Thurrock Flexible Generation Plant

Preliminary Environmental Information Report
Chapter 10: Traffic and Transport

Date: September 2018

Environmental Impact Assessment

Preliminary Environmental Information Report

Volume 3

Chapter 10

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Summary

This PEIR document considers the traffic and transport impact of the proposed Thurrock Flexible Generation Plant development. Supporting information on the assessment methodology and modelling results can be found in Volume 6, Appendix 10.1: Transport Assessment.

Qualifications

This document has been prepared by Joanna Gunn, a Consultant Transport Planner who has three years’ experience of environmental impact assessment.

It has been checked by David Archibald, Director, a Member of the Chartered Institution of Highways and Transportation with 18 years’ experience of environmental impact assessment.

1. Introduction

1.1 Purpose of this chapter

1.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) presents the findings of Environmental Impact Assessment (EIA) work undertaken to date concerning potential impacts of Thurrock Flexible Generation Plant on traffic and transport.

1.1.2 The PEIR is being published to inform pre-application consultation. Following consultation, comments on the PEIR will be reviewed and taken into account in preparation of the Environmental Statement (ES) that will accompany the application to the Planning Inspectorate (PINS) for development consent.

1.1.3 The construction phase will generate the greatest number of vehicle movements as the transportation of materials and infrastructure will incur the greatest number of heavy goods vehicles (HGV) and staff movements. It is this phase that this chapter focusses on principally but not exclusively.

1.1.4 The level of vehicles generated during the operational and maintenance phase will be irregular and very low, only a few vehicle movements per week. When the site is decommissioned, the process will require its removal from site which will generate associated vehicle movements, including HGV movements. Since there is no further use for the materials, such materials can be removed in bulk after demolition without the care that is taken during construction. This means that larger payloads can be achieved, and the traffic flows associated with decommissioning would be lower than those during construction. The assessments undertaken for the construction phase will therefore cover the decommissioning phase, together with the measures identified.

1.1.5 This chapter summarises and builds upon information contained within technical assessment, included at Volume 6, Appendix 10.1: Transport Assessment (TA).

1.1.6 In particular, this PEIR chapter:

- presents the existing environmental baseline established from studies, surveys and consultation to date;
- presents the potential environmental effects on traffic and transport arising from Thurrock Flexible Generation Plant, based on the information gathered and the analysis and assessments undertaken to date;
- identifies any assumptions and limitations encountered in compiling the environmental information; and
- highlights any necessary monitoring and/or mitigation measures that could prevent, minimise, reduce or offset the possible environmental effects identified in the EIA process.

1.2 Planning policy context

1.2.1 Planning policy for energy generation Nationally Significant Infrastructure Projects (NSIPs), specifically in relation to traffic and transport is contained in the Overarching National Policy Statement (NPS) for Energy (EN-1; DECC, 2011a) and the NPS for Fossil Fuel Electricity Generating Infrastructure (EN-2, DECC, 2011b).

1.2.2 These documents frame the planning policy perspective for this type of development, with EN-2 being the most relevant, given the small scale of gas and electricity grid connection required at this location.

1.2.3 NPS EN-1 includes guidance on what matters are to be considered in the assessment. These are summarised in Table 1.1 below.

Table 1.1: Summary of NPS EN-1 provisions relevant to this chapter.

Summary of NPS EN-1 provision	How and where considered in the PEIR
Introduction	
The transport of materials, goods and personnel to and from a development during all project phases can have a variety of impacts on the surrounding transport infrastructure and potentially on connecting transport networks, for example through increased congestion. Impacts may include economic, social and environmental effects. Environmental impacts may result particularly from increases in noise and emissions from road transport. Disturbance caused by traffic and abnormal indivisible loads generated during the construction phase will depend on the scale and type of the proposal (paragraph 5.13.1).	This chapter of the PEIR considers all relevant potential transport impacts during the construction, operational and decommissioning phases of the proposed development. The traffic and transport study area has been established through discussions with the relevant highway authorities. Noise is considered in Volume 3, Chapter 11: Noise and Vibration, air impacts are considered in Volume 3, Chapter 12: Air Quality, and environmental impacts acting in combination on receptors are considered in Volume 4, Chapter 17: Summary of Inter-Related Effects.
The consideration and mitigation of transport impacts is an essential part of Government's wider policy objectives for sustainable development as set out in Section 2.2 of NPS EN-1 (paragraph 5.13.2).	This chapter of the PEIR identifies possible transport impacts and ways to mitigate them. The mitigation of these impacts is incorporated into the proposed development.

Summary of NPS EN-1 provision	How and where considered in the PEIR
Applicants Assessment	
If a project is likely to have significant transport implications, the applicant's Environmental Statement (ES) should include a TA[1], using the NATA/WebTAG methodology stipulated in Department for Transport (DfT) guidance (DfT, 2007), or any successor to such methodology. Applicants should consult the Highways Agency and Highways Authorities as appropriate on the assessment and mitigation (paragraph 5.13.3).	A TA is submitted in accordance with the NATA/WebTAG methodology stipulated in Department for Transport (DfT) guidance (DfT, 2007) and its replacement Planning Practice Guidance (PPG). The TA is presented at Volume 6, Appendix 10.1: Transport Assessment.
Where appropriate, the applicant should prepare a travel plan including demand management measures to mitigate transport impacts. The applicant should also provide details of proposed measures to improve access by public transport, walking and cycling, to reduce the need for parking associated with the proposal and to mitigate transport impacts (paragraph 5.13.4).	A Construction Staff Travel Plan will be submitted with the application for development consent.
If additional transport infrastructure is proposed, applicants should discuss with network providers the possibility of co-funding by Government for any third-party benefits. Guidance has been issued in England 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 5.13.5).	Additional transport infrastructure will not be co-funded by Government and will be funded by the applicant.
Decision Making	
A new energy NSIP may give rise to substantial impacts on the surrounding transport infrastructure and the Secretary of State should therefore ensure that the applicant has sought to mitigate these impacts, including during the construction phase of the development. Where the proposed mitigation measures are insufficient to reduce the impact on the transport infrastructure to acceptable levels, the Secretary of State should consider requirements to mitigate adverse impacts on transport networks arising from the development, as set out below. Applicants may also be willing to enter into planning obligations for funding infrastructure and otherwise mitigating adverse impacts (paragraph 5.13.6).	Section 4 identifies possible transport impacts resulting from all phases of development. Section 2.9 identifies mitigation measures (where relevant/necessary) incorporated into the proposed development.
Provided that the applicant is willing to enter into planning obligations or requirements can be imposed to mitigate transport impacts identified in the NATA/WebTAG TA, with attribution of costs calculated in accordance with the Department for Transport's guidance, then development consent should not be withheld, and appropriately limited weight should be applied to residual effects on the surrounding transport infrastructure (paragraph 5.13.7).	Section 4 identifies possible transport impacts resulting from all phases of development. Section 2.9 identifies commitments made to implementing appropriate mitigation measures.
Mitigation	
Where mitigation is needed, possible demand management measures must be considered and if feasible and operationally reasonable, required, before considering requirements for the provision of new inland transport infrastructure to deal with remaining transport impacts (paragraph 5.13.8).	The proposed mitigation measures relate to the routeing and timing of HGV movements and management of construction staff movement. Transport infrastructure is considered in Section 2.9.
The Secretary of State should have regard to the cost-effectiveness of demand management measures compared to new transport infrastructure, as well as the aim to secure more sustainable patterns of transport development when considering mitigation measures (paragraph 5.13.9).	Transport infrastructure is considered in Section 2.9.
The Secretary of State may attach requirements to a consent where there is likely to be substantial HGV traffic that: • Control numbers of HGV movements to and from the site in a specified period during its construction and possibly on the routing of such movements; • Make sufficient provision for HGV parking, either on the site or at dedicated facilities elsewhere, to avoid 'overspill' parking on public roads, prolonged queuing on approach roads and uncontrolled on-street HGV parking in normal operating conditions; and Ensure satisfactory arrangements for reasonably foreseeable abnormal disruption, in consultation with network providers and the responsible police force (paragraph 5.13.11).	Proposed HGV routes are identified and restrictions on HGV timing are proposed to avoid adverse impact on sensitive receptors, particularly schools. The design of the construction works will avoid the risk of HGV parking on surrounding highway. The transport of abnormal indivisible loads has been subject to necessary studies and is expected to cause minimal disruption.
If an applicant suggests that the costs of meeting any obligations or requirements would make the proposal economically unviable this should not in itself justify the relaxation by the Secretary of State of any obligations or requirements needed to secure the mitigation (paragraph 5.13.12).	The costs of transport mitigation currently envisaged by the applicant will not make the Thurrock Flexible Generation Plant economically unviable.

[1] Transport Assessment (TA)

1.2.4 NPS EN-2 also highlights a number of factors relating to the determination of an application and in relation to mitigation. These are summarised in Table 1.2 below.

Table 1.2: Summary of NPS EN-2 policy on decision making relevant to this chapter.

Summary of NPS EN-2 policy on decision making (and mitigation)	How and where considered in the PEIR
Transport Infrastructure	
Government policy encourages multi-modal transport and materials (fuel and residues) may be transported by water or rail routes where possible. (See Section 5.13 of EN-1 on transport impacts). Applicants should locate new fossil fuel generating stations in the vicinity of existing transport routes wherever possible. Although there may in some instances be environmental advantages to rail or water transport, whether or not such methods are viable is likely to be determined by the economics of the scheme. Road transport may be required to connect the site to the rail network, waterway or port. Any application should therefore incorporate suitable access leading off from the main highway network. If the existing access is inadequate and the applicant has proposed new infrastructure, the IPC should satisfy itself that the impacts of the new infrastructure are acceptable as set out in Section 5.13 of EN-1 (paragraph 2.2.6).	Transport infrastructure is considered in Section 2.9.

Other Relevant Policies

National Planning Policy Framework (2018)

1.2.5 The National Planning Policy Framework (NPPF) adopted in July 2018 (Ministry for Housing, Communities and Local Government, 2018), replaces the previous version adopted in March 2012. The NPPF aims to enable local people and their accountable councils to produce their own distinctive local and neighbourhood plans, which reflect the needs and priorities of their communities.

1.2.6 National policy in relation to the transport planning of developments is set out in Section 9 of the framework 'Providing Sustainable Transport – considering development proposals' and states the following:

1.2.7 Paragraph 106 states that:

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

1.2.8 Paragraph 108 states that:

"In assessing sites that may be allocated for development in plans, or specific applications for development, it should be ensured that:

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

1.2.9 Paragraph 109 states that:

"Development should only be prevented or refuse on highway grounds if there would be an unacceptable impact on highway safety or residual cumulative impacts on the road network would be severe."

1.2.10 Paragraph 111 states that:

"All developments that will generate significant amounts of movement should be required to provide a travel plan, and the application should be supported by a transport statement or transport assessment so that the likely impacts of the proposal can be assessed."

1.2.11 Having regard to the above, the proposed development's access and movement will ensure that the development is connected to the wider highway network.

Local Policy

1.2.12 Local strategy with respect to land use and transport is articulated in statutory documents prepared by planning and highway authorities which, for this development, comprises of:

- Thurrock Core Strategy and Policies for Management of Development (Thurrock Council, 2015);
- Thurrock Transport Strategy (Thurrock Council, 2013);
- Thurrock Council – Parking Strategy and Policies (Thurrock Council, 2016) and

- Essex County Council Development Management Policies (Essex County Council, 2011).

1.2.13 National policy on transport and land use establishes broad policy objectives that reflect the Government's aspirations for integrating land development and transport. The role of local government is to develop strategies based on specific local social and spatial requirements, which deliver the national aspirations.

Thurrock Core Strategy and Policies for Management of Development (2015)

1.2.14 The Thurrock Borough Core Strategy and Policies for Management of Development (Adopted December 2011, amended 2015) is a strategic document providing broad guidance on the scale and distribution of development and the provision of supporting infrastructure. It sets out the spatial vision, spatial objectives, the spatial development strategy and policies for Thurrock to 2026 and beyond, together with a monitoring and implementation framework.

1.2.15 The Transport and Access section sets out the Council's strategy for tackling congestion, road safety, air quality and enabling better access to services. Its aims are to reduce the need to travel and encourage the location of new development and delivery of services in places that have good levels of accessibility for people.

1.2.16 Policy CSTP14 (Transport in the Thurrock Urban Area) identifies the measures to be promoted to increase the uptake of travel by sustainable modes, it is identified that the Council will work to deliver at least a 10% reduction in car traffic from forecast 2026 levels. Within Policy CSTP14 it is stated that new development should:

"promote high levels of accessibility by sustainable transport modes and local services are conveniently located to reduce the need to travel by car."

