	1007	0.6	2.061	A
2	49	1042	920	0.053	49	0.1	4.546	A
3	540	770	2672	0.202	540	0.3	1.857	A
4	900	521	2120	0.424	901	0.8	3.254	A

2028, DS 100%Rd AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	1, 2, 3, 4	4.07	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D5	2028	DS 100%Rd AM	ONE HOUR	07:30	09:00	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	1827	100.000
2		✓	68	100.000
3		✓	560	100.000
4		✓	856	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	76	18	492	1241
	2	34	0	18	16
	3	439	5	14	102
	4	766	12	42	36

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	10	10	10	10
	2	10	10	10	10
	3	10	10	10	10
	4	10	10	10	10

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
07:30-07:45	1	1375	1375
	2	51	51
	3	422	422
	4	644	644
07:45-08:00	1	1642	1642
	2	61	61
	3	503	503
	4	770	770
08:00-08:15	1	2012	2012
	2	75	75
	3	617	617
	4	942	942
08:15-08:30	1	2012	2012
	2	75	75
	3	617	617
	4	942	942
08:30-08:45	1	1642	1642
	2	61	61
	3	503	503
	4	770	770
08:45-09:00	1	1375	1375
	2	51	51
	3	422	422
	4	644	644

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
1	0.69	4.36	2.4	A
2	0.19	12.71	0.3	B
3	0.31	2.85	0.5	A
4	0.46	3.57	0.9	A

Main Results for each time segment

07:30 - 07:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1375	82	2949	0.466	1372	1.0	2.504	A
2	51	1427	725	0.071	51	0.1	5.873	A
3	422	1053	2429	0.174	421	0.2	1.971	A
4	644	427	2185	0.295	643	0.5	2.564	A

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1642	98	2936	0.559	1641	1.4	3.052	A
2	61	1707	583	0.105	61	0.1	7.591	A
3	503	1260	2251	0.224	503	0.3	2.265	A
4	770	510	2128	0.362	769	0.6	2.912	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	2012	120	2919	0.689	2008	2.4	4.325	A
2	75	2089	389	0.193	74	0.3	12.582	B
3	617	1541	2010	0.307	616	0.5	2.839	A
4	942	624	2050	0.460	941	0.9	3.567	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	2012	120	2919	0.689	2011	2.4	4.363	A
2	75	2093	387	0.194	75	0.3	12.705	B
3	617	1545	2007	0.307	617	0.5	2.847	A
4	942	625	2050	0.460	942	0.9	3.575	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1642	98	2936	0.559	1646	1.4	3.079	A
2	61	1713	580	0.105	62	0.1	7.653	A
3	503	1265	2247	0.224	504	0.3	2.274	A
4	770	512	2127	0.362	771	0.6	2.924	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1375	82	2949	0.466	1377	1.0	2.523	A
2	51	1433	722	0.071	51	0.1	5.907	A
3	422	1058	2425	0.174	422	0.2	1.978	A
4	644	428	2184	0.295	645	0.5	2.574	A

2028, DS 100%Rd PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	1, 2, 3, 4	4.14	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D6	2028	DS 100%Rd PM	ONE HOUR	16:15	17:45	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	1360	100.000
2		✓	65	100.000
3		✓	718	100.000
4		✓	1209	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	71	42	354	893
	2	32	1	10	22
	3	560	26	12	120
	4	1107	25	50	27

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	10	10	10	10
	2	10	10	10	10
	3	10	10	10	10
	4	10	10	10	10

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
16:15-16:30	1	1024	1024
	2	49	49
	3	541	541
	4	910	910
16:30-16:45	1	1223	1223
	2	58	58
	3	645	645
	4	1087	1087
16:45-17:00	1	1497	1497
	2	72	72
	3	791	791
	4	1331	1331
17:00-17:15	1	1497	1497
	2	72	72
	3	791	791
	4	1331	1331
17:15-17:30	1	1223	1223
	2	58	58
	3	645	645
	4	1087	1087
17:30-17:45	1	1024	1024
	2	49	49
	3	541	541
	4	910	910

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
1	0.52	2.84	1.2	A
2	0.11	6.70	0.1	A
3	0.34	2.55	0.6	A
4	0.68	6.40	2.3	A

Main Results for each time segment

16:15 - 16:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1024	106	2930	0.349	1022	0.6	2.072	A
2	49	1057	913	0.054	49	0.1	4.581	A
3	541	786	2658	0.203	539	0.3	1.868	A
4	910	527	2116	0.430	907	0.8	3.266	A

16:30 - 16:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1223	127	2914	0.420	1222	0.8	2.339	A
2	58	1264	808	0.072	58	0.1	5.284	A
3	645	940	2526	0.256	645	0.4	2.105	A
4	1087	631	2046	0.531	1085	1.2	4.114	A

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1497	155	2891	0.518	1496	1.2	2.835	A
2	72	1547	664	0.108	71	0.1	6.684	A
3	791	1150	2345	0.337	790	0.6	2.544	A
4	1331	772	1950	0.683	1327	2.3	6.307	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1497	155	2891	0.518	1497	1.2	2.840	A
2	72	1549	663	0.108	72	0.1	6.696	A
3	791	1152	2344	0.337	791	0.6	2.548	A
4	1331	773	1950	0.683	1331	2.3	6.398	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1223	127	2913	0.420	1224	0.8	2.347	A
2	58	1267	806	0.072	59	0.1	5.299	A
3	645	942	2524	0.256	646	0.4	2.110	A
4	1087	632	2045	0.531	1091	1.3	4.169	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1024	106	2930	0.349	1025	0.6	2.080	A
2	49	1060	911	0.054	49	0.1	4.594	A
3	541	788	2656	0.204	541	0.3	1.871	A
4	910	529	2115	0.430	912	0.8	3.294	A

Appendix L Outline Construction Traffic Management Plan

Document Control Sheet

Project Name: Riverside Energy Park

Project Ref: 42166/5501

Report Title: Outline Construction Traffic Management Plan

Doc Ref:

Date: November 2018

	Name	Position	Signature	Date
Prepared by:	Bryn Kemp	Principal Engineer	BK	November 2018
Reviewed by:	Adrian Neve	Senior Associate	AN	November 2018
Approved by:	Dermot Scanlon	Director of Major Infrastructure	DS	November 2018
For and on behalf of Peter Brett Associates LLP				

Revision	Date	Description	Prepared	Reviewed	Approved

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Content

Figures

Tables

1 Introduction

1.1 Overview

1.1.1 Peter Brett Associates LLP (PBA) has been commissioned by Cory Environmental Holdings Limited (Cory or the Applicant) to prepare an outline for a Construction Traffic Management Plan (CTMP) which supplements the construction of an integrated Energy Park, to be known as Riverside Energy Park (REP). The principal elements of REP comprise complementary energy generating development and an associated Electrical Connection (together referred to as the 'Proposed Development'). The two principal elements of the Proposed Development are: the Energy Park which would be located adjacent to an existing Energy Recovery Facility (ERF) operated by Cory (referred to as Riverside Resource Recovery Facility (RRRF)) situated at Norman Road in Belvedere within the London Borough of Bexley (LBB). The underground Electrical Connection would run from the REP site and terminate at the Littlebrook substation in Dartford.

1.1.2 This outline for a Construction Traffic Management Plan (CTMP) has been produced in accordance with TfL's Construction Logistics Plan (CLP) guidance (July 2017) and is appended to the Transport Assessment (TA) submitted with the application for REP's Development Consent Order (DCO).

1.1.3 This outline CTMP provides a framework for information and strategies that would be adopted within final CTMPs which would be developed for the construction stages for REP. Requirement 13 of the draft DCO (**Document Reference 3.1**) for a CTMP to be submitted for approval by the relevant planning authority (in consultation with the highway authority) prior to the commencement of the Proposed development or part thereof. Any CTMP submitted for approval must be substantially in accordance with this outline CTMP which provides a framework for:

- the traffic management processes and proposals that should be anticipated to be put in place during the construction processes associated with the delivery of the works consented within the DCO;
- the basis for the logistics strategy to be adopted during the construction stages; and
- the travel planning framework that would be implemented to assist and guide the construction workforce travel patterns.

1.1.4 Separate CTMPs would be prepared for different stages of the construction process, reflecting the different requirements of each stage. It is envisaged the staged plans could include:

- Site Establishment and Preliminary Works;
- REP construction; and

- The Electrical Connection construction.

1.2 CTMP Objectives

1.2.1 The coverage and objectives of the approved CTMPs would be to:

- Set out the details of the construction processes for the stage of works covered by that CTMP;
- minimise impacts of the demolition and construction stages on the local community and highway network;
- lower emissions from those construction processes;
- enhance safety and awareness;
- identify the site location specific to that CTMP;
- provide information on traffic routeing and site access;
- provide an indication of programme and key dates; and
- identify temporary traffic management, waiting and loading controls and parking suspensions and Highway Licences required to undertake the works safely and efficiently.

1.3 Site Context

1.3.1 The REP site is located in Belvedere, in the LBB, in an area bounded to the north by the River Thames and the adjacent Thames Path long distance trail. It is bounded to the east by a boundary fence onto a public footpath linking Norman Road with the Thames Path, and to the west by a boundary fence onto the adjacent undeveloped Crossness Nature Reserve, between the REP site and Thames Water's Crossness Sewage Treatment Works (STW) site, approximately 200 m away. Within this area a public footpath links the Crossness Local Nature Reserve (LNR) with the Thames Path. A number of ditches and small watercourses surround the REP Site.

1.3.2 The Riverside Resource Recovery Facility (RRRF) lies immediately to the north-east of REP. RRRF will continue to operate on continuous basis during construction of REP.

1.4 Development Proposal

1.4.1 REP would comprise of:

- an Energy Recovery Facility (ERF);
- an Anaerobic Digestion facility;
- a Solar Photovoltaic installation;

- Battery storage; and
- Enabling infrastructure for Combined Heat and Power to provide for a potential future local district heating (DH) pipe connection at the site boundary.

1.4.2 The proposed Main Temporary Construction Compound would be located in an area of previously developed land (a former National Grid substation site) adjacent to the west side of Norman Road, immediately north of its junction with A2016 Picardy Manor Way. The northern extent of this area most recently received planning permission for the erection of three industrial units for mixed-use within Class B1 (business), Class B2 (general industrial) and B8 (storage/distribution), with associated ancillary works (Local Planning Authority reference: 13/00918/FULM). Part of the southern portion comprises an existing joinery business.

1.4.3 An Electrical Connection would be constructed, running predominantly underground between the REP site and the Electrical Connection Point at Littlebrook substation, connecting into an existing National Grid building in Dartford. The likely statutory undertaker for the Electrical Connection would be UK Power Networks (UKPN). Cable Route Temporary Construction Compounds would be required to support the construction of the selected Electrical Connection route.

2 Context, Considerations and Challenges

2.1 Introduction

2.1.1 This section of the outline CTMP sets the general context for the Proposed Development at REP, including the Electrical Connection route. This would be refreshed at the time of preparing the detailed CTMPs for each stage of construction, considering the different characteristics of each work stage.

2.2 Policy Context

2.2.1 As is set out within TfL's Construction Logistics Plan (CLP) guidance document (July 2017) the key national and regional planning policies explain why CLPs and CTMPs are used in planning. This policy base would be reviewed and refreshed as necessary at the time of preparing the CTMP for each stage of construction.

Overarching National Policy Statement for Energy – EN1 July 2011

2.2.2 Section 5.13 of the NPS includes the following points which have helped to inform this outline CTMP:

2.2.3 "*The consideration and mitigation of transport impacts is an essential part of Government's wider policy objectives for sustainable development as set out in Section 2.2 of this NPS.*" (Paragraph 5.13.2).

2.2.4 "*Where appropriate, the applicant should prepare a travel plan including demand management measures to mitigate transport impacts. The applicant should also provide details of proposed measures to improve access by public transport, walking and cycling, to reduce the need for parking associated with the proposal and to mitigate transport impacts.*" (Paragraph 5.13.4).

2.2.5 "*A new energy NSIP may give rise to substantial impacts on the surrounding transport infrastructure and the IPC should therefore ensure that the applicant has sought to mitigate these impacts, including during the construction phase of the development.*" (Paragraph 5.13.6).

2.2.6 "*Water-borne or rail transport is preferred over road transport at all stages of the project, where cost-effective.*" (Paragraph 5.13.10).

2.2.7 "*All large infrastructure projects are likely to generate hazardous and non-hazardous waste. The [Environment Agency's] EA's Environmental Permitting (EP) regime incorporates operational waste management requests for certain activities. When an applicant applies to the EA for an Environmental permit, the EA will require the application to demonstrate that processes are in place to meet all relevant EP Requirements*". (Paragraph 5.14.4).

National Policy Statement for Renewable Energy Infrastructure – EN3 July 2011

2.2.8 Section 2.5.25 of NPS EN-3 seeks that "*Government policy encourages multi-modal transport and the IPC should expect materials (fuel and residues) to be transported by water or rail routes where possible…….Applicants should locate new biomass or waste combustion generating stations in the vicinity of existing transport routes wherever possible.*"

National Planning Policy Framework (NPPF), 2018

2.2.9 The National Planning Policy Framework (NPPF) was published in July 2018 and sets out the Government's environmental, economic and social policies for England. Section 9: Promoting Sustainable Transport, of the NPPF, paragraph 102 is applicable to the preparation of this outline CTMP and states that;

"transport issues should be considered from the earliest stages of plan-making and development proposals, so that:

a) the potential impacts of development on transport networks can be addressed;
b) opportunities from existing or proposed transport infrastructure, and changing transport technology and usage, are realised – for example in relation to the scale, location or density of development that can be accommodated;
c) opportunities to promote walking, cycling and public transport use are identified and pursued;…"

Traffic Management Act, 2004

2.2.10 Part 2 of the Traffic Management Act sets out the responsibility of Local Traffic Authorities to manage traffic networks within their geographical area of responsibility. This includes efficient use of the highway network and the requirement to take measures to minimise contributions to traffic congestion. Part 5 outlines the responsibility of local authorities in Greater London to manage the strategic route network. This includes TfL's role to manage certain areas of the Greater London route network.

The London Plan, 2016

2.2.11 Chapter 6 (Policies 6.3 and 6.14) of the London Plan makes specific reference to CLPs as a way of making more efficient use of the road network. It encourages developers to submit CLPs and consider freight. CLPs are secured for planning applications which are referable to the Mayor, where there are construction impacts. In addition, they are encouraged on all other applications where there are construction issues.

Draft New London Plan showing Minor Suggested Changes, 2018

2.2.12 A replacement London Plan has been drafted and will be the subject of an Examination in Public starting in January 2019. The relevant policies proposed for construction freight in the document are: Policy SI15 Water transport; Policy T4 Assessing and mitigating transport impacts; and Policy T7 Freight and servicing.

2.2.13 The policies state that construction works should comply with TfL's CLP Guidance, take account of modal options, adopt the latest standards around safety and environmental performance of vehicles, enable the use of vehicles which meet TfL's Direct Vision standard[1] attending the site; and embrace best practices as set out in Fleet Operator Recognition Scheme (FORS) and CLOCS (Construction Logistics and Community Safety).

Mayor's Transport Strategy, March 2018

2.2.14 This document uses construction logistics in relation to the transport of demolition and construction materials by road, rail and water. The document highlights the importance of CLPs in supporting and improving the efficiency and sustainability of construction supply chains.

2.2.15 In relation to FORS, and in addition to references in the draft New London Plan 2018, the document states that it can promote best practice in order to tackle congestion and improve the efficiency of the freight industry.

2.2.16 Proposal 16 states that "*The Mayor, through TfL, and working with the boroughs and members of the Freight Forum, will improve the efficiency of freight and servicing trips on London's strategic transport network by:*

a. Identifying opportunities for moving freight on to the rail network where this will not impact on passenger services and where the benefits will be seen within London.

b. Increasing the proportion of freight moved on London's waterways.

c. *Reviewing the potential benefits of a regional freight consolidation and distribution network and completing the network of construction consolidation centres in London.*"

Local Policy

2.2.17 LBB's 'Bexley Sustainable Design and Construction Guide - Supplementary Planning Document' (adopted October 2007) sets out guidance that would be followed as part of the construction logistics of the Proposed Development.

[1] [1] Direct Vision – a term used by Transport for London in reference to the initiative to improve vision standards for lorries. Refer: http://content.tfl.gov.uk/working-towards-direct-vision-hgvs.pdf

2.2.18 Under the Section 5 ‘Conserving resources and reducing carbon emissions’ and the sub-section on ‘Materials’ Guidance 22 states that developers should:

- Consider the use of prefabricated elements in order to reduce total energy used in the construction phase, speed up assembly, improve quality and minimise defects and wastage; and
- Consider the source location of prefabricated elements to minimise transportation.

2.2.19 Guidance 33 in Section 6 ‘Ensuring comfort and security in and around the development’ and the sub-section on ‘Waste and recycling’ states that at the design stage the waste hierarchy should be applied:

- Reduce the amount of waste generated;
- reuse;
- recycle;
- recover energy and materials; and
- minimise disposal.

2.2.20 Re-use and recycling of construction and demolition waste on site should be considered.

2.2.21 Section 7 ‘Minimising the adverse effects of the construction on site and surroundings’ sub-section ‘Considerate construction’ Guidance 35 expects developers to achieve certification under the Considerate Constructors Scheme.

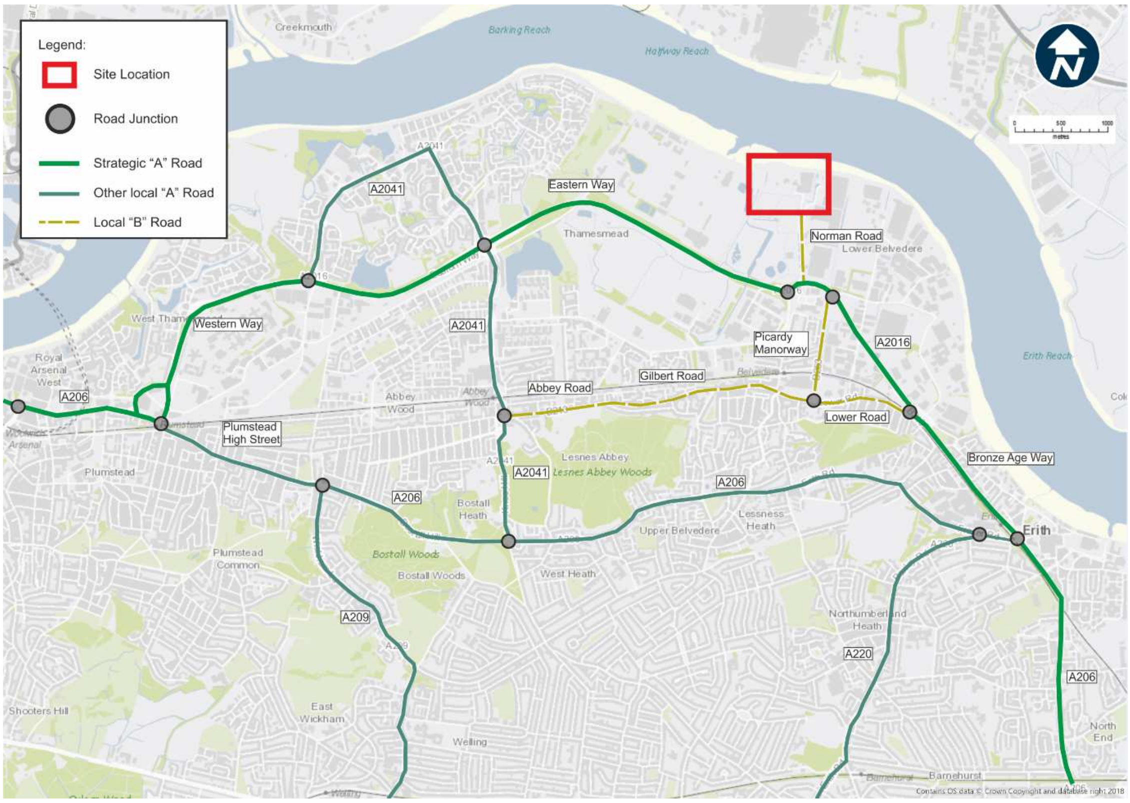
2.2.22 Guidance 38 within Section 8 ‘Encouraging sustainable living through building design and information provision’ sub-section ‘Sustainable forms of transport, information provision and locally sourced labour’ suggests that the river should be used where possible for the transport of materials to development sites and identifies that water is more efficient than rail, though both are preferred to road freight. This particularly relates to bulk materials. That sub-section further promotes the use of travel planning initiatives and the provision of suitable cycle parking and welfare facilities.

