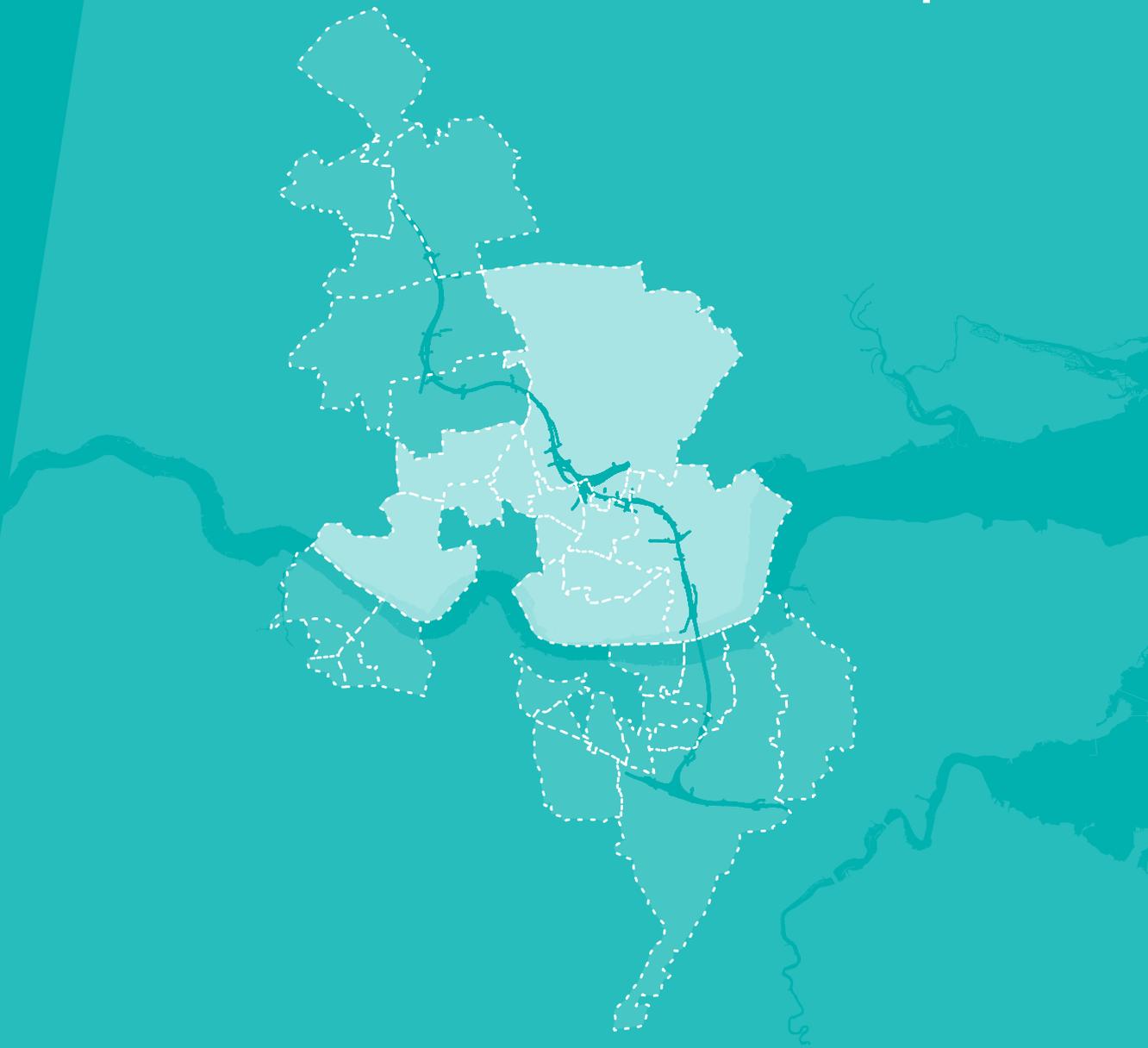


Lower Thames Crossing

Ward impact summaries

north of the river - part 1



July 2021
Community impacts consultation

North of the Thames part 1

To make the Ward impact summaries more user-friendly, we have split the document into three sections. The first covers all wards south of the River Thames. The second and third sections cover the wards impacted by the Lower Thames Crossing north of the Thames. All three sections include the same introductory chapter, which explains more about the document and the assessments that we have carried out.

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Chapter 1: Introduction

1.1 About this consultation

The Ward impact summaries are among the documents produced for our community impacts consultation. The consultation materials also include:

- **Guide to community impacts consultation**

An overview of the information included in our consultation materials and directions on where to find out more detail in the technical documents.

- **Construction update**

An overview of the principles and methods that would be used to build the new road and tunnel, and changes to existing utilities infrastructure. It also details the measures proposed to mitigate potential adverse effects.

- **Operations update**

Information on the new road, junctions, the tunnel, utilities, environmental design and green infrastructure. It also includes changes we've made since the last consultation, some updates to our traffic forecasts and how the new road would impact the environment.

- **You said, we did**

A summary of responses received during our three previous consultations and how these have been used to further refine the project's design.

In addition to the documents listed above, we are also consulting on draft versions of a number of control documents. These are technical documents that set out how our proposed measures would reduce the potential adverse impacts of the construction and operation of the new road. For more information about these documents, see chapter 1 of the Construction update.

To make the Ward impact summaries more user-friendly, we have split the printed document into three sections. The first covers all wards south of the River Thames. The second and third sections cover the wards impacted north of the Thames. All three sections include the same introductory chapter, which explains more about the document and the assessments that we have carried out.

Each chapter within the Ward impact summaries includes numerous ward-specific maps showing information about different topic areas. As well as referring to those maps, we recommend that you also visit the online GIS map-viewer on our consultation website and look at the three A3 map books that are included as part of this consultation (see below). In some instances, the GIS viewer and the map books will provide similar information at a larger scale or additional information about the project that may be of interest to you. We also recommend you refer to the other consultation documents described above, which are referenced through the Ward impact summaries.

Map Book 1: General Arrangements

The General Arrangements show the proposed layout details of the project including: permanent works; new roads, earthworks and roadside features; construction compounds; environmental mitigation; landscaping and tree planting; utilities diversions; Order Limits (previously known as the 'development boundary'); and open space and replacement land.

Map Book 2: Land Use Plans

The land use plans show the areas where we are seeking powers to compulsorily acquire land or permanent rights. They also show the land we require temporary rights to use in order to construct and operate the project. Areas we may need to purchase include the land required for the permanent works, temporary works and compensation land.

Map Book 3: Engineering Plans

The engineering plans show plan and profile drawings which detail the vertical and horizontal road alignment. They also include junction arrangements showing the proposed layout and cross-sections throughout the route showing the lanes and earthworks.

Overview of the Ward impact summaries

These Ward impact summaries provide an overview of the proposals for the project and the associated impacts the project would have in nearby wards, should we be granted development consent. We also explain the measures that we would take to reduce the impacts on local communities. We intend to provide you with information that is relevant to your area, so you can take an informed view of how the project might affect you during construction and operation.

Once appointed, our contractors would further develop our construction plans for the Lower Thames Crossing and, as a result, some of the construction methods and timing may differ from those included in this document. For example, utility diversions are subject to agreement on timing with the relevant companies, which work to ensure supply is maintained to all customers and disruption is minimised across areas far greater than the project footprint. In the event that consent is granted for the project, the contractors would need to confirm that any changes to construction methods or timings would not result in an environmental impact that is materially different from that presented in our application.

To make sure people are aware of any anticipated disruption and can plan ahead, we would share more information during construction. If parts of the project are finished before the main route is open, such as the upgrades to the Gravesend East junction, we would inform local communities and road users so they can make use of the upgrades.

Our target date for the road opening is 2029/30, but for the purposes of construction and traffic modelling the opening date is assumed to be 2029 throughout this consultation.

1.2 Ward selection

For the purposes of describing the impacts of the project, we have divided the project up using the existing local authority electoral wards. The wards included are those that are directly affected by the project, in that part of the Order Limits falls within those wards. The Order Limits (also known as the ‘development boundary’) is the area required to build and operate the new road.

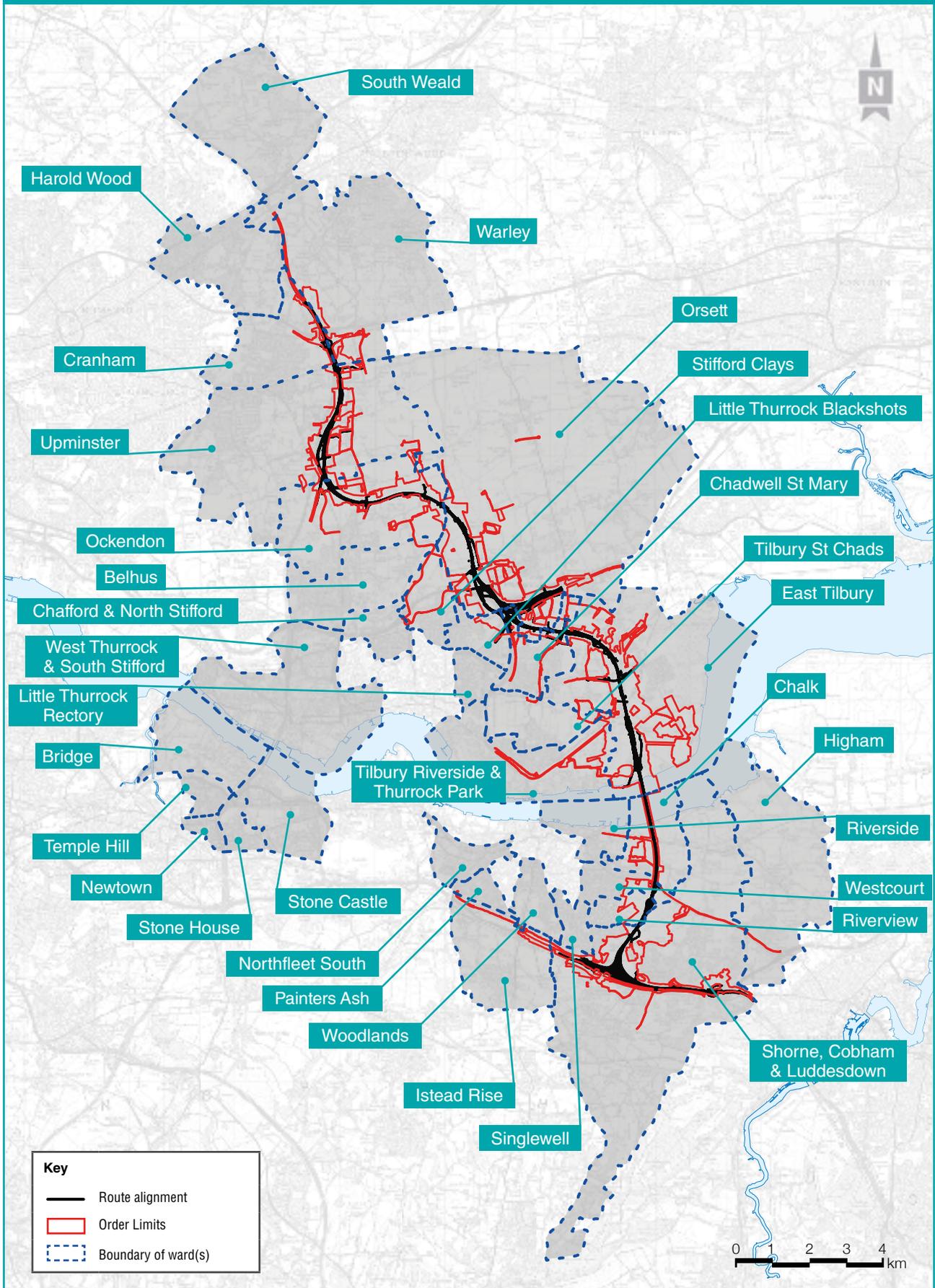
We have also included two chapters covering wards immediately north and south of the Dartford Crossing, even though these are not directly affected by the Order Limits. This is because it is the existing situation at Dartford that underpins the need for the Lower Thames Crossing. Table 1.1 below presents a list of chapters, including the wards in each and the associated local authority, while figure 1.1 maps all the included wards.

The wards in this document are presented from south to the north of the project. In some chapters, two or more wards are presented together because they are impacted in similar ways.

Table 1.1: Ward selection

Chapter	Ward(s) included	Local authority
2	Higham	Gravesham
3	Shorne, Cobham and Luddesdown	Gravesham
4	Chalk	Gravesham
5	Riverside	Gravesham
6	Westcourt	Gravesham
7	Riverview	Gravesham
8	Singlewell	Gravesham
9	Woodlands	Gravesham
10	Northfleet South; Istead Rise; Painters Ash	Gravesham
11	Newtown; Stone Castle; Stone House; Bridge; Temple Hill	Dartford
12	East Tilbury	Thurrock
13	Tilbury Riverside and Thurrock Park	Thurrock
14	Tilbury St Chads	Thurrock
15	Chadwell St Mary	Thurrock
16	Orsett	Thurrock
17	Little Thurrock Blackshots; Little Thurrock Rectory	Thurrock
18	Stifford Clays; Chafford and North Stifford; Belhus	Thurrock
19	West Thurrock and South Stifford	Thurrock
20	Ockendon	Thurrock
21	Upminster	Havering
22	Cranham; Harold Wood	Havering
23	Warley; South Weald	Brentwood

Figure 1.1: Map of the wards featured in this document



1.3 Topics covered in each chapter

We've divided each chapter into 12 sections (listed in table 1.2). In each one, we summarise the existing situation and explain how construction and operation would have effects within the ward(s). We set out what the impacts could be and the measures we would use to reduce them. Where there are no significant impacts, this is highlighted.

Landscape, climate, geology and soils, archaeology and water management are predominantly dealt with at a project-wide level in the Construction and Operations updates, with additional maps and information. Following engagement with local authorities, it was determined that these impacts were more appropriately dealt with on a project-wide level. Traffic impacts are covered both at a ward and project level.

Table 1.2: Topics in each ward impact summary

Section	Topics covered
Overview	Information about the ward, including area, population and significant features, such as population centres and transport links. This section also includes a table summarising the impacts and mitigation expected in this ward.
Project description	The construction activities required to build the project in this ward, including information about traffic management measures associated with construction. It also includes information about the elements of the new road that would be in this ward once the project is open, information about the impacts on open space and recreational land, and changes to the Order Limits since our design refinement consultation in 2020.
Traffic	Descriptions of the impacts of construction on local roads, including HGV and project workforce movements. It also includes information about traffic flows on roads in the ward once the project is open, and information about how the new road would affect journey times and the availability of job opportunities for people within the ward.
Public transport	The impact on bus and rail services during construction, including any closures or diversions required. It also sets out the impacts on bus and rail services once the new road is open, with the latter including information about journey times by car to nearby stations.
Footpaths, bridleways and cycle routes	The impacts of the project on footpaths, bridleways and cycle routes during construction, including any proposed diversions. It also includes information about new and upgraded routes once the new road is operational.
Visual	The visual impacts of the construction and operation of the Lower Thames Crossing, as well as information about how we have sought to reduce these through measures such as landscaping and good design.
Noise and vibration	Daytime noise impacts from construction sites, information about traffic noise for each year of construction, and a summary of areas likely to experience 24-hour/ seven-day working. This section also explains the anticipated noise and vibration impacts of the new road once it is operational. It also includes information about the measures put in place to reduce noise and vibration impacts during construction and operation. More information about the noise and vibration assessments carried out can be found below.

Section	Topics covered
Air quality	Air quality impacts during construction of the new road, including the impact of construction traffic. It also explains the controls that would be in place during construction to reduce the impacts of dust, while providing information about the impact on air quality once the new road is open. More information about the air quality impact assessments carried out can be found below.
Health	The potential positive and negative impacts of the project on people's health and wellbeing, including from increased access to job opportunities and from changes to noise or air quality. Demographic data presented in the Health sections is derived from independent sources such as the UK Census and the Office for National Statistics.
Biodiversity	The impact of the new road on local flora and fauna during construction and operation. Where relevant, this section includes information about designated sites. It also describes our work to create new habitats, build green bridges and introduce landscaping measures.
Built heritage	The impact of construction and operation on conservation areas, listed buildings, scheduled monuments and other buildings of local importance. This section includes information about how we have sought to preserve the integrity of local built heritage where possible.
Contamination	How we would manage existing sites of potential contamination, such as landfill and petrol stations, to prevent harm to local land or water supplies. It also sets out procedures to manage contamination from incidents, such as collisions, once the road is open.

1.4 Transport

1.4.1 Construction traffic

There would be more traffic on the roads in the vicinity of the project due to people travelling to the construction sites and the delivery of materials. The location of the construction activities and traffic management measures within each ward are discussed in the Project description section of each chapter, along with information about the expected daily number of construction vehicles travelling to and from each site.

Traffic management measures would be required on the road network at different locations and for varying lengths of time during construction to maintain safety for all road users and the project workforce. A list of all currently proposed measures is presented in the Outline Traffic Management Plan for Construction (OTMPfC), which is one of the technical documents included in this consultation.

Local diversions during construction may be required for some bus routes and these are reported in the relevant ward chapters. Information is also provided about likely disruptions to rail services that serve each ward.

Information about closures and realignments of existing footpaths, bridleways and cycle routes is presented for each ward.

1.4.2 Operational traffic

We have used traffic modelling to forecast what the conditions on the road network are predicted to be in the project's opening year, 2029, both with and without the project. Maps showing data for current and predicted traffic flows and road capacity for the wider area can be found in the Operations update, which also includes information about how we carried out our modelling.

For this consultation, local adjustments were made to our modelling to update the geographic information, such as the location of new housing, retail and leisure sites, and the trips associated with them. We have included the main future development areas that are either under construction or already within the planning process, based on local authority information made available at the end of June 2020. More information about how we carried out our operational traffic modelling can be found in chapter 4 of the Operations update.

In each chapter of this document, we also explain the predicted change in conditions on the road network within each ward for three different time periods: the morning peak hour (7-8am), the interpeak period (a typical hour between 9am-3pm) and the evening peak hour (5-6pm). For each time period, we provide a map showing the changes in traffic flows measured in Passenger Car Units (PCUs), where one PCU is equivalent to a car and 2.5 PCUs is equivalent to an HGV. For each time period, we also show the changes in traffic flow as a percentage of the existing traffic flow on that road. On each set of maps, we have not highlighted roads where the change in flow on that road is predicted to be between -49 PCUs and +50 PCUs in each of the modelled time periods.

We have also included maps that show predicted changes in the distance that people within each ward would be able to travel within either a 30 to 60-minute drive once the new road is open.

Information is also provided on any changes to local bus routes and journey times (greater than one minute) within each ward, as well as information about impacts on rail services, including journey times to stations within or near each ward.

1.5 Environmental Impact Assessment

The type and scale of the project means that it automatically requires an Environmental Impact Assessment (EIA) to meet the requirements of legislation and policy. The results of the EIA process is being documented in an Environmental Statement (ES), which will be submitted with our application for development consent.

The EIA follows industry-standard methods as set out in Highways England's Design Manual for Roads and Bridges, along with other topic-specific methods and guidance. Each topic chapter of the ES will be completed by competent experts.

Within the ES, all effects will be reported according to their significance (very large, large, moderate, slight or neutral). These categories are determined by understanding how sensitive a 'receptor' might be (where a receptor is something that can experience an impact, such as a person, property or animal), as well as the size of an impact, which could be classed as major, moderate, minor, negligible or no change. These are understood using a matrix to determine the overall significance of an impact. See table 1.3

Table 1.3: How the size of an impact and the sensitivity of a receptor combine to establish the significance of an effect

		Size of impact (degree of change)				
		No change	Negligible	Minor	Moderate	Major
Environmental value (sensitivity)	Very high	Neutral	Slight	Moderate or large	Large or very large	Very large
	High	Neutral	Slight	Slight or moderate	Moderate or large	Large or very large
	Medium	Neutral	Neutral or slight	Slight	Moderate	Moderate or large
	Low	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or moderate
	Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight

For example, if a major impact affects a 'sensitive receptor' (such as a local community), then the level of environmental effect would be 'very large'. The matrix shows the magnitude of effects possible with different degrees of sensitivity and sizes of impacts. It is shown here to provide the context of the assessment presented in the ward summaries.

The typical methodology used for producing an EIA is not designed to be reported at ward level, so in some cases it can be hard to interpret at that scale. However, the effects have been presented for visual, noise, air quality, health, biodiversity (ecology) and built heritage to help show how communities would be affected by the project. The typical language used in an EIA as shown in table 1.3 has not been used in the ward summaries. However, this is how effects will be presented in the Environmental Statement.

Other topics such as climate, road drainage and the water environment, and geology and soils are presented in chapter 7 of the Construction update and chapter 5 of the Operations update. These chapters also include information about noise and vibration and air quality impacts, presented from a project-wide perspective.

The EIA process follows a series of key steps:

1. Identification of the study area and the receptors to be assessed. Receptors can include people, properties, flora and fauna, and the surrounding environment and its resources.
2. Information on the existing environment is collected through surveys, desk-based studies, and consultation with environmental groups and the public.
3. A Scoping Report was produced to request a Scoping Opinion from the Planning Inspectorate (the government body that oversees our application for development consent). The scoping process identifies the key environmental issues relevant to the project and determines which environmental topics and elements of these topics are to be assessed. This step was completed in 2017.
4. A Scoping Opinion was received from the Planning Inspectorate on 13 December 2017.
5. Environmental assessment of the project to identify any potential significant effects on what is a reasonable worst-case scenario for both construction and operation of the project.

6. Mitigation measures are set out that seek to avoid, reduce or offset potential adverse impacts.
7. Likely significant environmental effects are identified, considering whether effects would be beneficial or adverse, permanent or temporary, while taking proposed mitigation measures into account.

Measures to reduce impacts

To avoid or reduce potentially significant effects on the environment we would use the following:

- Embedded mitigation: Such as the use of cuttings to hide roads or green bridges to link footpaths, bridleways and ecological habitats.
- Good practice: These are standard approaches and actions, for example, suppressing dust to reduce air quality impacts during construction and measures to reduce the risk of pollution.
- Essential mitigation: These are specific measures to avoid or reduce localised environmental effects. They include monitoring protected ecological species during construction or building earth walls (bunds) alongside construction compounds to reduce noise.

More information can be found in the following control documents:

- Design principles: Embedded mitigation would be committed to within this document.
- Register of Environmental Actions and Commitments (REAC): Presents good practice measures and essential mitigation to be carried out during construction and operation of the project.
- Code of Construction Practice (CoCP): Provides a framework to manage construction activities and will accompany the ES when we submit our application for development consent. It aims to make sure environmental mitigation commitments are met and that any necessary consents and licences are obtained.

Throughout this document we have signposted to the above where relevant, while also referring to the Construction update and Operations update.

A Habitat Regulations Assessment is also being prepared and will be submitted with the application for development consent. This is required due to the proximity of the project to internationally designated sites including Thames Estuary and Marshes Special Protection Area and Ramsar site.

1.6 Air quality and noise assessments

The effects reported in the ward summaries are representative of a reasonable worst-case scenario, which is the basis for carrying out environmental assessments. This is assessed for the construction and operation of the project and takes account of mitigation which we have proposed to avoid, reduce or offset the effects. As a reasonable worst-case scenario has been considered, the actual impact of the project on air quality once constructed may well be less than we have assessed.

Although the impacts set out in the ward summaries provide a reasonable representation of the likely effects from our proposals in this consultation, the air quality and noise assessments are based on earlier versions of the project. The information provided about air quality and noise when the road opens is based on traffic data from an earlier opening year than is now planned for and the construction traffic air quality and noise information does not include all of the traffic management measures that we have developed subsequently.

The chapters in this document present an indicative summary of the likely effects of the project for each ward or group of wards, although further modelling will be required. For consultation, more information is described in relation to construction compounds and activities than has been included within air and noise predictions that are presented.

Air quality assessment

When a project leads to traffic changes, an air quality assessment is carried out. Roads that are modelled as part of the traffic assessment are included within the air quality assessment. These roads are collectively called the 'affected road network'.

Nitrogen dioxide (NO₂) is one of a group of gases called nitrogen oxides, which are generated by road traffic (among other things). There is evidence that high levels are harmful to health, causing symptoms such as shortness of breath and coughing. The health effects are likely to be more pronounced in people with pre-existing conditions like asthma. PM₁₀ is a type of particulate matter (fine particles of dust) that is also generated by road traffic and high levels can cause similar health issues.

Before an air quality assessment can be made, it is important we understand what the current air quality is like in the area. We have sourced air quality data from local authorities and the Department for Transport, used existing Highways England data, and collected our own project data. Background air quality is measured by placing diffusion tubes (a type of monitoring equipment) at the roadside, for example, attached to a lamp post for weeks at a time. These tubes are changed intermittently and sent to a laboratory, where they are analysed and the results collated. There are also automatic monitoring stations that continuously measure both NO₂ and PM₁₀ concentrations and collect annual averages. Collectively, these results provide us with a good picture of existing levels of NO₂.

Next, the area is analysed for 'sensitive receptors'. These can be human or natural, so residential properties are included, as well as locations that have an ecological interest, such as Sites of Special Scientific Interest (SSSIs). In line with standards and guidance, only those receptors that fall within 200 metres of an affected road are included in the analysis because air quality impacts tend to decrease beyond this distance.

Following this, we carry out dispersion modelling, which predicts future NO₂ and PM₁₀ concentrations, for scenarios with the new road and without it.

In some ward impact summaries, we explain that we expect local increases and exceedances in pollutants and in others there would be an improvement in air quality. To derive the significance of the effect of the project on air quality best-practice guidance has been followed (in the Design Manual for Roads and Bridges) to establish if the project overall has a significant effect. The conclusion of this assessment of significance is presented in the construction and operation summary documents. Localised increases and decreases in air quality do not necessarily result in a 'likely significant effect', for air quality for the project overall.

Glossary of air quality terms

Air Quality Standards

The project must comply with UK air quality objectives and the relevant Air Quality Regulations, which apply to the UK following withdrawal from the EU and which reflect the limit and target values contained in the EU Air Quality Directive.

Air Quality Standards (AQS) are concentrations recorded over a given time. They take into account what is known about the effects of pollutants on health and on the environment, and can be used as a benchmark to show whether air quality is getting better or worse. AQS have set objectives for two important air pollutants: NO₂ and PM₁₀.

An exceedance is a period of time (defined for each standard) during which the concentration is higher than that set out in the standard.

The parameters set out in the Air Quality Regulations are legally binding and must not be exceeded.

Air Quality Management Areas

Since December 1997, each local authority in the UK has been carrying out reviews and assessments of air quality within its area. This involves measuring air pollution and trying to predict how it will change over the next few years. The aim of the reviews is to make sure the national air quality objectives will be achieved throughout the UK by the relevant deadlines. These objectives have been put in place to protect people's health and the environment.

In addition to the baseline monitoring that we have carried out, we have established which AQMAs are within the vicinity of the project, which helps us understand what the existing air quality is like and where there are areas already impacted by poor air quality. We have used this knowledge to help predict how air quality may change during both the construction of the project as well as after it is built and open to traffic.¹

¹ (Source: <https://uk-air.defra.gov.uk/aqma>).

Glossary of noise terms

Decibels

Decibels (dB) is the unit used to measure noise. The typical level ranges from 30 dB(A)², which is a quiet night-time level in a bedroom, to 90 dB(A), which would be kerbside by a busy road.

When we report noise levels and thresholds within the ward summaries, we use the label 'LAeq'. The 'A' refers to a standard weighting that is applied to noise to represent the range of noise that people can hear. The 'eq' stands for 'equivalent' and means the average noise over an amount of time. The amount of time would then be written after the label, with the most-used time period presented in the ward summaries being 12 hours, which is expressed as 'LAeq12hour'. L stands for level.

Noise impacts are described as being negligible, minor, moderate, or major. These levels of change are associated with an increase in decibels of less than 1.0 dB(A) to greater than 5.0 dB(A), as shown in table 1.4.

Table 1.4: Terms used to describe noise impacts

Noise increase	In decibels	Meaning
Negligible	Less than 1.0 dB(A)	Change in noise is not noticeable
Minor	Greater than or equal to 1.0 and less than 3.0 dB(A)	Change in noise is barely noticeable
Moderate	Greater than or equal to 3.0 and less than 5.0 dB(A)	Change in noise is noticeable (requires concentration to hear)
Major	Greater or equal to 5.0 dB(A)	Change in noise is apparent (can be heard easily)

² (A) shown after dB refers to weighting applied to sound levels to mimic the human hearing range.

Noise assessment

As the area surrounding the project has the potential to be affected by noise caused by construction or operation of the project, a noise assessment is being carried out for both the construction and operational phases. This would predict the likely noise levels from construction traffic and equipment, as well as changes in road noise once the new road is open.

First, we establish existing background noise levels by surveying locations agreed by the Local Planning Authority. These are recorded using sound level meters over a set timeframe, to provide day and night-time averages in decibels.

Noise hotspots

Noise Important Areas are 'hotspots' where the highest 1% of noise levels at residential locations can be found and are defined by DEFRA. These areas provide a framework for further investigation and are used to produce action plans to manage environmental noise and its effects.

British Standard (BS) 5228

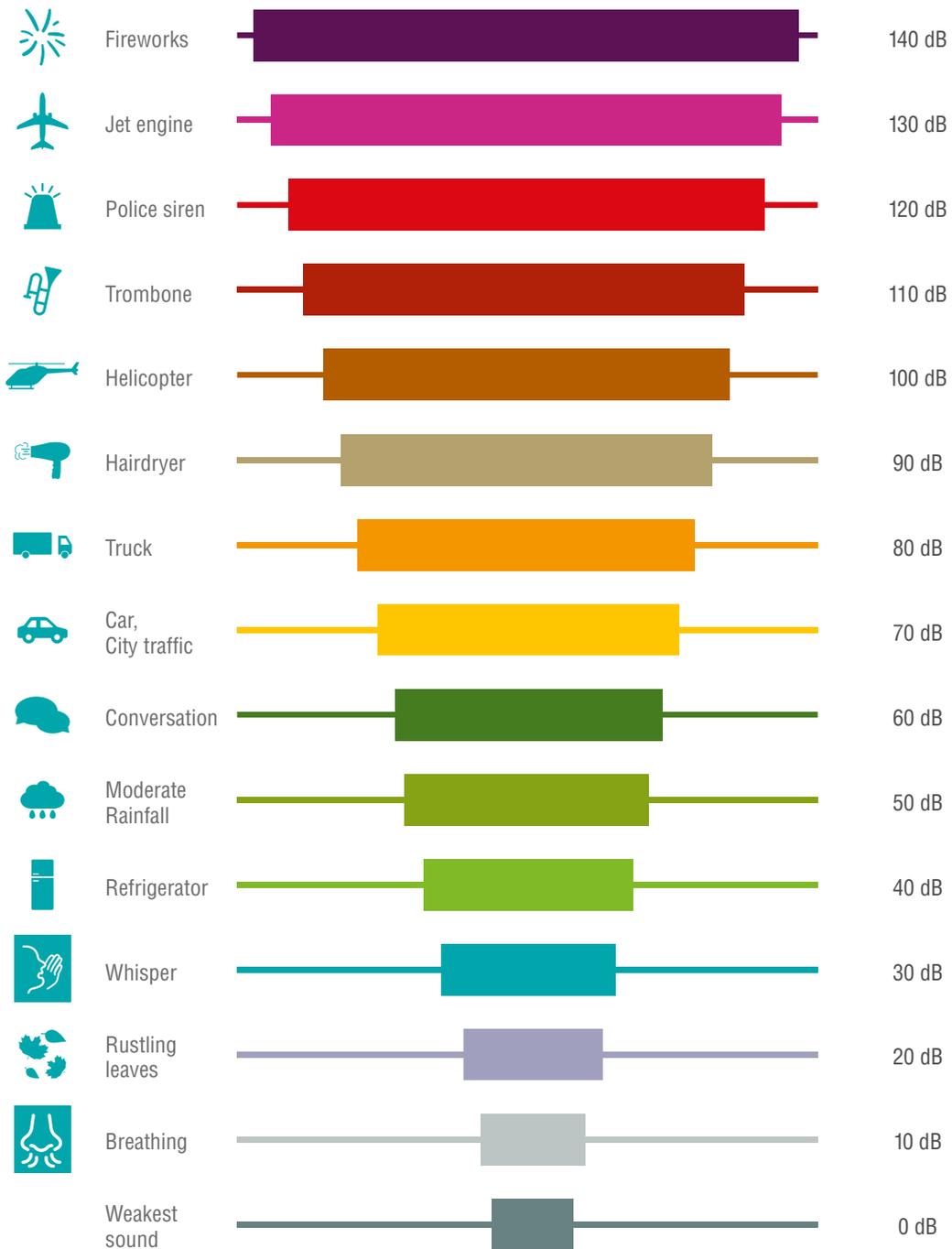
We refer to BS 5228 in the noise sections of the ward summaries. This is a British Standard for conducting noise modelling. It provides the methodology for assessing changes in noise and tells us how we determine the significance of a change. The guidance provides threshold levels for noise during the day, the evening, at weekends and at night. If these thresholds are exceeded mitigation is needed.

Where we present a threshold based on BS 5228 this is done over an average time period. Where we predict that noise levels would be below a threshold this is the average noise level rather than the peak noise level. For example, over the course of a day the average noise level may remain well below the baseline noise levels but individual short-term activities might cause noise levels which peak above the threshold.

Figure 1.2: Noise impacts, decibel changes and how these might be perceived

decibel Scale (dB)

An explanation of the decibel scale and related units for measuring sound and loudness. How noise levels measured in decibels might sound.



12

Chapter 12: East Tilbury ward

This chapter summarises the activities in East Tilbury ward relating to the project's construction and its operational phase (when the new road is open). It also explains the measures intended to reduce the project's impacts on the local area. For more information about the assessments in this chapter and other information available during this consultation, see chapter 1, which also includes a map showing all the wards described in this document.

Within this document, we sometimes advise where additional information can be found in other consultation documents, including the Construction update, Operations update, You said, we did, Register of Environmental Actions and Commitments (REAC), Code of Construction Practice (CoCP), Outline Traffic Management Plan for Construction (OTMPfC), and the Design principles. To find out more about these documents, see chapter 1. References to these documents provide an indication as to how our proposals to reduce the project's impacts will be secured within our application for development consent.

12.1 Overview

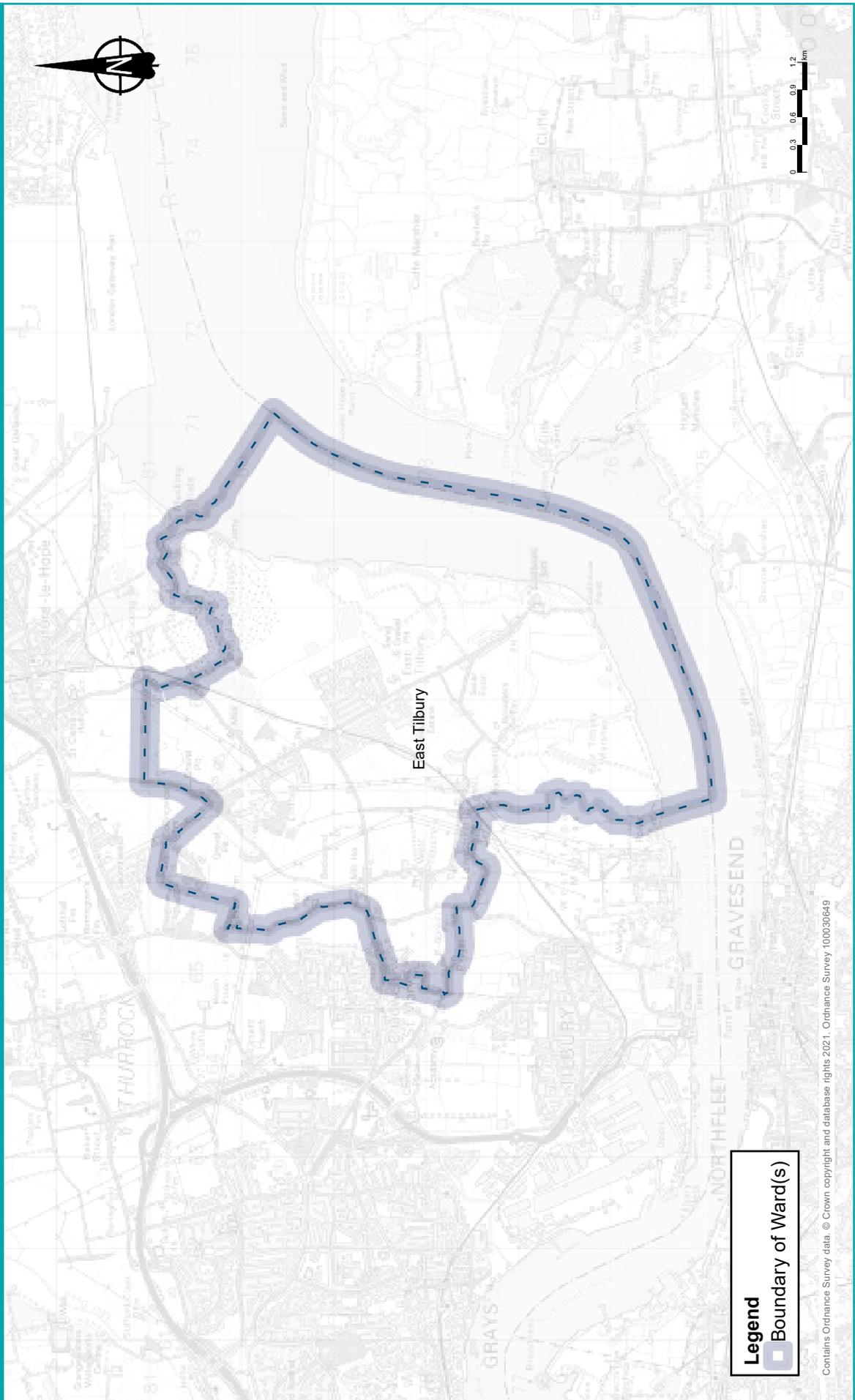
12.1.1 About this ward

East Tilbury ward is located north of the River Thames, to the west of Tilbury Riverside and Thurrock Park ward. The ward has an area of around 17km² and an estimated population of 7,176¹. The residential areas of East Tilbury and Linford are in the centre of the ward and are surrounded by agricultural land. These areas are separated by the Tilbury Loop railway line, with East Tilbury station located off Princess Margaret Road. The residential area of East Tilbury continues to the south-east of the ward towards Coalhouse Fort. West Tilbury is a small village in the west of the ward.

A network of high voltage overhead power lines pass through the centre of the ward, to the west of Linford and East Tilbury, separating east and west towards neighbouring wards. There is a network of low-voltage overhead power lines in the south of the ward to the west of Coalhouse Fort. There are two high-pressure gas pipelines situated north from the River Thames, running through East Tilbury and Linford to the neighbouring ward.

¹ Office for National Statistics, 2018 ward-level population estimate

Figure 12.1: Ward boundary map for East Tilbury ward



Contains Ordnance Survey data. © Crown copyright and database rights 2021. Ordnance Survey 100030649

12.1.2 Summary of impacts

Table 12.1: Summary of impacts during the project’s construction and operation

Topic	Construction	Operations
<p>Traffic</p>	<p>Impacts</p> <p>There would be delays to traffic using the local roads at the locations where there are traffic management measures in place. Journeys along Muckingford Road may be affected by construction vehicles crossing the road.</p> <p>Mitigation</p> <p>There are several measures – including minimising the use of local roads for construction purposes – that we would introduce to reduce the impact of the construction process in East Tilbury ward. These are outlined in more detail in the traffic section of this chapter.</p>	<p>Impacts</p> <p>The project runs through the East Tilbury ward.</p> <p>On the local road network, changes in traffic flows would be less than 250 PCUs an hour in all of the modelled time periods, with some roads seeing decreases of up to 40%, while others would see an increase of up to 40%. Analysis of the traffic flow increases and impacts can be found in the traffic section.</p> <p>Mitigation</p> <p>Once the project is operational, traffic impacts on the affected road network would be monitored, including local roads.</p>
<p>Public transport</p>	<p>Buses</p> <p>During construction, there may be some increases in journey times along local roads, which would impact the 374 bus route.</p> <p>Rail</p> <p>The Tilbury Loop railway line would need to close at night-time over a period of two months while the Tilbury Viaduct is built, but this is not expected to impact rail services. Increases in journey times along some local roads may affect journey times to East Tilbury station.</p>	<p>Buses</p> <p>There would be no changes to bus routes through the ward nor any discernible change to bus journey times once the project is operational.</p> <p>Rail</p> <p>There would be no changes in access times to East Tilbury station, nor changes to services from that station.</p>

Topic	Construction	Operations
<p>Footpaths, bridleways and cycle routes</p>	<p>Impacts</p> <p>Due to the construction of the northern tunnel entrance, northern connecting road and new viaduct, a number of footpaths and bridleways would be disrupted in this ward during the construction period, with some requiring permanent closure.</p> <p>Mitigation</p> <p>Where footpaths and bridleways require temporary closure to allow the construction of the northern tunnel, new road, or viaduct, these closures would be as short as possible.</p>	<p>Impacts</p> <p>A number of footpaths and bridleways would be impacted by the project once it is operational, with some being divided by the northern tunnel entrance, new road, viaduct or the realignment of Muckingford Road.</p> <p>Mitigation</p> <p>Where footpaths and bridleways are permanently divided by the northern tunnel, new road, or viaduct, or Muckingford Road realignment, diversions would maintain existing connections to the existing public rights of way network.</p>

Topic	Construction	Operations
<p>Visual</p>	<p>Impacts</p> <p>There would be views towards construction activities from residential properties on the western edge of East Tilbury and Linford, NCN Route 13 and Two Forts Way. Road construction and overhead line diversions would be visible from some residential properties on the edge of West Tilbury. The Northern Tunnel Entrance Compound would likely be visible from the southern edge of East Tilbury, with close range views of Low Street Lane Utility Hub and flood compensation area excavation from residential properties at the junction of Church Road and Low Street Lane, from which the construction of the Tilbury Viaduct would be visible.</p> <p>Mitigation</p> <p>Taller compound facilities would be located as far away as possible from homes within the Northern Tunnel Entrance Compound. Earth bunds would visually screen residential properties at the junction of Church Road and Station Road.</p>	<p>Impacts</p> <p>Tilbury Viaduct would feature in some views from East Tilbury and Linford, with views of the tops of HGVs and gantries visible above the grassed false cutting slope.</p> <p>Traffic and gantries would be visible above the grassed false cutting slopes through gaps in existing vegetation. From residential properties at the junction of Church Road and Low Street Lane, the Tilbury Viaduct and flood compensation area would feature prominently.</p> <p>Mitigation</p> <p>A wide belt of new woodland planting would provide screening in views from Orsett Golf Club. The areas used temporarily for construction would be restored to their former use.</p>

Topic	Construction	Operations
<p>Noise and vibration</p>	<p>Impacts</p> <p>The construction activity associated with the northern tunnel entrance, main alignment and utility work is expected to create noise and vibration in this ward. There would also be 24-hour, seven-day construction working in some locations, particularly while tunnelling is being undertaken when the site would be working 24/7. There would be negligible changes in road traffic noise during all construction years, except along Coopers Shaw Road where minor increases in road traffic noise are predicted.</p> <p>Mitigation</p> <p>Construction noise levels would be controlled through the mitigation measures set out in the REAC. There are also measures presented in the CoCP.</p>	<p>Impacts</p> <p>Once the project is built, there would be direct noise impacts in the western section of the ward, near the north tunnel entrance and new road. There would be an indirect noise impact from the changes in traffic flow and speed on the existing road network.</p> <p>Mitigation</p> <p>Low-noise road surfaces would be installed on new and resurfaced roads, plus noise barriers would be installed in locations such as along the Tilbury Viaduct.</p>

Topic	Construction	Operations
<p>Air quality</p>	<p>Impacts</p> <p>There is likely to be dust and emissions from construction equipment and traffic during the construction phase.</p> <p>Analysis of the construction phase traffic flows show that increases in construction lorries moving to and from the site compounds could lead to a temporary, but negligible increase in pollutant concentrations.</p> <p>Mitigation</p> <p>The contractor would follow good practice construction measures which are presented in the CoCP and REAC to minimise the dust. Construction vehicles would need to comply with emission standards. An Air Quality Management Plan would be designed in consultation with the relevant local authorities. The plan would include details of monitoring which would ensure measures are effectively controlling dust and exhaust emissions.</p>	<p>Impacts</p> <p>Air quality modelling shows there would be a minimal increase in pollutants as a result of project-associated changes in traffic flows and the new road.</p> <p>Mitigation</p> <p>As our modelling shows there would be a minimal increase in NO₂ as a result of the operation of the project, no mitigation is proposed.</p>

Topic	Construction	Operations
<p>Health</p>	<p>Impacts</p> <p>The construction phase of the project would present opportunities to access work and training.</p> <p>There are likely to be changes in the area that may result in negative impacts on health, including mental health and wellbeing. These include changes in accessibility of local resources and amenities as a result of road and footpath closures.</p> <p>There is also likely to be perceivable changes in the levels of noise from the construction works, construction traffic and percussive piling activities.</p> <p>There would also be temporary visual impacts as set out in this table above.</p> <p>Mitigation</p> <p>The negative impacts would be mitigated through the good practice construction measures presented in the CoCP and REAC relating to dust emissions, working hours, noise and visual screening, traffic management measures and community engagement.</p>	<p>Impacts</p> <p>The project would improve access to work and training, and access to open space and accessibility of local resources and amenities.</p> <p>There would be changes in the levels of noise. Some residents may experience impacts on mental health and wellbeing as a result of the project, such as anxiety around perceived changes to air quality or as a result of changes to the noise environment.</p> <p>Mitigation</p> <p>No essential mitigation is required for health other than those measures described in the Noise and visual section.</p>

Topic	Construction	Operations
<p>Biodiversity</p>	<p>Impacts</p> <p>The construction of the project would involve the removal of areas of habitat, both temporarily and permanently for the new road, including an area of Ancient Woodland within Rainbow Shaw. These habitats support a number of protected and notable species which would be impacted including badgers, bats, water voles, reptiles, great crested newts (GCN), breeding birds and invertebrates.</p> <p>Mitigation</p> <p>Vegetation clearance would be undertaken in winter to avoid impacting breeding birds. Protected species would be relocated, carried out under a Natural England licence. Boxes to support bats and birds would be erected. Areas of woodland planting are proposed to offset woodland lost. Two green bridges would be created to provide habitat connectivity within this area at Muckingford Road and Hoford Road.</p>	<p>Impacts</p> <p>There is the potential to cause mortality of species by encountering road traffic as well as habitat fragmentation and disturbance from traffic.</p> <p>Mitigation</p> <p>Landscape planting would be designed to provide strong links for animal movement and foraging. Impacts would also be managed through the range of good practice measures set out in the CoCP and REAC.</p>

Topic	Construction	Operations
<p>Built heritage</p>	<p>Impacts</p> <p>Built heritage assets would not be directly affected, however there would be a change to the setting of Coalhouse Fort, West Tilbury Battery and WWII anti-aircraft battery at Bowaters Farm scheduled monument due to the audible and visual impact of the construction activity.</p> <p>Mitigation</p> <p>The design and layout of Northern Tunnel Entrance Compound and Station Road Compound would take into account the surroundings of heritage assets and seek to avoid/ minimise light glare, light spill and light pollution during night-time construction. Dust and noise reduction measures would also be implemented in accordance with the REAC.</p>	<p>Impacts</p> <p>The surroundings of WWII Battery at Bowaters Farm scheduled monument would be impacted through increases in the traffic noise. The standard lighting at night associated with new road would increase background lighting on the built heritage assets.</p> <p>Mitigation</p> <p>To preserve the rural and historic character of the landscape, road lighting would be minimised where it is safe and practical to do. However, there would be lighting at the tunnel entrance, and this would remain in accordance with relevant standards.</p>

Topic	Construction	Operations
<p>Contamination</p>	<p>Impacts</p> <p>There is a risk of contamination from East Tilbury landfill migrating towards the area during the construction of the tunnel entrance and during dewatering required prior to construction. There is also the risk of accidental spillages of oils, cement and fuels from the movement of construction traffic and the storage of materials.</p> <p>Mitigation</p> <p>A deep barrier would be constructed around the excavation of the tunnel entrance, the design of which would be agreed with the Environment Agency prior to starting any excavation work. To reduce risk, the contractor would follow good practice construction measures as detailed in the REAC. Where contamination is identified during ground investigation work, site-specific remediation would be undertaken in consultation with the local authority.</p>	<p>Impacts</p> <p>None identified.</p> <p>Mitigation</p> <p>None required.</p>

12.2 Project description

12.2.1 Construction

Construction activities

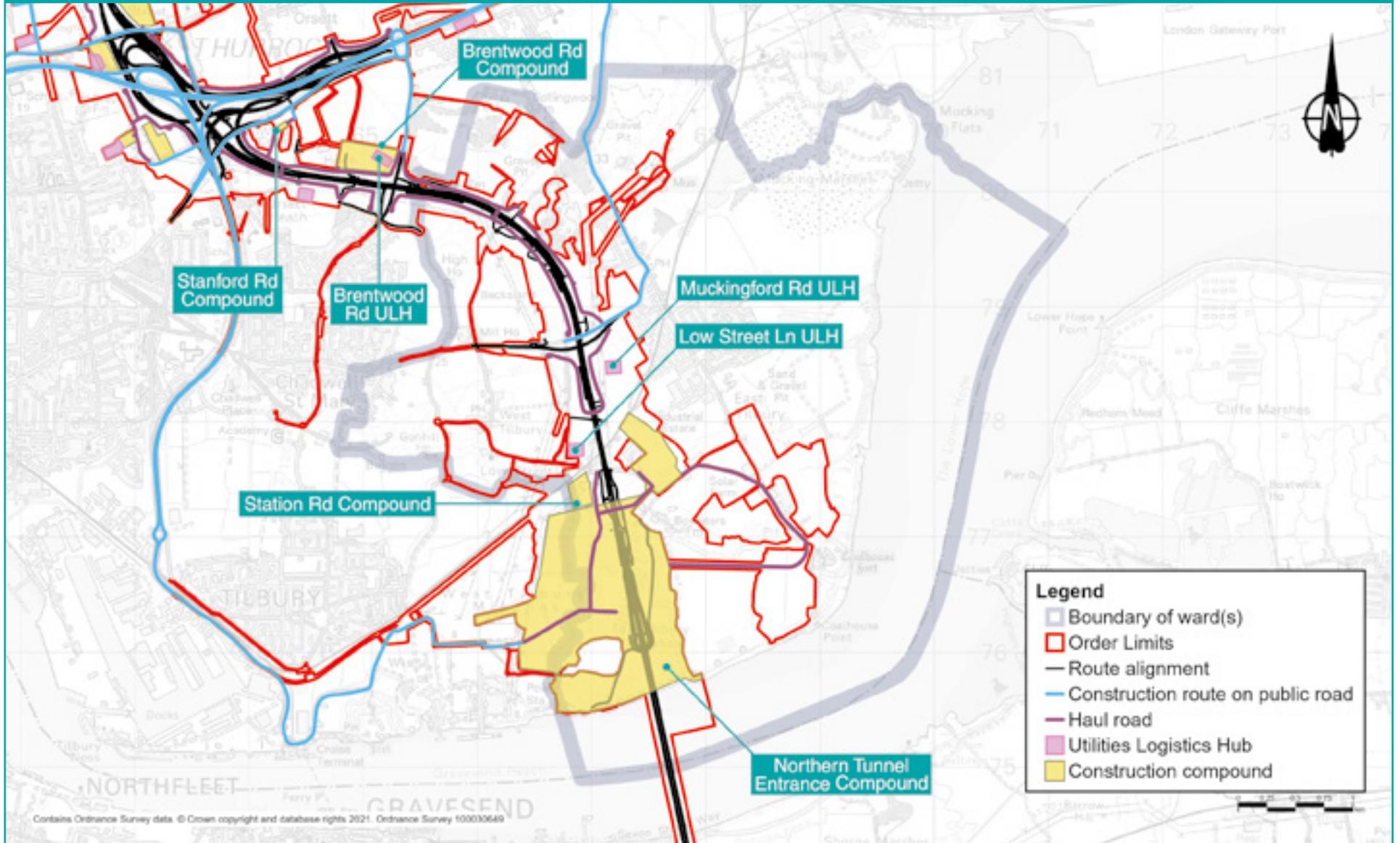
More information about how the area would look during construction, including visualisations, can be found in the Construction update. You can also view a video fly-through of the project during construction by visiting our consultation website.

East Tilbury ward would experience a large amount of construction activity, which would include building the two tunnels under the River Thames, construction of a new viaduct over the Tilbury Loop railway line, building a section of the new road within a false cutting (earthworks designed to reduce the impacts on the surrounding area), and the construction of bridges over the new road at Muckingford Road, Hoford Road and Brentwood Road. There would also be substantial utility works, including the diversion of overhead power lines, and the creation of large areas of environmental mitigation, including flood compensation and new habitats.

Tunnelling and supporting operations on the surface would take place within the largest compound operated by the project, the Northern Tunnel Entrance Compound. Activities within it would be continuous and require substantial temporary infrastructure, such as haul roads to allow for the movement of heavy equipment and other materials around the worksite without using public roads, and utility infrastructure such as the tunnel boring machine (TBM), substation and water supplies.

Before tunnelling starts, work would be required to excavate and construct the tunnel entrance. This would also be the assembly point for the TBMs, which would be used to build the tunnel shafts under the river, bored as far as the Southern Tunnel Entrance Compound east of Gravesend. There, the TBMs would be taken apart and removed once boring of the tunnels was complete. Construction of the tunnel approach would take place at the same time as tunnel boring, with substantial excavation required. The tunnels would be lined with concrete segments and fitted out with the necessary highways and technological infrastructure to allow them to operate safely.

Figure 12.2: Construction area in East Tilbury ward



The Tilbury Viaduct would require piling to build its foundations and the construction of major structures to support the new road over the flood plain. North of the new viaduct, the road would be built in a false cutting, which would require excavations and landscaping to help minimise the impacts of the road on the surrounding area.

Construction compounds

Construction compounds are fenced-off areas, accessible to construction traffic, which provide the facilities for our project to be built efficiently. For example, compounds would provide parking, storage for machinery and materials, offices, welfare facilities, refuelling, and vehicle and wheel-washing facilities to make sure vehicles leaving the compound do not dirty local roads.

To support the tunnel works, the Northern Tunnel Entrance Compound would be established at Tilbury Marshes, west of East Tilbury and Coalhouse Fort, in an area currently being used to extract pulverised fuel ash from the former Tilbury Power Station. This compound would be the main tunnelling worksite, located as far as practical away from residential areas. The compound would require access from the local road network for HGV and workforce traffic. The compound would require substantial utility works to allow it to operate.

The compound would require the construction of buildings to support the tunnelling, such as offices, accommodation for up to 480 workers, and a factory to manufacture the concrete tunnel-lining segments. There would be other specialist tunnelling activities in this ward too, including the establishment of facilities for treating excavated tunnel materials.

This compound would also support works to place around 2.5km of existing 132kV overhead power line underground, including the removal of nine pylons.

Also within East Tilbury ward, the Station Road Compound would be used to facilitate the construction of the Tilbury Viaduct.

The number of vehicles predicted to go to the Northern Tunnel Entrance Compound and the Station Road Compound are shown in table 12.2. These are the number of vehicles going to each compound and there would be the same number of vehicles, on an average weekday, leaving each compound. The entrance for HGVs would be in the west from Tilbury Riverside and Thurrock Park ward, once the new haul road from Fort Road is constructed early in the programme. Staff cars would be able to enter the compounds either from the west through Tilbury Riverside and Thurrock Park ward or from the east in East Tilbury ward.

Table 12.2: Average daily vehicle numbers going to compounds in East Tilbury ward

Time period	Northern Tunnel Entrance Compound		Station Road Compound	
	HGV	Cars	HGV	Cars
January to August 2024	90	377	2	27
September 2024 to February 2025	105	580	13	38
March to May 2025	133	593	20	35
June to October 2025	133	466	20	35
November 2025 to March 2026	133	506	18	35
April to August 2026	132	611	21	35
September 2026 to March 2027	132	670	16	24
April to November 2027	131	720	4	18
December 2027 to March 2028	131	684	0	0
April to July 2028	122	619	0	0
August 2028 to December 2029	39	73	0	0

The entrance for staff vehicles to these compounds from the east would be via Station Road in East Tilbury. Staff cars would be able to pass through East Tilbury using Princess Margaret Road, after having approached the area either from the north along Buckingham Hill Road (which leads through Linfield up to the A1013 and then the A13) or from the west along Muckingford Road (which leads to Chadwell St Mary).

HGV access to both construction compounds would be from the west via Fort Road/Substation Road, with HGVs using the A1089 to reach the area. Most of the HGVs would use the stretch of Fort Road south of the Tilbury Loop railway line, and then a construction haul route which would be built from Fort Road to the compounds. The section of Fort Road to the north of the Tilbury Loop railway line would be a secondary access which would allow access to the sites between the Thames and the Tilbury Loop railway line via Station Road.

Station Road would only be used as a secondary access by HGVs to the worksites between the Tilbury Loop railway line and the Thames. Station Road has a level crossing and therefore is not suitable for a large number of vehicle movements. Station Road would be used initially for access to the compounds while the haul route from Fort Road is constructed, very early in the construction programme. Station Road would then be used mainly for staff access rather than by larger vehicles.