1.2.17 Policy CSTP16 (National and Regional Transport Networks) states that the Council will work with partners to deliver improvements to national and regional networks, in particular to:

"Support the delivery of additional highway capacity, including through the use of technology and information, but only where modal shift will be insufficient to address congestion. Opportunities will be taken to improve public transport as part of any enhancements. Priority will be given to routes that provide access, especially for freight, to Strategic Employment Sites, the ports at London Gateway, Tilbury and Purfleet, and regeneration areas. This will include:

- *M25 between junctions 27 and 30;*
- *M25 junction 30;*
- *A13 from A128 to A1014;*
- *A13 and A1089 junction improvement; and*
- *A1014 from A13 to London Gateway."*

1.2.18 Policy CSTP17 (Strategic Freight Movement and Access to Ports) states that, the Council will support the logistics and port sectors, and the positive impacts of freight activity in Thurrock and beyond, by:

- *"Facilitating a shift to rail freight and freight carried on the River Thames. This will be through;*
- *Protecting inter-modal, rail and water-borne freight facilities from other development at locations where a demand exists or is expected to exist;*
- *Promoting the use of rail and water borne freight facilities by supporting the development of appropriate infrastructure;*
- *Supporting improvements to facilitate sustainable freight movements, including the rail hub at London Gateway, the South West Thurrock Railhead and improving access to the ports;*
- *Facilitating the provision of 24-hour lorry parks at Tilbury Port, London Gateway and West Thurrock. Subject to compliance with other policies in this plan, other lorry parks will be considered in locations where demand can be shown to exist, which are located away from residential areas and have good access to the Strategic Road Network"*

1.2.19 It is also identified in Policy CSTP17 that the Council will support the logistics and port sectors by working as part of a Freight Quality Partnership and with other relevant partners to:

- *"Maximise modal shift opportunities;*
- *Ensure freight traffic keeps to the most suitable routes as defined in TC's Road Network Hierarchy;*
- *Promote the use of less polluting vehicles; and*
- *Reduce the adverse impact of congestion caused by freight on the A13, A1089 and A1306."*

Thurrock Transport Strategy 2013 – 2026

1.2.20 The Thurrock Transport Strategy describes Thurrock Council's transport strategy for the period 2013 to 2026, setting out the aims, objectives and policies for delivering transport improvements in Thurrock. As such, the document comprises the strategy element of the third Local Transport Plan (LTP3) for Thurrock. Thurrock's Transport Strategy Vision aims to create a transport system for Thurrock that:

- is fully inclusive, meeting the social needs of residents;
- is integrated to provide seamless multi-modal journeys;
- is accessible for everyone, safe and attractive to use;
- delivers sustainable community regeneration and growth; and
- reflects the exceptional circumstances of Thurrock as an international centre for logistics and commercial development.

1.2.21 The plan seeks to promote capacity improvements on the Strategic Road Network, with priority for freight routes to key strategic economic hubs.

Thurrock Council – Parking Strategy and Policies (2016-2021)

1.2.22 The Thurrock Parking Strategy outlines the policies and strategies over the five years from 2016-2021.

1.2.23 It is identified that Thurrock Council will:

"Work in close partnership with the ports, freight operators and Essex Police to ensure that freight movements can be accommodated with minimum disruption to residents."

Essex County Council Development Management Policies (February 2011)

1.2.24 The Essex Development Management Policies outlines the key transport policies for Essex County Council. In terms of Transport Assessments, Policy DM13 states that the highway authority will require:

"A Transport Assessment (TA) to accompany a planning application in accordance with the thresholds set out in Appendix B, or where the Highway Authority deems it to be necessary."

1.2.25 In relation to HGV movements, Policy DM19 states:

"The Highway Authority will protect the safety and efficiency of the highway network by ensuring that any proposals which generate a significant number of heavy goods vehicle movements:

- *Are located in close proximity to Strategic Routes / Main Distributors and / or Secondary Distributors;*
- *Are connected to Strategic Routes / Main Distributors and / or Secondary Distributors via short sections of other roads;*
- *Will where appropriate require the developer to submit and agree with the Highway Authority a routing management plan in relation to heavy goods vehicle movements."*

1.2.26 The requirements for the management of construction traffic are set out in Policy DM20:

"The Highway Authority will protect the safety and efficiency of the highway network by ensuring that:

- *Any temporary construction access and / or haul road will be agreed with the Highway Authority prior to commencement of development;*
- *A Construction Traffic Management Plan is submitted and agreed with the Highway Authority prior to commencement of development;*
- *Details of parking and turning for all construction traffic within the development site are submitted and agreed with the Highway Authority prior to commencement of development;*
- *Details of wheel cleaning facilities within the development site are submitted and agreed with the Highway Authority prior to commencement of development.*

1.3 Consultation

1.3.1 Key issues raised during scoping and consultation to date specific to Traffic and Transport are listed in Table 1.3, together with how details of how these issues have been considered in the production of this PEIR and cross-references to where this information may be found.

Table 1.3: Key points raised during scoping and consultation to date.

Date	Consultee and type of response	Points raised	How and where addressed
August 2018	Thurrock Council and Highways England	An initial meeting between the Applicant and Highway Officers at Thurrock Council and Highways England identified the potential for a haul road to be provided between St Chad's Road and Gun Hill.	Access is considered in Section 2.9 and is based upon the advice received from Highway Officers.
August 2018	Thurrock Council	The Applicant provided details of a potential haul road between St Chad's Road and Gun Hill to a Highway Officer at Thurrock Council, which received positive feedback.	Access is considered in Section 2.9 and is based upon the advice received from Highway Officers.
September 2018	The Planning Inspectorate Scoping Opinion: Proposed Thurrock Flexible Generation Plant	The ES should address cumulative impacts from traffic during operation of the Proposed Development together with traffic from other developments (including Tilbury2, Tilbury Energy Centre and the Lower Thames Crossing) where significant effects are likely.	Cumulative effects are considered in Section 5 and have considered these emerging developments.
September 2018	The Planning Inspectorate Scoping Opinion: Proposed Thurrock Flexible Generation Plant	The ES should clearly define the study area used for the assessment and explain the approach taken to do so which should be influenced by the extent of likely impacts. The ES should include a plan to depict the study area.	Details on the study area are set out in Section 2.4.
September 2018	The Planning Inspectorate Scoping Opinion: Proposed Thurrock Flexible Generation Plant	The ES should assess impacts that may result in likely significant effects on the safety, reliability and operation of the Strategic Road Network, including the M25 (particularly Junction 30), the A13 and the A1039.	An assessment of the significant effects of the development upon the strategic road network is set out in Section 4 and at Volume 6, Appendix 10.1: Transport Assessment.
September 2018	The Planning Inspectorate Scoping Opinion: Proposed Thurrock Flexible Generation Plant	Paragraph 8.50 of the Scoping Report indicates that a Construction Worker Travel Plan and Construction Traffic Management Plan are to be provided. Draft/ outline versions of these documents can be appended to the ES.	An Outline Construction Worker Travel Plan and Outline Construction Traffic Management Plan (CTMP) will be submitted with the application for development consent.
September 2018	The Planning Inspectorate Scoping Opinion: Proposed Thurrock Flexible Generation Plant	The ES should confirm the anticipated number of abnormal loads, the types of vehicles required. Any mitigation measures required to facilitate the delivery of abnormal loads should be detailed in the ES.	An estimate of the number of abnormal indivisible loads is set out in Table 2.6.
September 2018	The Planning Inspectorate Scoping Opinion: Proposed Thurrock Flexible Generation Plant	The ES should explain and justify the locations for the traffic count surveys. The locations should be shown on a supporting plan included within the ES or supporting appendices.	Details on background traffic flows are set out in Volume 6, Appendix 10.1: Transport Assessment.
September 2018	The Planning Inspectorate Scoping Opinion: Proposed Thurrock Flexible Generation Plant	The ES should clearly describe the routes to be used for all vehicular access during construction and operation of the Proposed. For the assessment of impacts during construction the ES should explain how the proposed access route(s) relate to sensitive receptors.	Details on access routes are set out on Figure 1 of Volume 6, Appendix 10.1: Transport Assessment. The identification of sensitive receptors along the access route is set out in Table 3.1.
September 2018	The Planning Inspectorate Scoping Opinion: Proposed Thurrock Flexible Generation Plant	The Traffic and Transport chapter of the ES should include an assessment of impacts resulting from transportation of construction materials/ abnormal loads to the site via water, if this option is pursued.	Consideration on the ability of using the jetty to enable transportation by water is set out in Volume 6, Chapter 2: Project Description.
September 2018	The Planning Inspectorate Scoping Opinion: Proposed Thurrock Flexible Generation Plant	It is unclear whether an assessment of impacts during decommissioning is proposed. The ES should set out the likely impacts on Traffic and Transport resulting from decommissioning of the Proposed Development in respect to Traffic and Transport. Any likely significant effects should be assessed.	Consideration of the traffic generated during decommissioning is set out in paragraph 1.1.4.

2. Assessment Approach

2.1 Transport Guidance

2.1.1 The traffic and transport assessment has followed the methodology set out in Volume 2, Chapter 4: Environmental Impact Assessment Methodology. Specific to this chapter, the following guidance documents have also been considered:

- Guidelines for the Environmental Assessment of Road Traffic (Institute of Environmental Management and Assessment (IEMA), 1993);
- Volume 11 – Environmental Impact Assessment of the Design Manual for Roads and Bridges (DMRB) (Highways Agency *et al,* 2008); and
- Guidance on Transport Assessment, (DfT, 2007)[2].

2.2 Assessment Methodology

2.2.1 In accordance with the 'Guidelines for the Environmental Assessment of Road Traffic' (IEMA, 1993), the significance of effects have been assessed by considering the interaction between the magnitude of the impact and the sensitivity of the receptor in the vicinity of transport corridors. This assessment has compared the future baseline situation in the year of construction, taking into account other schemes that are likely to affect the future baseline condition in the year of construction, against a scenario which includes the development of the Thurrock Flexible Generation Plant.

2.2.2 Consistent with the IEMA guidelines, the following have been considered in this chapter:

- driver delay;
- severance of routes;
- pedestrian delay;
- pedestrian amenity;
- accidents and road safety; and
- hazardous, dangerous and abnormal indivisible loads.

2.3 Baseline study

Desktop study

2.3.1 Information on traffic and transport within the transport study area was collected through a detailed desktop review of existing studies and datasets. These are summarised in Table 2.1 below.

Table 2.1: Summary of key desktop reports.

Title	Source	Year	Author
Identification of sensitive receptors	Search along access routes	2018	N/A
Road geometries and layouts	Analysis of access routes	2018	N/A
Identification of facilities for sustainable travel	Desktop analysis	2018	N/A
Analysis of Personal Injury Accident data	Crashmap.co.uk	2013 to 2017	Crashmap

Site specific surveys

2.3.2 Site visits to review the highway network have been undertaken to inform the EIA, as set out in Table 2.2.

[2] Although this guidance has since been withdrawn, it has not been replaced with a like-for-like document and in the absence of any such replacement remains a useful guide that is frequently referred to by Transport and Highways professionals.

Table 2.2: Summary of site-specific surveys undertaken.

Title	Extent of survey	Overview of survey	Survey provider	Year	Reference to further information
Highway inspections	Along the access routes	Highway inspections to consider highway extents, highway geometries and layouts, sensitive receptors and confirm the access route.	RPS	2018	N/A

2.4 Study area

2.4.1 As set out in Volume 2, Chapter 2: Project Description of this PEIR, the applicant is considering a number of potential construction access and traffic routes due to constraints, in particular for abnormal indivisible loads, caused by weight and dimensional limitations on sections of the public highway and the Station Road railway level crossing.

2.4.2 These access routes to the site from Junction 30 of the M25 are shown on Figure 2.1 and set out in Volume 6, Appendix 10.1: Transport Assessment and these highway links form the study area of this chapter.

2.5 Uncertainties and/or data limitations

2.5.1 The baseline data and survey data have been obtained from recognised sources and methodologies. In this sense, there are only limited limitations to their use. The traffic data is considered representative of current conditions.