2.3 Location Context

2.3.1 The following plans provide information about the site’s location in the context of Greater London and the local road network. A plan indicating the Application Boundary is provided at Appendix A of this document together with an illustrative site layout.

Figure 2-1: London Context

Figure 2-2: Local Context Plan



2.4 Local Access Context

Highways, Carriageways and Footways

2.4.1 The REP site would be served by Norman Road, an adopted 2 lane single carriageway road with an approximate width of 6 m and a footway on its eastern side with an approximate width of 1.8 m. The footway for its northern section is a shared unsegregated footway / cycleway with no provision of a safety margin adjacent to the carriageway.

2.4.2 The Main Temporary Construction Compound would be accessed directly from Norman Road via a priority junction. Separate vehicle and pedestrian access points would be provided. Details of the layout and design of the access points would be set out in the CTMP.

2.4.3 The design of a controlled pedestrian crossing of Norman Road, to the north of the access to the Asda depot. This would provide a safe direct route for pedestrians and cyclists accessing and leaving the welfare facilities at the Main Temporary Construction Compound.

2.4.4 The primary materials, plant and equipment for the site establishment; pre-commencement works and construction of REP would move directly to and from the construction site. Access to the construction areas adjacent to RRRF would be set out in the detailed design information for the construction period – indicating how RRRF would continue to function efficiently and safely, whilst REP is constructed. The access strategy for the construction site would include safe corridors for REP construction workforce and RRRF employees.

2.4.5 Access to the mobile works for the Electrical Connection would be planned in line with the staged construction of the cable route – typically access to the cable construction area would be by way of site transport or to a Cable Route Temporary Construction Compound. Direct access to the cable construction areas would be for works transport only.

Railway/Underground

2.4.6 There are no railway or underground lines or stations that could be directly affected by the construction programme for REP.

2.4.7 The Electrical Connection route options would cross the alignment of the railway lines along the route. Exact locations would be determined through detailed design but are anticipated to include:

- Queens Road (A2016);
- Northend Road (A206); and
- Thames Road (A206).

2.4.8 Other locations could include:

- Howbury Lane; and
- Moat Lane.

2.4.9 The CTMP for each stage would identify the implications on rail infrastructure and set out how the works should be co-ordinated with Network Rail and the train operating company. Where works would affect rail infrastructure, this could include night-time or weekend working if required in co-ordination with Network Rail, the train operating company and the Local Highway Authority (LHA).

Bus Routes

2.4.10 In the vicinity of the REP site, there are three bus routes serving Picardy Manorway (180, 401 and 601), with bus stops located on each side of the dual carriageway. Given that site construction traffic would have to pass these stops on its in/outbound journeys this might pose, some minor effects on buses arriving / departing the stops. Service 601 provides school transport with one journey in the morning and one in the afternoon.

2.4.11 The preferred main route for the Electrical Connection would not interact with local bus services for much of its length by follow strategic roads. The exception to this would be the section along the Fastrack corridor within Dartford Borough, along the dedicated busway.

2.4.12 Options for the alignment of the Electrical Connection are being explored. Sections of the Electrical Connection route options within the DCO follow an alignment which interfaces with bus routes 229 and 469, and school services 602 and 669. Services 602 and 669 provide school transport with one journey each in the morning and one in the afternoon.

2.4.13 An appraisal would be included within each CTMP of the anticipated disruption to bus services during that stage of the works. This would be developed in consultation with the bus service operator and should include such matters as:

- a judgement of the disruption to those services;
- details of any proposed diversions or suspensions to the routes;
- bus stop suspensions or temporary relocations; and
- the programme for those impacts.

Cycling

2.4.14 Advisory cycle lanes are provided on each side of Norman Road for c. 390 m between the REP site and Picardy Manorway. These do not completely link between REP and Picardy Manorway, but begin/end approximately c. 100 m north of the Norman Road / Picardy Manorway junction and begin/end c. 225 m south of the shared access to REP and RRRF.

2.4.15 Cyclists traveling north from Picardy Manorway join the carriageway by crossing from the eastern footway to the advisory on-carriageway cycle lane. Where the cycle lane ceases at the north section of Norman Road, it combines with the footpath on the east side. To join the shared cycle track, cyclists travelling north leave the carriageway on the nearside to cross to the eastern side by effectively a “jug handle” arrangement where they are advised by a sign to dismount to cross the carriageway. Cyclists travelling south at this point are directed to give-way by road markings to join the carriageway and the advisory on-carriageway cycle lanes. At the southern end of Norman Road, southbound cyclists are directed off the carriageway to join a shared segregated path to connect to Picardy Manorway.

2.4.16 The cycle route serves as a link to REP and RRRF and the Thames Path National Trail. The on-carriageway cycle lanes are advisory and vehicles would be driving in these lanes due to the carriageway width. There would be a potential for conflict between construction traffic and cyclists for both the movement along Norman Road and when crossing the road to connect with the shared footway/ cycle track.

2.4.17 At the Main Temporary Construction Compound, cycle access should include a link from the current cycle provision on Norman Road into a safe access point for cycle storage and other associated welfare.

2.4.18 For the Electrical Connection undertaker’s workers, where it is judged to be appropriate, access for cyclists would be incorporated into Cable Route Temporary Construction Compound layouts, to facilitate safe access for workforce commuting. Cycle access is less likely to the construction areas given the worksite safety requirements and the linear and temporary nature of the works.

2.5 Considerations and Challenges

Neighbouring Construction Sites

2.5.1 There is an extant outline planning permission granted July 2016 for a Data Centre (ref: 15/02926/OUTM) to the south of REP and west of Norman Road. The CTMPs would reflect the status of this proposal, seeking to co-ordinate construction activities where necessary and feasible if both construction periods are concurrent.

2.5.2 When preparing the CTMP for the Electrical Connection, the statutory undertaker would engage with the LHAs and LPAs to confirm the programme and sequence of works. This process would take account of other construction activity along the corridor. The statutory undertaker would work with those undertaking other consented works to seek to co-ordinate construction and maximise the efficiency of the construction programmes for each party, limiting impacts on the public and others. The LHAs would advise on other works by statutory undertakers and would co-ordinate planned and unplanned works in accordance with their Network Management duties.

Pre-submission consultation with relevant parties

2.5.3 Consultation has been undertaken with near neighbours, Local Planning Authorities, LHAs and the Port of London Authority.

2.5.4 In response to the pre-submission consultation, the Royal Mail has requested notification of road closures and diversions to address concerns of traffic congestion and to ensure they are able to retain access to their collection and delivery points. The CTMPs would identify that this process is observed and how the contractor could engage with the Royal Mail.

2.6 Communication

2.6.1 The Principal Contractor would be responsible for insuring coordination with adjacent development sites to minimise traffic disruption. They would also be responsible for promoting a good working relationship with the immediate neighbours to the REP site and dealing with any complaints arising from the construction of REP and the associated Electrical Connection. Contact details would be provided on information boards adjacent to the work site and the Main Temporary Construction Compound on Norman Road. The information on the notice board would provide information on the works and contact details for general enquiries and emergencies.

2.6.2 It is anticipated that UK Power Networks (UKPN) would be responsible for the construction of the Electrical Connection. The works are remote from the REP site. The statutory undertaker’s site agent would be responsible for coordinating the cabling works with any other undertaker or highway authority undertaking adjacent works. Complaints specific to works on the highway would be the responsibility of the statutory undertaker’s site agent to manage. Site boards would be provided at work sites and compounds on the highway giving contact details for both day to day enquiries and emergencies. The signs would be the responsibility of the statutory undertaker to provide and maintain during the period of highway works.

3 Construction Programme and Methodology

3.1 Works Description

3.1.1 The works comprise of the following:

- The construction of Riverside Energy Park (REP) located to the north of Belvedere off Norman Road comprising:
  - an Energy Recovery Facility (ERF);
  - an Anaerobic Digestion facility;
  - a Solar Photovoltaic installation;
  - Battery Storage; and
  - On site enabling infrastructure for Combined Heat and Power to provide for a potential future local district heating (DH) network.
- The Main Temporary Construction Compounds located to the south of the REP site and west of Norman Road;
- The Electrical Connection, running underground between the REP site and the Electrical Connection Point at Littlebrook substation connecting into an existing National Grid building in Dartford; and
- Cable Route Temporary Construction Compounds required to support the construction of the selected Electrical Connection route.

3.1.2 Each CTMP will provide details of the specific works to be undertaken during that stage. This would include information on individual tasks and operations, such as:

- demolition works;
- hoarding and boundary treatment construction and decommissioning;
- site set up and establishment works;
- significant concrete pours and construction tasks;
- periods and durations of piling;
- Mechanical Electrical Instrumentation Control and Automation and fit out periods;
- demobilisation operations; and
- other major construction processes.

3.2 Works Programme

3.2.1 The Proposed Development would be constructed over a period of c. 45 months with construction starting in 2021 and operations starting in 2024.

3.2.2 The final CTMPs to be submitted to the Local Planning Authority for approval would provide a detailed and current programme for the works covered by that document.

3.3 Construction Hours

3.3.1 Subject to confirmation through the DCO and in the final CTMPs, the core construction hours would be: -

- 07.00hrs – 19.00hrs Monday to Friday (excluding Bank Holidays);
- 07.00hrs – 13.00hrs Saturdays

3.3.2 The assessment within Chapter 6 of the ES has been conducted on the basis of the following working hours:

- 08.00hrs - 18.00hrs Monday to Friday (excluding Bank Holidays);
- 08.00hrs – 13.00 hrs Saturdays

3.3.3 The assessed hours provide for a reasonable worst case assessment in that construction trip impacts would occur during the morning and evening highway network peak periods.

3.3.4 The Principal Contractor would likely require a period of up to one hour before and one hour after core working hours for start-up and close-down activities such as:

- Arrival and departure of workforce and staff on site;
- Deliveries and unloading;
- Checks and examinations of plant and machinery (including test running) and the carrying out of essential repairs/maintenance to plant and machinery;
- Re-fuelling of plant and machinery engines;
- Site inspections and safety checks prior to commencing work;
- Site meetings; and
- Site clean-up.

3.3.5 Certain specific construction activities will require extended working hours for reasons of engineering practicability and safety such as slip form working, surveys and lifting/fitting of infrastructure and abnormal deliveries.

3.3.6 The works on the highway would generally follow the above working hours. As a result of the location of some of the areas of highway works it could be necessary for working hours to be extended, this could include night time and weekend working to minimise disruption on the road network. Advice given in Traffic Advisory Leaflet 8/14 Extended Working Hours at Road Works would be followed. These adjusted hours, in needed, would be agreed with the relevant LHAs and LPAs. Works at rail interfaces could also require night time or extended working hours where confirmed with Network Rail and the local authorities.

3.3.7 Applications under S61 of the Control of Pollution Act 1974 would be made to the relevant LPA to cover working outside standard hours.

4 Vehicle Routeing and Access

4.1 Routeing of Worksite Construction Traffic

4.1.1 The preferred routeing for construction traffic to the REP work site would be from Norman Road which has direct access to the A2016 via a left in and left out junction, which forms part of the Strategic Road network (SRN). An overview of the local access plan is shown in **Figure 4-1**.

Figure 4-1: Local Construction Traffic Access Plan

4.2 Construction Traffic Approaching from the East and M25

4.2.1 Traffic accessing the construction site from the east would access the site from the A206/A282(M25) Littlebrook Interchange or A2/A282(M25) Darenth Interchange.

4.2.2 Traffic accessing from the A206/A282 Littlebrook Interchange would approach the site from the A206 Bob Dunn Way, A206 Thames Road, A206 Northend Road, A206 Queens Road, A2016 Bronze Age Way and the A2016 Picardy Manorway. When reaching the A2016 Picardy Manorway vehicles would proceed to A2016 Eastern Way/Picardy Manorway roundabout to undertake a U-turn manoeuvre to access Norman Road.

4.2.3 The access route from the A206/A282 Littlebrook interchange is mainly dual carriageway. There is a short section reduced to single carriageway due to a railway bridge over the carriageway on the A206 Thames Road. The carriageway is reduced to single carriageway on the approach to the bridge and the bridge then dissects the single carriageway with opposing traffic lanes passing through separate bridge arches. The maximum height for vehicles passing through the bridge arches is 16 ft 3 in (4.9 m).

4.3 Construction Traffic Approaching from the West

4.3.1 Construction traffic travelling from the west would approach the site from the A2016 Eastern Way. The network feeding traffic to the construction site from the north of the River Thames and the A12 is likely to be from the A102 Blackwall Tunnel approach where it joins the A206 Woolwich Road, A206 Woolwich Church Street, A206 Woolwich High Street, A206 Plumstead Road, A206 Pettman Crescent, A2016 Western Way and the A2016 Eastern Way before joining A2016 Picardy Manorway to access the site from Norman Road. The route is predominantly dual carriageway with a section of Woolwich Road being single carriageway.

4.3.2 Traffic travelling from the southwest within the M25 would approach the site from the South Circular and joining the A206 on Woolwich High Street where traffic joins the route from the A102 Blackwall Tunnel approach to access the site from the A2016 Picardy Manorway.

4.3.3 Access to the mobile works for the Electrical Connection would follow the same strategic routes but could require local variations to access the temporary works areas. The local variations would be confirmed as part of the detailed CTMP for that stage.

4.3.4 Where access is required during the operating hours of the London Lorry Control Scheme (LLCS), it will be the responsibility of the haulier to agree exemptions as necessary. Eastern Way (A2016) is a route included within the LLCS.

5 Site Access

5.1 Site Access – REP Site and Main Temporary Construction Compound

5.1.1 The Main Temporary Construction Compound would be located off Norman Road, as illustrated in **Figure 5-1**, with the provision of a boundary line gate suitably sized to facilitate access for large construction vehicles. The boundary line gate would be provided for site security when the site is not operational. The site and compound gate line or barrier system would be provided to enable maximum legal length delivery vehicles to pull off the highway to be checked.

5.1.2 The Main Temporary Construction Compound would have sufficient room for vehicles to turn to enable them to exit on to Norman Road in a forward gear. The compound would be used to consolidate smaller deliveries to the REP site.

Figure 5-1: Main Temporary Construction Compound Location

5.1.3 A pedestrian and cycle access would be provided, separate to the vehicle access, for site workers and visitors to access the site offices, welfare and laydown areas. The strategy for accessing on-site parking would be identified within the compound layout and details provided in the detailed CTMP for that stage.

5.1.4 Bulk materials movements, such as concrete and excavated material, and large loads would be instructed, at the time of booking, to proceed direct to the REP construction site.

5.1.5 A method of washing down vehicles would be provided to prevent material and debris from being deposited onto Norman Road and the adjacent highway. This would apply for both the site compound and the REP site. The wheel washing facility would be supplemented by a road sweeper call-off contract operating on Norman Road and Picardy Manorway when necessary.

5.1.6 The detailed layout of the Main Temporary Construction Compound has yet to be determined, although it is anticipated that it should accommodate a laydown area, including a delivery reception area and consolidation point, office and welfare facilities, and on-site parking.

5.1.7 Vehicles and loads not accepted would be rejected from the compound or works area. They would be directed to turn within the site and leave in a forward gear. They would not be inspected within the Highway.

5.2 The REP Site Access

5.2.1 Construction traffic would enter the REP site through the existing RRRF delivery and servicing access to the north of Norman Road. The RRRF would be receiving vehicles during construction. Access to the existing weighbridges and access/egress points would be maintained for RRRF operational vehicles while REP is under construction.

5.2.2 The combination of construction vehicles and RRRF operational vehicle movements would be coordinated to ensure minimal impact with clear directional signing provided as part of the temporary traffic management. The preferred traffic management would be determined during detailed design and presented through the CTMP for that stage.

5.2.3 The construction site at REP would have similar access arrangement to the Main Temporary Construction Compound - comprising of a gate line with Traffic Marshals controlling access. Rejected vehicles or loads would be required to turn within the construction areas or compound and leave in a forward gear to Norman Road. Exiting vehicles would not be permitted to wait on Norman Road, where they could cause delays and disruption and would conflict with on-carriageway cycle facilities.

5.3 Construction Site Parking

5.3.1 Vehicle parking would be provided during construction for up to 552 cars and vans. These spaces would be provided for workforce or visitor parking. Further parking and holding areas would be provided by the Principal Contractor in their detailed site layout arrangements within the Main Temporary Construction Compound and the REP works area for essential vehicles associated with specific operations such as: concrete pours; cranage operations; materials, plant and equipment deliveries and removals; and vehicles undertaking maintenance operations.

5.3.2 The strategy for maintaining and managing the parking stock would be developed for the CTMP for that stage. This could include a system of permits to guide who can park within the area and to limit off-site parking. The Principal

Contractor would work with LBB to monitor and manage off-site parking to protect the effective operation of the local road network.

5.4 Cable Route Temporary Construction Compounds and Works Areas

5.4.1 Access to the Cable Route Temporary Construction Compounds would be configured, to allow access in a forward gear, manoeuvring within the compound to deliver to the site and exit in a forward gear. The location and layout of these compounds would be identified within the detailed CTMP for that stage.

5.4.2 At the Electrical Connection construction areas, vehicles will be required to access the safe working zone directly from the running carriageway and travel through the construction area to leave forwards. The construction areas will be configured to comply with Traffic Signs Manual Chapter 8 – Road Works and Temporary Situations. The layouts and associated temporary traffic management would be agreed with the LHAs through the associated CTMP.

5.4.3 In addition to the Cable Route Temporary Construction Compounds and the Electrical Connection construction areas there are areas which will require special engineering operations to enable the cable ducting to traverse structures and water courses. These construction areas would need a separate compound to house specialist equipment and associated materials. These compounds would accept deliveries specific to the operation being undertaken from the compound area. The currently identified areas are: Thames Road between its roundabout with Bob Dunn Way and its roundabout with Crayford Way adjacent to the rail over bridge; and on Bob Dunn Way between its roundabout with Thames Road and its roundabout with Central Road adjacent to the River Darent. Other locations would be set out in the CTMP for that stage.

5.5 Pedestrians, Cyclists and Parking

5.5.1 Pedestrian and cycle access for those working at and visiting the Main Temporary Construction Compounds would be from Norman Road, as indicated at Section 2.4. Workers will then transfer to the construction area from the compound facilities. Access to the construction area at the REP site would be limited to construction traffic only.

5.5.2 Parking access at the Main Temporary Construction Compound would be determined through the detailed layout design for the compound, reflecting the safe co-ordinated operation of workforce access with plant, materials and equipment deliveries and extractions.

5.5.3 Detailed arrangements for pedestrian and cycling access would be set out in the detailed CTMP. This would include a strategy for parking provision and management within the Main Temporary Construction Compound.

5.5.4 In the CTMP for the construction of the Electrical Connection, the statutory undertaker will define where their workforce would be directed to and how they will commute. Private vehicle parking would not be provided for at the construction areas.

6 Impact on Other Highway Users

6.1 Construction Delivery Impact on Other Highway Users

6.1.1 The Main Temporary Works Construction Compound and the REP site layout would not directly impact the highway network in their operation.

6.1.2 The impact of construction related traffic is considered in the Transport Assessment and shows that there will be some residual impacts primarily due to workforce movements. This peak impact would be temporary during the busiest construction period and during morning and afternoon arrivals.

6.1.3 The impact of construction traffic for the main site works would be minimised with deliveries being programmed to quieter periods on the road network, where possible, taking account of peak traffic periods and local events.

6.1.4 Prior to deliveries being undertaken to site, information would be provided to each supplier outlining the requirements needing to be followed when delivering to site. The information should include such points as.

a. The presence of cycle and pedestrian infrastructure within the vicinity of the worksite or compound e.g. the on-carriageway advisory cycle route on Norman Road;

b. Likely conflicts with other vulnerable user groups in the immediate area of the construction areas; and

c. The location of the access points and crossings for pedestrians and cyclists – at compounds and construction areas.

6.1.5 The information for drivers would be contained in a Driver Information Pack. The Driver Information Pack should be updated, during the construction process, to reflect the requirement and conflict points on the delivery route to reflect the changing operations that are in progress at the time delivery is being made. A copy of the information pack would be made available through the suppliers to the driver before commencing their journey to the site.