Utilities

Chapter 2 of the Construction update provides an overview of how existing utilities would be affected by our plans to build the new road, with further detail including maps in chapters 4 and 5. Chapter 2 of the Operations update also describes the project's impacts on utilities, including a map showing the utilities that would be repositioned to accommodate the new road.

Two Utility Logistics Hubs (ULHs), located within East Tilbury, would be used as supporting compounds for utility works. Muckingford Road ULH would be located east of the new road and south of Muckingford Road. Access for utility companies using this ULH would be via Muckingford Road and a temporary road off the haul road. Low Street Lane ULH would be north of the Tilbury Loop railway and west of the proposed Tilbury Viaduct. It would be accessed from the north, via a temporary access built off the haul road.

On average, there would be up to nine staff cars a day going to the Muckingford Road and Low Street Lane ULHs and, during the period from January 2024 to February 2025, there would be a maximum of 20 HGVs a day to each ULH.

The ULHs would support works to modify an existing 400kV overhead power line, around 2.5km in length, including the removal of three pylons and construction five new ones.

The realignment of an existing 132kV overhead power line, around 1.5km in length, would lie partially in this ward and would involve the removal of four existing pylons and construction of five new ones. This utility diversion would be managed out of the Brentwood Road Compound (see chapter 16, Orsett ward).

Tunnelling activities would require the installation of utilities to provide power and water to the compound. Installation of these utilities would require traffic management on some local roads. A summary of the proposed traffic management is provided below.

Near to our proposed new road, Thurrock Power Ltd is proposing to construct the Thurrock Flexible Generation Plant (TFGP), which is currently going through its Development Consent Order (DCO) examination. We are working closely with Thurrock Power Ltd and have identified areas where construction of both projects would overlap, including the diversion of a high-pressure gas pipeline. The gas pipeline runs through where our construction compounds and work areas would be and crosses under the new main road.

We are working on an alternative route for this gas pipeline beneath the Tilbury Viaduct and adjacent to Low Street Pit (see Map Book 1: General Arrangements) so that if both projects are consented they can be developed together. The proposed diversion of this gas pipeline will be included within our DCO application. In addition to the construction activities set out already, we would also carry out the following:

- Walton Common and Parsonage Common are designated as common land and provide scrub and grassland habitat, which is valuable for wildlife and drainage. We would need to use this land temporarily for utility works at the northern tunnel entrance, but then it would be returned to its current use (although with rights to access underground equipment if necessary).
- Environmental mitigation would be implemented in three areas to the east of the Northern Tunnel Entrance Compound, north and west of the River Thames. More information can be found in the Operations section below.
- The area north of Coalhouse Fort would be used for the creation of an open mosaic habitat. In addition, at the southern end of the area of land, soil salvaged from an area of acid grassland at Low Street Pit Local Wildlife Site (LWS) would be translocated.
- The area west of Coalhouse Fort would be used for the creation of open mosaic habitat and wildlife ponds to attract great crested newts and reptiles, as well as create a new habitat for terrestrial invertebrates. The land to the south-west of Coalhouse Fort would be used to create wet scrapes (small seasonal ponds) and short grassland. It would provide for birds currently using the designated Special Protection Area and other linked land.

Construction routes on public roads

The main access to the Northern Tunnel Entrance Compound for most traffic, including HGVs, would be eastbound along the A1089, Fort Road and then the Port of Tilbury's Substation Road. Three further proposed access points would be located off Station Road. These would mainly be used by contractors and smaller delivery vehicles. They would link to internal east-west and north-south haul roads within the compound area.

At the beginning of the construction period, it may be necessary to allow some HGVs to access the compound via Station Road. This would be a temporary measure while we installed an access road, after which HGVs would use Substation Road.

To reduce the number of HGV journeys on public roads, equipment and materials are expected to be brought into the construction area via the Port of Tilbury and Tilbury2. Some would come via the strategic road network, through Tilbury2 and the temporary haul road. Smaller deliveries, personnel shuttlebuses from local train stations and Gravesend Ferry, together with cycles and cars, would access the construction area from north-east of the site via Station Road.

Construction schedule

Construction of the whole project is scheduled to last for around six years from 2024 to 2029. To deliver the construction programme efficiently, activities would be divided into packages of work and delivered in a coordinated way. Maps and programmes for the work to build the tunnel and its approaches can be found in chapter 4 of the Construction update. New habitats would be created early in the construction programme to provide space for protected species to be moved into. Establishment of the Northern Tunnel Entrance Compound, including associated utility works, would be during the first two years of construction (January 2024 to early 2026). It is expected that this and the Station Road Compound would be active until late 2029.

Construction working hours

Tunnel construction activities would take place 24/7 to maintain safety and efficiency. Wherever practical, noisy tunnel works would not be carried out at night. Most other construction activities would take place during the core construction hours, which are from 7am to 7pm on weekdays and from 7am to 4pm on Saturdays, with additional repair and maintenance periods (if required) from 8am to 5pm on Sundays.

There may be extended working hours for earthworks when days are longer (spring to autumn) and during periods of fine weather. Typically, noisier works such as piling or bridge-building would not take place outside core hours. Extended working hours would also be needed to cross the railway line, including works to put utilities under the railway and weekend and night activities for those works on the overhead power lines. More information about working hours is set out in the Noise and vibration section below and in the CoCP.

Impacts on open space and common land

We propose to permanently acquire part of Tilbury Green Common which includes footpath 200 for the new road and landscaping at Tilbury Green. We have proposed an alternative route for the footpath, the land on which this lies would be designated common land. It would have the same rights as the affected part of the common land and footpath. The replacement land would be larger in area than the land that is proposed to be acquired and would join up two separate parts of the existing common land.

Within East Tilbury ward there are no proposed changes to open space or common land as previously consulted. More information about our proposals for compensating for impacts on open space land and common land can be found in chapter 3 of our Operations update.

Impacts on private recreational facilities

Within East Tilbury there are approximately 2 ha of the Linford allotments which would be required for the temporary construction and for permanent operation in relation to an existing overhead electricity cable and a new corridor for several utilities. The required rights would not affect the use of the site as an allotment. This is because the utility corridor would be buried at a depth at which the site could be continued to be used as an allotment. Any rights required for the re-stringing of the overhead power lines reflect the existing rights.

More information about any impact that the project has on private recreational facilities, including proposals we have consulted on previously, can be found in chapter 3 of our Operations update.

Traffic management

The main traffic management measures for East Tilbury ward are listed below.

All traffic management measures are based on an indicative construction programme, which would be finalised by the appointed contractor. The contractor's final traffic management plans would be subject to approval by the Secretary of State for Transport, following consultation with the local highway authority.

Table 12.3: Main traffic management measures in East Tilbury

Road(s) affected	Proposed traffic management	Purpose	Indicative period
Love Lane, Princess Margaret Road, Station Road	Lane closure, traffic lights and short-term road closures are required for 530 metres of affected road (in short sections)	To install temporary supplies for the tunnel-lining segment factory	2 months between March and May 2025
Coopers Shaw Road	Lane closures and traffic lights in 300 metre sections	Modifications to local utility networks	4 months between September 2024 and February 2025
Muckingford Road	Lane closures and traffic lights in 300 metre sections	Modifications to local utility networks	6 months between March 2025 and October 2025
Hoford Road	Traffic light controlled crossing point for construction vehicles	To allow construction vehicles to cross until the bridge over the project has been constructed	From January 2024 to August 2026
Hoford Road	Closure	To carry out bridge and utilities works	Nights and weekends over short periods associated with specific works activities
Hoford Road	Closure	Switch to permanent alignment	Weekends between June and October 2025
Coopers Shaw Road/Gun Hill/ Fort Road	Three-way traffic lights	To facilitate utility modifications	2 weeks between September 2024 and February 2025
Rectory Road/ Church Road/ Station Road	Lane closures and traffic lights in 300 metre sections	For utility modifications and the installation of the Northern Tunnel Entrance Compound	9 months between March 2025 and October 2025
Station Road	Lane closures and traffic lights	To carry out nearby works and remove equipment	Nights and weekends over short periods associated with specific works activities
Muckingford Road	Switchover	To align the old road to the new road	1 weekend June to October 2025
Horford Road	Switchover	To align the old road to the new road	1 weekend between April to August 2026

Muckingford Road between Hoford Road and Princess Margaret Road would be used for initial access by HGVs to the area before the new offline haul routes are ready. Traffic volumes using the route would be low as they would mainly be facilitating site setup and the construction of the offline haul routes. Although HGVs would not then use Muckingford Road, there would be traffic lights at the points where the HGVs have to cross over Muckingford Road. Once the new bridge over Muckingford Road is constructed and opened the traffic lights would be removed as the construction traffic would be able to cross under the new bridge.

Traffic management measures required across the project would include narrow lanes, lane reductions, reduced speed limits and temporary traffic lights. We have tried to minimise traffic management measures wherever practical, but these would be necessary in some locations to allow construction traffic and local communities to move around safely while providing construction workers with sufficient space to operate. An overview of the traffic management required across the project can be found in the Outline Traffic Management Plan for Construction.

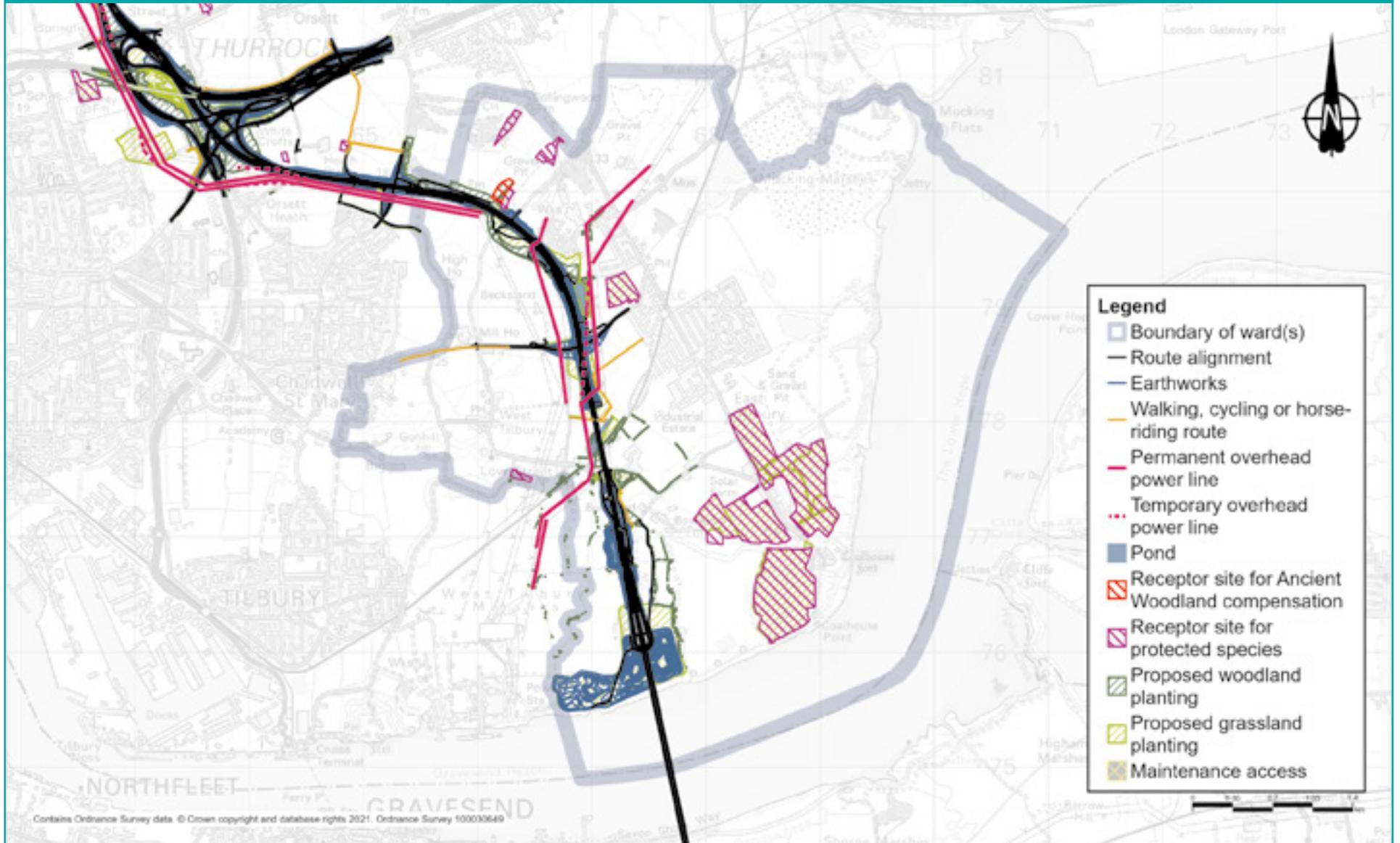
12.2.2 Operations

The completed project

For more information about the completed project, see the Operations update, as well as the figures in Map Book 1: General Arrangements.

This section sets out elements of the project that would feature permanently in East Tilbury ward once construction is complete and the new road is open. Figure 12.3 shows the section of the completed project within East Tilbury ward.

Figure 12.3: Main features of the operational project in East Tilbury ward



- The northern tunnel entrance would operate east of Tilbury Sewage Treatment Works on land permanently acquired for the project. The tunnel entrance would be in a cutting, before rising to cross the Tilbury Loop railway line on the Tilbury Viaduct and then continuing northwards in a false cutting. Following feedback from our 2016 consultation, we lowered the height of the road in some locations by as much six metres to reduce its visual and noise impacts.
- Two flood mitigation ponds would be built next to the new road to manage the risk of flooding. Improved water management would reduce the risk of flooding on local roads, reducing flood-related congestion. Two more flood mitigation ponds would be built near the Tilbury Viaduct south of Station Road.
- Excavated materials from the construction of the tunnel and north tunnel entrance would be used to create new landforms, Tilbury Fields, that draw on the heritage of the local area. Tilbury Fields' newly landscaped areas would provide views of the Thames Estuary, surrounding area and local heritage features, with improved recreational amenities. The riverside space includes proposals for artwork that could be viewed from the river, acting as a local and regional landmark.
- To the east of the new road, there would be three environmental mitigation areas. To the immediate west and south-west of Coalhouse Fort, marsh and wet grassland would be provided. In addition, two areas of land to the north-west and north of Coalhouse Fort would be landscaped into open grassland. A smaller area of land next to the junction with East Tilbury Road and Muckingford Road would also be landscaped as open grassland. The areas that run along the new connecting route from the northern tunnel entrance to the A13 junction would be landscaped as species rich grassland. These areas would help reduce the impact of the new road and replace habitats lost when the route is constructed.
- The watercourse that runs from the wetland area to the east of Linford to the pond west of Linford would be landscaped along its banks as woodland edge scrub. The watercourse would run under the viaduct and continue to run south along an existing course as well as a new diverted course running west, crossing under the viaduct to the northern side to run parallel with the road. This section of the watercourse would be bordered by woodland habitat. This would ensure that animals and marine wildlife reliant on this watercourse would continue to have access to it.

- A new habitat area would be created to the west of Condoovers Scout Activity Centre. This would ensure that any ecology in the path of the new road could be relocated to an area nearby.
- The Tilbury Viaduct would be the first structure beyond the northern tunnel entrance, passing over the Tilbury Loop on the London, Tilbury and Southend Railway Line and a series of drainage ponds and ditches, before crossing Coal Road and continuing towards Muckingford Road to the north. The viaduct would be seen primarily by road users travelling along Station Road, those using the diverted bridleway BR58, and those travelling by train.
- Some footpaths and bridleways would be rerouted permanently as part of our proposals for over 46km of upgraded, diverted, extended or entirely new walking paths, cycle routes and bridleways that would benefit communities along the route. For more information, see the Footpaths, bridleways and cycle routes section below.
- Realigned overhead power lines would be visible from some residential properties on the edge of West Tilbury, with the number and size of the pylons east of Low Street being increased.
- An existing overhead power line is being placed underground from east of West Tilbury to the western side of Linford, so the overhead line and nine associated pylons would no longer be there once the new road is open.

Changes to the project since our design refinement consultation

As part of our ongoing design development, including discussions with utility companies, we have made several changes to the project and its Order Limits since our design refinement consultation in July 2020.

- Ongoing discussions with the utility companies have enabled us to remove areas of land parallel to Beechcroft Avenue, north and north-west of Ashlea Farm and to the east of High House Lane (land at Sugarloaf Riding Association for the Disabled also included in removal) from the Order Limits as they are no longer required for utility diversions.

The areas of land north of East Tilbury are now proposed as an alternative location for the re-stringing of overhead lines north of Linford and refinement of Order Limits around Hoford Road.

More information about any proposed changes can be found in chapter 3 of the Operations update.

Impacts on open space and common land

Within East Tilbury ward the project is proposing to create Tilbury Fields, a new park which would provide new open space in the area. This would be located on the northern banks of the River Thames, just west of the northern tunnel entrance. Tilbury Fields would be created using some of the two million cubic metres of material dug from the tunnels and other associated works in the area. The proximity of Tilbury Fields to the northern tunnel construction site means that none of this material has to be transported on the public roads, which would have meant about 47,000 lorry movements. Once complete Tilbury Fields would be publicly accessible, with informal footpaths that would follow historic routes and allow users to explore interesting landforms and raised areas.

The recreational facility at Tilbury Fields is not “replacement land” for the purposes of the Planning Act 2008. It is a new open space facility which is being provided, unconnected with any existing open spaces.

More information about our proposal for Tilbury Fields can be found in chapter 3 of our Operations update.

Tilbury Green Common Land is registered as common land under the Commons Act 2006, which the public has a right of access over. Tilbury Green has an area of 1.59 ha and the existing site is currently used as a footpath (Footpath FP200).

We are proposing to provide replacement land comprising approximately 7,800m² against a total loss of approximately 7,400m². Therefore, more land is replaced than lost, with a surplus balance of approximately 26m². This replacement land would join up two separate parts of the existing common land.

The replacement land would continue to support a footpath and allow the public to enjoy the same rights which they have currently. The characteristic of the setting would be improved, with woodland planting and the walking, cycling and horse riding route being of a higher standard than the existing footpath.

12.3 Traffic

We carried out traffic assessments to understand how construction and operation would affect nearby roads, compared with the situation if the project was not implemented. For more information, see chapter 4 of the Operations update.

12.3.1. Construction

Construction Impacts

There would be delays to traffic using the local roads at the locations where there are traffic management measures in place. The longest period of time for these works would be on Muckingford Road and Coopers Shaw Road. Journeys along Muckingford Road may be affected by construction vehicles crossing the road.

Most of the staff vehicles would use the entrance to the compounds in Tilbury Riverside and Thurrock Park ward rather than the entrance in East Tilbury, so the impact of this additional traffic on the local roads would likely be minimal.

Measures to reduce construction traffic impacts

Our approach to construction has been refined after further investigations and feedback received from the public and stakeholders. A summary of the proposed measures to reduce the volume of construction materials transported in and out by road can be found in chapter 2 of the Construction update.

To reduce the construction traffic impacts in East Tilbury, we would carry out the following measures:

- Minimise use of the local road network as far as practical through construction of temporary offline haul routes directly from the strategic road network.
- Our proposals allow for re-use of excavated materials, and would substantially reduce the need to dispose of excavated material via the road network, thereby reducing the number of HGV movements from the public road network during the construction phase.
- Where practical, new bridge structures have been designed so that they can be built offline to avoid the need to close local roads for extended periods. Where offline construction is not possible and space is available to do so, the existing road would be temporarily realigned to facilitate construction of new bridges.
- HGVs associated with construction of the project would be banned, where possible, from using some local roads. For more information on these bans, see the Outline Traffic Management Plan for Construction.
- We would stockpile material within the Order Limits (the area of land required to construct and operate the project, formerly known as the development boundary), to allow material to be managed on-site rather than offsite, reducing the number of HGVs journeys needed.
- Works would be planned so that multiple works are completed at the same time during one element of traffic management, including the installation of temporary and permanent utility works.

12.3.2. Operations

Operational impacts

Figures 12.4, 12.6 and 12.8 show the predicted changes in traffic in the morning peak (7am to 8am), an average interpeak hour between 9am and 3pm, and evening peak (5pm to 6pm) measured in Passenger Car Units (PCUs per hour), where 1 PCU is equivalent to a car, and 2.5 PCUs is equivalent to an HGV. Figures 12.5, 12.7 and 12.9 show the predicted percentage increase in traffic flows during the morning, interpeak and evening peak. For information about how we assessed operational traffic impacts, see chapter 1. For more information about how we carried out our operational traffic modelling, see chapter 4 of the Operations update, which also includes information about the interpeak periods, when traffic flows tend to be lower.

The project runs through East Tilbury. The highest flows would be on the main route itself in the morning peak, when there would be 4,200 PCUs northbound and 3,400 PCUs southbound. In the interpeak hour there would be around 3,500 PCUs northbound and 2,800 PCUs southbound. In the evening peak hour, there would be around 3,600 PCUs northbound and 4,100 PCUs southbound.

The predicted change in traffic flows on the local roads in the ward would be less than 250 PCUs an hour in all the modelled time periods. On Buckingham Hill Road north of Linford travelling northbound there would be a decrease of between 50 and 250 PCUs an hour (a 20%-40% decrease) in the morning and evening peak hours. Southbound there would be an increase of between 50 and 250 PCUs an hour (over a 40% increase) in all the modelled time periods.

On Turnpike Lane north of West Tilbury travelling northbound there would be a decrease in traffic of between 50 and 250 PCUs an hour in the morning and evening peak hours. In the morning peak this would be a decrease of between 10% and 20% and in the evening peak hour it would be a decrease of between 20% and 40%. Southbound along Turnpike Lane there is expected to be an increase in traffic flows of between 50 and 250 PCUs an hour in each of the modelled time periods, which would be a 20%-40% increase in traffic flows.

Where Muckingford Road crosses the project there would be little change in traffic flows, with the only change of greater or less than 50 PCUs being an increase of flows eastbound of between 50 and 250 PCUs (20%-40%) in the evening peak hour.

Figure 12.4: Predicted change in traffic flows (PCUs) with the project during the morning peak in 2029

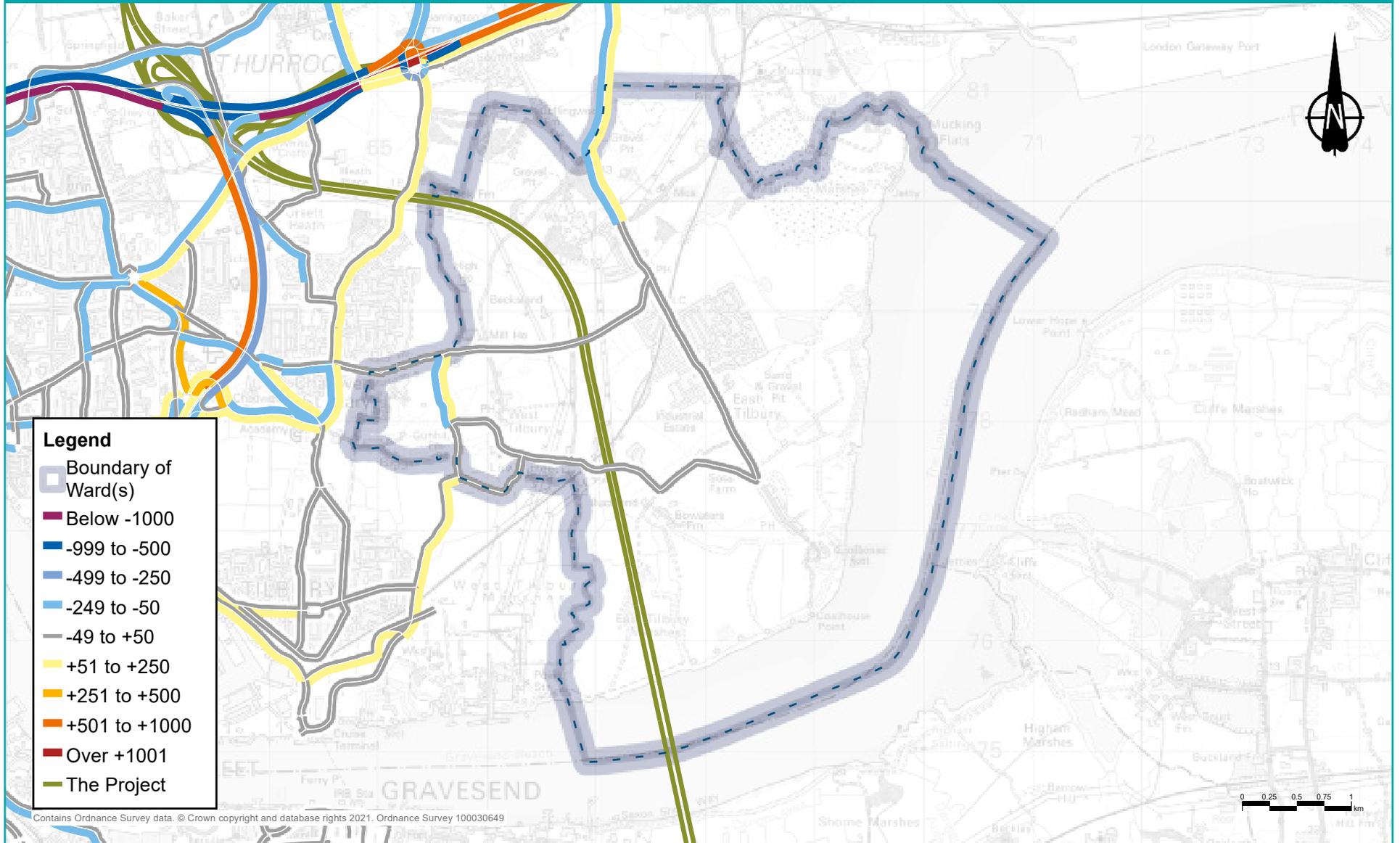
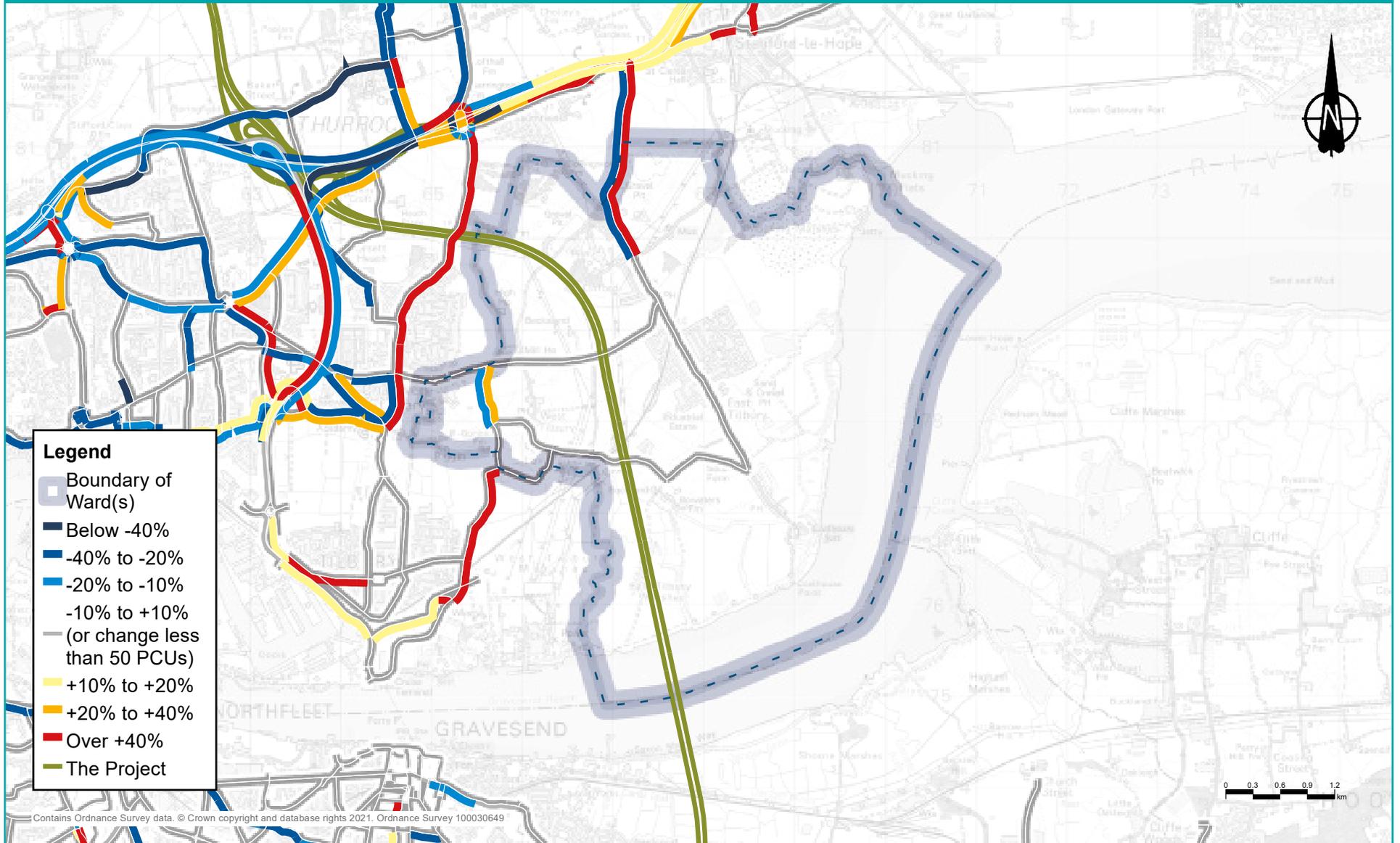


Figure 12.5: Predicted percentage change in traffic flows with the project during the morning peak in 2029



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Figure 12.6: Predicted change in traffic flows (PCUs) with the project during the interpeak in 2029

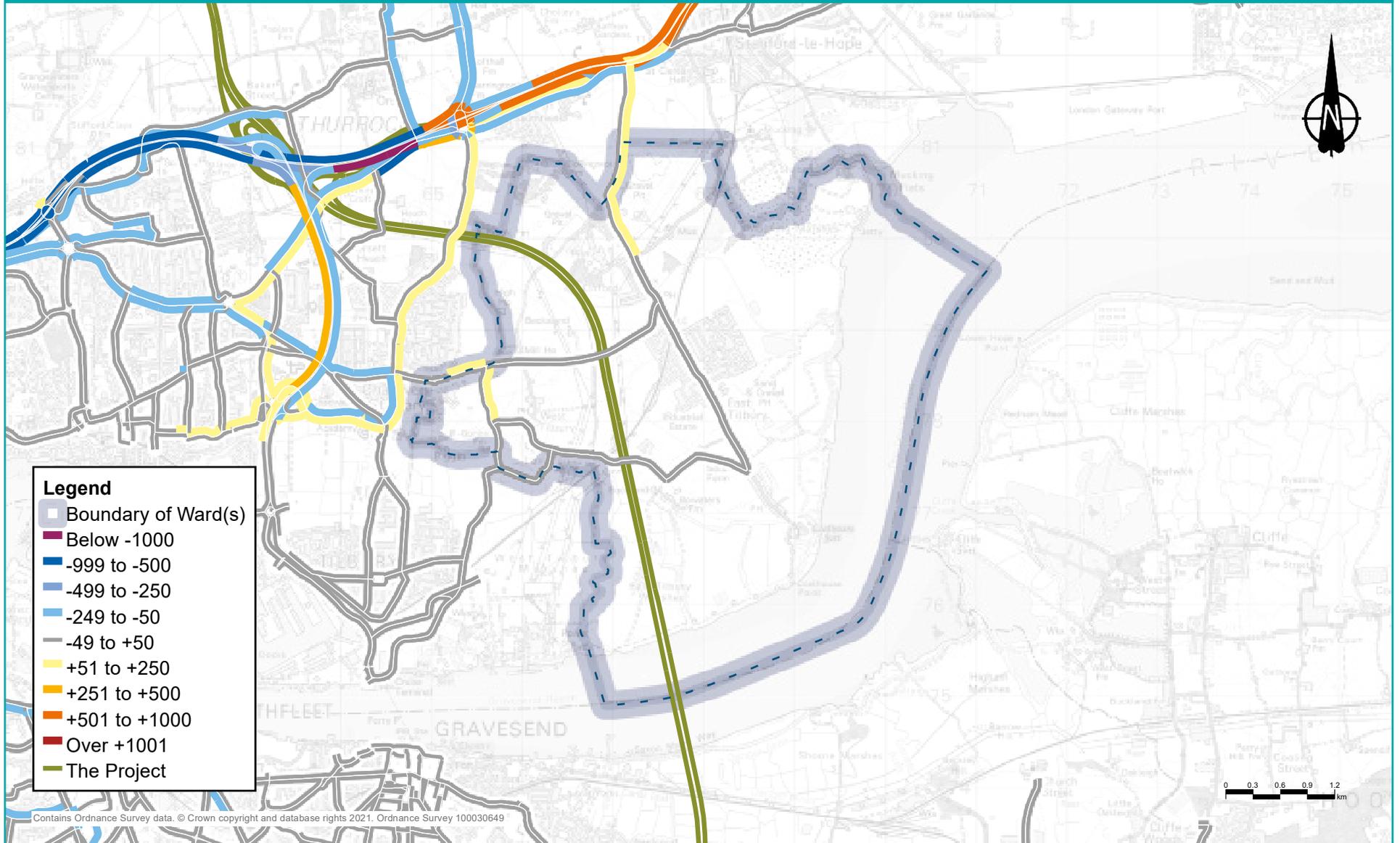
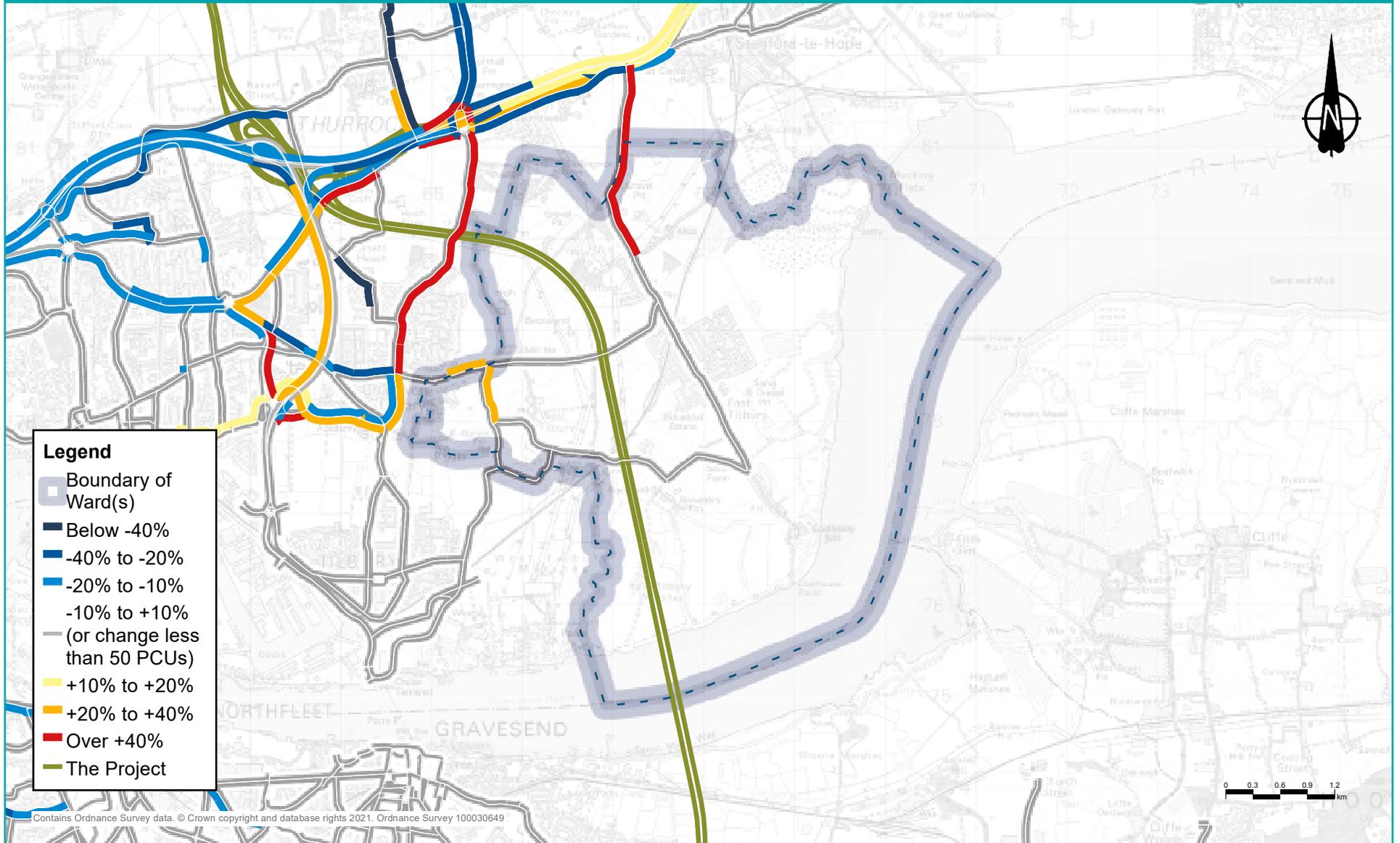


Figure 12.7: Predicted percentage change in traffic flows with the project during the interpeak in 2029



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Figure 12.8: Predicted change in traffic flows (PCUs) with the project during the evening peak in 2029

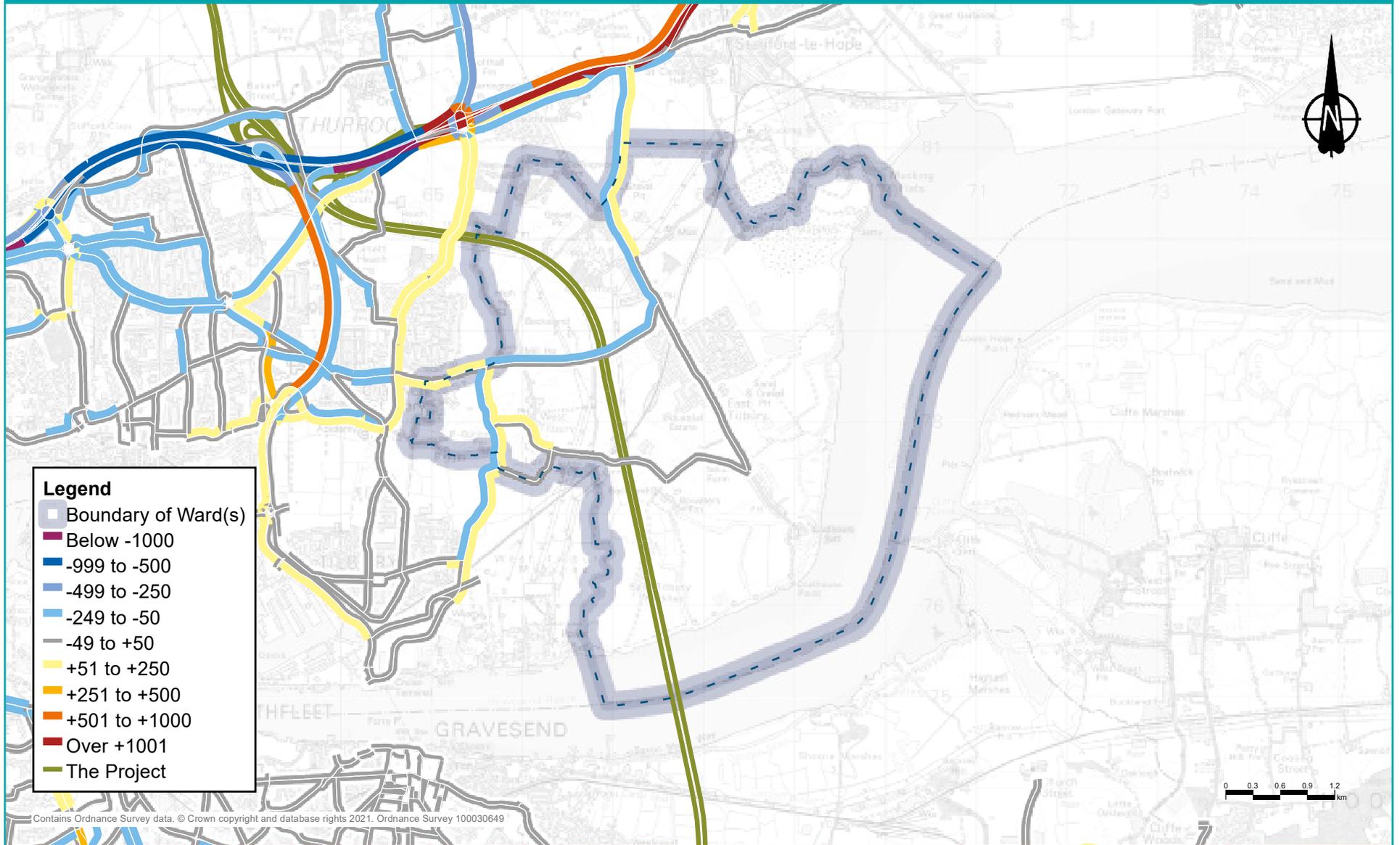
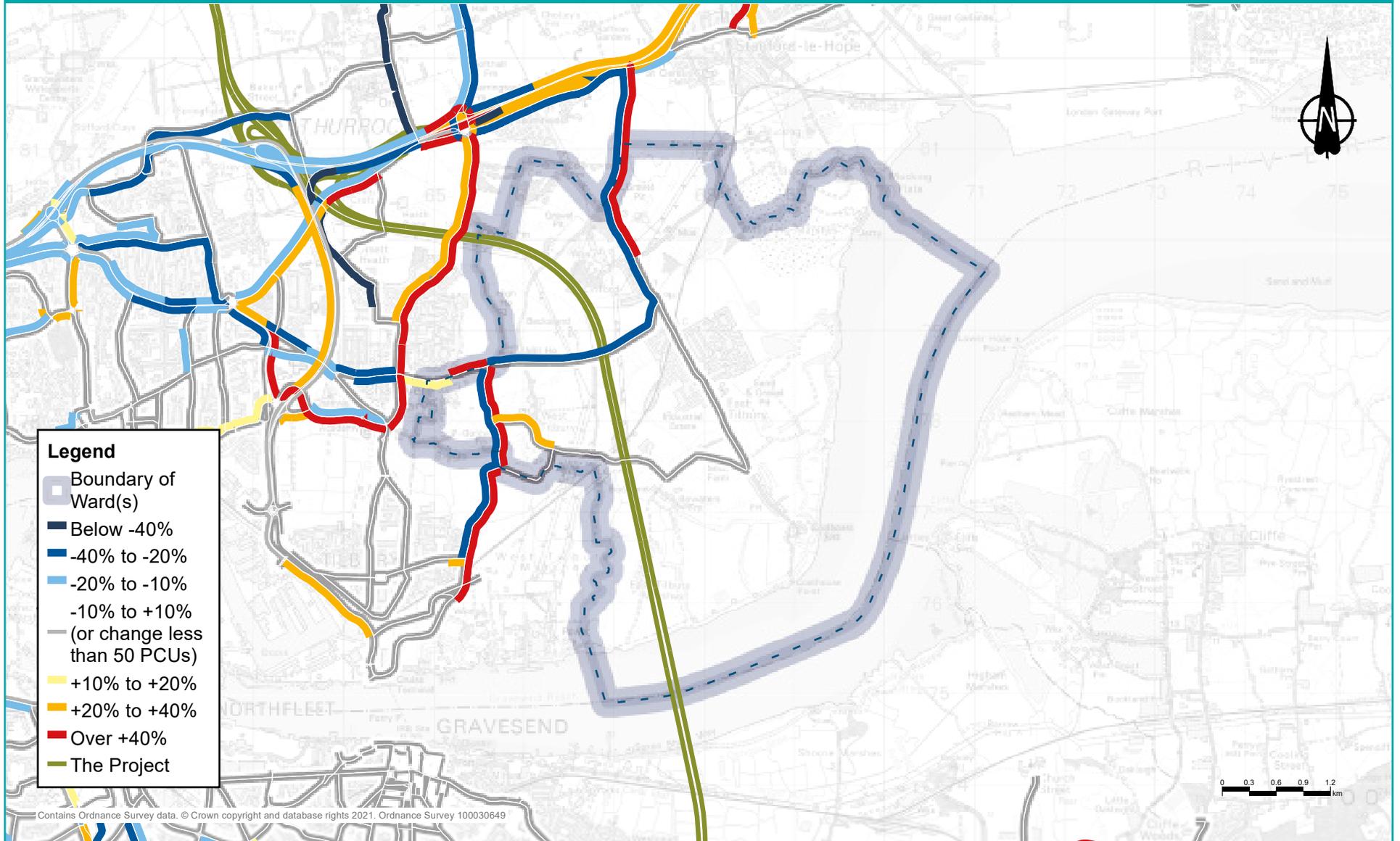


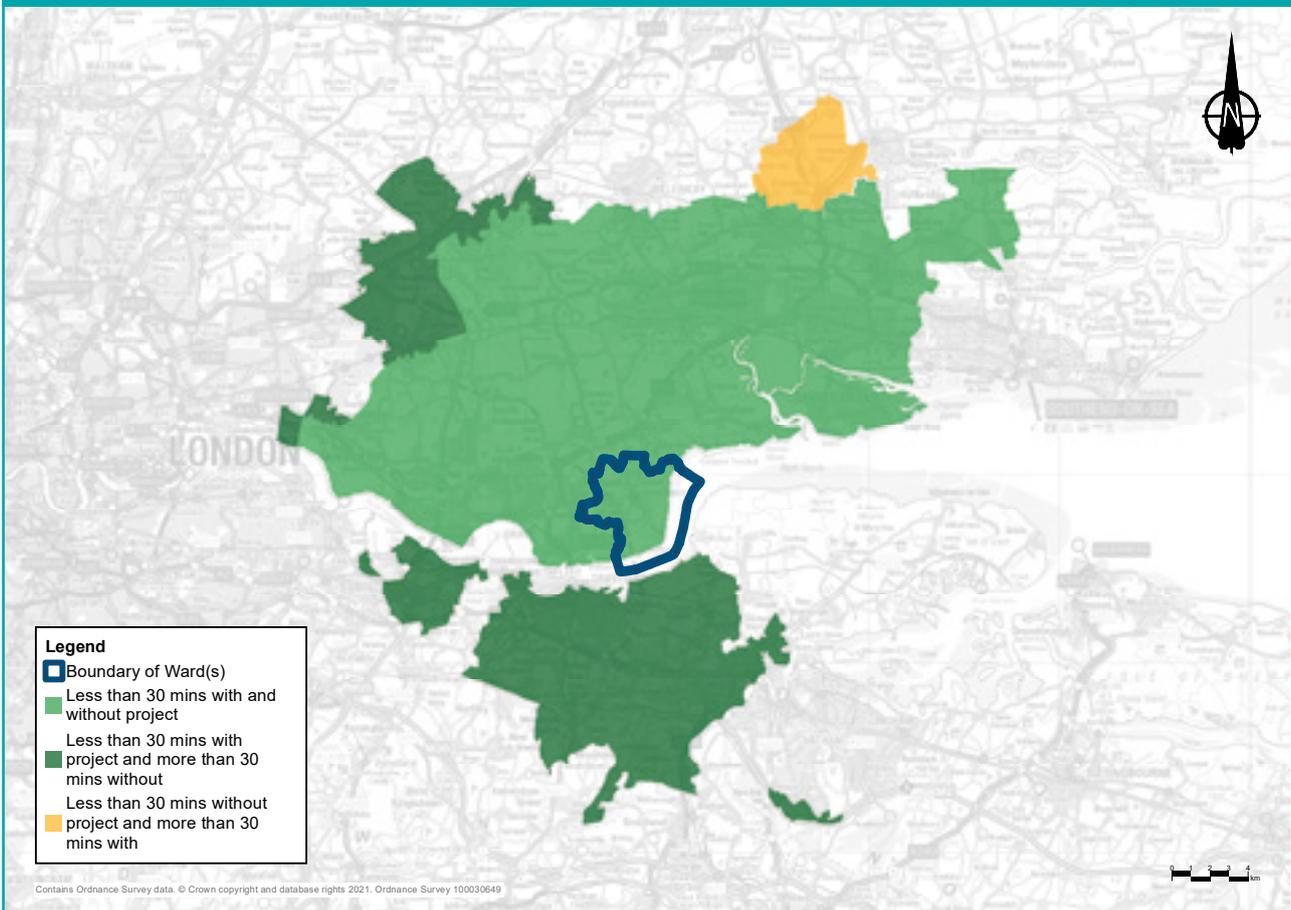
Figure 12.9: Predicted percentage change in traffic flows with the project during the evening peak in 2029



Changes to journey times

Figure 12.10 shows the change in the area that can be reached within a 30-minute drive from the centre of the ward both without the project and with the project. Figure 12.11 shows the change in areas that could be reached within a 60-minute drive time. The drive times have been calculated for the morning peak hour (7am-8am). The number of jobs within a 30-minute catchment area would increase by 55% which would provide access to an additional 128,700 jobs and within a 60-minute drive by 34%, which would provide access to an additional 615,000 jobs.

Figure 12.10: Change in area that motorists could drive to within 30 minutes from East Tilbury ward



Operational traffic flows

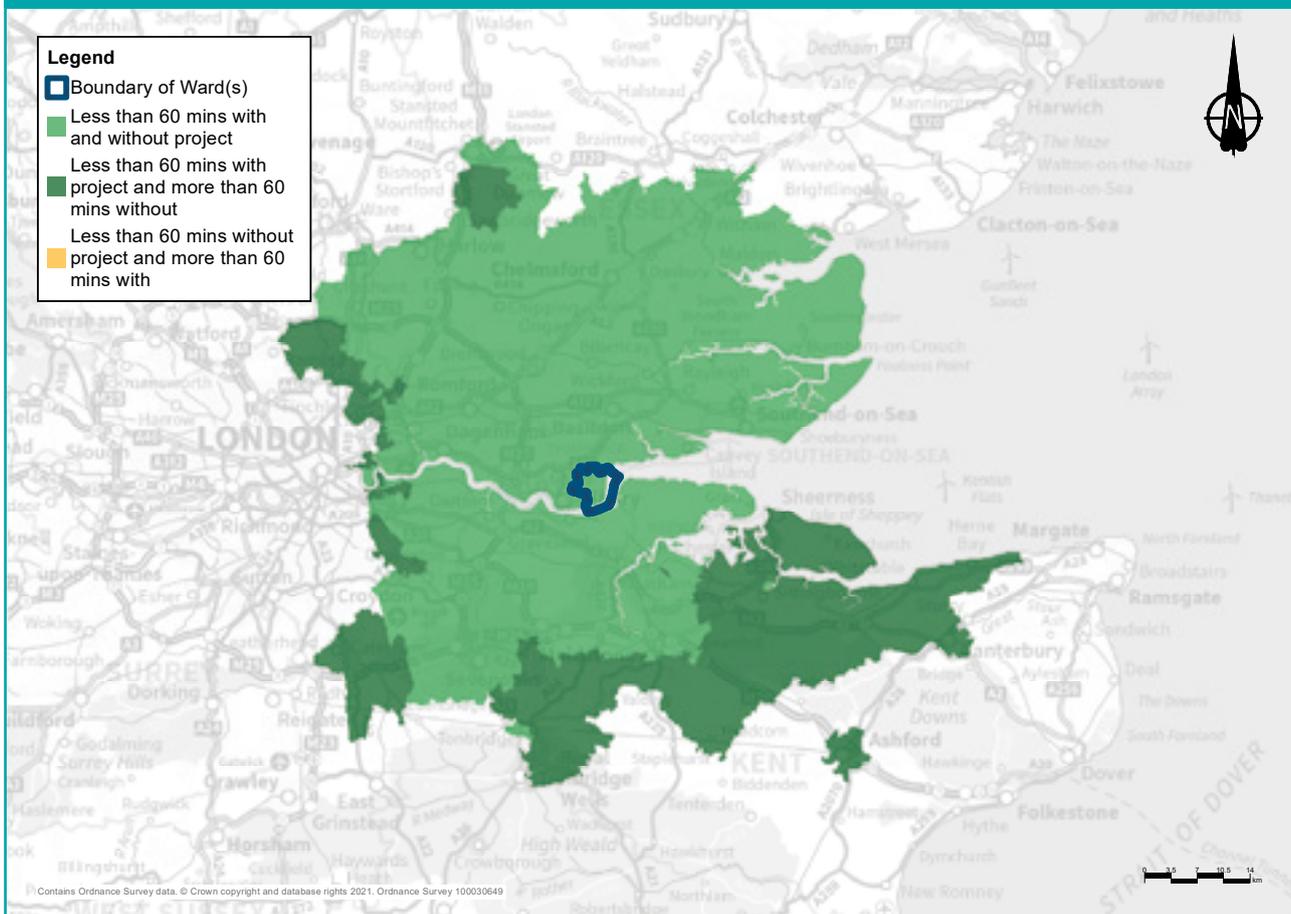
The project has been designed to improve traffic flows, including the design of free-flowing connections with the A13 and A1089. In addition, the main route would have no traffic lights or roundabouts to ensure continuous traffic flow. However, traffic lights or roundabouts would be necessary at some minor junctions away from the main route where traffic meets local roads. All new junctions would be designed to the latest safety standards.

An iterative design process, including successive stages of traffic modelling and extensive consultation and engagement, has ensured that only the links to the existing road network providing the most benefits would be implemented.

Once the project is operational, traffic impacts on the affected road network would be monitored, including local roads.

Where appropriate, we would work with the relevant highway authority to seek funding from the Department for Transport for further interventions.

Figure 12.11: Change in area that motorists could drive to within 60 minutes from East Tilbury ward



12.4 Public transport

Existing situation

Rail

East Tilbury station is within the ward with services operated by c2c running between Essex and London Fenchurch Street along the 'Tilbury Loop'.

Buses

A number of buses run through East Tilbury, including the 374 which runs through the ward and the 66, 73a, 77, 77a and 83 which run along the western boundary of the ward.

12.4.1 Construction

Rail

There would be a series of night-time rail closures of the Tilbury Loop railway line over a period of two months while the Tilbury Viaduct is constructed. These closures would be agreed with the network operator. It is intended that the works will take place outside train operational times, and so services would not be disrupted.

Throughout construction there may be some increases in journey times to East Tilbury station, associated with increased traffic through the area and traffic management on the local roads.

Buses

There would be increases to journey times for the 374, associated with increased traffic throughout construction and the traffic management required in this area.

12.4.2 Operations

Rail

There would be no discernible change in local access times to East Tilbury station and no change to the rail services at the station. It would be quicker to access HS1 services at Ebbsfleet International Station with the journey time to that station decreasing by nearly nine minutes in the morning and evening peaks, and by six minutes in the interpeak.

Buses

There would be no changes to bus routes through the ward once the project opens and no discernible change to bus journey times.

12.5 Footpaths, bridleways and cycle routes

Existing situation

East Tilbury ward is part-urban, part-countryside with a network of footpaths and bridleways that run along the riverbank that connect to Chadwell St Mary. For other potential impacts, see the other topic areas in this chapter, such as Visual and Noise and vibration.

12.5.1 Construction

Construction impacts

There would be significant changes to the network of footpaths and bridleways during the construction period. More information about the proposed network of footpaths, bridleways and cycle routes after completion of the project can be found below.

- Bridleway BR58 would need to be closed for five years to allow for overhead power line works and road construction until a realignment south of the existing bridleway opens to re-establish the link under the new Tilbury Viaduct. We are currently working on a potential temporary diversion for this route, so that some or all of the amenity currently provided would be retained during the construction period.
- Footpath FP60 would need to be temporarily closed for eight months due to traffic management required for Muckingford Road utility diversions and main construction activities. A short section of the path would be permanently closed due to a realignment of Muckingford Road south, with the path connecting to the newly aligned road. Bridleway BR63 that connects with BR58 would need to be temporarily closed for eight months due to traffic management required for Muckingford Road utility diversions and road construction.
- Footpath FP61 would be permanently divided by the construction of the project. A new route would be provided to the south of the existing alignment, maintaining a connection under the viaduct by the diversion of BR58. We are currently working on a potential temporary diversion for this route, so that some or all of the amenity currently provided would be retained during the construction period.
- Footpath FP64 would need to be temporarily closed for four months for utilities diversion works to take place.
- FP146 is expected to remain open throughout the construction period. However, there may be circumstances where it may need to close temporarily for a short time. If this were the case, we would aim to communicate this to local people in advance.