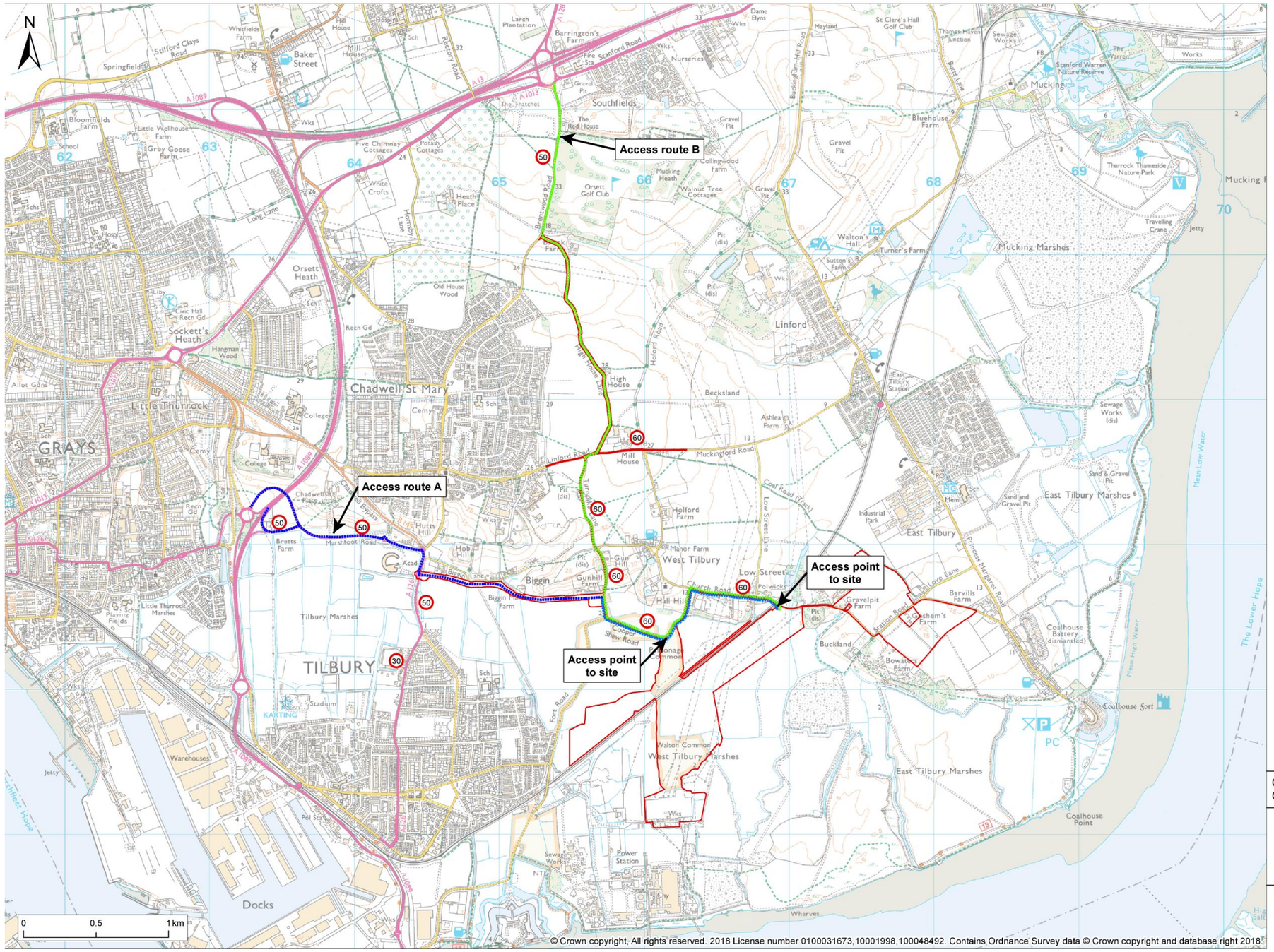
2.6 Impact assessment criteria

2.6.1 The significance of an effect is determined based on the magnitude of an impact and the sensitivity of the receptor affected by the impact. This section describes the criteria applied in this chapter to characterise the magnitude of potential impacts and sensitivity of receptors. The terms used to define magnitude and sensitivity are based on those used in the DMRB methodology, which is described in further detail in Volume 2, Chapter 4: Environmental Impact Assessment Methodology.

2.6.2 The criteria for defining magnitude in this chapter are outlined in Table 2.3.

Table 2.3: Criteria for magnitude of impact.

Magnitude of impact	Definition used in this chapter
Major	Substantial or total loss of capability for movement along or across transport corridors, loss of access to key facilities and loss of highway safety. Severe delays to travellers (adverse).
	Large scale improvement in the capability for movement along and across transport corridors, major improvement in access to key facilities, in highway safety and in delays to travellers (beneficial).
Moderate	Moderate loss of capability for movement along or across transport corridors, loss of access to key facilities and loss of highway safety. Severe delays to travellers (adverse).
	Moderate improvement in the capability for movement along and across transport corridors, major improvement in access to key facilities, in highway safety and in delays to travellers (beneficial).
Minor	Some measurable loss of capability for movement along and across transport corridors, some measurable loss of access to key facilities and some measurable loss of highway safety. Some measurable increase in delays to travellers (adverse).
	Some measurable increase in the capability for movement along and across transport corridors, some measurable increase in access to key facilities and some measurable increase in highway safety. Some measurable increase in delays to travellers. Reduced risk of negative impacts occurring (beneficial).
Negligible	Very minor loss of capability for movement along and across transport corridors, very minor loss of access to key facilities and very minor loss of highway safety. Very minor increase in delays to travellers (adverse).
	Very minor increase in capability for movement along and across transport corridors, very minor increase in access to key facilities and very minor increase in highway safety. Very minor decreases in delays to travellers (beneficial).
No change	No loss of capability for movement along and across transport corridors, no change of access to key facilities and highway safety. No delays to travellers.



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Thurrock Flexible Generation Plant
Route Access Options

Figure 2.1: Access Routes Options

2.6.3 The criteria for defining sensitivity in this chapter are outlined in Table 2.4.

Table 2.4: Criteria for receptor sensitivity.

Sensitivity	Definition used in this chapter
Very High	Very High: Those receptors with greatest sensitivity due to site-specific characteristics which make them particularly sensitive to changes in traffic flow (e.g. community with high incidence of mobility impairment requiring residents to cross roads to access essential facilities)
High	High: Receptors of high sensitivity to traffic flows (e.g. schools, colleges, playgrounds, accident black spots, urban/residential roads without footways that are used by pedestrians)
Medium	Medium: Receptors of medium sensitivity to traffic flows (e.g. congested junctions, doctors' surgeries, hospitals, shopping areas with roadside frontage, roads with narrow footways, un-segregated cycle ways, community centres, parks, recreation facilities, retirement homes)
Low	Low: Receptors with some sensitivity to traffic flows (e.g. places of worship, public open space, nature conservation areas, listed buildings, tourist attractions and residential areas with adequate footway provision)
Negligible	Receptors with low sensitivity to traffic flows and those sufficiently distant from affected roads and junctions

2.6.4 The significance of the effect upon traffic and transport is determined by correlating the magnitude of the impact and the sensitivity of the receptor. The particular method employed for this assessment is presented in Table 2.5. Where a range of significance of effect is presented in Table 2.5, the final assessment for each effect is based upon expert judgement.

2.6.5 For the purpose of this assessment, any effects with a significance level of minor or less are considered to be **not significant** in EIA terms.

Table 2.5: Matrix used for the assessment of the significance of an effect.

		Magnitude of impact				
Sensitivity of receptor		***No change***	***Negligible***	***Minor***	***Moderate***	***Major***
	Negligible	No change	Negligible	Negligible or minor	Negligible or minor	Minor
	Low	No change	Negligible or minor	Negligible or minor	Minor	Minor or moderate
	Medium	No change	Negligible or minor	Minor	Moderate	Moderate or major
	High	No change	Minor	Minor or moderate	Moderate or major	Major or substantial
	Very high	No change	Minor	Moderate or major	Major or substantial	Substantial

Screening Tests

2.6.6 In order to establish whether a highway link should be included as part of the detailed environmental assessment the following tests, that are set out in the IEMA Guidelines, are applied:

- Rule 1: include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%); and
- Rule 2: include any other specifically sensitive areas where traffic flows will increase by 10% or more.

2.6.7 Based on the above, any link where changes in total traffic flows or HGV flows resulting from the development are predicted to be less than 10% and 30% respectively is screened out of the assessment. It should be noted that changes in total traffic flows of less than 10% are generally considered to be insignificant given that the daily variations in background traffic flows may fluctuate by this amount. Based on the above, any link where changes in total traffic flows are predicted to be less than 30% when not in a sensitive location are also screened out of the assessment.

2.6.8 Links that are defined as high or very high sensitivity are deemed as sensitive, in accordance with the IEMA thresholds, and have been assessed against the rule 2 threshold. Links that are defined as medium, low or negligible sensitivity are deemed as not being sensitive, in accordance with the IEMA thresholds, and have been assessed against the rule 1 threshold.

2.7 Maximum design envelope parameters for assessment

2.7.1 The maximum design envelope parameters identified in Table 2.6 have been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group. These parameters have been identified based on the overview description of the development provided in Volume 2, Chapter 2: Project Description, including all potential development options where these are under consideration by the applicant.

2.7.2 Effects of greater adverse significance are not predicted to arise should any other development scenario within the project design envelope be taken forward in the final design scheme.

2.7.3 There is an inter-relationship with this chapter and Volume 3, Chapter 11: Noise and Vibration and Chapter 12: Air Quality in so far as these two chapters consider traffic flows. The traffic flows will be used to inform the assessments of these two chapters and are therefore fully consistent with the above.

2.8 Impacts scoped out of the assessment

2.8.1 On the basis of the baseline environment and the project description outlined in Volume 2, Chapter 2: Project Description, a number of impacts are proposed to be scoped out of the Traffic and Transport assessment. These impacts are outlined, together with a justification for scoping them out, in Table 2.7.

2.8.2 The level of vehicle generation during the operational and decommissioning phases would be lower than during the construction phase, thus, these impacts have been scoped out of the assessment.

2.8.3 The impacts listed in Table 2.7 have been scoped out of the assessment for Traffic and Transport as agreed through the EIA scoping process detailed in Volume 2, Chapter 5: Scoping and Consultation.

Table 2.6: Maximum design envelope parameters assessed.

Potential impact	Maximum design scenario	Justification
Construction		
The temporary impact of construction work on: • severance of routes; • pedestrian delay; • pedestrian amenity; • highway capacity; and/or accidents and road safety.	Minimum construction period 12 months within each phase	Fewer number of days to transport a given amount of material results in a larger number of daily HGV movements
	Construction workforce averaging 80 FTE and peaking at 120 FTE for up to 18 months	Maximum expected construction workforce maximises daily staff vehicle movements
	75% of construction staff will arrive as a single occupant car driver, the remainder will car share and travel by other sustainable modes of transport	A reasonable maximum proportion of staff driving to / from the site maximises the number of daily staff vehicle movements
	All material removed from the development area is transported by road with an average of 20 HGV movements per day and a peak of up to 40 to 60 HGV movements per day	A reasonable maximum for HGV vehicle movements on public roads, which would be lower if barge transport or local disposal were used for some material
The temporary impact of hazardous, dangerous and abnormal loads during construction works	Up to 80 abnormal load movements by road required in total	Maximum abnormal loads expected
Operation and maintenance		
The impact of maintenance workforce traffic on traffic and transport receptors.	Up to one major maintenance period (duration three weeks) and four minor maintenance visits (duration one week) per annum, requiring up to 20 and six staff daily respectively	Maximum reasonably expected operational traffic generation
Decommissioning		
The temporary impact of decommissioning work on: • severance of routes; • pedestrian delay; • pedestrian amenity; • highway capacity; and/or accidents and road safety.	All building materials, equipment and infrastructure are removed from the site by road. Transport requirements no greater than during the construction period.	A reasonable maximum transport scenario; transport impact if some infrastructure (such as buried assets) were left in place or if flexible generation plant were to continue in operation would be lower
The temporary impact of hazardous, dangerous and abnormal loads during decommissioning works		

Table 2.7: Impacts scoped out of the assessment.

Potential impact	Justification
Construction	
N/A	N/A
Operation	
The impacts arising from the operation and maintenance of the Thurrock Flexible Generation Plant.	Vehicle movements when the plant is operational will be irregular and low and are significantly under thresholds on which assessment is required.

Potential impact	Justification
Decommissioning	
The impacts arising from the decommissioning of the Thurrock Flexible Generation Plant.	When the site is decommissioned, the process will require its removal from site which will generate associated vehicle movements, including HGV movements. Since there is no further use for the materials, such materials can be removed in bulk after demolition without the care that is taken during construction. This means that larger payloads can be achieved and the traffic flows associated with decommissioning are lower than those during its construction. The assessments undertaken for the construction assessment will therefore cover the decommissioning phase together with the measures identified.

2.9 Measures adopted as part of Thurrock Flexible Generation Plant

2.9.1 A number of measures have been designed in to the Flexible Generation Plant to reduce the potential for impacts on Traffic and Transport. These are listed in Table 2.8. As there is a commitment to implementing these measures, they are considered inherently part of the design of the Thurrock Flexible Generation Plant and have therefore been considered in the assessment (i.e. the determination of magnitude and therefore significance assumes implementation of these measures). These measures are considered standard industry practice for this type of development and will be secured as a requirement of the DCO.

Table 2.8: Designed-in measures.

