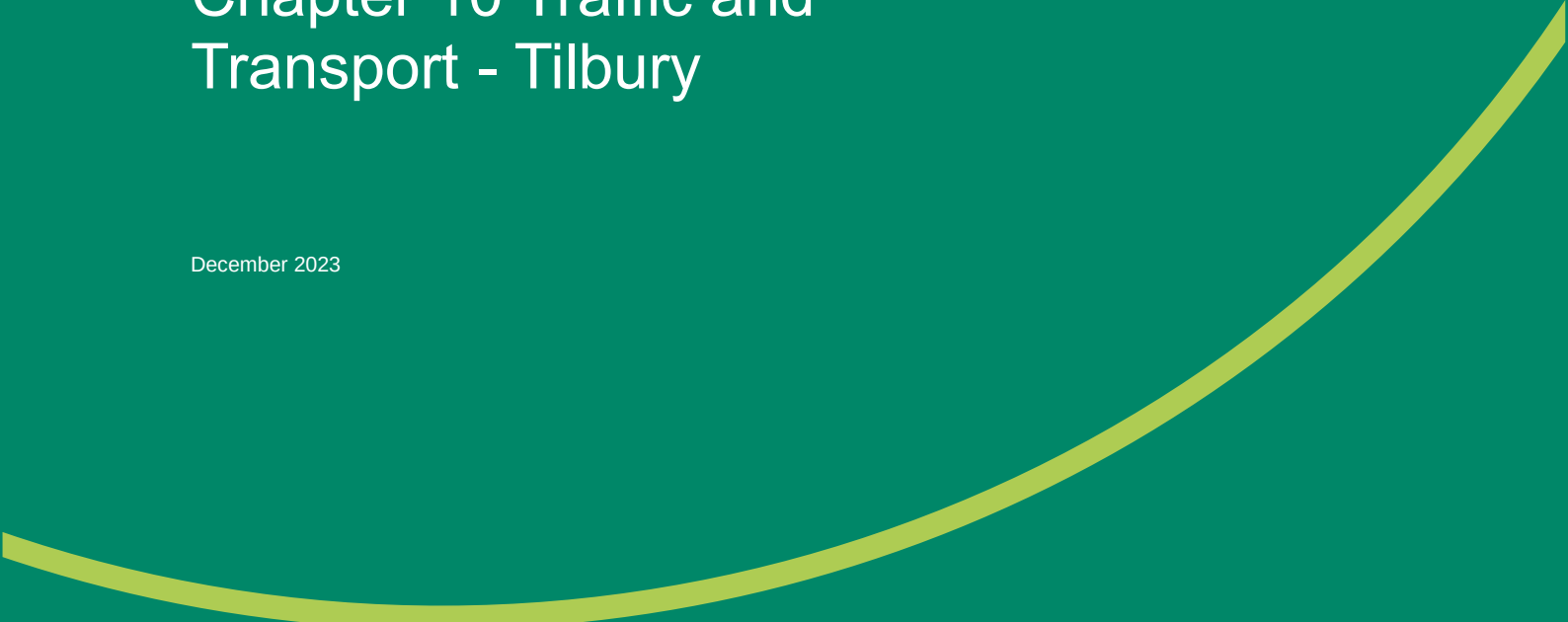


National Grid
Cable Tunnel Replacement
Project

Environmental Statement

Volume III
Chapter 10 Traffic and
Transport - Tilbury

December 2023



Quality information

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10 Traffic and Transport

10.1 Introduction

- 10.1.1 This chapter assesses the likely effects of the Tilbury to Grain and Tilbury to Kingsnorth (TKRE) Tunnel Replacement Project (“the Proposed Development”). It considers the likely effects on traffic and transport receptors during the construction and operational phases of the Proposed Development at the Tilbury site.
- 10.1.2 This chapter also identifies any additional mitigation measures to prevent, minimise or control likely adverse effects on traffic and transport receptors arising from the Proposed Development.
- 10.1.3 This chapter should be read together with the introductory chapters of this Environmental Statement (ES Volume II, Chapters 1 – 6). This traffic and transport assessment has also been informed by the schemes listed in Chapter 23: Cumulative Effects (ES Volume V).
- 10.1.4 This chapter is supported by the following appendices in ES Volume VI and figures contained within this chapter:
- Appendix 10.1: Outline Construction Traffic Management Plan (CTMP);
 - Appendix 10.2: Abnormal Load Assessment Report;
 - Appendix 10.3: Transport Note (Tilbury);
 - Appendix 10.4: Transport Scoping Presentation and Meeting Minutes;
 - Appendix 10.5: Receptor Sensitivity Levels;
 - Appendix 10.6: Baseline Traffic Movements;
 - Appendix 10.7: Preliminary Highway Impact Assessment;
 - Appendix 10.8: Magnitude of Change;
 - Appendix 10.9: Assessment of Construction and Decommissioning Phase;
 - Appendix 10.10: Cumulative Assessment;
 - Figure 1.1: Site Location Plan (in ES Volume II Chapter 1);
 - Figure 10-1: Traffic & Transport Study Area (Tilbury);
 - Figure 10-2: Tilbury Road Link and Road Junction Receptors;
 - Figure 10-3: Traffic Survey Locations;
 - Figure 10-4: Surrounding Highway Network;
 - Figure 10-6: Walking and Cycling Routes; and
 - Figure 10.6: Site Access and Construction Vehicle Routing.

10.2 Relevant Legislation, Policy and Guidance

Introduction

- 10.2.1 The section of this chapter provides an overview of the relevant legislation, planning policy and technical guidance relevant to the traffic and transport assessment.

Legislation

- 10.2.2 The following pieces of legislation apply specifically to the traffic and transport assessment:
- Traffic Management Act (2004); and
 - Highways Act (1980).
- 10.2.3 The Traffic Management Act aims to improve traffic management, enhance road safety, reduce congestion, and facilitate efficient transportation systems. It provides a legislative framework for authorities to take necessary actions in managing traffic flow, implementing traffic regulations, and ensuring the effective operation of the road network.
- 10.2.4 The Highways Act is an Act of the Parliament of the United Kingdom that outlines various provisions and regulations related to highways, roads, and their management.
- 10.2.5 Further details on the above are set out within the Outline CTMP (Appendix 10.1).

National Policy

- 10.2.6 National Planning Policy relevant to this traffic and transport assessment are detailed in Table 10-1.

Table 10-1: National Planning Policy

Policy Reference	Policy Context
National Planning Policy Framework (Ref 10-1)	The Government's National Planning Policy Framework (NPPF) was originally published in March 2012 and later revised in September 2023, and outlines the Government's planning policies and how they are expected to be applied. The most relevant paragraphs in the context of transport are set out below. Paragraph 104 outlines that 'transport issues should be considered from the earliest of stages of plan-making and development proposals'; this is to ensure 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 considered – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains • Patterns of movement, streets, parking and other transport considerations are integral to the design of schemes and contribute to making high quality places. Paragraph 110 outlines the key considerations when assessing sites to be allocated for development in plans or specific development applications. These are: • Appropriate opportunities to promote sustainable transport modes can be (or have been) taken up, given the type of development and its location

Policy Reference	Policy Context
	• Safe and suitable access to the site can be achieved for all users • The design of streets, parking areas, other transport elements and the content of associated standards reflects current national guidance • 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. Paragraph 111 states that development should only be prevented or refused on highways grounds where there would be an unacceptable impact on highway safety, or the residual cumulative impacts of development on the road network would be severe. As outlined in Paragraph 113, all developments that will generate significant amounts of movement should be required to provide a travel plan and be supported by a Transport Statement (TS) or Transport Assessment (TA) so that the likely impacts of the proposal can be assessed.
Overarching National Policy Statement for Energy (NPS EN-1) (Ref 10-2)	NPS EN-1 was published in 2011 and provides the basis for decisions regarding nationally significant energy infrastructure. Section 5.13 outlines the planning policy for traffic and transport, including guidance on undertaking relevant parts of the Environmental Impact Assessment (EIA) (which has been considered in producing this chapter of the Environmental Statement (ES). The most relevant paragraphs for this purpose are 5.13.3 to 5.13.5 which are set out as follows: • Paragraph 5.13.3, which states that if a project is likely to have significant transport implications, a transport assessment should be included with the ES; • Paragraph 5.13.4, which states that where appropriate, a travel plan to include demand management measures to mitigate transport impacts should be prepared; and • Paragraph 5.13.5, which states that where additional transport infrastructure is proposed, this should be discussed with the relevant network providers (in terms of the possibility of co-funding by Government for any third-party benefits). In addition, Section 3.1 relates to the decision making which includes the following: • Paragraph 3.1.1: “the UK needs all the types of energy infrastructure covered by this NPS in order to achieve energy security at the same time as dramatically reducing greenhouse gas emissions”; • Paragraph 3.1.2: “it is for industry to propose new energy infrastructure projects within the strategic framework set by Government. The Government does not consider it appropriate for planning policy to set targets for or limits on different technologies”; • Paragraph 3.1.3: the decision maker should therefore “assess all applications for development consent for the types of infrastructure covered by the energy NPSs on the basis that the Government has demonstrated that there is a need for those

Policy Reference	Policy Context
	types of infrastructure and that the scale and urgency of that need is as described for each of them in this Part”; and Paragraph 3.1.4, the decision maker should “give substantial weight to the contribution which projects would make towards satisfying this need when considering applications for development consent under the Planning Act 2008”.
National Policy Statement for Energy (NPS EN-1) (November 2023) (Ref 10-3)	The 2011 versions of the National Policy Statements remain in force until the revised NPS are designated in early 2024. Section 5.14 outlines the Planning Policy for Traffic and Transport, including guidance on undertaking relevant parts of the EIA. The most relevant paragraphs for this purpose are Paragraphs 5.14.5 to 5.14.21 as follows: - Paragraph 5.14.5, which states that if a project is likely to have significant transport implications, a Transport Appraisal should be included with the ES (with reference to the Department for Transport’s Transport Analysis Guidance (TAG)); - Paragraph 5.14.6, which sets out that applicants should consult National Highways and Highways Authorities as appropriate to agree the assessment and mitigations; - Paragraph 5.14.7, which states that that a Travel Plan including demand management measures to mitigate transport impacts should be provided. The applicant should also provide details of proposed measures to improve access by active, public and shared transport to: reduce the need for parking associated with the proposal; contribute to decarbonisation of the local network; and reduce the need to travel and secure modal shifts to mitigate transport impacts; - Paragraph 5.14.8, which also highlights that the assessment should consider any possible disruption to services and infrastructure (such as road, rail and airports); - Paragraph 5.14.9, which states if additional transport infrastructure is needed or proposed, it should always include good quality walking, wheeling and cycle routes, and associated facilities (changing/storage etc) needed to enhance active transport provision; - Paragraph 5.14.10, which discusses that applicants should discuss with network providers the possibility of co-funding by government for any third-party benefits. Guidance has been issued which explains the circumstances where this may be possible, although the government cannot guarantee in advance that funding will be available for any given uncommitted scheme at any specified time; - Paragraph 5.14.13, which informs that regard should always be given to the needs of freight at all stages in the construction and operation of the development including the need to provide appropriate facilities for Heavy Goods Vehicle (HGV) drivers as appropriate, and; - Paragraph 5.14.16, directs that applicants should consider the Department for Traffic (DfT) policy guidance “Water Preferred Policy Guidelines for the movement of abnormal indivisible loads” when preparing their application.

Policy Reference	Policy Context
National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (Ref 10-4)	NPS EN-5 was published in 2011 and sets out the policies relating to electricity generation and its infrastructure, for consideration in conjunction with NPS EN-1. It is currently in force until early 2024.
National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (November, 2023) (Ref 10-5)	The 2011 versions of the National Policy Statements remain in force until the revised NPS are designated in early 2024.

Local Planning Policy

10.2.7 Local Planning Policies relevant to this traffic and transport assessment are detailed in Table 10-2.

Table 10-2: Local Planning Policy

Policy Reference	Policy Context
Essex Local Transport Plan 3 (Ref 10-6)	The Essex Local Transport Plan (LTP3) was adopted in June 2011 and builds on the previous local transport plans for Essex, covering the period 2011-2026. It sets out Essex County Council's (ECC) policies to deliver the aspirations for improving travel in the county and achieve sustainable long-term economic growth. ECC set the following vision which is supported by five broad outcomes of the LTP 3 outlined below: <i>"Our Vision is for a transport system that supports sustainable economic growth and helps deliver the best quality of life for the residents of Essex"</i>. Outcome 1 – <i>"Provide connectivity for Essex communities and international gateways to support sustainable economic growth and regeneration"</i> Outcome 2 – <i>"Reduce carbon dioxide emissions and improve air quality through lifestyle changes, innovation and technology"</i> Outcome 3 – <i>"Improve safety on the transport network and enhance and promote a safe travelling environment"</i> Outcome 4 – <i>"Secure and maintain all transport assets to an appropriate standard and ensure that the network is available for use"</i> Outcome 5 – <i>"Provide sustainable access and travel choice for Essex residents to help create sustainable communities"</i>.
Thurrock Council Local Development Framework – Core Strategy (Ref 10-7)	This Core Strategy sets out Thurrock Council's spatial vision, objectives and the development strategy and policies for the borough to 2026 and beyond and has a supplementary monitoring and implementation framework. It was adopted in January 2015. Paragraph 6.47 – 6.49 of the Core Strategy introduces Policy PMD10: Transport Assessments and Travel Plans, and outlines that <i>"...Taking into account any proposed mitigation including provision of sustainable transport modes and safe and suitable access, the Council will resist development where the residual cumulative impacts would be severe. Depending on the circumstances, this may include development proposals that would have a significant adverse effect on the free flow and safe</i>

Policy Reference	Policy Context
	<i>movements of vehicular and non-vehicular traffic and/or fail to limit the use of motor vehicles and promote adequate alternative modes of transport”.</i> Paragraph 6.50 continues to outline Policy PMD10 and states that <i>“Development will only be permitted where the Travel Plans, Transport Assessments or Transport Statements are agreed by the Council and there is adequate provision for existing or planned transport infrastructure and other proposed measures. Proposed mitigation measures will either be implemented in their entirety by or on behalf of the developer or will be implemented as part of a wider pooling of resources. Developers will be required to make provision for the objectives of the agreed Travel Plans to be monitored. Agreed Travel Plans will include targets, coupled with penalties if outcomes are not being met”.</i>

Guidance

10.2.8 This traffic and transport assessment has been carried out in accordance with the following:

Institute of Environmental Management and Assessment Guidelines (IEMA, July 2023)

10.2.9 The Institute of Environmental Management and Assessment (IEMA) Guidelines for the Environmental Assessment of Traffic and Movement (2023) (Ref 10-8) provides guidance on examining the environmental impacts of developments in terms of traffic and transportation.