Figure 12.12: Footpaths, bridleways and cycle routes in the vicinity of the project in East Tilbury ward

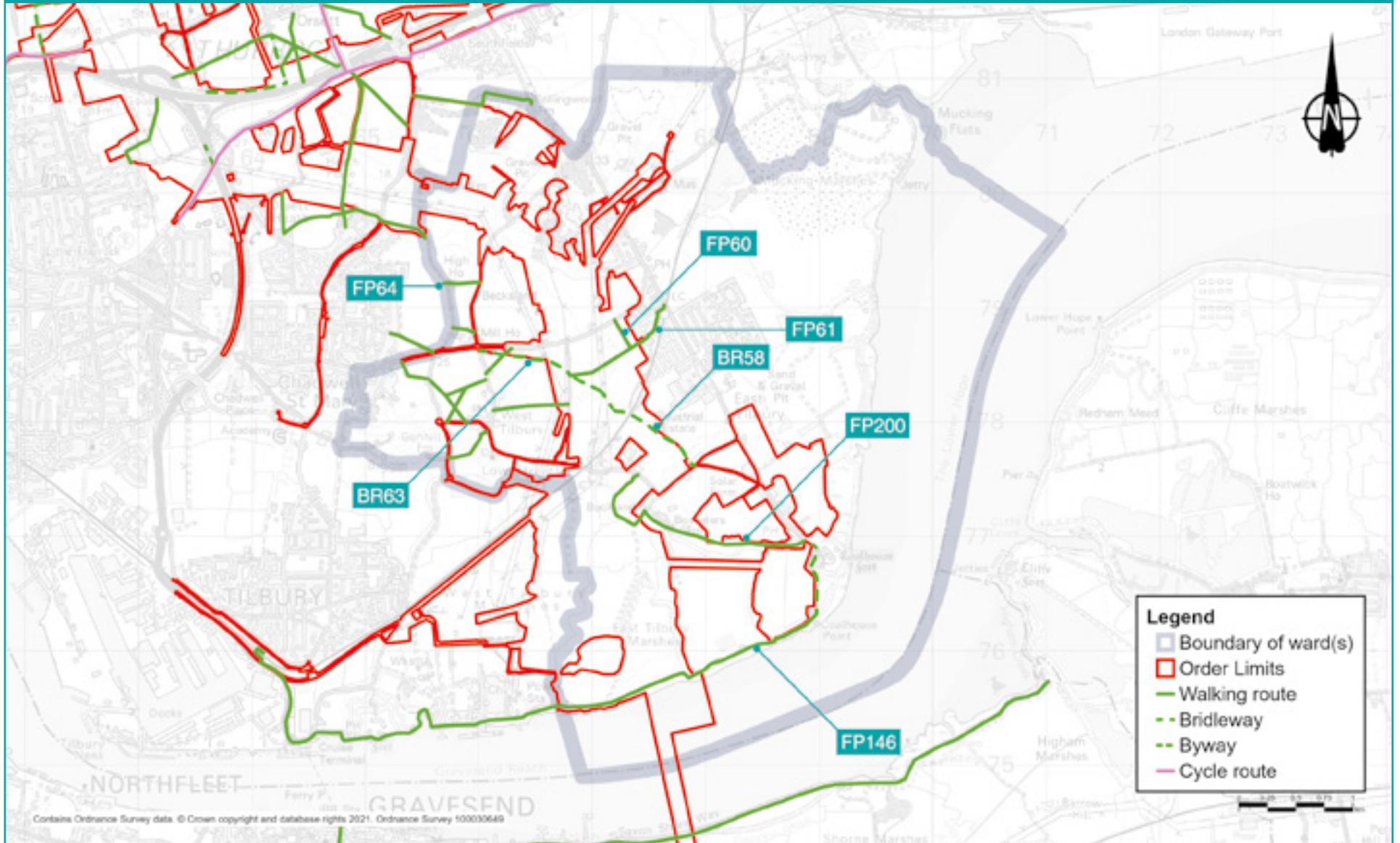
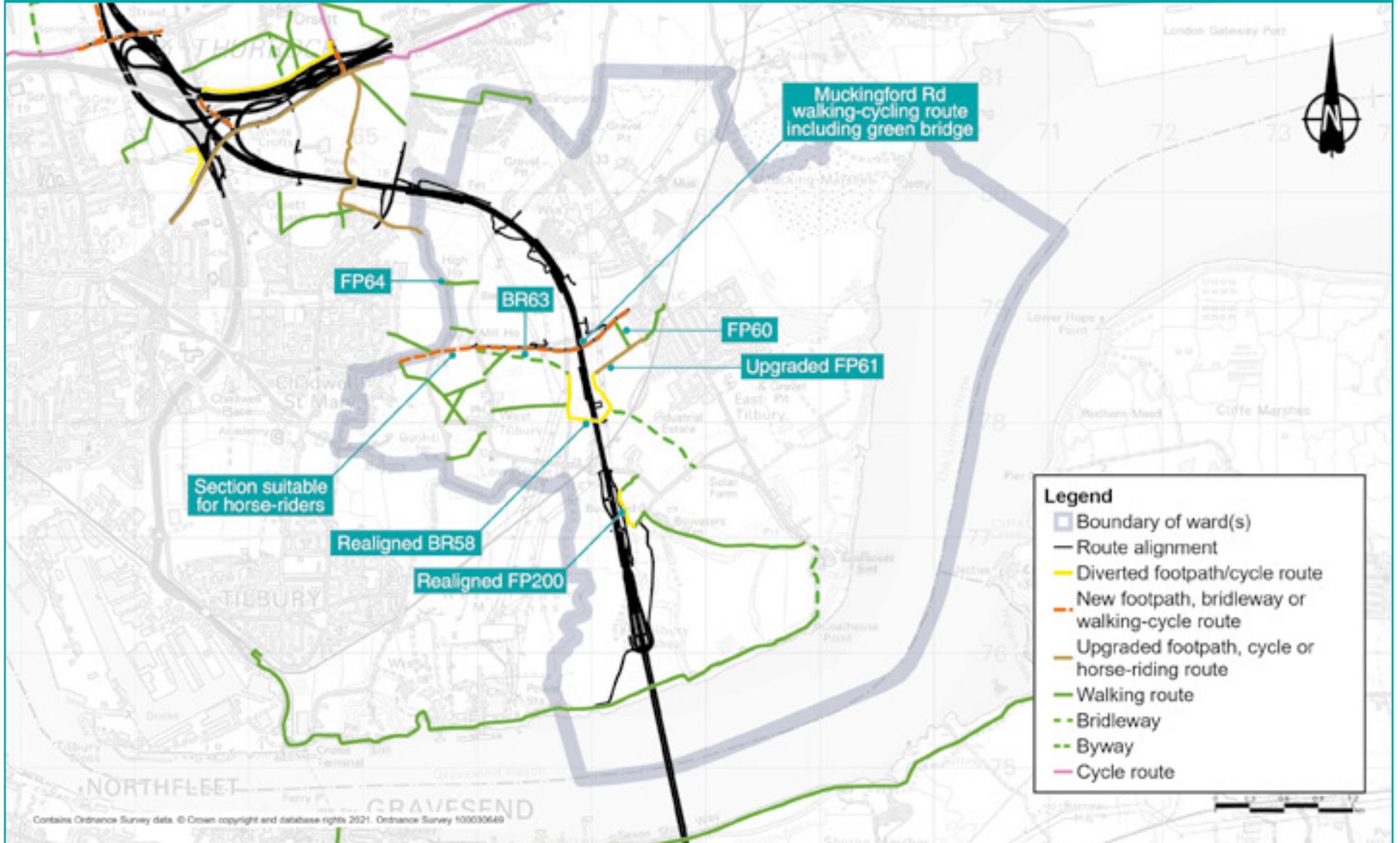


Figure 12.13: Proposed footpaths, bridleways and cycle routes in East Tilbury ward



- Footpath FP200 would be closed for five years to allow for utilities diversions and construction of the new road until the realigned route is opened.

12.5.2 Operations

Operational impacts

The project's proposals include more than 46km of upgraded, extended, diverted and entirely new footpaths, bridleways and cycle routes, including new routes that link the populations of East Tilbury and Chadwell St Mary. Our proposals were developed after consultation with local communities and stakeholders, including walking, cycling and horse-riding groups. For project-wide information about changes to footpaths, bridleways and cycle routes, see chapter 2 of the Operations update.

- Bridleway BR58 would reopen via a diversion south of the previous alignment to re-establish connection under the Tilbury Viaduct.
- Footpath FP60 would reopen with a short section of the path to be permanently closed due to a realignment of Muckingford Road. The path would connect to the newly aligned road.
- Footpath FP61 would be impacted by the construction of the project. FP61 would be permanently diverted south to connect with BR58, which would maintain connectivity towards Coalhouse Fort. Connectivity to the west would be re-established when the diversion of FP58 beneath Tilbury Viaduct becomes available. FP61 to the west of the diversion would be permanently closed.
- Bridleway FP63, that connects with BR58, would reopen after eight months due to traffic management required for Muckingford Road utility diversions and road construction.
- Footpath FP64 would reopen after four months.
- Footpath FP200 would reopen after five and a half years, with a section of the route near the new road realigned.
- Muckingford Road would include a shared route for walking and cycling, crossing over the new road via a green bridge with walking-cycling provision. The section of Muckingford Road between High House Lane and BR63 would also be made suitable for horse-riding.

12.6 Visual

Existing situation

Views towards the land on which the project would be built from the main populated areas are principally limited to the western edge of East Tilbury and Linford. There are also likely to be views from the edge of West Tilbury and a small group of homes at the junction of Church Road and Low Street Lane.

Other views towards the land on which the project would be built would be from the east part of Orsett Golf Club in the north of the ward, views from National Cycle Network (NCN) Route 13 and Two Forts Way and the local footpath network. The project would also be visible from Coalhouse Fort.

Current views from the edge of East Tilbury and Linford overlook flat agricultural land crossed by multiple overhead power lines which are partially softened by existing vegetation. There are similar views from the edge of West Tilbury, partially screened by roadside vegetation along Church Road and Blue Anchor Lane. Views from homes at the junction of Church Road and Low Street Lane comprise agricultural land, with more distant views filtered by trees.

Orsett Golf Club can be partially seen between the bunding on the perimeter of the adjoining quarry but include more distant views to the south-west over gently rolling arable landscape crossed by overhead lines.

From Two Forts Way and NCN Route 13, there are westerly views along the Thames Estuary towards Tilbury Docks, with overhead power lines and wind turbines appearing on the skyline. Inland to the north, there are views across flat open landscape towards the Chadwell escarpment, with tower blocks in Chadwell St Mary clearly visible on the skyline. To the south, there are distant views across the estuary towards the project and urban area of Gravesend. From Coalhouse Fort, the main focus of views is over the Thames Estuary to the south, with inland views towards the project largely obscured by existing trees.

12.6.1 Construction

Construction impacts

The main construction activities likely to be seen from this ward are:

- Construction of the northern tunnel entrance and project route to the north
- Earthworks and landscaping near the northern tunnel entrance
- Establishment and operation of the Northern Tunnel Entrance Compound
- Establishment and operation of the Station Road Compound
- Establishment and operation of the Low Street Lane Utility Hub
- Utilities diversions, including overhead lines
- Construction of Tilbury Viaduct and associated flood compensation area

More information about the construction activities are provided in the Project description section above, as well as in the Construction update. There is also a video fly-through on our consultation website.

Views of construction activities from homes on the western edge of East Tilbury and Linford are likely to be of road construction and overhead line diversions. The Northern Tunnel Entrance Compound is also likely to be visible from the southern edge of East Tilbury. Road construction and overhead line diversions are also likely to be visible from some homes on the eastern edge of West Tilbury and local footpath network between settlements. There would be close range views of the Low Street Lane Utility Hub, associated utility works and flood compensation area excavation from homes at the junction of Church Road and Low Street Lane. From these properties, construction of the Tilbury Viaduct would also feature prominently.

There would be views of highway construction, including Hoford Road green bridge, from Orsett Golf Club.

Users of NCN Route 13 and Two Forts Way would be able to see the Northern Tunnel Entrance Compound and the adjacent Tilbury Fields. The wide panoramic view would also include some distant views towards construction activity to the south of the Thames, however, although perceptible, views of the south tunnel entrance would not be prominent given the distance of over 2.5km. Some limited construction activity would also be visible from Coalhouse Fort seen between vegetation gaps.

Measures to reduce visual impacts during construction

Mitigation would include locating construction compound facilities greater than six metres in height at the south of the Station Road Compound, where reasonably practical, to maximise distance and visual screening from homes at the junction of Church Road and Station Road. Further visual screening for these properties would be provided by forming earth bunds, where soil is excavated and temporarily retained on site. These temporary features would be seeded with grass to soften their appearance.

The visual impacts of the project would be controlled through the range of good practice measures set out in the project's CoCP and the REAC. See chapter 5 of the Consultation guide for more information about this and the project's other control documents.

12.6.2 Operations

Operational impacts

When the Lower Thames Crossing opens the northern tunnel entrance and close-by sculptural mounding would be complete, together with the continuation of the new road to the north, including Tilbury Viaduct. A section of approximately 2.5km of existing 132kV overhead power line would be removed, extending from the south of Tilbury Loop railway line and continuing west of the new Tilbury Viaduct to Linford allotments. The land used temporarily for construction would be reinstated to the reasonable satisfaction of the owner of the land.

More information about the completed project is provided in the Project description section above.

The visual impacts from homes on the edge of East Tilbury and Linford, would be caused by the tops of HGVs and gantries visible above the grassed false cutting slopes, with Tilbury Viaduct also featuring in some views. To the west of Tilbury Viaduct, the overhead power line closest to homes in East Tilbury would no longer feature in views.

From West Tilbury, there could be partial views through gaps in existing vegetation, towards traffic and gantries above the grassed false cutting slopes. Tilbury Viaduct, crossing the new flood compensation area, would feature prominently in views from some homes at the junction of Church Road and Low Street Lane. The diverted overhead power line, seen in front of the viaduct, would not appear dissimilar to the existing route.

A wide belt of proposed woodland planting would help screen views of the road and infrastructure from Orsett Golf Club.

From NCN Route 13 and Two Forts Way, there would be close-range views of the new sculptural landform in front of the northern tunnel entrance, returned to agricultural use for grazing. Views of the project to the south of the Thames Estuary would be barely perceptible.

Measures to reduce visual impacts of the operational project

The false cuttings north of Tilbury Viaduct and landscape treatment along the road corridor are the primary mitigation in this ward, helping to screen views of the new road and traffic and integrate the project into the surrounding landscape. Sculptural mounding to the south of the tunnel entrance would create a new landscape feature on the northern margin of the Thames Estuary.

12.7 Noise and vibration

We have carried out noise and vibration assessments for both the construction and operational phases of the project. As explained in chapter 1, some of the assessments set out below are based on earlier versions of the project. The information provided still presents a reasonable representation of the likely effects from the proposals presented during this consultation.

Existing situation

The existing noise environment in East Tilbury ward is mainly created by traffic, industrial, agricultural activities and some railway noise. The main sources of traffic noise within the ward of East Tilbury are from Muckingford Road, Station Road and Princess Margaret Road.

As part of our environmental assessment process, we carried out surveys of existing background noise at seven locations in the ward, which were agreed with the local authority. The levels monitored at these locations recorded average existing noise levels in the range of 44 to 59dB (A)² during the day and 43 to 54 dB(A)² during the night.

To understand how noise levels would vary with and without the new road, we used noise modelling to predict what noise levels would be like in the project's proposed opening year, if the new road was not built. We model this because we cannot assume that noise levels in future would be the same as they are now. For example, our assessment of the opening year noise levels accounts for predicted changes in traffic levels.

We also modelled the predicted noise levels for the opening year with the project in place. This provides a useful comparison as to how the project would change the noise levels in the project's opening year if it were implemented.

2 Decibel (dB) is the unit used to measure noise levels, with dB(A) being a standardised way of averaging noise levels that accounts for how humans hear sounds. The typical level of sounds in the environment ranges from 30 dB(A), which is a quiet night-time level in a bedroom, to 90 dB(A), which is how it would sound by a busy road. See chapter 1 for more information about what decibel levels mean.

In the opening year, noise levels without the new road are predicted to range from 42 to 72 dB(A) in the day and from 31 to 58 dB(A) during the night at our identified locations in the ward. As such, our noise assessments predict that by opening year noise levels will increase compared to the existing situation even if the road is not built. Information about how noise levels would change with the project in place, during its construction and operation, are presented below.

12.7.1 Construction

Daytime construction noise impacts

The main construction activities expected to create noise and vibration impacts in this ward would be associated with the northern tunnel entrance construction and main route as well as utilities works.

Two main works compounds and two Utility Logistics Hubs (ULHs) would be located within East Tilbury. These are described in the Project description section above.

Although not located within the ward, Brentwood Road Compound and Brentwood Road ULH may contribute to the noise impacts in this ward due their proximity to the ward boundary.

There would also be haul roads built and used during the construction period, and these are shown in the Project description section.

Within the ward there are two proposed structures expected to be constructed using vibratory or percussive piling, but these works would not be within 100 metres of any sensitive receptor and as such no vibration impacts during the construction works are predicted to occur.

Construction noise levels have been predicted at 12 locations across this ward. These were chosen to provide a representative level of the noise local communities are likely to experience during construction. For more information about how we carried out these assessments, see chapter 1.

Noise levels are shown using the standard units for major projects, dB LAeq(12 hour), which represent the average noise level for the assessed 12-hour daytime period.

Figure 12.14: Construction noise assessment locations in East Tilbury ward

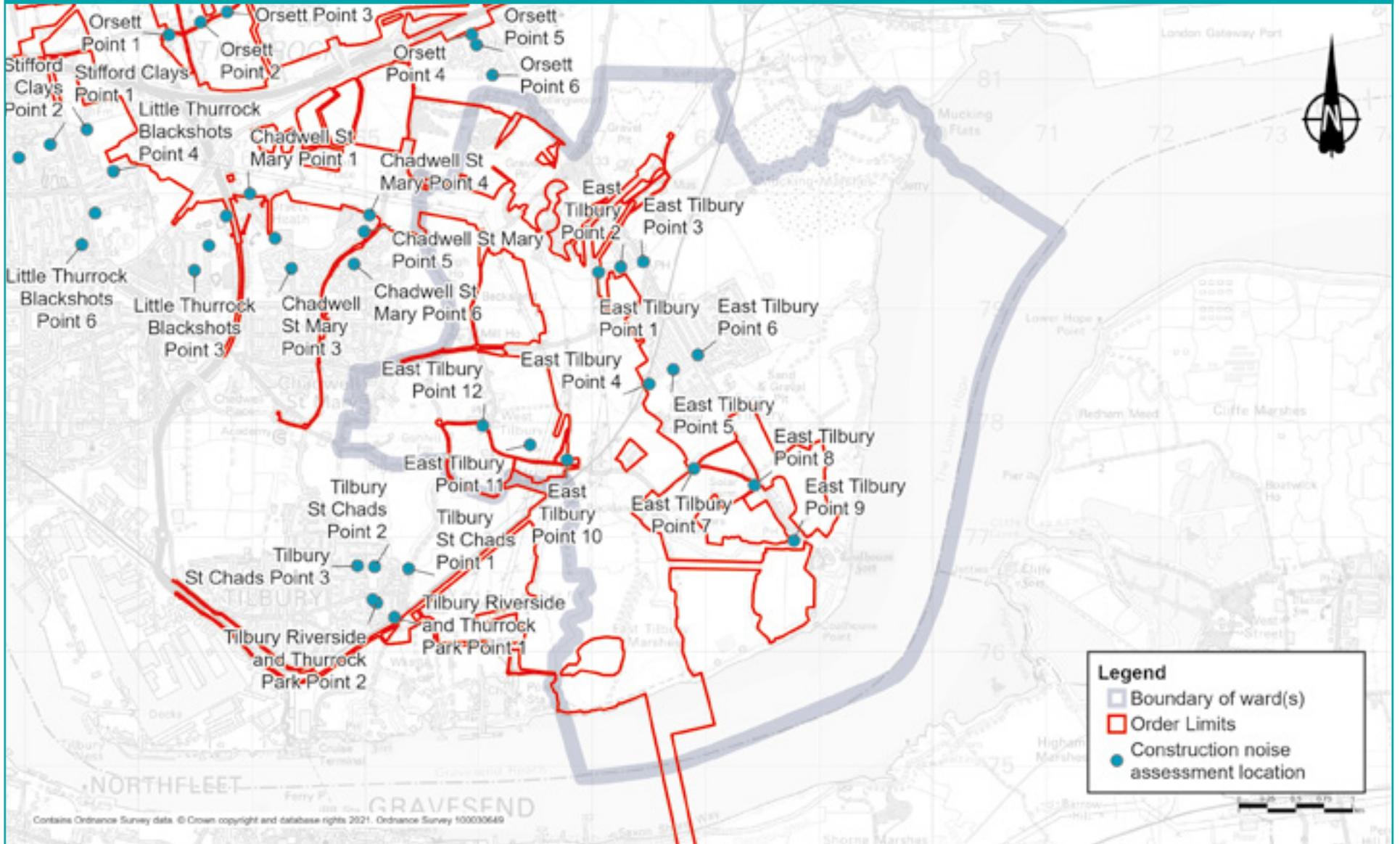
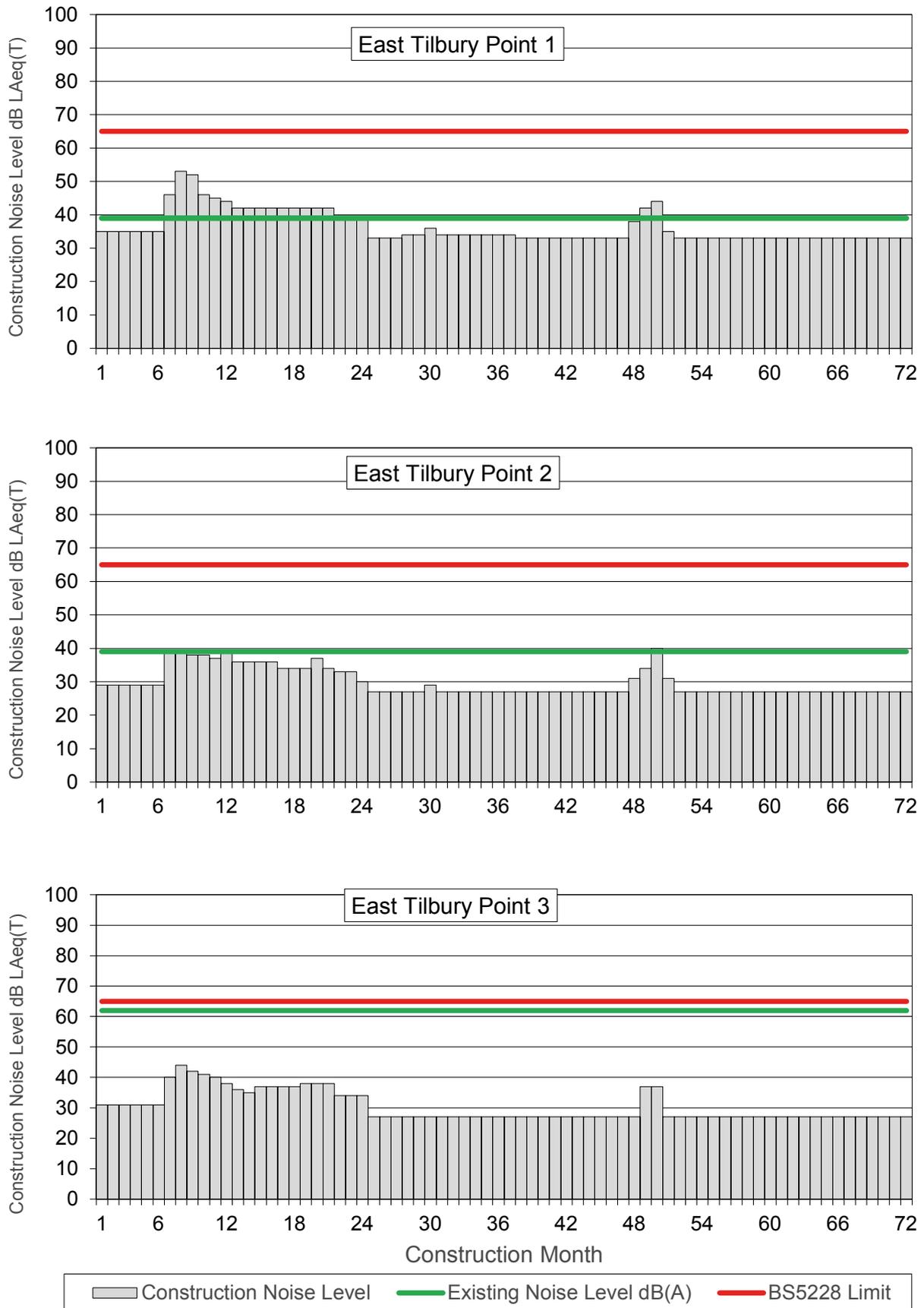


Figure 12.15: Construction noise by month for points 1, 2 and 3 in East Tilbury ward



Figures 12.14 and 12.19 show the locations at which we have predicted the daytime construction noise while the new road is being built.

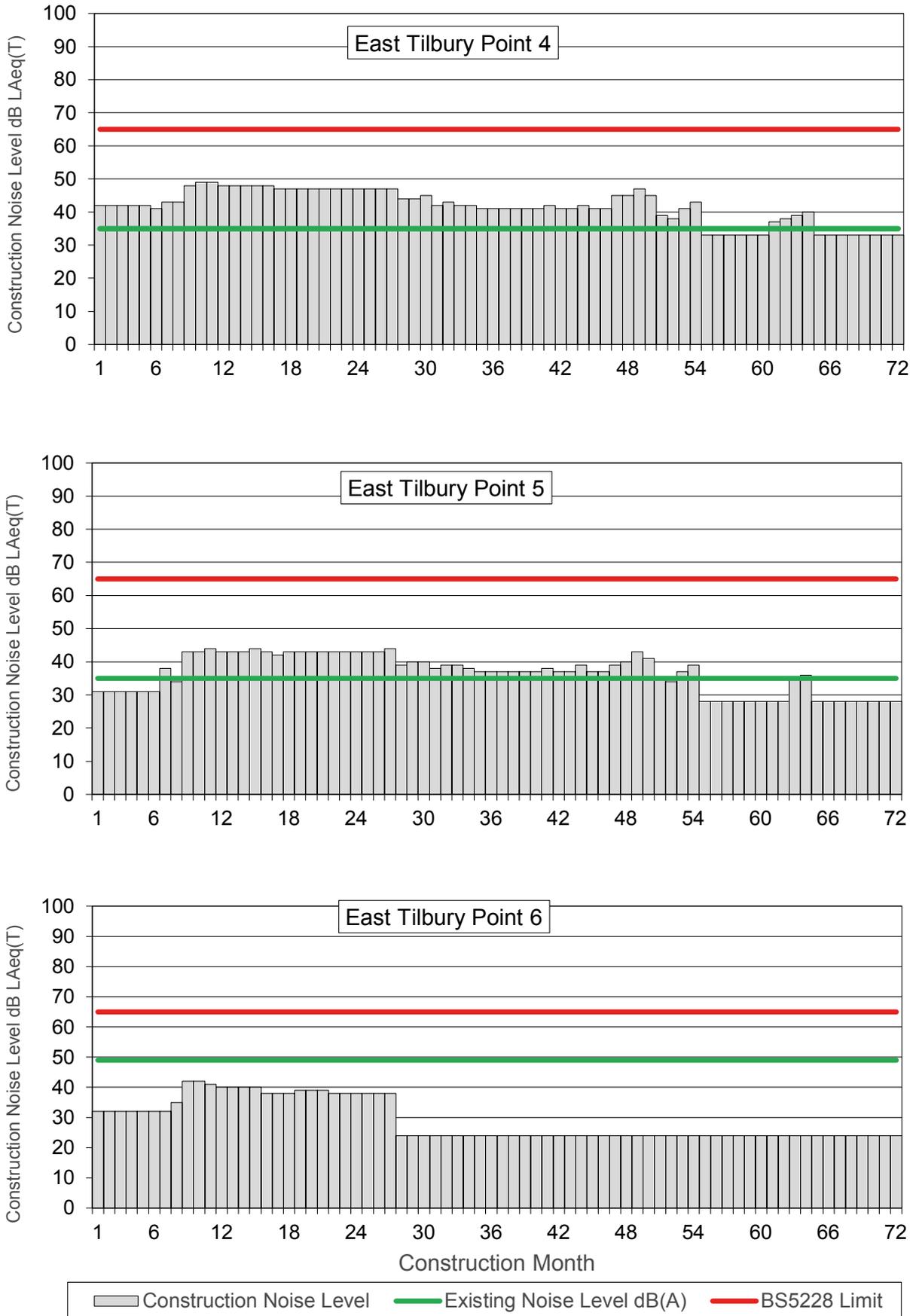
Each vertical bar in figures 12.15, 12.16, 12.17 and 12.18 show the predicted noise levels for that month of the construction period (from months 1-72). The horizontal green line in each chart represents the existing background noise level at each assessment point without the project. The horizontal red line shows the level at which construction noise would exceed the BS threshold (see chapter 1 for more information about these thresholds). If noise is predicted to exceed acceptable levels, then specific measures would be implemented to reduce the noise.

The predicted construction noise levels show that higher noise levels and disturbance would be experienced closer to construction activity. Levels gradually diminish as a result of increased distance and additional buildings and other features screening the noise from more distant residential areas.

With reference to figure 12.15 the following summarises the noise level changes over the construction period for points 1 to 3:

- At point 1, construction noise levels are predicted to range from 33 to 53 dB LAeq (12hour) during the six-year construction programme. Construction noise levels would exceed the existing background daytime noise level for approximately 17 months. However, they would not breach the defined threshold.
- At point 2, construction noise levels are predicted to range from 27 to 40 dB LAeq (12hour) during the six-year construction programme. Construction noise levels would exceed the existing background daytime noise level for only one month. However, during this month it would not breach the defined threshold.
- At point 3, construction noise levels are predicted to range from 27 to 44 dB LAeq (12hour) during the six-year construction programme. Construction noise levels are not predicted to exceed the existing background noise levels at this assessment location.

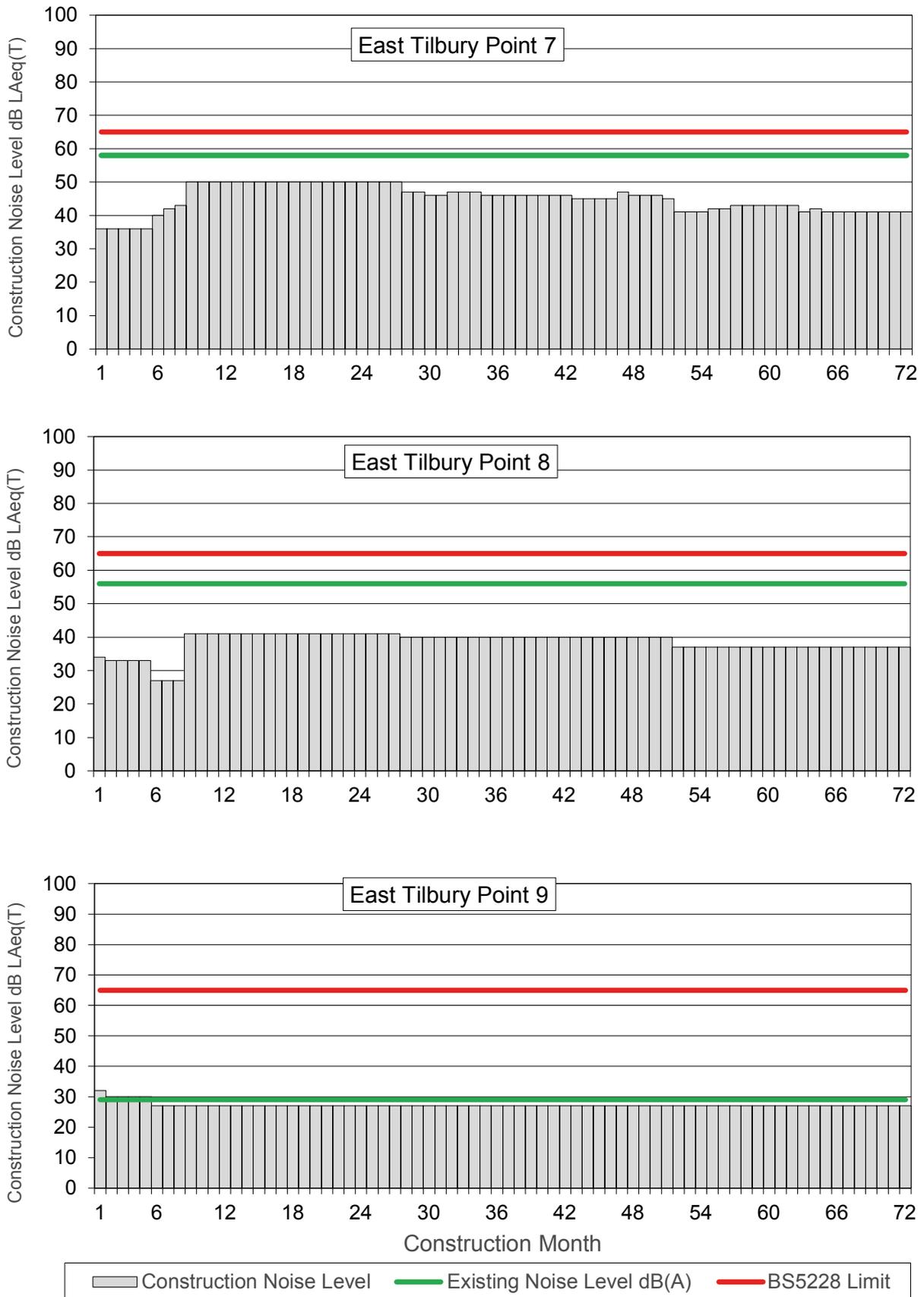
Figure 12.16: Construction noise by month for points 4, 5 and 6 in East Tilbury ward



With reference to figure 12.16 the following summarises the noise level changes over the construction period for points 4 to 6:

- At point 4, construction noise levels are predicted to range from 33 to 49dB LAeq (12hour) during the six-year construction programme. Construction noise levels would exceed the existing background daytime noise level for approximately 58 months. However, they would not breach the defined threshold.
- At point 5, construction noise levels are predicted to range from 28 to 44dB LAeq (12hour) during the six-year construction programme. Construction noise levels would exceed the existing background daytime noise level for approximately 46 months. However, they would not breach the defined threshold.
- At point 6, construction noise levels are predicted to range from 24 to 42dB LAeq (12hour) during the six-year construction programme. Construction noise levels are not predicted to exceed the existing background noise levels at this assessment location.

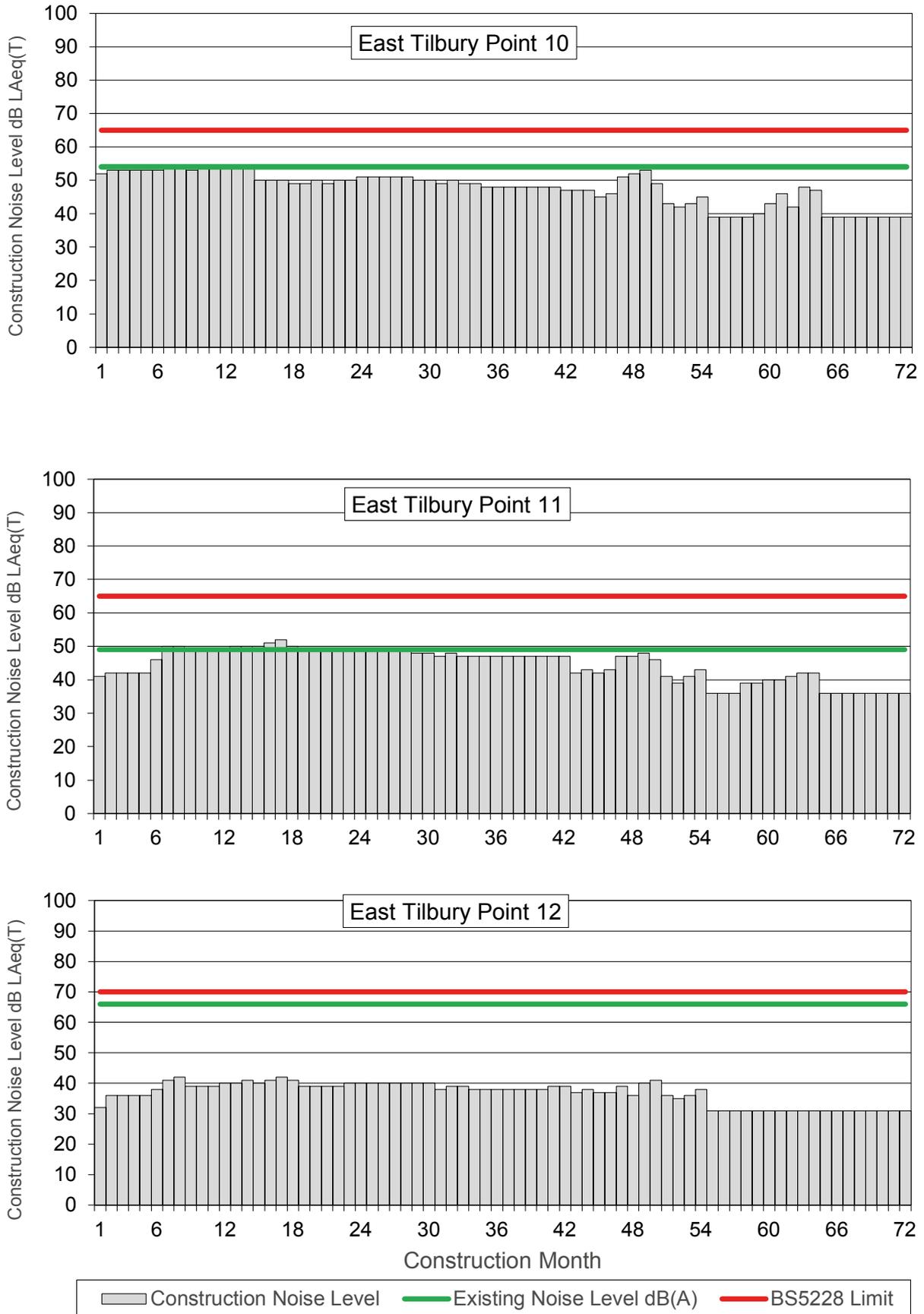
Figure 12.17: Construction noise by month for points 7, 8 and 9 in East Tilbury ward



With reference to figure 12.17 the following summarises the noise level changes over the construction period for points 7 to 9:

- At point 7, construction noise levels are predicted to range from 36 to 50dB LAeq (12hour) during the six-year construction programme. Construction noise levels are not predicted to exceed the existing background noise levels at this assessment location.
- At point 8, construction noise levels are predicted to range from 27 to 41dB LAeq (12hour) during the six-year construction programme. Construction noise levels are not predicted to exceed the existing background noise levels at this assessment location.
- At point 9, construction noise levels are predicted to range from 27 to 32dB LAeq (12hour) during the six-year construction programme. Construction noise levels would exceed the existing background daytime noise level for approximately five months. However, they would not breach the defined threshold.

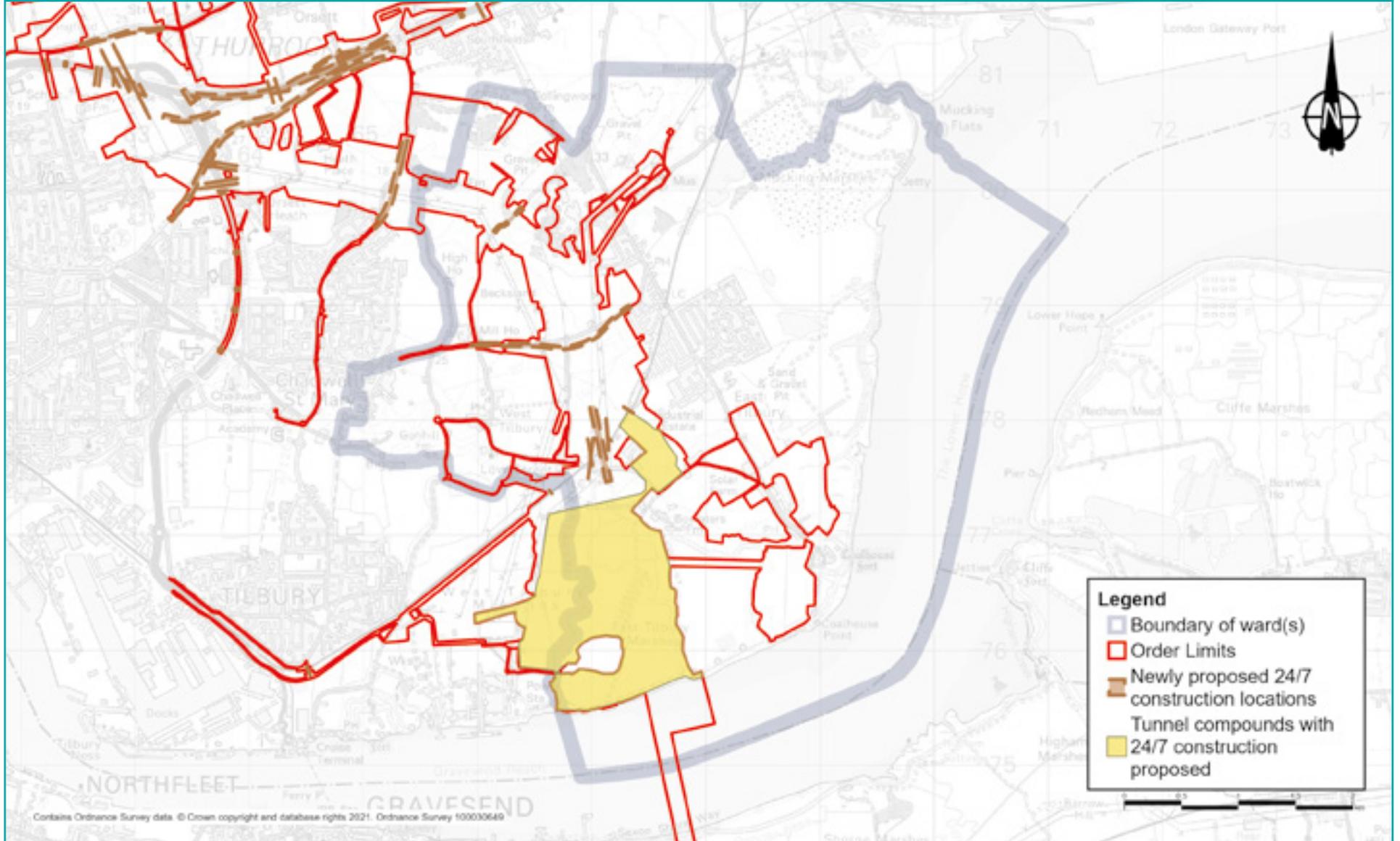
Figure 12.18: Construction noise by month for points 10, 11 and 12 in East Tilbury ward



With reference to figure 12.18 the following summarises the noise level changes over the construction period for points 10 to 12:

- At point 10, construction noise levels are predicted to range from 39 to 54dB LAeq (12hour) during the six-year construction programme. Construction noise levels are not predicted to exceed the existing background noise levels at this assessment location.
- At point 11, construction noise levels are predicted to range from 36 to 52dB LAeq (12hour) during the six-year construction programme. Construction noise levels would exceed the existing background daytime noise level for approximately eight months. However, they would not breach the defined threshold.
- At point 12, construction noise levels are predicted to range from 31 to 42dB LAeq (12hour) during the six-year construction programme. Construction noise levels are not predicted to exceed the existing background noise levels at this assessment location.

Figure 12.19: Newly proposed and tunnel 24/7 working locations in East Tilbury



24/7 construction working

In addition to the changes to the daytime noise impacts reported in the section above, 24-hour seven-day construction working is proposed at the locations shown in figure 12.19.

These works, which include the support of the tunnelling works and works over the railway or works on the public highway, have been identified as they may need to be undertaken at night to maintain safety and reduce disruption to road, railway and utility networks. The duration for the works within this area is anticipated to be nights and weekends over short periods associated with specific works activities for highways and utilities work.

These works would have an impact on local communities, and we would work with the local authority to manage these impacts.

Construction traffic noise impacts

Maps showing the predicted change in road traffic noise within this ward during each year of construction can be found in chapter 7 of the Construction update. Based on the currently available traffic data (which offers a representative picture of what people within the ward are likely to experience) during the construction period, there would be negligible changes in traffic noise (less than 1dB change in noise levels) during all construction years, except along Coopers Shaw Road where minor increases in noise levels (greater than 1dB but less than 3dB) have been predicted. For more information about how we define noise impacts, that is, negligible, minor, moderate and major, see chapter 1.

Table 12.4: Construction traffic noise impacts in East Tilbury ward

Affected road(s)	Predicted noise impact	Construction year(s)
Coopers Shaw Road	Minor increase in noise levels	2, 3, 4 and 5

Measures to reduce construction noise and vibration

Construction noise levels would be controlled through the use of best available techniques (BAT), with specific measures at certain locations such as:

- installing and maintaining hoardings around the construction compounds
- installing temporary acoustic screening around the construction areas likely to generate noise
- keeping site access routes in good condition with onsite assessments to inspect for defects such as potholes
- turning off plant and machinery when not in use
- maintaining all vehicles and mobile plant so loose body fittings or exhausts do not rattle or vibrate
- using silenced equipment where available, specifically silenced power generators and pumps
- no outdoor music or radios would be played for entertainment purposes onsite
- site layout would be planned to make sure reversing is kept to a minimum. Necessary reversing manoeuvres would be managed by a trained banksman or vehicle marshal to ensure they are conducted safely and concluded quickly to reduce the noise from vehicle reversing warnings
- non-percussive demolition techniques would be used where possible to reduce noise and vibration impact
- careful consideration of the location and layout of compounds to separate noise-generating equipment from sensitive receptors, and use of mains electricity rather than generators, where possible
- keeping construction vehicle traffic to a minimum by using local suppliers, where possible, local workforces and reducing the transport of material for earthworks construction

All control measures, including those above, fall under the principles of BAT and are included in the REAC. For more information, see the sections NV001 to NV010, which set out how we would work under the supervision of the relevant local authorities to implement noise-reduction measures where these are needed.

The CoCP sets out additional measures that would be implemented to reduce noise and vibration during the construction period.

12.7.2 Operations

Operational traffic noise impacts

Within this ward, the project route and the northern tunnel entrance runs through the western part of the ward.

Direct noise impacts from the route, would be experienced in the western section of the ward, close to the northern tunnel entrance and the main project alignment. There would also be indirect noise impact as a result of predicted changes in traffic flow and traffic speed on the existing road network within the ward.

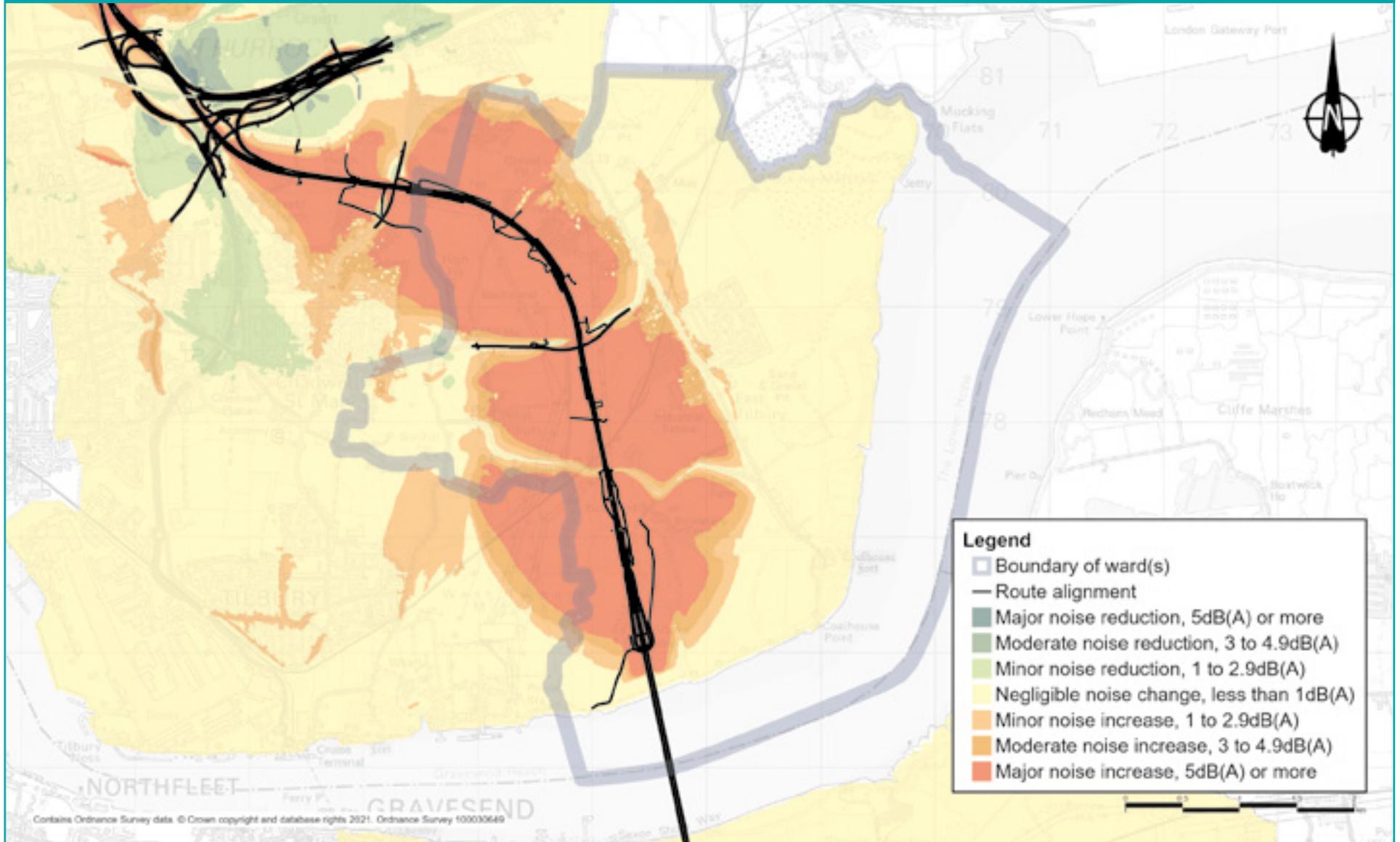
Figure 12.20 shows the predicted changes in road traffic noise in the opening year of the project. Within the ward, changes in road traffic noise at identified noise sensitive receptors (such as nearby properties) are predicted to range from negligible reductions in noise levels of less than 1.0 dB to major increases in noise levels of greater than 5dB. For more information about how we define noise impacts, that is, negligible, minor, moderate and major, see chapter 1.

Measures to reduce noise and vibration during operations

The main methods of controlling noise would be, where practical, to design the road within landscaped features such as cuttings and bunds (walls of earth). However, where noise impacts are greatest, we would install noise barriers (typically, wooden fences) in addition to these earthworks features. The use of low-noise surfacing would also reduce the traffic noise once the road is in use.

For more information about the proposed measures to reduce operational noise, see the REAC (including references NV011 and NV013).

Figure 12.20 Noise impacts during operation in East Tilbury ward



12.8 Air quality

We have carried out air quality assessments for both the construction and operational phases of the project. As explained in chapter 1, some of the assessments set out here are based on earlier versions of the project. The information provided here still presents a reasonable representation of the likely effects from the proposals presented during this consultation.

Existing situation

East Tilbury ward is not located within an Air Quality Management Area (AQMA). AQMAs are areas that have been identified by local authorities as areas of poor air quality that require additional monitoring and controls.

12.8.1 Construction

Construction impacts

Construction activities have the potential to affect nearby air quality through the release of dust and emissions from construction equipment and traffic. The areas most likely to be affected are those close to haul roads, compounds and soil storage areas.

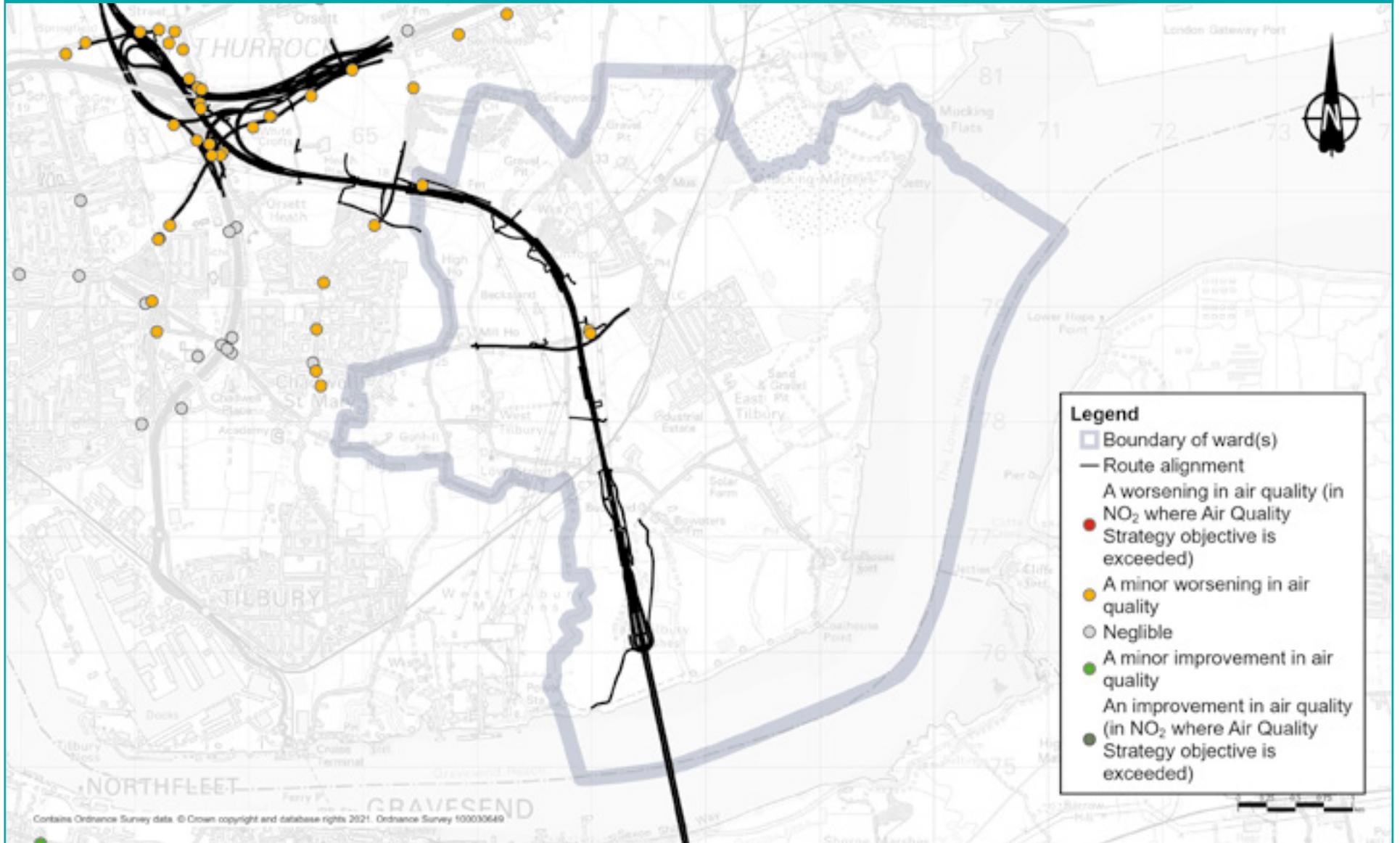
Properties more than 200 metres from the worksite, which is the majority of properties within this ward, are outside the area likely to be affected by construction dust or emissions from the worksite. In this ward, there are only a few properties within 200 metres of the worksite, including those along Station Road and Muckingford Road. Air quality impacts on these properties during construction would be temporary and we would put in place measures to minimise the dust impacts (see below). The proposed measures to reduce dust and emissions are ones that have been proven to be effective when used on similar construction projects in the past. The change in air quality during the construction phase would be negligible. There would be no discernible effect on health.

Our analysis of construction traffic predicts that the impact on most roads in this ward would be negligible. There would not be any changes in air quality in the area, as a result of the traffic management in place from 2024 to 2029. More information about construction traffic impacts on air quality can be found in chapter 7 of the Construction update.

Measures to reduce air quality impacts during construction

The impact of construction machinery and traffic on air quality would be controlled through the range of good practice measures set out in the CoCP and the REAC. For example, there would be measures to suppress dust, such as damping down dry haul roads and spoil heaps, as well as the use of low-emission machinery and vehicles. We would put in place an Air Quality Management Plan to ensure the measures set out in the CoCP and the REAC would effectively monitor and control dust and exhaust emissions. The location and type of monitoring would be submitted in advance to Thurrock Council for consultation (see REAC entry AQ006).

Figure 12.21: Predicted changes in NO₂ levels within East Tilbury ward once the new road is open



12.8.2 Operations

Operational impacts

We have carried out an assessment of the operational impacts of the new road on air quality. The assessment area includes a 200-metre buffer within the affected road network, with this area being the most likely to experience changes to air quality as a result of the new road. More information about air quality impacts once the road is open can be found in chapter 5 of the Operations update.

There are receptors (properties or habitats that are sensitive to changes in air quality) within the ward, along Muckingford Road, that are predicted to experience a minor worsening in the air quality for nitrogen dioxide (NO₂), the main traffic-related pollutant³. The highest modelled yearly average NO₂ concentration within this ward is 24.6 µg/m³ (on the Muckingford Road), which is below the yearly average threshold of 40µg/m³. Our assessment is based on our opening year model, which represents a worst-case scenario, without accounting for the increase in less-polluting vehicles on our roads over time.

In addition to our assessment of NO₂ our assessment predicts that PM₁₀ levels (small particles of dust, mainly from vehicle exhausts and brakes) are unlikely to exceed threshold levels across the assessed area.

Measures to reduce air quality impacts during operation

The assessed air quality impacts in this area as a result of the project would not trigger the need for additional monitoring or other mitigation measures once the road is open.

³ NO₂ levels are measured in 'micrograms per cubic metre', or µg/m³, where a microgram is one millionth of a gram.

12.9 Health

Existing situation

A range of personal, social, economic and environmental factors influence our health. Different groups within the population may be more sensitive to these factors than others – for example, children, older people or those with pre-existing health conditions.

The East Tilbury ward is characterised by a younger population than is the case for Thurrock and England as a whole (24.3% of residents are aged under 16, compared to 24.2% for Thurrock and 20.3% for England). East Tilbury has a significantly higher proportion of white residents when compared to the England average, 94.6% and 85.4% respectively.