Measures adopted as part of Thurrock Flexible Generation Plant	Justification
Suitable HGV routes have been identified.	To avoid adverse effects on communities and road users.
Video condition surveys will be undertaken before HGVs make use of a section of road and after the substantial completion of works on minor links used by HGVs to access the Thurrock Flexible Generation Plant. Damage to the highway caused by construction traffic will be repaired.	To ensure that construction traffic has no lasting adverse impact on the condition of highways.
Temporary reduction in speed limits at constrained junctions.	To provide safe access for construction HGVs and to other road users along the highway network.
A route for abnormal indivisible loads will be identified between the strategic road network and the development site. The route, timing and method of transport of abnormal indivisible loads will be discussed and agreed with Highways England, the police and relevant highways and bridge authorities.	To avoid damage to inappropriate highways, to minimise delays and risks to road users and to avoid adverse impacts on local communities.
Where there is a risk of mud being deposited on the road, wheel wash facilities will be provided at each construction site. These include dry wheel 'wash' facility (rumble grids).	To eliminate risks to highway users resulting from mud and debris on the highway.
Measures to minimise dust and dirt associated with the movement of construction vehicles are set out in the CoCP (Volume 5, Appendix 2.2).	To minimise adverse air quality effects.
Monitor load sizes and vehicle usage and, where possible, load consolidation and delivery to construction sites using alternative vehicles. Encouragement to re-use HGVs wherever possible, such as backloading. Where suitable, local suppliers will be used to minimise the distance travelled by HGVs.	To minimise the impact on sensitive receptors.
Where possible the appointed contractor should seek to minimise overall vehicle movement generation through measures to encourage and promote sustainable travel and transport, for example by using a minibus to shuttle staff between key pick up locations and the compounds (main compound and secondary compounds).	To minimise overall emissions and to minimise other traffic and transport impacts.
It is expected that a number of abnormal indivisible loads comprising large components such as transformers will be transported to the site. The haulage contractor appointed to undertake this work will be required to comply with statutory regulations in terms of consulting with Highways England, police and Local Highway Authorities. The notification requirements differ depending on the weight, length and width of the abnormal indivisible load.	To minimise disruption and driver delay.
The timing of abnormal indivisible load deliveries will be discussed with the relevant highway authorities to minimise delay for other road users and to minimise risk to highway users. The timing of abnormal indivisible load deliveries will be discussed to ensure that there is no adverse impact on the access road in terms of delays to vehicles using the site.	To minimise disruption and driver delay.
The routeing of abnormal indivisible load deliveries will be agreed with the relevant highway authorities. The delivery of abnormal indivisible loads would typically be undertaken in convoy and under escort. Where abnormal indivisible loads require the full width of the carriageway or for unusual manoeuvres at junctions, appropriate temporary road closures and traffic management will be put in place as appropriate to maintain the safety of other road users.	To minimise disruption and driver delay.
An Outline CTMP will be submitted as part of the application for development consent. The CTMP will form part of the CoCP. The DCO submitted with the application will require that no phase of any works may commence until the CTMP has been submitted to and approved by the relevant planning authority, in consultation with the relevant highway authority.	This is to minimise the impacts of construction vehicle movements and to manage those movements in a manner that road safety is maintained.

3. Baseline environment

3.1 Current baseline

3.1.1 Details of the strategic highway network and the highway network providing access to the Thurrock Flexible Generation Plant are set out in Volume 6, Appendix 10.1: Transport Assessment.

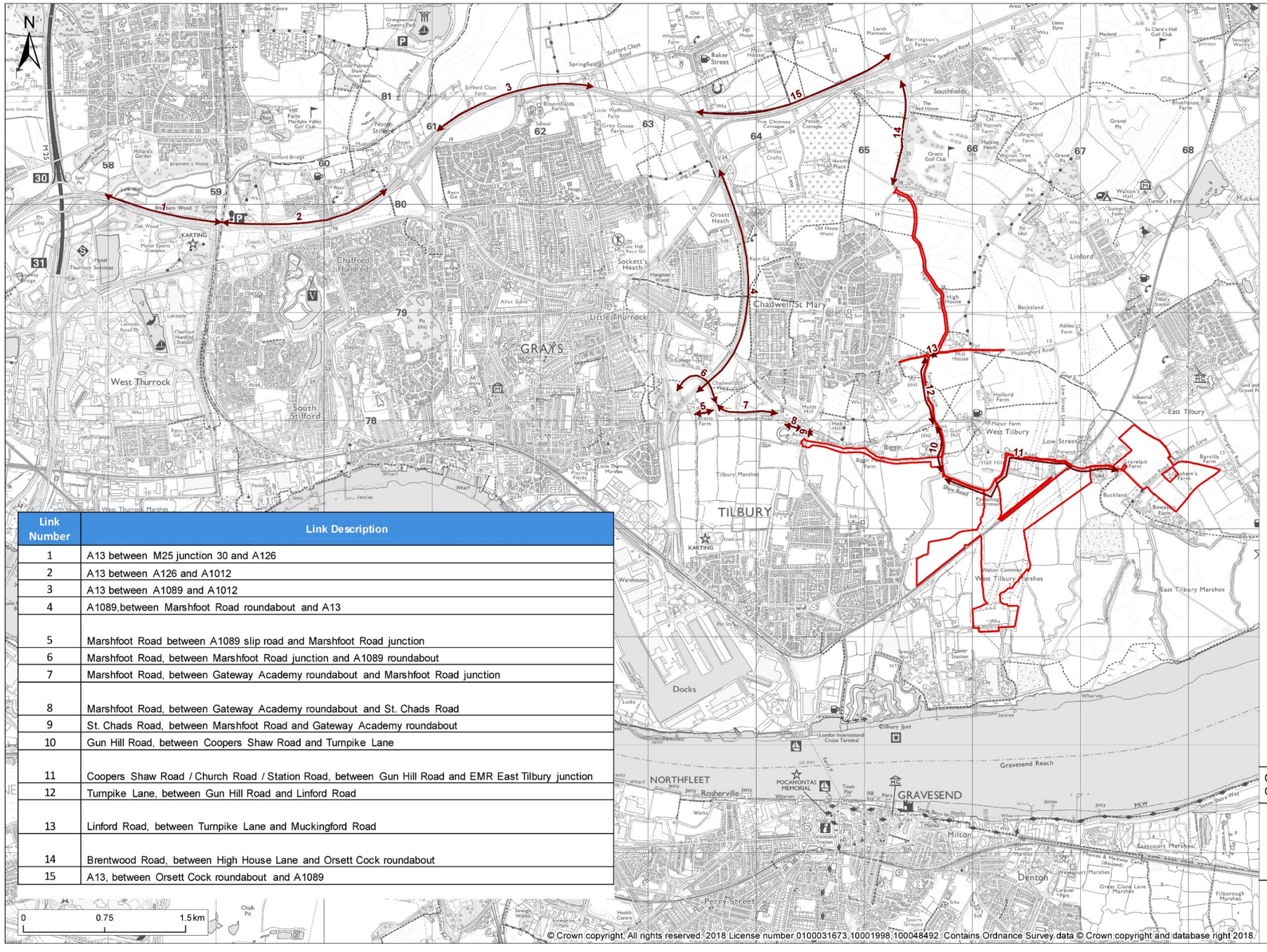
3.1.2 Details of baseline traffic flows and the public transport network are set out in Volume 6, Appendix 10.1: Transport Assessment.

3.1.3 An analysis of road safety via Personal Injury Accidents is set out in Volume 6, Appendix 10.1: Transport Assessment. Figure 3 of the TA, shows the location of the personal injury accidents in relation to the location of the Thurrock Flexible Generation Plant.

3.1.4 Table 3.1 sets out the sensitivity assessment for each of the road links along the access routes. The sensitivity for each road link has been defined using the criteria set out in Table 3.1, using professional judgement and by incorporating all receptor groups identified and discussed above. Figure 3.1, shows the links in relation to the development site.

Table 3.1: Sensitivity of Receptor.

Link Number	Link Description	Link Sensitivity	Justification
1	A13 between M25 junction 30 and A126	Negligible	Trunk Road Network with no sensitive receptors.
2	A13 between A126 and A1012	Negligible	Trunk Road Network with no sensitive receptors.
3	A13 between A1089 and A1012	Negligible	Trunk Road Network with no sensitive receptors.
4	A1089,between Marshfoot Road roundabout and A13	Negligible	Trunk Road Network with no sensitive receptors.
5	Marshfoot Road between A1089 slip road and Marshfoot Road junction	Low	Provides access to two dwellings, farmland and a local business with no footway north of south of the units. Street lighting is present on the eastern side of the carriageway.
6	Marshfoot Road, between Marshfoot Road junction and A1089 roundabout	Negligible	Foot / Cycleway on north side of carriageway with street lighting.
7	Marshfoot Road, between Gateway Academy roundabout and Marshfoot Road junction	Negligible	Foot / Cycleway on north side of carriageway with street lighting.
8	Marshfoot Road, between Gateway Academy roundabout and St. Chads Road	High	Opposite school with signalised crossing for pedestrians accessing the Gateway Academy. Footway / Cycleway on northern side of carriageway with street lighting.
9	St. Chads Road, between Marshfoot Road and Gateway Academy roundabout	Low	Footway / Cycleway on eastern side of carriageway with street lighting. Pedestrian and cyclist access to the Gateway Academy on the southern arm of the roundabout not on the link itself.
10	Gun Hill Road, between Coopers Shaw Road and Turnpike Lane	Low	Provides access to some farmland. No street lighting.
11	Coopers Shaw Road / Church Road / Station Road, between Gun Hill Road and EMR East Tilbury junction	Low	Railway crossing located to the west of the EMR access. Provides access to some farmland. No street lighting.
12	Turnpike Lane, between Gun Hill Road and Linford Road	Low	Provides access to some dwellings with no street lighting or footways.
13	Linford Road, between Turnpike Lane and Muckingford Road	Low	No street lighting. Sign indicating a public footpath north of Turnpike Lane junction - shown on the Thurrock Council PROW map
14	Brentwood Road, between High House Lane and Orsett Cock roundabout	Low	Street lighting and narrow footways to the north on this link, with no footways south of the Welling Road junction.
15	A13, between Orsett Cock roundabout and A1089	Negligible	Trunk Road Network with no sensitive receptors.



Link Number	Link Description
1	A13 between M25 junction 30 and A126
2	A13 between A126 and A1012
3	A13 between A1089 and A1012
4	A1089,between Marshfoot Road roundabout and A13
5	Marshfoot Road between A1089 slip road and Marshfoot Road junction
6	Marshfoot Road, between Marshfoot Road junction and A1089 roundabout
7	Marshfoot Road, between Gateway Academy roundabout and Marshfoot Road junction
8	Marshfoot Road, between Gateway Academy roundabout and St. Chads Road
9	St. Chads Road, between Marshfoot Road and Gateway Academy roundabout
10	Gun Hill Road, between Coopers Shaw Road and Turnpike Lane
11	Coopers Shaw Road / Church Road / Station Road, between Gun Hill Road and EMR East Tilbury junction
12	Turnpike Lane, between Gun Hill Road and Linford Road
13	Linford Road, between Turnpike Lane and Muckingford Road
14	Brentwood Road, between High House Lane and Orsett Cock roundabout
15	A13, between Orsett Cock roundabout and A1089

Legend

Development boundary

Road link

Created by: CR Scale: A3@ 1:40,000 Date: 05/10/2018
Checked by: RT Doc no: 10872-0061-03

Thurrock Flexible Generation Plant
Link Locations

Figure 3.1: Link Locations.

3.2 Future baseline

3.2.1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, as amended, require that "*an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge*" is included within an assessment.

3.2.2 The peak construction period typically occurs in earlier phases of construction works and therefore an assessment year of 2021 has been adopted. Therefore, for assessment purposes, the traffic flows on the adjacent highway network have been estimated for a future year of 2021. Details of the derivation of 2021 future baseline traffic flows are set out in Volume 6, Appendix 10.1: Transport Assessment.

3.2.3 The construction phase generates the most vehicle movements in comparison to the operational and decommissioning phases. Therefore, undertaking assessments with a future baseline for the construction phase equates to an assessment of the maximum design scenario, and as such it is not necessary to individually assess the other phases.

Climate change

3.2.4 The Met Office UK Carbon Projections ('UKCP09') dataset[3] provides probabilistic projections of change in climatic parameters over time for 25 km grid squares across the UK. Projected changes during low, medium and high future global greenhouse gas emissions scenarios have been reviewed for the period from 2020 up to 2069, encompassing the potential six year construction and 35 year operational periods of the proposed development.

3.2.5 The likely ranges of change in climatic parameters including precipitation, temperature, wind speed, humidity and frequency of extreme weather are not considered to materially affect the future baseline described above for traffic and transport or increase the sensitivity of receptors to impacts beyond that described in Section 4.