6.1.6 Traffic Marshals would, where appropriate, be employed to operate and manage the site gates and check and record vehicle arrivals against those booked arrivals. The Principal Contractor would determine the number of gate staff required and their locations.

6.1.7 Site and compound access points should be managed to ensure vehicles do not wait on the Highway. Where there is a possibility of this occurring, potentially during large concrete pours, the activity would be supported by an approved system of temporary traffic management.

6.2 Works Impact on Other Highway Users

6.2.1 The offsite works associated with the construction of the Electrical Connection between REP and the Littlebrook Substation would have an impact on the road network at the locations where the cable installation works are undertaken. The length of works area would be determined in co-ordination with the LHAs to minimise traffic impact whilst maintaining a work site to maximise cable installation efficiency. It is anticipated that each construction area would be up to approximately 200 m in length (extending to approximately 300 m when including the associated temporary traffic management measures), unless agreed otherwise with the LHA. Suitable temporary traffic management would be put in place and maintained in accordance with the Traffic Signs Manual Chapter 8 – Road Works and Temporary Situations.

6.2.2 The Electrical Connection construction site would be a rolling lane closure or temporary side road closures to accommodate open trenching duct installation, backfilling and surface reinstatement. The cable laying work site would be provided by temporary traffic management comprising of worksite barriers, cones and warning signs. The temporary traffic management would be provided following best practice principles with any full road closures timed to cause least impact on traffic.

6.2.3 There should be minimal road closures and diversion during the cable installation works. These would be associated with works to cross side roads and junction arms. The main impact of the highway related work would be the loss of highway capacity due to lane closures on sections of dual-carriageway and possibly the need for single lane alternate working on sections of the cable route provided on single carriageway roads.

6.2.4 Detailed traffic management phasing and designs would be provided through the associated CTMP and should be developed in engagement with the LHA. The method and programming of when and how the Electrical Connection should be constructed across side road and road crossing would be co-ordinated and agreed with the affected LHAs as part of the preparation of the final CTMP for that work. This could include temporary traffic management measures such as short term closures of side roads and slip roads, with associated temporary diversions. Where feasible road crossings would be carried out using single lane closures, however, alternative detailed temporary traffic management arrangements could be agreed with the affected LHAs.

6.2.5 The interaction of the works with the PRoW network would include a number of instances where the works abut the terminal points of footpaths and three locations where the routes are directly affected. These are considered in summary in the Transport Assessment at Section 2.8. The details and timing of the interaction and impacts would be set out in the respective CTMP for those stages.

6.2.6 The detailed CTMPs would explain the method of management of the construction areas and compounds and how affected PRoWs would be protected and / or diverted during the adjoining construction processes. The time over which the footpaths would be affected should be indicated within the CTMP and plans showing diversions where they are required. The 'Transport' section of the outline Code of Construction Practice (CoCP) (**Document Reference 7.5**) identifies the requirement to protect users of PRoWs. A full and final CoCP will be secured through a DCO Requirement and the final CoCP provisions will be reflected in the final CTMPs.

6.2.7 Footpath DB5 would be affected by the Cable Route Temporary Construction Compound where the directional drilling is anticipated under the River Darent. The alignment of the footpath will be retained where feasible and protected from the works or a suitable alternative local route provided.

6.2.8 An option for the route of the Electrical Connection could follow the alignment of FP2 through the Crossness Nature Reserve. If this were pursued, FP2 could be closed temporarily whilst the cable route is constructed. An alternative alignment should be identified, which could follow footpath FP4 and Norman Road. The details of this would be presented within the detailed CTMP.

7 Temporary Traffic Management and Traffic Regulation Orders.

7.1 Parking Suspensions, Waiting and Loading Restrictions and Highway Licences

7.1.1 There are no proposals for waiting restrictions to ensure access for construction traffic at the REP worksite or the associated Main Temporary Works Compound. Consideration would be given during the construction stage to introduce waiting and loading restrictions on Norman Road if required to deter waiting by construction vehicles and parking by workers on Norman Road which could impede access and egress to the site.

7.1.2 The temporary closures of footways, footpaths, cycle paths and traffic lanes along with road closures, suspensions of access restrictions and on street parking would be determined and are subject to confirmation following detailed proposals for the Electrical Connection route prior to the final CTMP being prepared. Any necessary Traffic Regulation Orders, permits and licences would be identified in the final CTMPs and progressed in accordance with the processes set out in the DCO Requirements and the final CoCP.

7.1.3 The need for licences for the use of two way and multiphase temporary signals would be determined through the detailed programming of the cabling works. The notifications of the works and the preparation of the licences would be subject to LHA approval.

7.1.4 When undertaking certain operations during cabling works the use of Stop Works traffic management may be required, this traffic management would only be used during off peak times and with prior approval from the LHA. The associated temporary traffic management would be deployed.

7.1.5 Statutory undertaker connections to the Main Temporary Works Compounds would be undertaken by approved statutory undertakers contractors. This would include electrical, communications, water and sewer connections to the construction sites and compounds. Those contractors' works would be co-ordinated in accordance with standard New Roads and Street Works Act 1991 systems.

7.2 Electrical Connection Construction Area Traffic Management

7.2.1 The construction of the Electrical Connection will involve a combination of Temporary Construction Compounds and laydown areas and mobile construction areas. The former will be established to provide materials storage and lay down facilities and some fixed site welfare. These compounds will have semi-permanent access provision and, in the instance of the anticipated compound location on Bob Dunn Way, would incorporate provision for the local diversion and protection of the DB5 PRoW route.

7.2.2 The Electrical Connection construction areas would be established as safe working areas within the Highway with associated temporary traffic management. The layout of the construction areas would follow the statutory undertakers' established practices and accord with the guidance in Traffic Signs Manual Chapter 8 – Road Works and Temporary Situations. Streetworks notification processes would be implemented in accordance with the LHA for that road.

8 Construction Traffic Site Deliveries

8.1 Construction Traffic REP Site Deliveries

8.1.1 Day to day site deliveries and removals would be undertaken during site working hours where possible.

8.1.2 The times for acceptance of key deliveries are set out at Section 3.3 and would be confirmed through the approved CTMP for that stage.

8.1.3 Where practical the Principal Contractor would consider programming site deliveries to arrive after 09.00hrs Monday to Friday to seek to minimise impacts on the local Highway network peak periods. This should take account of the origin of the load and vehicle, which could restrict retiming opportunities – such as due to operating licence restrictions or LLCS controls.

8.1.4 Information on the plant, equipment and materials required for each stage of the works would be provided within the detailed CTMP for that stage.

8.1.5 Site deliveries and removals involving Abnormal Indivisible Loads (AILs) would typically be undertaken at times of reduced traffic flow normally outside of the normal working hours and following notification through the ESDAL system (Electronic Service Delivery of Abnormal Loads) or similar recognised process. Movement times would adhere to advice given by the affected Police and Highway Authorities.

8.1.6 Key deliveries or removals would where appropriate be booked in with the Principal Contractor's in good time prior to the planned movement. In the case of AILs 7 day prior notice would be required. Planned arrival or removal times would be coordinated on site to ensure there is sufficient space on site to accept the haulier's vehicle within the compound or works area, ensuring the vehicle could be loaded/unloaded promptly and safely and avoiding any vehicle queuing and waiting on roads adjacent to the site.

8.1.7 Deliveries would be controlled at the site access by trained Traffic Marshalls who would record vehicle arrivals and subsequent departures against those booked in with the Principal Contractor. Drivers of booked vehicles would be directed to the appropriate area within the site compound.

8.1.8 The contractor would ensure that vehicles delivering to site comply with requirements of TfL's Work-Related Road Risk (WRRR) and the Construction Logistics and Community Safety (CLOCS) standards.

8.1.9 In meeting the WRRR requirements, the contractor would ensure that operators providing vehicles delivering construction materials, plant and sundries on the project – using vehicles with Gross Vehicle Weights greater than 8 t would be a member of the Fleet Operators Recognition Scheme (FORS) – unless specific circumstances are confirmed with LBB Highways officers.

8.1.10 Where there is a requirement for specialist operators to access site, who are not FORS registered and CLOCS compliant, and it is not reasonable to expect that company to become so, this will be confirmed with the LHA, with justification given. This could include specialist haulage or lifting contractors who could be visiting site on fewer than three occasions.

8.2 Construction Traffic – Electrical Connection Site Deliveries

8.2.1 The installation of the power cable between REP and Littlebrook Substation located off Rennie Drive would be remote from the REP site. The main materials for the cable route comprise of: ducting; pipe bedding back fill; cable warning tape; junction pit components comprising of joint boxes, covers and cable; excavated material; and surfacing materials. Plant and equipment would be delivered and removed directly to or from the construction areas. Refuelling would be carried out either on-site by way of mobile tanker or off-site.

8.2.2 The materials would typically be delivered in bulk to the works compounds and then transported to the work site by site vehicles. The onsite operation would require direct removals of surplus excavated material from the work site along with any removed vegetation from the cable route. It would also be necessary for reinstatement materials to be delivered direct to the work site. The onsite welfare for cable laying work sites would require a weekly maintenance visit by a pump vehicle with reception tank.

9 Strategies to Reduce Impacts

9.1 Planned Measures

9.1.1 The following Planned Measures have been identified to help the Principal Contractor achieve the goals of the CTMP and better manage the challenges identified in Section 2. Measures identified as “committed” are those that would be anticipated to be included as requirements within the DCO or Code of Construction Practice. The items listed as “proposed” are measures that could be advanced but would not be a binding commitment. The “considered” measures would continue to be explored and would be employed should an acceptable opportunity be available.

Table 9-1: Planned Measures

Planned Measures Checklist	Committed	Proposed	Considered
Measures influencing construction vehicles and deliveries			
Vehicle safety and environmental standards and programmes	x		
Adherence to designated routes	x		
Delivery scheduling		x	
Retiming for out of peak time deliveries		x	
Retiming for out of hours’ deliveries		x	
Use of holding areas and vehicle call off areas			x
Measures to encourage sustainable freight			
Freight by Water			x
Freight by Rail			x
Material procurement measures			
DfMA and off-site manufacture			x
Reuse of material on site		x	
Smart procurement		x	
Collaboration amongst other sites in the area			x
Implement a staff travel plan		x	

9.1.2 Cory Riverside Energy is a water freight operator and would explore the movement of materials by river where opportunities are viable, efficient and safe. They would continue to review options for moving bulk material by river which would be off-loaded using the current gantry crane system. The use of the existing jetty facilities for the construction of REP should only be considered where there would be no undue disruption to the operation of RRRF and convenient pre-existing water interface is available at the starting point of that material's journey. The operation of marine activities would be managed by Cory Riverside Energy's existing marine logistics department, who are highly trained in the operations on the River Thames, and would co-ordinate vessel movements with those for the continuing operation of RRRF.

9.1.3 Opportunities to move material by rail would be monitored, as the project progresses, and consideration would be given to moving material by rail where rail interchange is available and could be appropriate to the construction programme.

9.1.4 Each CTMP will set out the measures that have been adopted to reduce the impacts of the construction processes associated with the movement of plant, materials and equipment.

9.2 Measures Influencing Construction Vehicles and Deliveries

Safety and environmental standards and programmes

9.2.1 The Applicant and Principal Contractor would ensure all contractor and subcontractor vehicles arriving at site comply with sufficient safety measures and requirements relating to Work Related Road Risk (WRRR), as detailed by TfL.

9.2.2 The requirements for compliance with WRRR are set out at: https://tfl.gov.uk/info-for/deliveries-in-london/delivering-safely/work-related-road-risk.

9.2.3 The CTMPs would reiterate this commitment and detail how compliance should be enforced, monitored and managed.

9.2.4 Industry best practice would be adopted, wherever possible, to support the construction stage of REP. This would be likely to be achieved by ensuring that, through the procurement process, the Principal Contractor and its subcontractors are members of, or signatories to, relevant best practice schemes and initiatives including, for example:

- Considerate Contractors Scheme (CCS) – promotes best practice that relates to on-site activities and those in the vicinity of the site. It is noted that the site would be registered under this scheme.
- Fleet Operator Recognition Scheme (FORS) – for suppliers that would deliver to, and hauliers that visit the site, the Principal Contractor would mandate these businesses to be members of FORS before they could deliver to site – unless a specific exception is agreed with the LHA prior to that haulier or supplier visiting site (Section 8.1.10 refers).
- Construction Logistics and Community Safety (CLOCS) – CLOCS brings the construction logistics industry together to revolutionise the management of work-related road risk and ensure a road safety culture is embedded across

the industry. The Principal Contractor would require all hauliers and suppliers to be CLOCS compliant – unless a specific exception is agreed with the LHA prior to that haulier or supplier visiting site (Section 8.1.10 refers).

- Construction Logistics Improvement Group (CLIG) – CLIG comprises around 50 construction industry stakeholders which are involved in TfL's behaviour change project aimed at minimising the impact of the increasing amount of construction and to ultimately reducing the congestion and improve safety and air quality for the capital.

9.2.5 Current levels of good practice implemented by major projects such as Crossrail and the Thames Tideway Tunnel have led the way in setting the standards which construction projects should attain. The Applicant for the Riverside Energy Park is supportive of these standards and would adopt good practices consistent or exceeding these high levels. The extent to which the developer could apply and possibly enhance the standards would be appraised and set out in the detailed CTMPs for each stage.

Adherence to designated routes

9.2.6 Road traffic routes to be used for journeys to/from the Transport for London Road Network and SRN in London and the strategic road network in Kent are specified in Section 4. These access routes have been reviewed with respect to physical obstructions and hazards which could restrict access for larger construction vehicles. Qualitative assessments of junctions on the approach to REP have been undertaken within the Transport Assessment.

9.2.7 A copy of the route plan would be given to all suppliers when orders are placed to ensure drivers are fully briefed on the required route to take. The supplier would be made aware that these routes are required to be followed at all times, unless agreed or alternate diversions are in place by the LHA or other parties.

9.2.8 Routes for AILs would be determined by the haulier in collaboration with the affected Police and LHAs. These would be determined by the configuration of the load, depending on its height, width, weight and length. The need for escort vehicles would be determined through that process.

Delivery scheduling and monitoring

9.2.9 Delivery scheduling for road movements would be confirmed with the Principal Contractor's logistics team. An electronic delivery management system could be implemented to book and manage vehicles visiting the site. This could be a proprietary system or bespoke to the project. Such systems can record all details relevant to the vehicle visit, which are then available for the inclusion into monitoring reports. More information regarding the system would be presented in the approved CTMP for that stage.

9.2.10 Water freight movements that are viable would be managed by Cory Riverside Energy's Lighterage Team, to ensure they are co-ordinated with the marine operations of RRRF.

Retiming of deliveries outside peak traffic times

9.2.11 Retiming of deliveries outside peak traffic times could improve the operational efficiency of the construction site, as well as lessening the impact of vehicle activity on the neighbouring area. The Principal Contractor and the Electrical Connection statutory undertaker would explore in the CTMPs where they are minded to support retiming of site deliveries to times outside the morning peak (i.e. outside 07:00-09:00hrs).

9.2.12 In the case of deliveries and collections by water, these are anticipated to occur at varying times over a 24-hour period, as they would be governed by the tidal state of the River Thames.

Use of holding and vehicle call off areas

9.2.13 The use of a holding area for construction vehicles approaching site has been considered, but the location of the development and amount of available space at the REP site does not lead to this type of facility being required for the construction works. Subject to the detailed layout design of the compound, the Main Temporary Construction Compound on Norman Road could be used to muster some vehicles prior to sending them to the REP site.

9.2.14 The statutory undertaker would determine where to locate laydown areas for the construction of the Electrical Connection. The operation would not require remote holding areas for vehicles.

Use of logistics and consolidation centres

9.2.15 The decision to use a consolidation centre would be made once the Principal Contractor has been appointed and its need and viability investigated in greater detail. The conclusions and result of the appraisal, and the approach to be adopted would be set out in the detailed CTMP for that stage.

9.3 Measures to Encourage Sustainable Freight

Freight by Water

9.3.1 The REP site lies within 100 m of the River Thames and has an existing jetty for the movement of standard containers as part of RRRF's present operations. Where practicable, water transport would be considered as a mode for inbound materials and outbound construction waste streams. The precise details on the use of waterborne transport are to be made once the Principal Contractor has investigated its need and viability in greater detail and would be in co-ordination with Cory Riverside Energy's existing marine operations.

9.3.2 It is proposed that the contract for ready mixed concrete would require that supplier to explore the use waterborne or rail deliveries as part of their transport chain for some, or all of the raw materials to their batch plant. The supply of batched concrete from the plant would be by road.

9.3.3 The feasibility of transporting materials or equipment by water would be addressed by the Main Works Contractor and presented in the detailed CTMP.

9.3.4 Water freight is not proposed to be used by the statutory undertaker for the construction of the Electrical Connection.

Freight by Rail

9.3.5 The REP site would not directly link to the railway network and there are currently no rail freight terminals within a reasonable distance of the site. Therefore, it is not envisaged rail freight would feature as a primary transport mode for the delivery and removal of construction materials and waste. Proposals for the Howbury Strategic Rail Freight Interchange would be monitored. Its use in the supply chain for the construction of REP would be considered should the facility become operational prior to the commissioning of REP.

9.3.6 As stated above, it is the Applicant's preference that the contract for ready mixed concrete would require the supplier to use waterborne or rail deliveries as part of their transport chain for some, or all of the raw materials to their batch plant.

9.4 Material Procurement Measures

Design for Manufacture and Assembly and off-site manufacture

9.4.1 The potential to use prefabricated assemblies and techniques could be considered as an approach to reduce the number of construction vehicle movements, once a Principal Contractor has been appointed. A decision as to how prefabrication might be integrated into the construction process would be included in the detailed CTMP.

Reuse of material on site

9.4.2 Demolition materials arising from site clearance and ground preparations could be reused as part of the site levelling and the provision of a building platform and piling mat for the construction works. The material would be stored within the site area until required. This would be determined during the detailed design development and reflected in the CTMP for that stage.

9.4.3 Consideration could also be given to the reuse of excavated material for filling, depending on its suitability - e.g. potential contamination. Where possible, the project could seek to maximise the reuse of suitable soils for landscaping, to minimise waste disposal.

Smart procurement

9.4.4 Where appropriate suppliers are available and suitable contracts can be negotiated, materials, equipment and plant could be sourced from local suppliers. Furthermore, during the procurement stage the Principal Contractor would explore with suppliers if the use of waterborne or rail transport would be possible for part of the transport chain.

9.4.5 Opportunities to source materials from the suppliers supplying other development sites already underway in the immediate area would also be investigated.

9.5 Other Measures

Collaboration amongst other sites in the area

9.5.1 The Applicant is not averse to working with other construction site contractors in the vicinity and would ascertain the feasibility of a shared consolidation or holding area for construction vehicles and/or materials. If a suitable forum were to be established, the Principal Contractor could attend working group meetings to discuss opportunities to collaborate with other sites and suppliers, to minimise any disruption during the construction stages.

9.6 Vehicle Holding Areas and Call Up Procedure

9.6.1 There is no intention currently to provide a remote lorry holding area, therefore a vehicle call up procedure would not be required. There would be communication between the Main Temporary Construction Compound and the REP site to co-ordinate when vehicles need to move between the two areas.

9.6.2 In the case of larger concrete pours the site would coordinate deliveries with the batching plant to ensure a constant turnaround of vehicles. Where pours are of sufficient scale, multiple batching plants could be used. The co-ordination between batching plants would be the responsibility of the concrete supplier.

9.6.3 The use of interactive communication devices which may distract driver's attention whilst driving would be discouraged during vehicle movements on the highway associated with the developments construction.

9.7 Implement a Workforce Travel Plan

9.7.1 An outline Operational Worker Travel Plan has been developed to promote sustainable transport for workers during the operational phase of REP. This would be extended to a full final Operational Worker Travel Plan as a Requirement of the DCO. Through the inclusion in the final CTMP of details of travel planning initiatives and measures, construction staff engaged on the project would similarly be encouraged to use alternatives to the car to travel to site which should include promotion of walking, cycling, car sharing, bus and rail. The need for workers to drive to site is recognised and onsite parking for approximately 550 cars would be provided.