Parts of East Tilbury are within the 50% most deprived areas in England. Economic activity rates are similar to those for Thurrock as a whole, as is the proportion of people claiming benefits. Many residents own their own property, a significantly higher proportion than is the case for Thurrock and England as whole, 75.8%, 66.2% and 63.2% respectively.

The self-reported health status is generally poor, with a lower proportion of residents who report that their health is good when compared with Thurrock and England as a whole, 45.9% and 48.2% respectively. Life expectancy at birth for residents of East Tilbury is 80.1 for males and 82.8 for females (slightly higher than the UK average for males and slightly lower for females for the period of 2017-19 of 79.4 for males and 83.1 for females). Regarding deaths from all causes, respiratory disease and coronary heart disease, East Tilbury has similar outcomes when compared to Thurrock and England as a whole.

12.9.1 Construction

Construction impacts

East Tilbury ward would experience a large amount of construction activity, which would include building the two tunnels under the River Thames, construction of a new viaduct over the Tilbury Loop railway, and building a section of the new road within a false cutting (earthworks designed to reduce the impacts on the surrounding area). There would also be substantial utility works and the creation of large areas of environmental mitigation, including flood compensation areas and new habitats. To support the tunnel works, the Northern Tunnel Entrance Compound would be established at Tilbury Marshes, west of East Tilbury and Coalhouse Fort, in an area currently being used to extract pulverised fuel ash

from the former Tilbury Power Station. Two Utility Logistics Hubs (ULHs), located within East Tilbury, would be used as supporting compounds for utility works. Muckingford Road ULH would be located east of the new road and south of Muckingford Road. Elements of each of these activities have the potential to impact health, whether this be the noise associated with construction activities or construction traffic, changes to air quality (dust emissions), potential severance (where communities would be divided by new roads or traffic) caused by construction traffic, or through impacts on mental health and wellbeing.

There are both positive and negative potential impacts on people's health and wellbeing as a result of the construction stage. Through good communications and engagement and providing people with information about when construction works would be taking place and its impacts, negative impacts on people's mental health and wellbeing would be reduced. Equally, some residents would see health and wellbeing benefits from improved access to work and training opportunities presented by construction activities (see the Traffic impacts section). The relationship between mental health and unemployment is bi-directional.

Different groups of people within the population may be more sensitive to factors which potentially affect their health than others. Some of the changes identified as a result of construction activities may therefore only affect a small proportion of the population. Potential impacts are shown below.

- Residents would be likely to experience adverse effects from construction traffic noise. As East Tilbury has higher proportions of children (under 16 years old) these groups may be more susceptible to increases in noise levels.
- Temporary adverse visual effects have been identified within East Tilbury.
- Conversely, positive health outcomes may be experienced by residents as a result of access to work and training opportunities presented by construction activities.

Measures to reduce impacts on health during construction

Mitigation measures relevant to health and wellbeing (including good practice measures relating to dust emissions, hours of working and visual screening) are described in relation to air quality, noise and vibration, and visual impacts respectively. Further detail relating to mitigation (for example, in relation to footpath

closures) is set out in our CoCP, the REAC, and the package of traffic management plans detailed in the traffic management section. For example, the commitments in the REAC include items such as adhering to Best Practicable Means (BPM) to reduce noise impacts (see NV007 in the REAC), dust-management good practice (see AQ005 in the REAC) and planning construction works to reduce the length of time that footpaths are closed (see PH001 in the REAC).

Engagement and effective two-way communication with communities both prior to and during construction by providing information about the programme and impact of works is important to reduce mental health and wellbeing impacts associated with uncertainty, stress and anxiety. The CoCP describes proposals for community engagement, setting out how we would continue to liaise with local communities, stakeholders and affected parties to make sure they are kept informed of our construction works, their progress and associated timescales.

12.9.2 Operations

Operational impacts

Information about the operational project in the ward is provided in the Project description section.

The noise assessments indicate increases in noise levels greater than 5dB in East Tilbury, which may have some negative affects. In addition, adverse visual impacts in the opening year have been identified. A proportion of residents may experience anxiety or stress associated with perceptions of environmental change as a result of a major road project. As with the construction stage, different groups in the East Tilbury population may be more susceptible to anxiety and stress than others.

A proportion of residents may also experience positive health benefits through accessibility improvements, better access to employment (greater than 10%), services, training and to open space, including new recreational areas outside East Tilbury, including Tilbury Fields.

Measures to reduce operational health impacts

Mitigation measures to address noise and visual impacts have been described above. No further impacts relating to health have been identified for this ward and consequently no specific additional measures are required.

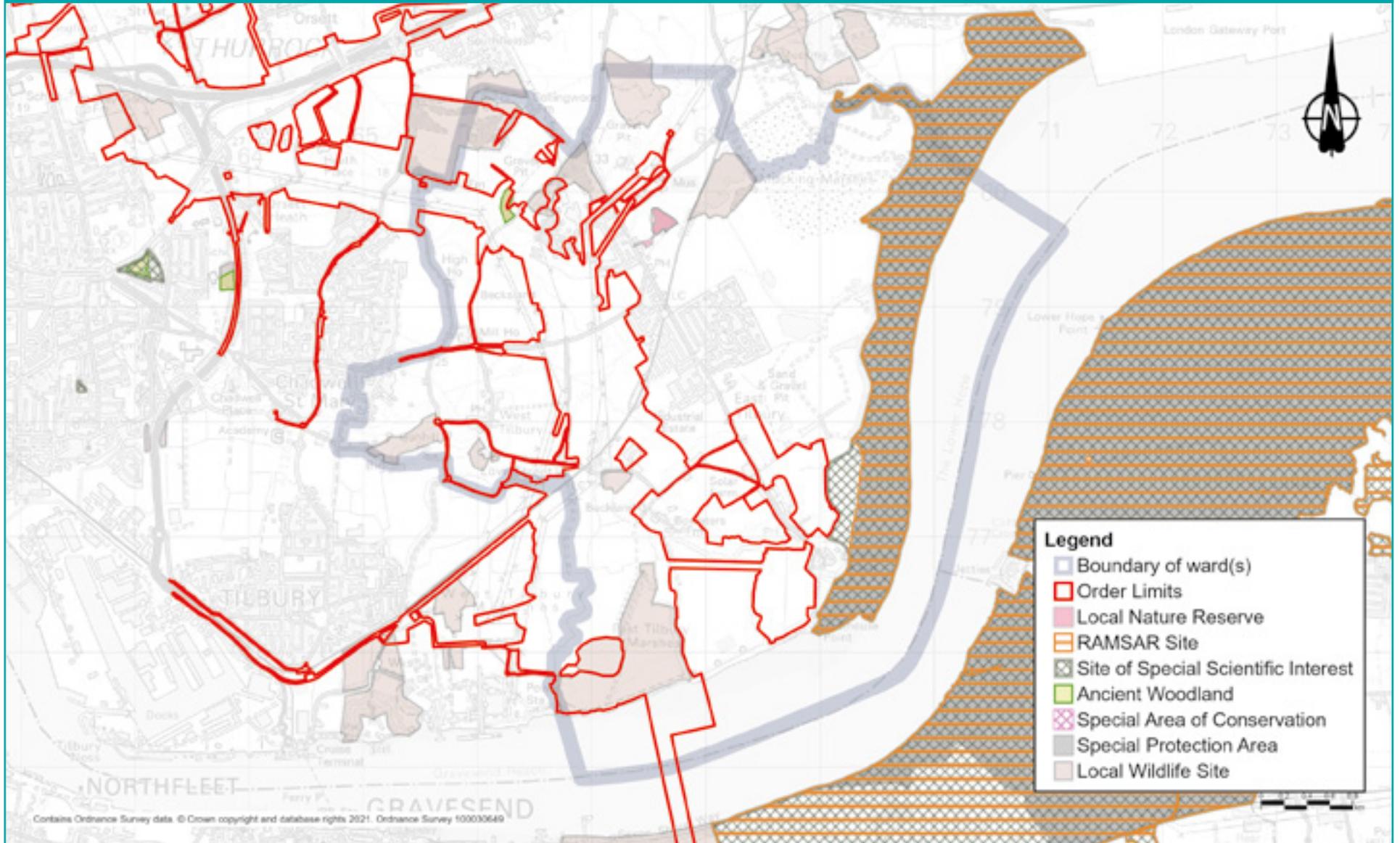
12.10 Biodiversity

Existing situation

The main habitats present within the Order Limits in the East Tilbury ward are areas of arable farmland. There are some areas of brownfield sites next to the Thames containing a large number of watercourses. In addition, there are areas of pasture, rough grassland, scrub and woodland, including one ancient woodland.

Within 2km of the Order Limits in the East Tilbury ward are the designated sites of the Thames Estuary and Marshes Special Protection Area (SPA) and Ramsar, and the Mucking Flats and Marshes SSSI. Within 500 metres of the Order Limits, the non-designated sites are Goshems Farm Local Wildlife Site (LWS), Low Street Pit LWS, West Tilbury Hall LWS, West Tilbury Church LWS, Broom Hill LWS, Gobions Lake LWS, Linford Pit LWS, Buckingham Hill LWS, Mucking Heath LWS, Linford Wood Local Nature Reserve and Rainbow Shaw ancient woodland. For marine biodiversity, please refer to chapter 7 of the Construction update.

Figure 12.22 Designated and non-designated biodiversity sites in East Tilbury ward



We carried out surveys across the project to set a baseline for assessment, and these identified the presence of a range of protected and notable species. Species present include bats, badgers, water vole, terrestrial invertebrate species, great crested newt (GCN) and reptiles such as adder. The brownfield areas also contained notable breeding bird species including cuckoo, corn bunting and nightingale. The north shore of the River Thames is important for both wintering and passage wetland birds, with a number of SPA bird species foraging in these areas including redshank, ringed plover and avocet.

12.10.1 Construction

Construction impacts

Construction of the project would require the removal of areas of habitat, both temporarily and permanently, from the route of the new road. This habitat consists of areas of arable farmland, brownfield habitat, scrub, rough grassland and woodland. A small area of ancient woodland would be removed within Rainbow Shaw. This habitat supports a range of protected and notable species which would be impacted by construction in terms of direct habitat loss (the loss of badger setts, including two main setts, bat roosts, water vole, reptile, great crested newt, breeding bird and invertebrate habitat); fragmentation of habitat (which includes the loss of two bat routes); and disturbance to retained habitat.

Measures to reduce the impact of construction on biodiversity

Vegetation clearance would be undertaken during the winter where possible to avoid the impacts on breeding birds. Where this is not practical, clearance would be supervised by an ecological clerk of works to ensure no nests are disturbed or destroyed. Where protected species are present, these would be moved away from the site prior to any construction activities either through habitat manipulation (for example strimming to reduce the height of vegetation and displace reptiles), or translocation. Where required, works affecting protected species would be carried out under a Natural England licence. Mitigation would include the creation of an artificial badger sett as a replacement for one of the main setts that would be lost. Boxes to support bats and birds would be erected within retained habitat.

Areas of woodland planting would be carried out to offset woodland habitat being lost.

Areas of open mosaic habitat (mixture of bare ground, scrub and grassland with areas of aggregates – mixture of gravel/excavated materials – that have been landscaped to provide south-facing slopes) would be created to provide quality habitat for a number of species, particularly invertebrates, reptiles and amphibians including great crested newts. This habitat would also be suitable for the breeding bird flocks in this area. Ponds would be included to further diversify the present habitats and provide breeding grounds. These are shown in a map in the general arrangement drawings. For more information, see Map Book 1: General Arrangements, included as part of this consultation.

Two green bridges would be created to provide habitat connectivity within this area. These green bridges would be over the project at Muckingford Road and Hoford Road, with Hoford Road in particular created to allow bats to commute over the project.

The impact of construction on biodiversity would be controlled through the range of good practice measures set out in the project's CoCP and the REAC. See chapter 1 of the Construction update for more information about this and the project's other control documents.

12.10.2 Operations

Operational impacts

Operation of the project has the potential to cause mortality of species by encountering road traffic, habitat fragmentation and noise disturbance from traffic.

Measures to reduce the biodiversity impacts of the operational project

Landscape planting has been designed to provide strong links for animals to move and forage along, guiding them to safe crossing points over the new road such as the green bridges mentioned above. To mitigate disturbance from traffic, the new road would be in a cutting north of Muckingford Road to reduce noise and visual impacts.

Newly created habitat, including support for animals moved from the construction area, would be managed to ensure that they provide high quality habitat to support a broad range of different plant and animal species.

The impact of the new road on biodiversity would be controlled through the range of good practice measures set out in the project's CoCP and the REAC. See chapter 1 of the Construction update for more information about this and the project's other control documents.

12.11 Built heritage

Existing situation

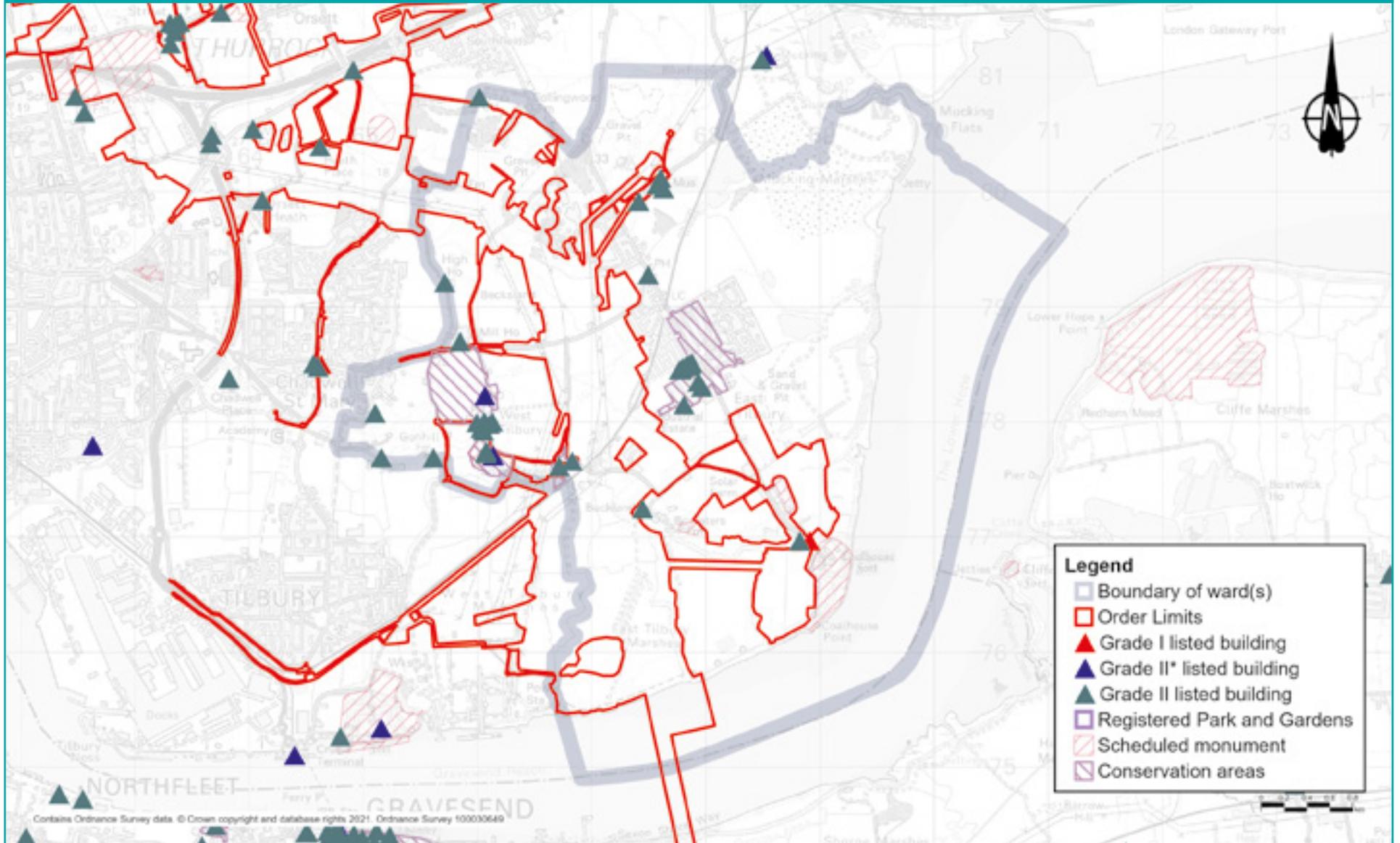
There are 38 listed buildings, four scheduled monuments, two conservation areas and nine structures of local historical relevance located in East Tilbury Ward in relation to the project.

One of the listed buildings is Grade I, two are Grade II* and the remaining are Grade II.

Scheduled monuments

- The site of a system of earthworks near the church at West Tilbury is located within West Tilbury Conservation Area, about 70 metres south-west of the project. The earthworks stand at the edge of an escarpment overlooking the East Tilbury marshes towards the River Thames and cover the neck of a promontory. The churchyard stands on a slight mound suggesting a possible earlier medieval settlement. The site is also reputed to be the location of Queen Elizabeth I's camp for her review of troops in 1588.
- WWII anti-aircraft battery at Bowaters Farm that lies on the boundary of the project. The monument and area surrounding the battery may contain archaeological remains related to the use of the anti-aircraft battery. The battery consists of eight concrete gun emplacements in two distinct groups with a rectangular magazine building in between and brick barracks. The battery was first constructed in 1939.
- Coalhouse Fort and East Tilbury Battery (both scheduled monuments) are located adjacent to the boundary of the project to the east and south of Princess Margaret Road. The current Coalhouse Fort was constructed between 1860-1874 as part of a major programme of construction of military defences following the 1860 report by the Royal Commission to consider the defences of the UK. It is likely that there is an earlier fortification located around the site, with the earliest fortification at East Tilbury known through a 1402 commission, but the exact location is unknown. East Tilbury Battery was constructed between 1889-90 to support Coalhouse Fort. The battery was a disguised fortification to minimise the effectiveness of the attacker's ordnance, and maximise the effectiveness of the defence. The battery is protected by a long and sloping earthen area that blends into the landscape. The battery was decommissioned in 1913 and sold to a local farmer in 1930. It was then used as an unofficial air-raid shelter during WWII.

Figure 12.23 Built heritage locations in East Tilbury ward



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Listed buildings

- The church of St Katherine is a Grade I listed building located 60 metres north of the project. The church dates from the 12th century, with significant alterations in the 13th and 17th centuries. Constructed mostly in flint and rubble with tiled roofs, the church also has some Roman and Medieval brickwork and limestone dressings.
- The Church of St James is a Grade II* listed building located within West Tilbury Conservation Area (Stanford Road Compound). It is located 45 metres south and 330 metres north of the boundary of the project. The church dates from the late 11th or early 12th century and underwent alterations in the 14th and 19th centuries. The building is built in flint and ragstone rubble with limestone dressings and a tiled roof.
- Marshall's Cottages is the second Grade II* listed building within West Tilbury Conservation Area. It is located 250 metres north and 380 metres west of the project. The early 15th century hall house has a red tile roof and a timber frame, which has been part plastered and part weather boarded.

There are another 35 Grade II listed buildings within the ward.

12.11.1 Construction

Construction impacts

None of the identified buildings of historical relevance within the ward are directly impacted by the project. Activities include the construction of the northern tunnel entrance, establishment and operation of the associated tunnel compounds (Northern Tunnel Entrance Compound and Station Road Compound) and earthworks. These works, which include the support of the tunnelling works and works over the railway or works on the public highway, have been identified as they may need to be undertaken at night to maintain safety and reduce disruption to road, railway and utility networks. The duration for the works within this area is anticipated to be nights and weekends over short periods associated with specific works activities for highways and utilities work.

Construction activities would temporarily introduce additional noise, lighting and visible construction activity and machinery. Known built heritage assets would not be directly affected, as they would not be physically impacted. However, there would be an indirect effect through the change to the surroundings of Coalhouse Fort, West Tilbury Battery and WWII anti-aircraft battery at Bowaters Farm scheduled monuments due to audible and visual impact from construction activity to the west, as well as potentially as a result of the temporary access route east of the Northern Tunnel Entrance Compound.

Measures to reduce construction impacts

The design and layout of Northern Tunnel Entrance Compound and Station Road Compound would take in to account the setting of heritage assets (the surroundings in which a heritage asset is 'located'), and seek to avoid light glare, light spill and light pollution during night-time construction as much as practicably possible. More information can be found in the Design principles (section S326). Good practice measures including dust and noise reduction measures are also relevant in mitigating the setting of heritage assets. For more information, refer to the Air quality, Noise and vibration and Cultural heritage section of the REAC.

12.11.2 Operations

Operational impacts

The setting of some known built heritage assets including WWII Battery at Bowaters Farm scheduled monument would be impacted once the project becomes operational. Six Grade II listed buildings and two conservation areas would receive non-physical impacts due to changes within their setting caused by the operation of the new road. The presence of the project, within what is currently a peaceful rural setting, would increase the traffic noise. At night, the new road lighting would not be directly visible but would increase the background lighting of the area. The buildings are:

- Polwicks
- Walnut Tree Cottage
- Buckland
- Building 13, Bata Factory
- Bata Industrial Buildings
- Bata Industrial Building Number 12
- East Tilbury Conservation Area
- West Tilbury Conservation Area
- WWII Battery at Bowaters Farm

Measures to reduce the built heritage impacts of the operational project

The engineering and landscape design for the project seeks to avoid or reduce negative impacts on heritage assets arising from increase in noise and lighting changes to the surrounding areas. To preserve the rural and historic characteristics of the landscape, road lighting would be minimised where it is safe and practical to do so in accordance with relevant standards (Design Principle LST.02 and LST.03). Northern Tunnel Entrance Compound and Station Road Compound would be reinstated after construction to reflect the existing surrounding landscape character as outlined under Design Principle S3.05. Refer to the Project Description section above for further information about the completed project.

12.12 Contamination

Existing situation

Potential sources of contamination have been identified based on land uses, from the review of desk-based sources (historical maps and environmental data). Within this ward, the following have been identified:

- There are five contamination sources north of the River Thames:
 - East Tilbury landfill, former hazardous waste landfill.
 - Goshems Farm landfill, former early 20th century landfill, reportedly mostly ash and bottles, dock and river dredgings. It is currently undergoing restoration.
 - Tilbury ash disposal site, Area C, Area C2 (authorised landfill) and Tilbury Power Station. PFA landfill for Tilbury Power Station (and potential for unrecorded disposal of other materials).
 - Shed Marsh Landfill (historical landfill). This site forms part of Thurrock Council reference THU011 (HLU0529).
 - East Tilbury (Northern section) landfill. A former hazardous waste landfill.
- There are five contamination sources surrounding Station Road:
 - Suspected quarry. Suspected area of fill (material used to infill the quarry) (1.3 ha) based on historical mapping 1961 to 1991, south of Station Road.
 - Suspected quarry fill. Suspected partially backfilled disused gravel pit (1.4 ha), south of Station Road.
 - Metal recycling facility. Current waste processing site including end of life vehicles and metal processing.
 - Low Street Brickworks landfill. Industrial landfill (1956 to 1977).
 - Low Street landfill. Industrial/commercial landfill (1969 to 1976).

The overall impact from these contamination sources is considered to be low, given the mitigation proposed.

12.12.1 Construction

Construction impacts

The main construction activity in this ward is the creation of the north tunnel entrance. Other works include utility diversions, topsoil stripping, earthworks/movements and excavations which could cause the mobilisation of contamination (if present). This area is part of the main construction compound where the stockpiling of soils may occur, as well as the storage of materials/chemicals within compounds. A temporary access route is proposed across East Tilbury landfill for ecological mitigation.

During construction of the tunnel entrance and during any dewatering of the site prior to construction, there is a risk of contamination from East Tilbury landfill migrating towards the northern tunnel entrance. During construction there is the possibility for existing contamination within the ground becoming mobilised. There is a potential risk for accidental spillages of oils, cement and fuels from the movement of construction traffic and the storage of materials. Utility diversions are taking place within this ward around Station Road and some are through areas identified as potential sources of contamination. The utility trenches may create preferential pathways for existing contamination to migrate into the wider area. The temporary access route across East Tilbury landfill may damage the capping layer (protective layer over the waste) and allow liquid waste to come to the surface.

Measures to reduce contamination management impacts of construction

To reduce the impact to an acceptable level, good practice measures include appropriate storing of equipment and clear soil handling, storage of chemicals and re-use guidance. These would be used during construction to reduce the risk of spreading contamination and spillage or pollution.

To reduce the risk of accidental spillages, procedures would be in place such as designated areas to re-fuel plant, tanks would be bunded, spill kits would be available and incidents would be recorded and managed, with impacted soils being assessed and removed if necessary.

Essential mitigation such as the development of site-specific remediation, where contamination has been identified during ground investigation work, would be completed in consultation with the local authority. During the earthworks, workers would remain vigilant and any suspected contamination would be recorded and assessed accordingly via a watching brief protocol.

For the utility diversions, to reduce the risk of existing contaminant migration, the design of utility works would use the findings of the ground investigation data to inform any site-specific remediation required.

To reduce the risk of contaminated liquid generated from water from East Tilbury landfill percolating through soil towards the construction of the north tunnel entrance, a deep barrier would be constructed around the excavation to reduce groundwater ingress. The design of the deep barrier and requirement for other supplementary mitigation would be agreed with the Environment Agency prior to commencement of the excavation works. For the temporary access route across East Tilbury landfill (mentioned above), to mitigate associated risks, the design would be agreed with the Environment Agency in consultation with Thurrock Council prior to installation.

Contamination would be controlled through the range of good practice measures set out in the project's CoCP and the REAC. See chapter 1 of the Construction update for more information about this and the project's other control documents.

12.12.2 Operations

During the operation of the road, should an incident occur, such as a traffic collision resulting in localised contamination, significantly affected soils would be assessed and, if necessary, removed to reduce the risk of contamination migrating across a wider area or entering controlled waters. For more information on these controls, see the REAC.

13

Chapter 13: Tilbury Riverside and Thurrock Park ward

This chapter summarises the activities in Tilbury Riverside and Thurrock Park ward relating to the project's construction and its operational phase (when the new road is open). It also explains the proposed measures to reduce the project's impacts on the local communities. For more information about the assessments, see chapter 1.

Within this document, we sometimes advise where additional information can be found in other consultation documents, including the Construction update, Operations update, You said, we did, Register of Environmental Actions and Commitments (REAC), Code of Construction Practice (CoCP), Outline Traffic Management Plan for Construction (OTMPfC) and Design principles. To find out more about these documents, see chapter 1. References to these documents provide an indication as to how our proposals to reduce the project's impacts will be secured within our application for development consent.

13.1 Overview

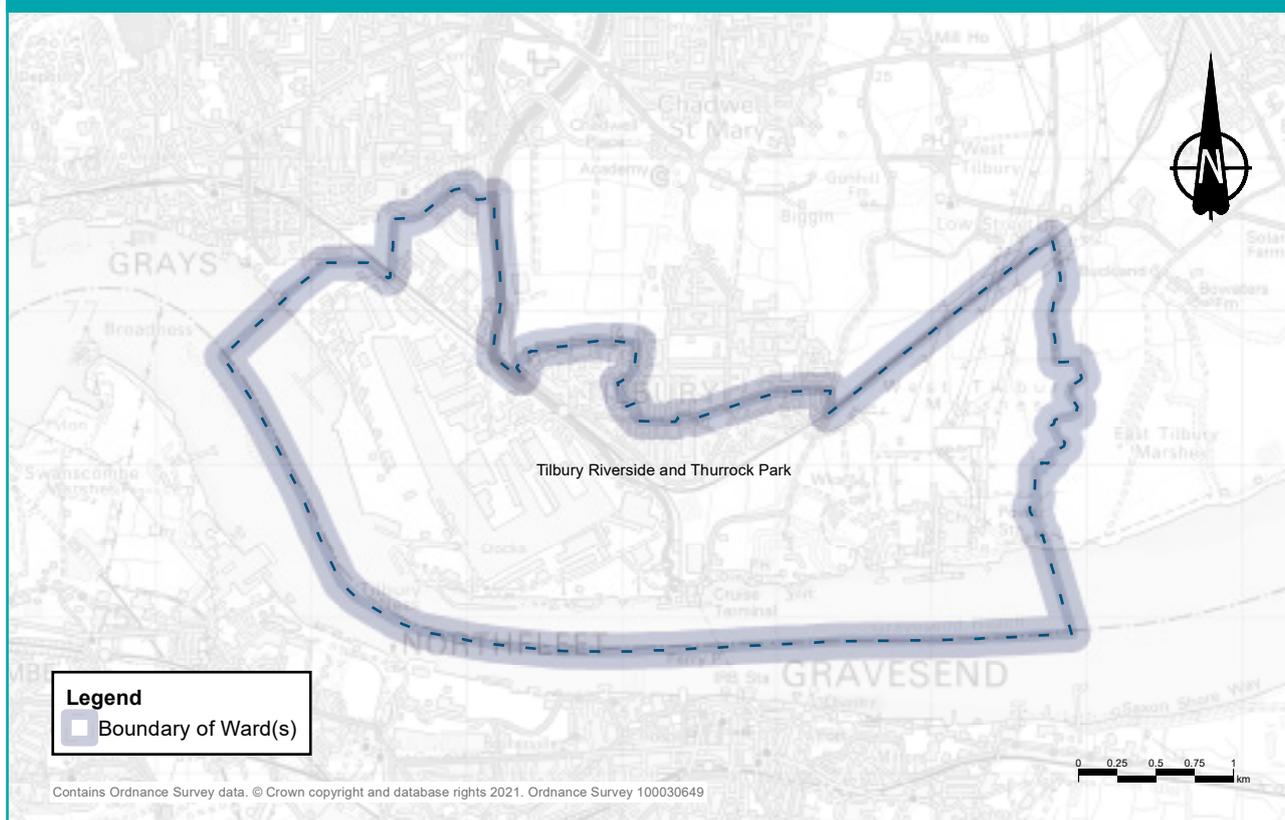
13.1.1 About this ward

Tilbury Riverside and Thurrock Park is located to the west of East Tilbury, south of Tilbury St Chads. The ward is approximately 7km² in area and has an estimated population of 7,809¹.

The London, Tilbury and Southend railway runs east to west in the north of the ward, with Tilbury Town station located off St Andrew's Road (A1089). Tilbury Docks to the south-west accounts for most of the ward, with part of Tilbury and Thurrock Park residential areas falling within the boundary. Tilbury Fort, a former artillery fort, sits to the east of the docks on the northern banks of the Thames. The site is a scheduled monument and Tilbury substation is adjacent to it.

A high-voltage overhead line runs to the east of the ward, following Fort Road south, crossing the road to the east into Tilbury substation. There are Environment Agency designated 'main rivers' in the southern part of the ward which flow to the Thames in the south of the ward. The A1089 (Dock Road) runs north-south along the western side of the ward.

Figure 13.1: Ward boundary map for Tilbury Riverside and Thurrock Park ward



13.1.2 Summary of impacts

Table 13.1: Summary of impacts during the project’s construction and operation

Topic	Construction	Operations
<p>Traffic</p>	<p>Impacts</p> <p>There would be delays to traffic using the A1089 and Asda roundabout due to increased traffic, and along Dock Road while traffic management is in place.</p> <p>Mitigation</p> <p>There are several mitigation measures to reduce construction impacts on local residents such as minimising the use of local roads by construction vehicles. Further information about mitigation measures can be found in the traffic section of this chapter.</p>	<p>Impacts</p> <p>There would be only a very slight change in predicted traffic flows along roads in this ward at any time of day, with the exception of the A1089 north of the Asda roundabout. Further details of the impacts on traffic flows can be found in the traffic section.</p> <p>Mitigation</p> <p>Throughout the design process numerous mitigation measures have been implemented to reduce the operational impact on local residents. Details can be found in the traffic section.</p>
<p>Public transport</p>	<p>Buses</p> <p>Due to increases in journey times along the A1089 and at Asda roundabout, journey times on the 99 bus route may increase.</p> <p>Rail</p> <p>Throughout construction there may be some increases in train journey times to Tilbury Town station, associated with increased traffic through the area and traffic management on the local roads.</p>	<p>Buses</p> <p>There would be no predicted changes to bus routes through the ward required once the project opens and very few discernible changes to bus journey times.</p> <p>Rail</p> <p>There would be no discernible change in local access times to East Tilbury station and it would be quicker to access Ebbsfleet International station.</p>

Topic	Construction	Operations
<p>Footpaths, bridleways and cycle routes</p>	<p>No footpaths, bridleways or cycle routes would be affected during construction in Tilbury Riverside and Thurrock Park ward. For other potential impacts, see the other topic areas in this chapter, such as Visual and Noise and vibration.</p>	<p>No footpaths, bridleways or cycle routes would be affected when the project is operational in Tilbury Riverside and Thurrock Park ward. For other potential impacts, see the other topic areas in this chapter, such as Visual and Noise and vibration.</p>
<p>Visual</p>	<p>Impacts</p> <p>Homes on the eastern edge of Tilbury would have construction activities screened by vegetation along the Tilbury Loop line, with limited views of taller elements within the Northern Tunnel Entrance Compound, which would also be visible from Tilbury Fort. Users of Two Forts Way and National Cycle Network Route 13 would be able to see close-range views of the earthworks joining the northern tunnel entrance.</p> <p>Mitigation</p> <p>Given the limited views of the project from this ward, no specific mitigation measures are considered necessary.</p>	<p>Impacts</p> <p>Homes on the eastern edge of Tilbury would have distant and partial views of Tilbury Viaduct. From Two Forts Way and NCN Route 12, the landform associated with the northern tunnel entrance would be visible. There would be limited views of the Lower Thames Crossing to the south of the Thames Estuary. From Tilbury Fort, there may be glimpses between gaps in existing infrastructure and vegetation.</p> <p>Mitigation</p> <p>The landscaping embedded in the design of the Lower Thames Crossing would help integrate the new road into the surrounding landscape.</p>

Topic	Construction	Operations
<p>Noise and vibration</p>	<p>Impacts</p> <p>The construction of the northern tunnel entrance and utilities work, and associated haul roads, are expected to create noise. There would also be a change in road traffic noise which would be negligible on most roads, apart from A1089 St Andrews Road, Ferry Road and Fort Road where it would be minor or moderate.</p> <p>Mitigation</p> <p>Noise levels would be controlled through mitigation measures presented in the REAC. There are also measures presented in the CoCP.</p>	<p>Impacts</p> <p>This ward would be approximately 400 metres west of where the new road is proposed, and so noise changes would be confined to its eastern edge. The change in noise would be a result of change in traffic flow and speed, vehicle type and physical alterations on the existing road network. The change in noise is predicted to be negligible in some areas with major increases in others.</p> <p>Mitigation</p> <p>Low-noise road surfaces would be installed on all new roads. The road has been kept low in the environment using cuttings and bunds. Noise barriers would be installed in East Tilbury ward, which would help reduce traffic noise in this ward.</p>

Topic	Construction	Operations
<p>Air quality</p>	<p>Impacts</p> <p>There is likely to be dust and emissions from construction equipment and traffic during the construction phase. Analysis of the construction phase traffic flows associated with the project indicate that increases in construction lorries moving to and from the site compounds via the A1089 and Fort Road could lead to a temporary, but minor increase in pollutant concentrations.</p> <p>Mitigation</p> <p>The contractor would follow good practice construction measures presented in the CoCP and REAC to minimise the dust. Construction vehicles would need to comply with emission standards. An air quality management plan would be designed in consultation with the relevant local authorities. The plan would include details of monitoring which would ensure measures are effectively controlling dust and exhaust emissions.</p>	<p>Impacts</p> <p>No worst-case sensitive receptors have been identified through air quality modelling in this ward.</p> <p>Mitigation</p> <p>As our modelling shows there would be minimal increases in pollutants as a result of the operation of the project, no mitigation is proposed.</p>

Topic	Construction	Operations
<p>Health</p>	<p>Impacts</p> <p>The construction phase of the project would present opportunities to access work and training. There are likely to be changes in the area that may result in negative impacts on health, including mental health and wellbeing. These include changes in accessibility of local resources, amenities and open space. Much of the local footpath network to the east of the urban area would be temporarily blocked during construction. There are also likely to be perceivable changes in the levels of road traffic noise on Ferry Road, Fort Road and St Andrew’s Road.</p> <p>Mitigation</p> <p>The potential negative impacts would be mitigated through the good practice construction measures presented in the CoCP and REAC relating to dust emissions, working hours and visual screening, traffic management measures and community engagement.</p>	<p>Impacts</p> <p>Some residents may experience impacts on mental health and wellbeing as a result of the project, such as anxiety around perceived changes to air quality or as a result of changes to noise levels. The project would improve access to work and training, and access to open space and accessibility of local resources and amenities. This specifically includes further education colleges and primary schools, employment opportunities and open space, including new recreational areas outside Tilbury Riverside & Thurrock Park.</p> <p>Mitigation</p> <p>No essential mitigation is required for health other than those measures described in the noise mitigation section.</p>

Topic	Construction	Operations
<p>Biodiversity</p>	<p>Impacts</p> <p>The construction of the project would require the removal of areas of habitat, both temporarily and permanently for the new road. These habitats support a number of protected and notable species, including badgers, water voles, reptiles, breeding birds and invertebrates.</p> <p>Mitigation</p> <p>Vegetation clearance would be undertaken in winter to avoid impacting breeding birds. Protected species would be relocated, carried out under a Natural England licence. Boxes to support bats and birds would be erected. Areas of woodland planting are proposed to offset woodland loss.</p>	<p>Impacts</p> <p>There is the potential to cause mortality of species by encountering road traffic as well as habitat fragmentation and disturbance from traffic.</p> <p>Mitigation</p> <p>Landscape planting is designed to provide strong links for animal movement and foraging. Impacts would also be managed through the range of good practice measures set out in the CoCP and REAC. Newly created habitats would be managed to retain structure and function for the species present.</p>
<p>Built heritage</p>	<p>Impacts</p> <p>Built heritage assets would not be directly affected, however there would be a change to the surroundings of Tilbury Fort (scheduled monument) due to the audible and visual impact of the construction activity.</p> <p>Mitigation</p> <p>The design and layout of the Northern Tunnel Entrance and Station Road Compounds would take into account the surroundings of heritage assets and seek to avoid/minimise light glare, light spill and light pollution during night-time construction. Dust and noise reduction measures would also be implemented in accordance with the REAC.</p>	<p>Impacts</p> <p>The surroundings of Tilbury Fort (scheduled monument) would not be impacted once the Lower Thames Crossing becomes operational.</p> <p>Mitigation</p> <p>To preserve the rural and historic character of the landscape, road lighting would be minimised where it is safe and practical to do so but remain in accordance with relevant standards. The Northern Tunnel Entrance and Station Road Compounds would be reinstated after construction.</p>

Topic	Construction	Operations
<p>Contamination</p>	<p>Impacts</p> <p>The potential sources of contamination are unlikely to be significantly affected during the construction work. There is the risk of accidental spillages of oils, cement and fuels from the movement of construction traffic and the storage of materials.</p> <p>Mitigation</p> <p>To reduce risk, the contractor would follow good practice construction measures as detailed in the REAC. Where contamination is identified during ground investigation work, site-specific remediation would be completed in consultation with the local authority.</p>	<p>Impacts</p> <p>No impacts identified. Any incidents would be dealt with by means of standard operating procedures to avoid contamination.</p> <p>Mitigation</p> <p>If during operation any incident were to occur which resulted in localised contamination, soils which had become significantly affected would be assessed and, if necessary, removed to reduce the risk of contamination migrating across a wider area or entering controlled waters.</p>

13.2 Project description

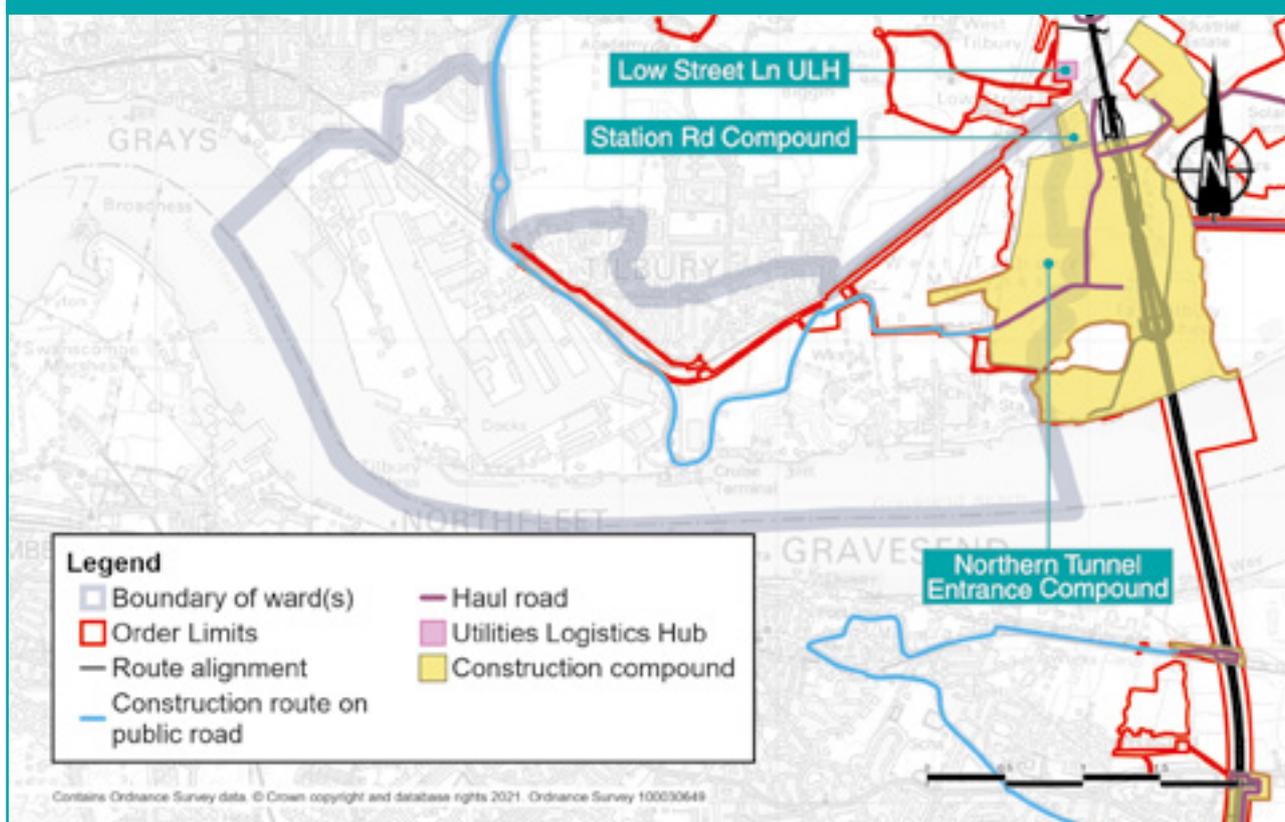
13.2.1 Construction

Construction activities

More information about how the area would look during construction, including visualisations, can be found in the Construction update.

The main construction activities in this ward would involve HGV movements to build the compounds and the tunnels, as well as works to build Tilbury Viaduct. There would also be utilities connections for the tunnel works.

Figure 13.2: Main construction areas in Tilbury Riverside and Thurrock Park



The eastern boundary of Tilbury Riverside and Thurrock Park ward is on the western edge of the Northern Tunnel Entrance Compound, which we would use to build the two tunnels under the River Thames. Activities within this compound would be continuous and require substantial temporary infrastructure, such as haul roads to allow for the movement of heavy equipment and other materials around the worksite without using public roads. We would also install a water supply for the tunnel boring machines (TBMs) along Dock Road and a temporary substation to power them. For more information about the tunnel construction, see chapter 6 of the Construction update.

This ward also encompasses the start of the proposed works to put the existing overhead power line underground, which would result in one pylon and 0.25km of power line being removed.

Construction compound

Construction compounds are fenced-off areas, accessible to construction traffic, which provide the facilities for our project to be built efficiently. For example, compounds would provide parking, storage for machinery and materials, offices, welfare facilities, refuelling, and vehicle and wheel-washing facilities to make sure vehicles leaving the compound do not dirty local roads.

To support the tunnel works, the Northern Tunnel Entrance Compound would be established at Tilbury Marshes, west of East Tilbury and Coalhouse Fort, in an area currently being used to extract pulverised fuel ash from the former Tilbury power station. This compound would be the main tunnelling worksite, located as far as practicable away from residential areas. The compound would require access from the local road network for HGV and workforce traffic. The compound would also require substantial utility connections to allow it to operate.

The compound would require the construction of buildings to support the tunnelling activities, such as offices, accommodation for up to 480 workers and a factory to manufacture the concrete tunnel-lining segments. There would be other specialist tunnelling activities in this ward too, including the establishment of facilities for treating excavated tunnel materials. For more information on the Northern Tunnel Entrance Compound, see chapter 4 of the Construction update.

The Station Road Compound would be located close the Northern Tunnel Entrance Compound, but is in East Tilbury ward. The access arrangements to the two compounds would be the same, via Fort Road/Substation Road with most HGVs using the A1089.

The number of vehicles that would go to the Northern Tunnel Entrance and Station Road Compounds is given in table 13.2. These are the number of vehicles going to each compound and there would be the same number of vehicles, on an average weekday, leaving each compound.

Table 13.2: Average daily vehicle numbers going to compounds near Tilbury Riverside and Thurrock Park ward

Time period	Northern Tunnel Entrance Compound		Station Road Compound	
	HGV	Cars	HGV	Cars
January to August 2024	90	377	2	27
September 2024 to February 2025	105	580	13	38
March to May 2025	133	593	20	35
June to October 2025	133	466	20	35
November 2025 to March 2026	133	506	18	35
April to August 2026	132	611	21	35
September 2026 to March 2027	132	670	16	24
April to November 2027	131	720	4	18
December 2027 to March 2028	131	684	0	0
April to July 2028	122	619	0	0
August 2028 to December 2029	39	73	0	0

Utilities

A 6.2km water pipeline is proposed, connecting to utilities beneath the local road network at the western end of Dock Road. The works would be carried out early in the programme, and last for six to nine months. Open cut methods would mainly be used, with trenchless techniques needed for installation under Fort Road and the railway line. Traffic management would be necessary, including single-lane closures and traffic signals in 300-metres sections.

In addition, the permanent power supply for the northern tunnel entrance building would be installed from a substation at Fort Road, along the southern edge of the railway line heading east.

Near to our proposed new road, Thurrock Power Ltd is proposing to construct the Thurrock Flexible Generation Plant (TFGP), which is currently going through its Development Consent Order (DCO) Examination. We are working closely with Thurrock Power Ltd and have identified areas where construction of both projects would overlap, including the diversion of a high-pressure gas pipeline. The gas pipeline runs through areas where our construction compounds and work areas would be and crosses under our project's main road.

We are working on an alternative route for this gas pipeline beneath the Tilbury Viaduct and adjacent to Low Street Pit (see Map Book 1: General Arrangements) so that if both projects are consented, they can be developed together. The proposed diversion of this gas pipeline will be included within our DCO application. Chapter 2 of the Construction update provides an overview of how existing utilities would be affected by our plans to build the new road, with further detail including maps in chapters 4 and 5. Chapter 2 of the Operations update also describes the project's impacts on utilities, including a map showing the utilities that would be repositioned to accommodate the new road.

Construction routes on public roads

The main access to the Northern Tunnel Entrance Compound for most traffic, including HGVs, would be eastbound along the A1089, Fort Road and then the Port of Tilbury's Substation Road. Three further proposed access points would be located off Station Road. These would mainly be used by contractors and smaller delivery vehicles. Occasionally, larger vehicles such as cranes would have to use this route. They would link to internal east-west and north-south haul roads within the compound area.

At the beginning of the construction period, it may be necessary to allow some HGVs to access the compound via Station Road. This would be a temporary measure while we installed an access road, after which HGVs would use Substation Road.

To reduce the number of HGV journeys on public roads, equipment and materials are expected to be brought into the construction area via the Port of Tilbury and Tilbury2. Some would come via the strategic road network, through Tilbury2 and the temporary haul road. Smaller deliveries, personnel shuttlebuses from local train stations and Gravesend Ferry, together with cycles and cars, would access the construction area from north-east of the site via Station Road. We are currently in discussions with the operator of the Port of Tilbury about using their new Tilbury2 infrastructure corridor as a primary access for the tunnelling compounds.

Traffic management

The main traffic management measures in Tilbury Riverside and Thurrock Park ward are listed below.

All traffic management measures are based on an indicative construction programme, which would be finalised by the appointed contractor. The contractor’s final traffic management plans would be subject to final approval by the Secretary of State for Transport, following consultation with the local highways authority.

Table 13.3: Main traffic management measures in Tilbury Riverside and Thurrock Park ward

Road(s) affected	Proposed traffic management	Purpose	Duration
Dock Road and Hume Avenue	Lane closures and traffic lights for 1.4km of the affected road (in 300-metre sections)	To install the new water main needed to serve the Northern Tunnel Entrance Compound	9 months between March 2024 and November 2024

We have sought to minimise traffic management measures wherever practical, but these would be necessary in some locations to allow construction traffic and local communities to move around safely while providing construction workers with sufficient space to operate. An overview of the traffic management required across the project can be found in the Outline Traffic Management Plan for Construction.

Construction schedule

Construction of the entire project is scheduled to last for around six years from 2024 to 2029. To deliver our construction programme efficiently, we would divide activities into coordinated packages of work. Maps and programmes for the packages north of the river can be found in chapters 4, 5 and 6 of the Construction update.

Construction working hours

Tunnel construction activities would take place 24/7 to maintain safety and efficiency. Wherever practicable, noisy tunnel works would not be carried out at night. Most other construction activities would take place during the core construction hours, which are from 7am to 7pm on weekdays and from 7am to 4pm on Saturdays, with additional repair and maintenance periods (if required) from 8am to 5pm on Sundays.

There may be extended working hours for earthworks when days are longer (spring to autumn) and during periods of fine weather. Typically, noisier works such as piling would not take place outside core hours. Extended working hours would also be needed to cross the railway line, including works to put utilities under the railway and weekend and night activities for works on the overhead power lines. More information about working hours is set out in the Noise and vibration section below and in the CoCP.

13.2.2 Operations

The completed project

This section sets out the elements of the project that would feature permanently in Tilbury Riverside and Thurrock Park ward once construction is complete and the new road is open (see figure 13.3). For more information about the completed project, see the Operations update, as well as the figures in Map Book 1: General Arrangements.

- The areas of land running parallel to the connecting road and the Tilbury Loop railway line would be returned to agricultural use once the route is operational.
- Some footpaths and bridleways would be rerouted permanently as part of our proposals for 46km of upgraded or entirely new walking paths, cycle paths and bridleways that would benefit communities along the route. For more information, see the Footpaths, bridleways and cycle routes section.

Changes to the project since our design refinement consultation

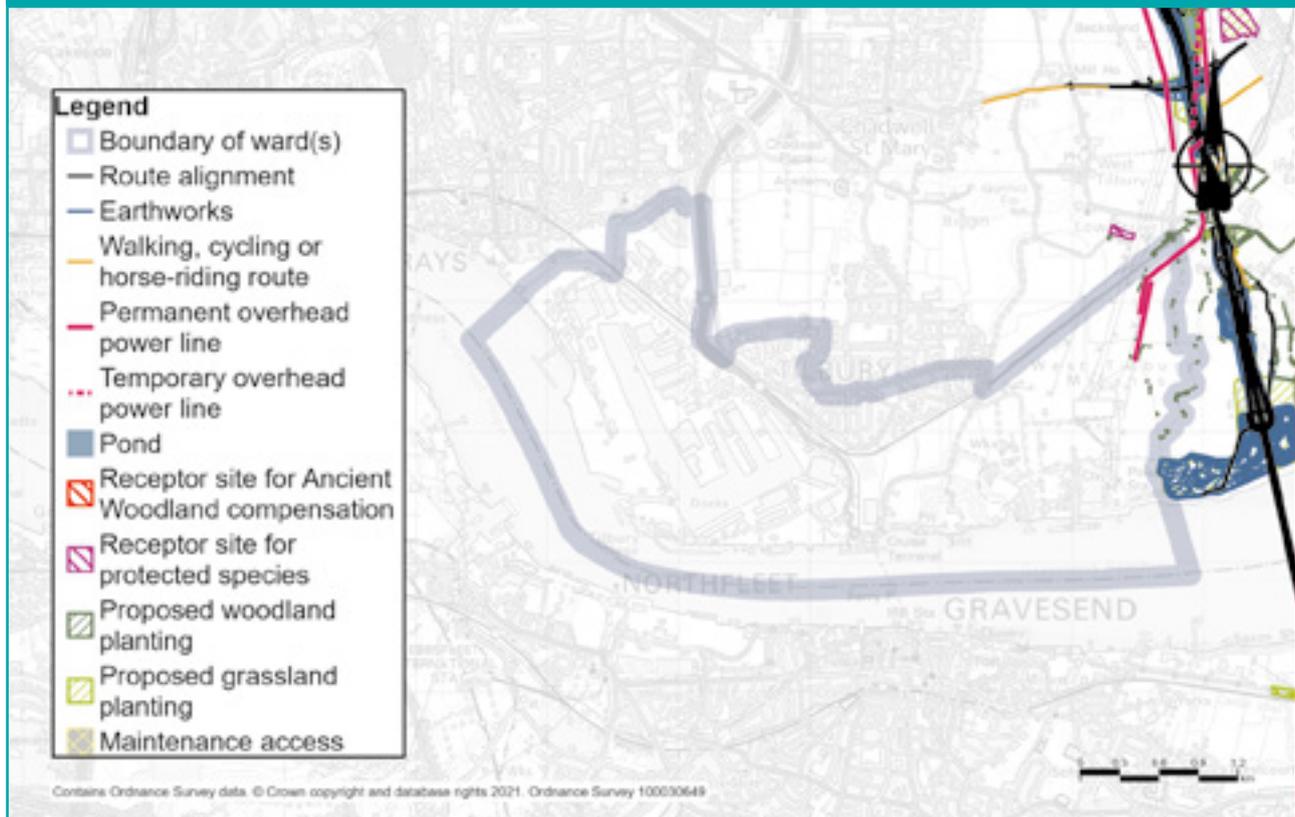
As part of our ongoing design development, including discussions with utility companies, we have made several proposed changes to the project and its Order Limits (the area of land required to construct and operate the project, formerly known as the development boundary), since our design refinement consultation in July 2020. Within this ward the proposed changes would be as follows:

- Following feedback from Natural England and Thurrock Council, Order Limits west of the P&O Tilbury2 roll-on roll-off terminal are proposed to be amended to avoid an area of ecological interest.

- As a result of the Port of Tilbury entering detailed design and review of the project proposals, several issues have been identified with the access road to the Northern Tunnel Entrance Compound from Substation Road. In response to this feedback, we propose to extend the Order Limits to the south to allow for the access road to be moved further south to avoid or reduce these conflicts. It is also proposed that the Order Limits would be extended to the south east of Walton Common and Parsonage Common to allow for an access road to be moved further south to avoid or reduce the potential for conflicts with existing utilities.

It is also proposed that the Order Limits would be extended to the south-east of Walton Common and Parsonage Common to allow for an access road to be moved further south to avoid or reduce the potential for conflicts with existing utilities.

Figure 13.3: Main features of the completed project in Tilbury Riverside and Thurrock Park



Impacts on open space and common land

Within Tilbury Riverside and Thurrock Park ward we propose to acquire permanent rights over an area of land at Walton Common and Parsonage common for utility works required for the northern tunnel entrance. The land would also be used for temporary access and construction purposes. This area is designated as common land and provides scrub and grassland habitat which is valuable for wildlife. During construction we would need to take possession of the land for up to six months for installation of a power supply and to reinstate the land. The power supply would later become the permanent supply to the tunnels operations. The proposed works would be underground in this location and the rights are required in connection with the maintenance, access and protection of these plots. These rights would not affect the current use of the land.

Within Tilbury Riverside and Thurrock Park ward there are no proposed changes to open space or common land as previously consulted. More information about our proposals for compensating for impacts on open space land and common land can be found in chapter 3 of our Operations update.

13.3 Traffic

We carried out traffic assessments to understand how construction and operation would affect nearby roads, compared with the situation if the project was not built. For more information, see chapter 4 of the Operations update.

13.3.1 Construction

Construction impacts

There would be additional cars and HGVs on the A1089 which may lead to an increase in journey times through the Asda roundabout. There would also be delays to local traffic using Dock Road while the new water main is installed.

Measures to reduce construction traffic impacts

Our approach to construction has been refined after further investigations and feedback. A summary of the proposed measures to reduce the volume of construction materials transported in and out by road can be found in the Construction update.

To reduce the construction traffic impacts in Tilbury Riverside and Thurrock Park, we would carry out the following measures:

- Minimise use of the local road network as far as practicable through construction of temporary offline haul roads, mainly from the strategic road network.
- Our proposals allow for re-use of excavated materials, and would substantially reduce the need to dispose of excavated material via the road network, thereby reducing the number of HGV movements from the public road network during the construction phase.
- Build new bridge structures offline (away from the existing roads) where possible to avoid closing local roads for extended periods. Where offline construction is not possible and space is available, the existing road would be temporarily realigned for the construction of new bridges.
- Ban HGVs associated with the project's construction from using local roads where possible, following discussion with key stakeholders.
- Stockpile material within the Order Limits to allow material to be managed onsite rather than offsite, reducing the number of HGVs journeys needed.

13.3.2 Operations

Operational impacts

Traffic modelling has been carried out to predict the change in traffic flows on roads in the area, including those within or on the boundary with Tilbury Riverside and Thurrock Park ward for the first year of operation, 2029.