[3] CP09 is presently being updated to CP18, expected to be published in November 2018 (Met Office, 2018). CP09 remains the most up-to-date available data and remains an appropriate tool for adaptation planning (Met Office, 2017).

4. Assessment of Effects

4.1 Construction phase

4.1.1 The potential impacts arising from the maximum design scenario for the construction of the Thurrock Flexible Generation Plant have been assessed.

4.1.2 The identification of the traffic and transport environmental effects requires an assessment of the amount of traffic associated with construction activities and the significance of this additional traffic.

Screening for assessment of Transport Environmental Impacts

Average Construction Traffic Flows

4.1.3 Table 4.1 and Table 4.2 calculate the percentage change in daily two-way traffic flows arising from the average construction and the peak construction traffic flows respectively based upon the numbers of total vehicles and HGVs predicted as a result of the Thurrock Flexible Generation Plant.

4.1.4 In terms of total vehicle flows, none of the links exceed their respective threshold (rule 1 or rule 2).

4.1.5 In terms of HGV movements, it can be seen that Linford Road experiences increases in daily two-way flows over 30% (at 35.63%) and thus requires assessment of the transport environmental effects.

4.1.6 There are currently no HGV movements along Turnpike Lane and Gun Hill and so an assessment of these links has been undertaken.

4.1.7 Therefore, assessment of the average construction traffic flows is required on Linford Road, Turnpike Lane and Gun Hill owing to their HGV increases.

Peak Construction Traffic Flows

4.1.8 Table 4.2 sets out the percentage impact of the Thurrock Flexible Generation Plant peak construction traffic flows upon the baseline traffic flows.

Table 4.1: Average Daily Construction Traffic Flow Percentage Impact.

Link	Link Description	2021 Baseline		Average Construction Traffic Flows				2021 Base + Average Construction	
		AADT	HGV AADT	AADT	HGV AADT	Percentage Impact (AADT)	Percentage Impact (HGV AADT)	AADT	HGV AADT
1	A13 between M25 junction 30 and A126	119672	13264	141	20	0.12%	0.15%	119813	13284
2	A13 between A126 and A1012	98635	12562	141	20	0.14%	0.16%	98776	12582
3	A13 between A1089 and A1012	102529	12252	141	20	0.14%	0.16%	102670	12272
4	A1089, between Marshfoot Road roundabout and A13	28210	7480	141	20	0.50%	0.27%	28351	7500
5	Marshfoot Road between A1089 slip road and Marshfoot Road junction	5629	303	70	10	1.25%	3.30%	5699	313
6	Marshfoot Road, between Marshfoot Road junction and A1089 roundabout	11284	356	70	10	0.62%	2.81%	11354	366
7	Marshfoot Road, between Gateway Academy roundabout and Marshfoot Road junction	8266	207	141	20	1.71%	9.68%	8407	227
8	Marshfoot Road, between Gateway Academy roundabout and St. Chads Road	8266	207	141	20	1.71%	9.68%	8407	227
9	St. Chads Road, between Marshfoot Road and Gateway Academy roundabout	12088	218	141	20	1.17%	9.16%	12229	238
10	Gun Hill Road, between Coopers Shaw Road and Turnpike Lane	2000	0	141	20	7.05%	N/A	2141	20
11	Coopers Shaw Road / Church Road / Station Road, between Gun Hill Road and EMR East Tilbury junction	1101	262	141	20	12.80%	7.63%	1242	282
12	Turnpike Lane, between Gun Hill Road and Linford Road	2000	0	141	20	7.05%	N/A	2141	20
13	Linford Road, between Turnpike Lane and Muckingford Road	5570	56	141	20	2.53%	35.63%	5711	76
14	Brentwood Road, between High House Lane and Orsett Cock roundabout	10032	434	141	20	1.41%	4.61%	10173	454
15	A13, between Orsett Cock roundabout and A1089	94043	8888	141	20	0.15%	0.23%	94184	8908

Table 4.2: Peak Daily Construction Traffic Flow Percentage Impact.

Link	Link Description	2021 Baseline		Peak Construction Traffic Flows				2021 Base + Peak Construction	
		AADT	HGV AADT	AADT	HGV AADT	Percentage Impact (AADT)	Percentage Impact (HGV AADT)	AADT	HGV AADT
1	A13 between M25 junction 30 and A126	119672	13264	241	60	0.20%	0.45%	119913	13324
2	A13 between A126 and A1012	98635	12562	241	60	0.24%	0.48%	98876	12622
3	A13 between A1089 and A1012	102529	12252	241	60	0.24%	0.49%	102770	12312
4	A1089, between Marshfoot Road roundabout and A13	28210	7480	241	60	0.85%	0.80%	28451	7540
5	Marshfoot Road between A1089 slip road and Marshfoot Road junction	5629	303	120	30	2.14%	9.89%	5750	333
6	Marshfoot Road, between Marshfoot Road junction and A1089 roundabout	11284	356	120	30	1.07%	8.44%	11404	386
7	Marshfoot Road, between Gateway Academy roundabout and Marshfoot Road junction	8266	207	241	60	2.92%	29.05%	8507	267
8	Marshfoot Road, between Gateway Academy roundabout and St. Chads Road	8266	207	241	60	2.92%	29.05%	8507	267
9	St. Chads Road, between Marshfoot Road and Gateway Academy roundabout	12088	218	241	60	1.99%	27.47%	12329	278
10	Gun Hill Road, between Coopers Shaw Road and Turnpike Lane	2000	0	241	60	12.05%	N/A	2241	60
11	Coopers Shaw Road / Church Road / Station Road, between Gun Hill Road and EMR East Tilbury junction	1101	262	241	60	21.89%	22.89%	1342	322
12	Turnpike Lane, between Gun Hill Road and Linford Road	2000	0	241	60	12.05%	N/A	2241	60
13	Linford Road, between Turnpike Lane and Muckingford Road	5570	56	241	60	4.33%	106.89%	5811	116
14	Brentwood Road, between High House Lane and Orsett Cock roundabout	10032	434	241	60	2.40%	13.82%	10273	494
15	A13, between Orsett Cock roundabout and A1089	94043	8888	241	60	0.26%	0.68%	94284	8948

4.1.9 In terms of total vehicle flows, none of the links exceed their respective threshold (rule 1 or rule 2).

4.1.10 In terms of HGV movements, it can be seen that Linford Road experiences increases in daily two-way flows over 30% (at approximately 107%) and thus requires assessment of the transport environmental effects.

4.1.11 There are currently no HGV movements along Turnpike Lane and Gun Hill and so an assessment of these links has been undertaken.

4.1.12 Therefore, assessment of the peak construction traffic flows is required on Linford Road, Turnpike Lane and Gun Hill owing to their HGV increases.

The temporary impact of the construction works on driver delay

4.1.13 Driver delay can result from the following:

- an increase in traffic flows, particularly during peak hours resulting in increased queues on links and at junctions;
- the passage of slow moving vehicles such as abnormal indivisible loads; and
- reduction in link capacity resulting from changes in carriageway width or other highway characteristics.

Magnitude of impact

4.1.14 Volume 6, Appendix 10.1: Transport Assessment considers highway capacity and concludes that traffic flows on Linford Road, Turnpike Lane and Gun Hill are all low and would not create capacity issues. It concludes that the construction of the Thurrock Flexible Generation Plant would not create any severe impacts upon the operation on Linford Road, Turnpike Lane or Gun Hill. This means that there would be negligible changes arising in relation to driver delay as a result of the construction vehicle movements.

4.1.15 The magnitude of impact in terms of driver delay resulting from additional traffic flows associated with the construction of the Thurrock Flexible Generation Plant is therefore considered to be negligible, of short term duration, continuous and fully reversible once works end.

4.1.16 The negligible impact is predicted to be of local spatial extent, short term duration, continuous and fully reversible. It is predicted that the impact will affect the receptor directly. The magnitude is therefore considered to be negligible.

Sensitivity of the receptor

4.1.17 Linford Road, Turnpike Lane and Gun Hill have few sensitive receptors; therefore, the links are deemed to be of low vulnerability, fully recoverable and low value. The sensitivity of the receptors is therefore, considered to be low.

Significance of effect

4.1.18 Overall, it is predicted that the sensitivity of the receptors is considered to be low and the magnitude is deemed to be negligible. The effect will, therefore, be of **negligible** significance, which is not significant in EIA terms.

Further mitigation or enhancement

4.1.19 No significant adverse effects have been predicted and no further mitigation is considered to be required.

Residual effect

4.1.20 The residual effect following further mitigation is predicted to be not significant in EIA terms.

The temporary impact of the construction works on severance of routes

4.1.21 Severance is only likely to occur on highly trafficked roads and result from the perceived division the road and traffic creates between communities on either side.

4.1.22 The IEMA guidance set out above identifies that increases in total traffic volumes of between 30% and 60% could result in a slight impact (the lowest category) upon severance.

Magnitude of Impact

4.1.23 The change in total traffic flow as a result of the construction traffic along Linford Road, Turnpike Lane and Gun Hill is significantly lower than the 30% that the IEMA guidance sets out is required for a slight effect (the lowest category) to occur.

4.1.24 The impact is predicted to be of local spatial extent, short term duration, continuous and fully reversible. The magnitude is therefore, considered to be negligible.

Sensitivity of the Receptor

4.1.25 Linford Road, Turnpike Lane and Gun Hill have few sensitive receptors; therefore, the links are deemed to be of low vulnerability, fully recoverable and low value. The sensitivity of the receptors are therefore, considered to be low.

Significance of the Effect

4.1.26 Overall, it is predicted that the sensitivity of the receptors is considered to be low and the magnitude is deemed to be negligible. The effect will, therefore, be of **negligible** significance, which is not significant in EIA terms.

Further mitigation or enhancement

4.1.27 No significant adverse effects have been predicted and no further mitigation is considered to be required.

Residual effect

4.1.28 The residual effect following further mitigation is predicted to be not significant in EIA terms.

The temporary impact of the construction works on pedestrian delay

4.1.29 Highly trafficked roads and changes to the volume or speed of traffic may affect the ability of people to cross roads. The IEMA guidance set out above notes that studies have shown that pedestrian delay is perceptible or considered significant beyond a delay threshold of 10 seconds, for a link with no crossing facilities. It goes on to say that a 10 second pedestrian delay in crossing a road broadly equates to a two-way link flow of approximately 1,400 vehicles per hour. This means that where two-way traffic flows on a road exceed 1,400 vehicle movements per hour, then a pedestrian seeking to cross that route would perceive a delay.

4.1.30 Although there is a public footpath to the north of the Linford Road / Turnpike Lane junction, there are no footways on Linford Road, Turnpike Lane or Gun Hill.

Magnitude of Impact

4.1.31 Daily traffic flows for Linford Road, Turnpike Lane and Gun Hill during the 2021 future baseline year are highest on Linford Road and forecast to be a total of 5,570 daily two-way vehicle movements, increasing to 5,711 daily two-way vehicle movements during the average construction period and 5,811 daily two-way vehicle movements during the peak construction period.

4.1.32 Professional experience dictates that peak hourly traffic flows are unlikely to exceed 600 two-way vehicle movements on Linford Road with even lower hourly traffic flows on Turnpike Lane and Gun Hill. As a result, the 1400 hourly vehicle movements during the AM and PM peak hours threshold will not be exceeded.

4.1.33 The impact is predicted to be of local spatial extent, short term duration, intermittent and fully reversible. It is predicted that the impact will affect the receptor directly. The magnitude is therefore considered to be negligible.

Sensitivity of the Receptor

4.1.34 The road links have few sensitive receptors; therefore, the links are deemed to be of low vulnerability, fully recoverable and low value. The sensitivity of the receptors is therefore, considered to be low.

Significance of the Effect

4.1.35 Overall, it is predicted that the sensitivity of the receptors is considered to be low and the magnitude is deemed to be negligible. The effect will, therefore, be of **negligible** significance, which is not significant in EIA terms.

Further mitigation or enhancement

4.1.36 No significant adverse effects have been predicted and no further mitigation is considered to be required.

Residual effect

4.1.37 The residual effect following further mitigation is predicted to be not significant in EIA terms.

The temporary impact of the construction works on pedestrian amenity

4.1.38 The term pedestrian amenity is broadly defined as the relative pleasantness of a journey and is considered to be affected by traffic flow, traffic composition and footway width and separation from traffic.

4.1.39 The IEMA guidance refers to a tentative threshold for judging the significance of changes in pedestrian amenity where the traffic flow (or its HGV component) is halved or doubled.

4.1.40 HGV flows will be introduced to Turnpike Lane and Gun Hill (the construction HGVs only) whilst the change in HGV use on Linford Road is approximately doubled during the peak construction period and far less than double (36% increase) during the average construction period.

4.1.41 Linford Road, Turnpike Lane and Gun Hill have no footways along them and pedestrian movements are observed to be low.