Construction Logistics and Community Safety (CLOCS, August 2022)

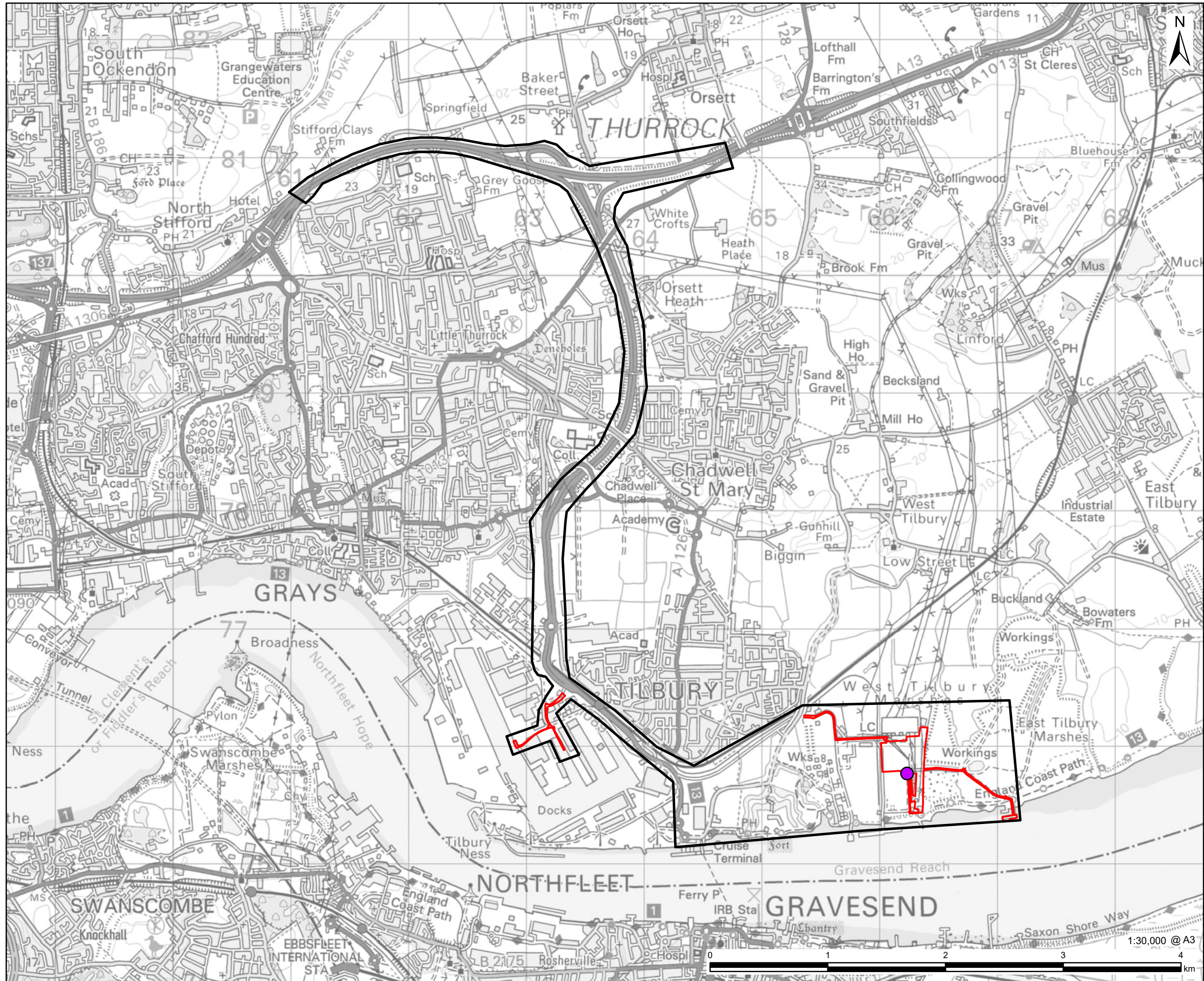
10.2.10 The CLOCS guidance (Ref 10-9) draws upon evolving best practice, standards, policies and codes of practice. It provides a standard which planning authorities, developers and contractors can implement and provides a coherent set of guidelines which can be adhered to, with the primary goals of achieving:

- Zero collisions between construction vehicles and the community;
- Improved air quality and reduced emissions;
- Fewer vehicle journeys; and
- Reduced reputational risk.

10.3 Scope and Methodology

Study Area

10.3.1 The site is bound by Tilbury Substation to the north, East Tilbury Marshes to the east, the River Thames to the south and industrial uses including a port operating company (P&O Tilbury 2) to the west. A site location plan is held in Figure 1.1 (within ES Volume II Chapter 1: Introduction). The study area for the assessment has been defined based on the area where there may be a transport impact resulting from the construction of the Proposed Development. This includes routes along which HGVs and construction worker vehicles will travel during the works programme. The traffic and transport study area is shown on Figure 10-1 below.



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LEGEND

	Red Line Boundary (Above Ground)
	Site Access
	Traffic and Transport Study Area

Figure 10.1

10.3.2 The following road link receptors have been assessed in relation to the Proposed Development within the study area:

- T-RL1: A13 West;
- T-RL2: A13 East;
- T-RL3: A1089 North (North of A1089/Dock Road/Thurrock Park Way Roundabout);
- T-RL4: A1089 South (South of A1089/Dock Road/Thurrock Park Way Roundabout); and
- T-RL5: Station Approach.

10.3.3 The following road junction receptors have been assessed in relation to the Proposed Development within the study area:

- T-RJ1: A13/A1089 Junction;
- T-RJ2: A1089/Dock Road/Thurrock Park Way (ASDA) Roundabout; and
- T-RJ3: A1089/Station Approach Junction.

10.3.4 The above receptors are shown on Figure 10-2.

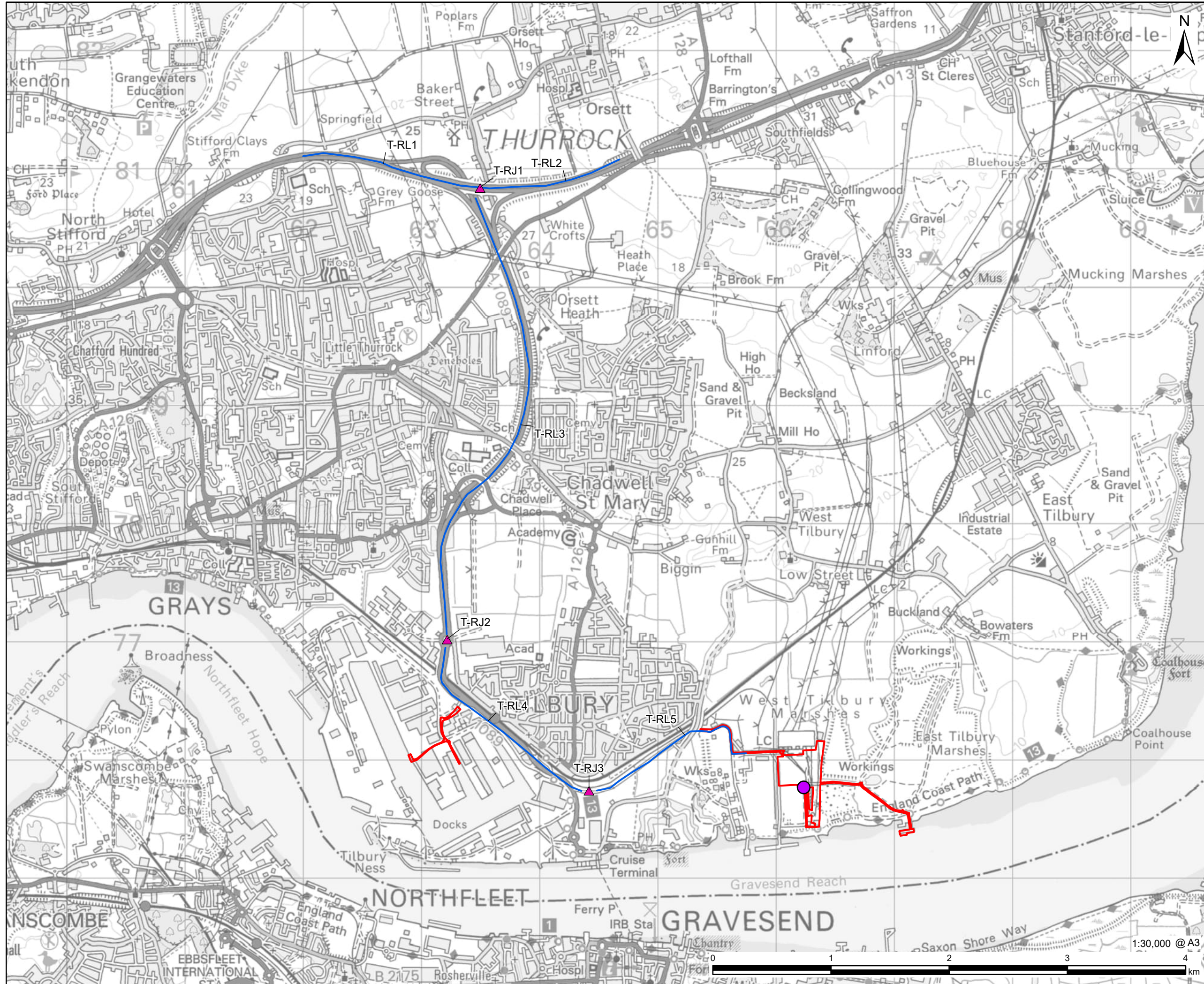
Scope and Assessment Methodology

10.3.5 The technical methods used to determine the baseline conditions, sensitivity of the receptors, magnitude of effects and the significance criteria that have been used for the traffic and transport assessment are described in Section 10.6.

Desk Study

10.3.6 The traffic and transport baseline environment conditions described in Section 10.5 have been informed by the following data sources (see section below in relation to traffic survey data):

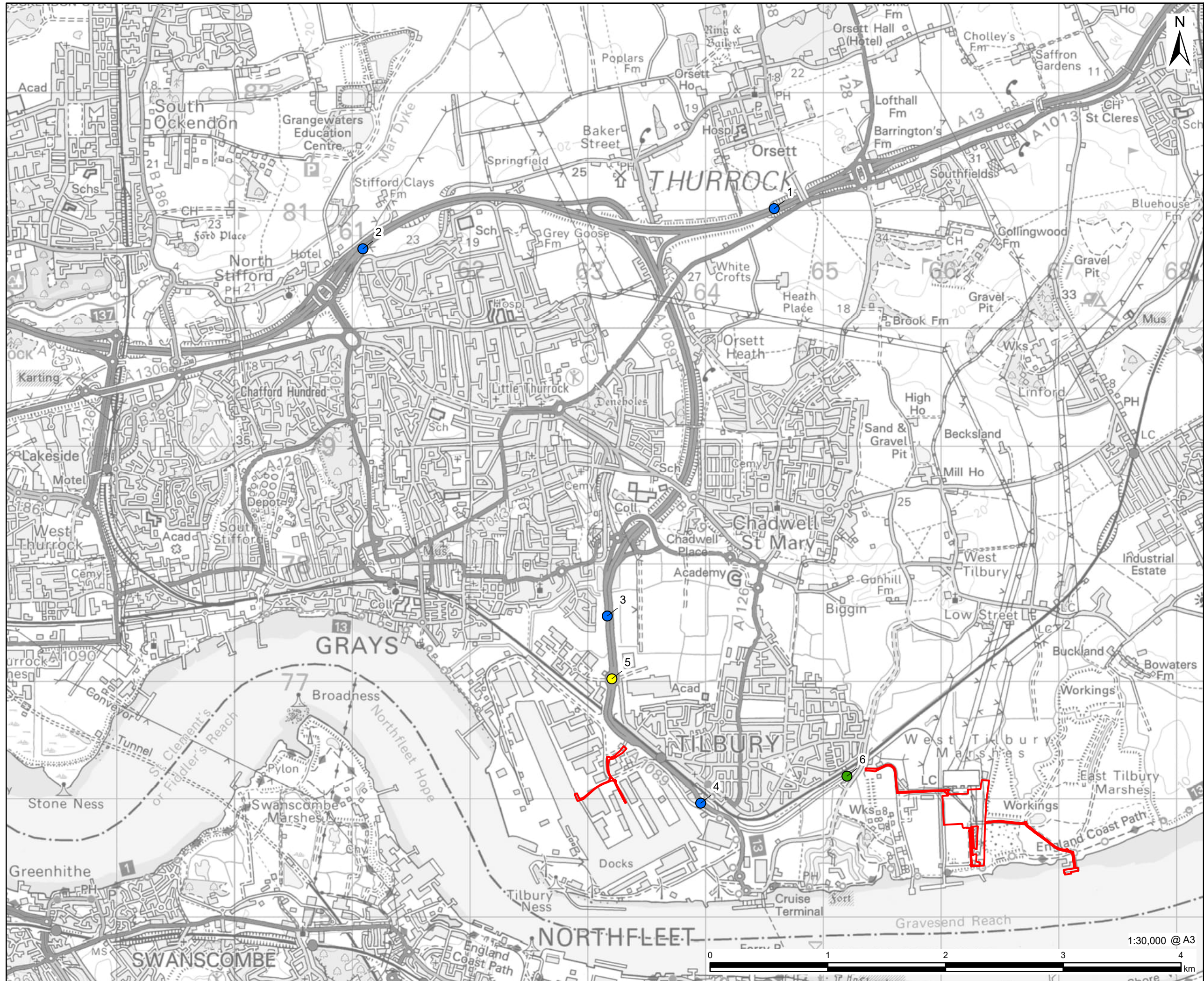
- Traffic growth calculated using National Road Traffic Forecast (NRTF) growth factors, with National Transport Model (NTM) adjustments applied within the Trip Ends Model Program (TEMPro) Version 8.1 (Ref 10-11) utilising National Trip Ends Model (NTEM) dataset v8.0;
- Personal Injury Accident (PIA) data from Essex County Council (ECC) for the agreed study area shown on Figure 10-1;
- Local travel and network information gathered from various online sources including local public transport operators, PRow and walking and cycling routes;
- For cumulative schemes, planning application documents on the Planning Inspectorate (PINS) Examination Library for Lower Thames Crossing (Ref 10-12) and Thurrock Flexible Generation Plan (Ref 10-13), as well as on the Thurrock Council planning portal for Land at Marsh Farm Sewage Treatment Plant (Ref 10-14) and Land at Former Tilbury B Power Station for External Storage (Ref 10-15 and Ref 10-16). These have informed Section 10.10 based on the schemes listed in Chapter 23: Cumulative Effects; and
- Route planning software, such as Google Maps (Ref 10-17), to inform the review of the most direct and functional routes to the Proposed Development (in combination with the above).



PROJECT	
TKRE National Grid	
CLIENT	
National Grid	
CONSULTANT	
AECOM Limited 100 Embankment Cathedral Approach Manchester, M3 7FB www.aecom.com	
LEGEND	
	Red Line Boundary (Above Ground)
	Site Access
	Road Junction
	Road Link
NOTES	
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ISSUE PURPOSE	
Traffic and Transport	
PROJECT NUMBER	
60677311	
FIGURE TITLE	
Thurrock Road Link and Road Junction Receptors	
FIGURE NUMBER	
Figure 10.2	

Survey

- 10.3.8 Baseline traffic data has been obtained for the surrounding highway network as follows (see Figure 10-3 for the locations of these counts):
- Department for Transport (DfT) traffic counts (Ref 10-10) where available;
 - Data from the Transport Assessment (TA) prepared to inform the Land at Marsh Farm Sewage Treatment Plant planning application (Ref: 22/01461/FUL) (Ref 10-14) for the A1089/Dock Road/Thurrock Park Way (ASDA) Roundabout; and
 - Recent traffic survey on Station Approach.
- 10.3.9 DfT traffic count data has been obtained for the following:
- The A13 to the west of the junction with the A1089 (2022 manual count);
 - The A13 to the east of the junction with the A1089 (2022 manual count);
 - The A1089 to the north of the A1089/Dock Road/Thurrock Park Way (ASDA) Roundabout (2022 manual count); and
 - The A1089 to the south of the A1089/Dock Road/Thurrock Park Way (ASDA) Roundabout and southeast of the Port of Tilbury access (2022 estimated count).
- 10.3.10 The following traffic count data has been obtained from Table 3.3 of the Land at Marsh Farm Sewage Treatment Plant TA:
- The A1089/Dock Road/Thurrock Park Way (ASDA) Roundabout (2022 manual count).
- 10.3.11 The following Automatic Traffic Count (ATC) has been carried out to supplement the above:
- Station Approach (ATC, 9-15 June 2023).
- 10.3.12 The scope of the above baseline traffic count data usage/surveys was developed in consultation with Thurrock Council and National Highways. National Highways confirmed (by email, on 24 November 2023) that the 2022 data was considered to be suitable for use.