Figures 13.4, 13.6 and 13.8 show the predicted changes in traffic in the morning peak (7am to 8am), interpeak (an average hour between 9am and 3pm) and evening peak (5pm to 6pm) measured in Passenger Car Units (PCUs per hour), where 1 PCU is equivalent to a car, and 2.5 PCUs is equivalent to an HGV. Figures 13.5, 13.7 and 13.9 show the predicted percentage changes in traffic flow during the morning, interpeak and evening peak. For information about how we assessed operational traffic impacts, see chapter 1. For more information about how we carried out our traffic modelling, see chapter 4 of the Operations update.

There would generally be only a very slight change in predicted traffic flows along roads in this ward. On the A1089 north of the Asda roundabout there would be an increase of between 50 and 250 PCUs an hour in the morning and evening peak hours, which is less than a 10% change in flows. Southbound the change is less than 50 PCUs an hour for all three modelled time periods.

On Dock Road by Tilbury Town railway station there would be an increase in flows of between 50 and 250 PCUs (over 40%) northbound in the morning peak hour only. In all other time periods, and southbound, the change in flows would be less than 50 PCUs an hour. On St Andrew's Road, also near Tilbury Town railway station there would be an increase northbound in the morning and evening peak hours of between 50 and 250 PCUs an hour (between a 10% and 20% increase in the morning peak hour and between a 20% and 40% increase in the evening peak hour). There would be no noticeable change in traffic flows predicted southbound.

The change in flows on Fort Road, south of the junction with Brennan Road, would be less than 50 PCUs an hour in all modelled time periods northbound. Southbound there would be an increase in flows of between 50 and 250 PCUs an hour in the morning and evening peak hours, which would be an increase of over 40%.

Figure 13.4: Predicted change in traffic flows (PCUs) with the project during the morning peak in 2029

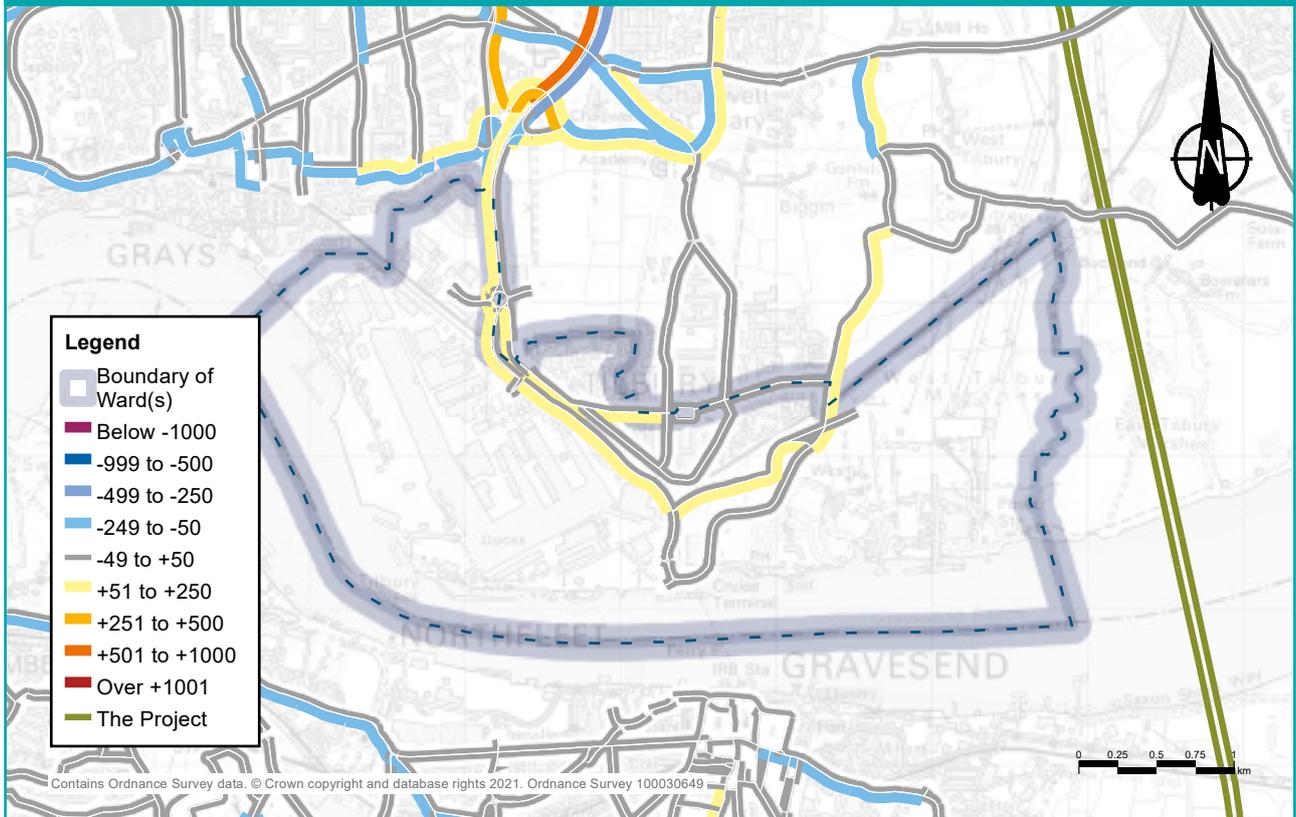


Figure 13.5: Predicted percentage changes to traffic flows during the morning peak in 2029

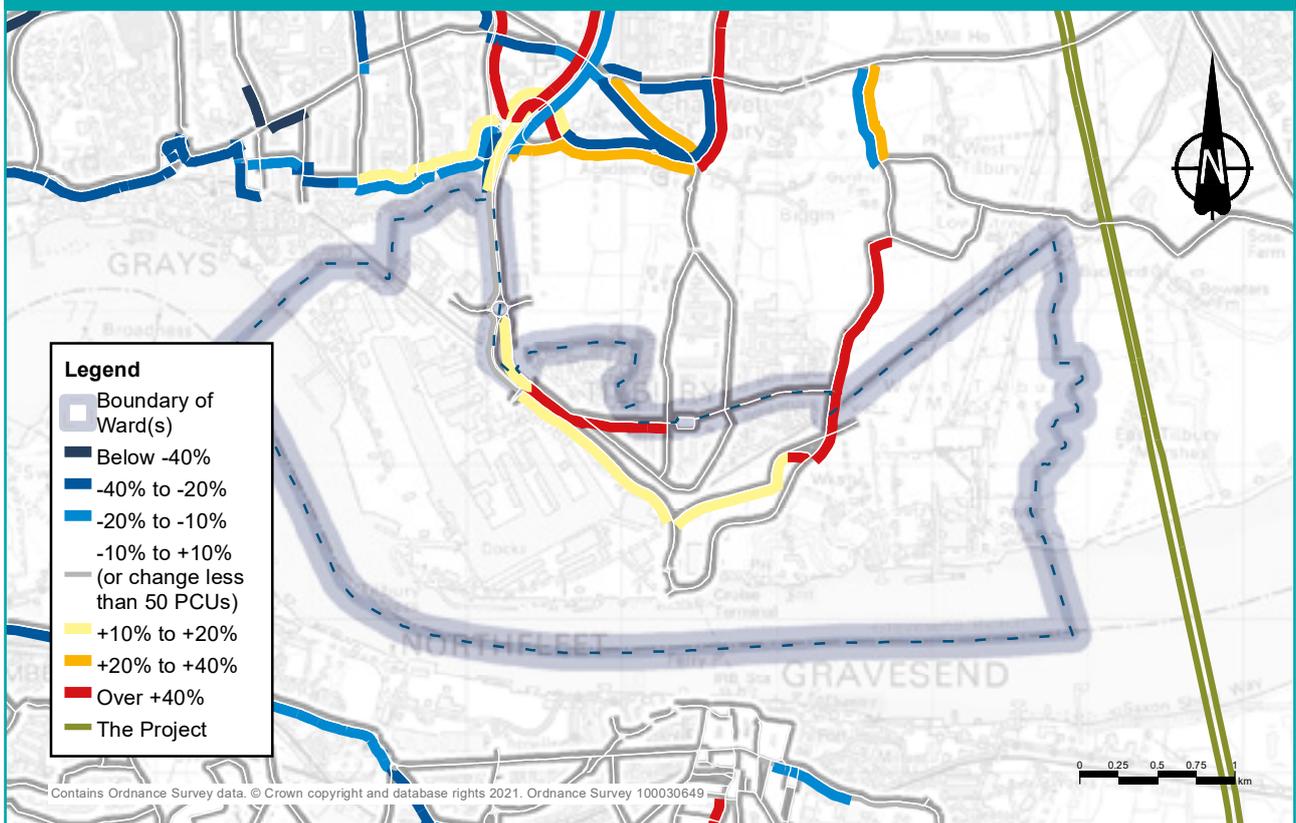


Figure 13.6: Predicted change in traffic flows with the project during the interpeak in 2029

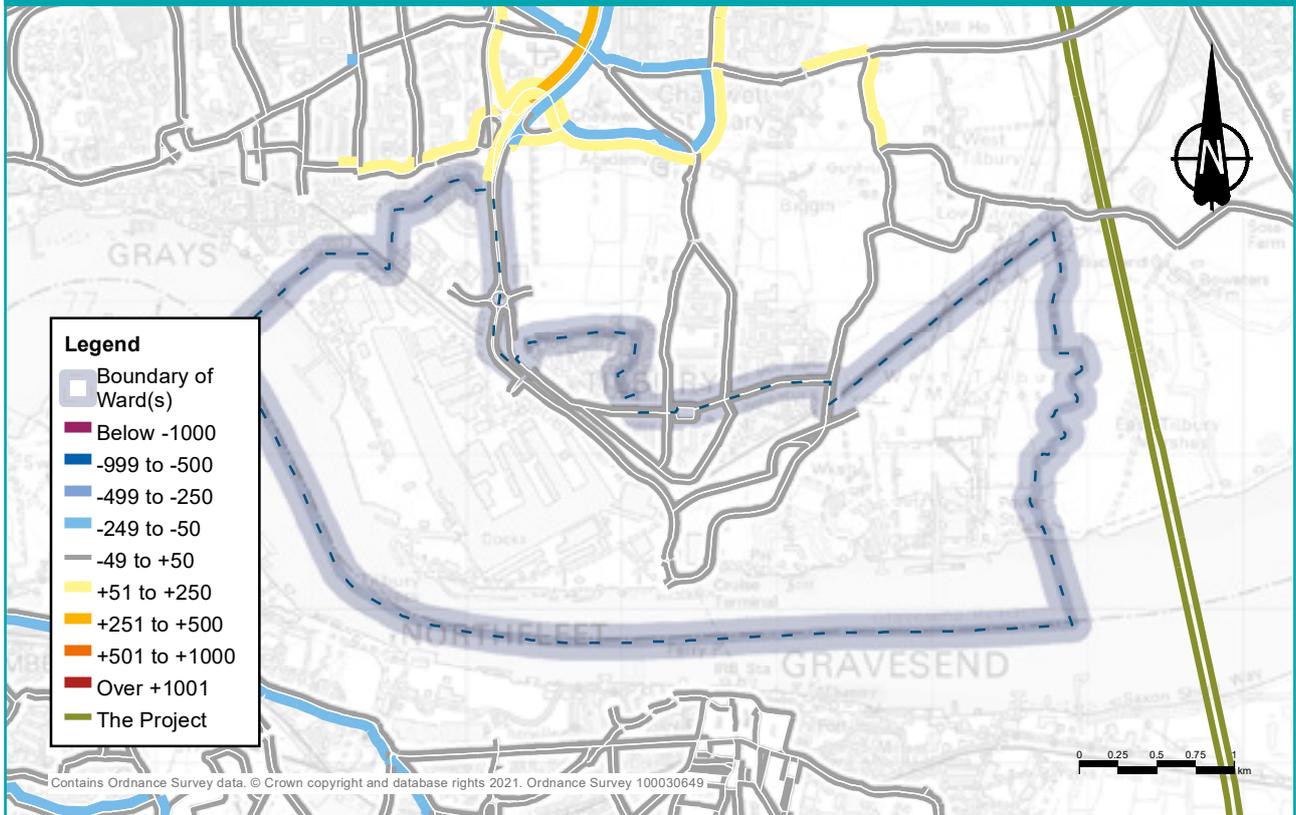


Figure 13.7: Predicted percentage changes to traffic flows during the interpeak in 2029

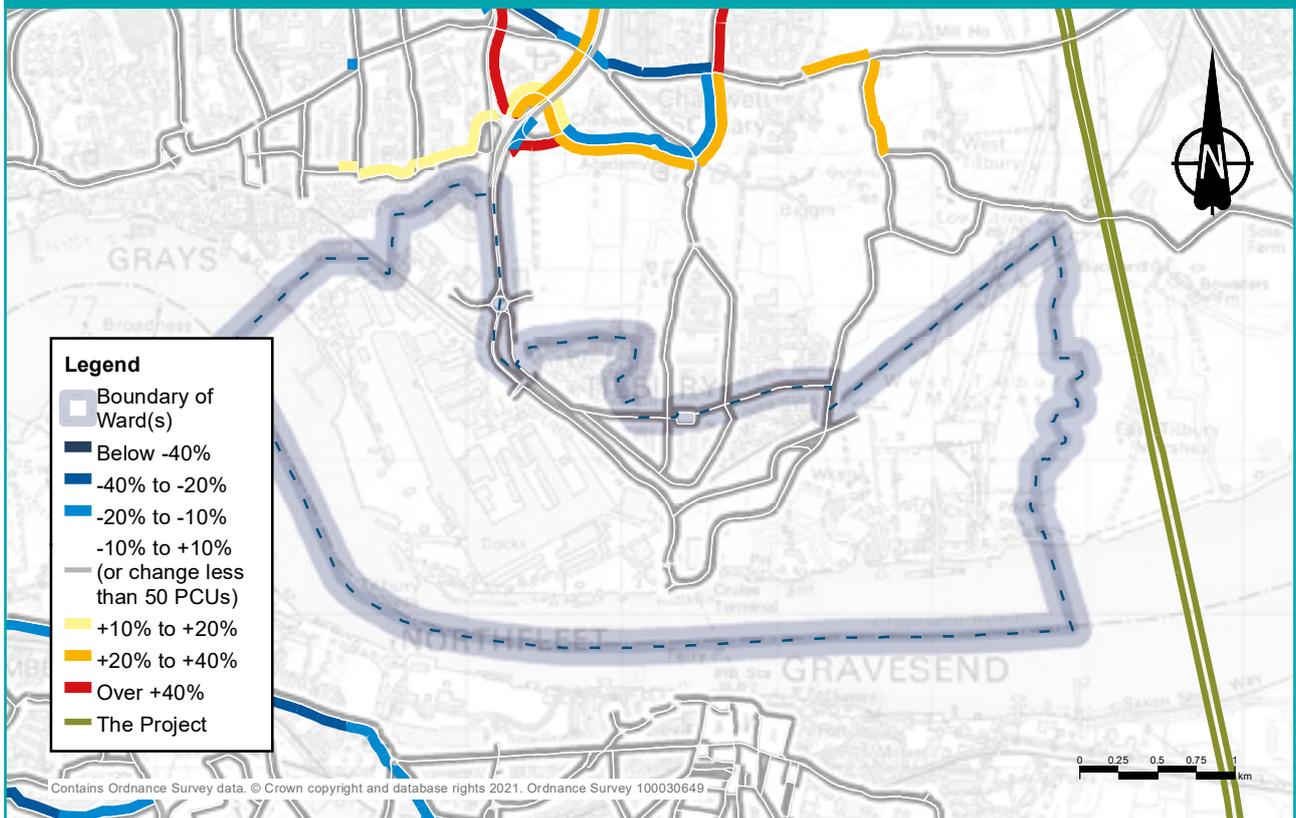


Figure 13.8: Predicted change in traffic flows with the project during the evening peak in 2029

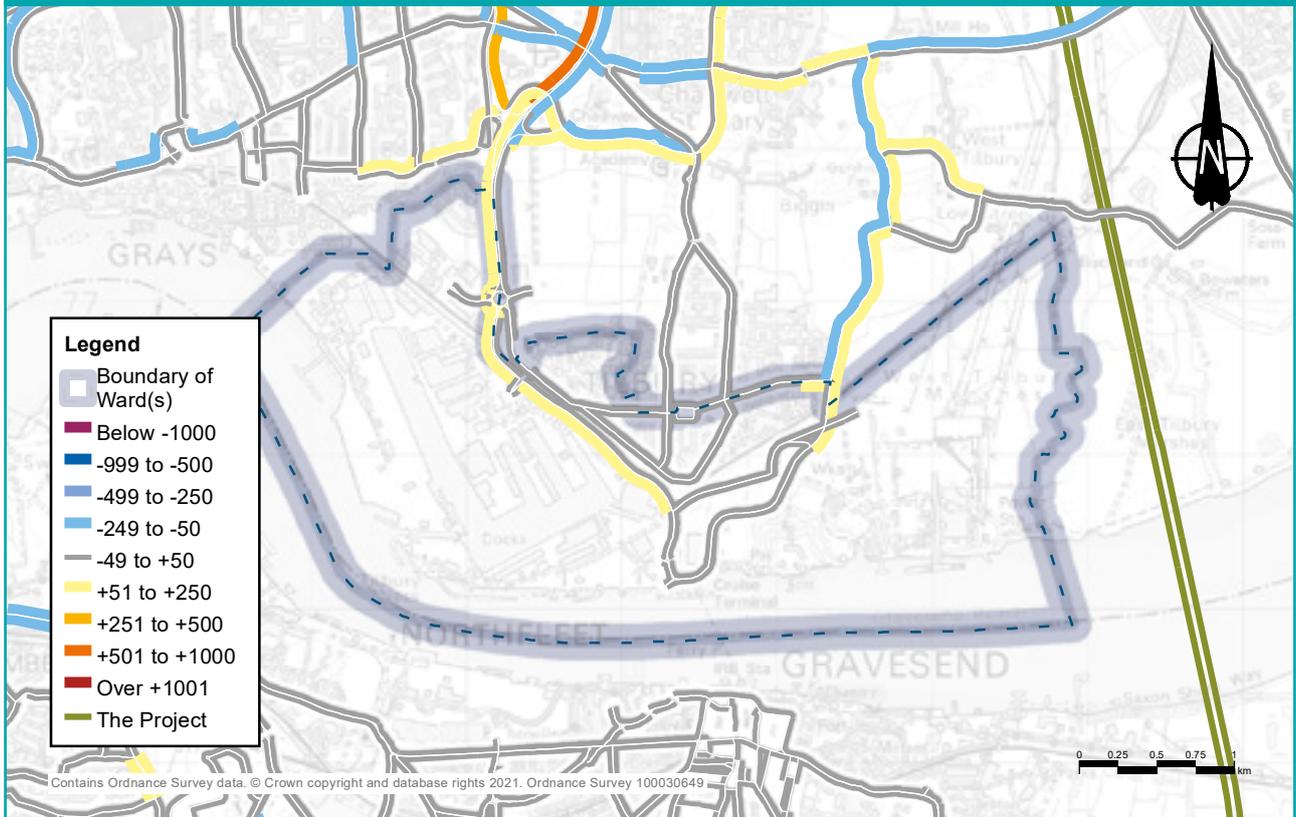
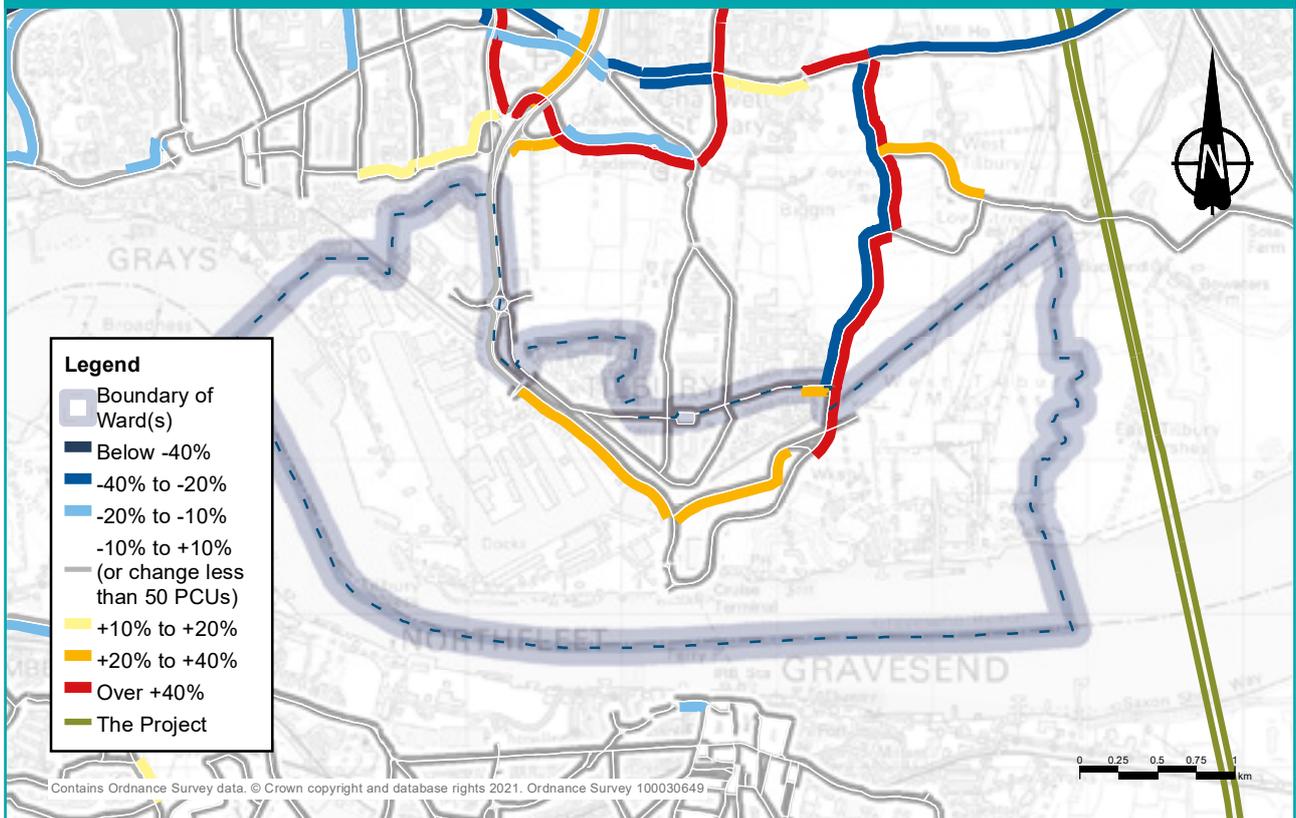


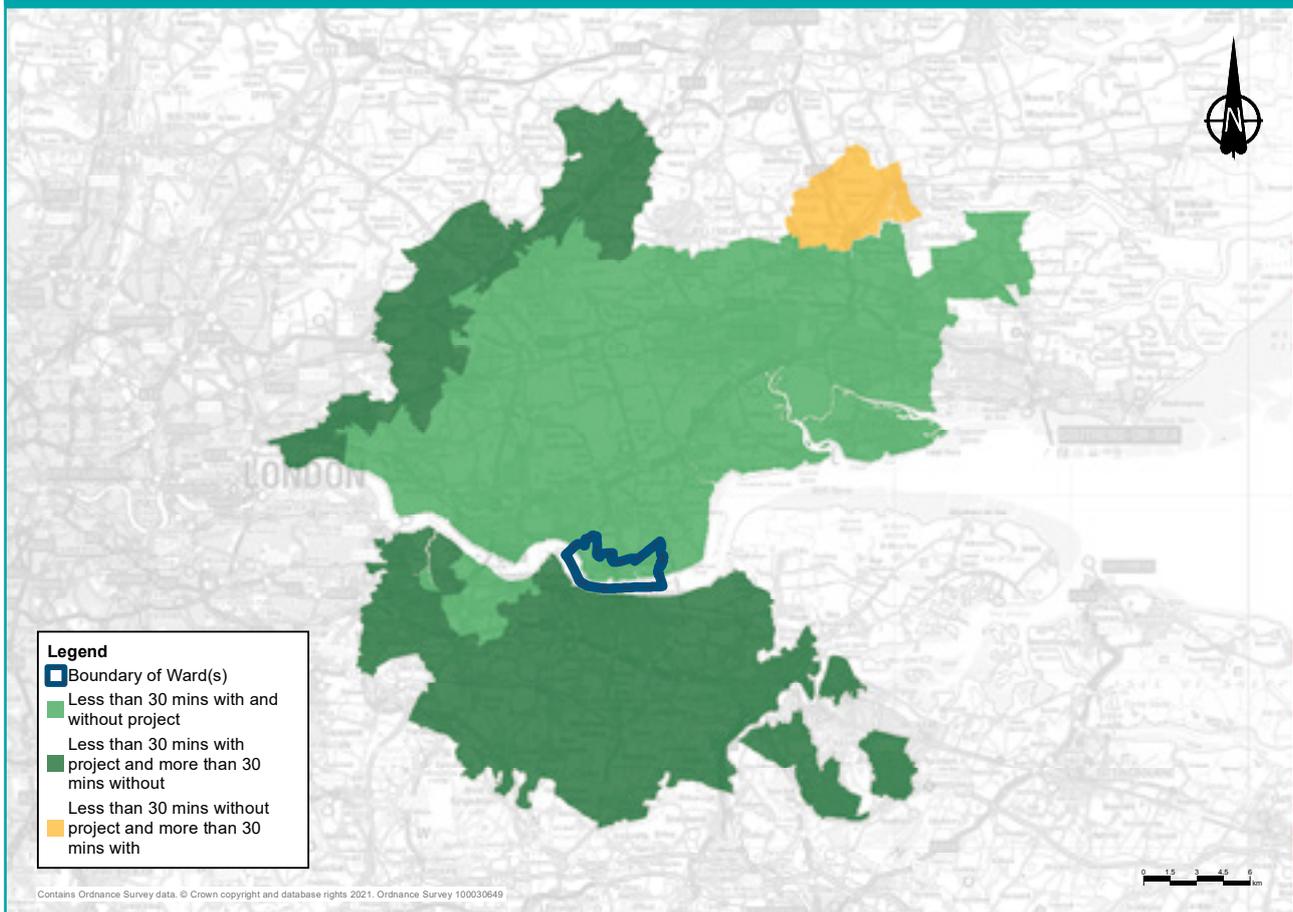
Figure 13.9: Predicted percentage changes to traffic flows during the evening peak in 2029



Changes to journey times

Figure 13.10 shows the change in the area that could be reached within a 30-minute drive from the centre of the ward both with and without the project. Figure 13.11 shows the change in area that can be reached within a 60-minute drive. The areas have been calculated for the morning peak hour (7-8am). The number of jobs within a 30-minute drive with the project in place would increase by 80%, an additional 241,600 jobs. Within a 60-minute drive, the number would increase by 25%, an additional 570,500 jobs.

Figure 13.10: Change in area that motorists could drive to within 30 minutes from Tilbury Riverside and Thurrock Park ward



Measures to reduce impacts on traffic flow

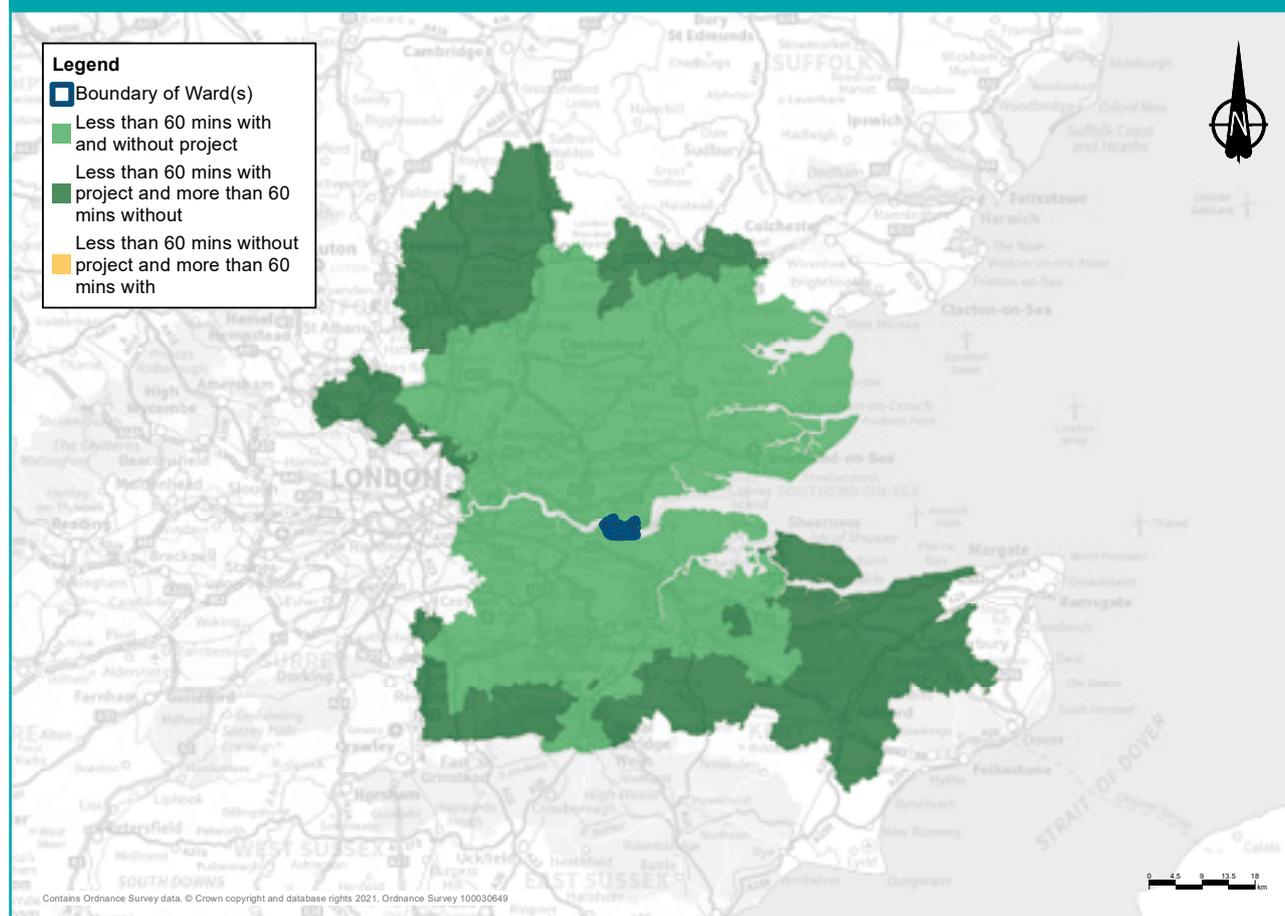
The project has been designed to optimise its impacts on traffic, including the design of free-flowing connections with the A13 and A1089. In addition, the main route would have no traffic lights or roundabouts to ensure continuous traffic flow, although traffic lights or roundabouts would be necessary at some minor junctions away from the main route where traffic meets local roads. All new junctions would be designed to the latest safety standards, with high consideration for efficiency.

An iterative design process, including successive stages of traffic modelling and extensive consultation and engagement, has ensured that only the optimal links to the existing road network would be provided.

Once the project is operational, traffic impacts on the affected road network would be monitored, including local roads.

Where appropriate, we would work with the relevant highway authority to seek funding from the Department for Transport for further interventions.

Figure 13.11: Change in area that motorists could drive to within 60 minutes from Tilbury Riverside and Thurrock Park ward



13.4 Public transport

Existing situation

Tilbury Riverside and Thurrock Park ward contains Tilbury Town station with services operated by c2c that run between London and destinations in Thurrock and Essex.

There are a number of bus services through the ward, including the 7A, 7B, 7C, 51, 66, 66A, 73, 73a, 77, 77a, 99, Z1 and Z4.

13.4.1 Construction

Rail

There would be a series of night time rail possessions of the Tilbury Loop railway line in the adjacent East Tilbury ward over a period of two months while the Tilbury Viaduct is constructed. These possessions would be agreed with the network operator. It is intended that the works would take place outside train operational times, and so services would not be disrupted.

Throughout construction there may be some increases in journey times to Tilbury Town station, associated with increased traffic through the area and traffic management on the local roads.

Buses

Traffic management measures may lead to increases in journey times for the 7A, 7B, 7C, 51, 66, 66A, 77, 77A, 99, 475, Z1 and the Z4 bus routes.

13.4.2 Operations

Rail

There would be no discernible change in local access times to Tilbury Town station and no change to the rail services at the station. It would, however, be quicker to access Ebbsfleet International Station, with the journey time to that station decreasing by over eight minutes in the morning and evening peaks.

Buses

There would be no predicted changes to bus routes through the ward required once the road opens and very few discernible changes to bus journey times.

The 51 bus from Prittlewell to Grays and Chafford Hundred would have a predicted increased journey time of nearly seven minutes in the westbound direction along the entire route in the morning peak hour. There would be only a slight predicted change in other time periods and directions.

The 73 bus runs from Tilbury through Grays to Lakeside Shopping Centre. The predicted journey times westbound in the morning peak hour would decrease by around two minutes.

The Z4 service from the Amazon distribution centre to Basildon and Pitsea would take approximately two minutes longer in the northbound direction in the evening peak hour.

13.5 Footpaths, bridleways and cycle routes

No footpaths, bridleways or cycle routes would be affected during construction or operation in Tilbury Riverside and Thurrock Park ward.

13.6 Visual

Existing situation

Views towards the land on which the project would be built from Tilbury are largely obscured by buildings and the Fort Road bridge embankment crossing the Tilbury Loop railway line. There would be views from a small number of homes on Sandhurst Road on the eastern edge of Tilbury, Two Forts Way coastal path and National Cycle Network (NCN) Route 13. Views towards the land on which the project would be built from Tilbury Fort are largely screened by buildings and vegetation.

Current views towards the land on which the project would be built from the eastern edge of Tilbury are of flat farmland, set against a backdrop of vegetation on the Tilbury Loop railway line embankment and many overhead lines. From Two Forts Way, there are open views along the riverside and over flat ground towards Thames Industrial Park to the north-east. There are also distant views across the Thames towards Gravesend and adjoining farmland, seen against the wooded backdrop of Shorne Woods Country Park to the south. Views from the eastern bastion of Tilbury Fort look over the perimeter moat, towards Tilbury Sewage Treatment Plant and overhead lines beyond, partially softened by woodland.

13.6.1 Construction

Construction impacts

More information about how the area would look during construction, including visualisations, can be found in the Construction update.

The main construction activities likely to be seen from this ward are:

- sculptural earthworks adjacent to the northern tunnel entrance
- establishment and operation of the Northern Tunnel Entrance Compound
- diversion of overhead lines
- construction of Tilbury Viaduct

Properties on the eastern edge of Tilbury are likely to be partially screened from construction activities by vegetation along Tilbury Loop railway line, with views limited to taller elements further away within the Northern Tunnel Entrance Compound. Overhead line diversion works and the construction of Tilbury Viaduct may be visible from these properties. Users of Two Forts Way and NCN Route 13 would have close range views of the large-scale sculptural earthworks adjoining the northern tunnel entrance. The wide panoramic view from this recreational route would also include some distant views towards construction activity south of the Thames. Although perceptible, views of the south tunnel entrance would not be prominent given the distance. From Tilbury Fort the taller structures within the Northern Tunnel Entrance Compound and the sculptural earthworks adjoining the northern tunnel entrance are likely to be partially visible.

Measures to reduce visual impacts of construction

Given the limited views of the project from this ward, no specific mitigation measures are considered necessary.

The visual impacts of the project would be controlled through the range of good practice measures set out in the project's CoCP and the REAC. See chapter 1 of the Construction update for more information about this and the project's other control documents.

13.6.2 Operations

Operational impacts

By the time the new road opens, the new landscaping would be complete, together with Tilbury Viaduct. Most of the Northern Tunnel Entrance Compound would be reinstated to support the required end use or returned to agricultural use. More information about the completed project can be found in the Project description section above.

Once the project is complete, residents on the eastern edge of Tilbury are likely to see distant partial views of Tilbury Viaduct. From Two Forts Way and NCN Route 13, there would be close range views of the new sculptural landform in front of the northern tunnel entrance, landscaped as pasture for grazing. Views of the Lower Thames Crossing to the south of the Thames Estuary would be barely perceptible. There could be some glimpsed views from Tilbury Fort of Tilbury Viaduct and the sculptural earthworks, between gaps in existing built infrastructure and vegetation.

Measures to reduce visual impacts of the operational project

In this ward, we would use landscaping along the new road corridor to reduce visibility of the new road and traffic using it within the surrounding landscape. A landscaped raised area south of the northern tunnel entrance, Tilbury Fields, would create a landmark feature on the northern margin of the Thames Estuary.

13.7 Noise and vibration

We have carried out noise and vibration assessments for both the construction and operational phases of the project. As explained in chapter 1, some of the assessments set out below are based on earlier versions of the project. The information provided still presents a reasonable representation of the likely effects from the proposals presented during this consultation.

Existing situation

The existing noise environment in Tilbury Riverside and Thurrock Park ward is mainly created by traffic and some railway noise. The main sources of traffic noise are from the A126 and the A1089.

In addition, the Tilbury Docks are located in the west of this ward, along with the main access route of the A1089.

As part of our environmental assessment process, we carried out surveys of existing background noise at three locations in the ward, which were agreed with the local authority. The levels monitored at these locations recorded average existing noise levels in the range of 41 to 50 dB(A)² during the day.

To understand how noise levels would vary with and without the new road, we use noise modelling to predict what noise levels would be like in the project's proposed opening year if the new road was not built. We model this because we cannot assume that noise levels in future will be the same as they are now. For example, our assessment of the opening year noise levels accounts for predicted changes in traffic levels.

We also modelled the predicted noise levels for the opening year with the project in place. This provides a useful comparison as to how the project would change the noise levels in the project's opening year if it were implemented.

2 Decibel (dB) is the unit used to measure noise levels, with dB(A) being a standardised way of averaging noise levels that accounts for how humans hear sounds. The typical level of sounds in the environment ranges from 30 dB(A), which is a quiet night-time level in a bedroom, to 90 dB(A), which is how it would sound by a busy road. See chapter 1 for more information about what decibel levels mean.

In the opening year (2029), without the project, noise levels are predicted to range from 41 to 72 dB(A) during the day and from 30 to 58 dB(A) during the night at our identified locations in the ward. As such, our noise assessments predict that by opening year noise levels will increase compared to the existing situation even if the road is not built. Information about noise levels with the project, during its construction and operation, are presented below.

13.7.1 Construction

Daytime construction noise impacts

The main construction activities that are expected to make noise and vibration in this ward relate to the northern tunnel entrance construction and various utilities works.

Part of the Northern Tunnel Entrance Compound would be partly located in the ward, with the Station Road Compound on the boundary. There are no Utility Logistics Hubs proposed in this ward. These are described in the Project description section above.

Although not located in the ward, Station Road Compound and Low Street Lane ULH may contribute to the noise experienced due to how close they would be to the ward.

There would also be haul roads built and used during the construction period, these are shown in the Project description.

Within this ward there are no percussive or vibratory works proposed to be undertaken.

Construction noise levels have been predicted at three locations across this ward. These have been chosen to illustrate the level of noise local communities are likely to experience during construction. For more information about our methodology, see chapter 1.

Noise levels are shown using standard units for road projects, dBLAeq (12 hour), which represents the average noise level for the assessed 12-hour daytime period. While there might be short-term noises that are louder than the noise level shown during the assessed period, the averaged figure provides a fair representation of what the overall noise impacts would be.

Figure 13.12 represents the locations where we have predicted daytime construction noise during the project's construction.

Each vertical bar in figure 13.13 shows the predicted noise levels for that month of the construction period (month 1 to month 72). The horizontal green line in each chart shows the existing background noise level at each assessment point without the project. The horizontal red line shows the level at which construction noise would exceed defined thresholds (see chapter 1 for more information about these thresholds). If noise is predicted to exceed acceptable levels, then specific mitigation measures would be implemented to reduce the noise.

The predicted noise levels show that higher construction noise levels and disturbance would be experienced closer to construction activity. Levels gradually diminish as a result of increased distance and additional buildings and other features screening the noise from more distant residential areas.

Figure 13.12: Construction noise assessment locations in Tilbury Riverside and Thurrock Park ward

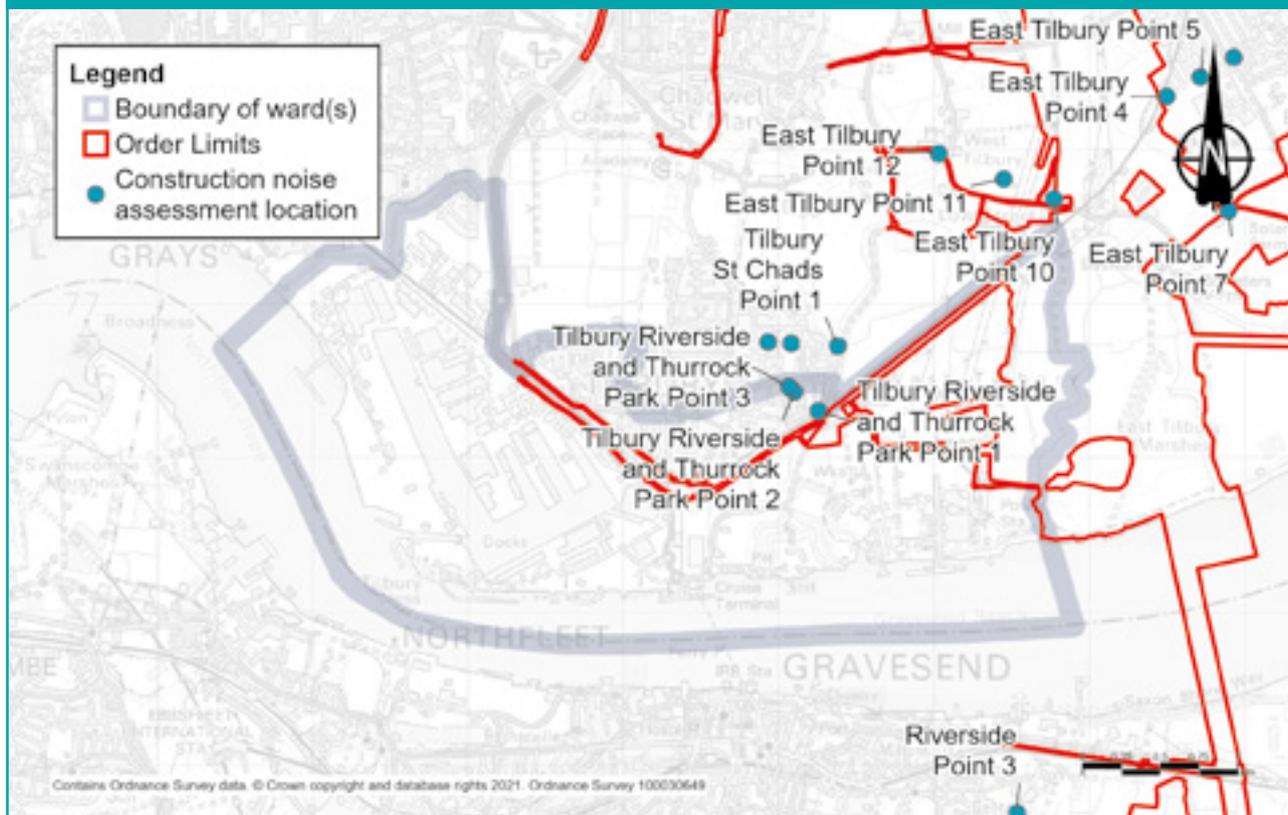
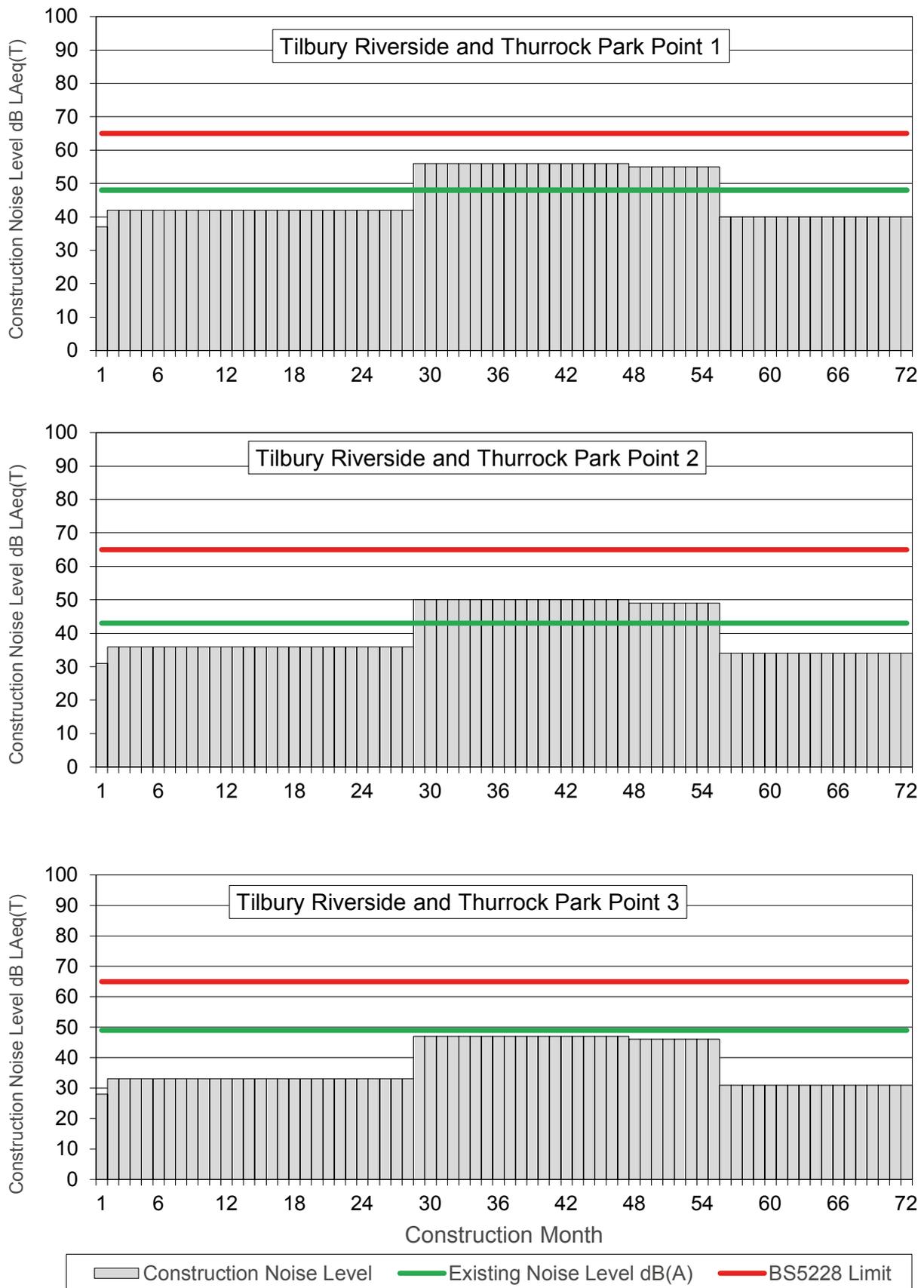


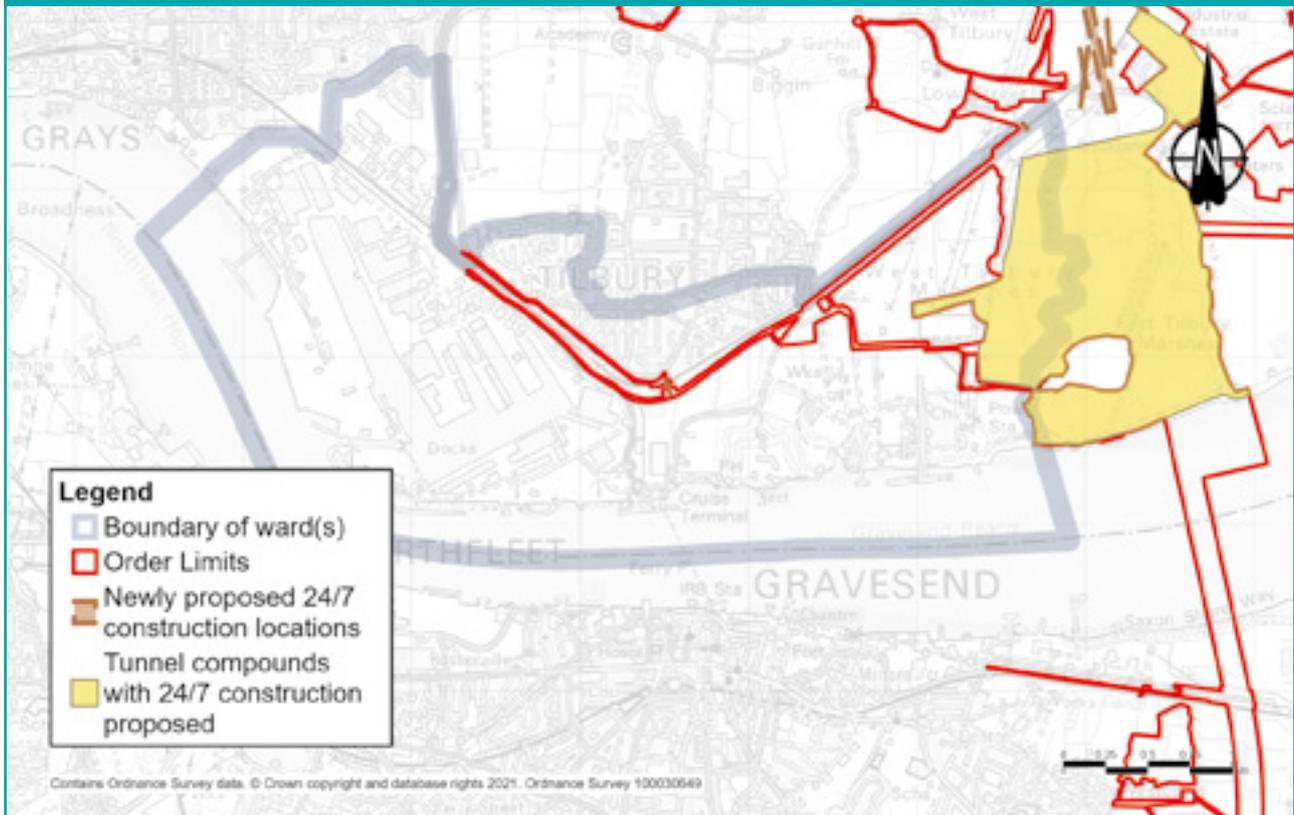
Figure 13.13: Construction noise by month for points 1, 2 and 3 in Tilbury Riverside and Thurrock Park ward



With reference to Figure 13.13 the following summarises the noise level changes over the construction period for points 1 to 3:

- At point 1, construction noise levels are predicted to range from 37 to 56dBLAeq (12 hour) during the six-year construction programme. Construction noise levels would exceed the existing background daytime noise level for approximately 27 months. However, they would not breach the defined threshold.
- At point 2, construction noise levels are predicted to range from 31 to 50dB LAeq (12 hour) during the six-year construction programme. Construction noise levels would exceed the existing background daytime noise level for approximately 27 months. However, they would not breach the defined threshold.
- At point 3, construction noise levels are predicted to range from 28 to 47dBLAeq (12 hour) during the six-year construction programme. Construction noise levels are not predicted to exceed the existing background noise levels at this assessment location.

Figure 13.14: Newly proposed and tunnel 24/7 working locations in Tilbury Riverside and Thurrock Park ward



24/7 construction working

These works, which include the support of the tunnelling works and works over the railway or works on the public highway, have been identified as they may need to be undertaken at night to maintain safety and reduce disruption to road, railway and utility networks. The duration for the works within this area is anticipated to be nights and weekends over short periods associated with specific works activities for highways and utilities work.

In addition to the changes to the daytime noise impacts reported in the section above, 24-hour seven-day construction working is proposed at the locations shown in figure 13.14 above.

These works would be carried out at night to maintain safety and reduce disruption to road, railway and utility networks. This would also include utilities works at the weekends.

These works could affect local communities, and we would work with the local authority to manage the impacts.

Construction traffic impacts

Maps showing the predicted change in road traffic noise within this ward during each year of construction can be found in chapter 7 of the Construction update. Based on currently available traffic data (which offers a representative picture of what people within the ward are likely to experience), increases in traffic noise are predicted on the following roads. For more information about how we define noise impacts (negligible, minor, moderate and major), see chapter 1.

Table 13.4: Construction traffic noise impacts in Tilbury Riverside and Thurrock Park ward

Affected road(s)	Predicted noise impact	Construction year(s)
A1089 St Andrew's Road	Minor increase in noise levels	1
Ferry Road	Minor increase in noise levels	2, 3 and 4
Fort Road Ferry Road	Moderate increase in noise levels	1

Measures to reduce construction noise and vibration

Construction noise levels would be controlled by using best available techniques (BAT), with specific measures at some locations such as:

- installing and maintaining hoarding around the construction compounds
- installing temporary acoustic screening around the construction areas likely to generate noise
- keeping site access routes in good condition with onsite assessments to inspect for defects such as potholes
- turning off plant and machinery when not in use
- maintaining all vehicles and mobile plant so loose body fittings or exhausts do not rattle or vibrate
- using silenced equipment where available, specifically silenced power generators and pumps
- no outdoor music or radios would be played for entertainment purposes onsite
- site layout would be planned to make sure reversing is kept to a minimum. Necessary reversing manoeuvres would be managed by a trained banksman/vehicle marshal to ensure they are conducted safely and quickly to reduce the noise from vehicle reversing warnings

- Non-percussive demolition techniques would be used where possible to reduce noise and vibration impact
- Careful consideration of the location and layout of compounds to separate noise-generating equipment from sensitive receptors, and use of mains electricity rather than generators, where possible
- Keeping construction vehicle traffic to a minimum by selecting of local suppliers and local workforces where possible, and reducing the transport of material for earthworks construction

All control measures, including those above, fall under the principles of BAT and are included in the REAC. For more information, see the sections NV001 to NV010, which set out how we would work under the supervision of the relevant local authorities to install noise-reduction measures where these are needed.

The CoCP sets out additional measures used to reduce noise and vibration during our construction period.

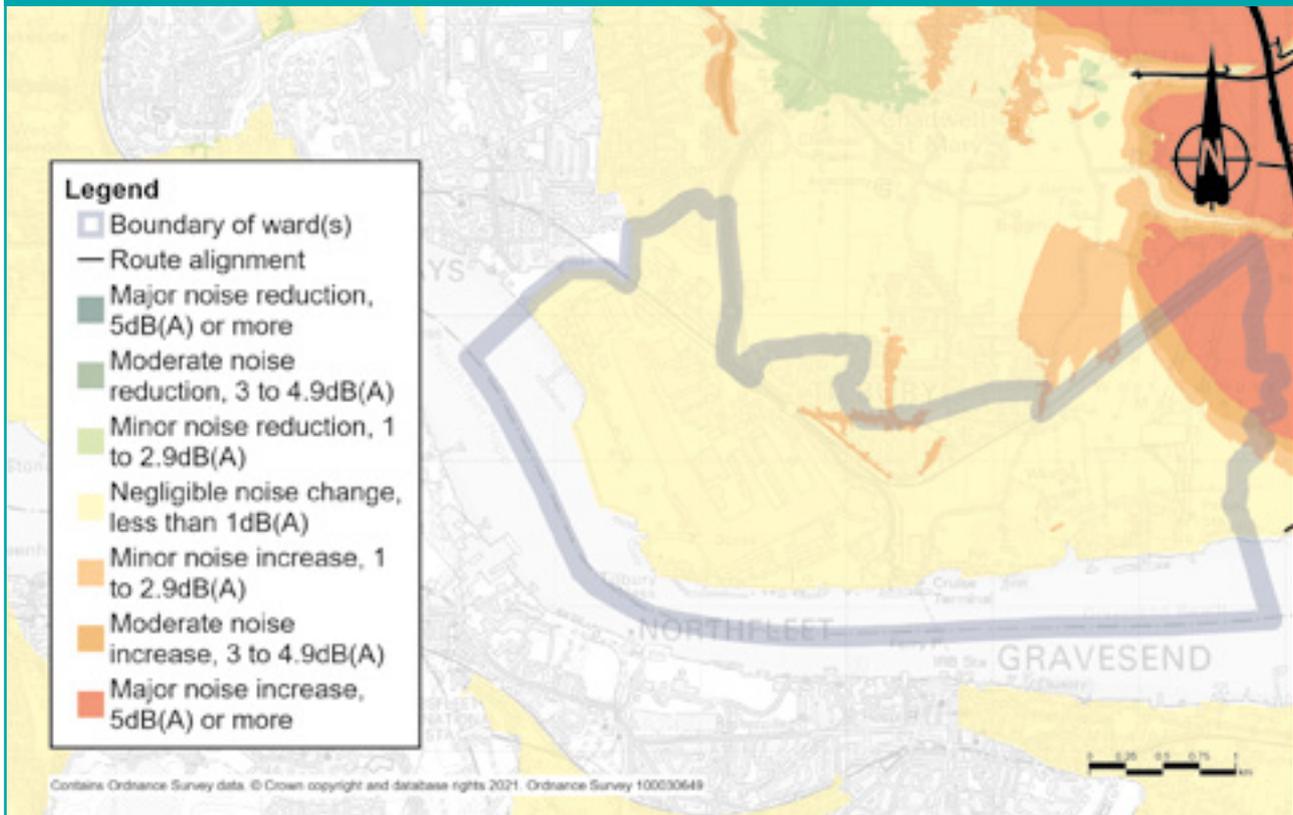
13.7.2 Operations

Operational impacts

Tilbury Riverside and Thurrock Park ward is located approximately 400 metres to the west of the project route. Direct noise impacts from the main route of the project would be confined to the very eastern edge of the ward. Noise impacts within this ward would be as a result of changes in traffic flow, the number of HGVs, traffic speed or physical alterations on the existing road network.