Magnitude of Impact

4.1.42 The impact is predicted to be of local spatial extent, short term duration, intermittent and fully reversible. It is predicted that the impact will affect the receptor directly. The magnitude is considered to be moderate.

Sensitivity of the Receptor

4.1.43 The identified road links have few sensitive receptors; therefore, the links are deemed to be of low vulnerability, fully recoverable and low value. The sensitivity of the receptors is therefore, considered to be low.

Significance of the Effect

4.1.44 Overall, it is predicted that the sensitivity of the receptors is considered to be low and the magnitude is deemed to be moderate. The effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

Further mitigation or enhancement

4.1.45 No significant adverse effects have been predicted and no further mitigation is considered to be required.

Residual effect

4.1.46 The residual effect following further mitigation is predicted to be not significant in EIA terms.

The temporary impact of the construction work on accidents and road safety

Magnitude of Impact

4.1.47 The impact of construction work in terms of road safety affects receptors directly and would be short-term, continuous and fully reversible once construction work is complete. The magnitude of increase in total vehicle movements on Linford Road, Turnpike Lane and Gun Hill is negligible/low.

4.1.48 An analysis of injury accidents has been undertaken and concluded that the highway network currently operates in a safe manner and thus there are no road safety concerns with the layout of the road network.

4.1.49 There would be a temporary increase in the proportion of HGVs on Linford Road, Turnpike Lane and Gun Hill. Such HGV movements would be under contract and would be under the construction traffic management conditions and measures. There is no reason to suggest that the HGVs would travel in a manner that is unsafe or that the injury accident rate would change.

4.1.50 The impact is predicted to be of local spatial extent, short term duration, intermittent and fully reversible. It is predicted that the impact will affect the receptor directly. The magnitude is therefore considered to be negligible.

Sensitivity of the Receptor

4.1.51 An analysis of injury accident showed that Linford Road, Turnpike Lane and Gun Hill operate in a safe manner. It is considered that the vulnerability and value of the receptor with regards to accidents and road safety is low but fully recoverable.

4.1.52 The road users are deemed to be of low vulnerability, fully recoverable and low value. The sensitivity of the receptor is therefore, considered to be low.

Significance of the Effect

4.1.53 Overall, it is predicted that the sensitivity of the receptor is considered to be low and the magnitude is deemed to be negligible. The effect will, therefore, be of **negligible** significance, which is not significant in EIA terms.

Further mitigation or enhancement

4.1.54 On the basis of the above no further mitigation is considered necessary in relation to the temporary impact in terms of accidents and road safety during construction.

Residual effect

4.1.55 The residual effect following further mitigation is predicted to be not significant in EIA terms.

The temporary impact of the construction work on hazardous, dangerous and abnormal indivisible loads

4.1.56 It is expected that some abnormal indivisible loads would be transported to the site. The abnormal indivisible loads are expected to be components that exceed standard load weight and possibly exceed standard width and height.

Magnitude of Impact

4.1.57 The passage of abnormal indivisible loads would be discussed with the relevant highway authorities and police authority prior to delivery and measures adopted to ensure that the movement is undertaken safely and with minimal delay for other highway users.

4.1.58 Depending on the width, length or weight of the vehicle, different notice periods have to be provided to Highways England, Bridge Authorities and the Police. These can vary between two and five days. The following activities would need to be undertaken in accordance with the Road Vehicles (Authorisation of Special Types) (General) Order 2003 (STGO).

- Before the start of any journey, notify in accordance with Schedule 5 the chief office of Police for each area in which the vehicle or vehicle-combination is to be used.
- Ensure that the vehicle or vehicle-combination is used in accordance with the requirements of that Schedule.
- Ensure that the vehicle or vehicle-combination is accompanied during the journey by one or more attendants employed in accordance with Schedule 6.

4.1.59 The impact in relation to the transport of abnormal indivisible loads would be short-term and intermittent and would affect receptors directly.

4.1.60 The magnitude of the impact of abnormal indivisible loads would be negligible since the number of abnormal indivisible load movements would be low, each load would be present on the network for a short period of time and standard measures applied in terms of route, timing and method of delivering to minimise delays to other highway users.

4.1.61 The impact is predicted to be of local spatial extent, short term duration, intermittent and fully reversible. It is predicted that the impact will affect the receptor directly. The magnitude is therefore considered to be negligible.

Sensitivity of the Receptor

4.1.62 The access route used by the abnormal invisible load would necessarily be of a standard to accommodate the transport delivery vehicles.

4.1.63 Any restrictions would also necessarily be removed to accommodate the transport delivery vehicles and they would travel under controlled environments.

4.1.64 The passage of abnormal indivisible loads would, however, lead to some limited driver delay as the loads would move slowly. The sensitivity of the public roads to the passage of abnormal indivisible loads is therefore considered to be low.

4.1.65 It is considered that the vulnerability and value of the receptor with regards to abnormal indivisible loads is low but fully recoverable.

4.1.66 Given the controlled environment, the road users are deemed to be of negligible vulnerability, fully recoverable and negligible value. The sensitivity of the receptor is therefore, considered to be negligible**.**

Significance of the Effect

4.1.67 Overall, it is predicted that the sensitivity of the receptor is considered to be negligible and the magnitude is deemed to be negligible. The effect will, therefore, be of **negligible** significance, which is not significant in EIA terms.

Further mitigation or enhancement

4.1.68 No significant adverse effects have been predicted and no further mitigation is considered to be required.

Residual effect

4.1.69 The residual effect following further mitigation is predicted to be not significant in EIA terms.

Future monitoring

4.1.70 No traffic and transport monitoring, to test the predictions made within the construction phase, is considered necessary.

4.2 Operational and maintenance phase

4.2.1 For the reasons set out in paragraph 1.1.4, an assessment of this phase has been scoped out.

4.3 Decommissioning phase

4.3.1 For the reasons set out in in paragraph 1.1.4, an assessment of this phase has been scoped out.

4.4 Transboundary effects

4.4.1 A screening of transboundary impacts has been carried out and is presented in Volume 5, Appendix 4.2: Transboundary Impacts Screening Note. This screening exercise identified that there was no potential for significant transboundary effects with regard to Traffic and Transport from Thurrock Flexible Generation Plant upon the interests of other EEA States.

4.5 Inter-related effects

4.5.1 Inter-relationships are considered to be the impacts and associated effects of different aspects of the construction, operation or decommissioning of Thurrock Flexible Generation Plant on the same receptor. The following assessments have been made and a description of the likely inter-related effects on traffic and transport is provided in Volume 4, Chapter 17: Summary of Inter-Related Effects.

Project lifetime effects

4.5.2 Assessment of the potential for effects that occur during more than one stage of the development's lifetime (construction, operation or decommissioning) to interact such that they may create a more significant effect on a receptor than when assessed in isolation for each stage

Receptor-led effects

4.5.3 Assessment of the potential for effects via multiple environmental or social pathways to interact, spatially and temporally, to create a greater inter-related effect on a receptor than is predicted for each pathway (in its respective topic chapter) individually.

5. Cumulative Effects Assessment

5.1 Introduction

5.1.1 The process of identifying other consented or proposed developments and screening to create a shortlist of those having potential for cumulative effects with Thurrock Flexible Generation Plant is described in Volume 2, Chapter 4: Environmental Impact Assessment Methodology and Volume 5, Appendix 4.1: Cumulative Developments and Screening. Appendix 4.1 lists the shortlisted cumulative developments and the tier they have been assigned (guiding the weight that the decision-maker may place on each development's likelihood of being realised) in accordance with PINS Guidance Note 17.

5.1.2 Cumulative developments shortlisted are those that have potential to contribute to impacts affecting receptors also affected by the proposed development (for example, contributing significant additional traffic to the same road links), or that introduce additional sensitive receptors (for example, new residences or a school closer to the proposed development than existing), or both.

5.1.3 The cumulative effects assessment for traffic and transport has been undertaken in two stages, reported as follows. In the first stage, cumulative effects of the proposed development have been considered in an overall scenario where the land surrounding the proposed development could be largely transformed by three adjacent NSIP developments and the possible expansion of nearby residential and employment uses to the east. This is referred to as the 'max development' scenario.

5.1.4 In the second stage, cumulative effects with specific individual development projects have been assessed where these would affect a particular environmental pathway or receptor for Traffic and Transport. Only shortlisted developments with potential cumulative effects specific to Traffic and Transport are assessed in this chapter.

5.2 Cumulative effects in 'max development' scenario

5.2.1 Three NSIP developments are proposed on land adjacent to and in some cases overlapping with the Thurrock Flexible Generation Plant application boundary. The Tilbury2 port expansion adjacent to the west is at examination stage (Tier 1). The Tilbury Energy Centre power station to the south and Lower Thames Crossing motorway and link road to the east and north are both at EIA scoping stage (Tier 2).

5.2.2 Outline planning permission has been granted for several residential and mixed-use developments expanding Linford and East Tilbury in the direction of Thurrock Flexible Generation Plant (Tier 1).

5.2.3 Should all of these developments proceed, Thurrock Flexible Generation Plant's main development site would be closely surrounded on all sides by the temporary or permanent works areas of the NSIPs. Its gas connection point to Feeder 18 could be adjacent to the expanded outskirts of East Tilbury and also potentially to the Tilbury Energy Centre gas connection, and the pipeline route could cross land to be developed for the Lower Thames Crossing.

5.2.4 The Thurrock Core Strategy (2015) allocates land for possible strategic employment provision and sustainable economic growth to the west of the proposed development and to the east where there is existing industry at East Tilbury. Thurrock Borough Council is drafting a new Local Plan to replace the Core Strategy. The Issues and Options (Stage 2) consultation document proposals map of July 2018 (withdrawn temporarily due to recent changes to the NPPF) suggested possible zones for residential and commercial/employment development in areas east of the proposed development, where this would be facilitated by the Lower Thames Crossing project. However, these Tier 3 development possibilities are afforded only limited weight due to the early stage of this local plan development process.

5.2.5 For the traffic and transport cumulative assessment, of the above only Tilbury2 of the NSIPs was included in the cumulative effects of Thurrock Flexible Generation Plant against the 2021 baseline flows. The methodology is set out in Section 5 of Volume 6, Appendix 10.1: Transport Assessment.

5.3 Cumulative effects with specific developments

5.3.1 The Transport Assessment sets out the cumulative assessment methodology, found at in Section 8 of Volume 6, Appendix 10.1: Transport Assessment.

5.3.2 The following developments have been included in the cumulative assessment:

- 16/01232/OUT - Proposed development of 1000 dwellings on land for development, Muckingford Road, Linford, Essex; and
- 16/00412/OUT - Proposed development of 203 dwellings on Star Industrial Estate, Linford Road, Chadwell St Mary, Essex; and;
- 15/00379/OUT - Proposed development of 43 dwellings on land between 39 and 41 St John's Road and to the south of St Johns Road, Chadwell St Mary, Essex and;

- TR030003 – Tilbury 2 – a new port facility at the site of Tilbury B Power Station, East Tilbury, Essex.

5.3.3 The estimated traffic generation from the above developments have been taken from their respective transport document submissions. These have then been added to the Thurrock Flexible Generation Plant construction traffic flows and assessed against the baseline traffic flows. The resultant cumulative percentage impacts are calculated in Table 5.1 and Table 5.2 respectively.

5.3.4 In terms of total vehicle flows, only one link exceeds its respective threshold (rule 1 or rule 2), Marshfoot Road, between Gateway Academy roundabout and St. Chads Road (Link 8).

5.3.5 In terms of HGV movements, it can be seen that Linford Road and the A1089 experience increases in daily two-way flows over 30% (at 107% and 32% respectively) and thus require assessment of the transport environmental effects.

5.3.6 There are currently no HGV movements along Turnpike Lane and Gun Hill and so an assessment of these links will be undertaken of the transport environmental effects.

5.3.7 Therefore, assessment of the average construction traffic flows is required on the A1089, Linford Road, Turnpike Lane and Gun Hill owing to their HGV increases.

5.3.8 Volume 6, Appendix 10.1: Transport Assessment sets out that the contributing traffic flow to increases on the A1089 and Marshfoot Road by the Thurrock Flexible Generation Plant are negligible in the context of the total cumulative traffic flows.

5.3.9 Indeed, on the A1089, the average construction traffic flows form only 4.2% of the total cumulative traffic flows. On Marshfoot Road, the average construction traffic flows form only 13% of the total cumulative traffic flows. For both, the other cumulative traffic flows are long term traffic flows generated by built development, whereas the construction traffic flows generated by the plant are temporary during the construction period only.

5.3.10 The below assessment considers this where necessary.

5.3.11 Table 5.2 sets out the percentage impact of the Thurrock Flexible Generation Plant peak construction traffic flows plus cumulative development flows against the baseline traffic flows.

Table 5.1: Average Construction + Cumulative Development Flows.