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10.4 Consultation Undertaken

- 10.4.1 The Screening Opinion received from Thurrock Council (dated 7 July 2023) concluded that the proposal would not result in significant environmental effects and that an EIA was not required for the proposed development.
- 10.4.2 Notwithstanding the above, an EIA has prepared given that the Screening Opinion received from Gravesham Borough Council (dated 3 August 2023) for the component of the Proposed Development to the south of the River Thames was considered to be an EIA development.
- 10.4.3 Consultation has since been undertaken with key stakeholders including Thurrock Council as the Local Highways Authority (LHA) and National Highways. A meeting was held with Thurrock Council and National Highways on the 6 September 2023 to review the following:
- The feedback received within the Screening Opinion;
 - The latest information relating to the project and Proposed Development;
 - The key traffic and transport parameters relating to the construction phase, including the proposed construction programme, construction vehicle numbers, assessment scenario, working hours and travel patterns;
 - The proposed construction vehicle routes, study area and traffic surveys to inform the assessment;
 - An initial highway impact assessment for the surrounding highway network during the peak construction phase;
 - Any nearby walking and cycling routes to be managed during construction;
 - The proposed scope and methodology for the transport deliverables including this ES chapter, the Transport Assessment, Outline CTMP and Abnormal Load Assessment Report;
 - The project programme leading up to planning submission.
- 10.4.4 The presentation and meeting minutes are held in Appendix 10.4 (ES Volume VI).
- 10.4.5 As part of the scoping discussions, National Highways confirmed that in terms of the Transport Assessment (TA), it would be acceptable to prepare a short note with any TA-specific content (where not covered elsewhere), signposting the remaining TA components (i.e. within the ES/CTMP) to minimise document crossover. Therefore, a Transport Note has been prepared on this basis, which is held in Appendix 10.3 (ES Volume VI).

10.5 Baseline Environment

Existing Baseline

Highway Network

- 10.5.1 The A13 and A1089 are both part of the Strategic Road Network (SRN) managed by National Highways. The A13 is a dual carriageway road which runs in an east-west direction between East London and Shoeburyness and is a major road subject to a derestricted speed limit (70mph). It is National Highways trunk road between London and the Tilbury (A1089) junction, a primary route between Tilbury and the Sadlers Farm roundabout, and a non-primary route between Sadlers Farm roundabout and Shoeburyness.
- 10.5.2 The A1089 trunk road is a dual carriageway road subject to a derestricted speed limit (70mph) which runs in a north-south direction between the A13 and Tilbury Fort.
- 10.5.3 Station Approach is a single carriageway road which runs in an east-west direction between the A1089 and Fort Road, providing access to the Tilbury 2 Port Terminal and other local employment sites in this area. The surrounding highway network is shown in Figure 10-4.

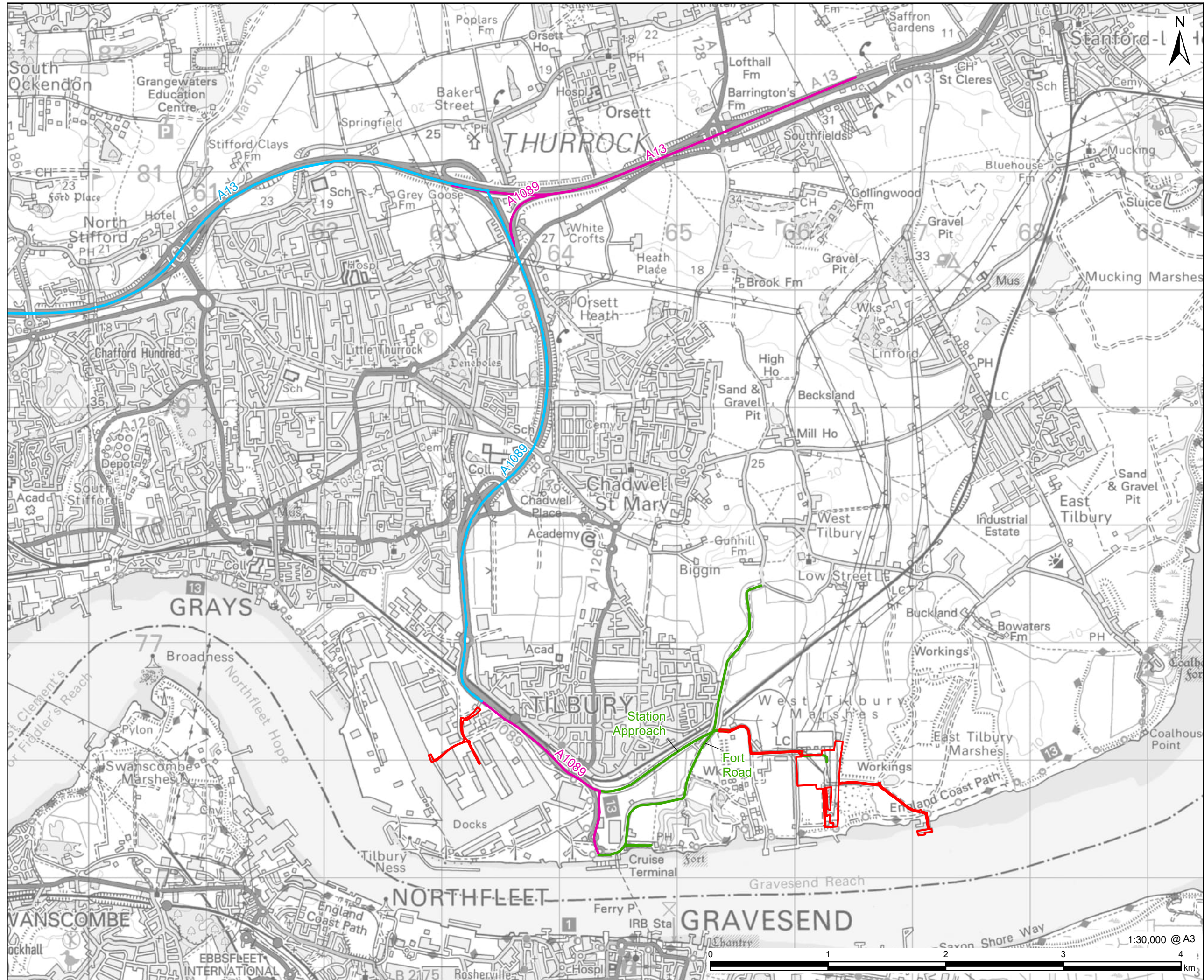


FIGURE NUMBER
Figure 10.4

Baseline Traffic Flows

- 10.5.4 As identified above, baseline traffic data has been obtained for the surrounding highway network within the study area based on available DfT traffic counts (Ref 10-10), traffic count data from the Land at Marsh Farm Sewage Treatment Plant TA (Ref 10-14) and the recent traffic survey carried out on Station Approach in September 2023 (see Figure 10-3 for the survey locations).
- 10.5.5 The DfT traffic counts were carried out in 2022. Traffic growth to derive 2023 baseline flows has been calculated using National Road Traffic Forecast (NRTF) growth factors, reflecting projected increases in annual vehicle mileage on roads within England and Wales. National Transport Model (NTM) adjustments have then been applied within TEMPro Version 8.1 (Ref 10-11) using NTEM dataset v8.0 and the NRTP 2022 Core dataset to reflect local factors (Thurrock) for the appropriate road types. The growth factors have been used to determine the forecast increases in baseline car driver/ passenger trips during each period.
- 10.5.6 A summary of the growth factors is set out in Table 10-3 below. It is noted that the AM peak, average weekday and average day growth factors are identical. For robustness, the higher factors for a 'trunk road' have been adopted for the A13 and A1089.

Table 10-3: Traffic Growth Factors to 2023

Growth Period	Road Type	Adopted Road	Traffic Growth Factor			
			AM Peak	PM Peak	Average Weekday	Average Day
2022 to 2023	Trunk	A13 A1089	1.0111	1.0109	1.0111	1.0111
	A Road	-	1.0064	1.0062	1.0064	1.0064
	All	-	1.0076	1.0075	1.0076	1.0076

- 10.5.7 In addition to the parts of the highway network covered by the traffic counts, the above information has been used to estimate baseline (2023) traffic flows for the following road junctions within the study area:
- A13/A1089 Junction – based on the traffic flows entering the junction from all three arms comprising the A13 (west), A13 (east) and A1089 (south); and
 - A1089/Station Approach Junction – in the absence of data for the A1089 to the south of the junction, this has been based on the traffic flows entering and exiting the junction via the A1089 to the west (two-way flows), as well as the traffic flows entering the junction via Station Approach (one-way flows).
- 10.5.8 Baseline traffic flows for the A1089 to the south of the A1089/Dock Road/Thurrock Park Way (ASDA) Roundabout have been based on a 24 hour daily count to the southeast of the Port of Tilbury access where traffic flows are considerably lower than to the northwest of the Port of Tilbury access. This is designed to provide a robust assessment when proportional increases are identified as a result of the Proposed Development (see Section 10.8). The baseline traffic flows have then been estimated for the peak hours and 12 hour weekday (7am-7pm) period based on the profile of traffic movements on the A1089 to the north of the roundabout. The traffic profile for the A1089 (2022 manual count) has also been used to estimate traffic flows at the A1089/Dock Road/Thurrock Park Way (ASDA) Roundabout for the 6pm-7pm and 12 hour weekday periods (as well as to estimate HGV flows for all time periods), in the absence of this information within the Land at Marsh Farm Sewage Treatment Plant TA.
- 10.5.9 A summary of the 2023 baseline traffic flows on the above parts of the highway network, during the weekday network peaks (8am-9am and 5pm-6pm) and shoulder peak hours (7am-8am and 6pm-7pm), as well as 12 hour weekday (7am-7pm) and 24 hour (daily) are held in Appendix 10.6. The average weekday and daily traffic flows are also provided in Table 10-4.

Table 10-4: 2023 Baseline Average Weekday (12 hours) and Daily (24 hours) Two-Way Flows

Receptor Ref	Location	Average Weekday (7am-7pm)		Average Day (24 Hours)	
		HGVs	Total	HGVs	Total
T-RL1	A13 West	10,553	70,184	10,677	81,523
T-RL2	A13 East	8,362	59,089	8,265	68,918
T-RL3	A1089 North (North of A1089/Dock Road/Thurrock Park Way Roundabout)	6,850	27,562	6,864	32,402
T-RL4	A1089 South (South of A1089/Dock Road/Thurrock Park Way Roundabout)*	1,407	2,856	1,409	3,358
T-RL5	Station Approach	702	1,796	717	2,054
T-RJ1	A13/A1089 Junction	12,984	79,224	13,005	92,349
T-RJ2	A1089/Dock Road/Thurrock Park Way (ASDA) Roundabout	8,621	34,686	8,638	40,777
T-RJ3	A1089/Station Approach Junction	1,737	3,847	1,729	4,489

*A1089 St Andrew's Road (southeast of Port of Tilbury access) where baseline flows are considerably lower than to the northwest of the Port of Tilbury access

Collision Data

- 10.5.10 This section provides a summary of full PIA data obtained from ECC Highways for the highway network within the agreed study area as shown on Figure 10-1. The most recently available PIA data covers the five-year period between the start of August 2018 and the end of July 2023. Whilst it is acknowledged that the data includes the period of Covid-19 restrictions between the first Covid lockdown in March 2020 and the start of the 2021 autumn school term (considered by National Highways as representing 'a-typical' traffic conditions), this nonetheless includes more than three years' of 'typical' data and provides a single complete dataset. The study area for the collision review was agreed with Thurrock Council during the scoping meeting on 6 September 2023.
- 10.5.11 A summary of the PIA data from ECC (categorised by severity: slight, serious and fatal) is set out below in Table 10-5. This includes a separate summary of collisions involving goods vehicles (>3.5 tonnes) to inform the assessment of Hazardous/Large Loads in Section 10.9.

Table 10-5: Collision Review (ECC Data)

Receptor Ref	Location	Total Collisions				Collisions involving a Goods Vehicle (>3.5 tonnes)			
		Sl	Se	Fa	Total	Sl	Se	Fa	Total
T-RL1	A13 West	13	2	0	15	3	1	0	4
T-RL2	A13 East	3	1	1	5	1	0	0	1
T-RL3	A1089 North (North of A1089/Dock Road/Thurrock Park Way Roundabout)	7	2	1	10	2	0	1	3
T-RL4	A1089 South (South of A1089/Dock Road/Thurrock Park Way Roundabout)	4	0	0	4	4	0	0	4
T-RL5	Station Approach	0	0	0	0	0	0	0	0
T-RJ1	A13/A1089 Junction	18	5	0	23	6	1	0	7
T-RJ2	A1089/Dock Road/Thurrock Park Way (ASDA) Roundabout	11	1	0	12	3	0	0	3
T-RJ3	A1089/Station Approach Junction	0	0	0	0	0	0	0	0

Sl = Slight, Se = Serious, Fa = Fatal

- 10.5.12 The above shows that there are several locations where more than five PIAs were recorded within the five year period, which may suggest that these locations are more sensitive to an increase in traffic from a highway safety perspective. There are also several locations which appear to have a good safety record with four or fewer PIAs within the five year period, which suggest that these locations may be less sensitive to an increase in traffic from a highway safety perspective. In terms of PIAs involving goods vehicles, there is only one location where more than five PIAs were recorded within the five year period.
- 10.5.13 Following on from the above, collision rates have been calculated in billion vehicle miles for road links to provide a comparison with national road safety statistics provided within Road Casualties Great Britain (Ref 10-18). The following formula has been used to calculate the collision rate, where 1,826 reflects the number of days over which the collision data has been sourced (between 01 August 2018 to 31 July 2023).

$$\text{Collision Rate} = \frac{\text{Number of recorded PIAs (per road link)} \times 1 \text{ billion}}{1,826 \times \text{AADT (2023)} \times \text{length of road (miles)}}$$

10.5.14 The above has been informed by the 2023 baseline traffic flows presented in Table 10-4 for an average day (24 hours). The national average collision rate has been calculated between 2018 and 2022 using dataset RAS0302: Urban and rural roads, for the appropriate road type. A summary of the comparison is presented in Table 10-6 below. The A1089 to the south of the A1089/Dock Road/Thurrock Park Way Roundabout (T-RL4) has been split into two links given that traffic flows significantly vary to the northwest and southeast of the Port of Tilbury access.