Figure 13.15 shows the predicted changes in road traffic noise in the opening year of the project. Within the ward, changes in road traffic noise at identified noise sensitive receptors (such as nearby properties) are predicted to range from negligible changes in noise levels of less than 1.0dB to major increases in noise levels of greater than 5.0dB. Direct noise impacts would be confined to the very eastern edge of the ward where there are fewer noise sensitive receptors. For more information about how we define noise impacts, (negligible, minor, moderate and major) see chapter 1.

Figure 13.15 Noise impacts during operation in Tilbury Riverside and Thurrock Park ward



Operational traffic flows

The main methods of controlling noise would be, where practicable, to design the road within landscaped features such as cuttings and bunds (walls of earth). However, where noise impacts are greatest, we would install noise barriers (typically, wooden fences) in addition to these earthworks features. While no noise barriers are proposed within this ward, there are noise barriers proposed that would mitigate impacts in the ward, which are shown in chapter 5 of the Operation update. The use of low-noise surfacing would also reduce the traffic noise once the road is in use.

For more information about the proposed measures to reduce operational noise, see the REAC (including references NV011 and NV013).

13.8 Air quality

We have carried out air quality assessments for both the construction and operational phases of the project. As explained in chapter 1, some of the assessments set out here are based on earlier versions of the project. The information provided here still presents a reasonable representation of the likely effects from the proposals presented during this consultation.

Existing situation

Within Tilbury Riverside and Thurrock Park ward three roads (Tilbury Dock Road, Calcutta Road and part of St Chads Road) have been declared an AQMA (Air Quality Management Area) due to yearly levels of airborne pollution above accepted standards. AQMAs are areas that have been identified by local authorities as areas with poor air quality that require additional monitoring and controls. No other areas within the ward have been identified as AQMA.

13.8.1 Construction

Construction impacts

Construction activities have the potential to affect nearby air quality through the release of dust and emissions from construction equipment and traffic. The areas most likely to be affected are those close to haul roads, compounds and soil storage areas. Properties more than 200 metres from the worksite, which is the majority of properties within this ward, are outside the area likely to be affected by construction dust or emissions from the worksite. In this ward, there are only a few properties within 200 metres of the worksite, including those on the west side of Tilbury. Air quality impacts on these properties during construction would be temporary and we would put in place measures to minimise the dust impacts (see below). The proposed measures to reduce dust and emissions are ones that have been proven to be effective when used on similar construction projects in the past. The change in air quality during the construction phase would be negligible, and there would be no discernible effect on health.

Our analysis of construction traffic predicts that the impact on most roads in this ward would be negligible, although there would be a temporary minor worsening in air quality in the area around Fort Road (from 2025 to 2027) and A1089 (from 2024 to 2027) as a result of traffic management in place. More information about construction traffic impacts on air quality can be found in chapter 7 of the Construction update.

Measures to reduce air quality impacts of construction

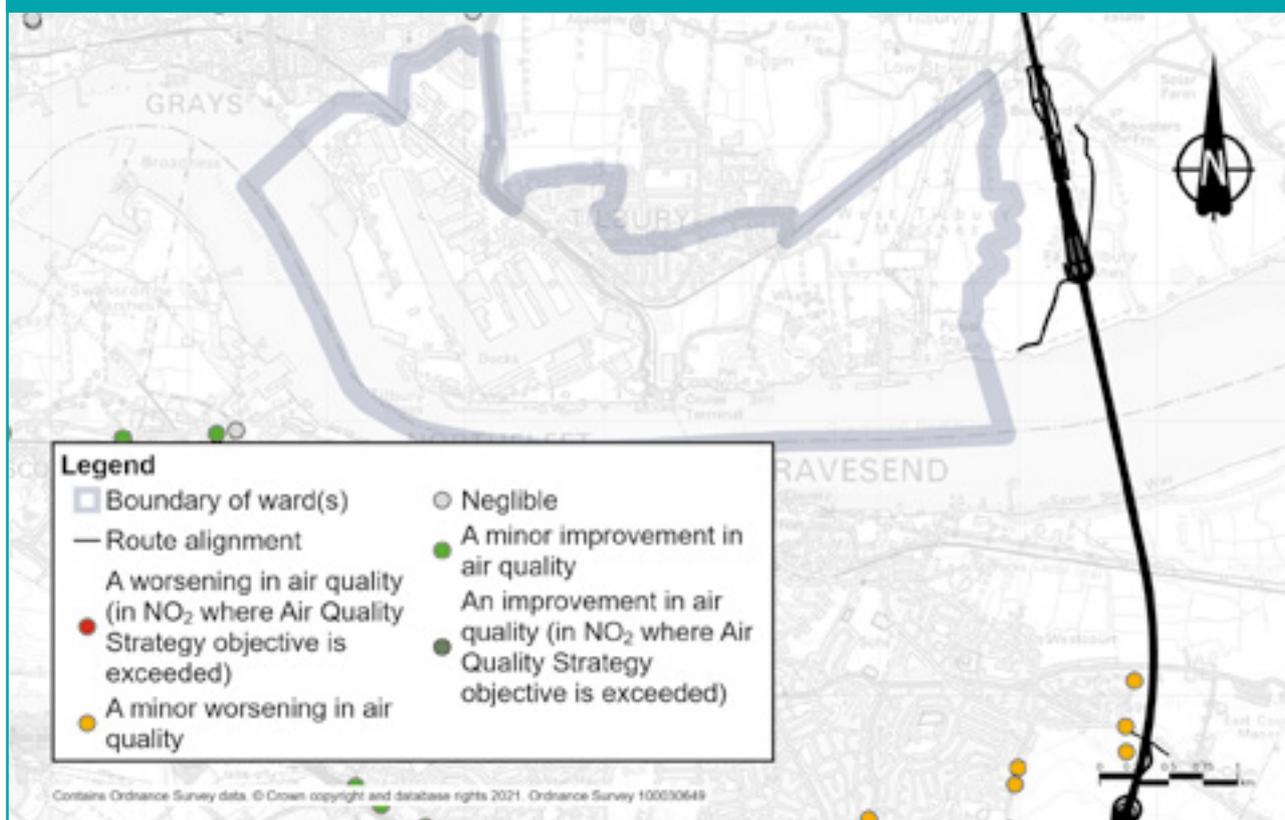
The impact of construction machinery and traffic on air quality would be controlled through the range of good practice measures set out in the CoCP and the REAC. For example, there would be measures to suppress dust, such as damping down dry haul roads and spoil heaps, as well as the use of low-emission machinery and vehicles. We would put in place an Air Quality Management Plan to ensure the measures set out in the CoCP and the REAC would effectively monitor and control dust and exhaust emissions. The location and type of monitoring would be submitted in advance to Thurrock Council for consultation (see REAC entry AQ006).

13.8.2 Operations

Operational impacts

We have carried out an assessment of the operational impacts of the new road on air quality. The assessment area includes a 200-metre buffer around the affected road network, with this area being the most likely to experience changes to air quality as a result of the new road. More information about air quality impacts once the road is open can be found in chapter 5 of the Operations update.

Figure 13.16: Predicted changes in NO₂ levels within Tilbury Riverside and Thurrock Park ward once the new road is open



There are no worst case receptors (properties or habitats that are sensitive to changes in air quality) modelled within the Tilbury Riverside and Thurrock Park ward, because the project is not considered to result in any noticeable air quality effects. However the closest receptors are predicted to be below the air quality thresholds for nitrogen dioxide (NO₂), the main traffic-related pollutant³.

Furthermore, local air quality data shows an overall downward trend in NO₂ over recent years, which means that future air quality improvements at this location are likely (for example, through increased adoption of electric vehicles meaning a reduction in exhaust emissions).

In addition to our assessment of NO₂, our assessment predicts that PM₁₀ levels (small particles of dust, mainly from vehicle exhausts and brakes) are unlikely to exceed threshold levels across the assessed area.

Measures to reduce air quality impacts of the operational project

The assessed air quality impacts in this area as a result of the project would not trigger the need for additional monitoring or other mitigation measures once the road is open.

³ NO₂ levels are measured in 'micrograms per cubic metre', or µg/m³, where a microgram is one millionth of a gram.

13.9 Health

A range of personal, social, economic and environmental factors influence our health. Different groups within the population may be more sensitive to these factors than others – for example, children, older people or those with pre-existing health conditions.

Tilbury Riverside and Thurrock Park ward is characterised by a younger population, with nearly a third of its residents aged under 16 (30.7% compared to 24.2% for Thurrock and 20.3% for England). The ward has a relatively high ethnically diverse population compared to other Thurrock wards.

Parts of Tilbury Riverside and Thurrock Park are among the top 10% deprived areas in England. Economic activity rates are lower than for Thurrock and nationally. The ward has very high proportions of social grade D and E residents. The number of people claiming benefits is one of the highest throughout Thurrock. Analysis also reveals variations by gender, with a claimant count of 4.3% for males and 5.0% for females. The area also has the highest proportion of socially rented households in Thurrock. The ward has a high proportion of households without access to a car or van at 34.2%, compared to 20.1% for England as a whole.

Tilbury Riverside and Thurrock Park exhibits high rates of long-term health problems. In addition, residents report high rates of self-reported bad or very bad health and have lower life expectancies compared to other wards across Thurrock. Regarding deaths from all causes, there are high death rates from respiratory diseases and from cancer when compared to England as a whole.

13.9.1 Construction

Construction impacts

Construction activities affecting Tilbury Riverside and Thurrock Park ward residents are presented in the Project description section and relate primarily to construction activity to build the two tunnels under the River Thames. Tunnelling and supporting operations on the surface would take place within the largest compound operated by the project, the Northern Tunnel Entrance Compound, which would be partly in this ward. Activities within it would be continuous and require substantial temporary infrastructure, such as haul roads to allow for the movement of heavy equipment and other materials around the worksite without using public roads.

To support the tunnel works, the Northern Tunnel Entrance Compound would be established at Tilbury Marshes, west of East Tilbury and Coalhouse Fort, in an area currently being used to extract pulverised fuel ash from the former Tilbury Power Station. This compound would be the main tunnelling worksite, located as far as practicable away from residential areas on the northern banks of the River Thames. The compound would require access from the local road network for HGV and workforce traffic. The compound would require substantial utility connections to allow it to operate.

Elements of all these activities have the potential to affect human health. This could be through noise associated with construction activities or construction traffic, air quality (as a result of dust emissions), severance caused by construction traffic, road or footpath closures, or through impacts on mental health and wellbeing.

There are both positive and negative potential impacts on people's health and wellbeing as a result of the construction stage. With good communication and engagement, mental health and wellbeing impacts associated with stress and anxiety related to the construction of the project would be reduced. Equally, some residents would see health and wellbeing benefits from improved access to work and training opportunities presented by construction activities (see the Traffic impacts section). Good mental health is a key influence on employability, finding a job and remaining in that job. Unemployment causes stress, which ultimately has long-term physiological health effects and can have negative consequences for people's mental health, including depression, anxiety and lower self-esteem.

As highlighted at the outset of this section, different groups of people within the population may be more sensitive to factors which potentially affect their health than others. Some of the changes identified as a result of construction activities may therefore only affect a small proportion of the population. Impacts may include those shown below.

- Changes in accessibility. This may be the case for people who are more dependent on public transport and have less choice about method and route travelled.
- Ferry Road, Fort Road, St Andrew's Road and New Road would experience an increase in road traffic noise level during the construction phase of the project.
- Road and footpath closures may affect some people's ability to access services or facilities.
- Changes in access to open space. Much of the local footpath network to the east of the urban area would be temporarily blocked during construction. People without private cars may have fewer alternatives within a reasonable travel time.
- There may be mental health and wellbeing impacts associated with stress and anxiety relating to construction of the new road.

Measures to reduce impacts on health during construction

Proposed measures relating to health and wellbeing (including good practice for dust emissions, hours of working and visual screening) are described in this chapter in section 13.6 (Visual impacts), section 13.7 (Noise and vibration impacts) and section 13.8 (Air quality impacts). Further information relating to mitigation measures for these areas is set out in the Code of Construction Practice (CoCP), the Register of Environmental Actions and Commitments (REAC) and the package of traffic management plans. The commitments in the REAC include items such as adhering to Best Practicable Means (BPM) to reduce noise impacts (see NV007 in the REAC) and dust-management good practice (see AQ005 in the REAC). For more information about these documents, see chapter 5 of the Consultation guide.

Engagement and effective two-way communication with communities both prior to and during construction by providing information about the programme and impact of works is important in order to reduce mental health and wellbeing impacts associated with uncertainty, stress and anxiety. The CoCP sets out proposals for community engagement, including how we would make sure communities, stakeholders and any affected parties are kept informed of the construction works, their progress and associated programme.

13.9.2 Operations

Operational health impacts

Information about the operational project in this ward is provided in the Project description above.

The assessments undertaken for noise and air quality have shown that no adverse impacts are anticipated as a result of the project for people in the Tilbury Riverside and Thurrock Park ward. However, a proportion of residents may experience anxiety or stress associated with perceptions of environmental change as a result of a major road project. As with the construction stage, different groups in the ward population may be more susceptible to anxiety and stress than others.

A proportion of residents may also experience positive health benefits through accessibility improvements, better access to education opportunities, specifically further education colleges and primary schools. There would also be better access to employment opportunities (greater than 10%) and open space, including new recreational areas outside Tilbury Riverside and Thurrock Park.

Predicted improvements in employment may lead to changes in property values. As a result, residents within these wards, while potentially benefiting from employment opportunities, may also be at risk from displacement as a result of rising property prices.

Measures to reduce health impacts of the operational project

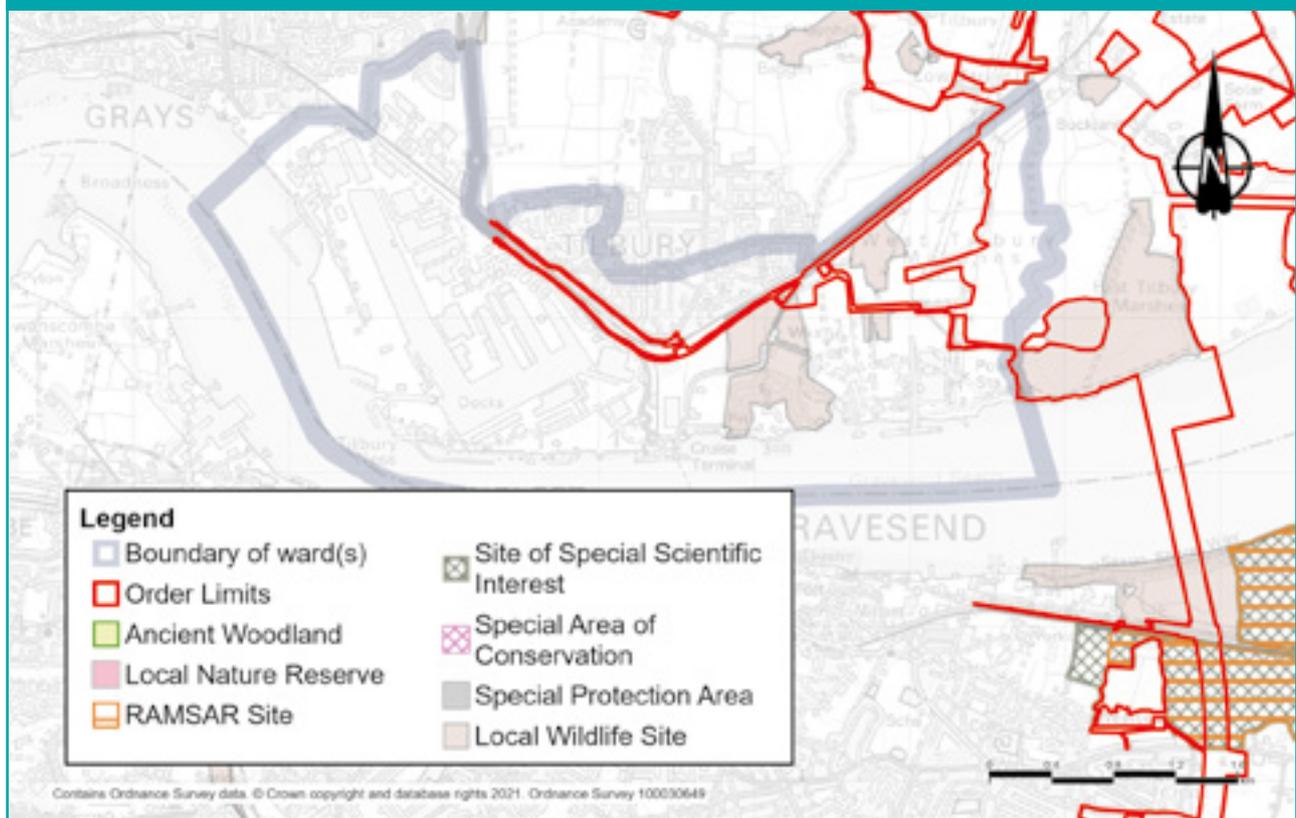
Mitigation measures to address noise and visual impacts have been described above. No further impacts relating to health have been identified for this ward and consequently no specific additional measures are required.

13.10 Biodiversity

The habitats present within the Order Limits in Tilbury Riverside and Thurrock Park ward, are arable farmland, with some areas of grazing marsh, and brownfield sites, as well as a number of watercourses.

There are no designated sites within 2km of the Order Limits in the ward. Within 500 metres of the Order Limits, the non-designated sites are Tilbury Centre Local Wildlife Site (LWS), Lytag Brownfield LWS, and Tilbury Marshes LWS. Goshems Farm is immediately adjacent to the eastern boundary of the ward. For Marine Biodiversity, please refer to Chapter 7 of the Construction update.

Figure 13.17 Designated and non-designated sites biodiversity in Tilbury Riverside and Thurrock Park ward



We carried out surveys across the project to set a baseline for assessment, and these identified the presence of a range of protected and notable species. Species present included badgers, water vole, terrestrial invertebrate species and reptiles including adder. The brownfield areas also contained notable breeding bird species including cuckoo, corn bunting and nightingale. The north shore of the Thames, and the areas around Tilbury Fort in particular, are important for wintering and passage wetland birds. A number of Special Protection Area (SPA) bird species have been identified foraging in these areas, including dunlin, ringed plover and avocet.

13.10.1 Construction

Construction impacts

Construction of the new road would require the removal of areas of habitat, both temporarily and permanently from the route alignment. This habitat consists of areas of arable farmland, brownfield habitat and grazing marsh and supports a range of protected and notable species. These would be affected by construction through direct habitat loss (the loss of badger setts, water vole, reptile, breeding bird and invertebrate habitat) and the fragmentation and disturbance to retained habitat.

Measures to reduce biodiversity impacts of construction

Where possible, vegetation clearance would take place during the winter to avoid breeding birds. Where this isn't practicable, clearance would be supervised by an Ecological Clerk of Works (ECoW) to ensure no nests are disturbed or destroyed. Where protected species are present, these would be moved away from the site prior to any construction either through habitat manipulation (for example strimming to reduce the height of vegetation to displace reptiles), or translocation. Where required, works affecting protected species would be performed under a Natural England licence. Boxes to support birds would be set up within retained habitat. Habitat lost for temporary construction works would be reinstated on completion.

The impact of construction on biodiversity would be controlled through the range of good practice measures set out in the Project's CoCP and the REAC. See chapter 1 of the Construction update for more information about this and the project's other control documents.

13.10.2 Operations

Operational impacts

The operation of the project has the potential to cause mortality among species as they encounter road traffic, habitat fragmentation, and noise disturbance from traffic.

Measures to reduce biodiversity impacts of the operational project

Landscape planting has been designed to provide strong links for animals to move and forage along, guiding them to safe crossing points around the new road. To minimise disturbance from traffic, the new road would be in a cutting north of the north tunnel entrance, reducing noise and visual impacts.

Newly created habitat would be managed to ensure that they provide high quality habitat to support a broad range of different plant and animal species.

The impact of operation on biodiversity would be controlled through the range of good practice measures set out in the project's CoCP and the REAC. See chapter 1 of the Construction update for more information about this and the project's other control documents.

13.11 Built heritage

Existing situation

There is one scheduled monument, three listed buildings and one other structure of historical relevance identified within Tilbury Riverside and Thurrock Park ward likely to be affected by the project.

Scheduled monument

- Tilbury Fort is a scheduled monument of high heritage value, located on the northern bank of the Thames, around 230 metres south of the project. The structure is one of six fortifications along the Thames and a front line of defence against invading armies along the estuary. Tilbury Fort dates back to the 17th century and has been restructured several times over the past 300 years. This type of fort, known as a 'bastion' system of fortification, is extremely rare in England and Tilbury Fort is the best preserved and most complete example. Since 1948, the fort has been in the hands of heritage conservation organisations. It was opened to the public in 1958 and remains so today.

Figure 13.18 Built heritage locations in Tilbury Riverside and Thurrock Park ward



Listed buildings

- Officer's barracks at Tilbury Fort is a Grade II* listed building of high heritage value, located 670 metres to the south of the project, within the scheduled area of Tilbury Fort. The building is a terrace of approximately 22 officers' houses within the fort, today it is seven houses and a museum. The barracks were built in 1772 by the Board of Ordnance, and later altered in the early 19th century.
- Riverside station, including floating landing stage is a Grade II* listed building of high heritage value, located 620 metres south of the Order Limits, in Tilbury. The listing includes the railway station, baggage hall, ticket office and the floating landing stage. The station was completed in 1924 and designed for the Port of London. It was constructed in red-brown brick with stone dressings and a tiled hipped roof. The building has connections with architect Edwin Cooper, through his work for the Port of London, and is an example of neo-Georgian style. The building has historical interest with the arrival and docking of the SS Empire Windrush. This was the first ship to bring a large group of migrants from the Caribbean to Britain, in 1948.
- Worlds End inn is a Grade II listed building of high heritage value, located 550 metres to the south of the project and immediately west of Tilbury Fort. The inn dates from the late 17th/early 18th century, with alterations in the 19th century. The building is a good example of a traditional inn from South East England and built using local materials. The inn is historically associated with Tilbury Fort, Tilbury Docks and the Port of Tilbury.

Other buildings/structures of historical relevance

- Pillbox south of Tilbury power station. This structure is in poor condition.

13.11.1 Construction

Construction impacts

Construction activities affecting the Tilbury Riverside and Thurrock Park ward relate to construction of the northern tunnel entrance, formation and operation of the associated tunnel compounds (Northern Tunnel Entrance Compound and Station Road compound) and earthworks. Northern Tunnel Entrance Compound is one of the areas along the project where 24/7 activities would occur, associated with works above ground to support the 24-hour tunnelling.

Construction activities would temporarily introduce additional noise, lighting and visible construction activity and machinery in the area of Fort Road. Known built heritage assets would not be directly affected, however, there would be an indirect effect through the change to the surroundings of Tilbury Fort scheduled monument. Sound and visual intrusion is expected from construction traffic on Fort Road immediately to the north.

Measures to reduce construction impacts

The design and layout of the Northern Tunnel Entrance Compound and Station Road Compound would take into account the setting of heritage assets (the surroundings in which a heritage asset is located), and we would seek to avoid light glare, light spill and light pollution during night-time construction. More information can be found in the Design Principles (section S326). Refer also to the air quality, noise and vibration, and heritage asset sections of the REAC.

13.11.2 Operations

Operational impacts

Once operational the project would not impact the setting of known built heritage assets including Tilbury Fort scheduled monument.

Measures to reduce operational impacts

Our engineering and landscape design seeks to avoid or reduce negative impacts on heritage assets. Impacts can be physical or result from changes in their surroundings. To preserve the rural and historic character of the landscape, road lighting would be minimised where it is safe and practicable to do so, and still comply with relevant standards (Design Principle LST.02 and LST.03). The Northern Tunnel Entrance Compound and Station Road Compound would be reinstated after construction to reflect the surrounding landscape character as outlined under Design Principle S3.05.

13.12 Contamination

Existing situation

From the review of desk-based sources (historical maps and environmental data), potential sources of contamination have been identified based on land uses. Within this ward, the following have been identified:

- Tilbury Power Station, a former fossil fuel power station from 1950s to 2013, had a major fire in 2012.
- Tilbury Ash Disposal Site (Area A1, A2 and A3) is an authorised and historical landfill with pulverised fuel ash (PFA) landfill from Tilbury power station (and potential for unrecorded disposal of other materials).
- Shed Marsh Landfill (historical landfill), forms part of Thurrock Council reference THU011 (HLU0529).
- The overall impact from these contamination sources is considered to be low, given the mitigation proposed.

13.12.1 Construction

Construction impacts

Construction work, for example, excavation and earth movements in this ward would be minimal and the potential sources of contamination are unlikely to be significantly affected.

During construction, there is the possibility for existing contamination within the ground to become mobilised. There is also a potential risk of accidental oil, cement and fuel spills from construction traffic and the storage of materials.

Measures to reduce contamination management impacts of the project

To reduce the impact to an acceptable level, good practice measures include appropriate storing of equipment and clear soil handling, storage of chemicals and re-use guidance. This would be used during construction to reduce the risk of spreading contamination and spillage or pollution.

To reduce the risk of accidental spillages, procedures would be in place such as designated areas to re-fuel plant, tanks would be bunded, spill kits would be available and incidents would be recorded and managed, with impacted soils being assessed and removed if necessary.

Essential mitigation such as the development of site-specific remediation, where contamination has been identified during ground investigation work, would be completed in consultation with the local authority. During the earthworks, workers would remain vigilant and any suspected contamination would be recorded and assessed accordingly via a watching brief protocol.

Contamination would be controlled through the range of good practice measures set out in the project's CoCP and the REAC. See chapter 1 of the Construction update for more information about this and the project's other control documents.

13.12.2 Operation

Verification reports would be prepared for the remediation that is undertaken in site-specific areas and this would be provided to the local authority. During the operation of the road, should an incident occur, for example, a traffic accident resulting in localised contamination, significantly affected soils would be assessed and if necessary removed to reduce the risk of contamination migrating across a wider area or entering controlled waters. For more information on these controls, see the REAC.

14

Chapter 14: Tilbury St Chads

This chapter summarises the activities in Tilbury St Chads ward relating to the project's construction and its operational phase (when the new road is open). It also explains the measures intended to reduce the project's impacts on the local area. For more information about the assessments in this chapter and other information available during this consultation, see chapter 1 which also includes a map showing all the wards described in this document.

Within this document, we sometimes advise where additional information can be found in other consultation documents, including the Construction update, Operations update, You said, we did, Register of Environmental Actions and Commitments (REAC), Code of Construction Practice (CoCP), Outline Traffic Management Plan for Construction (OTMPfC) and the Design principles. To find out more about these documents, see chapter 1. References to these documents provide an indication as to how our proposals to reduce the project's impacts will be secured within our application for development consent.

14.1 Overview

14.1.1 About this ward

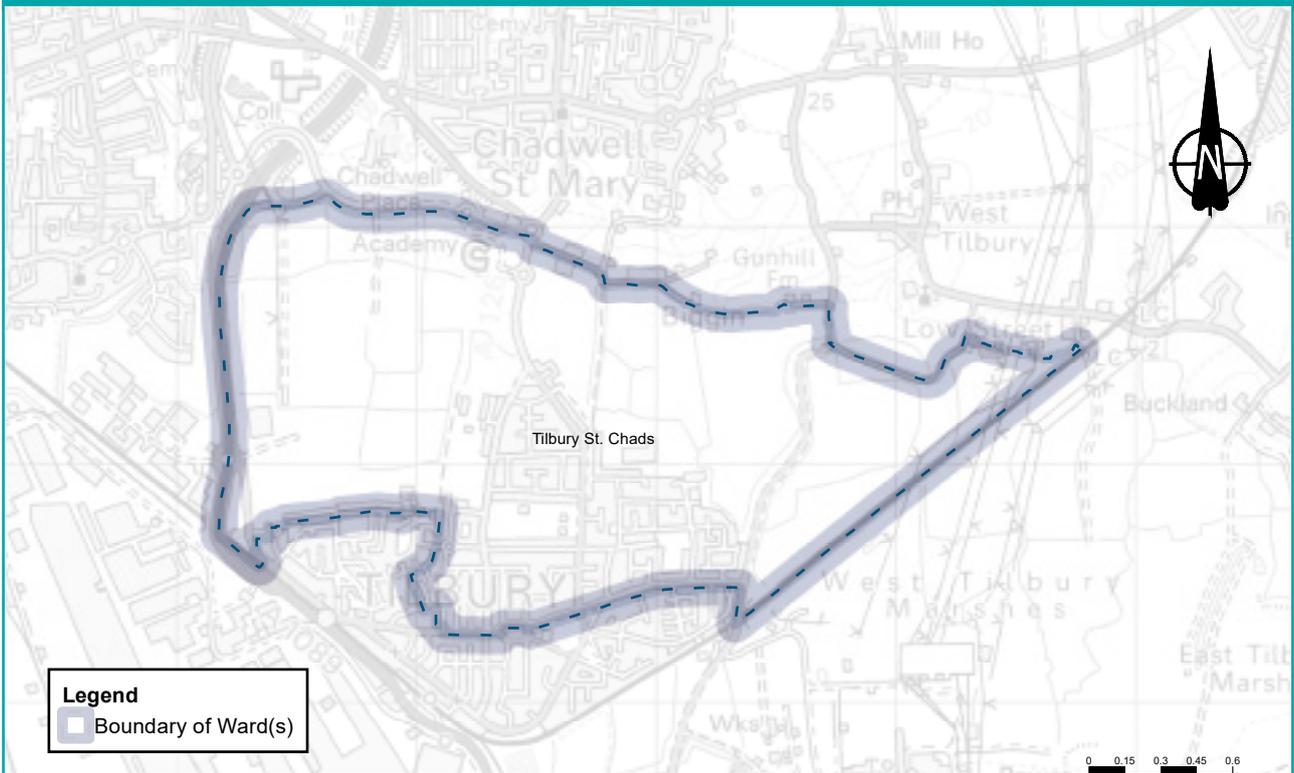
Tilbury St Chads is located to the west of East Tilbury, and north of Tilbury Riverside and Thurrock Park in the borough of Thurrock. The ward is around 3.9km² in area and has an estimated population of 6,733¹

Around half of Tilbury town falls within the ward, from the north of Brennan Road. The remainder of the ward is mostly agricultural. The Gateway Academy in the north of the ward, is located to the west of St Chads Road. Manor Primary and Olive AP Academy are also within the residential area of Tilbury. A high-pressure gas mains runs through the centre of the ward following Feenan Highway. A small section of high voltage overhead line crosses the A126 and travels south. There are Environment Agency designated main rivers in Tilbury St Chads, together with public parks, open spaces and allotments.

The A1089 runs north-south along the western side of the ward.

¹ Office for National Statistics, 2018 ward-level population estimate

Figure 14.1: Ward boundary map for Tilbury St Chads



14.1.2 Summary of impacts

Table 14.1: Summary of impacts during the project's construction and operation

Topic	Construction	Operations
<p>Traffic</p>	<p>Impacts</p> <p>There would be delays to traffic along some roads while traffic management is in place.</p> <p>There would be additional cars and HGVs on the A1089 which may lead to an increase in journey times through the Asda roundabout.</p> <p>Mitigation</p> <p>There are several mitigation measures to reduce construction impacts on local residents such as minimising the use of local roads by construction vehicles. Further information about mitigation measures can be found in the Traffic section of this chapter.</p>	<p>Impacts</p> <p>The predicted change in traffic flows, as a result of the project in this ward, would occur westbound along Marshfoot Road to the junction with the A1089, mainly carrying additional traffic that has left the A13 at the Orsett Cock junction. Further details of the impacts of the project can be found in the Traffic section of this chapter.</p> <p>Mitigation</p> <p>Throughout the design process numerous mitigation measures have been implemented to reduce the operational impact on local residents. Details can be found in the traffic section of this chapter.</p>
<p>Public transport</p>	<p>Buses</p> <p>Additional traffic along the A1089 may impact journey times for the 66, 77, 77a, Z2, Z4 and 99 bus routes.</p> <p>Rail</p> <p>Throughout construction there may be some increases in journey times to Tilbury Town station, associated with increased traffic through the area and traffic management on the local roads.</p>	<p>Buses</p> <p>There would be no changes to bus routes through the ward once the project opens and no discernible predicted change to most bus journey times.</p> <p>Rail</p> <p>There would be no discernible changes in local access times to Tilbury Town station. It would be quicker to access Ebbsfleet International Station once the project is operational.</p>

Topic	Construction	Operations
<p>Footpaths, bridleways and cycle routes</p>	<p>There are no footpaths, bridleways or cycle routes in Tilbury St Chads ward, so there would be no construction impacts. For other potential impacts, see the other topic areas in this chapter, such as Visual and Noise and vibration.</p>	<p>There are no footpaths, bridleways or cycle routes in Tilbury St Chads ward, so there would be no operational impacts.</p>
<p>Visual</p>	<p>Impacts</p> <p>Residential properties on the eastern edge of Tilbury would be screened from views of construction activities by vegetation along the Tilbury Loop railway line with limited views of taller elements of construction activities within the Northern Tunnel Entrance Compound. Overhead power line diversions and the construction of Tilbury Viaduct may be visible from these properties and Parsonage Common.</p> <p>Mitigation</p> <p>Given the limited views of the project from this ward, no specific mitigation measures are considered necessary. The visual impacts would be controlled through a range of good practice measures in the project's CoCP and REAC.</p>	<p>Impacts</p> <p>There would be little change in views from residential properties on the eastern edge and Parsonage Common, with distant partial views of Tilbury Viaduct. Overhead power line diversions would not noticeably alter the views.</p> <p>Mitigation</p> <p>The landscaping design of the Lower Thames Crossing would help integrate the new road into the surrounding landscape.</p>

Topic	Construction	Operations
<p>Noise and vibration</p>	<p>Impacts</p> <p>The construction of the northern tunnel entrance and utilities work are expected to create noise impacts. There would also be a change in road traffic noise which would be negligible on most roads, apart from Coopers Shaw Road during construction years 2, 3, 4 and 5, when there would be a minor increase.</p> <p>Mitigation</p> <p>Noise levels would be controlled through mitigation measures presented in the REAC, see REAC ref numbers NV001 to NV009. There are also measures presented in the CoCP.</p>	<p>Impacts</p> <p>This ward would be approximately 400 metres west of where the new road is proposed, and so noise changes would be confined to its eastern edge. The change in noise would be a result of the predicted change in traffic flow and speed, vehicle type and physical alterations on the existing road network. The change in noise is predicted to be negligible in the west of the ward, with major increases in the east.</p> <p>Mitigation</p> <p>Low-noise road surfaces would be installed on all new roads. The road has been kept low in the environment using cuttings and bunds. Noise barriers would be installed in some areas alongside the new road.</p>

Topic	Construction	Operations
<p>Air quality</p>	<p>Impacts</p> <p>There is likely to be dust and emissions from construction equipment and traffic during the construction phase.</p> <p>Analysis of the construction phase traffic flows associated with the project indicate that there are no roads where the long-term change in traffic flow and exhaust emissions between 2024 and 2029 would lead to a noticeable change in air quality.</p> <p>Mitigation</p> <p>The contractor would follow good practice construction measures which are presented in the CoCP and REAC to minimise the dust. Construction vehicles would need to comply with emission standards. An Air Quality Management Plan would be designed in consultation with the relevant local authorities. The plan would include details of monitoring which would ensure measures are effectively controlling dust and exhaust emissions.</p>	<p>Impacts</p> <p>Air quality modelling shows there would be a minimal increase in pollutants as a result of project-associated changes in traffic flows and the new road.</p> <p>Mitigation</p> <p>As our traffic modelling indicates a minimal increase in pollutants, no mitigation is required.</p>

Topic	Construction	Operations
<p>Health</p>	<p>Impacts</p> <p>The construction phase of the project would present opportunities to access work and training. There are likely to be changes in the area that may result in negative impacts on health, including mental health and wellbeing. These include changes in accessibility of local resources, amenities and open space. Much of the footpath network in neighbouring wards to the east would be temporarily blocked during construction. There is also likely to be perceivable changes in the levels of road traffic noise on Coopers Shaw Road.</p> <p>Mitigation</p> <p>The negative impacts would be mitigated through the good practice construction measures presented in the CoCP and REAC relating to dust emissions, working hours and visual screening, traffic management measures and community engagement. This includes the establishment of Community Liaison Groups.</p>	<p>Impacts</p> <p>The project would improve access to work, and training and access to open space and accessibility of local resources and amenities. This specifically includes further education colleges and primary schools, employment opportunities and open space, including new recreational areas outside Tilbury St Chads. Some residents may experience impacts on mental health and wellbeing as a result of the project such as anxiety around perceived changes to air quality or as a result of changes to the noise environment.</p> <p>Mitigation</p> <p>No essential mitigation is required for health other than those measures described in the noise mitigation section.</p>

Topic	Construction	Operations
<p>Biodiversity</p>	<p>Impacts</p> <p>The construction of the project would involve the removal of areas of habitat, both temporarily and permanently for the new road. These habitats support a number of protected and notable species which would be impacted including badger setts, water vole and reptile habitats.</p> <p>Mitigation</p> <p>Vegetation clearance would be undertaken in winter to avoid impacting breeding birds. Protected species would be relocated, carried out under a Natural England licence. Boxes to support bats and birds would be erected. Habitat lost for temporary construction works would be reinstated following construction.</p>	<p>Impacts</p> <p>There is the potential to cause mortality of species by encountering road traffic as well as habitat fragmentation and disturbance from traffic.</p> <p>Mitigation</p> <p>Landscape planting is designed to provide strong links for animal movement and foraging. Impacts would also be managed through the range of good practice measures set out in the CoCP and REAC. Newly created habitats would be managed to retain structure and function for the species present.</p>
<p>Built heritage</p>	<p>There are no buildings of historic relevance within Tilbury St Chads ward that would be affected by the project.</p>	
<p>Contamination</p>	<p>There are no known medium or high-risk sources of contamination that could be at risk of being disturbed during construction or operation of the project within Tilbury St Chads ward.</p>	

14.2 Project description

14.2.1 Construction

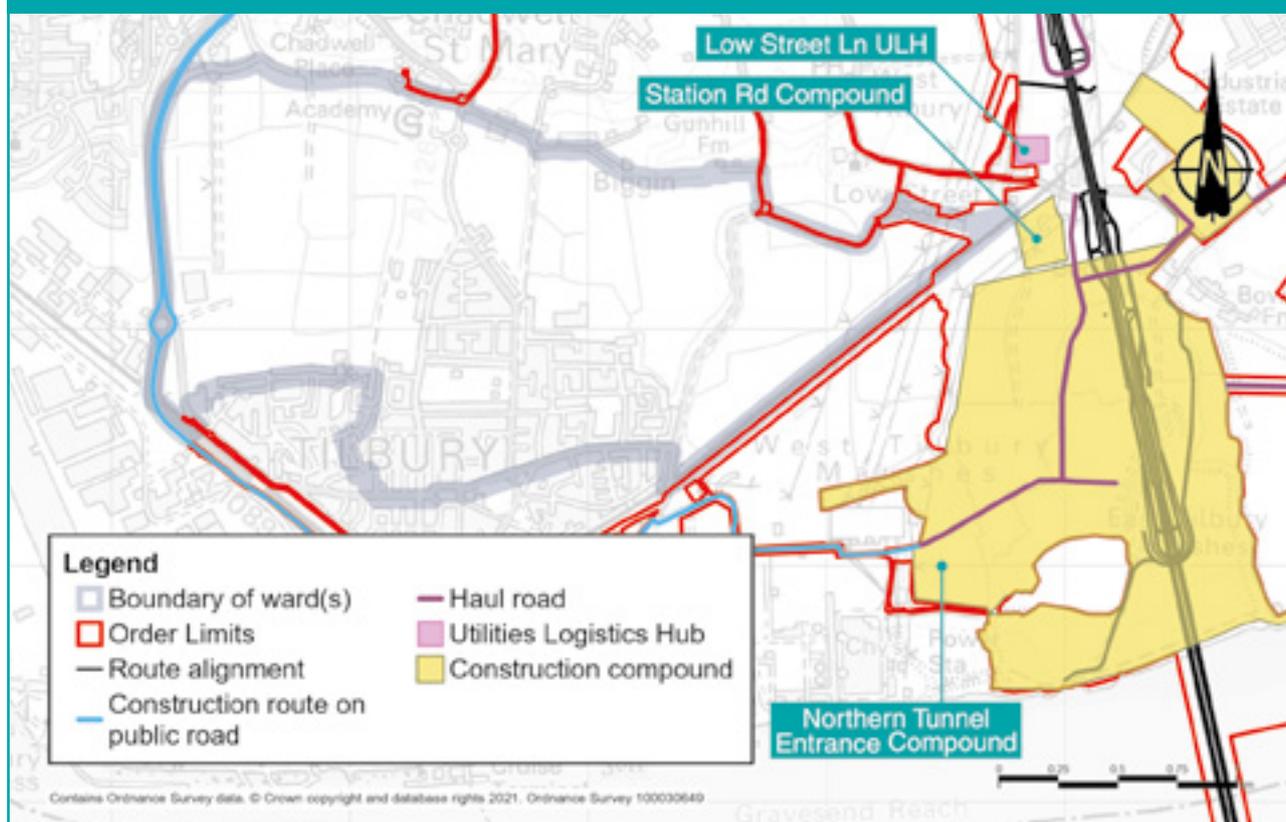
Construction activities

More information about how the area would look during construction, including visualisations, can be found in the Construction update. You can also view a video fly-through of the project during construction by visiting our consultation website.

Only a small section of the project's Order Limits (the area required to deliver the project) lies within Tilbury St Chads ward and little construction activity would take place within this ward, compared to neighbouring wards.

A proposed temporary access for utility companies would be built along the eastern boundary of the ward parallel to the railway line. An area at the north-eastern edge of Tilbury St Chads ward would be used for utility works. Further information about the utility works within Tilbury St Chads can be found in chapter 5 of the Construction update.

Figure 14.2: Main construction areas in Tilbury St Chads ward



Utilities

There would be no Utility Logistics Hubs within Tilbury St Chads ward. Works to provide temporary power for the compounds would be installed along A126 Marshfoot Road. Permanent water supply for the northern tunnel entrance would be installed in Coopers Shaw Road from Gun Hill and through the fields to the east of the ward. Connection and installation of a pipeline would be required at the western end of Dock Road for the temporary tunnel boring machine (TBM) water supply.

Chapter 2 of the Construction update provides an overview of how existing utilities would be affected by our plans to build the new road, with further detail including maps in chapters 4 and 5. Chapter 2 of the Operations update also describes the project's impacts on utilities, including a map showing the utilities that would be repositioned to accommodate the new road.

Construction routes on public roads

The HGV traffic access to the Northern Tunnel Entrance Compound and the Station Road Compound would pass through this ward, eastbound along the A1089 to Fort Road and then the Port of Tilbury's Substation Road. Construction related staff vehicles may use local roads within the ward such as Marshfoot Road, Gun Hill Road and Coopers Shaw Road to access the Northern Tunnel Entrance Compound and the Station Road Compound. This route runs along the northern boundary of the ward.

The number of vehicles predicted to go to the Northern Tunnel Entrance Compound and the Station Road Compound are shown in table 14.2. These are the number of vehicles going to each compound and there would be the same number of vehicles, on an average weekday, leaving each compound.

Table 14.2: Average daily vehicle numbers going to compounds located near Tilbury St Chads ward

Time period	Northern Tunnel Entrance Compound		Station Road Compound	
	HGV	Cars	HGV	Cars
January to August 2024	90	377	2	27
September 2024 to February 2025	105	580	13	38
March to May 2025	133	593	20	35
June to October 2025	133	466	20	35
November 2025 to March 2026	133	506	18	35
April to August 2026	132	611	21	35
September 2026 to March 2027	132	670	16	24
April to November 2027	131	720	4	18
December 2027 to March 2028	131	684	0	0
April to July 2028	122	619	0	0
August 2028 to December 2029	39	73	0	0

Construction equipment and materials are expected to arrive via the Port of Tilbury and Tilbury2 ferry terminal, reducing the amount that HGVs would need to travel on public roads. However, some HGVs would service the construction site via the strategic road network, through Tilbury2 and the temporary haul road. Impacts on the road network are presented in the Traffic section below, with additional information in chapter 7 of the Construction update.

Construction schedule

Construction of the entire project is scheduled to last for around six years from 2024 to 2029. To deliver our construction programme efficiently, we would divide activities into coordinated packages of work. Maps and programmes for the packages north of the river can be found in chapters 4, 5 and 6 of the Construction update.

Construction working hours

Most construction in this ward would take place during core construction hours, from 7am to 7pm on weekdays, and from 7am to 4pm on Saturdays. If necessary, additional repair and maintenance would take place on Sundays from 8am to 5pm. There would be circumstances when working hours may be extended. Typically, this would be to reduce the impact on road users by working at night. Activities that would require longer working hours include carrying out traffic management measures, joining new roads to existing ones, and resurfacing existing carriageways. For safety reasons, we would also need to undertake work close to railway lines outside core hours when trains are not in service. More information about working hours is set out in the Noise and vibration section below and in the CoCP.

Traffic management

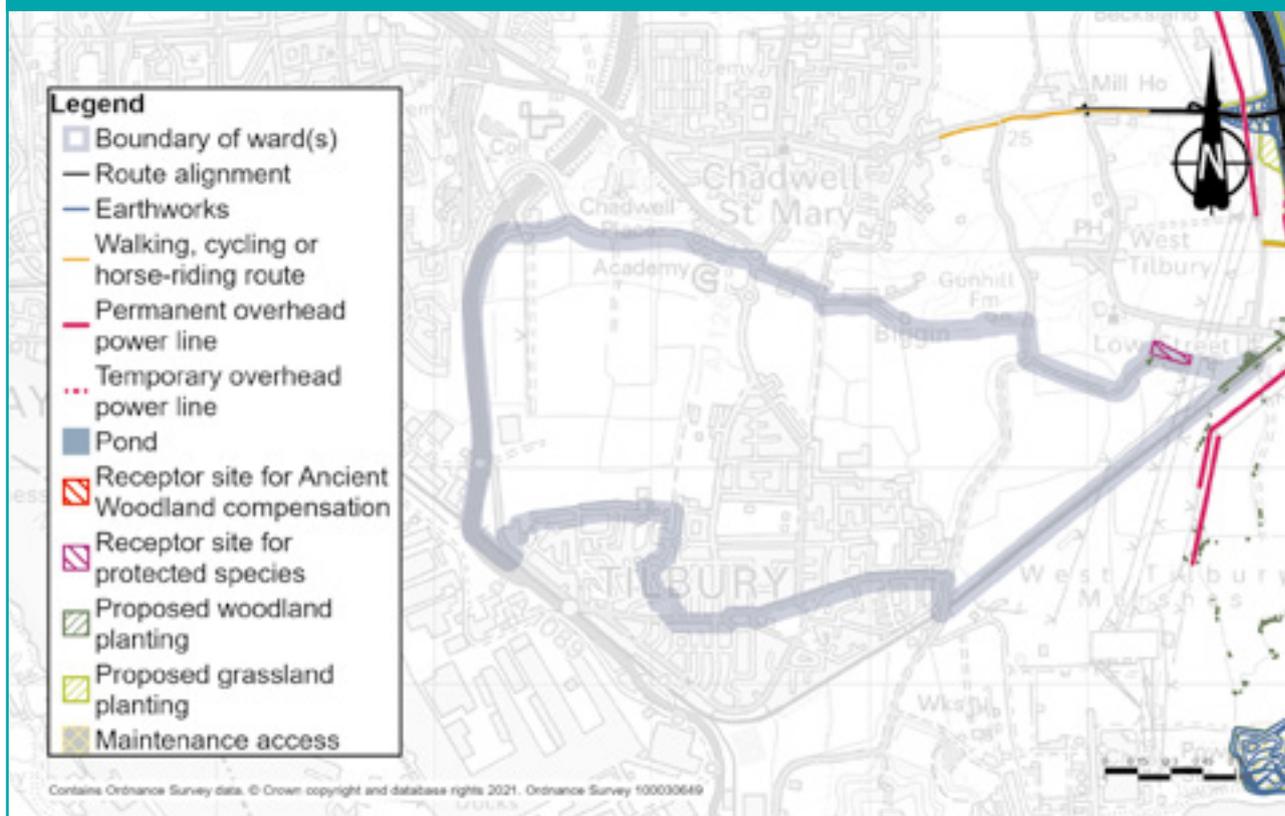
The main traffic management measures for Tilbury St Chads ward are listed below. All traffic management measures are based on an indicative construction programme which would be finalised by the appointed contractor. The contractor's final traffic management plans would be subject to final approval by the Secretary of State for Transport, following consultation with the local highways authority.

Table 14.3: Main traffic management during construction in Tilbury St Chads ward

Road(s) affected	Proposed traffic management	Purpose	Duration
Marshfoot Road, Chadwell Hill and Brentwood Road	Lane closure and traffic lights	To install power supplies for the project's compounds located around the A13 junction	12 months
A1089	Closures	For specific works including bridge works, tie in works and utilities	Nights and weekends over short periods associated with specific works activities
Coopers Shaw Road / Gun Hill / Fort Road	3-way traffic lights	To facilitate modifications to utilities	2 weeks
Coopers Shaw Road	Lane closures and traffic lights in 300-metre sections	To facilitate modifications to utilities	4 months between September 2024 and February 2025

We have sought to minimise traffic management measures wherever practical. However, measures would be necessary in some locations to allow construction traffic and local communities to move around safely, and to provide construction workers with sufficient space to operate. An overview of the traffic management required across the project can be found in the Outline Traffic Management Plan for Construction.

Figure 14.3: Main features of the operational project in Tilbury St Chads ward



14.2.2 Operations

The completed project

This section sets out the elements of the project that would feature permanently in Tilbury St Chads ward once construction is complete and the new road is open. For more information about the completed project, see the Operations update, as well as the figures in Map Book 1: General Arrangements.

- Permanent works within Tilbury St Chads ward would be limited to underground utility diversions along local roads. As such, there would be no visible elements of the project in this ward once it is operational.

Changes to the project since our design refinement consultation

As part of our ongoing design development, including discussions with utility companies, we have made several changes to the project and its Order Limits since our design refinement consultation in July 2020. Within this ward the proposed change would be as follows:

- Our ongoing discussions with the utility companies have enabled us to remove the area of farmland south of the Condovers Scout Activity Centre from the Order Limits as it is no longer required for utility diversions.

Impacts on open space and common land

Within Tilbury St Chads ward we propose to acquire permanent rights over an area of land at Walton Common and Parsonage Common for utility works required for the northern tunnel entrance. The land would also be used for temporary access and construction purposes. This area is designated as common land and provides scrub and grassland habitat which is valuable for wildlife. During construction we would need to take possession of the land for up to six months for installation of a power supply and then we would reinstate the land. The power supply would later become the permanent supply to the tunnel operations. The proposed works would be underground in this location and the rights are required in connection with the maintenance, access and protection of these plants. These rights would not affect the current use of the land.

Within Tilbury St Chads ward there are no proposed changes to open space or common land as previously consulted. More information about our proposals for compensating for impacts on open space and common land (which includes special category and recreational land), including proposals we have consulted on previously, can be found in chapter 3 of our Operations update.

14.3 Traffic

We carried out traffic assessments to understand how construction and operation would affect nearby roads, compared with the situation if the project was not implemented. For more information, see chapter 4 of the Operations update.

14.3.1 Construction

Construction impacts

There would be delays to traffic along the Coopers Shaw Road while the lane closure is in place. The traffic management on Marshfoot Road may also lead to delays to traffic. Gateway Academy has two access points, one onto Marshfoot Road and one on St Chad's Road (A126). The St Chad's Road access will provide access to the school when traffic management is implemented on Marshfoot Road.

There would be additional cars and HGVs on the A1089 which may lead to an increase in journey times through the Asda roundabout.

Measures to reduce construction traffic impacts

Our approach to construction has been refined after further investigations and feedback. A summary of the measures we propose to use to reduce the volume of construction materials transported in and out by road, can be found in chapter 2 of the Construction update.

To reduce the construction traffic impacts in Tilbury St Chads, we would carry out the following measures:

- Minimise use of the local road network as far as practicable through construction of temporary offline haul roads directly from the strategic road network.
- Our proposals allow for re-use of excavated materials, and would substantially reduce the need to dispose of excavated material via the road network, thereby reducing the number of HGV movements from the public road network during the construction phase.
- Where practicable, new bridge structures have been designed so that they can be built offline to avoid the need to close local roads for extended periods. Where offline construction is not possible, and space is available to do so, the existing road would be temporarily realigned to facilitate construction of new bridges.
- Following discussion with local authorities, and where possible, HGVs associated with construction of the project may be banned from using some local roads.
- Stockpile material within the Order Limits to allow material to be managed on-site rather than offsite, reducing the number of HGVs journeys needed.

14.3.2 Operations

Operational impacts

Traffic modelling has been carried out to predict the change in traffic flows on roads in the area, including those within or on the boundary with Tilbury St Chads ward for the first year of operation, 2029.

Figures 14.4, 14.6 and 14.8 below show the predicted changes in traffic in the morning peak (7am to 8am), interpeak (an average hour between 9am and 3pm) and evening peak (5pm to 6pm) measured in Passenger Car Units (PCUs per hour), where 1 PCU is equivalent to a car, and 2.5 PCUs is equivalent to an HGV. Figures 14.5, 14.7 and 14.9 below show the predicted percentage changes in traffic flow during the morning, interpeak and evening peak. For information about how we assessed operational traffic impacts, see chapter 1. For more information about how we carried out our traffic modelling, see chapter 4 of the Operations update.

The A1089 along the western boundary of the ward would experience an increase in traffic flows of between 50 and 250 PCUs northbound in the morning and evening peak hours. This would be less than a 10% change in flows. Southbound, the changes in flows would be less than 50 PCUs in each of the modelled hours. On Marshfoot Road westbound there would be an increase in traffic of between 50 and 250 PCUs in each of the modelled hours. This would be an increase of between 20% and 40% in the morning peak hour and an interpeak hour and more than a 40% increase in the evening peak hour. Eastbound there would be a decrease in traffic of between 50 and 250 PCUs in each of the modelled hours. This would be a decrease of between 20% and 40% in the morning peak hour and between 10% and 20% in the interpeak and evening peak hour.

On St Chad's Road the change in traffic flows would be less than 50 PCUs an hour in all modelled time periods in both directions. On Fort Road, north of the junction with Brennan Road, there would be a decrease in traffic flows of between 50 and 250 PCUs northbound in the evening peak hour. This would be a decrease of between 20% and 40%. Southbound, there would be an increase in traffic flows of between 50 and 250 PCUs in the morning and evening peak hours, which would be an increase in flows of over 40%.