9.7.2 Parking on Norman Road would be strongly discouraged. If necessary, however, working with LBB Highways, waiting restrictions may be proposed to maintain site access for deliveries and extractions and to deter worker and visitor parking other than in the designated areas.

9.7.3 The Principal Contractor will maintain the role of a Travel Plan Coordinator (TPC) who will champion initiatives to reduce the environmental impacts of work force travel and to minimise the impacts of commuting on the local road network.

9.7.4 The TPC would:

a. Implement and actively promote Travel Plan measures to maximise the use of non-car modes of travel to and from work, such as:
   i. providing information on public transport services in the area;
   ii. promoting the use of cycle facilities at the Main Temporary Construction Compound; and
   iii. extolling the virtues of active travel and encouraging walking for those living within 1 km of REP or cycling for those living within 5 km.
b. Ensure the requirements for workforce inductions, briefings and communications include information and guidance on the importance of environmentally friendly commuting;
c. Act as a focal point for workforce commuting issues;
d. Manage the monitoring, assessment and review of workforce travel patterns; and
e. Engage with subcontractors to encourage their workers to commute sustainably.

9.7.5 Those workers using cycles to commute would be encouraged to undertake cycle training, to wear appropriate safer cycling equipment, and be offered guidance on safe cycle maintenance. The cycle training would be arranged through TfL’s existing Cycle Skills training initiatives.

9.7.6 The Principal Contractor and sub-contractors would consider the use of crew buses to limit the number of individual car journeys. These could be established to provide a link between the REP site and Abbey Wood station – encouraging the use of the Elizabeth Line services.

10 Estimated Vehicle Movements

10.1 Vehicles Accessing Site

10.1.1 It is expected that a wide range of vehicle types would access the site to enable construction, which would comprise of the following (but not limited to):

- Service Vans – Plant maintenance, PPE, fixings, sundry items site office services and deliveries, canteen supplies, courier/post and small parcel deliveries
- 2 axle rigid lorries – site services deliveries building materials, waste skips, waste paper recycling, sundry items, PPE fixings, courier and parcel deliveries
- 3 axle rigid lorries – plant deliveries, access platforms heavy side building materials, refuse collection, ready mixed cement
- 4 axle rigid lorries – muck away, aggregate supplies, ready mixed cement, heavy side building materials
- Multi axle articulated lorries – materials deliveries, cement powder, rebar, plant deliveries, piling rig, access platforms
- Abnormal Indivisible Loads (AIL) – mobile cranes and large adapted articulated lorry combinations (for items such as non-road mobile machinery, transformers, turbines, generators and boiler drums).

10.2 Estimated Vehicle Numbers

10.2.1 The estimated peak of construction related goods vehicles has been identified during month 13 of the period of construction. The estimated demand for the peak month would be in the order of 500 goods vehicles which equates to an average over a 5.5 day working week of 22 vehicles per day. In addition to goods vehicle movements for plant, equipment and materials, there would be in the order of 550 worker vehicle visits each day during the peak month.

10.2.2 The CTMPs would include a fuller prediction on the programme for vehicle movements and the types of plant material and equipment to be transported. The predictions would provide an estimated average daily number of movements.

10.2.3 Marine movements would be predicted in collaboration with Cory Riverside Energy's marine department and summarised in the appropriate CTMP.

11 Implementing, Monitoring and Updating

11.1.1 This Outline CTMP does not include a detailed and defined description of how the CTMP would be implemented, monitored and updated. However, the following approach can be confirmed at this stage.

11.1.2 It is anticipated that an appointed Logistics Manager would be responsible for implementing the CTMPs on behalf of the Principal Contractor. Once implemented, it is expected that the data and information collected as part of the CTMP would include:

Vehicle bookings

- Number of vehicle movements to site; collected through a delivery booking-in system that provides data on:
  - total vehicles accessing the site;
  - type/size/age of vehicles;
  - time spent on site;
  - any consolidation centre utilisation; and
  - supplier FORS accreditation

Breaches, complaints and non-compliance:

- vehicle routeing;
- unacceptable queuing;
- unacceptable parking; and
- Ultra Low Emissions Zone compliance.

Safety:

- logistics-related accidents;
- record of associated injuries;
- vehicles and operations not meeting safety requirements.

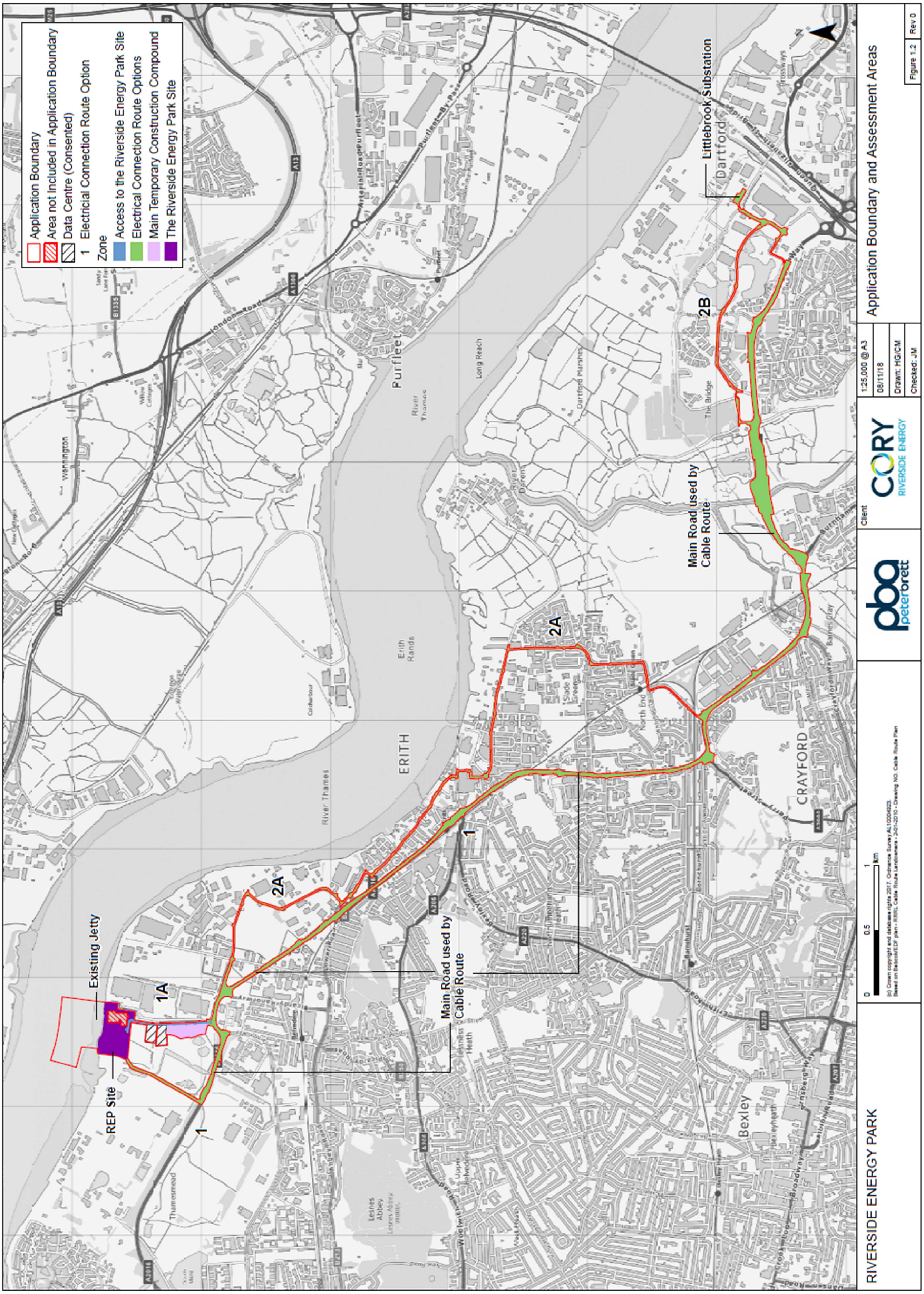
Workforce Travel Patterns

- details of staff travel modes when commuting to site;
- summary of travel times; and

- challenges and obstacles that are limiting the maximisation of non-car travel.

11.1.3 The data collected will be reported with full transparency to LBB and TfL. Kent County Council and Dartford Borough Council would be provided with data as required.

Appendix A Application Boundary and Illustrative REP layout


Application Boundary
Area not Included in Application Boundary
Data Centre (Consented)
1 Electrical Connection Route Option
Zone
Access to the Riverside Energy Park Site
Electrical Connection Route Options
Main Temporary Construction Compound
The Riverside Energy Park Site
Existing Jetty
REP Site
1A
2A
2B
1
Main Road used by Cable Route
Main Road used by Cable Route
Littlebrook Substation
ERITH
CRAYFORD
Purfleet
Dartford
Bexley
RIVERSIDE ENERGY PARK
Application Boundary and Assessment Areas
1:25,000 @ A3
08/11/18
Drawn: HG/CM
Checked: JM
Figure 1.2
Rev 0
Client
CORY RIVERSIDE ENERGY
pba peterbrett


KEY:
APPLICATION BOUNDARY
AREA NOT INCLUDED IN APPLICATION BOUNDARY
PARAMETERS KEY:
MAIN REP BUILDING
ANAEROBIC DIGESTION
ASSOCIATED PROCESS BUILDINGS AND INFRASTRUCTURE
STACKS
RIVERSIDE ENERGY PARK
NORMAN ROAD BELVEDERE LONDON
ILLUSTRATIVE SITE LAYOUT AND PARAMETERS PLAN
THE RIVERSIDE ENERGY PARK SITE LONDON
Date 13.11.18
A3 Scale 1:2000
Drawn by AG
Checked by PC
Drawing Number
Figure 1.3a
CORY
RIVERSIDE ENERGY
WEEDON architects

Appendix M Outline Operational Worker Travel Plan

Document Control Sheet

Project Name: Riverside Energy Park

Project Ref: 42166

Report Title: Outline Operational Worker Travel Plan

Doc Ref:

Date: **November** 2018

	Name	Position	Signature	Date
Prepared by:	Andy Wells	Associate	*A Wells*	November 2018
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Approved by:	Dermot Scanlon	Director of Major Infrastructure	*D Scanlon*	November 2018
For and on behalf of Peter Brett Associates				

Revision	Date	Description	Prepared	Reviewed	Approved

Contents

Tables

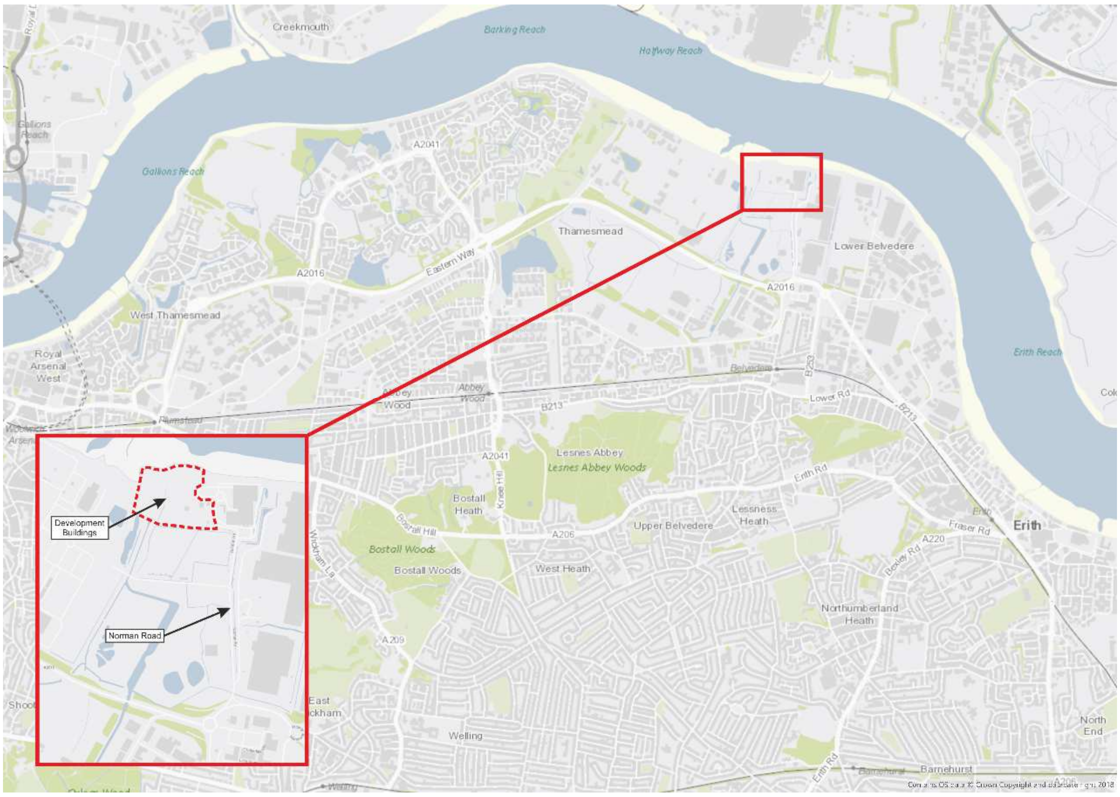
1 Introduction

1.1 Background

1.1.1 Peter Brett Associates LLP (PBA) has been commissioned by Cory Environmental Holdings Limited trading as Cory Riverside Energy (the Applicant), to provide transport and highway advice to support an application for an integrated Energy Park to be known as Riverside Energy Park (REP). The principal elements of REP comprise complementary energy generating development and an associated Electrical Connection (together referred to as the 'Proposed Development'). As REP would generate in excess of 50 MWe capacity it is classified as a Nationally Significant Infrastructure Project (NSIP) under section 14 of the PA 2008 and therefore requires a Development Consent Order (DCO) to authorise its construction and operation.

1.1.2 The Proposed Development, located in Belvedere in the London Borough of Bexley (LBB), would be known as 'Riverside Energy Park'(REP) and would be situated adjacent to an existing Energy Recovery Facility (ERF) (referred to as Riverside Resource Recovery Facility (RRRF)) also currently operated by the Applicant. A location plan is provided as **Figure 1.1**: and the DCO application boundary is provided in **Appendix A** .

Figure 1.1: REP site location



1.2 Scope

1.2.1 The TfL Travel Planning Guidance describes a Travel Plan as "*a long term management strategy which encourages sustainable travel for new and existing developments. It sets out transport impacts, establishes targets and identifies a package of measures to encourage sustainable travel*". A Travel Plan is intended to be a 'living' document that incorporates the flexibility to respond and adapt to changing conditions, such as:

- new or amended transport services in the vicinity of the site;
- transport network operations as a result of changing background travel demand over time; and
- initiatives employed through the travel plan drawing on experience of its implementation.

1.2.2 This outline Operational Worker Travel Plan provides a travel demand management strategy to address the travel behaviour of staff and visitors travelling to and from REP. The nature of REP requires the plant to be operated and staffed 24 hours per day. Staff shifts would be set to be able to benefit from opportunities to use public transport or walk or cycle to work. The indicative shift pattern is for the day time shift to be 06:00-18:00hrs and the night time shift to be 18:00-06:00hrs. This being the case, workers would arrive between 05:00-06:00hrs and 17:00-18:00hrs, and depart between 18:00-19:00hrs and 06:00-07:00hrs. The Operational Worker Travel Plan would not relate to the construction period nor the operational vehicle movements associated with the waste and by-products.

1.2.3 The movement of materials to and from the site, including waste imports and anaerobic digestion outputs, and the types of vehicles transporting these materials are considered elsewhere: in the Transport Assessment (TA). However, it is noted herein that the Applicant would consider delivering most of the waste to REP by barge from riparian Waste Transfer Stations (WTS) along the River Thames, utilising the existing jetty facilities as per the existing RRRF. The remainder of waste feedstock would be delivered by road. By-products including Incinerator Bottom Ash (IBA) would be transported by river to the existing IBA facility at the Port of Tilbury for treatment/recycling, and then onward use as secondary aggregate in the construction sector. Air Pollution Control Residues (APCR) (approximately 3% of throughput) would be taken off site by road in sealed containers to be recycled.

1.2.4 Travel plans prepared in advance of the occupation / commissioning of a site can only offer an overall strategy for the adoption of sustainable transport measures. Once the site is occupied and a Travel Plan Coordinator (TPC) appointed, there would be the opportunity to develop the document to reflect the specific needs of the site users, whilst meeting the key objectives and planning commitments. The proposed approach embeds measures from the outset, through good physical infrastructure and plans for management and monitoring, as discussed and outlined in this document.

1.2.5 There is an existing Travel Plan for RRRF and the appointed TPC for REP would seek to align the Operational Worker Travel Plan measures with those for RRRF, such as: undertaking joint events promoting sustainable travel; undertaking travel plan monitoring on a consistent basis; and 'joined-up thinking' when considering travel to both RRRF and REP.

1.3 Proposed Development – Summary

The Proposed Development comprises the following elements:

Energy Recovery Facility (ERF): to provide thermal treatment of Commercial and Industrial (C&I) residual (non-recyclable) waste with the potential for treatment of (non-recyclable) Municipal Solid Waste (MSW);

Anaerobic Digestion facility: to process food and green waste. Outputs from the Anaerobic Digestion facility would be transferred off-site for use in the agricultural sector as fertiliser or as an alternative, where appropriate, used as a fuel in the ERF to generate electricity;

Solar Photovoltaic Installation: to generate electricity. Installed across a wide extent of the roof of the Main REP Building;

Battery Storage: to store and supply additional power to the local distribution network at times of peak electrical demand. This facility would be integrated into the Main REP building; and

On Site Combined Heat and Power (CHP) Infrastructure: to provide an opportunity for local district heating for nearby residential developments and businesses. REP would be CHP Enabled with necessary on site infrastructure included within the REP site.

Electrical Connection REP would be connected to the electricity distribution network via a new 132 kilovolt (kV) underground electricity cable connection.

1.4 Travel Plan Structure

1.4.1 This outline Operational Worker Travel Plan is divided into the following chapters:

- Chapter 2 briefly summarises the existing national, regional and local planning policy and guidance that informs the writing of this Operational Worker Travel Plan;
- Chapter 3 outlines site accessibility and the existing travel situation;

- Chapter 4 discusses the objectives and targets;
- Chapter 5 presents the measures;
- Chapter 6 discusses the approach to management, monitoring and review; and
- Chapter 7 provides the implementation action plan.

1.4.2 This outline Operational Worker Travel Plan will form the basis of a final Operational Worker Travel Plan once detailed design works have progressed. This is secured through a draft DCO Requirement (**Document Reference 3.1**) which requires the Applicant to submit the final plan for the approval of the local authority prior to the date of final commissioning which must be in substantial accordance with the outline Operational Worker Travel Plan.

2 Policy and Guidance Review

2.1 Introduction

2.1.1 This section provides a review of the key national, regional and local policy and guidance documents relevant to travel planning for the Proposed Development. The policy and guidance covered within this review are:

- Overarching National Policy Statement for Energy (EN-1) (2011);
- National Planning Policy Framework (2018);
- Planning Practice Guidance (2014);
- Draft New London Plan (2018)
- Mayor's Transport Strategy (2018);
- TfL Travel Planning Guidance (online); and
- Bexley Core Strategy (2012).

2.2 National Policy and Guidance

Overarching National Policy Statement for Energy – EN1 July 2011

2.2.1 Section 5.13 of the NPS includes the following points which have helped to form the input and structure used for this outline Operational Worker Travel Plan and would guide the focus for the final report:

- "*The consideration and mitigation of transport impacts is an essential part of Government's wider policy objectives for sustainable development as set out in Section 2.2 of this NPS*." (Paragraph 5.13.2)
- "*If a project is likely to have significant transport implications, the applicant's ES (see Section 4.2) should include a transport assessment, using the NATA/WebTAG methodology stipulated in Department for Transport Guidance, or any successor to such methodology. Applicants should consult the Highways Agency and Highways Authorities as appropriate on the assessment and mitigation*." (Paragraph 5.13.3)
- "*Where appropriate, the applicant should prepare a travel plan including demand management measures to mitigate transport impacts. The applicant should also provide details of proposed measures to improve access by public transport, walking and cycling, to reduce the need for parking associated with the proposal and to mitigate transport impacts.*" (Paragraph 5.13.4)

- "*A new energy NSIP may give rise to substantial impacts on the surrounding transport infrastructure and the [Secretary of State] should therefore ensure that the applicant has sought to mitigate these impacts, including during the construction phase of the development*." (Paragraph 5.13.6)

National Planning Policy Framework (July 2018)

2.2.2 The National Planning Policy Framework (NPPF) was published in 2018. The document sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally-prepared plans for development can be produced.