Table 10-6: Collision Rates (Road Links)

Receptor Ref	Location	Road Type	PIAs	AADT (2023)	Link Length (miles)	Collision Rate	National Average
T-RL1	A13 West	Rural A-Road	15	81,523	1.01	100	181
T-RL2	A13 East	Rural A-Road	5	68,918	0.49	81	181
T-RL3	A1089 North (North of A1089/Dock Road/Thurrock Park Way Roundabout)	Rural A-Road	10	32,402	2.04	83	181
T-RL4 (west)	A1089 South (Northwest of Port of Tilbury Access)	Rural A-Road	3	17,125*	0.30	315	181
T-RL4 (east)	A1089 South (Southeast of Port of Tilbury Access)	Rural A-Road	1	3,358	0.73	224	181
T-RL5	Station Approach	Rural Other Road	0	2,054	0.98	0	313

*2022 daily traffic flow sourced from the Land at Marsh Farm Sewage Treatment Plant TA (Ref 10-14)

10.5.15 The above shows that the majority of the highway network within the study area has a lower collision rate than the national average for the comparable road type and location and may therefore be less sensitive to a change in traffic flow/type. However, the A1089 to the south of the A1089/Dock Road/Thurrock Park Way Roundabout (T-RL4) has a higher collision rate than the national average for the comparable road type and location and may therefore be considered to be more sensitive to a change in traffic flow/type. This information has been used to inform the assessment of Road Safety and Hazardous/Large Loads within Section 10.9.

Public Transport Network

10.5.16 Public transport in the vicinity of the site include Tilbury Town and Grays railway stations approximately 2.5km and 5km to the northwest of the site respectively, as well as East Tilbury station approximately 3.7km to the northeast of the site. Tilbury Town railway station can be accessed via bus route 99 (further details provided below). Tilbury Town railway station is served by c2c, which operates services between London Fenchurch Street and Shoeburyness via Southend Central. There are four trains in each direction during the AM and PM peak hours.

10.5.17 The nearest bus stop to the site is located on Fort Road (Fortress Distribution Park) approximately 1.3km to the northwest. This bus stop is served by bus route 99 which is a circular route operated

by Ensign Bus which provides access to Tilbury (including Tilbury Town Station) as well as the Tilbury Ferry Terminal, operating two services per hour (i.e. once every 30 minutes) throughout the day. Additional bus services can also be accessed from within Tilbury, namely:

- 51: Chafford Hundred – Prittlewell (NIBS buses); one service per day in each direction (06:45 service towards Prittlewell, 15:55 service towards Chafford Hundred);
- 66: Grays – Tilbury Civic Square/ Chadwell St Mary (Ensignbus); two services per hour in each direction (first service 05:02, last service 18:28);
- 73: Lakeside – Tilbury Civic Square (Ensignbus); two services per hour in each direction (first service 04:30, last service 18:00);
- 77/77A: Aveley, Usk Road – Tilbury Civic Square/ Asda (Ensignbus); two services per hour in each direction (first service 04:00, last service 23:40)
- 475: Stanford-le-Hope – Brentwood (NIBS buses); one service per day in each direction (07:04 service towards Brentwood, 15:15 service towards Stanford-le-Hope);
- Z1: Aveley, Usk Road – Amazon Tilbury (Ensignbus); four services per day in each direction (first service 05:00, last service 18:45);
- Z3: Amazon Tilbury – Southend-on-Sea, Arlington Road (First Essex); four services per day in each direction (first service 05:00, last service 18:45); and
- Z4: Amazon Tilbury – Stanford-le-Hope – Corringham – Basildon – Pitsea, Broadway (First Essex); four services per day in each direction (first service 05:00, last service 18:45).

Active Travel Network

10.5.18 The walking and cycling routes in the vicinity of the Proposed Development are presented in Figure 10-5. These include the following:

- National Cycle Network (NCN) Route 13 – this route passes east-west along the northern side of the River Thames and through the redline boundary; and
- PRoW 146 (Footpath) – this route passes east-west through the redline boundary, sharing the same route as NCN Route 13 in places.

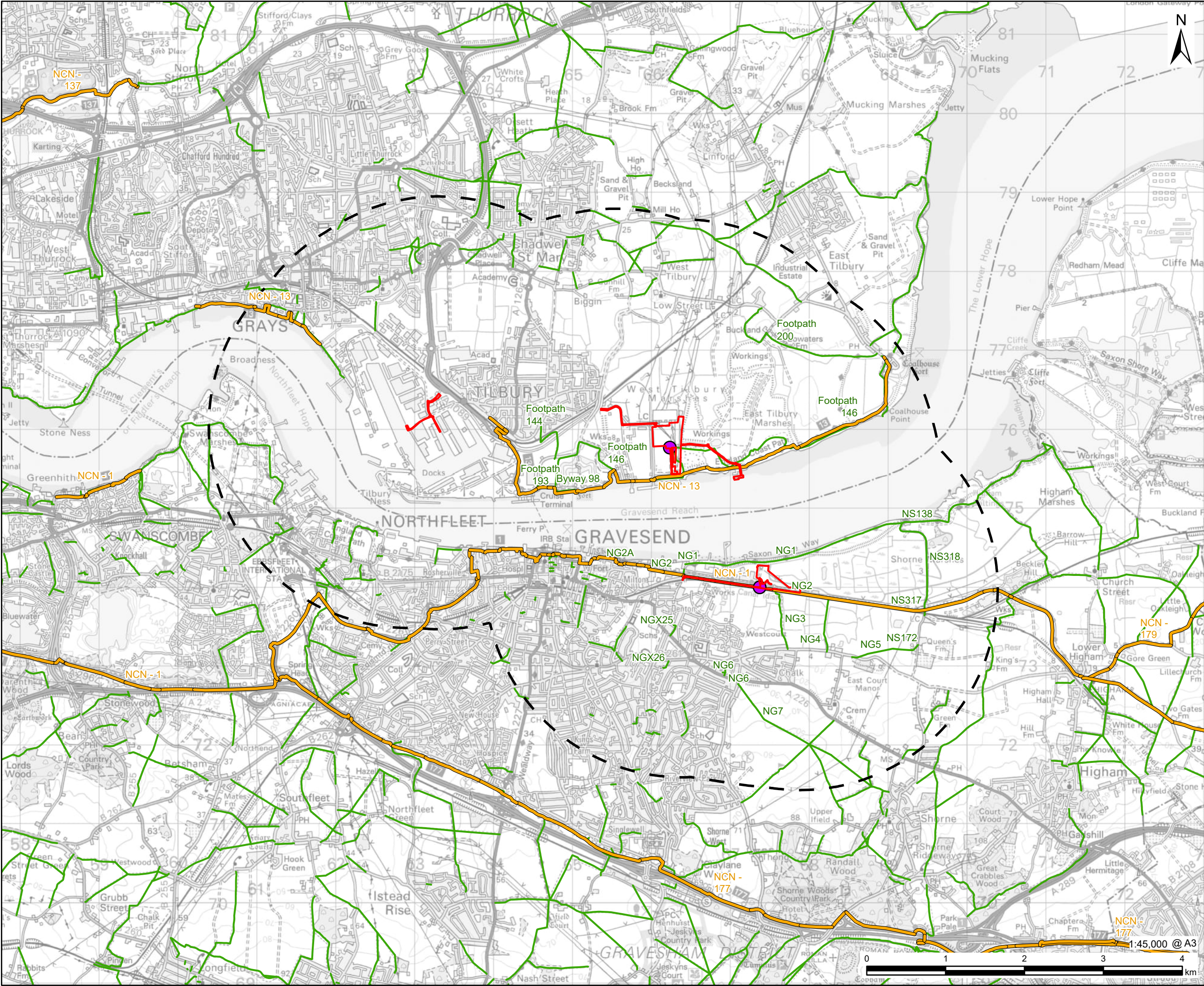
Future Baseline

10.5.19 The future baseline scenarios are set out in ES Volume II Chapter 4: Environmental Impact Assessment Methodology.

10.5.20 In the absence of the Proposed Development, traffic flows on the surrounding highway network would be expected to increase as a result of housing and employment growth. Therefore, projected background traffic growth has been applied to the 2023 baseline traffic flows to represent conditions during the future baseline (and construction peak assessment year) of 2026.

10.5.21 Traffic growth has been calculated using NRTF growth factors, reflecting projected increases in annual vehicle mileage on roads within England and Wales. NTM adjustments have then been applied within TEMPro utilising NTEM dataset v8.0 and the NRTP 2022 Core dataset to reflect local factors (Thurrock) for the appropriate road types. The growth factors have been used to determine the forecast increases in future baseline car driver/ passenger trips during each period. These represent the latest datasets available, covering the period up to 2061.

10.5.22 A summary of the growth factors is set out in Table 10-7 below. It is noted that the AM peak, average weekday and average day growth factors are identical. For robustness, the higher factors for a 'trunk road' have been adopted for the A13 and A1089.



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LEGEND

- Red Line Boundary (Above Ground)
- 2.5km Buffer of Red Line boundary
- Site Access
- National Cycle Network
- Public Rights of Way

NOTES

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ISSUE PURPOSE

Traffic and Transport

PROJECT NUMBER

60677311

FIGURE TITLE

Walking and Cycling routes (including PRow)

FIGURE NUMBER

Figure 10.5

1:45,000 @ A3

Table 10-7: Traffic Growth Factors to 2026

Growth Period	Road Type	Adopted Roads	Traffic Growth Factor			
			AM Peak	PM Peak	Average Weekday	Average Day
2023 to 2026	Trunk	A13 A1089	1.0355	1.0350	1.0355	1.0355
	A Road	-	1.0250	1.0245	1.0250	1.0250
	Minor	Station Approach	1.0252	1.0247	1.0252	1.0252
	All	-	1.0289	1.0284	1.0289	1.0289

10.5.23 The anticipated future baseline flows on the surrounding highway network are summarised in Appendix 10.6, including for the weekday peak hours. The average weekday and daily traffic flows are provided in Table 10-8.

Table 10-8: 2026 Future Baseline Average Weekday (12 hours) and Daily (24 hours) Two-Way Flows

Receptor Ref	Location	Average Weekday (7am-7pm)		Average Day (24 Hours)	
		HGVs	Total	HGVs	Total
T-RL1	A13 West	10,927	72,675	11,056	84,417
T-RL2	A13 East	8,658	61,186	8,559	71,364
T-RL3	A1089 North (North of A1089/Dock Road/Thurrock Park Way Roundabout)	7,093	28,540	7,108	33,552
T-RL4	A1089 South (South of A1089/Dock Road/Thurrock Park Way Roundabout)	1,456	2,958	1,459	3,477
T-RL5	Station Approach	720	1,841	735	2,106
T-RJ1	A13/A1089 Junction	13,445	82,036	13,467	95,626
T-RJ2	A1089/Dock Road/Thurrock Park Way (ASDA) Roundabout	8,927	35,917	8,945	42,225
T-RJ3	A1089/Station Approach Junction	1,795	3,973	1,787	4,637

10.5.24 The consideration of committed development traffic during the future baseline year is reviewed within Section 10.9.3, based on the schemes identified within Chapter 23: Cumulative Effects (ES Volume V).

10.6 Key Parameters for Assessment

Assessment Criteria

10.6.1 A detailed description of the Proposed Development is provided in ES Volume II, Chapter 3 – The Project Description. In accordance with the 2023 IEMA Guidelines for the Environmental Assessment of Traffic and Movement (Ref 10-8), the following criteria has been considered in this assessment of the construction phase:

- Severance of communities;
- Pedestrian delay (incorporating delay to all non-motorised users);
- Non-motorised user amenity;
- Fear and Intimidation on and by road users;
- Road vehicle driver and passenger delay;
- Road user and pedestrian safety; and
- Hazardous/large loads.

10.6.2 The 2023 IEMA guidelines set out two rules in identifying potential links for analysis:

- Rule 1: include highway links where traffic flows will increase by more than 30% (or the number of HGVs will increase by more than 30%); and
- Rule 2: include any other specifically sensitive areas (e.g. accident black spots, conservation areas, hospitals, links with high pedestrian flows etc.) where traffic flows have increased by 10% or more.

10.6.3 Based on this, links and junctions have been assessed where traffic flows are expected to increase by 30% or more as a result of the Proposed Development. Links and junctions have not been assessed where there is expected to be a less than 30% increase in traffic flows as a result of the Proposed Development, unless any specifically sensitive areas are identified. In addition, a negligible magnitude of change has been assigned where there is expected to be fewer than 30 additional vehicle trips per hour during each of the development peak hours as a result of the Proposed Development (except for the assessment of hazardous/large loads), irrespective of the proportional increase in traffic flows.

10.6.4 The type of traffic which is anticipated to be generated by the Proposed Development has been categorised as follows: General Traffic, Light Goods Vehicles (LGVs), HGVs and Abnormal Indivisible Loads (AILs). The vehicle routing and movements associated with the Proposed Development's construction have been considered and discussed through consultation with Thurrock Council and National Highways.

10.6.5 The receptors which may be impacted have been identified based on the locations and volumes of the proposed construction traffic i.e. the forecast increase in vehicle movements. This has been completed by identifying the percentage increases in vehicular activity along the identified construction routes when compared to the baseline traffic count data (factored up to the future baseline year of 2029) for road links within the traffic and transport study area.

10.6.6 Typically, when assessing the impacts of traffic effects, there are a range of particular groups and locations which may be sensitive to changes in traffic conditions compliant with the criteria previously outlined.

10.6.7 These are outlined in the 2023 IEMA Guidance as 'Affected Parties', as follows:

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

10.6.8 As a general rule, the forecast changes to baseline (magnitude of change), the relative value/sensitivity/importance of the affected receptor and the scale, nature and significance of the effect (consequence) should be considered. In addition, the anticipated effect should be classified as short-term, medium-term or long-term, as well as permanent or temporary.

10.6.9 Assessments have been undertaken at the peak period of construction (as agreed with Thurrock Council and National Highways), which is identified to be 2026 based on forecast construction traffic movements. Construction traffic associated with the Proposed Development has been distributed onto the surrounding highway network within the traffic and transport study area (see Figure 10-1) to calculate the resultant percentage increases on each link. This represents the area where transport impacts may arise as a result of the construction of the Proposed Development, with no impacts expected beyond this area.

10.6.10 Baseline traffic flows have been factored up to the identified peak year of construction (2026) by adopting growth factors derived from TEMPro (Ref 10-11) utilising NTEM dataset v8.0 for the relevant areas impacted by the Proposed Development.

Sensitivity

10.6.11 The general criteria for defining the importance or sensitivity of receptors are set out in Table 10-9, which applies to the assessment of Severance, Pedestrian Delay, Non-Motorised User Amenity, and Fear and Intimidation. Key factors influencing this include:

- The value of the receptor or resource based upon empirical and/or intrinsic factors, for example considering any legal or policy protection afforded which is indicative of the receptor or resources' value internationally, nationally or locally; and
- The sensitivity of the receptor or resource to change, for example is the receptor likely to acclimatise to the change. This will consider legal and policy thresholds which are indicative of the ability of the resources to absorb change.

Table 10-9: Categorising the Overall Sensitivity of Receptors (Severance, Pedestrian Delay, Non-Motorised User Amenity, and Fear and Intimidation)

Receptor Sensitivity	Receptor Examples
High	More than two sensitive users present (e.g. schools, play areas, care/retirement homes, disabled parking bays, hospitals, places of worship, historic buildings).
Medium	Two sensitive users present (e.g. schools, play areas, care/retirement homes, disabled parking bays, hospitals, places of worship, historic buildings).
Low	At least one of the following: - One sensitive user present (e.g. schools, play areas, care/retirement homes, disabled parking bays, hospitals, places of worship, historic buildings) - Many residential properties with direct frontage to highway link being used as construction route - Pedestrians using footways, PRow and/or crossings on highway link - Cyclists using on-road designated cycle routes along highway link.
Negligible	No receptors along link, or at least one of the following: - Few residential properties with direct frontage to the highway link being used as a construction traffic route - Workplaces with direct frontage to highway link being used as construction route - Cyclists using off-road designated cycle routes along highway link.