Figure 14.4: Predicted change in traffic flows (PCUs) with the project during the morning peak in 2029

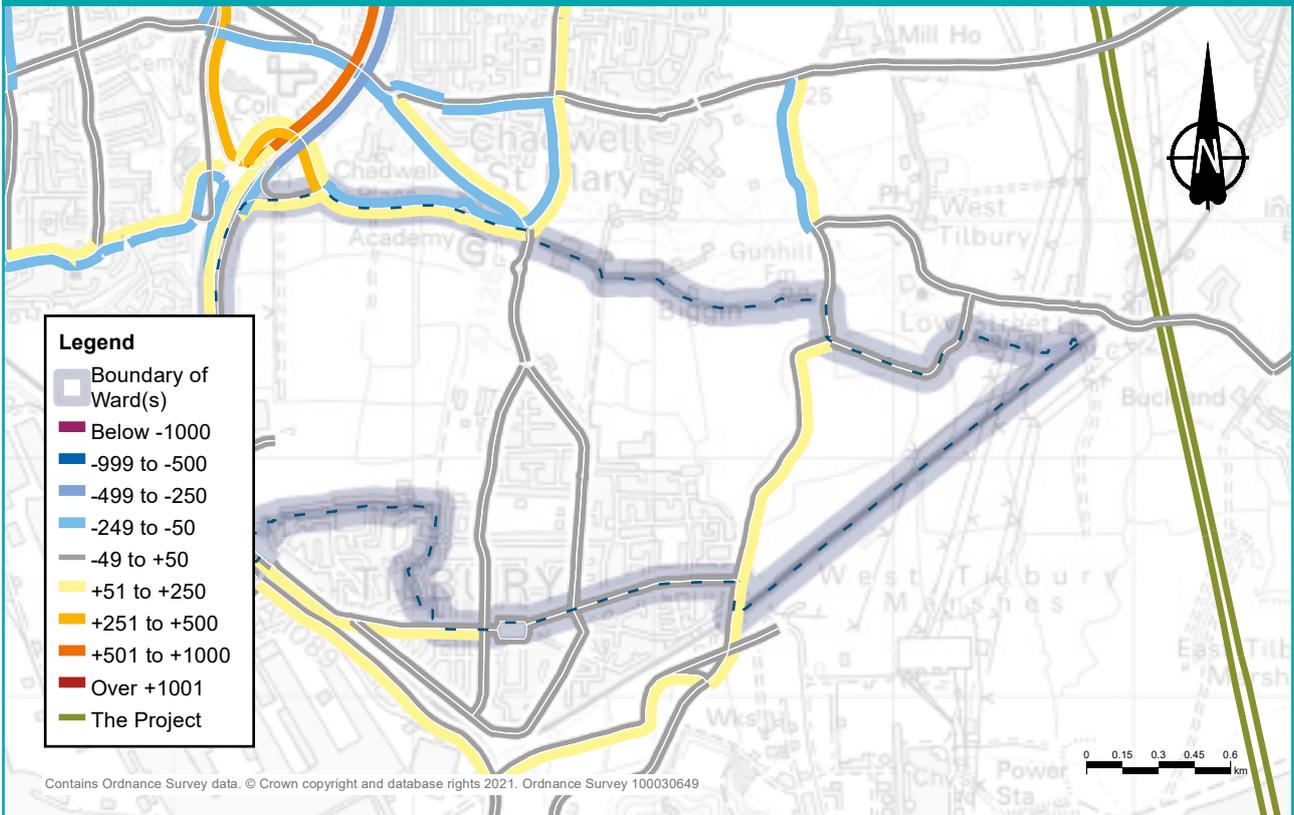


Figure 14.5: Predicted percentage changes to traffic flow during the morning peak in 2029

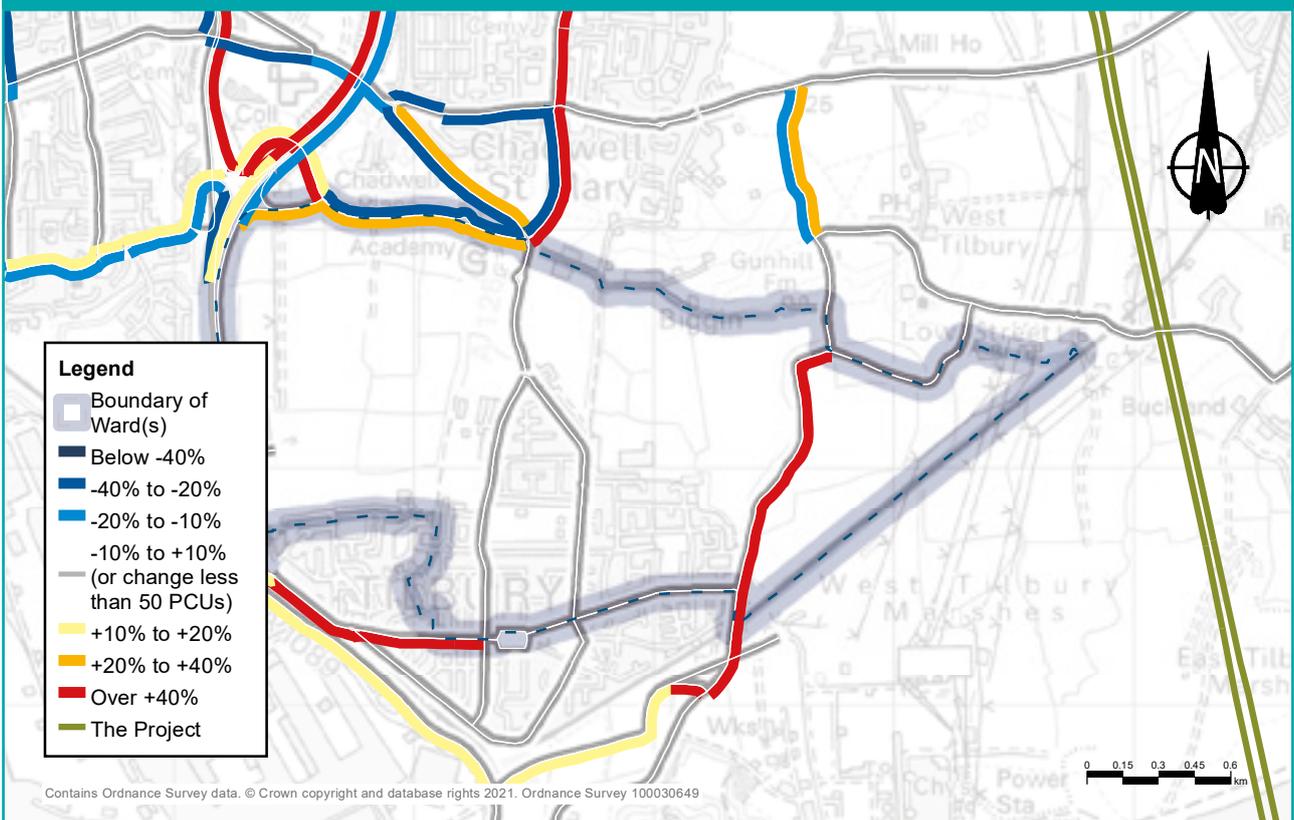


Figure 14.6: Predicted change in traffic flows (PCUs) with the project during the interpeak in 2029

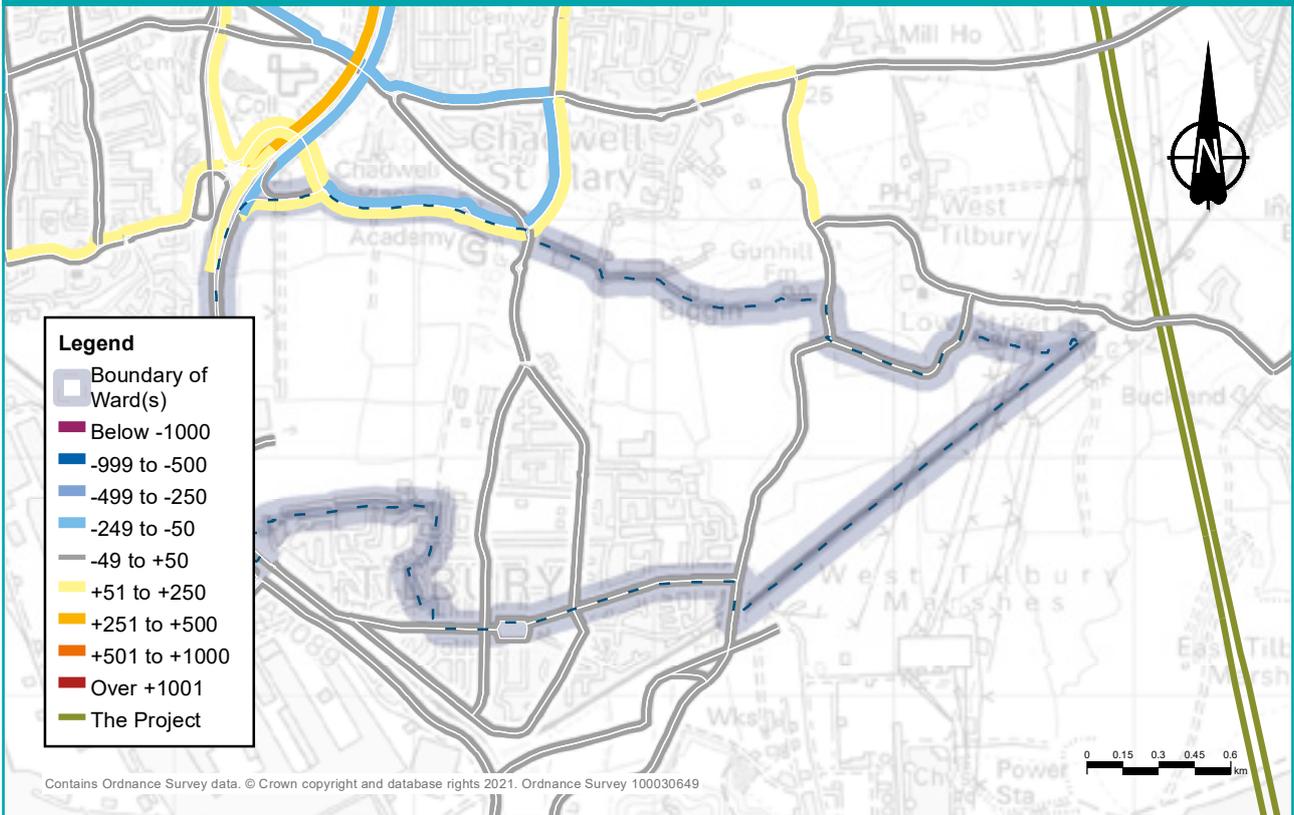


Figure 14.7: Predicted percentage changes to traffic flow during the interpeak in 2029

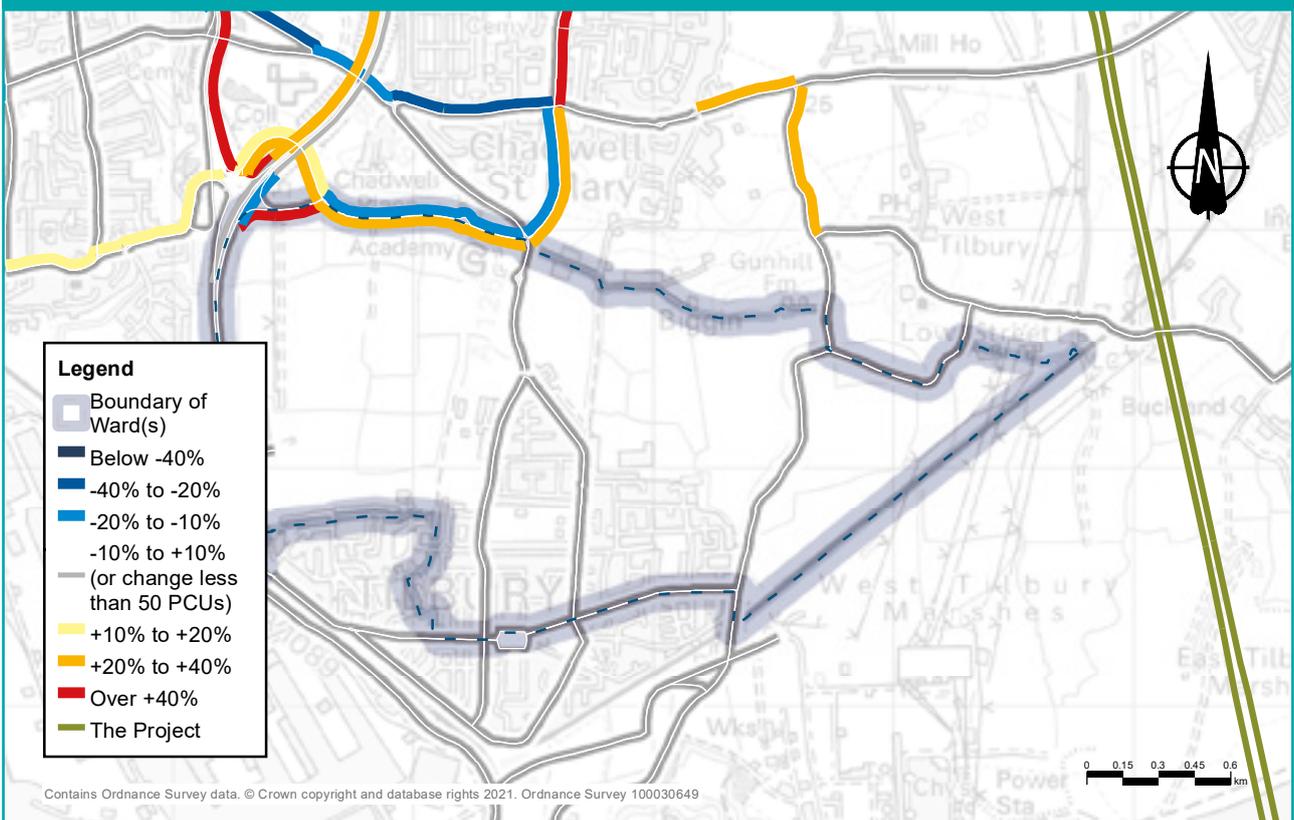


Figure 14.8: Predicted change in traffic flows (PCUs) with the project during the evening peak in 2029

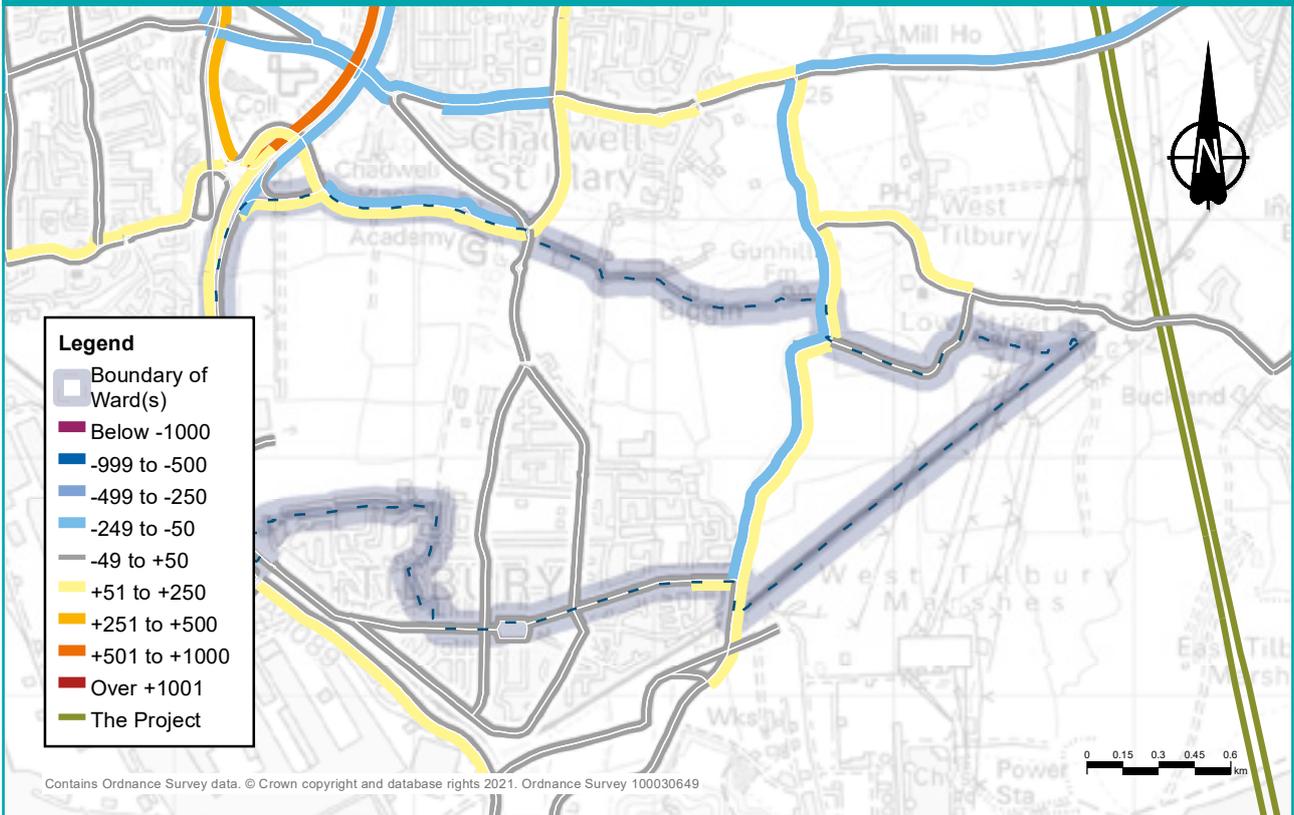


Figure 14.9: Predicted changes to percentage traffic flow during the evening peak in 2029

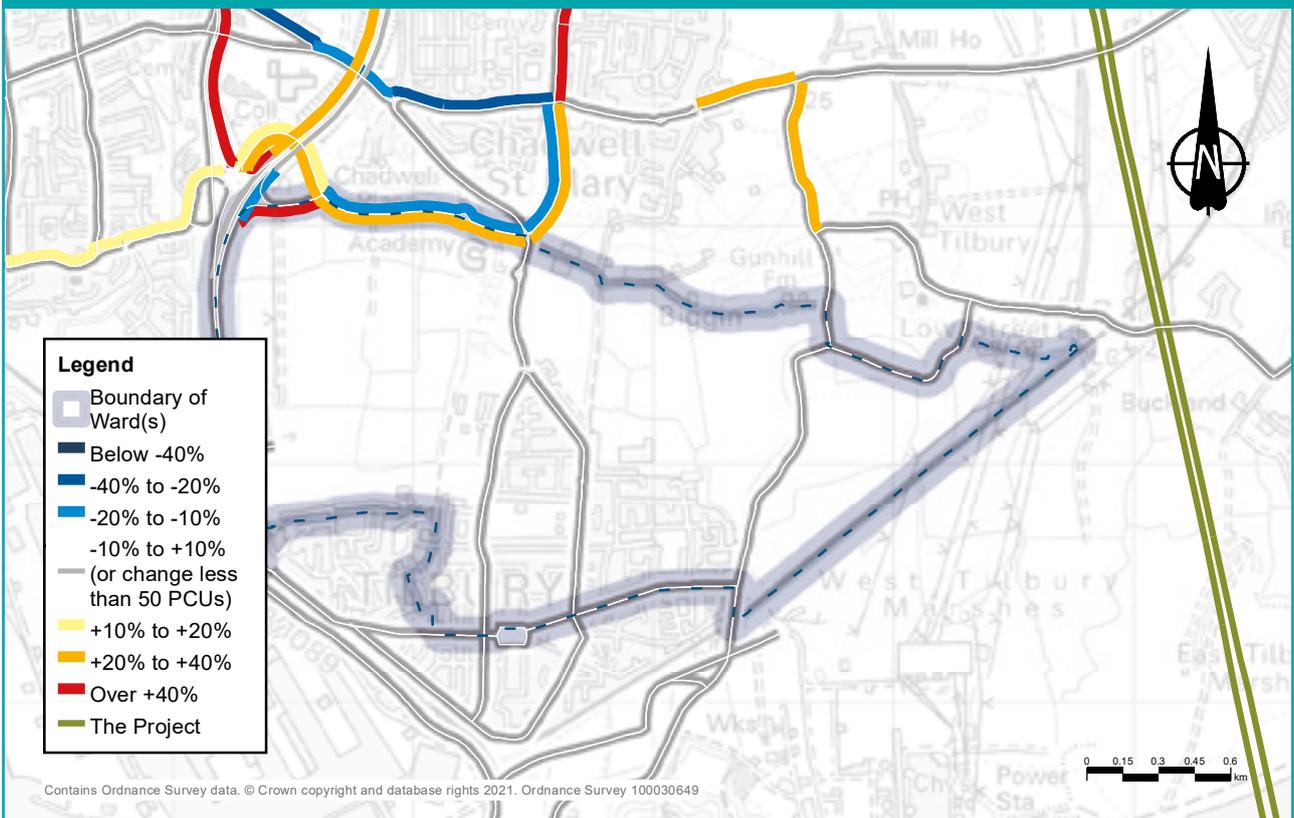
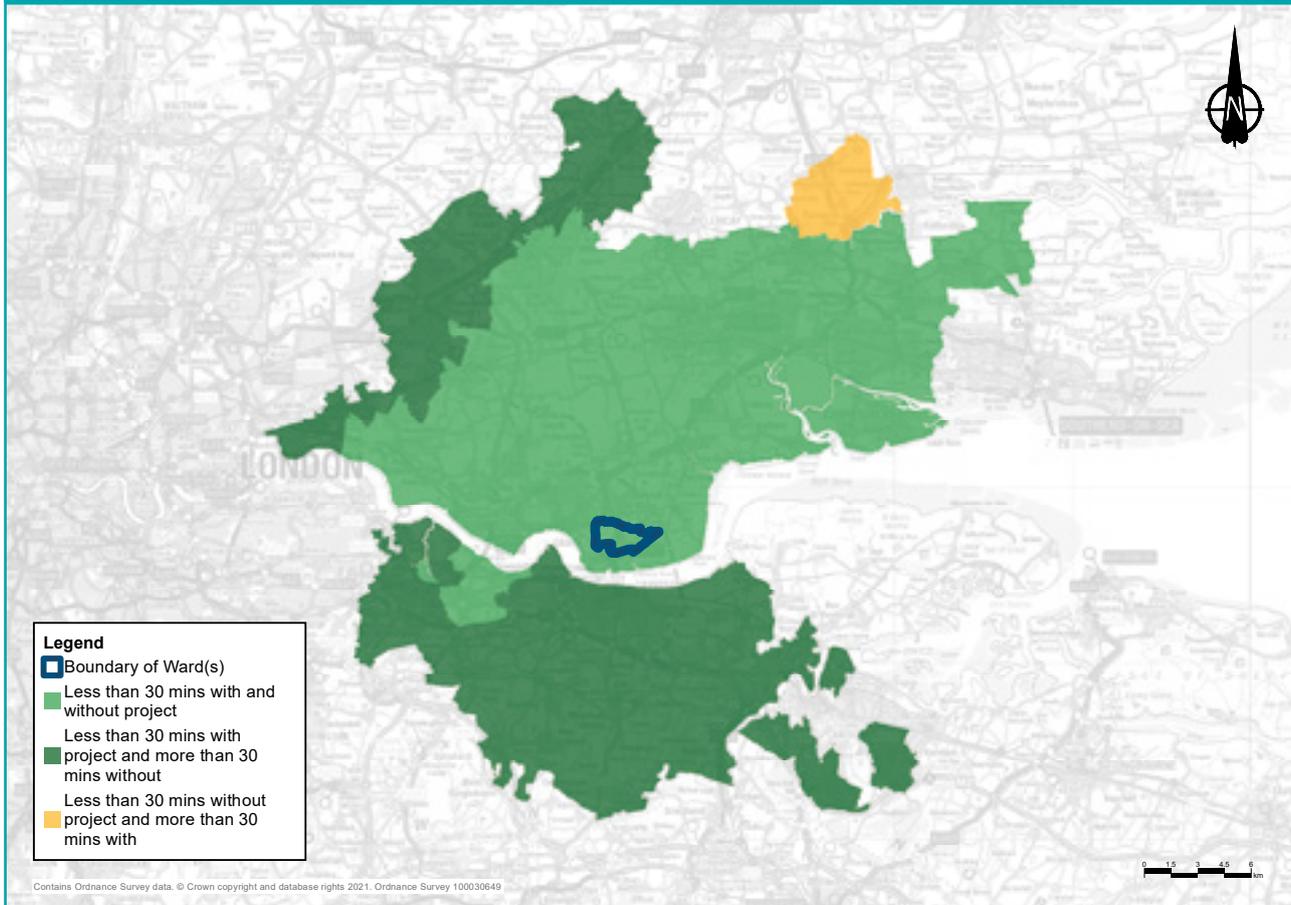


Figure 14.10: Change in area that motorists could drive to within 30 minutes from Tilbury St Chads ward



Changes to journey times

Figure 14.10 shows the change in the area that could be reached within a 30-minute drive time from the centre of the ward with and without the project. Figure 14.11 shows the change in areas within a 60-minute drive. The areas have been calculated for the morning peak hour (7am to 8am). The number of jobs within a 30-minute catchment area would increase by 81%, an additional 238,900 jobs, and within a 60-minute drive would increase by 26%, an additional 571,000 jobs.

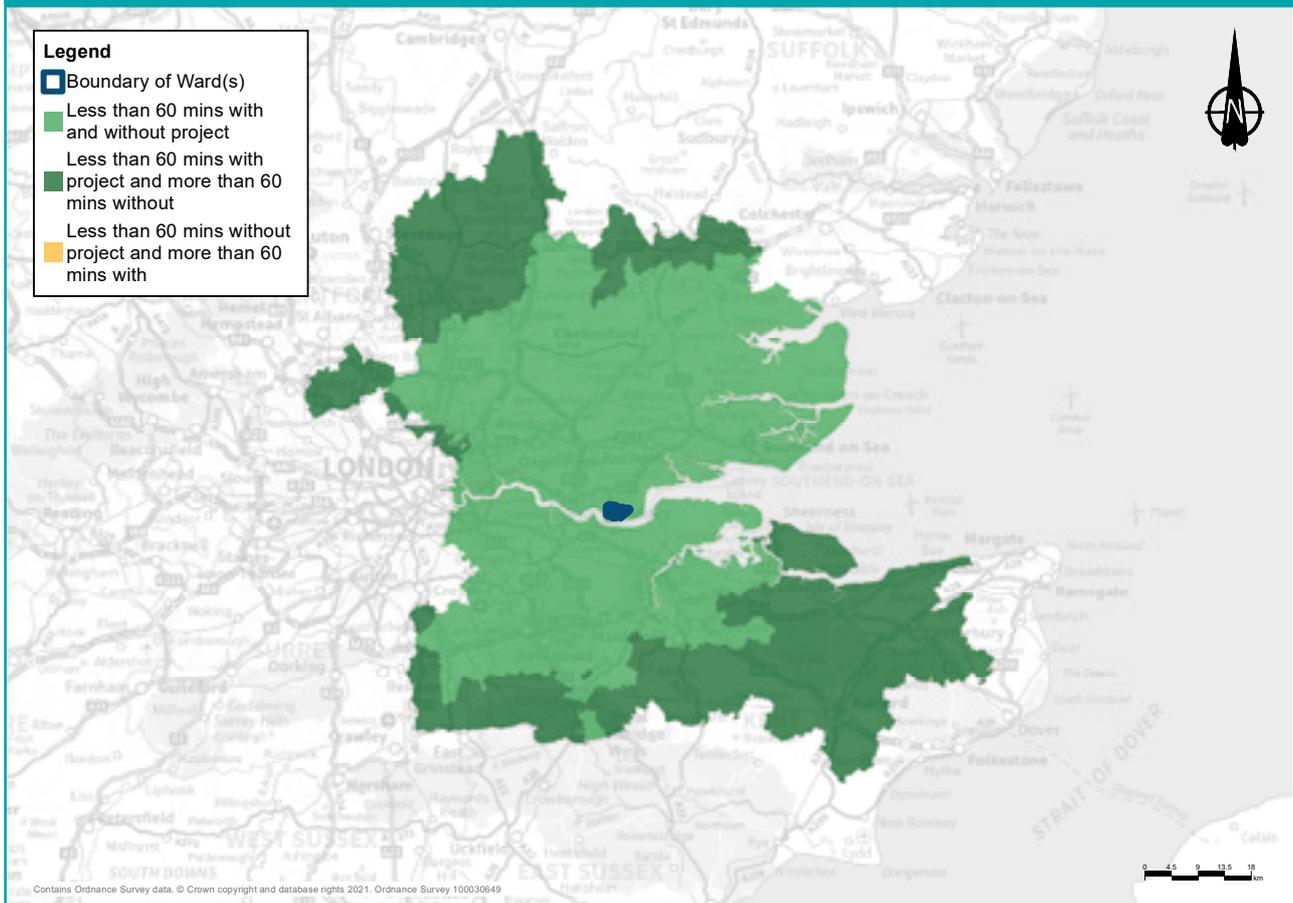
Operational traffic flow

The project has been designed to optimise its impacts on traffic, including the design of free-flowing connections with the M2/A2, A13/A1089 and the M25. In addition, the main route would have no traffic lights or roundabouts to ensure continuous traffic flow. Traffic lights or roundabouts would be necessary at some minor junctions away from the main route where traffic meets local roads. All new junctions would be designed to the latest safety standards, with high consideration for efficiency.

An iterative design process, including successive stages of traffic modelling and extensive consultation and engagement, has ensured that only the optimal links to the existing road network would be provided. For more information about how the project has developed, see the You said, we did consultation document.

Once the project is operational, traffic impacts on the affected road network would be monitored, including local roads. Where appropriate, we would work with the relevant highway authority to seek funding from the Department for Transport for further interventions.

Figure 14.11: Change in area that motorists could drive to within 60 minutes from Tilbury St Chads ward



14.4 Public transport

Existing situation

There are no railway stations within Tilbury St Chads ward but Tilbury Town station is nearby which provides c2c services between Essex and London Fenchurch Street.

There are a number of bus routes passing through or along the boundaries of Tilbury St Chads ward, including the 7A, 7B, 7C, 51, 66, 66A, 73, 73a, 77, 77a, 99, 475, Z1, Z2 and Z4.

14.4.1 Constructions

Rail

There would be a series of night time rail possessions of the Tilbury Loop railway line over a period of two months, in the adjacent East Tilbury ward, while the Tilbury Viaduct is constructed. These possessions would be agreed with the network operator. It is intended that the works would take place outside train operational times, and so services would not be disrupted.

Throughout construction there may be some increases in journey times to Tilbury Town station, associated with increased traffic through the area and traffic management on the local roads.

Buses

Traffic management measures may lead to increases in journey times for the 7A, 7B, 7C, 51, 66, 66A, 77, 77A, 99, 475 and Z1 bus routes.

14.4.2 Operations

Rail

There would be no discernible change in local access times to Tilbury Town station and no change to the rail services at that station. It would be quicker to access HS1 services at Ebbsfleet International Station, with the journey time decreasing by more than eight minutes in the morning and evening peaks.

Buses

There would be no required changes to bus routes through the ward once the project opens and no discernible predicted change to most bus journey times. The 73 bus runs from Tilbury through Grays to Lakeside Shopping Centre, and predicted journey times westbound in the morning peak hour would decrease by around two minutes.

14.5 Footpaths, bridleways and cycle routes

There are no footpaths, bridleways or cycle routes in Tilbury St Chads ward, so there would be no construction or operational impacts. For other potential impacts, see the other topic areas in this chapter, such as Visual, and Noise and vibration.

14.6 Visual

Existing situation

More information about how the area would look during construction, including visualisations, can be found in the Construction update.

Views towards the land on which the project would be built are limited to the eastern edge of Tilbury and open access land on Parsonage Common in the east of the ward.

Current views from the eastern edge of Tilbury overlook West Tilbury, bounded by the Chadwell escarpment and vegetation along the Tilbury Loop line, are dominated by overhead power lines.

14.6.1 Construction

Construction impacts

The main construction activities likely to be seen in this ward are:

- Formation and operation of the Northern Tunnel Entrance Compound
- Diversion and undergrounding of overhead power lines
- Construction of Tilbury Viaduct

Further information on our construction activities is provided in the Project description section above.

Any views of construction activity from properties on the eastern edge of Tilbury are likely to be partially screened by vegetation along Tilbury Loop line and limited to distant views of taller structures within the Northern Tunnel Entrance Compound.

Overhead power line diversion work and the construction of Tilbury Viaduct may also be visible from these properties. There would be similar views from Parsonage Common.

Measures to reduce visual impacts of construction

Given the limited views of the project from this ward, no specific mitigation measures are considered necessary.

The visual impacts of the project would be controlled through the range of good practice measures set out in the project's CoCP and the REAC. See chapter 1 of the Construction update for more information about this and the project's other control documents.

14.6.2 Operations

Operational impacts

By the time the new road opens in 2029, Tilbury Viaduct and the overhead power line diversions would be complete and much of the former Northern Tunnel Entrance Compound would be reinstated to support the required end use, or returned to agricultural use.

Further information about the completed project is provided in the Overview section above.

There is likely to be very limited visual impact from the project on residential properties on the eastern edge of Tilbury. However, there would be distant partial views of Tilbury Viaduct while the overhead power line diversions would not noticeably alter the character of the views. There would be a similar change to views from Parsonage Common.

Measures to reduce visual impacts of the operational project

The landscaping along the Lower Thames Crossing corridor would be the primary measure in this ward, helping to integrate the new road into the surrounding landscape.

14.7 Noise and vibration

We have carried out noise and vibration assessments for both the construction and operational phases of the project. As explained in chapter 1, some of the assessments set out below are based on earlier versions of the project. The information provided still presents a reasonable representation of the likely effects from the proposals presented during this consultation.

Existing situation

The existing noise environment in Tilbury St Chads ward is mainly a result of traffic noise from the A126 and the A1089. There is also noise from railways, and other human activities.

It is further noted that the operational Tilbury docks are located immediately to the south of this ward, with the main access route of the A1089 being within the ward, forming the western ward boundary.

As part of our environmental assessment process, we carried out surveys of existing background noise in close proximity to the Tilbury St Chads ward, the nearest ones being in the adjacent ward of East Tilbury and Tilbury Riverside and Thurrock Park which are representative of residential receptors within this ward.

To understand how noise levels would vary with and without the project, we used noise modelling to predict what noise levels would be like in the project's proposed opening year if the project was not built. We modelled this because we cannot assume that noise levels in the future will be the same as they are now. For example, our assessment of the opening year noise levels accounts for predicted changes in traffic levels.

We also modelled the predicted noise levels for the opening year with the project in place. This provides a useful comparison as to how the project would change the noise levels in the project's opening year if it were implemented.

In the opening year (2029), noise levels without the project are predicted to range, on average, from 41 to 71 dB(A) during the day and from 30 to 57 dB(A)² during the night at the identified locations within the ward. Our noise assessments predict that by opening year noise levels would increase compared to the existing situation, even if the road is not built. Information about how noise levels would change with the project in place, during its construction and operation, are presented below.

14.7.1 Construction

Daytime construction noise impacts

The main construction activities expected to create a slight increase in noise in this ward are those associated with northern tunnel construction and utilities works.

There would be no main works compounds or Utility Logistics Hubs in Tilbury St Chads ward.

Although not located within the ward, Northern Tunnel Entrance Compound, Northern Tunnel Entrance Compound A and Low Street Lane Utility Hub may contribute to the noise impacts experienced within this ward due to how close they are to the ward boundary.

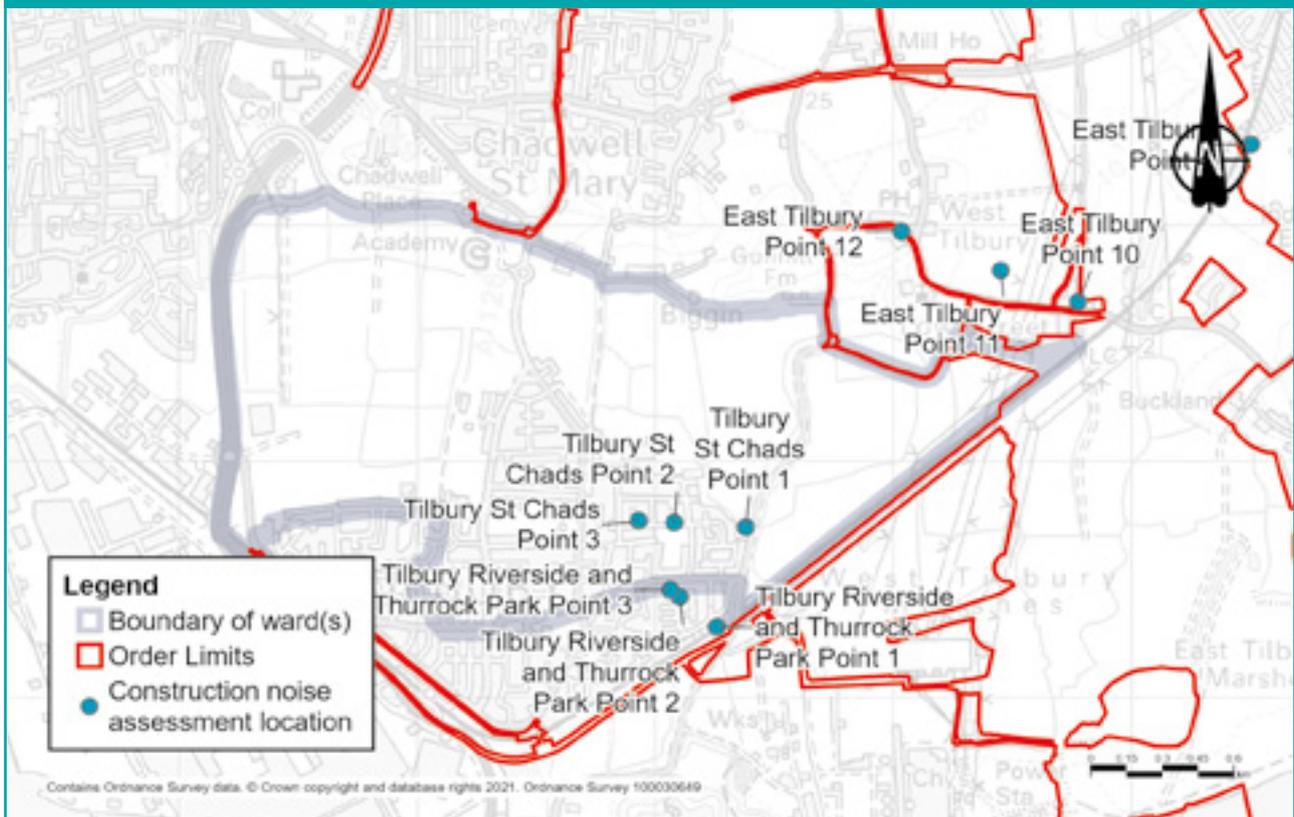
There are no haul roads proposed to be built and used during the construction period with the ward.

No percussive or vibratory works are proposed within the ward.

Construction noise levels have been predicted at three locations across this ward. These locations have been chosen to provide a representative level of the noise communities are expected to experience during construction. For more information about how we carried out these assessments, see chapter 1.

2 Decibel (dB) is the unit used to measure noise levels, with dB(A) being a standardised way of averaging noise levels that accounts for how humans hear sounds. The typical level of sounds in the environment ranges from 30 dB(A), which is a quiet night-time level in a bedroom, to 90 dB(A), which is how it would sound by a busy road. See chapter 1 for more information about what decibel levels mean.

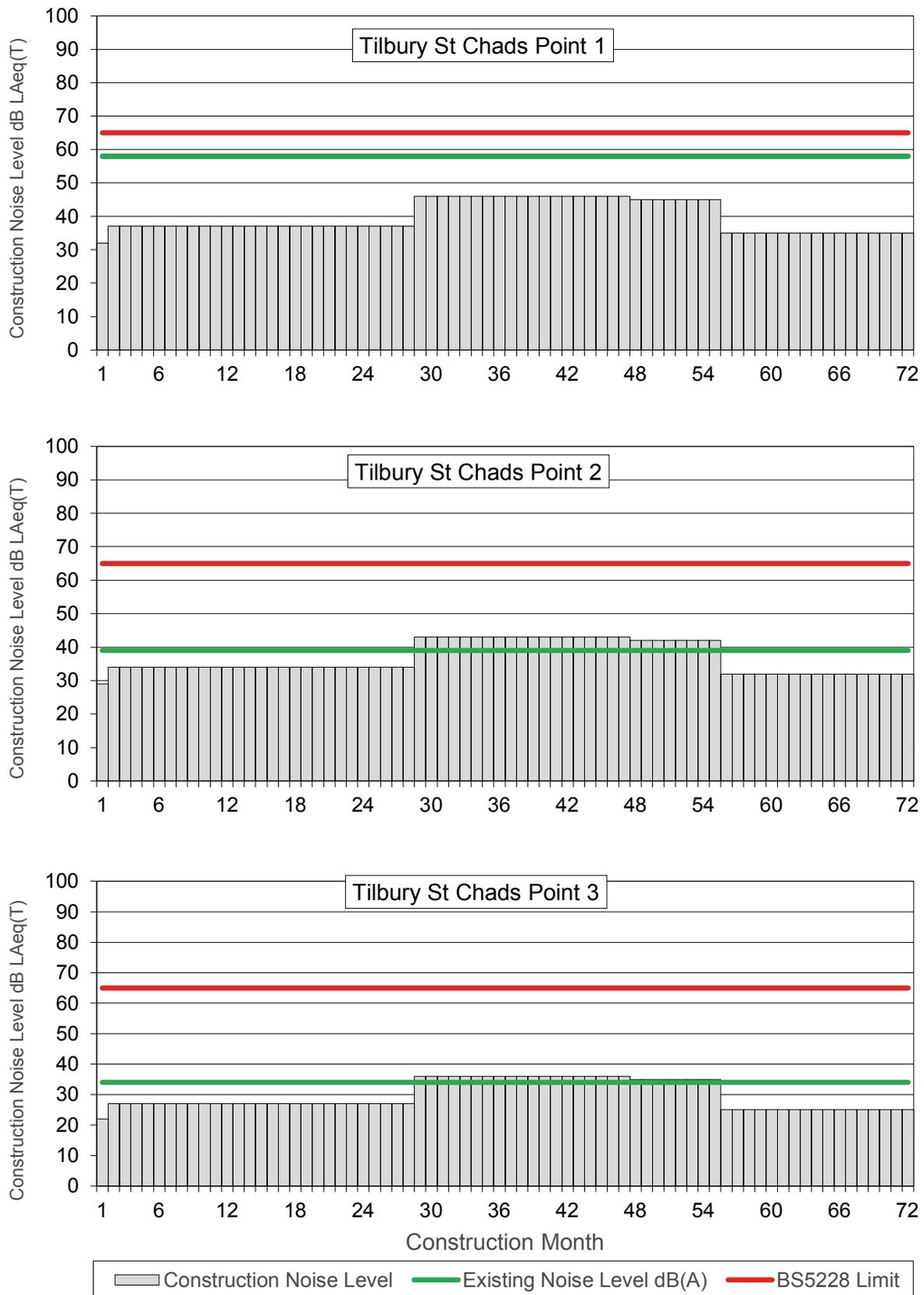
Figure 14.12: Construction noise assessment locations in Tilbury St Chads ward



Noise levels are shown using the standard units for major projects, dB LAeq(12 hour), which represent the average noise level for the assessed 12-hour daytime period. While there might be short-term noises that are louder than the noise level shown during the assessed period, the averaged figure provides a fair representation of what the overall noise impacts would be.

Figure 14.12 shows the locations at which we have predicted the daytime construction noise during the project's construction phase.

Figure 14.13: Construction noise by month for points 1, 2 and 3 in Tilbury St Chads ward



Each vertical bar in figure 14.13 shows the predicted noise levels for that month of the construction period (from month 1-72). The horizontal green line in each chart represents the existing background noise level at each assessment point without the project. The horizontal red line shows the level at which construction noise would exceed the BS threshold (see chapter 1 for more information about these thresholds). If noise is predicted to exceed acceptable levels, then specific measures would be implemented to reduce the noise.

The predicted construction noise levels show that higher noise levels and disturbance would be experienced closer to construction activity. Levels gradually diminish as a result of increased distance and additional buildings, and other features screening the noise from more distant residential areas.

With reference to figure 14.13 the following summarises the noise level changes over the construction period for points 1 to 3:

- At point 1, construction noise levels are predicted to range from 32 to 46dB LAeq(12hour) during the six-year construction programme. Construction noise levels are not predicted to exceed the existing background noise levels at this assessment location.
- At point 2, construction noise levels are predicted to range from 29 to 43 dB LAeq(12hour) during the six-year construction programme. Construction noise levels would exceed the existing background daytime noise level for approximately 27 months. However, they would not breach the defined threshold.
- At point 3, construction noise levels are predicted to range from 22 to 36 dBLAeq(12hour) during the six-year construction programme. Construction noise levels would exceed the existing background daytime noise level for approximately 27 months. However, they would not breach the defined threshold.

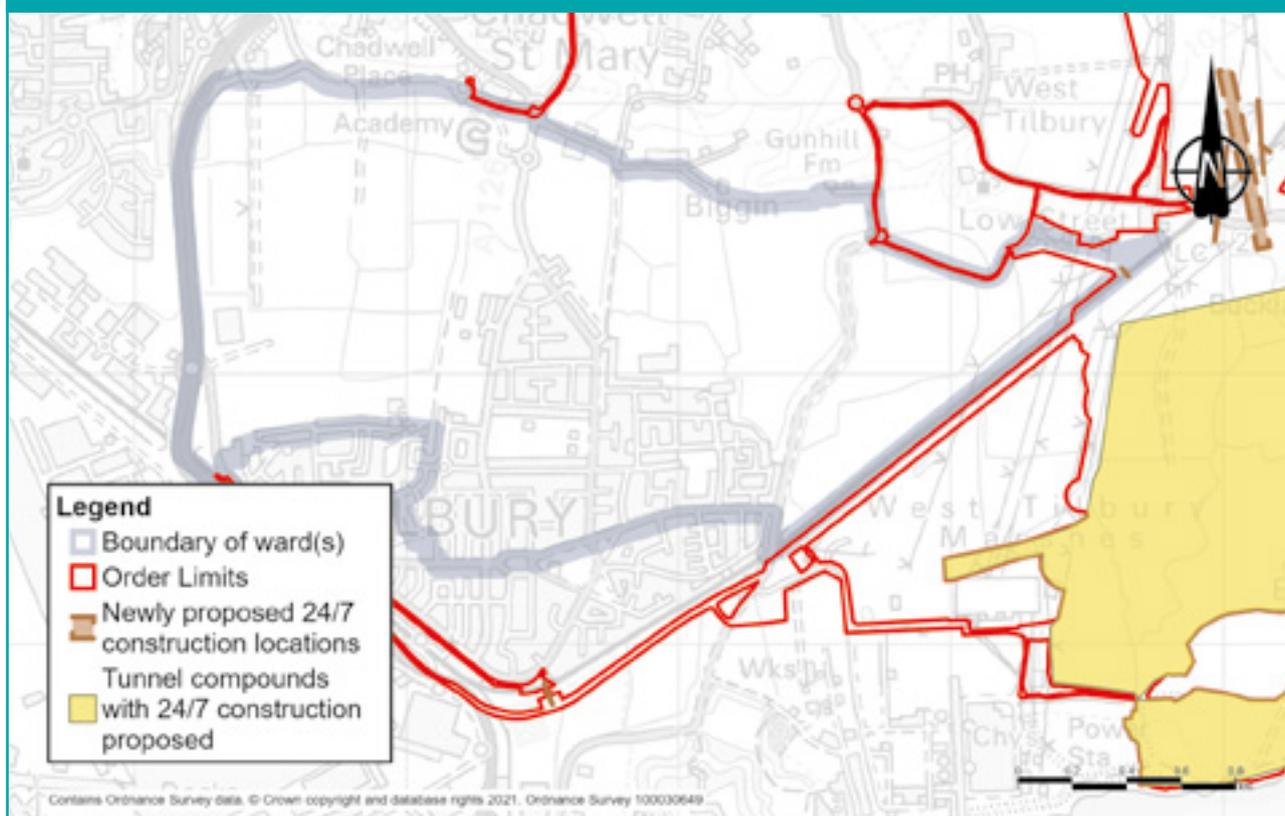
24/7 construction working

In addition to the changes to the daytime noise impacts reported in the section above, 24-hour seven-day construction working is proposed close to the ward at the locations shown in figure 14.14.

These works have been identified as they may need to be undertaken at night to maintain safety and reduce disruption to road, railway and utility networks. Construction would be required 24/7 within the Northern Tunnel Entrance Compound.

These works could have an impact on local communities, and we would work with the local authority to manage these impacts.

Figure 14.14: Newly proposed and tunnel 24/7 working locations in Tilbury St Chads ward



Construction traffic noise impacts

Maps showing the predicted change in road traffic noise within this ward during each year of construction can be found in chapter 7 of the Construction update. Based on the currently available traffic data (which offers a representative picture of what receptors within the ward are likely to experience) during the construction period there would be negligible changes in road traffic noise (less than 1dB change in noise levels) during all construction years. The exception would be along Coopers Shaw Road where minor increases in noise levels (increase of greater than 1dB but less than 3dB in noise levels) have been predicted. For more information about how we define noise impacts (negligible, minor, moderate and major), see chapter 1.

Table 14.4: Construction traffic noise impacts in Tilbury St Chads ward

Affected road(s)	Predicted noise impact	Construction year(s)
Coopers Shaw Road (which forms the boundary with the East Tilbury Ward)	Minor increase in noise levels	2, 3, 4 and 5

Measures to reduce construction noise and vibration

Construction noise levels would be controlled by using Best Available Techniques (BAT), with specific measures used at certain locations such as:

- Installing and maintaining hoarding around the construction compounds.
- Installing temporary acoustic screening around the construction areas likely to generate noise.
- Keeping site access routes in good condition with condition assessments onsite to inspect for defects such as potholes.
- Turning off plant and machinery when not in use.
- Maintaining all vehicles and mobile plant so that loose body fittings or exhausts do not rattle or vibrate.
- Using silenced equipment where available, in particular silenced power generators and pumps.
- No outdoor music or radios would be played onsite for entertainment.

- Site layout would be planned to ensure that reversing is kept to a practicable minimum. Necessary reversing manoeuvres would be managed by a trained banksman/vehicle marshal to ensure they are conducted safely and concluded quickly to reduce the noise from vehicle reversing warnings.
- Non-percussive demolition techniques would be used where possible to reduce noise and vibration impact.
- Careful consideration of the location and layout of compounds to separate noise-generating equipment from sensitive receptors, and the use of mains electricity rather than generators, where possible.
- Minimisation of construction vehicle traffic by, where practicable, selection of local suppliers along the project route, using local workforces and by minimising material transportation for earthworks construction along the project.

All control measures, including those above, fall under the principles of BAT and are secured in the REAC. For more information, see the sections NV001 to NV010 which set out how we would work under the supervision of the relevant local authorities to implement noise-reduction measures where appropriate.

The CoCP sets out additional measures that would be implemented to reduce noise and vibration during the construction period.

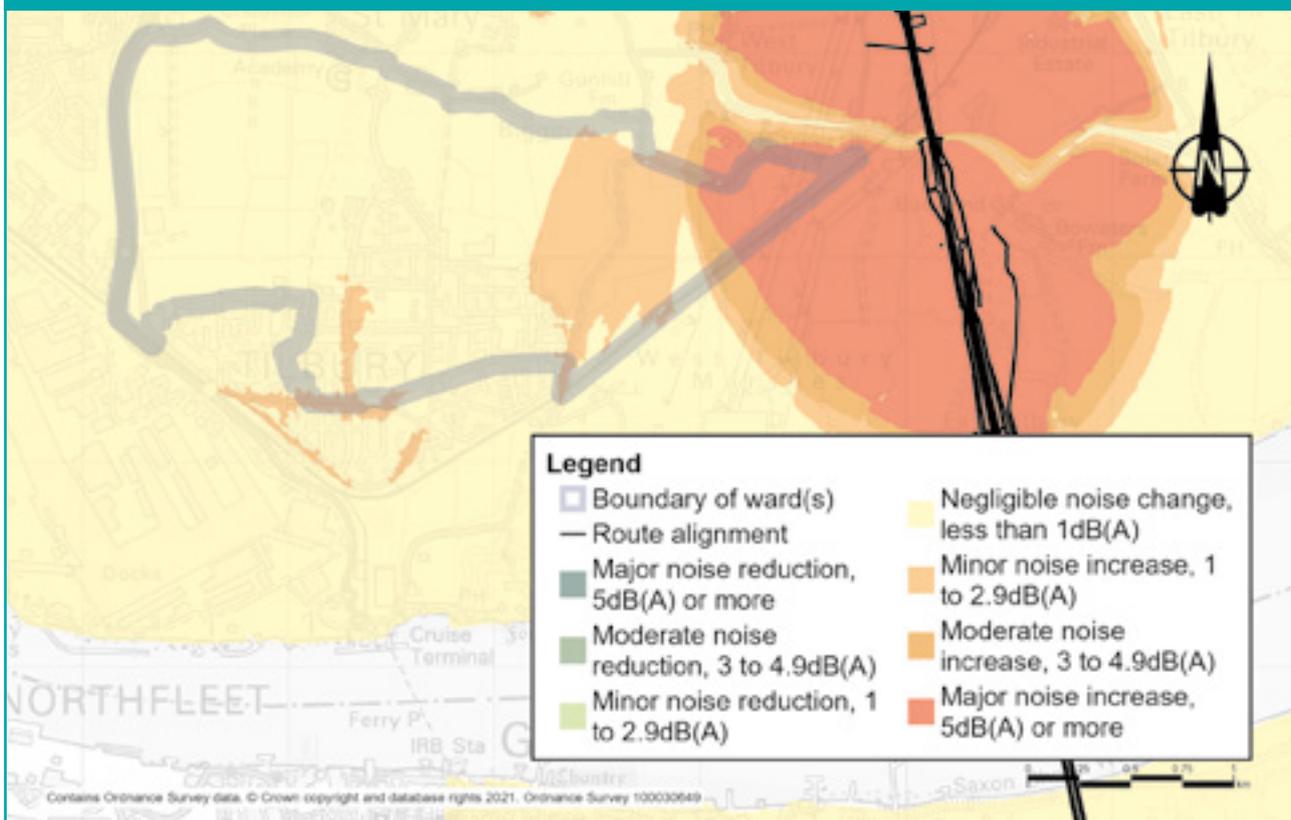
14.7.2 Operations

Operational impacts

This ward is located approximately 400 metres to the west of the project route. Direct noise impacts from the main route of the project would be confined to the eastern edge of the ward. There would also be indirect noise impact as a result of changes in traffic flow, the number of HGVs, and traffic speed on the existing road network within the ward.

Figure 14.15 shows the predicted changes in road traffic noise in the opening year of the project. Within the ward, changes in road traffic noise at identified noise sensitive receptors are predicted to range from negligible reductions of less than 1dB to major increases in noise levels of greater than 5dB. For more information about how we define noise impacts (negligible, minor, moderate, major), see chapter 1.

Figure 14.15: Noise impacts during operation in Tilbury St Chads ward



Measures to reduce noise and vibration during operations

The main methods of controlling noise would be, where practicable, to design the road within landscaped features such as cuttings and bunds (walls of earth). However, where noise impacts are greatest we would install noise barriers (typically, wooden fences) in addition to these earthworks features. While no noise barriers are proposed within Tilbury St Chads ward, there are noise barriers proposed in neighbouring wards that would mitigate impacts in the ward, which are shown in chapter 5 of the Operation update. The use of low-noise surfacing would also reduce the traffic noise once the road is in use.

For more information about the proposed measures to reduce operational noise see the REAC (including references NV011 and NV013).

14.8 Air quality

We have carried out air quality assessments for both the construction and operational phases of the project. As explained in chapter 1, some of the assessments set out here are based on earlier versions of the project. The information provided here still presents a reasonable representation of the likely effects from the proposals presented during this consultation.

Existing situation

Within Tilbury St Chads ward, the Thurrock AQMA No.24 has been declared an Air Quality Management Area (AQMA) due to yearly levels of air borne pollution above accepted standards. AQMAs are areas that have been identified by local authorities as areas of poor air quality that require additional monitoring and controls. No other areas within the ward have been identified as AQMA.

14.8.1 Construction

Construction impacts

Construction activities have the potential to affect nearby air quality through the release of dust and emissions from construction equipment and traffic. The areas most likely to be affected are those close to haul roads, compounds and soil storage areas.

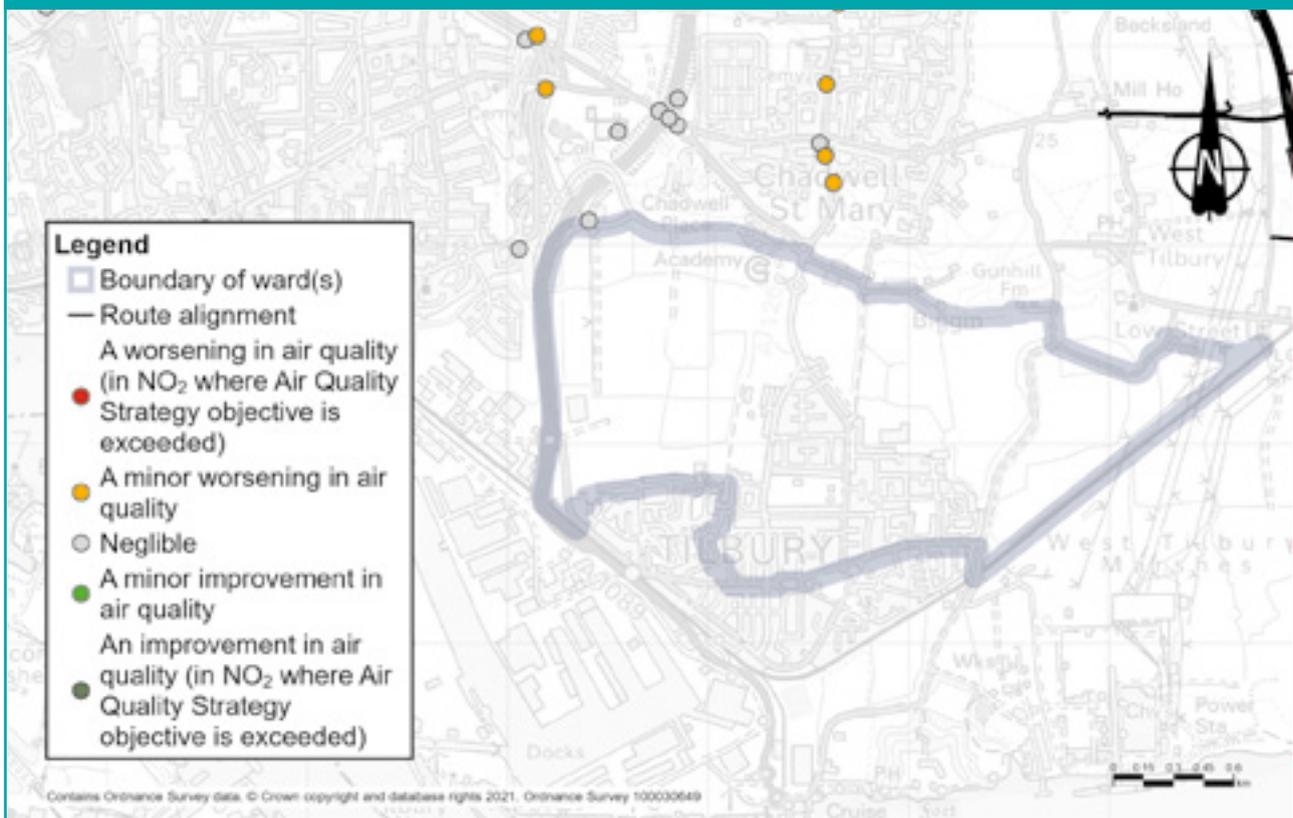
Properties more than 200 metres from the worksite, which is the majority of properties within this ward, are outside the area likely to be affected by construction dust or emissions from the worksite. In this ward, there are only a few properties within 200 metres of the worksite including those to the south of Chadwell St Mary. Air quality impacts on these properties during construction would be temporary and we would put in place measures to minimise the dust impacts (see below). The proposed measures to reduce dust and emissions are ones that have been proven to be effective when used on similar construction projects in the past. The change in air quality during the construction phase would be negligible, and there would be no discernible effect on health.