2.2.3 Chapter 9 of the NPPF refers to promoting sustainable transport with respect to development proposals. Paragraph 102 states that "*transport issues should be considered from the earliest stages of plan-making and development proposals, so that:*

- *The potential impacts of development on transport networks can be addressed;*
- *Opportunities from existing or proposed transport infrastructure, and changing transport technology and usage, are realised – for example in relation to the scale, location or density of development that can be accommodated;*
- *Opportunities to promote walking, cycling and public transport use are identified and pursued;*
- *The environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains; and*
- *Patterns of movement, streets, parking and other transport considerations are integral to the design of schemes, and contribute to making high quality places."*

2.2.4 Paragraph 110 refers to the fact that developments should be designed to give priority first to pedestrian and cycle movements, and access to high quality public transport should be facilitated. Paragraph 111 states that, "*All developments that will generate significant amounts of movement should be required to provide a Travel Plan*."

Planning Practice Guidance (PPG)

2.2.5 Sitting alongside and supporting the NPPF is the Planning Practice Guidance (PPG) which was published in March 2014. This offers guidance on effective delivery of objectives through the planning process.

2.2.6 The 'Travel plans, transport assessments and statements in decision-taking' section provides advice on when transport assessments and transport statements are required, and what they should contain:

- Paragraph 36 sets out that all developments which generate significant amounts of transport movement should be required to provide a Travel Plan.

2.3 Regional Policy and Guidance

London Plan (March 2016)

2.3.1 The London Plan was published in July 2011. Since than three sets of alterations have been made to ensure it is as up-to-date as possible.

2.3.2 A key objective of the 2016 London Plan, at Chapter 6 'London's Transport', states London should be:

"A city where it is easy, safe and convenient for everyone to access jobs, opportunities and facilities with an efficient and effective transport system which actively encourages more walking and cycling".

2.3.3 The London Plan's objectives, at Chapter 1, pertaining to Travel Plans are as follows:

- "*A city where it is easy, safe and convenient for everyone to access jobs, opportunities and facilities with an efficient and effective transport system which actively encourages more walking and cycling, makes better use of the Thames and supports delivery of all the objectives of this Plan*"; and

- "*A city that becomes a world leader in improving the environment locally and globally, taking the lead in tackling climate change, reducing pollution, developing a low carbon economy, consuming fewer resources and using them more effectively.*".

2.3.4 Chapter 6 of the London Plan identifies polices to support the delivery of an efficient and effective transport system and places emphasis on encouraging sustainable travel by enhancing walking policies, promoting electric car use and improving public transport capacity.

Draft New London Plan showing Minor Suggested Changes 2018

2.3.5 A draft new London Plan was published by the Mayor for consultation in December 2017, with a Draft New London Plan showing Minor Suggested Changes published in August 2018. Whilst the current 2016 plan is still the adopted Development Plan, the Draft London Plan is a material consideration in planning decisions.

2.3.6 The Draft New London Plan showing Minor Suggested Changes includes **Policy T4 Assessing and mitigating transport impacts**. This provides the following text, in paragraphs 10.4.3 to 10.4.4, highlighting the use of travel plans and freight strategies as a mechanism to reduce negative development impacts and bring about positive outcomes:

> "*10.4.3 It is important that development proposals reduce the negative impact of development on the transport network and reduce potentially harmful public health impacts. The biggest transport-related impact of development on public health in London is the extent to which it enables physical activity from walking, cycling and using public transport. The other main impacts on public health relate to air quality, road danger, noise, and severance. The phasing of development, and the use of travel plans and freight strategies, may help reduce negative impacts and bring about positive outcomes.*"

> "*10.4.4 New development that will give rise to significant numbers of new trips should be located in places well-connected by public transport, with capacity adequate to support the additional demand, or where there is a realistic prospect of additional access or capacity being provided in time to meet the new demand. The ability to absorb increased travel demand through active travel modes must also be considered.*"

2.3.7 Further policies with relevance to Travel Planning and sustainable modes of transport include:

- **Policy T5 Cycling** refers to developments' support of a network of cycle routes through London and provision of fit for purpose, secure and well-located cycle parking in accordance with standards set out in Table 10.2 and Figure 10.2 of the Plan.

  For REP, the cycle parking standard for 'sui generis' development is stated as "*As per most relevant other standards*". This is considered to be B2-B8 'General industrial, storage or distribution' for which the cycle parking standards are:

  Long Stay: 1 space per 500 sqm (GEA)
  Short Stay: 1 space per 1000 sqm (GEA)

- **Policy T6 Car parking** states that "*Car parking should be restricted in line with levels of existing and future public transport accessibility and connectivity*" and "*Where car parking is provided in new developments, provision should be made for infrastructure for electric or other Ultra-Low Emission vehicles in line with policies T6.1, T6.2, T6.3 and T6.4. All operational parking should make this provision, including offering rapid charging*."

  With regard to car parking standards, it is stated that "*Where no standard is provided, the level of parking should be determined on a case-by-case basis taking account of Policy T6 Car parking, current and future PTAL and wider measures of public transport, walking and cycling connectivity.*"

- **Policy T6.5 Non-residential disabled persons parking** states that "*All non-residential elements of a development should provide at least one on or off-street disabled persons parking bay*" with workplaces offering 5% of overall parking as designated and enlarged bays for disabled users (Table 10.6).

Mayor's Transport Strategy (2018)

2.3.8 The Mayor's Transport Strategy highlights the importance of travel planning and smarter, efficient and active travel initiatives to promote the range of health and environmental benefits of walking, particularly in schools, workplaces and in deprived areas where the cost of public transport may be a barrier to travel.

2.3.9 Throughout the strategy, emphasis is placed on:

- improving cycling and walking in London;
- improving the interchange between transport modes;
- promoting sustainable technologies such as electric vehicles;
- providing better travel information to travellers;
- encouraging the use of the River Thames and other waterways to transport goods and people;
- promoting strategic interchange between inner and outer areas of London; and
- improving strategies to tackle road congestion.

2.3.10 Policy 1 states that:

2.3.11 *The Mayor, through TfL and the boroughs, and working with stakeholders, will reduce Londoners' dependency on cars in favour of active, efficient and sustainable modes of travel, with the central aim for 80 per cent of all trips in London to be made on foot, by cycle or using public transport by 2041*"

2.3.12 Proposal 7 within the strategy states:

2.3.13 "*The Mayor, through TfL and the boroughs, will work with schools, employers and community groups to promote walking and cycling, whether for the whole journey or as part of a longer journey*."

TfL Travel Planning Guidance

2.3.14 TfL's guidance on travel plans is provided through their on-line portal.

2.3.15 The preferred contents of a travel plan are presented in the guidance and a number of possible measures to be implemented are recommended with information also on how they should be monitored, secured and enforced. For Travel Plans prepared at outline/interim stage (i.e. before occupation or commissioning) the following are required, to be changed by agreement with the local authority at a later stage:

- baseline travel patterns;
- targets for mode share; and
- an action plan with measures to be implemented.

2.4 Local Policy and Guidance

Bexley Core Strategy (2012)

2.4.1 The Bexley Core Strategy sets out the spatial planning framework for the Borough until 2026. It seeks to ensure that investment and development decisions are not made in isolation, but are coordinated appropriately, with a focus on promoting sustainable development.

2.4.2 Policy CS16 ‘Reducing the need to travel and the impact of travel’ specifically highlights accessibility and quality of life for Bexley residents which can be enhanced through minimising the need and distance of travel through “*promoting travel awareness campaigns, workplace travel plans, area based travel plans and car clubs*.”

2.4.3 There are several other references to workplace travel plans throughout the Core Strategy, particularly in relation to requiring new developments to produce such documents.

3 Existing Transport and Movement Context

3.1 Introduction

3.1.1 This chapter describes the existing conditions within the site and its vicinity; including, amongst other things, a description of existing uses, description of local transport networks, and their proposed improvements, and local amenities within the area.

3.2 Site Location and Existing Land Use

3.2.1 **Figure 1.1**: shows the REP site location. It's context within the Application Boundary is provided in **Appendix A** . To the east of REP lies RRRF, an existing Energy Recovery Facility (ERF) with a maximum consented residual waste throughput of approximately 785,000 tpa generating up to 72 MWe. RRRF operates 24 hours a day and seven days per week.

3.2.2 The REP site is currently used as an ancillary area associated with RRRF. The overall REP site includes the existing jetty in the River Thames which is used for delivery of waste and the despatch of some by-products at the RRRF. The jetty would be used for the same purpose for the operation of REP.

3.2.3 The REP site is accessed from Norman Road which extends southwards to the A2016 Picardy Manorway which forms part of the London Strategic Route Network (SRN) and runs in an east/west orientation. Norman Road is already used by vehicles associated with RRRF and operations would be coordinated and consolidated between RRRF and REP.

3.3 Public Transport

Public Transport Accessibility Level

3.3.1 Public Transport Accessibility Levels (PTALs) are a measure of the accessibility of a site to the public transport network, taking into account: walking access times; and public transport service availability; frequency and reliability. A PTAL can range from zero to 6b, where a score of zero is the worst case but typically the lowest rate of 1 indicates a “very poor” level of accessibility and 6b indicates “excellent” provision. PTALs are used to inform both the density of a proposed development as well as required car parking provision.

3.3.2 According to TfL's online WebCAT toolkit, the REP site has a PTAL of 0 as a result of the bus stops on Picardy Manorway being situated over 640 m from the site. The area around the Norman Road / Picardy Manorway junction is graded at PTAL1b/2. The complete PTAL report is included in **Appendix B .**

Bus Network

3.3.3 A number of bus services operate in the local area, as set out in **Figure 3.1**. There are two bus services (180 and 401) which operate on Picardy Manorway from which Norman Road forms the primary access into REP. Both routes offer services to local residential areas (Lewisham, Bexleyheath and Thamesmead), providing a viable alternative to the private car for employees at REP.

3.3.4 The eastbound bus stop is on the northern side of Picardy Manorway approximately 130m east of Norman Road and the westbound bus stop is on the southern side of Picardy Manorway. A summary of the two bus services is provided in **Table 3.1**. TfL is currently reviewing and developing the local bus routes as part of the North Greenwich to Slade Green Transit Corridor to coordinate with the opening of the Elizabeth Line (Crossrail).

Figure 3.1: Bus Service Plan

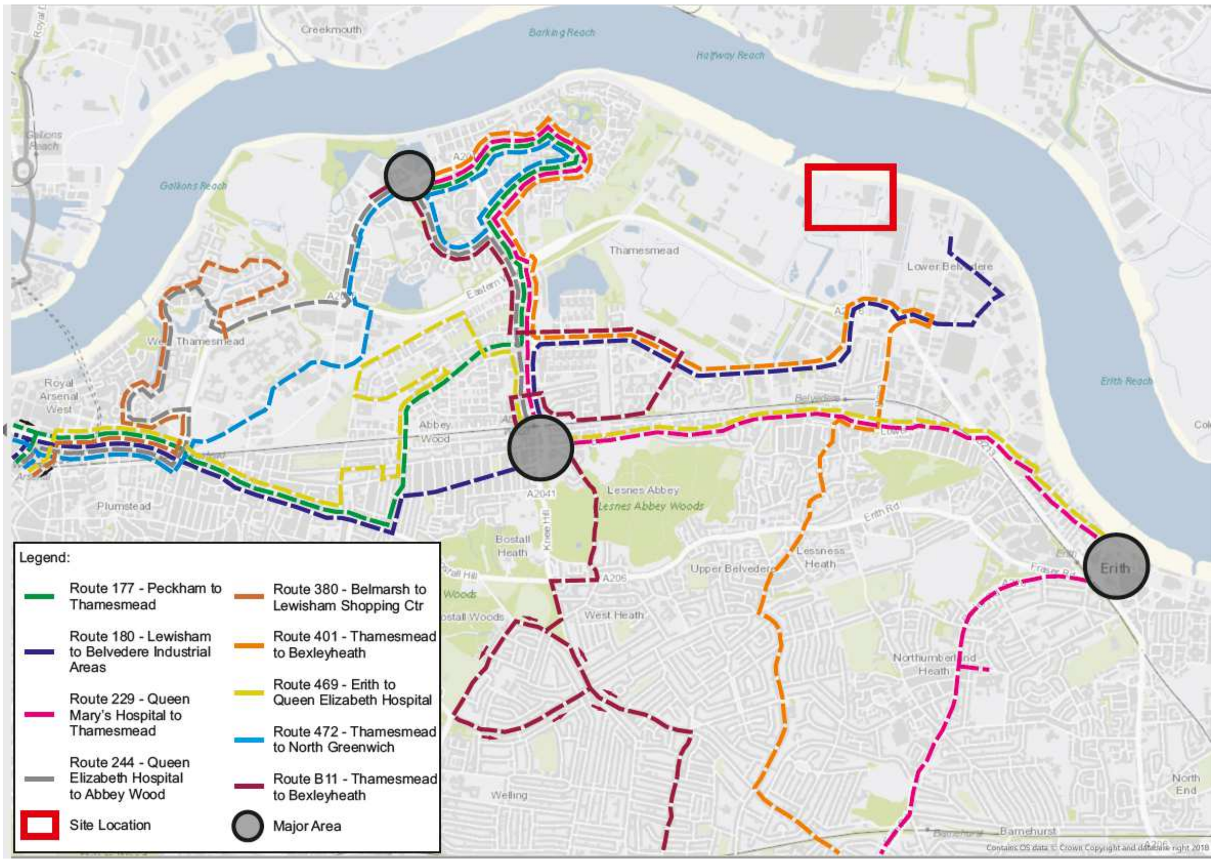


Table 3.1: Picardy Manorway Bus Service Summary

Bus No.	Route	Headway (mins)		
		Weekday (07:00-19:00)	Saturday (07:00-19:00)	Sunday (07:00-19:00)
180	Belvedere Industrial Area – Abbey Wood – Plumstead – Woolwich – Charlton – Greenwich – Lewisham	9-12	8-11	15
401	Bexleyheath – Belvedere – Thamesmead	15	15	30

Rail Network

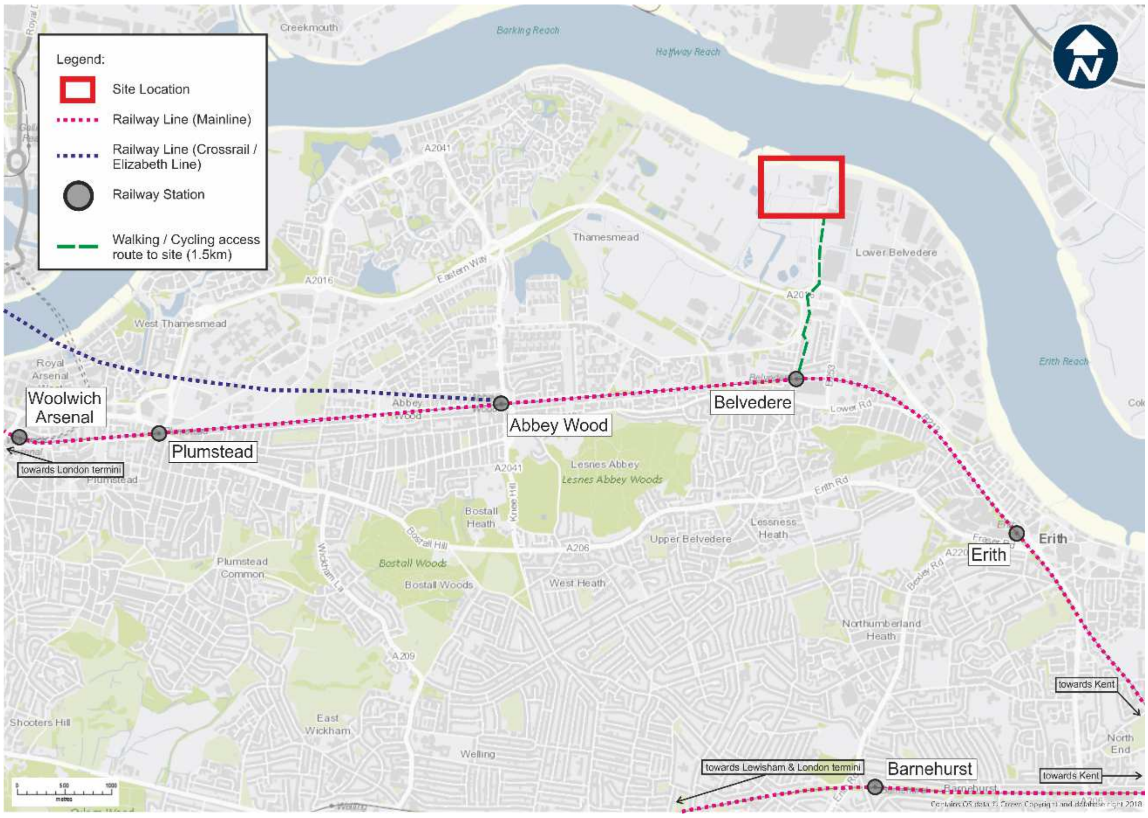
3.3.5 Belvedere railway station is located approximately 1.4 km to the south, a 17-minute walk, serving London Charing Cross, London Cannon Street, London Bridge, Dartford, Gravesend and Gillingham. The 401 bus, with the stop located immediately the east of Norman Road on Picardy Manorway, has a journey time to Belvedere station of three minutes.

3.3.6 The station has several peak hour services to/from London Charing Cross and has the following typical off-peak services:

- Six trains per hour to London Cannon Street calling at stops including Abbey Wood, Plumstead, Woolwich Arsenal;
- Two trains per hour to Dartford calling at Erith and Slade Green;
- Two trains per hour to Slade Green calling at Erith; and
- Two trains per hour to Hither Green calling at stops including Erith, Slade Green, Bexley and Sidcup.

3.3.7 Abbey Wood railway station is approximately 11 minutes on the 180 bus service or one stop west on the same line as Belvedere station. Elizabeth Line services will commence from Abbey Wood during 2019 (subject to adjusted completion dates) and the station also benefits from 2 tph to London Charing Cross via Lewisham, 2 tph in each direction between the Medway Towns and Luton via central London on Thameslink. **Figure 3.2** shows stations in proximity to the site.

Figure 3.2: Railway stations in proximity to the site



3.4 Pedestrian Network

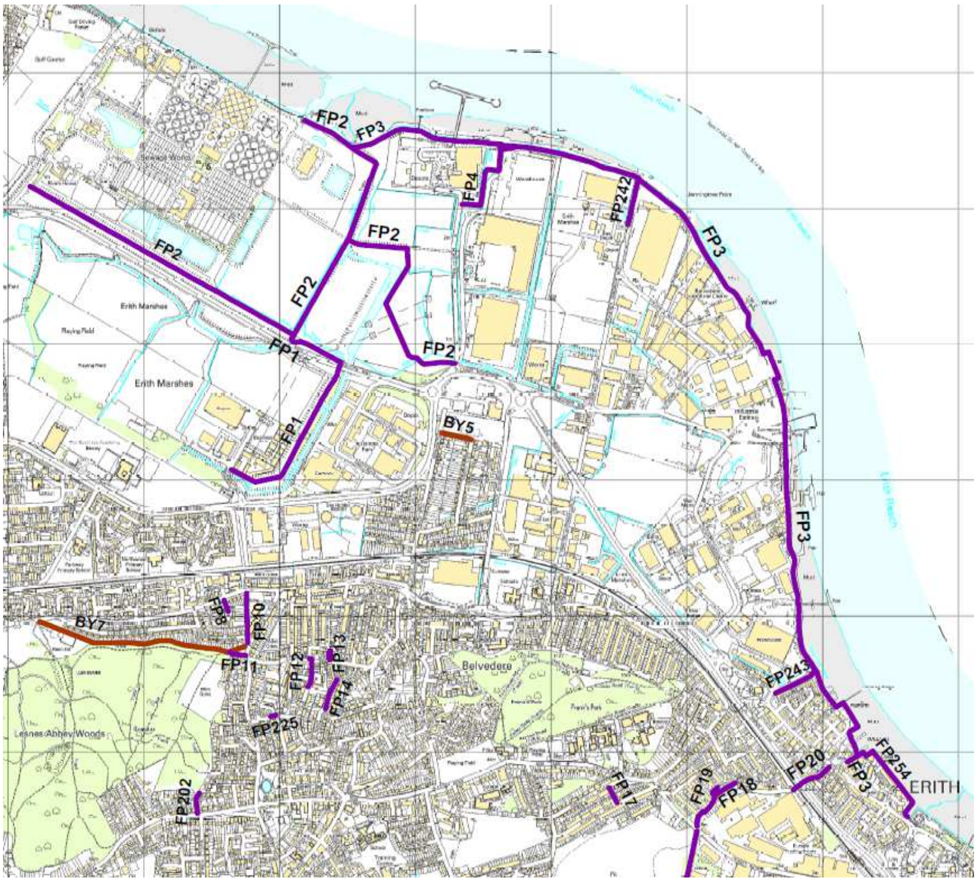
3.4.1 The network of Public Rights of Way (PRoW) FP2, FP3 and FP4 surround REP, linking Norman Road with the Thames Path to the north. The FP2 PRoW originates at the junction of Norman Road and the A2016, which extends west then northwest through the Crossness Nature Reserve to its border with the Thames Water Crossness STW. From here this PRoW extends north to the Thames Path, and south to the A2016.