10.6.12 The general criteria for defining the importance or sensitivity of receptors for the assessment of Driver Delay are set out in Table 10-10.

Table 10-10: Categorising the Overall Sensitivity of Receptors (Driver Delay)

Receptor Sensitivity	Receptor Examples
High	Road Links: Not applicable Road Junctions: Roundabout or signalised junction (at least four arms) within a built-up area or a junction with high queuing expected.
Medium	Road Links: Key local route within a built-up area Road Junctions: Roundabout or signalised junction (at least four arms) outside of a built-up area or a junction with moderate/high queuing expected.
Low	Road Links: Strategic route within a built-up area OR a local route outside of a built-up area Road Junctions: Roundabout or signalised junction (fewer than four arms) outside of a built-up area OR a priority junction within a built-up area with low/moderate queuing expected.
Negligible	Road Links: Strategic route outside of a built-up area OR a minor/ local no-through route Road Junctions: Priority junction outside of a built-up area with no/low queuing expected.

10.6.13 The preliminary criteria for defining the importance or sensitivity of receptors for the assessment of Road Safety and Hazardous/Large Loads are set out in Table 10-11. The collision rate for road links has also been calculated and compared with national road safety statistics provided within Road Casualties for Great Britain (Ref 10-18) to determine an appropriate receptor sensitivity level.

Table 10-11: Categorising the Overall Sensitivity of Receptors (Road Safety and Hazardous/Large Loads)

Receptor Sensitivity*	Road Safety	Hazardous/Large Loads
High	10+ collisions in five years, or more than three serious collisions and/ or one fatal collision in five years	5+ serious/fatal collisions (or more than one fatal collision) involving a goods vehicle (>3.5 tonnes) in five years
Medium	5-9 collisions (with up to three serious collisions and/ or one fatal collision) in five years	3-4 serious/fatal collisions (with up to one fatal collision) involving a goods vehicle (>3.5 tonnes) in five years
Low	3-4 collisions in five years (with up to one serious collision and no fatal collisions) in five years	1-2 serious collisions (with no fatal collisions) involving a good vehicle (>3.5 tonnes) in five years
Negligible	Fewer than three collisions (with no serious or fatal collisions) in five years	No serious or fatal collisions involving a goods vehicle (>3.5 tonnes) in five years

*subject to a collision rate comparison with national road safety statistics (for road links)

10.6.14 Table 10-12 provides a summary of receptor sensitivity to severance, pedestrian delay, non-motorised user amenity effects and fear and intimidation, which have been taken forward for assessment. Further detail is provided in Appendix 10.5 and Appendix 10.9.

Table 10-12: Sensitivity of Receptors for Severance, Pedestrian Delay, Non-motorised User Amenity, Fear and Intimidation

Ref	Receptor Type	Description	Sensitivity
T-RL1	Road Link	A13 West	Negligible
T-RL2	Road Link	A13 East	Negligible
T-RL3	Road Link	A1089 North (North of A1089/Dock Road/Thurrock Park Way Roundabout)	Negligible
T-RL4	Road Link	A1089 South (South of A1089/Dock Road/Thurrock Park Way Roundabout)	Low
T-RL5	Road Link	Station Approach	Low
T-RJ1	Road Junction	A13/A1089 Junction	Negligible
T-RJ2	Road Junction	A1089/Dock Road/Thurrock Park Way (ASDA) Roundabout	Medium
T-RJ3	Road Junction	A1089/Station Approach Junction	Low

10.6.15 Table 10-13 provides a summary of receptor sensitivity to driver delay effects, which have been taken forward for assessment. Further detail is provided in Appendix 10.5 and Appendix 10.9.

Table 10-13: Sensitivity of Receptors for Driver Delay

Ref	Receptor Type	Description	Sensitivity
T-RL1	Road Link	A13 West	Negligible
T-RL2	Road Link	A13 East	Negligible

Ref	Receptor Type	Description	Sensitivity
T-RL3	Road Link	A1089 North (North of A1089/Dock Road/Thurrock Park Way Roundabout)	Negligible
T-RL4	Road Link	A1089 South (South of A1089/Dock Road/Thurrock Park Way Roundabout)	Low
T-RL5	Road Link	Station Approach	Low
T-RJ1	Road Junction	A13/A1089 Junction	Negligible
T-RJ2	Road Junction	A1089/Dock Road/Thurrock Park Way (ASDA) Roundabout	High
T-RJ3	Road Junction	A1089/Station Approach Junction	Low

10.6.16 Table 10-14 provides a summary of receptor sensitivity to road safety and to hazardous/large loads effects, which have been taken forward for assessment. Further detail is provided in Appendix 10.5 and Appendix 10.9.

Table 10-14: Sensitivity of Receptors for Road Safety and Hazardous/Large Loads

Ref	Receptor Type	Description	Road Safety	Hazardous/Large Loads
T-RL1	Road Link	A13 West	Medium*	Low
T-RL2	Road Link	A13 East	Medium	Negligible
T-RL3	Road Link	A1089 North (North of A1089/Dock Road/Thurrock Park Way Roundabout)	Medium*	Medium
T-RL4	Road Link	A1089 South (South of A1089/Dock Road/Thurrock Park Way Roundabout)	Medium^	Negligible
T-RL5	Road Link	Station Approach	Negligible	Negligible
T-RJ1	Road Junction	A13/A1089 Junction	High	Low
T-RJ2	Road Junction	A1089/Dock Road/Thurrock Park Way (ASDA) Roundabout	High	Negligible
T-RJ3	Road Junction	A1089/Station Approach Junction	Negligible	Negligible

*sensitivity reduced from high to medium (lower collision rate than national average)

^sensitivity increased from low to medium (higher collision rate than national average)

Magnitude

- 10.6.17 As identified within the 2023 IEMA guidelines, the magnitude of each impact represents the level of change from the baseline conditions.
- 10.6.18 This assessment considers a range of potential effects that could be experienced during the construction stage of the Proposed Development and this section identifies how magnitude will be considered for each.
- 10.6.19 **Severance** is defined in the IEMA guidelines as the *“perceived division that can occur within a community when it becomes separated by major traffic infrastructure. The term is used to describe a complex series of factors that separate people from places and other people. Severance may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by infrastructure”*. The guidelines state that changes in traffic flow of 30%, 60% and 90% are regarded as producing ‘slight’, ‘moderate’ and ‘substantial’ changes in severance respectively. However, caution should be observed when applying these thresholds to very low baseline flows which are unlikely to experience severance impacts even with high percentage changes in traffic.
- 10.6.20 **Pedestrian Delay** (incorporating delay to all non-motorised users) is considered to be affected by the changes in volume, composition or speed of traffic, in terms of their respective impacts on the ability of pedestrians to cross roads. The assessment of pedestrian delay serves as a proxy for the delay that other modes of non-motorised users may experience when crossing roads. In general, increases in traffic levels and/or traffic speeds are likely to lead to greater increases in pedestrian delay.
- 10.6.21 **Non-Motorised User Amenity** is broadly defined as *“the relative pleasantness of a journey, and is considered to be affected by traffic flow, traffic composition and pavement width/separation from traffic”*. The guidance suggests that a tentative threshold for judging the significance of changes in non-motorised user amenity would be where the traffic flow (or HGV component) is halved or doubled.
- 10.6.22 **Fear and Intimidation** occurs through a combination of traffic flow, speed, proportion of HGVs and the proximity of traffic to people. These indicators are often heightened by a perceived lack of protection or buffers from the highway or through narrow or non-existent footways. The assessment considers each road on a case-by-case basis, however there are thresholds provided in the 2023 IEMA guidelines which are presented in Table 10-16.
- 10.6.23 **Driver Delay** relates to incremental increases in traffic (as outlined in Table 10-15). However, traffic delays are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system. As a further consideration, where any temporary road closures or traffic management is likely to be in place to enable the construction of the Proposed Development, any additional potential delay caused by these resultant diversion routes has been reported.
- 10.6.24 **Road Safety** considers Personal Injury Accident (PIA) data obtained for the most recent five-year period available at junctions and links along the proposed construction traffic routes. The sensitivity of discrete areas of the highway network can then be determined following a detailed review of the baseline characteristics including the collision rate and any collision clusters. This has been used to assess whether the additional traffic during construction of the Proposed Development would be likely to have a detrimental effect on road safety.
- 10.6.25 With regard to **Hazardous/Large Loads**, the guidance states that the transportation of dangerous or hazardous loads by road should be recognised including specialist loads that might be involved in the construction phase of the development. Where the number of movements is considered to be significant, risk or catastrophe analysis should be carried out to illustrate the potential for an accident and the likely effect of such an effect. Appropriate routes for abnormal load movements should be considered, with mitigation strategies to secure safe passage. As part of the Proposed Development, there will be the requirement for abnormal loads which are categorised as Large Loads.

- 10.6.26 In view of the above, the impacts of Hazardous/Large Loads have been considered, in the form of a qualitative risk assessment to establish the likelihood and extent of such effects. The projected impacts of the Proposed Development have been measured separately, dependent upon the receptor, for the construction period. The Outline CTMP, provided in Appendix 10.1 and Abnormal Load Assessment Report, provided in Appendix 10.2 include details of measures that will be employed to ensure the safe vehicular transport of components to and from the Proposed Development.
- 10.6.27 Table 10-15 and Table 10-16 summarise the criteria that have been used to assess the magnitude of effect (based on increases i.e. 'adverse' effects), along with the thresholds that have been used to determine whether effects are considered high, medium, low or negligible. Depending on the baseline information available, the various thresholds identified for the proportional increases in traffic flow relate to peak hour flows and daily flows (whichever is highest). Within these tables, neither the sensitivity of receptors, nor the duration of effects, is taken into consideration. These tables are formed using 2023 IEMA Guidelines and professional experience in order to build on the information presented by the guidelines to allow a more thorough assessment to be carried out.
- 10.6.28 In terms of magnitude of change for receptors, a negligible magnitude of change has been assigned where there is expected to be fewer than 30 additional vehicle trips per hour during each of the development peak hours as a result of the Proposed Development, irrespective of the proportional increase in traffic flows. This is designed to avoid over-reporting impacts in areas where baseline traffic flows are very low and is in line with the IEMA Guidelines which states that caution should be observed when applying thresholds to very low baseline flows given that these are unlikely to experience impacts even with high percentage changes in traffic.

Table 10-15: Categorising the Overall Magnitude of Effect of a Receptor

Impact	Negligible	Low	Medium	High
Severance	Increase in total traffic flows of below 30% (or increase in HGV flows of below 10%).	Increase in total traffic flows of 30-59% (or increase in HGV flows of 10-39%).	Increase in total traffic flows of 60-89% (or increase in HGV flows of 40-89%).	Increase in total traffic flows or HGV flows of 90% and above.
Pedestrian Delay	The severity of the impact will be determined based on the thresholds identified above for severance.			
Non-Motorised User Amenity	Increase in total traffic flows of below 50%.	Increase in total traffic flows of 50-69%.	Increase in total traffic flows of 70-99%.	Increase in total traffic flows of 100% or above.
Fear and Intimidation	No change in degree of hazard level for daily traffic flows, HGV flows and vehicle speeds (see Table 10-16 below).	One step change in degree of hazard level (see Table 10-16 below), but with <400 daily vehicle increase or <500 daily HGV increase.	One step change in degree of hazard level (see Table 10-16 below), but with >400 daily vehicle increase or >500 daily HGV increase.	Two step changes in degree of hazard level based on the degree of hazard scores for daily traffic flows, HGV flows and vehicle speeds (see Table 10-16 below).

Impact	Negligible	Low	Medium	High
Driver Delay	Increase in total traffic flows of below 30%.	Increase in total traffic flows of 30-59%.	Increase in total traffic flows of 60-89%.	Increase in total traffic flows of 90% and above.
Road Safety	Increase in total traffic flows of below 30% (or increase in HGV flows of below 10%).	All links estimated to experience increases in total traffic flows of at least 30% or increases in HGV flows of at least 10% are analysed further on a case by case basis.		
Hazardous/Large Loads	Based on the probability of a personal injury accident, categorised as fatal or serious, involving a hazardous/large load, occurring.			

10.6.29 Further details relating to Fear and Intimidation, in terms of calculating magnitude of impact based on the 2023 IEMA guidelines, are provided in Table 10-16 below.

Table 10-16: Categorising the Overall Magnitude for Fear and Intimidation

Criteria	Degree of Hazard Level			
	Small	Moderate	Great	Extreme
A) Average Hourly Traffic Flow	<600 (score of 0)	600-1,200 (score of 10)	1,201-1,800 (score of 20)	>1,800 (score of 30)
B) Daily HGV Flow	<1,000 (score of 0)	1,000-2,000 (score of 10)	2,001-3,000 (score of 20)	>3,000 (score of 30)
C) Average Speed	<20mph (score of 0)	20-30mph (score of 10)	31-40mph (score of 20)	>40mph (score of 30)
Total Score (A+B+C)	0-20	21-40	41-70	71+

10.6.30 Table 10-15 and Table 10-16 above set out the proposed magnitude thresholds for the respective environmental effects that are considered in this assessment. All effects have a proposed magnitude that does not, initially, consider the duration over which an effect is likely to be experienced.

10.6.31 Duration is considered when assessing the overall significance of residual effects, noting that the DMRB Volume 11 Section 2 Part 5 states in Paragraph 1.47:

“Recognition should be made that permanent impacts will be more significant than those of a temporary nature. For example, the impact may only occur during a single phase of the project construction and may be temporary. Alternatively, the impact may be long-term or irreversible and hence permanent. It is, therefore, important that the assessment distinguishes between permanent and temporary impacts”.

10.6.32 All of the traffic and transport effects associated with the construction of the Proposed Development would be temporary effects.

Significance of Effects

10.6.33 As set out in Volume II, Chapter 4: Environmental Impact Assessment Methodology, the significance of effect is determined through the consideration of two elements; the magnitude of the impact and the sensitivity of the receptor as outlined above. Table 10-17 below shows the matrix that has been used to determine the effect category. Effects which are classified as **major** or **moderate** are considered to be significant (shown in **bold**).