Link	Link Description	2021 Baseline		Average Construction + Cumulative				2021 Baseline + Average Construction + Cumulative	
		AADT	HGV AADT	AADT	Percentage Impact AADT	AADT HVs	Percentage Impact AADT HGVs	AADT	HGV AADT
1	A13 between M25 junction 30 and A126	119672	13264	2979	2.49%	1794	13.52%	122651	15058
2	A13 between A126 and A1012	98635	12562	2979	3.02%	1794	14.28%	101615	14356
3	A13 between A1089 and A1012	102529	12252	2979	2.91%	1794	14.64%	105509	14046
4	A1089,between Marshfoot Road roundabout and A13	28210	7480	3161	11.20%	2385	31.89%	31370	9865
5	Marshfoot Road between A1089 slip road and Marshfoot Road junction	5629	303	470	8.35%	10	3.30%	6099	313
6	Marshfoot Road, between Marshfoot Road junction and A1089 roundabout	11284	356	470	4.17%	10	2.81%	11754	366
7	Marshfoot Road, between Gateway Academy roundabout and Marshfoot Road junction	8266	207	940	11.38%	20	9.68%	9206	227
8	Marshfoot Road, between Gateway Academy roundabout and St. Chads Road	8266	207	940	11.38%	20	9.68%	9206	227
9	St. Chads Road, between Marshfoot Road and Gateway Academy roundabout	12088	218	208	1.72%	20	9.16%	12297	238
10	Gun Hill Road, between Coopers Shaw Road and Turnpike Lane	2000	0	141	7.05%	20	N/A	2141	20
11	Coopers Shaw Road / Church Road / Station Road, between Gun Hill Road and EMR East Tilbury junction	1101	262	141	12.80%	20	7.63%	1242	282
12	Turnpike Lane, between Gun Hill Road and Linford Road	2000	0	141	7.05%	20	N/A	2141	20
13	Linford Road, between Turnpike Lane and Muckingford Road	5570	56	1532	27.51%	20	35.63%	7102	76
14	Brentwood Road, between High House Lane and Orsett Cock roundabout	10032	434	1089	10.86%	20	4.61%	11121	454
15	A13, between Orsett Cock roundabout and A1089	94043	8888	1561	1.66%	611	6.88%	95604	9500

Table 5.2: Peak Construction + Cumulative Development Flows.

Link	Link Description	2021 Baseline		Peak Construction + Cumulative				2021 Baseline + Average Construction + Cumulative	
		AADT	AADT HGVs	AADT	Percentage Impact AADT	AADT HGVs	Percentage Impact AADT HGVs	AADT	AADT HGVs
1	A13 between M25 junction 30 and A126	119672	13264	3079	2.57%	1834	13.83%	122752	15098
2	A13 between A126 and A1012	98635	12562	3079	3.12%	1834	14.60%	101715	14396
3	A13 between A1089 and A1012	102529	12252	3079	3.00%	1834	14.97%	105609	14086
4	A1089,between Marshfoot Road roundabout and A13	28210	7480	3261	11.56%	2425	32.42%	31470	9905
5	Marshfoot Road between A1089 slip road and Marshfoot Road junction	5629	303	520	9.24%	30	9.89%	6149	333
6	Marshfoot Road, between Marshfoot Road junction and A1089 roundabout	11284	356	520	4.61%	30	8.44%	11804	386
7	Marshfoot Road, between Gateway Academy roundabout and Marshfoot Road junction	8266	207	1040	12.59%	60	29.05%	9306	267
8	Marshfoot Road, between Gateway Academy roundabout and St. Chads Road	8266	207	1040	12.59%	60	29.05%	9306	267
9	St. Chads Road, between Marshfoot Road and Gateway Academy roundabout	12088	218	308	2.55%	60	27.47%	12397	278
10	Gun Hill Road, between Coopers Shaw Road and Turnpike Lane	2000	0	241	12.05%	60	N/A	2241	60
11	Coopers Shaw Road / Church Road / Station Road, between Gun Hill Road and EMR East Tilbury junction	1101	262	241	21.89%	60	22.89%	1342	322
12	Turnpike Lane, between Gun Hill Road and Linford Road	2000	0	241	12.05%	60	N/A	2241	60
13	Linford Road, between Turnpike Lane and Muckingford Road	5570	56	1632	29.31%	60	106.89%	7202	116
14	Brentwood Road, between High House Lane and Orsett Cock roundabout	10032	434	1189	11.85%	60	13.82%	11221	494
15	A13, between Orsett Cock roundabout and A1089	94043	8888	1661	1.77%	651	7.33%	95704	9540

5.3.12 In terms of total vehicle flows, only one link exceeds its respective threshold (rule 1 or rule 2), Marshfoot Road, between Gateway Academy roundabout and St. Chads Road (Link 8).

5.3.13 In terms of HGV movements, it can be seen that Linford Road and the A1089 experience increases in daily two-way flows over 30% (at 107% and 32% respectively) and thus require assessment of the transport environmental effects.

5.3.14 There are currently no HGV movements along Turnpike Lane and Gun Hill and so an assessment of these links will be undertaken of the transport environmental effects.

5.3.15 Therefore, assessment of the average construction traffic flows is required on the A1089, Linford Road, Turnpike Lane and Gun Hill owing to their HGV increases.

5.3.16 Volume 6, Appendix 10.1: Transport Assessment sets out that the contributing traffic flow to increases on the A1089 and Marshfoot Road by the Thurrock Flexible Generation Plant are negligible in the context of the total cumulative traffic flows.

5.3.17 Indeed, on the A1089, the peak construction traffic flows form only 4.2% of the total cumulative traffic flows. On Marshfoot Road, the peak construction traffic flows form 23% of the total cumulative traffic flows. For both, the other cumulative traffic flows are long term traffic flows generated by built development, whereas the construction traffic flows generated by the plant are temporary during the construction period only.

5.3.18 The below assessment considers this where necessary.

The temporary impact of the construction works on driver delay

5.3.19 Driver delay can result from the following:

- an increase in traffic flows, particularly during peak hours resulting in increased queues on links and at junctions;
- the passage of slow moving vehicles such as abnormal indivisible loads; and
- reduction in link capacity resulting from changes in carriageway width or other highway characteristics.

Magnitude of impact

5.3.20 Volume 6, Appendix 10.1: Transport Assessment considers highway capacity and concludes that traffic flows on Linford Road, Turnpike Lane and Gun Hill are all low and would not create capacity issues. It concludes that the construction of the Thurrock Flexible Generation Plant would not create any severe impacts upon the operation on Linford Road, Turnpike Lane or Gun Hill. This means that there would be negligible changes arising in relation to driver delay as a result of the construction vehicle movements.

5.3.21 The increase in traffic flows on the A1089 and Marshfoot Road is on the boundary of what can typically be expected as day-to-day variances in traffic flows (10%, as set out in the above IEMA guidance). Such increases and resultant changes to driver delay on the A1089 and Marshfoot Road are therefore likely to be minor.

5.3.22 Volume 6, Appendix 10.1: Transport Assessment sets out that the contributing traffic flow to increases on the A1089 and Marshfoot Road by the Thurrock Flexible Generation Plant are negligible in the context of the total cumulative traffic flows. It goes on to say that the same cumulative impact would occur on the highway network (i.e. to driver delay) with or without the Thurrock Flexible Generation Plant.

5.3.23 In the context of the Thurrock Flexible Generation Plant, the magnitude of impact in terms of driver delay resulting from contributing traffic flows is considered to be negligible, short term duration, continuous and fully reversible once works end.

5.3.24 In the context of the other cumulative developments, the magnitude of impact in terms of driver delay resulting from contributing traffic flows is considered to be minor, long term duration, continuous and not reversible.

5.3.25 The minor impact on the A1089 and Marshfoot Road is predicted to be of local spatial extent, long term duration, continuous and not reversible. It is predicted that the impact will affect the receptor directly. The magnitude is therefore considered to be minor.

5.3.26 The negligible impact on Linford Road, Turnpike Lane and Gun Hill is predicted to be of local spatial extent, short term duration, continuous and fully reversible. It is predicted that the impact will affect the receptor directly. The magnitude is therefore considered to be negligible.

Sensitivity of the receptor

5.3.27 Linford Road, Turnpike Lane and Gun Hill have few sensitive receptors; therefore, the links are deemed to be of low vulnerability, fully recoverable and low value. The sensitivity of the receptors is therefore, considered to be low.

5.3.28 The A1089 has no sensitive receptors; therefore, the link is deemed to be of negligible vulnerability, fully recoverable and low value. The sensitivity of the receptor is therefore, considered to be negligible.

5.3.29 Marshfoot Road between the Gateway Academy Roundabout and St Chads Road is deemed to be of high vulnerability, fully recoverable and medium value. The sensitivity of the receptor is therefore, considered to be high.

Significance of effect

5.3.30 Overall, it is predicted that the sensitivity of the receptors on Linford Road, Turnpike Lane and Gun Hill are considered to be low and the magnitude is deemed to be negligible. The effect will, therefore, be of **negligible** significance, which is not significant in EIA terms.

5.3.31 Overall, it is predicted that the sensitivity of the receptors on the A1089 are considered to be negligible and the magnitude is deemed to be minor adverse. The effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

5.3.32 Overall, it is predicted that the sensitivity of the receptors on Marshfoot Road are considered to be high and the magnitude is deemed to be minor. The effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms

Further mitigation or enhancement

5.3.33 No significant adverse effects have been predicted and no further mitigation is considered to be required.

Residual effect

5.3.34 The residual effect following further mitigation is predicted to be not significant in EIA terms.

The temporary impact of the construction works on severance of routes

5.3.35 Severance is only likely to occur on highly trafficked roads and result from the perceived division the road and traffic creates between communities on either side.

5.3.36 The IEMA guidance set out above identifies that increases in total traffic volumes of between 30% and 60% could result in a slight impact (the lowest category) upon severance.

Magnitude of Impact

5.3.37 The change in total traffic flow on all links as a result of the total construction traffic is lower than the 30% that the IEMA guidance sets out is required for a slight effect (the lowest category) to occur.

5.3.38 The impact on Linford Road, Turnpike Lane and Gun Hill is predicted to be of local spatial extent, short term duration, continuous and fully reversible. The magnitude is therefore, considered to be negligible.

5.3.39 The impact on the A1089 and Marshfoot Road is predicted to be of local spatial extent, long term duration, continuous and not reversible. The magnitude is therefore, considered to be negligible.

Sensitivity of the Receptor

5.3.40 The A1089 Linford Road, Turnpike Lane and Gun Hill links have few sensitive receptors; therefore, the links are deemed to be of negligible / low vulnerability, fully recoverable and negligible / low value. The sensitivity of the receptor is therefore, considered to be negligible / low.

5.3.41 Marshfoot Road has high levels sensitive receptors and deemed to be of high vulnerability, fully recoverable and high value. The sensitivity of the receptor is therefore, considered to be high.

Significance of the Effect

5.3.42 Overall, it is predicted that the sensitivity of the receptors is considered to be negligible / low / high and the magnitude is deemed to be negligible. The effect will, therefore, be of **negligible** significance on Linford Road, Turnpike Lane, Gun Hill and the A1089, which is not significant in EIA terms, and of **minor adverse** significance on Marshfoot Road, which is not significant in EIA terms.

Further mitigation or enhancement

5.3.43 No significant adverse effects have been predicted and no further mitigation is considered to be required.

Residual effect

5.3.44 The residual effect following further mitigation is predicted to be not significant in EIA terms.

The temporary impact of the construction works on pedestrian delay

5.3.45 Highly trafficked roads and changes to the volume or speed of traffic may affect the ability of people to cross roads. The IEMA guidance set out above notes that studies have shown that pedestrian delay is perceptible or considered significant beyond a delay threshold of 10 seconds, for a link with no crossing facilities. It goes on to say that a 10 second pedestrian delay in crossing a road broadly equates to a two-way link flow of approximately 1,400 vehicles per hour. This means that where two-way traffic flows on a road exceed 1,400 vehicle movements per hour, then a pedestrian seeking to cross that would perceive a delay.

5.3.46 Although there is a public footpath to the north of the Linford Road / Turnpike Lane junction, there are no footways on Linford Road, Turnpike Lane or Gun Hill.

5.3.47 The A1089 has no pedestrian facilities and no pedestrian crossing desire lines. As a result, pedestrian delay is not applicable to it and has not been considered further.

5.3.48 Marshfoot Road between the Gateway Academy roundabout and Marshfoot Road junction has a combined footway/cycleway with a signalised crossing point for students at the Gateway Academy.

Magnitude of Impact

5.3.49 Daily traffic flows for Linford Road, Turnpike Lane and Gun Hill during the 2021 future baseline year are highest on Linford Road. These are forecast to be a total of 5,570 daily two-way vehicle movements, increasing to 7,102 daily two-way vehicle movements during the average construction period with cumulative flows and 7,202 daily two-way vehicle movements during the peak construction period with cumulative flows.