3.4.2 The England Coast Path, a new national trail around England's coast, in the vicinity of the proposed development, is to be confirmed but is expected to follow the route of the Thames Path and is scheduled for completion by 2020. The construction and operation of REP would have no direct impact on the operation of the Thames Path, and hence the anticipated route of the England Coast Path.

3.4.3 Norman Road has a footway on its eastern side which runs between RRRF in the north and Picardy Manorway to the south. A three-stage toucan crossing of Norman Road and Picardy Manorway provides connection with the southern footway of Picardy Manorway including the eastbound bus stop.

3.4.4 Via the toucan crossing on Picardy Manorway, pedestrians can access Belvedere station via Clydesdale Way and the southern section of Norman Road. The station has level access to the eastbound platform. Access to the westbound (London) platform is via a footbridge.

Figure 3.3: Extract from PRoW Definitive Map for Bexley north [courtesy LBB]



Pedestrian Environmental Review System (PERS) Audit

3.4.5 During pre-application discussions, TfL requested that an abridged (PERS) audit was carried out on footways immediately outside REP and routes towards local bus stops. An audit has therefore been conducted of Norman Road and routes from Norman Road to the westbound and eastbound bus stops of the A2016 Picardy Manorway. The full results of the PERS audit can be found at **Appendix C** and a summary is provided below.

3.4.6 The following table indicates the scores for each of the three links assessed. This includes the individual score and Red-Amber-Green (RAG) rating given to each of the three links.

Table 3.2: PERS Audit Link Assessment

ID	Link Name	RAG	RAG index	Overall Score
L1	Norman Road	Green	3	83
L2	Picardy Manorway EB	Green	3	92
L3	Picardy Manorway WB	Amber	2	35

3.4.7 Norman Road scored highly on criteria such as lack of obstructions and conflicts but scored negatively on personal security. Picardy Manorway, eastbound, scored well for the quality of footway on this link. The footway is wide and accommodates the more vulnerable users with high levels of tactile paving and tonal contrast between road, cycleway and footway. The link still scores negatively on permeability and quality of environment as a result of high traffic levels as well as the lack of sense of place. Picardy Manorway, westbound, scored lower than the other links due to a narrower footway and a perceived lower level of maintenance.

3.4.8 There are no major inclines in the area and footways are all bitumen-bound wide surfaced corridors. At the junction of Norman Road with Picardy Manorway there are connections to the wider footway and PRoW network. Controlled crossings are provided to assist with access to bus services. Street lighting is provided along the corridors, including Norman Road and Picardy Manorway. Signs and markings indicate the segregation between cycle and pedestrian corridors along the routes.

3.5 Cycle Network

3.5.1 Norman Road has a mixture of advisory cycle lanes and shared use paths providing a cycle route to the cycle path on the north side of Picardy Manorway and the three-stage toucan crossing of Norman Road and Picardy Manorway. There are elements of cycle infrastructure to provide a route to Belvedere station.

3.5.2 The Thames Path, which forms part of Route 1 of the National Cycle Network, would provide a good traffic-free route between REP, Thamesmead to the west and Erith to the east.

Cycling Level of Service Assessment

3.5.3 **Figure 3.4** shows cycle routes in the proximity of REP. National Cycle Network Route 1 runs along the Thames Path, due north of REP, with a further local cycle route connecting to this east of RRRF.

3.5.4 A Cycling Level of Service (CLoS) assessment of the Norman Road / A2016 Picardy Manorway junction was requested by TfL during the pre-application process. The full results of the CLoS assessment can be found at **Appendix D** . Applying a RAG assessment, the majority of movements on the assessed junctions scored 'green' movements. This is due to the provision of off-carriageway cycle lanes along the eastern side of Norman Road, along both sides of the A2016 (east of Norman Road), and a shared pedestrian / cycle route between the A2016 south side and Clydesdale Way. However, there were some 'amber' scoring movements as a result of unclear road markings to indicate whether routes were bi-directional or uni-directional.

Figure 3.4: Cycle routes in proximity to the site

3.6 Existing Travel Patterns

3.6.1 Census Journey to Work data has been analysed for the Super Output Area, E02000067: Bexley 003 (2011 super output area - middle layer). This indicates the 'main' mode of travel shares for journeys to work into the area shown in **Table 3.3**.

Table 3.3: Main Mode of Travel, Census Journey to Work, E02000067: Bexley 003

Travel Mode	Percentage
Underground, metro, light rail or tram	1%
Train	5%
Bus, minibus or coach	12%
Taxi	0%
Motorcycle, scooter or moped	2%
Driving a car or van	63%
Passenger in a car or van	5%
Bicycle	2%
On foot	9%
Other method of travel to work	0%

3.6.2 The trip generation of the existing, adjacent, RRRF has been examined through traffic surveys undertaken on Norman Road conducted over two weeks in April 2018. Further detail about these counts can be found in the Transport Assessment, however a summary of the peak hour and daily vehicle trip generation of the site is provided in **Table 3.4**.

Table 3.4: Existing Vehicle Trip Generation

(average of two weeks surveyed via ATC on Norman Road)

AM [All movements]						PM [All movements]			Daily [All movements]		
REP Shift peak (05:00-06:00)			Network peak (06:00-07:00)			REP Shift peak and Network peak (18:00-19:00)			24 hour		
Arr	Dep	Tot	Arr	Dep	Tot	*Arr*	Dep	Tot	Arr	Dep	Tot
12	6	18	25	4	29	8	25	33	199	195	394

4 Proposed Development

4.1 Development Proposals

REP would comprise of a number of different components, as set out below. **Appendix E** provides a site layout plan:

Processing

Main process building = 10,108 m^2

Turbine Hall = 1,326 m^2

ACC = 1,675 m^2

Processing Total = 13,109 m^2

Administration

Admin Building:

Ground Floor = 470 m^2

First Floor = 462 m^2

Second Floor = 462 m^2

Third Floor = 462 m^2

Fourth Floor = 462 m^2

Admin Building Total = 2,318 m^2

TOTAL AREA (Process and Administration) = 15,427 m^2

The above areas exclude any upper levels in the main process areas or the AD digester, transformer / switch yards and the fire water tank which are external.

4.2 Staff and Working Hours

4.2.1 In the order of 83 operational staff are anticipated on-site, split over two shifts daily. The assessment in the Environmental Statement allows for a ‘reasonable worst case’ of an additional 10% of staff. Management staff would be shared with the existing RRRF facility and are already present on the RRRF site. These staff are broken down as:

Operations	17
Jetty/site Ops	54
Engineers	1
Technicians/Fitters	9
Stores	1
Finance/Admin	1

4.2.2 Staff would work in two shifts to provide a 24 hour operation.

4.3 Proposed Vehicle Parking

4.3.1 The following areas of vehicle parking are proposed, as shown on the site layout plan in **Appendix E** with electric vehicle charging infrastructure provided in line with London Plan requirements.

Additional area within RRRF car park: 10 car/van spaces

New car park: 37 car/van spaces and 4 motorcycle spaces

4.4 Proposed Cycle Parking

4.4.1 The draft London Plan 'Policy T5 Cycling' includes cycle parking standards. The cycle parking standard for 'sui generis' development states "As per most relevant other standard". This is considered to be B2-B8 general industrial, storage or distribution for which the cycle parking standards are:

Long Stay: 1 space per 500 sqm (GEA)

Short Stay: 1 space per 1000 sqm (GEA)

4.4.2 Taking the development floor areas set out in paragraph 4.1.1 above and applying the cycle parking standards in full would result in a requirement for 31 long-stay cycle parking spaces and 16 short-stay cycle parking spaces. However, the 'Processing' components of the development have a predominantly operational, rather than staffed, function with only a small number of workers present in these areas, such as operating internal grab cranes and in the control room within REP. Applying the cycle parking standards to the 'Administration' components only results in a requirement for 5 long-stay cycle parking spaces and 3 short-stay spaces.

4.4.3 Operationally, it would be proposed to provide cycle parking at a level between the whole development floor areas (including non-staffed areas) and Administration only areas. The location of the cycle parking would be confirmed through the detailed layout of REP. The proposed number of spaces provided would be as follows:

Long Stay: 18 spaces

Short Stay: 10 spaces

5 Indicative Objectives & Targets

5.1 Objectives

5.1.1 The travel plan objectives describe the key ‘goals’ that the Outline Worker Travel Plan seeks to achieve. These are set out in **Table 5.1**: below.

Table 5.1: Indicative Travel Plan Objectives

Objective	Summary
1	To support the site as a sustainable workplace and environment.
2	To encourage a low single occupancy car travel mode by facilitating and encouraging the use of sustainable modes of travel for all journeys to and from the site.
3	To raise awareness of the Operational Worker Travel Plan and its objectives.
4	To promote healthy lifestyles to employees at the site.
5	To minimise travel demand and reduce the need to travel by providing on-site sustainable travel facilities at the outset of the development.
6	To reduce carbon emissions associated with the development.
7	To continually develop, implement, monitor and evaluate the progress of the Operational Worker Travel Plan towards achieving its targets.

5.1.2 Details on how the Operational Worker Travel Plan could deliver these objectives are considered as part of the measures proposed in **Chapter 6**. These would be refined in the approved Operational Worker Travel Plan.

5.2 Targets

5.2.1 The targets of this Operational Worker Travel Plan are SMART:

Specific Measurable Attainable Realistic Time-bound

5.2.2 The predicted staff multi-modal trip generation, based on the Census Journey to Work data for Bexley is presented in **Table 5.2**:

Table 5.2: Expected Staff Trip Generation

Travel Mode	Percentage	Baseline Staff Travel
Underground, metro, light rail or tram	1%	-
Train	5%	5
Bus, minibus or coach	12%	10
Taxi	0%	-
Motorcycle, scooter or moped	2%	2
Driving a car or van	63%	51
Passenger in a car or van	5%	5
Bicycle	2%	2
On foot	9%	8
Other method of travel to work	0%	-
TOTAL		**83**

N.B. Minor adjustments due to rounding

5.2.3 Mode share targets would be set following the start of operations at REP. Indicative targets for Years 1, 3 and 5 are shown, in **Table 5.3**: . These targets should prioritise a shift to sustainable modes of travel from single occupancy car use. Given the processing and manual nature of the work, encouraging a reduction in the 'need to travel' would not be appropriate for REP.

5.2.4 The Year 1 indicative target is deliberately challenging to encourage more sustainable travel from the outset and to ensure that there is no excess parking over that provided, even taking account of shift changeover times, when both shifts' staff may be present.

Table 5.3: Indicative Travel Plan Targets, Years 1, 3 and 5

Mode	Baseline Mode Share (%)	Year 1		Year 3		Year 5	
		Staff by Mode	Mode Share (%)	Staff by Mode	Mode Share (%)	Staff by Mode	Mode Share (%)
Underground	1%	-	0%	-	0%	-	0%
Train	5%	5	7%	5	7%	5	7%
Bus, minibus or	12%	11	15%	11	15%	12	16%
Taxi	0%	-	0%	-	0%	-	0%
Motorcycle	2%	2	3%	2	3%	2	3%
Driving a car or	63%	37	49%	34	45%	31	41%
Passenger in a car	5%	6	8%	7	9%	7	9%
Bicycle	2%	4	5%	5	7%	6	8%
On foot	9%	10	13%	11	15%	12	16%

Mode	Baseline Mode Share (%)	Year 1		Year 3		Year 5	
		Staff by Mode	Mode Share (%)	Staff by Mode	Mode Share (%)	Staff by Mode	Mode Share (%)
Other	0%	-	0%	-	0%	-	0%
Total		75	100.0%	75	100.0%	75	100.0%

6 Travel Plan Measures

6.1 Introduction

This section sets out potential measures which could be implemented to achieve the targets and to influence staff and visitor travel. The measures are deemed appropriate to the scale of development as well as having the greatest potential for encouraging the use of sustainable modes of travel.

It is anticipated that the Operational Worker Travel Plan for REP would be undertaken alongside RRRF, providing economies of scale and ensuring that employees of both facilities would be given similar messages and information.

6.2 'Hard' and 'Soft' Measures

6.2.1 A number of specific 'hard' (i.e. infrastructure) and 'soft' (i.e. marketing and promotional) measures could be implemented.

6.2.2 The links between the measures, targets and objectives are provided within the proposed Indicative Action Plan, which is included in **Chapter 8**.

6.3 Measures to Encourage Walking & Cycling

6.3.1 The following measures could be implemented to promote cycling and walking to and from the development amongst staff:

- Cycle parking would be provided in accordance with the London Plan, including short-stay parking for visitors and long-stay parking for staff. Details of the proposed cycle parking is set out in Section 4.4;
- A Bicycle User Group (BUG) could be formed of employees and chaired by the TPC;
- The development would provide showers, changing, drying and locker facilities for staff;
- The TPC could seek to negotiate discounts at local cycle shops for cycles and cycle equipment purchased by employees;
- The TPC should promote national sustainable travel events to workforces including Bike Week and Walk to Work Week; and
- The TPC should outline the health benefits and cost savings of walking and cycling over public transport and single occupancy vehicle trips.

6.4 Measures to Encourage Public Transport Use

6.4.1 Public transport use should be promoted within a Travel Information Pack. This could include the following information:

- Maps presenting local bus routes, bus stops and timetable information;
- Information on public transport fares, discounts and travelcards; and
- Key destination travel information for services from nearby rail stations.

6.5 Measures to Encourage Sustainable Car Use

Electric Vehicle Charging Points

6.5.1 Electric vehicle charging points (EVCPs) would be provided in line with the minimum requirements set out in the London Plan. For the proposed land use this requires 20% of spaces have ‘active’ provision and a further 10% have ‘passive’ provision. In the case of REP, there would be 7 spaces with active EVCPs and 4 with passive.

Car Sharing

6.5.2 Car sharing is already encouraged amongst RRRF staff and would be encouraged amongst staff of REP. It is a useful means of reducing the number of car vehicle trips through bringing together individuals living in the same areas or along the same journey corridors.

6.5.3 The existing database of staff willing to share journeys, home addresses and working hours would be updated to incorporate REP staff.

6.5.4 Staff could be directed to the Liftshare web-based journey matching service (liftshare.com) and also invited to promotional events, at which potential car sharers could be matched. Any events should be coordinated to include both RRRF and REP staff to increase the likelihood of matches.

6.6 Marketing and Promotional Strategy

6.6.1 Providing travel information and raising awareness of the benefits of sustainable travel would be key objectives of the approved Operational Worker Travel Plan. Measures would be utilised by the TPC to increase staff awareness and prompt individuals to think about their travel choices.

6.6.2 These measures could include a Travel Information Pack would be the initial means of informing staff about their travel options. The guide should include the following:

- Information on walking, including local walking maps to local destinations with walking times and distances provided.
- Information on cycling, including information about local cycle routes, cycle parking at REP, local cycle shops, information on cycle training and cycle safety.

- Information on local public transport, including route information, timetables and ticket information.
- Information on what to do if a member of staff wishes to car share.

6.7 Visitors

6.7.1 There would be a variety of visitor travelling to REP including contractors and maintenance personnel.

6.7.2 Visitors would benefit from a number of the measures set out above such as cycle parking and promotion through the Applicant's websites which could set out how to access the site by various modes of transport.

6.7.3 Parking spaces would be specifically set aside for visitors and the use of these should be monitored and revised if necessary. These spaces could be on a pre-book basis to limit car travel to REP and to ensure that there is no overspill parking onto the public highway.

7 Management, Monitoring and Review

7.1 Introduction

7.1.1 This chapter outlines the probable management structure for implementation as well as the ongoing monitoring and review programme. This would be determined through the approved Operational Worker Travel Plan.

7.2 Management Structure

7.2.1 The Applicant would have overall responsibility for the Operational Worker Travel Plan and the relevant obligations, including the funding of all measures listed in **Chapter 6** and appointing the TPC.

7.2.2 The implementation of ‘soft’ measures to influence travel behaviour of staff would be the responsibility of the TPC.

7.3 Travel Plan Coordinator (TPC)

7.3.1 A TPC would be appointed by the Applicant prior to final commissioning and would be responsible for the ongoing implementation and review of the Operational Worker Travel Plan. There is an existing Travel Plan for RRRF and the appointed TPC for REP should seek to align the Operational Worker Travel Plan measures with those for RRRF, such as undertaking joint events promoting sustainable travel, undertaking travel plan monitoring on a consistent basis and ‘joined-up thinking’ when considering travel to both RRRF and REP.

7.3.2 The name and contact details of the post holder would be notified to the relevant travel plan officer at LBB with funding terminating upon completion of the five-year review and submission of the final Year 5 Monitoring Report.

7.3.3 The role and responsibilities envisaged for the TPC are set out below and would be kept under review, in keeping with the evolving nature of the ‘living document’ nature of the Operational Worker Travel Plan:

- Establishing contacts within the local community including public transport operators, cycle shop owners, local planning and highway authorities;
- Leading on the implementation of measures, including preparing Travel Information Packs for issue to staff;
- Obtaining baseline mode share data for employees and agreeing final baseline mode share and final targets with LBB; and
- Conducting Staff Travel Surveys in Years 1, 3 and 5 following the baseline survey and submission of a Monitoring Report to LBB on each occasion.

7.3.4 It is anticipated that the TPC would dedicate approximately 2-3 hours per week to the travel plan duties. There would be a higher level of input at times of monitoring.

7.4 Monitoring and Review Framework

7.4.1 A programme of monitoring and review would be implemented by the TPC to evaluate the effectiveness of the measures and whether targets are being met.

7.4.2 The TPC would undertake baseline staff travel surveys within 6 months of first commissioning to refresh the initial targets set out in the approved Operational Worker Travel Plan. These would be reviewed and the results submitted to LBB to agree a final base mode share and targets.

7.4.3 Subsequent monitoring would be carried out one year, three years and five years after first commission and should update the initial baseline surveys. This would include:

Bi-annual staff travel surveys – a survey of staff to obtain a range of qualitative and quantitative information, including current mode of travel data, origin-destination point analysis and gather feedback on measures.

Compilation of Monitoring Reports – assessing the implementation status of the measures and performance of the Operational Worker Travel Plan in relation to the final targets. A copy of the Monitoring Reports would be submitted to LBB.

7.4.4 Monitoring would be undertaken during neutral months where possible, outside of summer months and not during the school holiday period, and should be carried out at a similar time each year.

7.5 Ownership, Duration and Handover

7.5.1 The ownership of the Operational Worker Travel Plan and TPC role would be maintained by the Applicant throughout the five year monitoring period at REP.

7.6 Securing the Travel Plan and Enforcement

Securing the Plan

7.6.1 The implementation of the approved Operational Worker Travel Plan is secured as a Requirement of the DCO, and will be reviewed in collaboration with LBB.

7.6.2 The travel survey results and travel plan reviews would be submitted to LBB. The ownership of the Operational Worker Travel Plan, the commitment to provide a TPC and the Coordinator’s role are set out above.

Enforcement

7.6.3 The TPC would seek support and guidance as necessary from the travel plan officer at LBB, in addition to reporting on Monitoring Reports, to ensure that the Operational Worker Travel Plan is effective in meeting its objectives. Where targets are not met, the TPC would develop and agree, with LBB, suitable remedial action – appropriate to the scale of operation at REP.