Table 10-17: Significance Matrix

Sensitivity of Receptor	Magnitude of Change			
	Negligible	Low	Medium	High
High	Negligible / Minor	Moderate	Major	Major
Medium	Negligible	Minor	Moderate	Major
Low	Negligible	Negligible	Minor	Moderate
Negligible	Negligible	Negligible	Negligible	Negligible / Minor

10.7 Embedded Mitigation

- 10.7.1 Embedded measures form an integral, committed and deliverable part of the Proposed Development design or comprise standard construction practices. They are assumed to be implemented and are therefore factored into the determination of significant residual effects.
- 10.7.2 The Proposed Development will minimise construction impacts through the implementation of an CTMP and Construction Environmental Management Plan (CEMP) during the construction phase. These documents will detail and formalise the measures that will mitigate construction-related effects and outline versions are set out in Appendix 10.1 and Appendix 3.1.
- 10.7.3 The Outline CTMP (ES Volume VI Appendix 10.1) sets out the mitigation measures to be implemented during the construction phase of the Proposed Development to ensure that all traffic associated with the construction works operates in a safe and compliant manner at all times. This section summarises the types of mitigation measures that have been considered to mitigate against the effects on traffic and transport receptors where required. These measures will be adopted during the construction phase and will be agreed with Thurrock Council and/ or National Highways (through regular liaison) and adhered to by the appointed Contractor. The Outline CTMP includes the following (note, this is not an exhaustive list):
- Investigating the potential to remove tunnelled spoil by barge at the Port of Tilbury Docks and via the River Thames, to reduce the number of HGV movements on the wider road network around Tilbury during the construction phase. This forms the preference for the Proposed Development and would reduce peak HGV activity by more than 50%;
 - Measures designed to manage construction traffic (e.g. HGVs and construction staff movements at the start and end of the working day) in order to minimise the impact on local residents, businesses, road users and other potentially sensitive land uses and ensure all third-party traffic interfacing with the Proposed Development is kept safe from the on-going work;
 - A traffic routing strategy to ensure vehicles accessing the site do so via the most appropriate route(s) and to avoid (or minimise) conflict with sensitive areas such as residential areas;
 - Access security personnel and traffic marshals to ensure the access point is managed safely and securely. Swept path analysis will be undertaken to ensure vehicles can safely enter and exit the Proposed Development from/ to the local highway network without impacting road users;
 - Temporary traffic management/ construction signage at the site access point and on the approach to the site access (as required) to ensure safe movements of all road users;
 - A Delivery Management System will be used to ensure deliveries to the site are spread across the whole day where possible, to minimise the impact of HGV traffic during the network peak periods;
 - Providing safe pedestrian access routes between car parking locations, access points, work areas, site office and welfare facilities. Appropriate crossing points and segregation will be provided where pedestrian and vehicle routes interact;

- Appropriate loading/ unloading and parking areas for construction vehicles to avoid the need for parking or waiting on the highway. Suitable space will be provided within the site to allow all vehicles to enter and exit the site in a forward direction;
- A parking review to ensure a clear route is available to construction vehicles travelling to/ from the Proposed Development, particularly on local/ access roads e.g. Station Approach;
- A requirement for vehicles to be correctly maintained and operated in accordance with the manufacturer's recommendations and in a responsible manner. All HGV and LGV construction vehicles associated with the Proposed Development will be clearly identifiable using a vehicle marking scheme to assist with the monitoring process of construction vehicles;
- An Information Pack to be provided to all contractors, covering a variety of topics and providing information on the requirements of working on the Proposed Development;
- A specialised haulage service to allow AILs to be transported, with the necessary escort, permits and traffic management in place;
- An access route inspection and swept path analysis for the largest equipment/ construction material delivery vehicles and transporters (including AILs) would also be undertaken to determine the need for any additional control measures; and
- Construction vehicles will be checked and cleaned where necessary prior to exiting the site to reduce debris on the road network and a road sweeper will be utilised to remove debris from the local road network if necessary.

10.7.4 Further to the above, the following management and mitigation will be put in place for walking and cycling routes including PRow:

- No works will be undertaken on PRow without the express consent of the Highways Authority;
- It is not envisaged that any temporary closure(s) will be required. However, should any PRow need to be temporarily closed to ensure public safety then the duration of the closure(s) will be kept to a minimum with alternative route(s) provided for the duration;
- PRow will otherwise not be stopped up, diverted, obstructed, or the surface disturbed;
- There will be no encroachment on the current width of PRow;
- No furniture or fixtures will be erected on or across PRow without consent; and
- Users of walking/ cycling routes (including PRow) will be managed when needed, to ensure that these routes remain accessible and can be safely used throughout the construction phase. This includes cyclists using NCN Route 13 and users of PRow 146 including when passing through the redline boundary.

10.7.5 The above measures will be adopted for NCN Route 13 and PRow 146.

10.8 Potential Impacts

Introduction

10.8.1 To identify potential impacts, this section provides details of the proposed construction access and vehicle routing arrangements, construction programme, working hours, assessment parameters, forecast trip attraction and distribution and a preliminary highway impact assessment. These details have informed the assessment of the effects of the Proposed Development set out within Section 10.9 based on the parameters set out in Section 10.6.

General Overview

- 10.8.2 The potential impacts of the Proposed Development, as assessed within Section 10.9, relate to the forecast increase in traffic levels (including HGVs) on the surrounding highway network (within the study area) during the peak construction phase (2026) and whether this increase is expected to have a significant impact on other road users, cyclists and pedestrians across any of the receptors based on the assessment criteria identified in Section 10.6.
- 10.8.3 To provide a worst-case assessment, the construction vehicle trip attraction (Table 10-18) has been based on spoil removal by road transport (HGVs) rather than by barge.

Forecast Construction Vehicle Trip Attraction

- 10.8.4 For the purposes of this assessment and based on the information provided in support of the application, the peak daily number of HGVs and construction staff required for the Proposed Development are identified below, during the peak construction phase (2026) which comprises the tunnelling works. The shortest expected construction programme for the tunnelling phase will be 8 months, which provides a worst-case in terms of monthly (and therefore daily) construction vehicle trips. The duration of the entire construction programme is approximately 46 months.
- 10.8.5 There is expected to be a daily peak of 151 HGVs (302 two-way movements) during the peak construction phase of the Proposed Development, in the instance that all spoil is removed by road transport rather than by barge. This type of traffic would mainly be associated with the delivery of materials and equipment as follows:
- Shaft construction (including spoil removal);
 - Tunnel construction (including spoil removal);
 - Tunnel lining segments delivery;
 - Shaft lining segments delivery;
 - AILs for the delivery of the Tunnel Boring Machine (five HGVs are expected in total);
 - AILs for the delivery of Cable Drums (36 HGVs are expected in total);
 - Shaft fit out and head house construction;
 - Sealing end compound construction; and
 - 400kv overhead line diversions.
- 10.8.6 In terms of staff, there is expected to be a daily peak of 160 construction workers associated with the Proposed Development (which is a maximum daily figure). All construction workers will travel to/from the Proposed Development at the start and end of the working day. It has been assumed that all construction workers would travel by vehicle to provide a worst-case assessment in terms of road trips. An average vehicle occupancy factor of 1.5 construction workers per vehicle has been adopted which is considered to be reasonable, yet robust, given that staff will be encouraged to car share wherever possible in order to reduce the number of trips generated. This therefore equates to a daily peak of 107 staff vehicles (214 two-way movements) during the peak construction phase of the Proposed Development.
- 10.8.7 The following assumptions have been adopted in terms of working hours and daily travel patterns:
- The core construction working hours will be Monday to Sunday (8am-6pm);
 - Construction worker travel patterns have been based on the 'shoulder' peaks to the traditional network peak hours, with staff arrivals taking place between 7am-8am and staff departures taking place between 6pm-7pm; and
 - HGV movements have been distributed across a 10-hour window, arriving and departing between 8am-6pm. Rather than just adopting a flat profile, the profile of HGV movements across

the day has been based on the existing daily profile of HGV movements on the A1089 (informed by the DfT traffic count data). It should be noted that HGV movements will, in practice, be limited as far as possible so as not to travel during the traditional peak hours of 8am-9am and 5pm-6pm through the measures set out within the Outline CTMP (Appendix 10.1).

- 10.8.8 A daily profile of overall construction vehicle movements (arrivals and departures) for the Proposed Development during the peak construction phase is presented in Table 10-18 below.

Table 10-18: Forecast Peak Construction Vehicle Movements (2026)

Time	Staff		HGVs*		Total Vehicles		
	Arr	Dep	Arr	Dep	Arr	Dep	Total
07:00-08:00	107	0	0	0	107	0	107
08:00-09:00	0	0	16	16	16	16	32
09:00-10:00	0	0	15	15	15	15	30
10:00-11:00	0	0	15	15	15	15	30
11:00-12:00	0	0	16	16	16	16	32
12:00-13:00	0	0	17	17	17	17	34
13:00-14:00	0	0	18	18	18	18	36
14:00-15:00	0	0	17	17	17	17	34
15:00-16:00	0	0	16	16	16	16	32
16:00-17:00	0	0	12	12	12	12	24
17:00-18:00	0	0	9	9	9	9	18
18:00-19:00	0	107	0	0	0	107	107
Total	107	107	151	151	258	258	516

*based on HGVs removing spoil, rather than spoil removal by barge

- 10.8.9 Peak HGV activity would reduce from 151 daily HGVs to 70 daily HGVs in the instance that spoil is removed by barge rather than by road. This forms the preference for the Proposed Development and would reduce the peak daily level of HGV activity by more than 50%. The assessment within this chapter has nonetheless been based on the worst-case construction vehicle trip attraction presented in Table 10-18 above, where spoil would be removed by road.

Forecast Construction Vehicle Trip Distribution

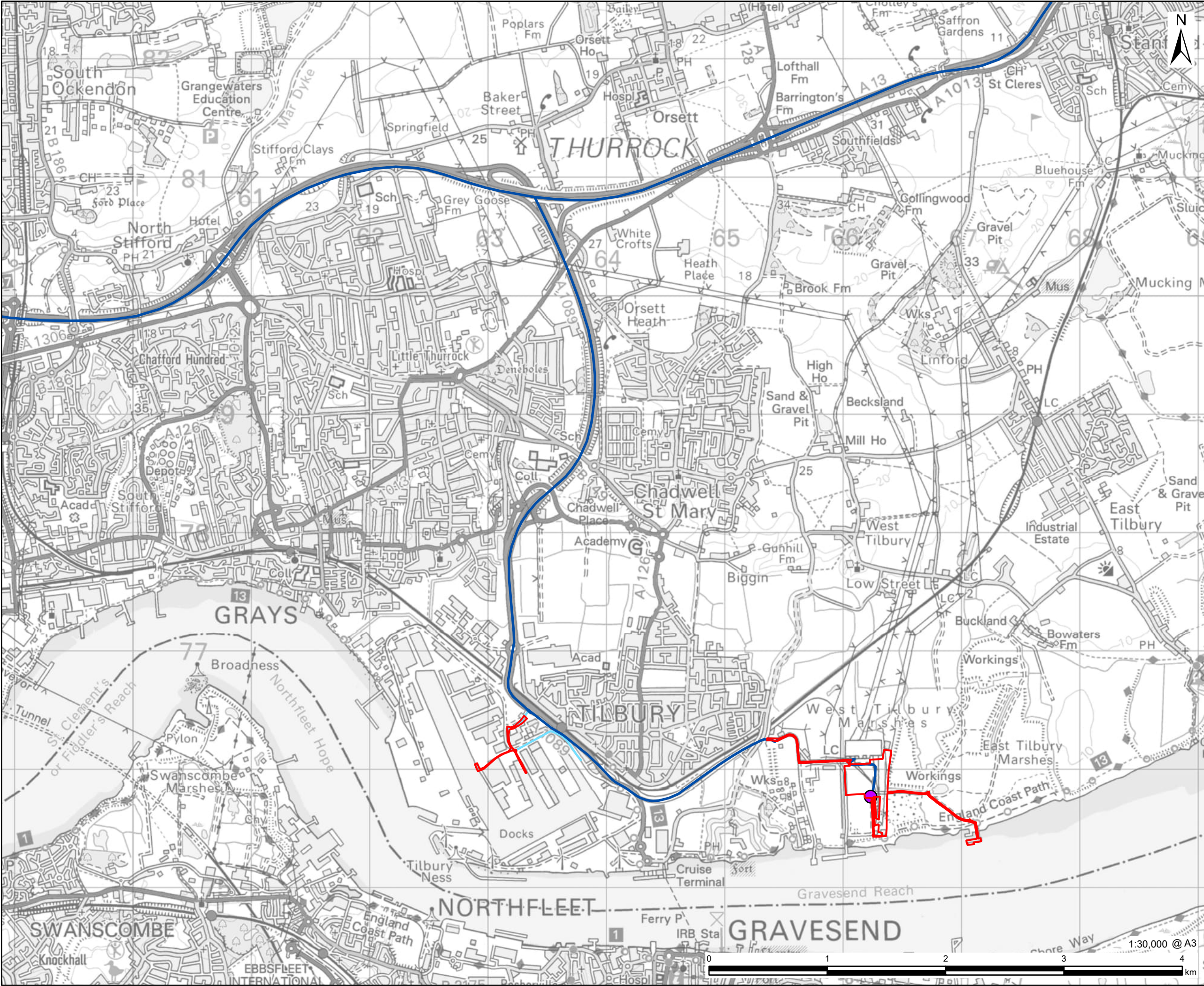
- 10.8.10 The Proposed Development will be accessed via Station Approach. The proposed construction route is the shortest available between the site and the SRN which is as follows:

- Arrivals: A13 – A1089 – Station Approach; and
- Departures: Station Approach – A1089 – A13.

- 10.8.11 An HGV routing plan is held in Figure 10-6.

- 10.8.12 Further details of the proposed access arrangements are set out within the Outline CTMP (Appendix 10.1). The location of the site access is also shown on Figure 10-6.

- 10.8.13 For the purposes of the trip distribution, it has been assumed that all vehicles would travel via the A13/A1089 junction to the north and use the A1089 and Station Approach to access the site to the south. To provide a worst-case assessment of the A13, all construction traffic has been assigned to both the A13 West (T-RL1) and the A13 East (T-RL2). This results in double-counting given that trips would be split between these two routes in reality.



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LEGEND

- Red Line Boundary (Above Ground)
- Site Access
- Abnormal Loads Route
- Construction HGV route

NOTES

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ISSUE PURPOSE

Traffic and Transport

PROJECT NUMBER

60677311

FIGURE TITLE

Site Access and Vehicle Routing

FIGURE NUMBER

Figure 10.6

Potential Construction Effects

- 10.8.14 A preliminary highway impact assessment has been undertaken to identify the forecast increases in traffic levels on the surrounding highway network (receptors) as a result of construction traffic during the peak construction phase. This has been informed by the forecast trip attraction and distribution presented above, on the basis that all spoil would be removed by road (worst-case).
- 10.8.15 The preliminary highway impact assessment is set out in Appendix 10.7, which includes all receptors during the development 'shoulder' peak hours (7am-8am and 6pm-7pm), network peak hours (8am-9am and 5pm-6pm), the weekday 12-hour period (7am-7pm) and 24 hour daily period. The average 12-hour weekday traffic flow assessment is also provided in Table 10-19, which typically identifies higher proportional increases than the average 24-hour daily traffic flow assessment due to lower baseline traffic flows. The results have been used to inform the assessments within Section 10.9.

Table 10-19: Preliminary Highway Impact Assessment – Construction Phase (2026) – Average Weekday (12 hours) Two-Way Flows

Receptor Ref	Location	Average Weekday (7am-7pm)			
		Base	Dev	Total	% Increase
T-RL1	A13 West	72,675	516*	73,191	0.7%
T-RL2	A13 East	61,186	516*	61,702	0.8%
T-RL3	A1089 North (North of A1089/Dock Road/Thurrock Park Way Roundabout)	28,540	516	29,056	1.8%
T-RL4	A1089 South (South of A1089/Dock Road/Thurrock Park Way Roundabout)	2,958	516	3,474	17.4%
T-RL5	Station Approach	1,841	516	2,357	28.0%
T-RJ1	A13/A1089 Junction	82,036	516	82,552	0.6%
T-RJ2	A1089/Dock Road/Thurrock Park Way (ASDA) Roundabout	35,917	516	36,433	1.4%
T-RJ3	A1089/Station Approach Junction	3,973	516	4,489	13.0%

*all trips assigned to both A13 West and A13 East to provide a worst-case assessment

- 10.8.16 The above shows that based on total traffic flows during the average weekday (12 hours), the proportional impacts as a result of construction traffic during the peak construction phase (2026) are below 30% for all receptors. Nonetheless, higher proportional increases in traffic flows are expected to be experienced during the development peak hours of 7am-8am and 6pm-7pm as a result of construction staff, as identified in Appendix 10.7.
- 10.8.17 As shown within Appendix 10.7, the largest proportional increase in traffic within the study area will be on Station Approach (T-RL5) during the PM development peak hour (6pm-7pm) due to construction staff departing the site. The increase in total traffic flows compared to baseline flows will be greater than 100% at this time, equating to a 'High' magnitude of change for the assessments of Severance, Pedestrian Delay, Non-Motorised User Amenity, Driver Delay and Road Safety. However, total traffic flows on Station Approach during the PM development peak hour (with the Proposed Development) will be comparable to future baseline levels during the AM network peak hour (8am-9am) without the Proposed Development. Furthermore, the high proportional increase in traffic flows during the PM development peak hour has been identified as a result of very low baseline flows on this part of the network (just 67 vehicles in an hour). There will also be no HGV movements during the PM development peak hour (6pm-7pm) as a result of the Proposed Development as shown by Table 10-18.