5.3.50 Professional experience dictates that peak hourly traffic flows are unlikely to exceed 71 two-way vehicle movements on Linford Road with even lower flows on Turnpike Lane and Gun Hill. As a result, the 1,400 hourly vehicle movements during the AM and PM peak hours threshold will not be exceeded.

5.3.51 The impact on Linford Road, Turnpike Lane and Gun Hill is predicted to be of local spatial extent, short term duration, intermittent and fully reversible. It is predicted that the impact will affect the receptor directly. The magnitude is therefore considered to be negligible.

5.3.52 Daily traffic flows for Marshfoot Road during the 2021 future baseline year are highest on Linford Road and forecast to be a total of 8,266 daily two-way vehicle movements, increasing to 9,206 daily two-way vehicle movements during the average construction period with cumulative flows and 9,306 daily two-way vehicle movements during the peak construction period with cumulative flows.

5.3.53 Professional experience dictates that peak hourly traffic flows are unlikely to exceed 1,000 two-way vehicle movements. As a result, the 1,400 hourly vehicle movements during the AM and PM peak hours threshold will not be exceeded.

5.3.54 The impact on Marshfoot Road is predicted to be of local spatial extent, short term duration, intermittent and fully reversible. It is predicted that the impact will affect the receptor directly. The magnitude is therefore considered to be negligible.

Sensitivity of the Receptor

5.3.55 Linford Road, Turnpike Lane and Gun Hill have few sensitive receptors; therefore, the links are deemed to be of low vulnerability, fully recoverable and low value. The sensitivity of the receptors is therefore, considered to be low.

5.3.56 Marshfoot Road has high levels sensitive receptors; it is deemed to be of high vulnerability, fully recoverable and high value. The sensitivity of the receptor is therefore, considered to be high.

Significance of the Effect

5.3.57 Overall, it is predicted that the sensitivity of the receptors is considered to be negligible / low / high and the magnitude is deemed to be negligible. The effect will, therefore, be of **negligible** significance on Linford Road, Turnpike Lane and Gun Hill, which is not significant in EIA terms, and of **minor adverse** significance on Marshfoot Road, which is not significant in EIA terms.

Further mitigation or enhancement

5.3.58 No significant adverse effects have been predicted and no further mitigation is considered to be required.

Residual effect

5.3.59 The residual effect following further mitigation is predicted to be not significant in EIA terms.

The temporary impact of the construction works on pedestrian amenity

5.3.60 The term pedestrian amenity is broadly defined as the relative pleasantness of a journey and is considered to be affected by traffic flow, traffic composition and footway width and separation from traffic.

5.3.61 The IEMA guidance refers to a tentative threshold for judging the significance of changes in pedestrian amenity where the traffic flow (or its HGV component) is halved or doubled.

5.3.62 HGV flows will be introduced to Turnpike Lane and Gun Hill (the construction HGVs only) whilst the change in HGV use on Linford Road is approximately doubled during the peak construction period and far less than double (36% increase) during the average construction period.

5.3.63 Linford Road, Turnpike Lane and Gun Hill have no footways along them and pedestrian movements are observed to be low.

5.3.64 There is no pedestrian activity along the A1089 and pedestrian amenity is not applicable to it, therefore it is not considered further.

5.3.65 Marshfoot Road between the Gateway Academy roundabout and Marshfoot Road junction has a combined footway/cycleway with a signalised crossing point for students at the Gateway Academy. The projected increase in daily HGVs does not exceed 50% of baseline HGVs; therefore the impact on this link is deemed to be negligible.

Magnitude of Impact

5.3.66 The impact on Linford Road, Turnpike Lane and Gun Hill is predicted to be of local spatial extent, short term duration, intermittent and fully reversible. It is predicted that the impact will affect the receptor directly. The magnitude is, therefore, considered to be moderate.

5.3.67 The impact on Marshfoot Road is predicted to be of local spatial extent, long term duration, intermittent and not reversible. It is predicted that the impact will affect the receptor directly. The magnitude is considered to be negligible.

Sensitivity of the Receptor

5.3.68 Linford Road, Turnpike Lane and Gun Hill have few sensitive receptors; therefore, the links are deemed to be of low vulnerability, fully recoverable and low value. The sensitivity of the receptors is therefore, considered to be low.

5.3.69 Marshfoot Road has high level sensitive receptors; it is deemed to be of high vulnerability, fully recoverable and high value. The sensitivity of the receptor is therefore, considered to be high.

Significance of the Effect

5.3.70 Overall, it is predicted that the sensitivity of the receptor on Linford Road, Turnpike Lane and Gun Hill is considered to be low and the magnitude is deemed to be moderate. The effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

5.3.71 Overall, it is predicted that the sensitivity of the receptor on Marshfoot Road is considered to be high and the magnitude is deemed to be negligible. The effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

Further mitigation or enhancement

5.3.72 No significant adverse effects have been predicted and no further mitigation is considered to be required.

Residual effect

5.3.73 The residual effect following further mitigation is predicted to be not significant in EIA terms.

The temporary impact of the construction work on accidents and road safety

Magnitude of Impact

5.3.74 The impact of construction work in terms of road safety affects receptors directly and would be short-term, continuous and fully reversible once construction work is complete. The magnitude of increase in total vehicle movements on Linford Road, Turnpike Lane and Gun Hill is negligible/low.

5.3.75 An analysis of injury accidents has been undertaken and concluded that they currently operate in a safe manner and thus there is no road safety concerns with the layout of the road network.

5.3.76 There would be a temporary increase in the proportion of HGVs on Linford Road, Turnpike Lane and Gun Hill. Such HGV movements would be under contract and would be under the construction traffic management conditions and measures. There is no reason to suggest that the HGVs would travel in a manner that is unsafe or that the injury accident rate would change.

5.3.77 The impact is predicted to be of local spatial extent, short term duration, intermittent and fully reversible. It is predicted that the impact will affect the receptor directly. The magnitude is therefore considered to be negligible.

5.3.78 For the A1089 and Marshfoot Road, the impact of cumulative traffic in terms of road safety affects receptors directly and would be long-term, continuous and not reversible. The cumulative traffic flows would be of similar classifications to existing traffic flows and there is nothing to suggest that they would alter the injury accident rate. It is predicted that the impact will affect the receptor directly. The magnitude is therefore considered to be minor.

Sensitivity of the Receptor

5.3.79 An analysis of injury accidents has been undertaken and concluded that the highway network currently operates in a safe manner and thus there is no road safety concerns with the layout of the road network. It is considered that the vulnerability and value of the receptor with regards to accidents and road safety is negligible for the A1089, low for Linford Road, Turnpike Lane and Gun Hill and high for Marshfoot Road, all of which are fully recoverable. The sensitivity of the receptor is therefore considered to be negligible for the A1089, low for Linford Road, Turnpike Lane and Gun Hill and high for Marshfoot Road.

Significance of the Effect

5.3.80 Overall, it is predicted that the sensitivity of the receptor on Linford Road, Turnpike Lane and Gun Hill is considered to be low and the magnitude is deemed to be negligible. The effect will, therefore, be of **negligible** significance, which is not significant in EIA terms.

5.3.81 Overall, it is predicted that the sensitivity of the receptor on Marshfoot Road is considered to be high and the magnitude is deemed to be minor. The effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

5.3.82 Overall, it is predicted that the sensitivity of the receptor on the A1089 is considered to be negligible and the magnitude is deemed to be minor. The effect will, therefore, be of **negligible** significance, which is not significant in EIA terms.

Further Mitigation

5.3.83 On the basis of the above, no further mitigation is considered necessary in relation to the temporary impact in terms of accidents and road safety during construction.

The temporary impact of the construction work on hazardous, dangerous and abnormal indivisible loads

5.3.84 It is expected that some abnormal indivisible loads would be transported to the site. The abnormal indivisible loads are expected to be components that exceed standard load weight and possibly exceed standard width and height.

Magnitude of Impact

5.3.85 The passage of abnormal indivisible loads would be discussed with the relevant highway authorities and police authority prior to delivery and measures adopted to ensure that the movement is undertaken safely and with minimal delay for other highway users.

5.3.86 Depending on the width, length or weight of the vehicle, different notice periods have to be provided to Highways England, Bridge Authorities and the Police. These can vary between two and five days. The following activities would need to be undertaken in accordance with the Road Vehicles (Authorisation of Special Types) Order 2003 (STGO).

- Before the start of any journey, notify in accordance with Schedule 5 the chief office of Police for each area in which the vehicle or vehicle-combination is to be used.
- Ensure that the vehicle or vehicle-combination is used in accordance with the requirements of that Schedule.
- Ensure that the vehicle or vehicle-combination is accompanied during the journey by one or more attendants employed in accordance with Schedule 6.

5.3.87 The impact in relation to the transport of abnormal indivisible loads would be short-term and intermittent and would affect receptors directly.

5.3.88 The magnitude of the impact of abnormal indivisible loads would be negligible since the number of abnormal indivisible load movements would be low, each load would be present on the network for a short period of time and standard measures applied in terms of route, timing and method of delivering to minimise delays to other highway users.

5.3.89 The impact is predicted to be of local spatial extent, short term duration, intermittent and fully reversible. It is predicted that the impact will affect the receptor directly. The magnitude is therefore considered to be negligible.

Sensitivity of the Receptor

5.3.90 The access route used by the abnormal invisible load would necessarily be of good standard to accommodate the transport delivery vehicles.

5.3.91 Any restrictions would also necessarily be removed to accommodate the transport delivery vehicles and they would travel under controlled environments.

5.3.92 The passage of abnormal indivisible loads would, however, lead to some limited driver delay as the loads would move slowly. The sensitivity of the public roads to the passage of abnormal indivisible loads is therefore considered to be low.

5.3.93 It is considered that the vulnerability and value of the receptor with regards to abnormal indivisible loads is low but fully recoverable.

5.3.94 Given the controlled environment, the road users are deemed to be of negligible vulnerability, fully recoverable and negligible value. The sensitivity of the receptor is therefore, considered to be negligible**.**

Significance of the Effect

5.3.95 Overall, it is predicted that the sensitivity of the receptor is considered to be negligible and the magnitude is deemed to be negligible. The effect will, therefore, be of **negligible** significance, which is not significant in EIA terms.

Future monitoring

5.3.96 No traffic and transport monitoring, to test the predictions made within the construction phase, is considered necessary.

Operational and maintenance phase

5.3.96.1 For the reasons set out in paragraph 1.1.4, an assessment of this phase has been scoped out.

Decommissioning phase

5.3.96.2 For the reasons set out in in paragraph 1.1.4, an assessment of this phase has been scoped out.

6. Conclusion and summary

6.1.1 The construction phase of the Thurrock Flexible Generation Plant will generate the greatest number of vehicle movements, with operational traffic flows negligible in comparison. Decommissioning will generate fewer HGV movements than construction.

6.1.2 This PEIR chapter has set out the estimated construction HGV movements along the adjacent highway network.

6.1.3 Environmental assessments have been undertaken and conclude that the effects on driver delay, severance, pedestrian delay, accidents and road safety and hazardous, dangerous and abnormal indivisible loads would be negligible or minor.

6.1.4 The assessment has identified that there would be no significant effects as a result of the construction vehicle movements.

6.1.5 Screening of potential transboundary impacts (as presented in Volume 5, Chapter 4.2: Transboundary Impacts Screening Note) has identified that there was no potential for significant transboundary effects with regard to traffic and transport.

6.1.6 A summary of the findings of the EIA related to traffic and transport are presented in Table 6.1.

6.2 Next Steps

6.2.1 An analysis of the road network, traffic flow data and road safety data has informed the assessment of the PEIR chapter and no further survey data is planned prior to the submission of the application for development consent.

6.2.2 An Outline Construction Traffic Management Plan and Outline Construction Staff Travel Plan will be submitted with the application for development consent.

Table 6.1: Summary of potential environment effects, mitigation and monitoring.

Description of impact	Measures adopted as part of the project	Magnitude of impact	Sensitivity of receptor	Significance of effect	Additional measures	Residual effect	Proposed monitoring
Construction							
Driver Delay	See Table 2.8	Negligible	Negligible / Low / High	Negligible	None	N/A	None
Severance	See Table 2.8	Negligible	Negligible / Low / High	Negligible	None	N/A	None
Pedestrian Delay	See Table 2.8	Negligible	Negligible / Low / High	Negligible	None	N/A	None
Pedestrian Amenity	See Table 2.8	Moderate	Negligible / Low / High	Minor Adverse	None	N/A	None
Accidents and Road Safety	See Table 2.8	Negligible	Negligible / Low / High	Negligible	None	N/A	None
Abnormal Indivisible Loads	See Table 2.8	Negligible	Negligible	Negligible	None	N/A	None

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