Remedial Measures

7.6.4 If the targets are not achieved, measures and initiatives could be further developed.

7.6.5 The TPC would prepare appropriate proposals for contingency measures designed to meet the agreed outcomes with LBB over an agreed period of time. Failure to meet targets in one sustainable mode (such as walking) could be offset by overachievement against targets for another sustainable mode (such as cycling), as it would still be meeting the objective to reduce single occupancy car trips.

7.6.6 Contingency measures could include:

- provision of further cycle parking;
- discounted public transport tickets for a limited period of time; and
- increased travel behaviour change initiatives such as travel awareness campaigns.

7.6.7 The TPC would review the measures proposed and make recommendations to the LBB officers.

7.7 Travel Plan Funding

7.7.1 The approved Operational Worker Travel Plan would be resourced by the Applicant as follows:

- All agreed ‘hard’ infrastructure measures -such as cycle parking and welfare facilities;
- All ‘soft’ measures - such as the production of Travel Information Packs; and
- The appointment of a TPC.

8 Indicative Action Plan

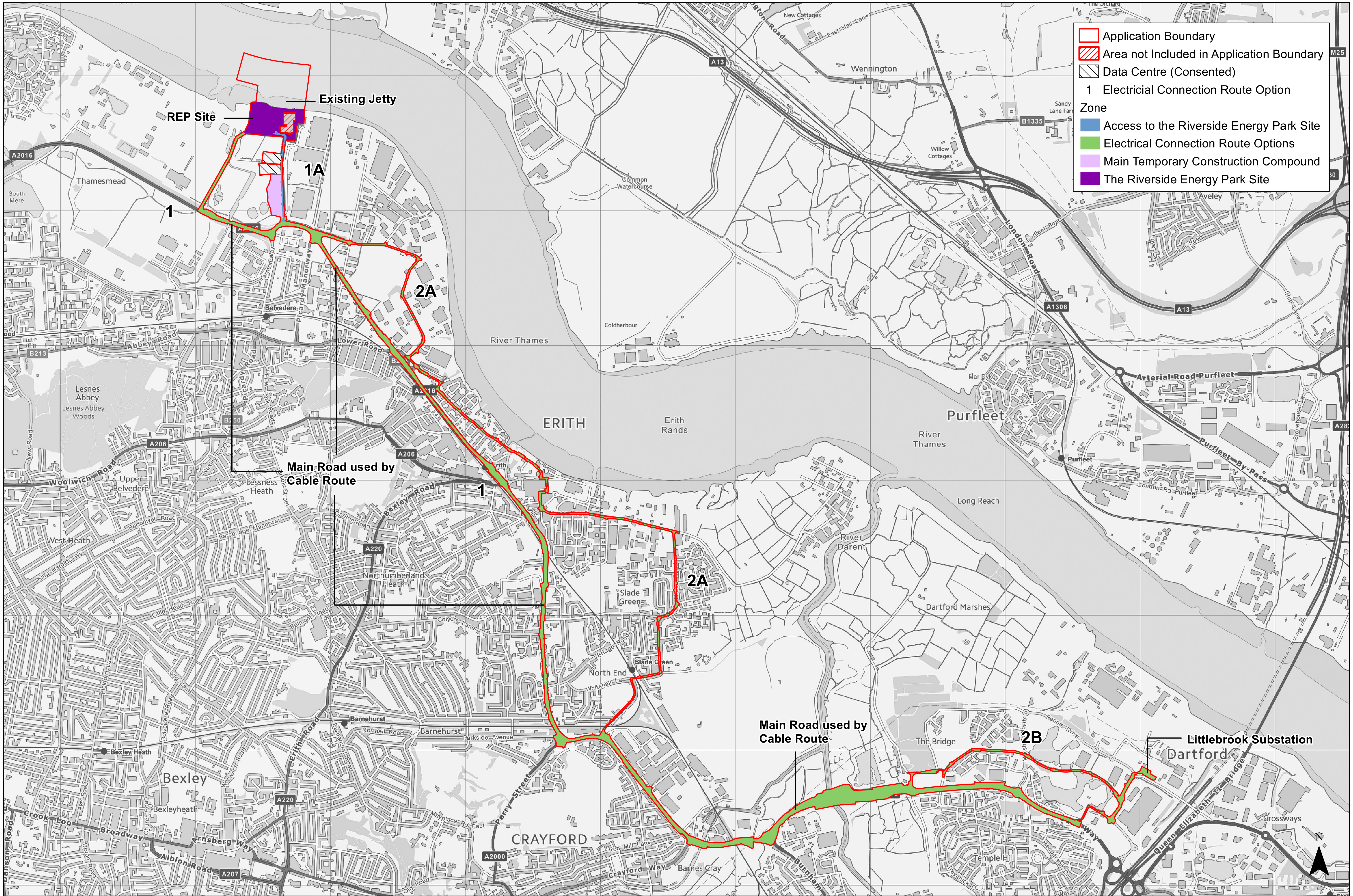
8.1.1 An indicative Action Plan which should be considered for the Operational Worker Travel Plan is included below in **Table 8.1**:

Table 8.1: Indicative Travel Plan Action Plan

Measures	Linked to Objectives	Timescale/Trigger	Responsibility
Short-Term (Construction Phase)			
Provide secure cycle parking.	1,2,4,6	Construction period	Applicant
Appoint a Travel Plan Coordinator (TPC).	7	4 months prior to commissioning	Applicant
Medium-Term (Commissioning to First Year Review)			
Prepare Travel Information Pack.	3,4	Prior to commissioning	TPC
Distribute Travel Information Packs to staff.	3,4	Upon commissioning	TPC
Conduct baseline staff travel surveys and update Operational Worker Travel Plan targets.	7	Within 6 months of commissioning	TPC
Promote Personalised Travel Planning service to staff.	3,4,5	During Year 1	TPC
Conduct Year 1 staff travel surveys.	7	12 months after commissioning	TPC
Review results of staff travel surveys including effectiveness of measures, mode shift attained over the previous review	7	Following Year 1 travel surveys	TPC

Measures	Linked to Objectives	Timescale/Trigger	Responsibility
period; submit Travel Plan Monitoring Report to LBB and feedback to staff.			
Long-Term (Third to Fifth Year Review)			
Conduct Year 3 staff travel surveys.	7	3 years after commissioning	TPC
Review results of staff travel surveys including effectiveness of measures, mode shift attained over the previous review period; submit Travel Plan Monitoring Report to LBB and feedback to staff.	7	Following Year 3 travel surveys	TPC
Promote national sustainable travel events including Cycle to Work Week, Liftshare Week and Walk to Work Week.	3,4	Annually	TPC
Conduct Year 5 staff travel surveys.	7	5 years after commissioning	TPC
Review results of staff travel surveys including effectiveness of measures, mode shift attained over the previous review period; submit Travel Plan Monitoring Report to LBB and feedback to staff.	7	Following Year 5 travel surveys	TPC

Appendix A Application Boundary



RIVERSIDE ENERGY PARK	0 0.5 1 km (c) Crown copyright and database rights 2017. Ordnance Survey AL10004923. Based on Babcock/EDF plan - RRRL Cable Route Landowners - 2-01-2010 - Drawing NO. Cable Route Plan	pba peterbrett	Client CORY RIVERSIDE ENERGY	1:25,000 @ A3 08/11/18 Drawn: HG/CM Checked: JM

Application Boundary and Assessment Areas

Figure 1.2 Rev 0

Document Path: Z:\Projects\42166\02_mxd\ESPlans\42166_ApplicationBoundary_AssessmentBoundary.mxd

Appendix B PTAL Report

TRANSPORT
FOR LONDON

PTAL output for Base Year
0

Norman Rd, Belvedere DA17 6JY, UK
Easting: 549502, Northing: 180472

Grid Cell: 80509

Report generated: 04/12/2017

Map key - PTAL

0 (Worst)	1a
1b	2
3	4
5	6a
6b (Best)	

Map layers

PTAL (cell size: 100m)

Calculation Parameters

Day of Week	M-F
Time Period	AM Peak
Walk Speed	4.8 kph
Bus Node Max. Walk Access Time (mins)	8
Bus Reliability Factor	2.0
LU Station Max. Walk Access Time (mins)	12
LU Reliability Factor	0.75
National Rail Station Max. Walk Access Time (mins)	12
National Rail Reliability Factor	0.75

Calculation data

Appendix C PERS Audit

Document Control Sheet

Project Name: **Riverside Energy Park**

Project Ref: **42166**

Report Title: **Pedestrian Environment Review System Audit**

Doc Ref: **001**

Date: **September 2018**

	Name	Position	Signature	Date
Prepared by:	Matt Bolshaw	Assistant Transport Planner	*M Bolshaw*	September 2018
Reviewed by:	Adrian Neve	Senior Associate	*A Neve*	September 2018
Approved by:	Manu Dwivedi	Senior Associate	*M Dwivedi*	September 2018
For and on behalf of Peter Brett Associates LLP				

Revision	Date	Description	Prepared	Reviewed	Approved

Contents

Figures

Tables

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1 Introduction

1.1 Overview

1.1.1 Peter Brett Associates LLP (PBA) has been commissioned by Cory Riverside Energy (Cory or “the Applicant”)) to produce a Pedestrian Environmental Review System (PERS) audit in support of an application to the Secretary of State under the Planning Act 2008 (PA 2008) for powers to construct, operate and maintain an integrated Energy Park, to be known as Riverside Energy Park (REP or the Proposed Development).

1.1.2 Pedestrian links to local bus facilities and on key links adjacent to the site have been assessed as well as the relevant pedestrian crossing points. The audit was undertaken on Tuesday 18th September 2018 during daylight hours, the weather conditions were cloudy but dry. The audit team were:

- Matthew Bolshaw – PBA Assistant Transport Planner; and
- Ella Pafford – PBA Graduate Transport Planner.

1.2 Preparation of Audit

1.2.1 This PERS audit is prepared as part of the requirements requested by Transport for London (TfL) and supplements the main Transport Assessment (TA). The audit extents have been agreed with TfL through the TA scoping, which is reported and included within the TA for this application.

1.2.2 To inform preparation for the audit, the location of key facilities in relation to REP were confirmed i.e. location of schools and places of worship; as well as trip generators within walking distance of the site. The extent of the audit has been determined through a desktop study with the scope of works chosen as nearby road and footpath links and local bus stops. The facilities being appraised could be used by workers during the construction phase and by employees during the operational phase at REP.

1.2.3 A map showing the extent of the audit was drawn up as shown in Figure 1.1. Facilities identified within the audit area include bus stops, crossings, links and routes. This extent was proposed by TfL. The audit includes three links, three crossing points, two public transport waiting areas and two routes.

1.2.4 When considering which public transport waiting areas to assess, only the bus stops that are closest to REP were included in the audit as it is assumed that employees would choose the closest bus stop if they are serviced by the same bus route. The pedestrian links as shown in the audit extent have also been combined to make two complete routes to demonstrate the environment across a number of links.

Figure 1.1 PERS Extent

1.3 Methodology

1.3.1 A PERS audit assesses the quality of an environment in terms of how it meets the needs of a pedestrian, with the "standard" pedestrian defined by Transport Research Laboratory (TRL) as *"towards the vulnerable end of the spectrum"*.

1.3.2 The PERS audit was conducted using the PERS Streetaudit software version 1.1.10.211. This software has been devised by the TRL for TfL.

1.3.3 All links, crossings and public transport waiting areas were assessed by review parameters as detailed in Table 1.1.

1.3.4 Each of these parameters is made up of a number of sub-factors which are given an individual score on a scale of -3 (very poor) to +3 (very good). A score of 0 represents an average score, whilst N/A indicates that a particular factor was not assessed or was not relevant. The reviewer uses these sub-factor scores to assign an overall score for each review parameter, again on a scale from -3 (very poor) to +3 (very good).

1.3.5 The scores for all parameters are entered into the TfL Streetaudit programme which weights all the parameters and assigns them a Red, Amber or Green (RAG) band. Each link; crossing; public transport waiting area; and interchange then has a RAG band assigned for each parameter assessed. Green represents good or very good provision. Amber represents average provision, with some features that give cause for concern potentially. Red represents a facility or aspect that presents significant cause of concern.

1.3.6 The process then brings together all parameters assessed and assigns each link, crossing or public transport waiting area an overall score. This overall score again informs a RAG band. The banding is graded the same way as above.

Table 1.1 PERS Review Parameters

Links	Crossings	PT Waiting Areas
Effective width Dropped kerbs Gradient Obstructions Permeability Legibility Tactile information Colour contrast Personal security Surface quality User conflict Maintenance	Crossing provision Deviation from desire line Performance Capacity Delay Legibility Legibility for sensory impaired people Dropped kerbs Gradient Obstructions Surface quality Maintenance	Information to the waiting area Infrastructure to the waiting area Boarding public transport Information at the waiting area Safety perceptions Security measures Quality of the environment Maintenance and cleanliness Waiting area comfort

1.3.7 Some photographs from the on-site audit are included within each review chapter.

1.4 Summary

1.4.1 This report presents the findings of the PERS audit which took place on 18th September 2018. The audit included three links, two public transport waiting areas and three crossings and two routes.

1.4.2 The audit was undertaken using the Streetaudit software and in line with the guidance given in the PERS handbook.

2 Links

2.1 Introduction

2.1.1 This chapter sets out the performance of the three links included within the audit. These links were selected as a result of discussions with TfL to assess the surrounding roads and their pedestrian facilities.

2.1.2 All links were audited during the site visit, with movements observed throughout the audit. Photos were also taken to support the conclusions of the audit.

2.2 Results

2.2.1 The following table indicates the scores for each of the three links. This includes the individual score and RAG rating given to each of the three links.

Table 2.1 Results of links audited

ID	Link Name	RAG	RAG index	Overall Score
L1	Norman Road (north of Picardy Manorway)	Green	3	83
L2	Picardy Manorway (eastbound side)	Green	3	92
L3	Picardy Manorway (westbound side)	Amber	2	35

2.2.2 As shown in the table above, both Picardy Manorway (eastbound side) and Norman Road (north of Picardy Manorway) have similar scores, with Norman Road scoring lower and achieving a lower RAG rating. Norman Road generally scores higher due to less traffic and Picardy Manorway (eastbound side) scores high as a result of the width of the footway. A more detailed review of the links is given below.

Norman Road (north of Picardy Manorway)

2.2.3 Norman Road routes north south and is approximately 600m in length when travelling north from Picardy Manorway. The main footway is adjacent to the southbound side of the carriageway which leads from the main highway network (Picardy Manorway) to REP.

2.2.4 The link scored highly on criteria such as lack of obstructions and conflicts but scored negatively on personal security. The pictures in Figure 2.1 show the footway at two locations on Norman Road. This indicates the lack of obstructions from street furniture and also the low number of conflicts as a result of the low pedestrian flows. They do, however, also highlight the isolated nature of the link and the lack of passive surveillance, which led to the lower personal security score.

Figure 2.1 Pictures of Norman Road (north of Picardy Manorway)

Picardy Manorway Eastbound

2.2.5 Picardy Manorway, on the eastbound side of the carriageway, as a link has been audited between the Picardy Manorway/Clydesdale Way/Yarnton Way/Eastern Way roundabout, to the west, and the Horse Roundabout, to the east. This audit result is relevant to the eastbound carriageway footway only. The westbound carriageway footway has been assessed separately.

2.2.6 The link has scored slightly higher than Norman Road as a consequence of the better quality footway on this link. The footway is wide and provides well for the more vulnerable users with high levels of tactile paving and tonal contrast between road, cycleway and footway, although the link still scores negatively on permeability and quality of environment. This is as a result of high traffic levels as well as the lack of sense of place.

Figure 2.2 Pictures of Picardy Manorway Eastbound

2.2.7 The pictures demonstrate the above, that whilst there is a wide footway in place and segregation from other modes, there is a lack of sense of place and permeability on the link.

Picardy Manorway Westbound

2.2.8 Picardy Manorway, on the westbound side of the carriageway, relates to the opposite carriageway to Picardy Manorway eastbound. The westbound link scores much lower and achieves an Amber rating compared to the Green ratings of the other links. This is because of a narrower footway and a perceived lower level of maintenance.

Figure 2.3 Pictures of Picardy Manorway Westbound

2.2.9 As can be seen from the photographs in Figure 2.3 the footway is narrower than in Figure 2.2 and this is exacerbated by the overhanging foliage which narrows the footway further. The worn markings and seasonal foliage also contribute to a lower score with the maintenance and quality of environment suffering as a result of this.

2.3 Summary

2.3.1 In summary the PERS assessment demonstrated that all three links assessed attained a positive score. Norman Road (north of Picardy Manorway) and Picardy Manorway (eastbound side) attained a ‘Green’ score with Picardy Manorway (westbound side) scoring ‘Amber’.

2.3.2 The lowest score recorded was 35 which was given to Picardy Manorway (westbound side). However, this link is only anticipated to be used by employees up to the bus stop.

2.3.3 Overall, all links expected to be commonly used by future employees of the REP attained positive ‘Green’ or ‘Amber’ scores and no serious issues or concerns were raised.

3 Crossings

3.1 Introduction

3.1.1 This chapter sets out the performance of the three crossings included within the audit. These crossings are those located in the extent suggested by TfL that are likely to be used by those travelling to and from REP.

3.2 Results

3.2.1 The following table indicates the scores for each of the three crossings. This includes the individual score and RAG rating given to each of the three crossings.

Table 3.1 Results of crossings audited

ID	Link Name	RAG	RAG index	Overall Score
C1	Picardy Manorway	Green	3	87
C2	Norman Road/Picardy Manorway	Green	3	92
C3	Isis Reach / Asda Depot Access Road	Green	3	76

3.2.2 Further detail of the scores provided above is given below.

Picardy Manorway

3.2.3 The scores for this crossing relate to the staggered crossing across Picardy Manorway. The two crossings have been assessed as one due to their similarities and the fact that they act as a staggered crossing rather than two individual crossings.

3.2.4 The crossing pictured in Figure 3.1 scores 87, as a result of having high scores on performance and crossing provision. The only negative scores for the crossing were in relation to ‘delay’. As the traffic flow is high on the A2016 there is considerable delay between calling the crossing and being able to cross.


Figure 3.1 Pictures of Picardy Manorway crossing

Norman Road to Picardy Manorway Crossing

3.2.5 This crossing facility is located close to the Picardy Manorway crossing. This facility relates to the crossing over the Norman Road connection to Picardy Manorway. This crossing has scored 92. The primary reasons for this scoring is due to high scores for ‘performance’ and ‘delay’ as well as the absence of any negative scores.

Figure 3.2 Pictures of Norman Road to Picardy Manorway crossing

Isis Reach / Asda Depot Access Road Crossing

3.2.6 This crossing is an uncontrolled crossing over the Isis Reach / Asda depot access road, which again scored all positive results. The crossing is staggered with a central reservation. The crossing is indicated by ‘elephant feet’ road marking which alert driver to the presence of the facility. The crossing also allows cyclists to cross here.

3.2.7 The crossing scored 71 and this is largely because of high scores for ‘crossing provision’, ‘maintenance’ and ‘surface quality’. The only negative scores were for ‘deviation from the desire line’. This is because when travelling northbound, the crossing is not located at the natural point to cross and has been located further round into the side road to reduce the crossing length.

Figure 3.3 Pictures of Isis Reach / Asda depot access road crossing

3.3 Summary

3.3.1 The PERS assessment demonstrated that all 3 crossings assessed attained a positive score, with all achieving ‘Green’ RAG scores.

3.3.2 The highest scoring crossing, Norman Road to Picardy Manorway, achieved a total score of 92 showing excellent provision. This is expected to be used by construction workers and employees walking from the bus stop on Picardy Manorway, westbound side, towards the construction site and REP, once completed.

3.3.3 The lowest score recorded was at the Isis Reach / Asda depot access crossing which was given a total score of 71. Though this link is expected to be a commonly used route by future employees, its ‘Green’ RAG score indicates good provision and no serious issues or concerns.

4 Public Transport Waiting Areas

4.1 Introduction

4.1.1 This chapter sets out the performance of the two public transport (PT) waiting areas included within the audit. These PT waiting areas are those located in the extent suggested by TfL that are likely to be used by those travelling to and from REP both when the facility is operational and during the construction period.