10.8.18 In view of the above, the magnitude of change relating to the Proposed Development has been downgraded from 'High' to 'Medium' (for the associated assessment criteria) given that Station Approach accommodates low baseline flows and will experience similar levels of traffic at peak times in the baseline scenario without the Proposed Development. The Proposed Development will also result in a 65% increase in traffic flows during the AM development peak hour (7am-8am), which equates to a 'Medium' magnitude of change (60-90%). Lower proportional increases (circa. 19%) are anticipated during the network peak hours, which would be equivalent to a 'Negligible' magnitude of change (<30%). This is also the case across the day (see Table 10-19). Therefore, the assigned magnitude level of 'Medium' is considered to be both appropriate and robust.

Potential Operational Effects

10.8.19 During normal operation of the Proposed Development, the only traffic generated would be associated with infrequent repair and routine maintenance works. Therefore, additional traffic movements during the operational phase are not anticipated to have a significant effect on the transport network or receptors. As such, an assessment of the operational phase has been scoped out of this ES chapter.

10.9 Assessment of Effects

10.9.1 This assessment of traffic and transport effects has been undertaken after the implementation of embedded mitigation. Please see Table 10-20: below.

10.9.2 The assessment has been based on the receptors identified in Section 10.3 (see also Appendix 10.5). Details of magnitude of impact with respect to each of the assessment criteria are set out in Appendix 10.8, based on the information presented in Section 10.6. Further details of the assessments are held in Appendix 10.9.

Table 10-20: Assessment of Traffic and Transport Effects during the Construction Phase

Receptor	Value/ Sensitivity	Potential Impact	Embedded Mitigation	Additional Mitigation	Magnitude	Effect
Construction Phase (Severance / Pedestrian Delay)						
T-RL1	Negligible	Severance / Pedestrian Delay	See Section 10.7	Not required	Negligible	Negligible
T-RL2	Negligible	Severance / Pedestrian Delay	See Section 10.7	Not required	Negligible	Negligible
T-RL3	Negligible	Severance / Pedestrian Delay	See Section 10.7	Not required	Negligible	Negligible
T-RL4	Low	Severance / Pedestrian Delay	See Section 10.7	Not required	Low	Negligible
T-RL5	Low	Severance / Pedestrian Delay	See Section 10.7	See Section 10.10	Medium	Minor
T-RJ1	Negligible	Severance / Pedestrian Delay	See Section 10.7	Not required	Negligible	Negligible
T-RJ2	Medium	Severance / Pedestrian Delay	See Section 10.7	Not required	Negligible	Negligible
T-RJ3	Low	Severance / Pedestrian Delay	See Section 10.7	Not required	Low	Negligible
Construction Phase (Non-Motorised User Amenity)						

Receptor	Value/ Sensitivity	Potential Impact	Embedded Mitigation	Additional Mitigation	Magnitude	Effect
T-RL1	Negligible	Non-Motorised User Amenity	See Section 10.7	Not required	Negligible	Negligible
T-RL2	Negligible	Non-Motorised User Amenity	See Section 10.7	Not required	Negligible	Negligible
T-RL3	Negligible	Non-Motorised User Amenity	See Section 10.7	Not required	Negligible	Negligible
T-RL4	Low	Non-Motorised User Amenity	See Section 10.7	Not required	Low	Negligible
T-RL5	Low	Non-Motorised User Amenity	See Section 10.7	See Section 10.10	Medium	Minor
T-RJ1	Negligible	Non-Motorised User Amenity	See Section 10.7	Not required	Negligible	Negligible
T-RJ2	Medium	Non-Motorised User Amenity	See Section 10.7	Not required	Negligible	Negligible
T-RJ3	Low	Non-Motorised User Amenity	See Section 10.7	Not required	Negligible	Negligible
Construction Phase (Fear and Intimidation)						
T-RL1	Negligible	Fear and Intimidation	See Section 10.7	Not required	Negligible	Negligible
T-RL2	Negligible	Fear and Intimidation	See Section 10.7	Not required	Negligible	Negligible
T-RL3	Negligible	Fear and Intimidation	See Section 10.7	Not required	Negligible	Negligible
T-RL4	Low	Fear and Intimidation	See Section 10.7	Not required	Negligible	Negligible
T-RL5	Low	Fear and Intimidation	See Section 10.7	Not required	Low	Negligible
T-RJ1	Negligible	Fear and Intimidation	See Section 10.7	Not required	Negligible	Negligible
T-RJ2	Medium	Fear and Intimidation	See Section 10.7	Not required	Negligible	Negligible
T-RJ3	Low	Fear and Intimidation	See Section 10.7	Not required	Low	Negligible
Construction Phase (Driver Delay)						
T-RL1	Negligible	Driver Delay	See Section 10.7	Not required	Negligible	Negligible
T-RL2	Negligible	Driver Delay	See Section 10.7	Not required	Negligible	Negligible
T-RL3	Negligible	Driver Delay	See Section 10.7	Not required	Negligible	Negligible
T-RL4	Low	Driver Delay	See Section 10.7	Not required	Low	Negligible
T-RL5	Low	Driver Delay	See Section 10.7	Not required	Medium	Minor

Receptor	Value/ Sensitivity	Potential Impact	Embedded Mitigation	Additional Mitigation	Magnitude	Effect
T-RJ1	Negligible	Driver Delay	See Section 10.7	Not required	Negligible	Negligible
T-RJ2	High	Driver Delay	See Section 10.7	Not required	Negligible	Minor
T-RJ3	Low	Driver Delay	See Section 10.7	Not required	Low	Negligible
Construction Phase (Road Safety)						
T-RL1	Medium	Road Safety	See Section 10.7	Not required	Negligible	Negligible
T-RL2	Medium	Road Safety	See Section 10.7	Not required	Negligible	Negligible
T-RL3	Medium	Road Safety	See Section 10.7	Not required	Negligible	Negligible
T-RL4	Medium	Road Safety	See Section 10.7	Not required	Low	Minor
T-RL5	Negligible	Road Safety	See Section 10.7	Not required	High	Minor
T-RJ1	High	Road Safety	See Section 10.7	Not required	Negligible	Minor
T-RJ2	High	Road Safety	See Section 10.7	Not required	Negligible	Minor
T-RJ3	Negligible	Road Safety	See Section 10.7	Not required	Low	Negligible
Construction Phase (Hazardous/Large Loads)						
T-RL1	Low	Hazardous/Large Loads	See Section 10.7	Not required	Low	Negligible
T-RL2	Negligible	Hazardous/Large Loads	See Section 10.7	Not required	Low	Negligible
T-RL3	Medium	Hazardous/Large Loads	See Section 10.7	Not required	Low	Minor
T-RL4	Negligible	Hazardous/Large Loads	See Section 10.7	Not required	Low	Negligible
T-RL5	Negligible	Hazardous/Large Loads	See Section 10.7	Not required	Low	Negligible
T-RJ1	Low	Hazardous/Large Loads	See Section 10.7	Not required	Low	Negligible
T-RJ2	Negligible	Hazardous/Large Loads	See Section 10.7	Not required	Low	Negligible
T-RJ3	Negligible	Hazardous/Large Loads	See Section 10.7	Not required	Low	Negligible

10.9.3 As shown above, the Proposed Development is expected to result in no significant impacts during the peak construction phase, with all effects for all receptors across all assessment criteria categorised as either negligible or minor. This is based on the worst-case assumption that all spoil would be removed by road transport.

10.10 Additional Mitigation

10.10.1 Additional mitigation measures are additional topic and site-specific measures that have been applied to mitigate or offset any likely significant effects. As no significant effects are expected, no additional mitigation has been identified further to the embedded mitigation set out previously.

10.11 Cumulative Effects

Combined Effects

10.11.1 There are unlikely to be any significant combined environmental effects associated with traffic and transport assessed above and other the environmental topics. Given the nature of the Proposed Development (replacing existing infrastructure within an industrial area) and following the embedded mitigation measures to be implemented as identified through the environmental assessments, it is determined that the combined impacts are of a scale that no significant combined impacts would arise.

Cumulative Effects

10.11.2 This section considers the potential cumulative traffic and transport effects on single receptors during the construction of the Proposed Development with regards to the construction and operational phases of other developments, based on those identified in Chapter 23: Cumulative Effects. Those developments which have been identified as potentially interacting with the Proposed Development, in terms of generating additional traffic movements within the study area during the peak construction phase (2026), are as follows:

- Lower Thames Crossing (Planning Inspectorate Reference: TR010032) – construction traffic;
- Thurrock Flexible Generation Plant (Planning Inspectorate Reference: EN010092) – construction traffic;
- Land at Marsh Farm Sewage Treatment Plant (Planning Application Reference: 22/01461/FUL) – operational traffic;
- Land at Former Tilbury B Power Station for External Storage – Area 1 (Planning Application Reference: 21/01927/FUL) – operational traffic; and
- Land at Former Tilbury B Power Station for External Storage – Area 2 (Planning Application Reference: 21/01928/FUL) – operational traffic.

10.11.3 The following developments have been scoped out of this cumulative assessment:

- Tilbury2 (Planning Inspectorate Reference: TR030003) – this development has been completed and any operational trips associated with this site should therefore be captured by the baseline traffic data including the 2023 survey on Station Approach;
- Extension to substation compound at Tilbury Power Station (Planning Application Reference: 15/00576/FUL) – the Design and Access Statement which accompanied the planning application stated that *“there will be a minor increase in traffic levels associated with the delivery and installation of new equipment and construction of associated infrastructure and no AILs are anticipated”*. As such, there is not expected to be a significant number of construction trips associated with the development; and
- Construction of up to 36 flats on Calcutta Road (Planning Application Reference: 21/01139/OUT) – due to the small-scale nature of the development (less than 50 dwellings) any potential increases in traffic levels as a result of the operational phase of the scheme have been treated through the application of TEMPro growth. In terms of the construction phase, no details of construction programme or trips were provided within the Transport Statement which accompanied the planning application.

10.11.4 The following section reviews each cumulative scheme in turn, followed by an overall cumulative assessment, including all cumulative schemes and the Proposed Development.

Lower Thames Crossing

10.11.5 The Lower Thames Crossing (LTC) is a Nationally Significant Infrastructure Project (NSIP) (Planning Inspectorate Reference: TR010032). This scheme has not yet been consented and any potential cumulative effects would therefore be subject to the approval of the application and the timescales for construction. Nonetheless, a review has been carried out below to inform this cumulative assessment.

10.11.6 The forecast construction traffic flows for the LTC are presented in the Transport Assessment (TR010032/APP/7.9) which was most recently updated in September 2023 at Deadline 4 (Ref 10-12). This identifies that, based on Tables 8.23-8.33 of that document, Phase 6 (scheduled to take place in 2027) is expected to be the peak construction phase in terms of construction traffic demand. The forecast changes in traffic flows to the north of the River Thames during Phase 6 are presented in plates 8.57 to 8.59 of the LTC Transport Assessment. These identify that there is expected to be additional traffic on the A13 and A1089 during the peak construction phase of the LTC. However, no additional movements are expected to use Station Approach, as vehicles would instead use Fort Road. The following assumptions have been adopted to estimate peak daily and peak hour construction vehicle movements on these parts of the network:

- Plates 8.57 (AM peak), 8.58 (Interpeak) and 8.59 (PM peak) present changes in Passenger Car Unit (PCU) flows, in each direction, based on various thresholds. The average value of each threshold (by direction) has therefore been adopted to estimate the change e.g. where a threshold is between +51 and +100 PCUs, a value of +75 PCUs has been adopted. This is considered to provide the most realistic estimate of traffic associated with LTC, to avoid potentially underestimating or overestimating traffic flows by adopting the lower or upper thresholds. The identified value for each direction has then been combined to identify an overall two-way change in PCU flows.
- The AM peak is 7am-8am, the PM peak is 5pm-6pm and Interpeak is an average hour within the period 9am-3pm. For the purposes of this assessment and in the absence of any further information, 12-hour weekday flows have been estimated by multiplying the Interpeak traffic flows by nine and then combining this with the AM and PM peaks, to represent an overall eleven-hour period of 7am-6pm (given that there is no information for 6pm-7pm).
- Table 8.28 presents construction traffic demand in Phase 6 and has been used to convert PCUs to total vehicles by adopting LTC's PCU conversion values of 1 for staff (to represent cars/ vans) and 2.5 for earthworks and supplies (to represent HGVs). This identifies that a 77% conversion factor should be applied to PCUs to identify total vehicles, and that 19% of total vehicles are expected to be HGVs. For example, 100 PCUs would equate to 77 vehicles including 62 cars/ vans (62 PCUs) and 15 HGVs (38 PCUs).
- Trips at the A13/A1089 junction have been calculated by combining 50% of the flows on each of the three arms to avoid double counting i.e. to represent traffic flows entering the junction on each arm.

10.11.7 The forecast cumulative increases in daily construction traffic flows as a result of LTC are presented in Table 10-21 below, based on peak construction traffic flows and on the worst-case assumption that the peak construction phases would both overlap. The full cumulative assessment for all schemes combined including for the peak hours is held in Appendix 10.10.

Thurrock Flexible Generation Plant

10.11.8 The forecast construction traffic flows for the Thurrock Flexible Generation Plant are presented in Tables 6.3 and 6.4 of Appendix 10.1: Transport Assessment of the Environmental Statement (EN010092 ES Volume 6). This identifies that construction vehicles would utilise the A13, A1089 and Station Approach. The peak construction traffic flows have therefore been adopted for these parts

of the highway network, to inform the assessment of potential cumulative effects carried out below. The following assumptions have been adopted based on the information presented in the Transport Assessment :

- There would be up to 82 HGVs and 63 cars/ minibuses per day during peak construction, equating to a daily total of 290 two-way vehicle movements (including 164 two-way HGV movements);
- There would be 16 two-way movements (all HGVs) during the weekday peak hours of 8am-9am and 5pm-6pm; and
- There would be 33 two-way movements (mostly cars/ minibuses) during the 'shoulder' peak hours of 7am-8am and 6pm-7pm.

10.11.9 In terms of trip distribution, it has been assumed that all vehicles would use Station Approach, the A1089 and the A13 within the study area. To provide a worst-case assessment of the A13, all construction traffic has been assigned to the A13 West (T-RL1) and the A13 East (T-RL2). This results in double-counting given that trips would be split between these two routes in reality. Trips at the A13/A1089 junction (T-RJ1) have however been based on A1089 flows to avoid double-counting.

10.11.10 The forecast cumulative increases in daily construction traffic flows as a result of Thurrock Flexible Generation Plant are presented in Table 10-21 below, based on peak construction traffic flows and on the worst-case assumption that the peak construction phases would both overlap. The full assessment including for the peak hours is held in Appendix 10.10.

Land at Marsh Farm Sewage Treatment Plant

10.11.11 The operational vehicle trip generation associated with Land at Marsh Farm Sewage Treatment Plant (Planning Application Reference: 22/01461/FUL) is presented in Tables 6.1 to 6.3 of the TA (Ref 10-14) which informed the planning application. The trips identified within Table 6.1 (cars associated with new vehicle storage) relate to the local highway network, whereas Tables 6.2 and 6.3 (HGVs associated with Port-related storage) relate to the wider highway network and the A1089/Dock Road/Thurrock Park Way (ASDA) Roundabout respectively. This information has been used to estimate operational traffic flows across the highway network within the study area, including for the peak hours of 8am-9am and 5pm-6pm, as well as daily. The following assumptions have been adopted:

- The forecast car trips on the local highway network (Table 6.1) relate to new vehicle storage and would travel along Station Approach and the A1089 Ferry Road to the south of the study area (via the A1089/Station Approach junction);
- The forecast HGV trips on the wider highway network (Table 6.2) are associated with Port-related storage and would travel along the A1089 to the east and west of the Port of Tilbury access (with a 50/50 split). Those travelling east would access the A1089 Ferry Road to the south of the study area (via the A1089/Station Approach junction). Those travelling west would pass through the A1089/Dock Road/Thurrock Park Way (ASDA) Roundabout (Table 6.3) and would continue towards the A1089 and A13; and
- To provide a worst-case assessment of the A13, all operational traffic has been assigned to the A13 West (T-RL1) and the A13 East (T-RL2). This results in double-counting given that trips would be split between these two routes in reality. Trips at the A13/A1089 junction (T-RJ1) have however been based on A1089 flows to avoid double-counting.

10.11.12 The forecast cumulative increase in daily operational traffic flows as a result of Land at Marsh Farm Sewage Treatment Plant are presented in Table 10-21 below. The full assessment including for the peak hours is held in Appendix 10.10.

Land at Former Tilbury B Power Station for External Storage (Areas 1 and 2)

- 10.11.13 The operational vehicle trip generation associated with Land at Former Tilbury B Power Station for External Storage – Area 1 (Planning Application Reference: 21/01927/FUL) is presented in Tables 5.5 and 5.6 of the TA (Ref 10-15) which informed the planning application. The trips identified within Table 5.5 (cars associated with new vehicle storage) relate to the local highway network, whereas Table 5.6 (HGVs associated with Port-related storage) relates to the wider highway network.
- 10.11.14 The operational vehicle trip generation associated with Land at Former Tilbury B Power Station for External Storage – Area 2 (Planning Application Reference: 21/01928/FUL) is presented in Tables 5.4 and 5.5 of the TA (Ref 10-16) which informed the planning application. The trips identified within Table 5.4 (cars associated with new vehicle storage) relate to the local highway network, whereas Table 5.5 (HGVs associated with Port-related storage) relates to the wider highway network.
- 10.11.15 This information has been used to estimate operational traffic flows across the highway network within the study area for both planning applications (Areas 1 and 2), including for the peak hours of 8am-9am and 5pm-6pm, as well as daily. The following assumptions have been adopted:
- The forecast car trips on the local highway network (Area 1 – Table 5.5 and Area 2 – Table 5.4) relate to new vehicle storage and would travel along Station Approach and the A1089 Ferry Road to the south of the study area (via the A1089/Station Approach junction);
 - The forecast HGV trips on the wider highway network (Area 1 – Table 5.6 and Area 2 – Table 5.5) are associated with Port-related storage and would travel along the A1089 to the east and west of the Port of Tilbury access (with a 50/50 split). Those travelling east would access the A1089 Ferry Road to the south of the study area (via the A1089/Station Approach junction). Those travelling west would pass through the A1089/Dock Road/Thurrock Park Way (ASDA) Roundabout and continue towards the A1089 and A13; and
 - To provide a worst-case assessment of the A13, all operational traffic has been assigned to the A13 West (T-RL1) and the A13 East (T-RL2). This results in double-counting given that trips would be split between these two routes in reality. Trips at the A13/A1089 junction (T-RJ1) have however been based on A1089 flows to avoid double-counting.
- 10.11.16 The forecast cumulative increase in daily operational traffic flows as a result of Land at Former Tilbury B Power Station for External Storage (Areas 1 and 2) are presented in Table 10-21 below. The full assessment including for the peak hours is held in Appendix 10.10.

Total Cumulative Traffic Flows

- 10.11.17 The total daily cumulative traffic flows associated with the schemes identified above are presented below in Table 10-21.

Table 10-21: Forecast Total Cumulative Two-Way Traffic Flows (Daily)

Receptor Ref	Location	LTC		Flexible Generation Plant		Marsh Farm		External Storage (Areas 1 and 2)	
		HGVs	Total	HGVs	Total	HGVs	Total	HGVs	Total
T-RL1	A13 West	565	2,902	164	286	66	66	425	425
T-RL2	A13 East	565	2,902	164	286	66	66	425	425
T-RL3	A1089 (North of Dock Road/ Thurrock Park Way Roundabout)	415	2,128	164	286	66	66	425	425

Receptor Ref	Location	LTC		Flexible Generation Plant		Marsh Farm		External Storage (Areas 1 and 2)	
		HGVs	Total	HGVs	Total	HGVs	Total	HGVs	Total
T-RL4	A1089 (South of Dock Road/ Thurrock Park Way Roundabout)	415	2,128	164	286	66	66	425	425
T-RL5	Station Approach	0	0	164	286	0	84	0	544
T-RJ1	A13/A1089 Junction	773	3,966	164	286	66	66	425	425
T-RJ2	A1089/Dock Road/Thurrock Park Way (ASDA) Roundabout	415	2,128	164	286	66	66	425	425
T-RJ3	A1089/ Station Approach Junction	415	2,128	164	286	66	150	425	969

10.11.18 The forecast increases in cumulative traffic levels on the surrounding highway network (receptors) as a result of the Proposed Development (construction traffic during the peak construction phase) and the above schemes are set out in Appendix 10.10. This includes the development 'shoulder' peak hours (7am-8am and 6pm-7pm), network peak hours (8am-9am and 5pm-6pm), the weekday 12-hour period (7am-7pm) and 24-hour daily period. In order to provide a worst-case assessment, the peak hour traffic flows for each scheme (which vary – see above) have been adopted for both the network and shoulder peak hours (except for Thurrock Flexible Generation Plant where this information was already available). The daily traffic flows presented for each cumulative scheme have been adopted for both the 12-hour weekday and 24-hour daily periods, given that it is not possible to calculate separate traffic flows for each period based on the information presented.

10.11.19 The average 12-hour weekday traffic flow assessment is also provided in Table 10-22, which identifies higher proportional increases than the average 24-hour daily traffic flow assessment due to lower baseline traffic flows.

Table 10-22: Cumulative Assessment – Construction Phase (2026) – Average Weekday (12 hours) Two-Way Flows

Receptor Ref	Location	Average Weekday (7am-7pm)			
		Base	Committed + Dev	Total	% Increase
T-RL1	A13 West	72,675	4,195	76,870	5.8%
T-RL2	A13 East	61,186	4,195	65,381	6.9%
T-RL3	A1089 North (North of A1089/Dock Road/Thurrock Park Way Roundabout)	28,540	3,421	31,961	12.0%

Receptor Ref	Location	Average Weekday (7am-7pm)			
		Base	Committed + Dev	Total	% Increase
T-RL4	A1089 South (South of A1089/Dock Road/Thurrock Park Way Roundabout)	2,958	3,421	6,379	115.7%
T-RL5	Station Approach	1,841	1,430	3,271	77.7%
T-RJ1	A13/A1089 Junction	82,036	5,259	87,295	6.4%
T-RJ2	A1089/Dock Road/Thurrock Park Way (ASDA) Roundabout	35,917	3,421	39,338	9.5%
T-RJ3	A1089/Station Approach Junction	3,973	4,049	8,022	101.9%

10.11.20 As can be seen from Table 10-22 (and from Appendix 10.10 for the peak hours), the predicted cumulative increases in traffic flows against baseline traffic flows are expected to be below the 30% threshold for the majority of the highway network, except for the parts of the local highway network (receptors T-RL4, T-RL5 and T-RJ3) where baseline traffic flows are much lower. Therefore, the cumulative increases identified above are assumed to result in no discernible environmental impact for the wider highway network (T-RL1, T-RL2, T-RL3, T-RJ1 and T-RJ2) as a result of the Proposed Development.

10.11.21 In terms of the local highway network, the A1089 South (T-RL4) to the southeast of the Port of Tilbury access and the A1089/Station Approach junction (T-RJ3) are expected to experience the following cumulative increases in traffic flows:

- For both receptors, a greater than 100% increase during the 12-hour weekday, 7am-8am, 8am-9am and 6pm-7pm periods, which equates to a 'High' magnitude of change for the assessments of Severance, Pedestrian Delay, Non-Motorised User Amenity, Driver Delay and Road Safety.
- For the A1089 South (T-RL4), a greater than 90% increase (but below 100% increase) over a 24-hour period, which equates to a 'High' magnitude of change for the assessments of Severance, Pedestrian Delay, Driver Delay and Road Safety, and a 'Medium' magnitude of change for the assessment of Non-Motorised User Amenity.
- For the A1089/Station Approach junction (T-RJ3), a greater than 70% increase (but below 90% increase) over a 24-hour period, which equates to a 'Medium' magnitude of change for the assessments of Severance, Pedestrian Delay, Non-Motorised User Amenity, Driver Delay and Road Safety.
- For both receptors, a greater than 70% increase (but below 90% increase) between 5pm-6pm, which equates to a 'Medium' magnitude of change for the assessments of Severance, Pedestrian Delay, Non-Motorised User Amenity, Driver Delay and Road Safety.

10.11.22 The Proposed Development will only result in a 'Low' magnitude of change (30-60%) for the A1089 South (T-RL4) and the A1089/Station Approach junction (T-RJ3) during the 7am-8am and 6pm-7pm periods, with a 'Negligible' magnitude of change (<30%) for the remaining periods (see Appendix 10.7). Therefore, traffic flows associated with the Proposed Development will represent an insignificant proportion of cumulative traffic flows for these parts of the network. Any potential discernible environmental impacts for the A1089 South (T-RL4) and the A1089/Station Approach junction (T-RJ3) as a result of additional traffic arising from committed schemes and the Proposed Development would not be expected to be attributed to the Proposed Development.

10.11.23 Lastly, Station Approach (T-RL5) is expected to experience the following cumulative increases in traffic flows:

- A greater than 100% increase between 6pm-7pm, which equates to a 'High' magnitude of change for the assessments of Severance, Pedestrian Delay, Non-Motorised User Amenity, Driver Delay and Road Safety.

- A greater than 90% increase (but below 100% increase) between 7am-8am, which equates to a 'High' magnitude of change for the assessments of Severance, Pedestrian Delay, Driver Delay and Road Safety, and a 'Medium' magnitude of change for the assessment of Non-Motorised User Amenity.
- A greater than 70% increase (but below 90% increase) during the 12-hour weekday, which equates to a 'Medium' magnitude of change for the assessments of Severance, Pedestrian Delay, Non-Motorised User Amenity, Driver Delay and Road Safety.
- A greater than 60% increase (but below 70% increase) over a 24-hour period, which equates to a 'Medium' magnitude of change for the assessments of Severance, Pedestrian Delay, Driver Delay and Road Safety, and a 'Low' magnitude of change for the assessment of Non-Motorised User Amenity.
- A greater than 30% increase (but below 50% increase) during the weekday peak hours of 8am-9am and 5pm-6pm, which equates to a 'Low' magnitude of change for the assessments of Severance, Pedestrian Delay, Driver Delay and Road Safety and a 'Negligible' magnitude of change for the assessment of Non-Motorised User Amenity.

10.11.24 As set out in Section 10.9, the high proportional traffic flow increases on Station Approach would arise due to very low baseline flows on this part of the network. There is expected to be a maximum of 172 two-way vehicle movements per hour on Station Approach during the future baseline scenario (2026). This would increase to a maximum of 320 two-way vehicle movements per hour (between 7am-8am) as a result of the cumulative schemes and the Proposed Development, and a maximum of 271 vehicle movements per hour (between 7am-8am) as a result of just the Proposed Development. Therefore, the Proposed Development would result in an increase of 1-2 vehicle movements per minute, with a further increase of around one additional vehicle movement per minute as a result of the cumulative schemes.

10.11.25 It is considered that Station Approach has a low level of sensitivity to such increases, as it consists of a wide single carriageway which is designed to accommodate HGVs (43% of baseline traffic comprises HGVs during the 12-hour weekday) with and has had no recorded collisions in five years. There is also a wide off-carriageway pedestrian/cycle facility on the southern side of Station Approach which reduces Severance and improves Non-Motorised User Amenity and Road Safety for pedestrians and cyclists. Therefore, it is not considered that the cumulative traffic flow increases would have the potential to result in any significant impacts on Station Approach, with respect to traffic and transport.

Cumulative Effects Summary

10.11.26 It is considered that each of the potential impacts and environmental risks relating to traffic and transport associated with the works can be managed through the application of accepted good practice and compliance with the measures outlined above. Cumulative traffic increases have been identified for the A1089 (South) and the A1089/Station Approach junction following the inclusion of the cumulative schemes (with an associated increase in magnitude of change). However, this remains the case without the Proposed Development, which is in itself expected to have a low or negligible impact with no environmental effects on these parts of the local highway network as a result of construction-related traffic. The high proportional traffic flow increases identified on Station Approach arise due to very low baseline flows and it is not considered that the cumulative increase in traffic would have the potential to result in any significant impacts with respect to traffic and transport.

10.11.27 As a result, the Proposed Development is not in itself expected to result in any significant environmental effects in terms of traffic and transport. It is concluded that any potential discernible environmental impacts as a result of additional traffic arising from committed schemes and the Proposed Development would not be expected to be attributed to the Proposed Development.

10.12 Overall Summary

10.12.1 Following the above assessment, no significant effects on traffic and transport have been identified as a result of the Proposed Development during any phase with the embedded mitigation in place, as all effects have either been categorised as minor adverse or negligible. No additional mitigation is therefore required to avoid any potentially significant effects. Whilst the assessment has been based on spoil removal by road as a worst-case in terms of HGV numbers, the preference will be to remove spoil by barge to reduce HGV movements on the wider road network around Tilbury. Further details of these proposals are set out within the Outline CTMP (Appendix 10.1).

10.13 References

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10.14 Abbreviations

Abbreviation	Meaning
AIL	Abnormal Indivisible Loads
ATC	Automatic Traffic Count
CLOCS	Construction Logistics and Community Safety
CTMP	Construction Traffic Management Plan
DfT	Department for Transport
ECC	Essex County Council
EIA	Environmental Impact Assessment
ES	Environmental Statement
HGV	Heavy Goods Vehicle
IEMA	Environmental Management and Assessment
LGV	Light Goods Vehicles
LHA	Local Highways Authority
LTC	Lower Thames Crossing
LTP	Local Transport Plan
NCN	National Cycle Network
NRTF	National Road Traffic Forecast
NSIPs	Nationally Significant Infrastructure Projects
NTM	National Transport Model
NTEM	National Trip Ends Model
NPS	National Policy Statement
PIA	Personal Injury Accident
PINS	Planning Inspectorate
PRoW	Public Right of Way
SRN	Strategic Road Network
TA	Transport Assessment
TAG	Transport Analysis Guidance
TEMPro	Trip Ends Model Program
TKRE	Tilbury to Grain and Tilbury to Kingsnorth
TS	Transport Statement