4.2 Results

4.2.1 The following table indicates the scores for each of the two PT waiting areas. This includes the individual score and RAG rating given to each of the two waiting areas.

Table 4.1 Results of PT waiting areas audited

ID	Link Name	RAG	RAG index	Overall Score
PT1	Eastern Way/Norman Road (westbound)	Amber	2	-19
PT2	Picardy Manorway/Eastern Way (eastbound)	Amber	2	-7

4.2.2 Further detail of the scores provided above is given below.

Eastern Way/Norman Road (Westbound)

4.2.3 Eastern Way/Norman Road (westbound) bus stop received a number of negative scores. These were attributed to the lack of perceived safety and security, the quality of environment and the waiting area comfort. The area around the bus stop is surrounded by trees which in most cases are overgrown into the footway. In particular, to the east of the bus stop, these block the sightline to oncoming buses and also encloses the bus stop so that there is almost no passive surveillance. The isolated nature of the bus stop is further exacerbated by any lighting being blocked out by trees.

4.2.4 In addition, there is no shelter or seating provided at the stop, with the only shelter provided by the overhanging foliage. Although under the cover of these trees, it is extremely difficult to be able to see the oncoming buses. The overgrown nature of the vegetation around the bus stop is shown in Figure 4.1.

Figure 4.1 Pictures of Eastern Way/Norman Road Bus Stop

Picardy Manorway/Eastern Way (EB)

4.2.5 The eastbound bus stop scores higher than the westbound bus stop although still receives a number of negative scores. Whilst there are no issues with foliage isolating the bus stop, it is still isolated from any passive surveillance other than from the road itself.

4.2.6 There is no seating or shelter provided, meaning anyone waiting at the stop is exposed to the weather conditions. Quality of environment also scored negatively, and this is due to there being no active frontage surrounding the bus stop, only the A2016. The fence surrounding the Asda depot further increases the feeling of enclosure. Pictures showing this bus stop are below in

4.2.7 Figure 4.2.

Figure 4.2 Pictures of Picardy Manorway/Eastern Way Bus Stop

4.3 Summary

4.3.1 The PERS assessment demonstrated that the two PT waiting areas assessed both scored negatively, receiving ‘Amber’ RAG ratings. This was due to the lack of: perceived safety and security; passive surveillance; waiting area comfort; and good visibility of waiting area due to overgrown trees.

4.3.2 Although these bus stops are expected to be commonly used by future employees of the proposed development and construction workers, the current bus stop provision is sufficient regarding the context of the site as workers are likely to leave in groups due to the shift work nature of the construction and operational phases.

5 Routes

5.1 Introduction

5.1.1 In order to assess the movement between all components of this PERS audit, two routes have been assessed. The two routes have been formed from key routes to and from REP.

5.1.2 The assessment of the routes is important as this provides an insight into the pedestrian environment over a longer distance and how different links, connect together. The two links selected in this audit are from REP, along Norman Road (north of Picardy Manorway) and then towards the two respective bus stops.

5.2 Results

5.2.1 The following table indicates the scores for each of the two routes. This includes the individual score and RAG rating given to each of the routes.

Table 5.1 Results of routes audited

ID	Link Name	RAG	RAG index	Overall Score
R1	REP to eastbound bus stop	Amber	2	25
R2	REP to westbound bus stop	Amber	2	3

5.2.2 Further detail of the scores provided above is given below.

Route 1 REP to Eastbound bus stop

5.2.3 This route is made up of the links Norman Road and Picardy Manorway, eastbound side, as well as the Isis Reach / Asda depot access road crossing. The route is one that would be used by those travelling to and from REP and the construction site and using the eastbound bus stop.

5.2.4 The route achieved mainly positive scores, with the ‘directness of the route’ and ‘legibility of signing’ being the highest scoring components. Negative scores were achieved, however, in regard to ‘rest points’ and ‘perception of road safety’. This is as a result of the high levels of traffic on the second part of the route as it runs parallel to Picardy Manorway and the fact that there are no rest stops or sheltered areas on the route.

Route 2 REP to WB bus stop

5.2.5 This route is made up of the links of Norman Road and Picardy Manorway westbound as well as all three crossing points. The route is one that would be used by those travelling to and from REP and the construction site when using the westbound bus stop.

5.2.6 The route achieved similar scores to the previous route although with some scores being slightly lower. ‘Personal security’ and ‘directness’ were two of the criteria that scored lower, this is as a result of Picardy Manorway westbound having less surveillance caused by overgrown trees and the directness reduced by the number of crossing points required along the route. All other scores are the same with the exception of ‘permeability’. This was also marked slightly lower due to the need to cross Picardy Manorway on this route.

5.3 Summary

5.3.1 The PERS assessment demonstrated that although the two routes assessed both scored positively, they both received ‘Amber’ RAG ratings.

5.3.2 The reason for both routes having relatively low scores is due to lack of: rest points; apparent road safety and personal security due to overgrown trees and high levels of traffic on the routes.

5.3.3 Although these routes are expected to be commonly used by future REP employees and construction workers, the current route provisions are sufficient regarding the context of REP as it is not anticipated that vulnerable users such as children or the elderly will frequently use these routes.

6 Summary

6.1 Summary

6.1.1 This report details the findings of the PERS audit undertaken for the Proposed Development.

6.1.2 In total, 3 links, 3 crossings, 2 routes and 2 public transport waiting areas were audited. Two out of the three links and all three crossings achieved a Green RAG score overall showing a good standard of provision.

6.1.3 Both public transport waiting areas scored 'Amber' which was due to a lack of 'perceived safety and security' and 'waiting area comfort'.

6.1.4 Both routes scored 'Amber' due to lack of 'rest points', 'road safety' and 'personal security'. However, due to both routes having positive scores, the current existing provisions are deemed sufficient.

6.1.5 Despite public transport waiting areas having a relatively low score, this can be easily resolved through better maintenance. Our recommendation would be to engage with LBB and request that notice is served on the Isis Reach estate managers to cut-back the trees that over-hang the Highway. These trees are blocking views of oncoming buses and restrict the spread of street lighting.

6.1.6 No improvements are suggested for the surrounding links and crossings as existing infrastructure is deemed sufficient.

6.2 Conclusion

6.2.1 Overall, this PERS audit suggests that if the above recommendations are executed the current facilities and infrastructure are sufficient in the context of the construction and operation of REP. This conclusion reflects the positive Link and Crossing scores and is in spite of the negative public transport waiting areas scores.

Appendix D CLoS Assessment

Document Control Sheet

Project Name: **Riverside Energy Park**

Project Ref: **42166**

Report Title: **Cycling Level of Service (CLoS) Assessment**

Doc Ref:

Date: **September 2018**

	Name	Position	Signature	Date
Prepared by:	Ella Pafford	Graduate Transport Planner	E Pafford	September 2018
Reviewed by:	Adrian Neve	Senior Associate	A Neve	September 2018
Approved by:	Manu Dwivedi	Senior Associate	M Dwivedi	September 2018
For and on behalf of Peter Brett Associates LLP				

Revision	Date	Description	Prepared	Reviewed	Approved

Contents

Figures

Tables

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1.1 Cycle Environment Assessment

Cycling Level of Service (CLoS)

1.1.1 Cory Environmental Holdings Limited (trading as Cory Riverside Energy (Cory or “the Applicant”)) is applying to the Secretary of State under the Planning Act 2008 (PA 2008) for powers to construct, operate and maintain an integrated Energy Park, to be known as Riverside Energy Park (REP). Peter Brett Associates LLP (PBA) has been commissioned by Cory to produce a Cycling Level of Service (CLoS) assessment in support of that application.

1.1.2 The CLoS assessment has been developed by TfL in order to set a common standard for the performance of cycling infrastructure for routes / schemes and for individual junctions.

1.1.3 This CLoS assessment focuses solely on the Norman Road / Picardy Manorway junction, as requested by TfL during pre-application discussions. The assessment has been undertaken in accordance with guidance outlined in Chapter 2 of TfL’s London Cycling Design Standard (2016).

1.1.4 The most common type of cycle collision tends to involve movements at or around junctions. A supplementary process for assessing junctions has therefore been developed to give a broader assessment of a given location.

1.1.5 Rather than going through the entire CLoS assessment for each possible movement of a cyclist through a junction, an estimation of potential conflict can be done through briefly assessing each junction in turn. Junctions are identified in a study area and each movement at each junction is marked on a plan. Each movement can be rated and marked on the plan according to how safely and comfortably it can be made by cyclists:

- Red – where conditions exist that are most likely to give rise to the most common collision types;
- Amber – where the risk of those collisions has been reduced by design layout or traffic management interventions; and
- Green – where the potential for collisions has been removed entirely.

1.1.6 In order to help assess junction movements, Table 1.1 suggests typical scenarios that might lead to a ‘red’, ‘amber’ or ‘green’ rating. This has been taken from the London Cycling Design Standards (2016).

Table 1.1: Indicative Criteria for Scoring Junction Assessments

Factors needing Removal or Mitigation	Possible Improvements	Further Improvements
Red	Amber	Green
Heavy left turn movement with high HGV mix	Entry treatment at side road junction	Left turn ban for general traffic
Opposed right turns with general traffic accelerating quickly into opportunistic gaps	Continuation of lane across junction	Opposing right turn banned for general traffic
Left slip lane	Right-turn protected island	Physically protected turn

Guard-railing	Tight corner radii; pinch points removed (avoiding nearside lane of 3.2-4.0m)	Left bypass of signals
Large junction radii	Bus lane of 3.0-3.2m or of 4.5m or more	Segregation of cycle movements using dedicated cycle signals
High speed motor traffic through junction	2m wide central feeder lane	Raised tables
Uphill gradients	ASLs (preferably 5m+ deep)	Area-wide speed limit/ reduction
Wide junction crossings	Signal adjustments to cycle movement	
No clear nearside access		
Multiple lanes		

1.1.7 Figure 1-1 shows the various movements which can be undertaken by cyclists at the junction scored by colour.

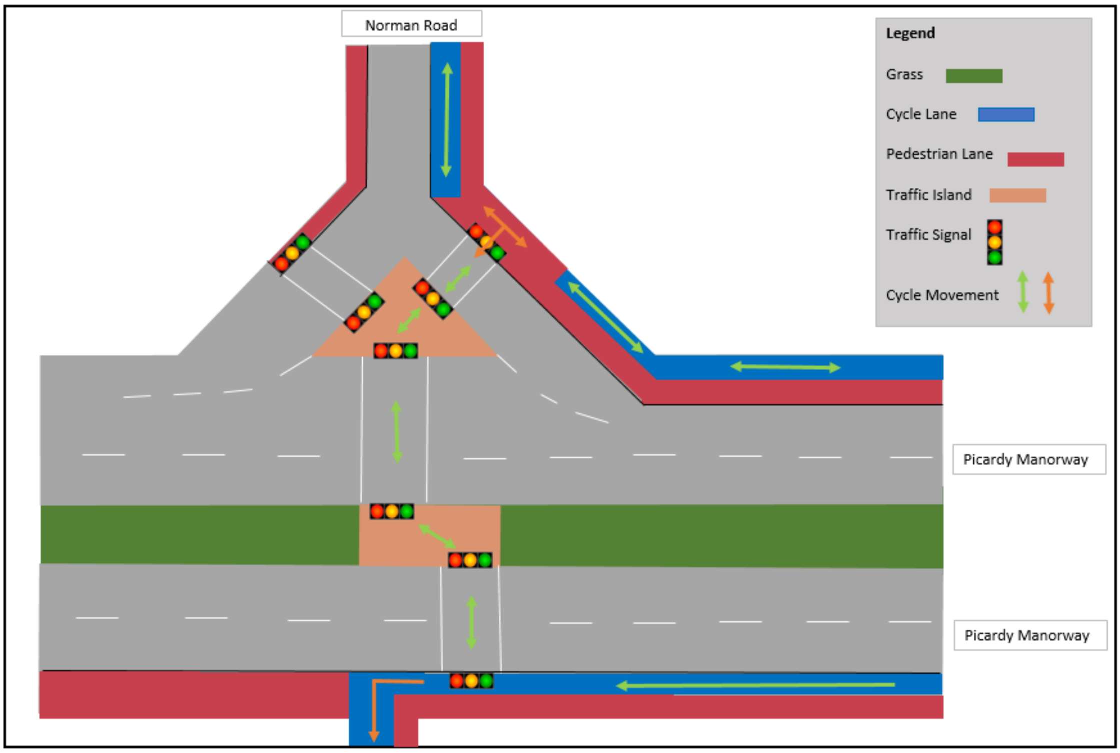


Figure 1-1: Norman Road / Picardy Manorway Junction – CLoS Assessment

1.1.8 As can be seen, the majority of movements on the assessed junctions were deemed to have a ‘green’ rating. This is due to the provision of off-carriageway cycle lanes along the eastern side of Norman Road, along both sides of Picardy Manorway (east of Norman Road), and a shared pedestrian / cycle route between the Picardy Manorway south side and Clydesdale Way.

1.1.9 The ‘amber’ cycle movements, shown in Figure 1-1, are due to the potential for pedestrian – cycle collisions where pedestrian and cycle routes intersect.

1.1.10 At the junction and on the eastern side of Norman Road, the cycle facility is located adjacent to the kerb. This stretch of cycle track is two-directional. On the northern side of Picardy Manorway, the cycle facility is alongside the Highway boundary. This latter section of cycle route is marked to imply it is for use westbound only, as a result of the ‘give-way’ markings.

1.1.11 On the southern side of Picardy Manorway, the cycle facility to the east of the crossing facility appears to be two-directional. Using the cycle route in the eastbound direction, however, would result in entering the carriageway against the flow of traffic. To the west of the crossing, on the southern side of Picardy Manorway, pedestrians are required to cross the cycle track to access the crossing, which provides potential for pedestrian – cycle collisions.

1.1.12 Overall, while it is considered that some minor improvements could be made to improve the cycle environment at this junction, it should be recognised that the PIC analysis, presented in Chapter 2, has identified no cycle incidents at this junction. The provision of off-carriageway cycle tracks in addition to crossing facilities, is considered to provide a safe environment for cyclists at the Norman Road / Picardy Manorway junction for access to the REP site.

Norman Road Cycle Environment

1.1.13 Norman Road, to the north of Picardy Manorway, provides on-street cycle lanes on both sides. The cycle lane on the western side of Norman Road stops approximately 150m to the south of the REP site. At this point, a ‘Cyclists Dismount’ sign is provided, and cyclists are directed to the cycle route on the eastern side of Norman Road which is provided as a shared off-carriageway cycle / pedestrian route.

1.1.14 Given the volume of HGV traffic along Norman Road, it is considered that on-street cycle lanes provide only minimal provision for cyclists. The facilities, however, reflect the probable low level of use and the constraints on the width of the corridor.

1.1.15 An alternative cycle route is running alongside Norman Road (using the Isis Reach access road). This cycle route is entirely off-carriageway and thus provides a safer alternative for cyclists to travel along Norman Road. However, the final connection to the north of this access road does not connect to Norman Road.

1.1.16 It would be beneficial for cycle access if the connection between the two existing cycle routes could be implemented, however, this is not currently viable due to the need for the public adoption of the Isis Reach access road and the land required to make the connection.

1.2 Conclusion

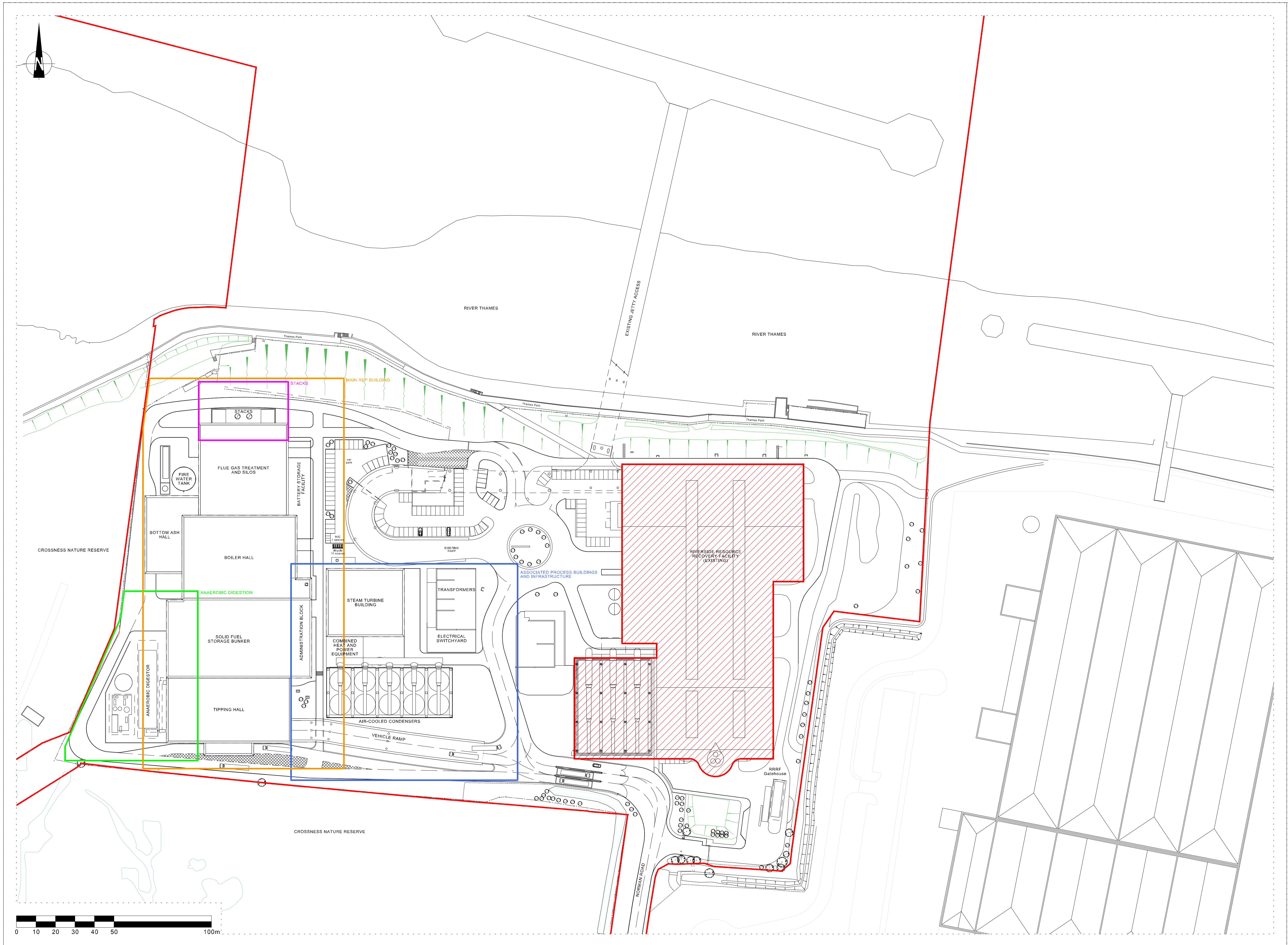
1.2.1 Off-carriageway cycle routes are clearly defined at the junction of Picardy Manorway with Norman Road which provide some connection to wider cycle facilities. These cycle lanes are generally well configured, indicating the areas of potential conflict.

1.2.2 The current signs, markings and lining shows some signs of age but are adequate to convey the messages to cyclists, pedestrians and motorists.

1.2.3 The on-carriageway facilities to the north of the Isis Reach access provides a minimal facility but reflect the corridor width constraints.

1.2.4 Whilst some improvements could be made to the local cycle infrastructure, the current facilities provide good crossing provision of Picardy Manorway and a connection to the proposed construction site compound, at the southern end of Norman Road (north of Picardy Manorway) and a connection to the operational REP.

Appendix E Site Layout Plan



KEY:

APPLICATION BOUNDARY

AREA NOT INCLUDED IN APPLICATION BOUNDARY

PARAMETERS KEY:

MAIN REP BUILDING

ANAEROBIC DIGESTION

ASSOCIATED PROCESS BUILDINGS AND INFRASTRUCTURE

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ILLUSTRATIVE SITE LAYOUT AND PARAMETERS PLAN

THE RIVERSIDE ENERGY PARK SITE LONDON

Date	31.10.18
A3 Scale	1:2000
Drawn by	AG
Checked by	PC
Drawing Number	Figure 1.3a