Our analysis of construction traffic predicts that the impact on most roads in this ward would be negligible, there would not be any changes in air quality in the area as a result of the traffic management in place from 2024 to 2029. More information about construction traffic impacts on air quality can be found in chapter 7 of the Construction update.

Measures to reduce air quality impacts of construction

The impact of construction machinery and traffic on air quality would be controlled through the range of good practice measures set out in the CoCP and the REAC. For example, there would be measures to suppress dust, such as damping down dry haul roads and spoil heaps, as well as the use of low-emission machinery and vehicles. We would put in place an air quality management plan to ensure the measures set out in the CoCP and the REAC would effectively monitor and control dust and exhaust emissions. The location and type of monitoring would be submitted in advance to Thurrock Council for consultation (see REAC reference AQ006).

Figure 14.16: Predicted changes in NO₂ levels within Tilbury St Chads ward once the new road is open



14.8.2 Operations

Operational impacts

We have carried out an assessment of the operational impacts of the new road on air quality. The assessment area includes a 200-metre buffer around the roads within the affected road network, with this area being the most likely to experience changes to air quality as a result of the new road. More information about air quality impacts once the road is open can be found in chapter 5 of the Operations update.

There are receptors (properties or habitats which are sensitive to changes in air quality) within the ward, close to the A1089 that are predicted to experience a negligible change in the air quality for nitrogen dioxide (NO₂), the main traffic-related pollutant³. The highest modelled yearly average NO₂ concentration within this ward is 22.2 µg/m³, which is well below the yearly average threshold of 40µg/m³. Our assessment is based on our opening year model, which represents a worst case scenario, without accounting for the increase in less polluting vehicles on our roads over time.

Furthermore, local air quality data shows an overall downward trend in NO₂ over recent years, which means that future air quality improvements at this location are likely (for example, through increased adoption of electric vehicles meaning a reduction in exhaust emissions).

In addition to our assessment of NO₂, we predict that PM₁₀ levels (small particles of dust, mainly from vehicle exhausts and brakes) are unlikely to exceed threshold levels across the assessed area.

Measures to reduce air quality impacts during operation

The assessed air quality impacts in this area, as a result of the project, would not trigger the need for additional monitoring or other mitigation measures once the road is open.

³ NO₂ levels are measured in 'micrograms per cubic metre', or µg/m³, where a microgram is one millionth of a gram.

14.9 Health

Existing situation

A range of personal, social, economic and environmental factors influence our health. Different groups within the population may be more sensitive to these factors than others – for example, children, older people or those with pre-existing health conditions.

Tilbury St Chads is characterised by a younger population with a relative high proportion of residents aged under 16 when compared to Thurrock and England as a whole, 28.4%, 24.2% and 20.3% respectively. The ward has a relatively high ethnically diverse population compared to other Thurrock wards and has a high concentration of residents for whom English is not their main language.

Parts of the ward are within the top 10% most deprived areas in England. Economic activity rates are the lowest of all Thurrock wards, and number of benefit claimants are higher in Tilbury St Chads when compared to Thurrock, and higher than for England as a whole. The ward has a very high proportion of residents within social grade D and E compared to Thurrock and England as a whole, 40.8%, 27.0% and 24.7% respectively. Tilbury St Chads also has a higher proportion of socially rented housing compared to Thurrock and England as a whole, 36.8%, 14.1% and 16.8% respectively

The ward has high rates of long-term health problems. In addition, Tilbury St Chads residents report high rates of self-reported bad health at 6.7%, compared to 4.7% for Thurrock as a whole. Tilbury St Chads also has a high proportion of residents who state that their day-to-day activities are limited a lot, compared to Thurrock and England as a whole, 8.8%, 7.2% and 8.3% respectively. Regarding deaths from all causes, there are high death rates from respiratory diseases and from cancer compared to Thurrock and England as a whole. The ward also has a high proportion of households without access to a car or van at 28.6% compared to 20.1% across Thurrock as a whole.

14.9.1 Construction

Construction impacts

Construction activities affecting Tilbury St Chads residents are presented in the Project description section. Only a small section of the project's Order Limits lies within Tilbury St Chads ward and little construction activity would take place within this ward, relative to neighbouring wards. A proposed temporary access for utility companies would be built along the eastern boundary of the ward parallel to the railway line, while an area at the north-eastern edge of Tilbury St Chads ward would be used for utility works. Further information about the utility works within Tilbury St Chads can be found in the Construction update.

Elements of all these activities have the potential to affect human health, whether through noise associated with construction activities or construction traffic, air quality (as a result of dust emissions), severance caused by construction traffic, road or footpath closures, or through impacts on mental health and wellbeing.

There are both positive and negative potential impacts on people's health and wellbeing as a result of construction. Through good communications and engagement, providing people with information about when construction works would be taking place and its impacts, the negative impacts on people's mental health and wellbeing would be reduced. Equally, some residents would see health and wellbeing benefits from improved access to work and training opportunities presented by construction activities (see the Traffic impacts section). Good mental health is a key influence on employability, finding a job and remaining in that job. Unemployment causes stress, which ultimately has long-term physiological health effects and can have negative consequences for people's mental health, including depression, anxiety and lower self-esteem.

As highlighted at the outset of this section, different groups of people within the population may be more sensitive to factors which potentially affect their health than others. Some of the changes identified as a result of construction activities may therefore only affect a small proportion of the population. Impacts may include:

- Changes in accessibility. This may be the case for people who are more dependent on public transport and have less choice about method and route travelled.
- Changes in access to open space. Much of the local footpath network to the east of the urban area of Tilbury would be temporarily closed during construction. People without access to private cars would have access to fewer alternatives.
- There are few properties in the Tilbury St Chads ward within 200 metres from the Order Limits and are therefore unlikely to be affected by dust or emissions from construction. However, properties within 200 metres may experience air quality changes as a result of increased dust and emissions from the nearby construction activities.

Measures to reduce impacts on health during operation

Proposed measures relating to health and wellbeing (including good practice for dust emissions, hours of working and visual screening) are described in this chapter in the Visual, Noise and vibration, and Air quality sections above. Further information relating to mitigation measures for these areas is set out in the Code of Construction Practice (CoCP), the Register of Environmental Actions and Commitments (REAC) and the package of traffic management plans. The commitments in the REAC include items such as adhering to Best Practicable Means (BPM) to reduce noise impacts (see NV007 in the REAC) and dust-management good practice (see AQ005 in the REAC). See chapter 1 of the Construction update for more information about this and the project's other control documents.

Engagement and effective two-way communication with communities, both prior to and during construction, by providing information about the programme and impact of works is important to reduce mental health and wellbeing impacts associated with uncertainty, stress and anxiety. The CoCP sets out proposals for community engagement, including how we would make sure that communities, stakeholders and any affected parties are kept informed of the construction works, their progress and associated programme.

14.9.2 Operations

Operational impacts

Information about the operational project in this ward is provided in the Project description above.

The assessments undertaken for air quality has shown that no adverse impacts are anticipated as a result of the project for people in the Tilbury St Chads ward. Noise impacts are predicted in the eastern edge of the ward.

A proportion of residents may also experience positive health benefits through accessibility improvements, better access to educational opportunities (specifically with further education colleges and primary schools), better access to employment opportunities and to open space, including new recreational areas outside Tilbury St Chads.

Measures to reduce health impacts of the operational project

Mitigation measures to address noise and visual impacts have been described above. No further impacts relating to health have been identified for this ward and consequently no specific additional measures are required.

14.10 Biodiversity

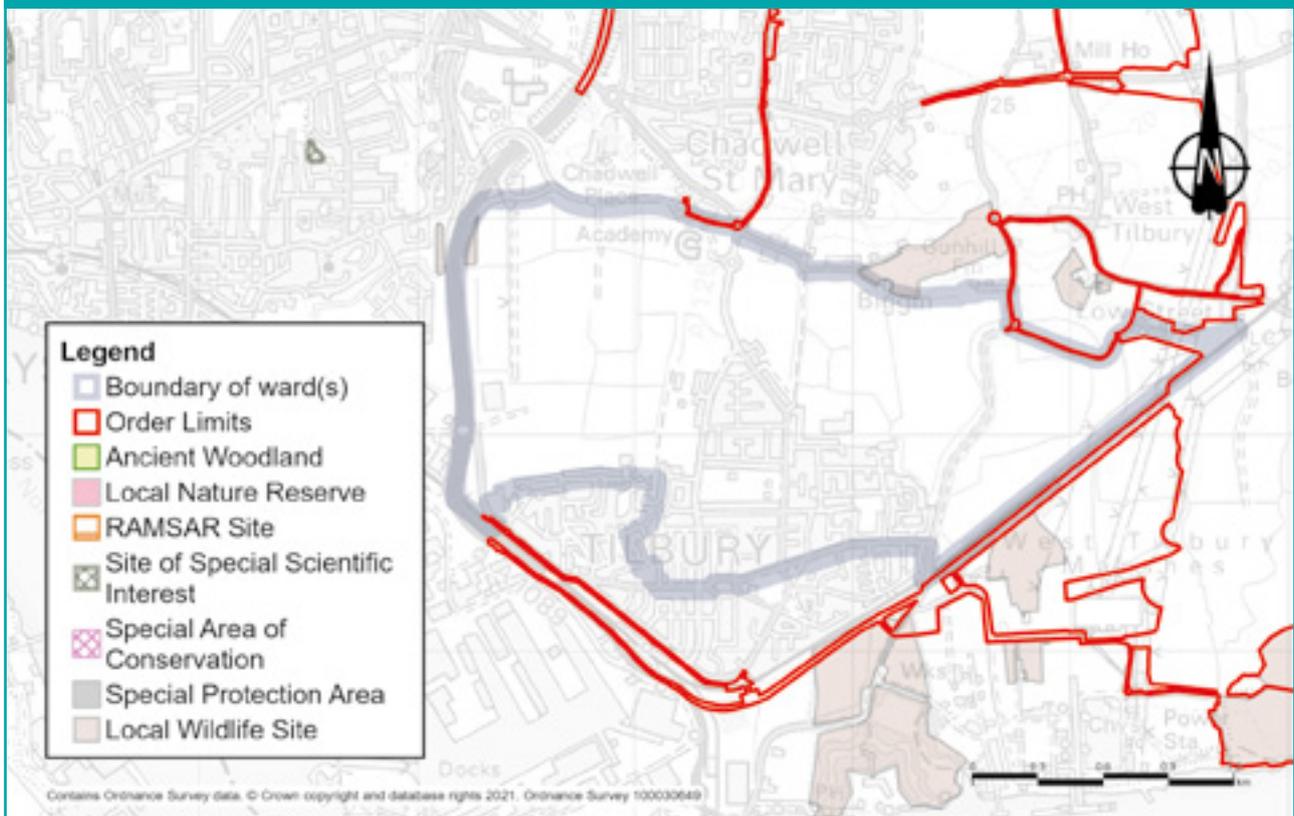
Existing situation

The main habitats in Tilbury St Chads within the Order Limits are arable farmland, with a small area of woodland, scrub and watercourses.

There are no designated sites within 2km of the Order Limits in this ward. Within 500 metres of the Order Limits, there are no non-designated sites, although both Lytag Brownfield Local Wildlife Site (LWS) and Broom Hill LWS are immediately adjacent to the boundary of the ward.

We carried out surveys across the project to set a baseline for assessment, and these identified the presence of a range of protected and notable species. These included bats, badgers, water vole and reptiles.

Figure 14.17 Biodiversity designated and non-designated sites in Tilbury St Chads ward



14.10.1 Construction

Construction impacts

Construction of the project would require removing areas of habitat, both temporarily and permanently. This habitat consists of arable farmland and scrub and supports a range of protected and notable species. These would be affected by construction due to direct habitat loss (the loss of badger setts, water vole and reptile habitat), fragmentation of habitat and disturbance to retained habitat.

Measures to reduce biodiversity impacts of construction

Vegetation clearance would take place during the winter, where possible, to avoid disturbing breeding birds. Where this is not practicable, clearance would be supervised by an ecological clerk of works to ensure that no nests are disturbed or destroyed. Where protected species are present, these would be moved from the site before construction, either through habitat manipulation (for example strimming to reduce the height of vegetation to displace reptiles), or translocation. Where necessary, works affecting protected species would be carried out under a Natural England licence. Boxes to support birds and bats would be set up within retained habitat. Habitat lost for temporary construction works would be reinstated following construction.

The impact of construction on biodiversity would be controlled through the range of good practice measures set out in the project's CoCP and the REAC. See chapter 1 of the Construction update for more information about this and the project's other control documents.

14.10.2 Operations

Operational impacts

Operation of the new road has the potential to cause mortality as species encounter road traffic, habitat fragmentation, and noise disturbance from traffic.

Measures to reduce biodiversity impacts of the operational project

Landscape planting has been designed to provide strong links for animals to move and forage along, guiding them to safe crossing points around the new road. To minimise disturbance from traffic, the new road would be in a cutting north of the northern tunnel entrance, reducing noise and visual impacts.

Newly created areas would be managed to ensure that they provide high quality habitat to support a broad range of different plant and animal species.

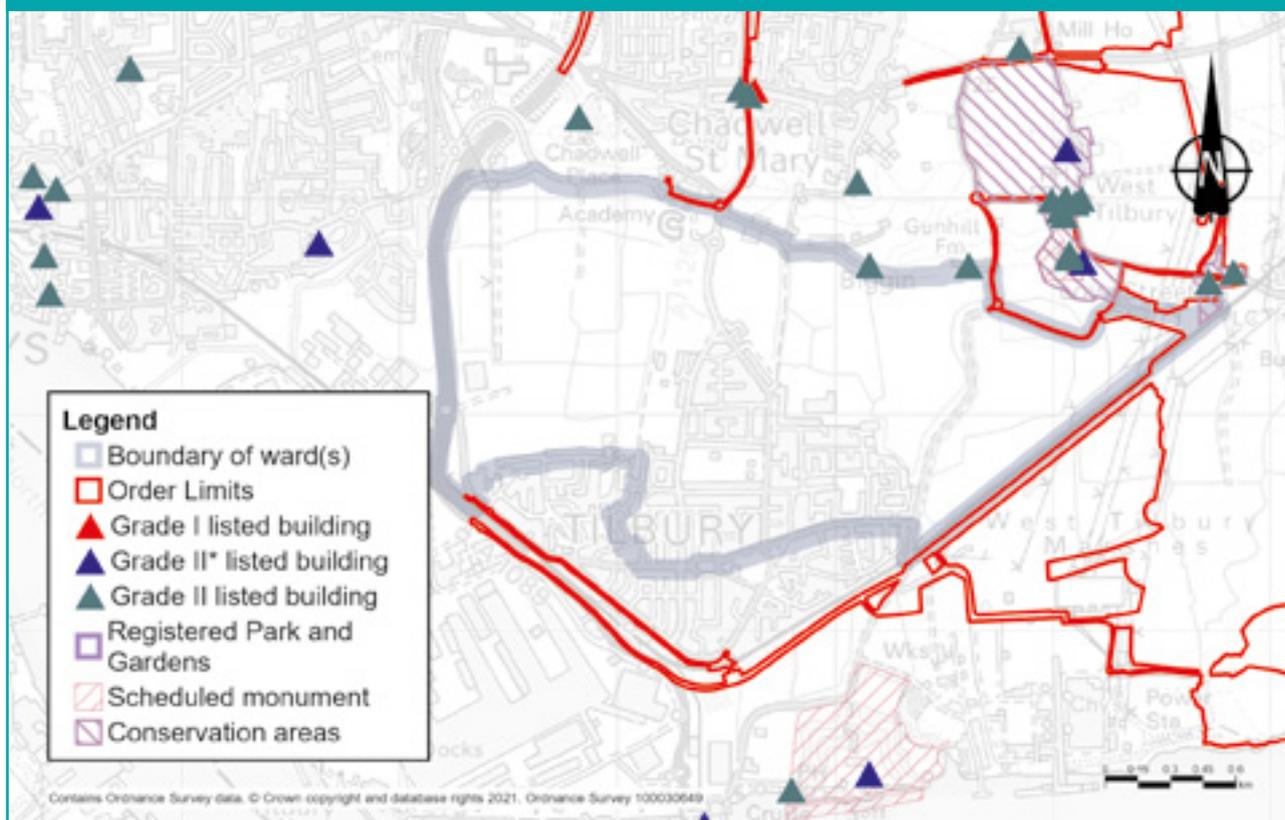
The impact of operation on biodiversity would be controlled through the range of good practice measures set out in the project's CoCP and the REAC. See chapter 1 of the Construction update for more information about this and the project's other control documents.

14.11 Built heritage

Existing situation

There are no buildings of historic relevance within Tilbury St Chads ward that would be affected by the new road. The West Tilbury conservation area does have a small part within the ward, but no areas with historic buildings. As such there would be no construction or operational impacts on built heritage in Tilbury St Chads ward.

Figure 14.18 Built heritage baseline for Tilbury St Chads Ward



14.12 Contamination

From the review of desk-based sources (historical maps and environmental data), there are no known medium or high-risk sources of contamination that would be disturbed during construction or operation of the new road within the Tilbury St Chads ward.

14.12.1 Construction

By following a construction management plan and ensuring that, where potential sources of contamination are used (such as oils, lubricants, mechanical plant), appropriate spill containment and emergency response procedures are in place to prevent adverse environmental impacts from occurring.

14.12.2 Operations

During the operation of the road, should an incident occur, for example, a traffic accident resulting in localised contamination, significantly affected soils would be assessed and if necessary removed to reduce the risk of contamination migrating across a wider area or entering controlled waters. For more information on these controls, see the REAC.

15

Chapter 15: Chadwell St Mary ward

This chapter summarises the activities in Chadwell St Mary ward relating to the project's construction and its operational phase (when the new road is open). It also explains the measures intended to reduce the project's impacts on the local area. For more information about the assessments in this chapter and other information available during this consultation, see chapter 1, which also includes a map showing all the wards described in this document.

Within this document, we sometimes advise where additional information can be found in other consultation documents, including the Construction update, Operations update, You said, we did, Register of Environmental Actions and Commitments (REAC), Code of Construction Practice (CoCP), Outline Traffic Management Plan for Construction (OTMPfC) and the Design principles. To find out more about these documents, see chapter 1. References to these documents provide an indication as to how our proposals to reduce the project's impacts will be secured within our application for development consent.

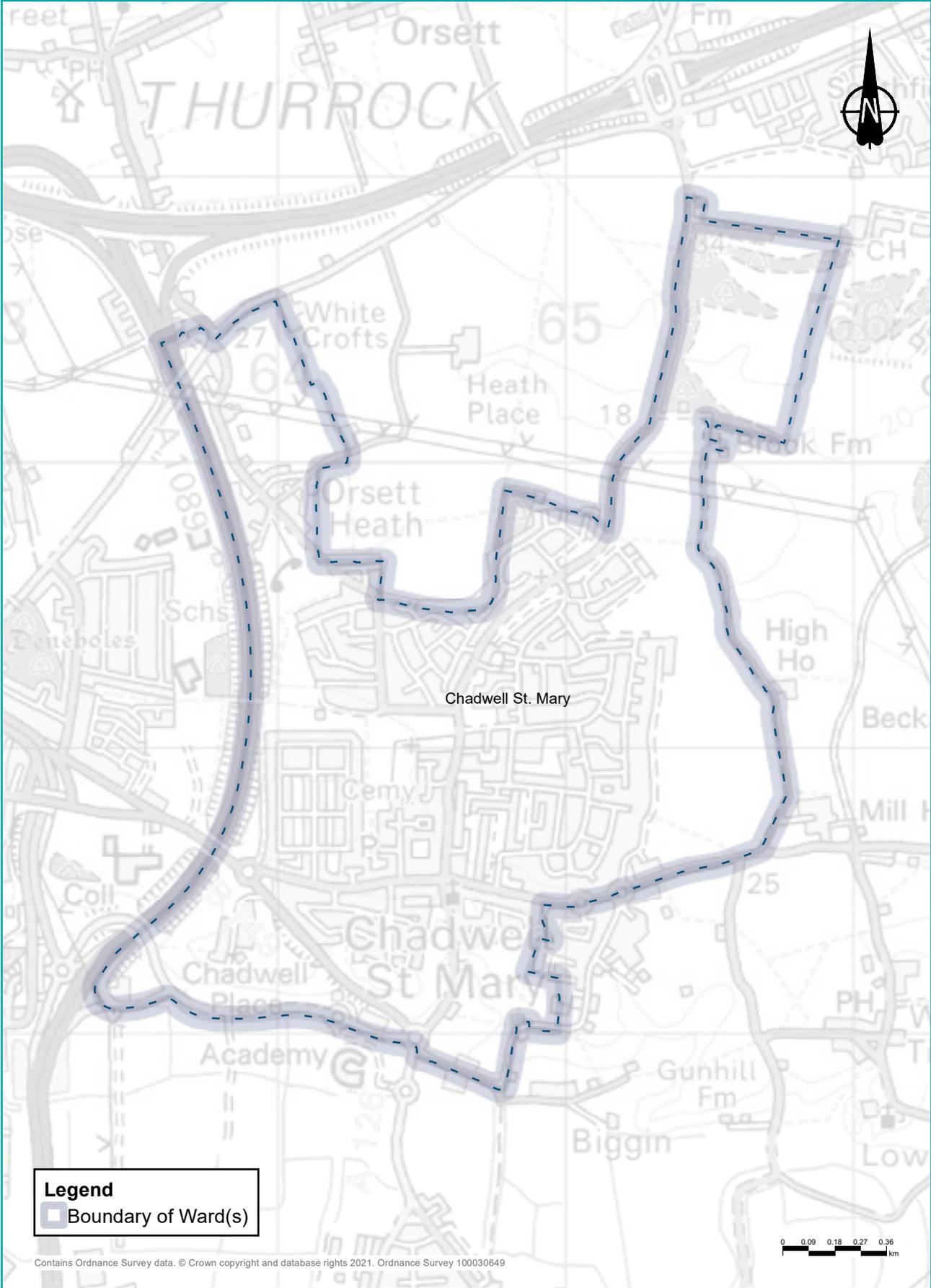
15.1 Overview

15.1.1 About this ward

Chadwell St Mary is located to the west of East Tilbury ward and to the north of Tilbury St Chads ward in the borough of Thurrock. The ward is also south of Orsett ward and east of Little Thurrock Blackshots and Rectory ward. It has an area of around 3.6km² and an estimated population of 10,274¹. The ward is predominantly residential (Chadwell St Mary and Orsett Heath) with some agricultural land to the north and east. Allotments and green space are located within the residential areas of Chadwell St Mary. An outline application for residential development of up to 230 dwellings was approved in 2019 at Star Industrial Estate, Linford Road. The A1089 (Dock Approach Road) runs north-south along the western side of the ward.

¹ Office for National Statistics, 2018 ward-level population estimate

Figure 15.1: Ward boundary map for Chadwell St Mary ward



15.1.2 Summary of impacts

Table 15.1: Summary of impacts during the project’s construction and operation

Topic	Construction	Operations
<p>Traffic</p>	<p>Impacts</p> <p>There will be additional traffic on the A1089 which may lengthen journey times along this route. There may be delays when lane closures are in place on the local road network.</p> <p>Mitigation</p> <p>There are several mitigation measures to reduce construction impacts on local residents, such as minimising the use of local roads by construction vehicles. Further information can be found in the Traffic section of this chapter.</p>	<p>Impacts</p> <p>The predicted change in traffic flows in this ward would occur along the route from the Orsett Cock junction southbound through Chadwell St Mary along Brentwood Road and Chadwell Hill, and westbound along Marshfoot Road to the junction with the A1089. In addition, the very western end of the A126 Marshfoot Road, from the junction with the Old Dock Approach Road, which goes over the A1089. Further details about the impacts on journey times can be found in the traffic section.</p> <p>Mitigation</p> <p>Throughout the design process several mitigation measures have been developed to reduce the road’s impact on local residents. More information can be found in the Traffic section later.</p>
<p>Public transport</p>	<p>Buses</p> <p>Additional traffic along the A1089 and traffic management measures on local roads may impact journey times for a number of local bus routes.</p> <p>Rail</p> <p>Throughout construction there may be some increases in journey times to Tilbury Town and East Tilbury stations, associated with increased traffic through the area and traffic management on local roads.</p>	<p>Buses</p> <p>It is expected there would be minor changes to journey times for several buses, including the 5X, 73, 83 and Z4.</p> <p>Rail</p> <p>Once the project is complete, there would be no discernible changes in local access times to the nearby train stations and it would be easier to access Ebbsfleet International Station.</p>

Topic	Construction	Operations
<p>Footpaths, bridleways and cycle routes</p>	<p>Impact</p> <p>Utilities diversion works, the realignment of the A1013 and High House Lane, and construction of the project main line would require both short and long term closures of footpaths and cycle routes in this ward.</p> <p>Mitigation</p> <p>Where footpaths and bridleways require temporary closure to allow the construction of the northern tunnel, new road, or viaduct, these closures would be as short as possible.</p>	<p>Impact</p> <p>Two footpaths would be open along realigned routes once the project is operational. All three footpaths affected during construction would be upgraded to bridleways. One new off-road cycle track with an adjacent grass verge for horse-riding would also be opened.</p> <p>Mitigation</p> <p>These realigned footpaths would be resurfaced and designated as bridleways, crossing the project by a new bridge designed to be safe for horse riding. All three footpaths affected during construction would be upgraded to bridleways. One new off-road cycle track with an adjacent grass verge for horse-riding would also be opened.</p>

Topic	Construction	Operations
<p>Visual</p>	<p>Impacts</p> <p>Construction activities would be visible from the northern edge of Chadwell St Mary including road construction, overhead power line diversion and multi-utility works. The Brentwood Road Compound and the Hornsby Lane and Brentwood Road Utility Logistics Hub would be visible from the north. Views from footpaths are likely to be similar with intermittent southerly views from Orsett Golf Club.</p> <p>Mitigation</p> <p>Temporary earth bunding on the southern boundary of the Brentwood Road Compound would be used to reduce views of construction activity from properties within this ward. Visual impacts would be controlled through the range of good practice measures within the project's CoCP and REAC.</p>	<p>Impacts</p> <p>Once the project is complete and in operation, the views from most residential properties along the northern edge of Chadwell St Mary would include the tops of HGVs and gantries above the false cuttings, and views of Brentwood Road overbridge. Diverted overhead lines would look similar to those in existing views. Properties along the eastern edge of Chadwell St Mary would include distant views of the top of HGVs and gantries. The project would be visible from local footpaths along the north and eastern edges of the settlement.</p> <p>Mitigation</p> <p>The false cutting and a wide belt of proposed woodland planting would reduce views of the project from the north and east of Chadwell St Mary.</p>

Topic	Construction	Operations
<p>Noise and vibration</p>	<p>Impacts</p> <p>Construction activity would include the A1089 upgrade, building the new road, utility works, and activities in and around compounds in adjacent wards. There would also be 24-hour, seven-day construction working in some locations. There would be negligible changes in noise from road traffic for a majority of roads within this ward, except for Hornsby Lane and the westbound exit from A13 on to Dock Approach Road, where there would be minor increases.</p> <p>There is one structure that is expected to be constructed using vibratory or percussive piling.</p> <p>Mitigation</p> <p>Construction noise levels would be controlled by mitigation measures set out in the REAC. There are also measures presented in the CoCP.</p>	<p>Impacts</p> <p>There would be increased levels of noise in the northern section of the ward as a result of the widening of the existing A13. Noise levels would also increase from existing roads due to the changes in traffic flow, speed and vehicle type.</p> <p>Mitigation</p> <p>The design of the new road has been kept low in the environment, which would help reduce the noise. There would also be a six-metre high noise barrier near Brook Farm Cottage within this ward.</p>

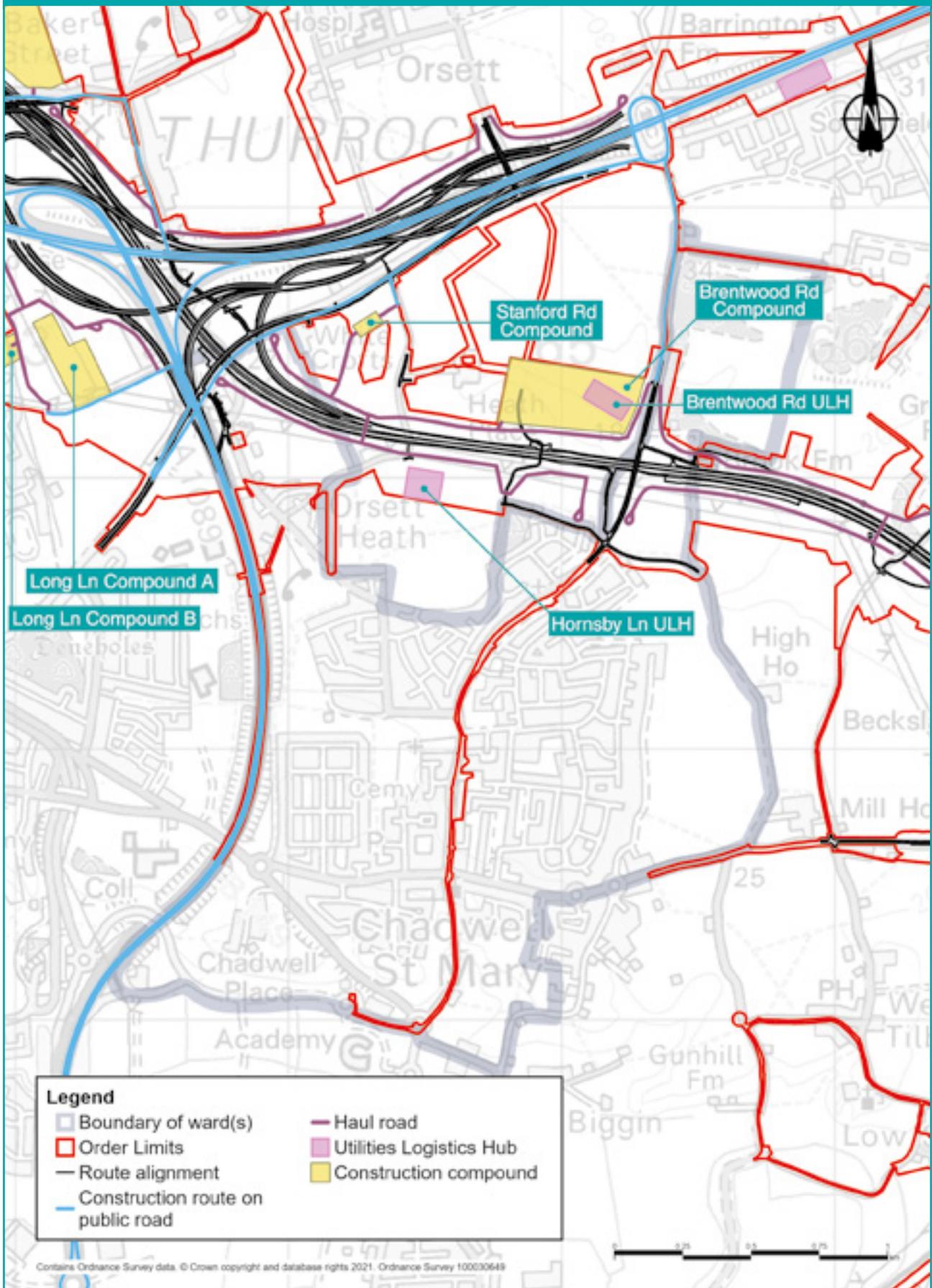
Topic	Construction	Operations
<p>Air quality</p>	<p>Impacts</p> <p>There is likely to be dust and emissions from construction equipment and traffic during the construction phase.</p> <p>Between 2025-27 there would be a minor worsening in air quality at receptors closest to the A1089. This would be temporary.</p> <p>Mitigation</p> <p>The contractor would follow good practice construction measures which are presented in the CoCP and REAC to minimise the dust. Construction vehicles would need to comply with emission standards. An Air Quality Management Plan would be designed in consultation with the relevant local authorities. The plan would include details of monitoring which would ensure measures are effectively controlling dust and exhaust emissions.</p>	<p>Impacts</p> <p>There are no predicted exceedances of NO₂ or PM₁₀.</p> <p>Mitigation</p> <p>As there are no predicted exceedances, no mitigation has been proposed.</p>

Topic	Construction	Operations
<p>Health</p>	<p>Impacts</p> <p>The construction phase of the project would present opportunities to access work and training. There is likely to be changes in the area that may result in negative impacts on health, including mental health and wellbeing. These include changes in accessibility of local resources and amenity as a result of road closures. Noise would increase as a result of construction, construction traffic and vibration caused by piling.</p> <p>Mitigation</p> <p>The negative impacts would be mitigated through the good practice construction measures presented in the CoCP and REAC relating to dust emissions, working hours and visual screening, traffic management measures and community engagement. This includes the establishment of Community Liaison Groups.</p>	<p>Impacts</p> <p>Residents may experience positive health benefits through accessibility improvements, better access to services, jobs and training, and to open space including new recreational areas. There would be increases in road traffic noise. Some residents within the ward may experience anxiety around perceived air quality and noise.</p> <p>Mitigation</p> <p>Low-noise road surfaces would be installed on all new and resurfaced roads. Acoustic screening (noise barriers) has been incorporated into the design where necessary.</p>

Topic	Construction	Operations
<p>Biodiversity</p>	<p>Impacts</p> <p>The construction of the project would involve the removal of areas of habitat, both temporarily and permanently. These habitats are home to a range of protected and notable species which would be impacted.</p> <p>Mitigation</p> <p>Vegetation clearance would be undertaken during the winter where possible. Protected species would be moved away outside of the construction working area under a Natural England licence. Boxes to support dormice and birds would be put up within the retained habitats. Impacts would also be controlled through a range of good practice measures set out in the project's CoCP and REAC.</p>	<p>Impacts</p> <p>The operation of the new road could cause mortality of species by encountering road traffic, habitat fragmentation, and disturbance from traffic.</p> <p>Mitigation</p> <p>Landscape planting would provide strong links for animals to move and forage along. A green bridge (over Hoford Road to the east of the ward boundary) would also be installed. Newly created habitat would be managed to ensure they provide a high-quality environment for plants and animals. Biodiversity impacts would also be controlled through good practice measures set out in the CoCP and REAC.</p>

Topic	Construction	Operations
<p>Built heritage</p>	<p>Impacts</p> <p>Construction of the project would result in the demolition of the Grade II listed 1 and 2 Grays Corner Cottages. The setting of Church of St Mary as well as Grade II listed Heath Cottage, Chadwell House, Sleepers Farmhouse would be temporarily impacted by construction activity and traffic.</p> <p>Mitigation</p> <p>The demolition of listed buildings would be mitigated by historic building recording in line with industry standards. The design and layout of Long Lane Utility Logistics Hub would avoid light pollution during night-time construction and would be appropriately screened as set out in the Design Principles. Dust and noise reduction measures are presented in the REAC.</p>	<p>Impacts</p> <p>There would be impacts to the setting of Grade II listed Heath Cottage due to visual and audible changes.</p> <p>Mitigation</p> <p>Earthworks alongside the new road and the establishment of native hedgerow and trees would soften the visual and audible changes impacting the setting of Heath Cottage.</p>
<p>Contamination</p>	<p>Impacts</p> <p>There is the possibility for existing contamination within the ground to become mobilised. There is also a potential risk of accidental oil, cement and fuel spills from construction traffic and the storage of materials.</p> <p>Mitigation</p> <p>To reduce this risk, the contractor would follow good practice construction measures.</p>	<p>Impacts</p> <p>None identified.</p> <p>Mitigation</p> <p>If during operation any incident were to occur which resulted in localised contamination, soils which had become significantly affected would be assessed and, if necessary, removed to reduce the risk of contamination migrating across a wider area or entering controlled waters.</p>

Figure 15.2: Main construction areas in Chadwell St Mary ward



15.2 Project description

15.2.1 Construction

Construction activities

More information about how the area would look during construction, including visualisations, can be found in the Construction update.

Most of Chadwell St Mary ward is outside the Order Limits (the area required to deliver the project), however, there would be a significant amount of construction work carried out in the north of the ward, as shown in figure 15.2 left. Works within this ward would include construction of parts of the proposed A13/A1089 junction, realignment of Brentwood Road, and a section of the main carriageway north of Chadwell St Mary settlement. Hornsby Lane would be permanently closed.

We would build haul roads in this area to allow construction vehicles to move machinery and materials around the worksite without using public roads. East of the A1089 and south of the A13, haul roads would run along the alignment of the proposed new road, connecting compounds, hubs and worksites.

Partly in this ward, the proposed A13/A1089 junction with the new road would make substantial changes to the existing junction at this location, requiring the construction of new structures and roads. For more information, see chapter 16 (Orsett ward) of this document and chapter 5 of the Construction update.

Within this ward, the new road has been designed to be as low as possible, keeping within the natural contours of the landscape. Where possible, the new road would be built within a false cutting (sitting inside a raised and landscaped embankment) to screen it for nearby communities. A new bridge over the new road would be built at Brentwood Road.

Construction compounds

Construction compounds are fenced-off areas, accessible to construction traffic, which provide the facilities for our project to be built efficiently. For example, compounds would provide parking, storage for machinery and materials, offices, welfare facilities, refuelling, and vehicle and wheel-washing facilities to make sure vehicles leaving the compound do not dirty local roads.

There are no construction compounds located here. However, roads within here would be impacted by traffic to three compounds, the Northern Tunnel Entrance Compound, Station Road Compound and Brentwood Road Compound. These compounds, located in adjacent wards, are described in more detail in the Construction update and the relevant ward summaries.

There would be construction related traffic going to the northern tunnel entrance, Station Road Compound and Brentwood Road Compound along the A1089. There would also be some construction traffic, mainly cars, using Brentwood Road in the ward to access the Brentwood Compound.

The average daily number of vehicles going to these compounds is shown in table 15.2. These are the number of vehicles going to each compound and there would be the same number of vehicles, on an average weekday, leaving each compound.

Utilities

There would be no Utility Logistics Hubs in this ward. However, there would be substantial works in this area to divert utilities away from the area required for the new road. In the north-west of the ward, we would carry out part of the diversion of the 272kV overhead power line, building two new pylons and removing two existing ones. In the north-east of the ward, we would carry out part of the realignment of the 400kV overhead power line, also removing two existing pylons and building two new ones as part of restringing works.

There would also be works to divert a high-pressure gas pipeline, 0.27km in length, that runs alongside Brentwood Road. In addition, a new underground power cable would be installed, 3km of which goes along Marshfoot Road and Brentwood Road.

Table 15.2: Average daily vehicle numbers going to compounds located near Chadwell St Mary ward

Time period	Northern Tunnel Entrance Compound		Station Road Compound		Brentwood Road Compound	
	HGV	Cars	HGV	Cars	HGV	Cars
January to August 2024	90	377	2	27	52	57
September 2024 to February 2025	105	580	13	38	56	90
March to May 2025	133	593	20	35	76	52
June to October 2025	133	466	20	35	102	113
November 2025 to March 2026	133	506	18	35	99	140
April to August 2026	132	611	21	35	82	140
September 2026 to March 2027	132	670	16	24	82	140
April to November 2027	131	720	4	18	78	114
December 2027 to March 2028	131	684	0	0	45	68
April to July 2028	122	619	0	0	21	47
August 2028 to December 2029	39	73	0	0	0	0

Chapter 2 of the Construction update provides an overview of how existing utilities would be affected by our plans to build the new road, with further detail including maps in chapter 6. Chapter 2 of the Operations update also describes the project's impacts on utilities, including a map showing the utilities that would be repositioned to accommodate the new road.

Construction routes on public roads

Access to Brentwood Road Utility Logistics Hub would be through Chadwell St Mary along Brentwood Road. The A1089 on the eastern boundary of the ward would also be a construction route. These roads would be used by HGV and workforce construction traffic but would remain open to the public.

Construction schedule

Construction of the entire project is scheduled to last for around six years from 2024 to 2029. To deliver our construction programme efficiently, we would divide activities into coordinated packages of work. Maps and programmes for the packages north of the river can be found in chapters 4, 5 and 6 of the Construction update.

Construction working hours

Most construction activities would take place during the core construction hours, which are from 7am to 7pm on weekdays and from 7am to 4pm on Saturdays, with additional repair and maintenance periods (if required) from 8am to 5pm on Sundays.

There may be circumstances when hours would need to be extended beyond core hours. Typically, this would be to reduce the impact to road users by working at night when there is less traffic. Activities that would involve longer working hours include implementing traffic management measures, joining new roads to existing ones, overhead power line works, under-road utility works, and resurfacing existing carriageways.

In addition, there may be extended working hours for ground preparation when days are longer (spring to autumn) and during periods of fine weather. Typically, noisier works such as piling or bridge-building would not take place outside core hours. More information about working hours is set out in the Noise and vibration section later and in the CoCP.

Traffic management

The main traffic management measures in Chadwell St Mary are listed below:

Table 15.3: Main traffic management during construction in Chadwell St Mary ward

Road(s) affected	Proposed traffic management	Purpose	Duration
Marshfoot Road, Chadwell Hill and Brentwood Road	Lane closure and traffic lights	To facilitate the installation of power supplies for the compounds at the A13 junction	12 months
Brentwood Road	Closure	To carry out bridge works and modifications to local utility networks and installation of the Brentwood Road Compound	Nights and weekends over short periods associated with specific works activities
Brentwood Road	Crossing point	To allow construction vehicles to cross	January 2024 and August 2026
Brentwood Road	Lane closures and traffic lights in 300m sections	To modify utilities and install temporary compound connections	6 months between January 2024 and August 2024
Brentwood Road	Closure	Switchover to new road alignment	Nights and weekends between June and October 2025
A1013 Stanford Road	Lane closures and traffic lights	To carry out nearby works and modifications to local utility networks	8 months between June and March 2026
A1013	Closures	For works on overhead power lines	Nights and weekends over short periods associated with specific works activities
A1013	Closures	Switchover to new road alignment	Occasional nights and weekends between December 2027 and March 2028
A1089	Lane closures and full closures	To facilitate bridge demolition works, removal of overhead power lines	Nights and weekends over short periods associated with specific works activities
A13 westbound to A1089 southbound	Closure	To carry out nearby works	Nights and weekends over short periods associated with specific works activities
Heath Road	Lane restrictions	To carry out nearby works and utilities	1 month between November 2025 and March 2026
Rectory Road	Closure	Diversion of a high pressure gas main	2 weeks between December 2027 and March 2028
Rectory Road	Closure	Works associated with replacing the Rectory Road bridge over the A13	7 months between September 2027 and March 2028

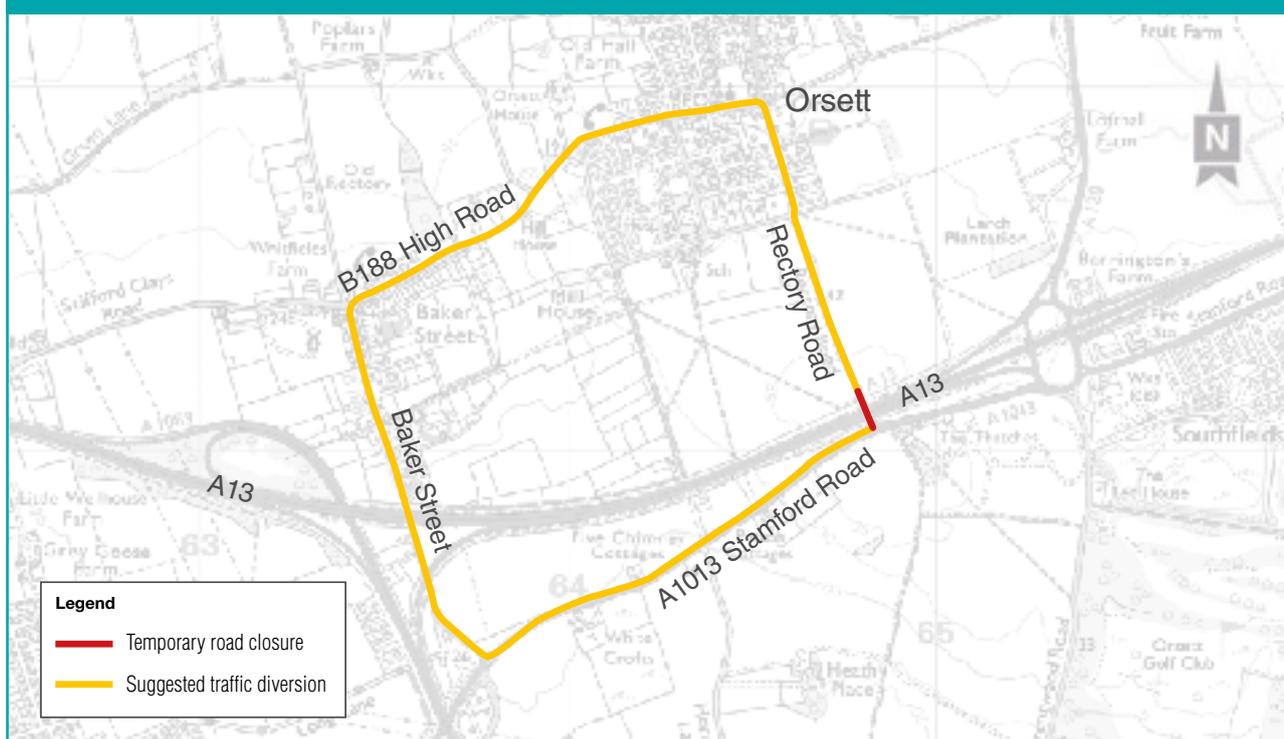
Rectory Road would be closed twice during the construction period. Initially it would be closed early on in the programme for two weeks to allow for the diversion of a high-pressure gas main. The replacement bridge over the A13, which is part of Rectory Road, would be at the same location as the current bridge. This means that later in the programme it will be necessary to close Rectory Road at this point for seven months. The diversionary route is shown in figure 15.3 below and runs through the north of Chadwell St Mary ward.

Rectory Road diversion route

An existing 7.5 tonne ban at the north end of Brentwood Road would be removed throughout the construction period to allow access to the Brentwood Road Compound.

Construction traffic going to the Brentwood Road Compound would need to approach it from the north, so no HGVs would go further south than the proposed Brentwood Road bridge over the new road. They would not go through the residential areas of Chadwell St Mary.

Figure 15.3: Rectory Road closure diversion



We have sought to minimise traffic management measures wherever practical, but these would be necessary in some locations to allow construction traffic and local communities to move around safely while providing construction workers with sufficient space to operate. An overview of the traffic management required across the project can be found in the OTMPfC. All traffic management measures are based on an indicative construction programme, which would be finalised by the appointed contractor. The contractor's final traffic management plans would be subject to final approval by the Secretary of State for Transport, following consultation with the local highways authority.

15.2.2 Operations

The completed project

This section sets out elements of the project that would feature permanently in Chadwell St Mary ward once construction is complete and the new road is open. For more information about the completed project, see the Operations update, as well as the figures in Map Book 1: General Arrangements.

- The new A13/A1089 junction would be a permanent feature in this ward, as would a section of the new road north of Chadwell St Mary. The area around the junction would be landscaped with species-rich grassland running along the roads and the edges of the junction to woodland edges. The majority of new roads that form the new junction would be cut into the landscape to reduce their visual and noise impacts, with the A13 remaining at its current height above the new roads.
- Realigned overhead power lines would run parallel to the south of the new road.
- Some footpaths and bridleways would be rerouted permanently as part of our proposals for 46km of upgraded or entirely new walking paths, cycle paths and bridleways that would benefit communities along the route. For more information, see the Footpaths, bridleways and cycle routes section below.
- There would be sections of two overhead power line diversions in the north of the ward, a 275kV line and a 400kV line. The former diversion, in the north-west, involves removing two existing pylons and building two new ones.

Impacts on open space land

Within Chadwell St Mary ward, there are no proposals to remove or replace open space land. More information about our proposals for compensating for impacts on open space land (which includes special category and recreational land), including proposals we have consulted on previously, can be found in chapter 3 of our Operations update.

Impacts on private recreational facilities

Within the Chadwell St Mary ward the project is proposing to permanently acquire the rights of a small area of land to the south west of the Orsett Golf Club for construction of the Brentwood Road bridge and diversion of a gas pipeline. The golf course would remain open during construction and any impact would be kept to a minimum. Permanent rights would be acquired over a limited corridor of land within this site, to operate and maintain the gas pipeline.

Within Chadwell St Mary ward there are no proposed changes to the private recreational facilities as previously consulted. More information about how our proposals impact private recreational facilities can be found in chapter 3 of our Operations update.

15.3 Traffic

We carried out traffic assessments to understand how construction and operation would affect nearby roads, compared with the situation if the road was not built. For more information, see chapter 4 of the Operations update.

15.3.1 Construction traffic impacts

There would be additional traffic on the A1089 from vehicles going to the northern tunnel entrance, Station Road and Brentwood Compounds which may lengthen journey times along this route. There would be delays whenever there are lane closures in place on the road network such as on Marshfoot Road, Chadwell Road and Brentwood Road for the delivery of the new electricity supply to the compounds in Orsett ward, and on the A1013 when utility diversions take place along that stretch of road.

Measures to reduce construction traffic impacts

Our approach to construction has been refined after further investigations and feedback. A summary of the proposed measures introduced to reduce the volume of construction materials transported in and out by road can be found in chapter 2 of the Construction update. To reduce the construction traffic impacts in Chadwell St Mary, we would:

- minimise use of the local road network as far as practical through construction of temporary offline haul roads directly from the strategic road network
- re-use excavated materials, where possible, to substantially reduce the need to dispose of them via the road network. This would reduce the number of HGV journeys from the public road network during construction
- build new bridge structures offline (off site), where practical, to avoid closing local roads for extended periods. Where this is not possible, and if space is available, the existing road would be temporarily realigned to allow for construction
- ban HGVs associated with construction of the project on some local roads where possible (following discussion with key stakeholders)
- stockpile material within the Order Limits to allow material to be managed on-site rather than offsite, reducing the number of HGVs journeys needed

15.3.2 Operations

Traffic impacts

Traffic modelling has been carried out to predict the change in traffic flows on roads in the area, including those within or on the boundary with East Tilbury ward for the first year of operation, 2029.

Figures 15.5, 15.7 and 15.9 show the predicted changes in traffic in the morning peak (7am to 8am), interpeak (an average hour between 9am and 3pm) and evening peak (5pm to 6pm) measured in Passenger Car Units (PCUs per hour), where 1 PCU is equivalent to a car, and 2.5 PCUs is equivalent to an HGV. Figures 15.6, 15.8 and 15.10 below show the predicted percentage changes in traffic flow during the morning, interpeak and evening peak. For information about how we assessed operational traffic impacts, see chapter 1. For more information about how we carried out our traffic modelling, see chapter 4 of the Operations update.

The largest change in traffic flows in the ward would occur on the northern section of the A1089 on the western boundary of the ward. In the northbound direction the traffic flows would increase by between 500 and 1,000 PCUs an hour in the morning and evening peak hour and by between 250 and 500 PCUs an hour in an interpeak hour. This represents an increase in flows of over 40% in the morning peak hour and between 20% and 40% in the interpeak and evening peak hour. The change in traffic flows would be a result of some traffic from the Stifford Clays and Grays area changing their routes, for example by driving eastwards to use the A1089 rather than joining the A13 at the Stifford interchange. There would be a decrease in traffic flows southbound on this section of the A1089, with a decrease of between 250 and 500 PCUs (between 10% - 20%) in the morning peak hour, and a decrease of between 50 and 250 PCUs (a decrease of under 10%) in the interpeak and evening peak period.

The A1013 Stanford Road passes through the north western corner of the ward. Here the traffic flows would decrease northbound by between 50 and 250 PCUs in the morning peak hour, the interpeak hours and the evening peak hour (a decrease of between 10% and 20% in each hour). There would be an increase in flows of between 50 and 250 PCUs in the morning peak hour, the interpeak hours and the evening peak hour (an increase of between 20% and 40%).

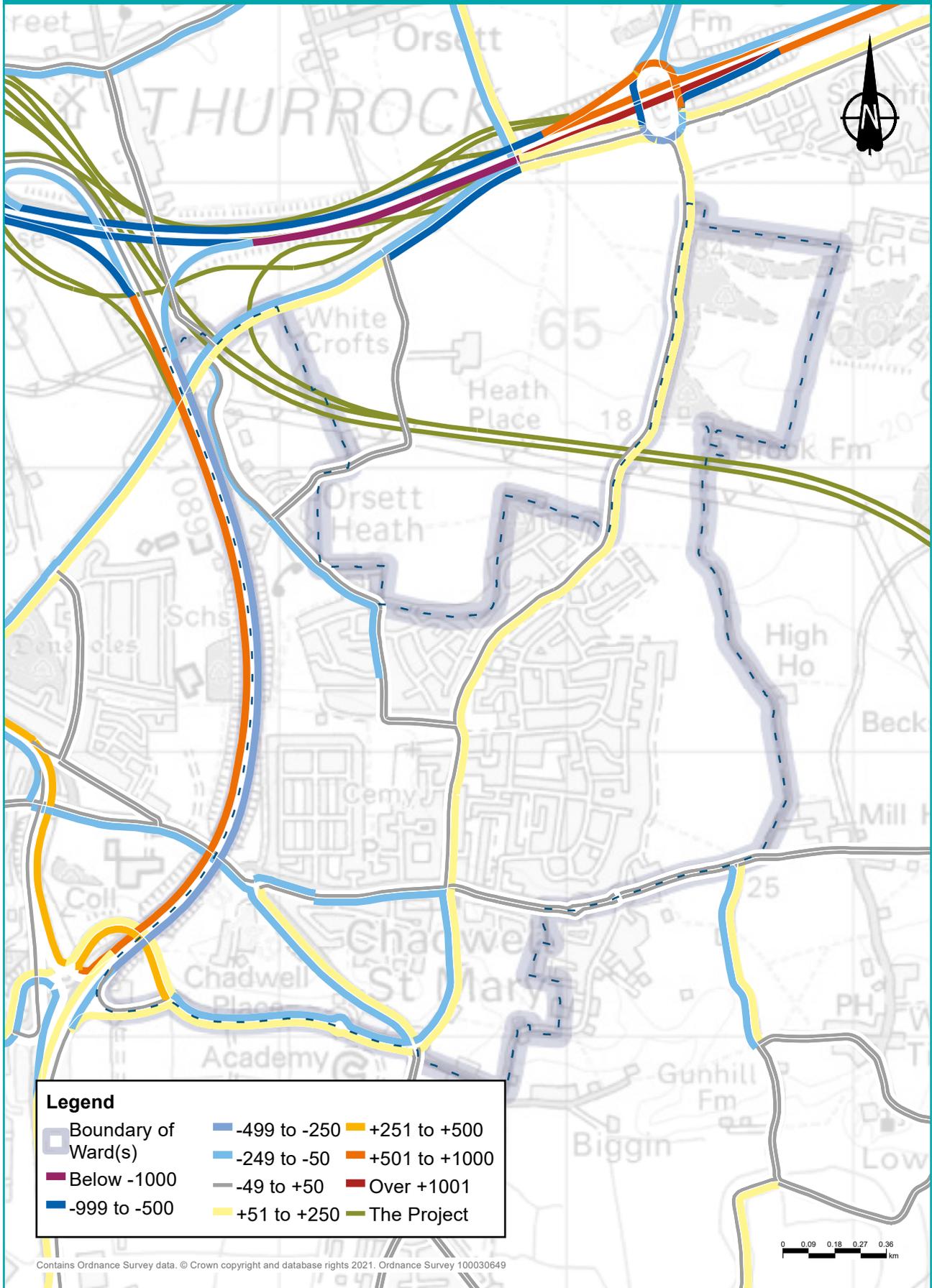
The Chadwell bypass lies to the east of the A1089. Here the traffic flows would decrease westbound by between 50 and 250 PCUs in the morning peak hour (a decrease of between 10% and 20% in each hour). Eastbound, towards the A1089 there would be an increase in flows of between 50 and 250 PCUs in the morning peak hour (an increase of between 20% and 40%). In all other time periods, and in both directions, any change in traffic flows would be less than 50 PCUs an hour.

On Marshfoot Road, east of the A1089, there would be an increase in traffic flows westbound and a decrease of traffic flows eastbound. In the westbound direction the increase in traffic flows would be between 50 and 250 PCUs in all of the modelled time periods. This would be an increase of between 20% and 40% in the morning peak hour and the average interpeak hour. The increase would be over 40% in the evening peak hour. The decrease in traffic eastbound would be between 50 and 250 PCUs in each modelled hour. This would be a reduction in traffic flows of between 20% and 40% in the morning peak hour and between 10% and 20% in the average interpeak hour and the evening peak hour.

The Brentwood Road passes through Chadwell St Mary. North of the junction with Heath Road the change in traffic flows northbound would be less than 50 PCUs an hour in the morning peak hour and in an average hour in the interpeak period, and between 50 and 250 PCUs in the evening peak hour. This would be an increase in traffic of between 20% and 40%. Traffic flows are predicted to increase southbound in all modelled time periods by between 50 and 250 PCUs an hour, an increase of over 40%.

Linford Road is in the east of Chadwell St Mary. The traffic flows on this road, east of the junction with Brentwood Road and Chadwell Hill would mainly remain unchanged with the exception of westbound traffic flows in the evening peak hour which are predicted to increase by between 50 and 250 PCUs an hour, an increase of between 10% and 20%.

Figure 15.5: Predicted change in traffic flows (PCUs) with the project during the morning peak in 2029



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Figure 15.6: Predicted percentage changes to traffic flows during the morning peak in 2029

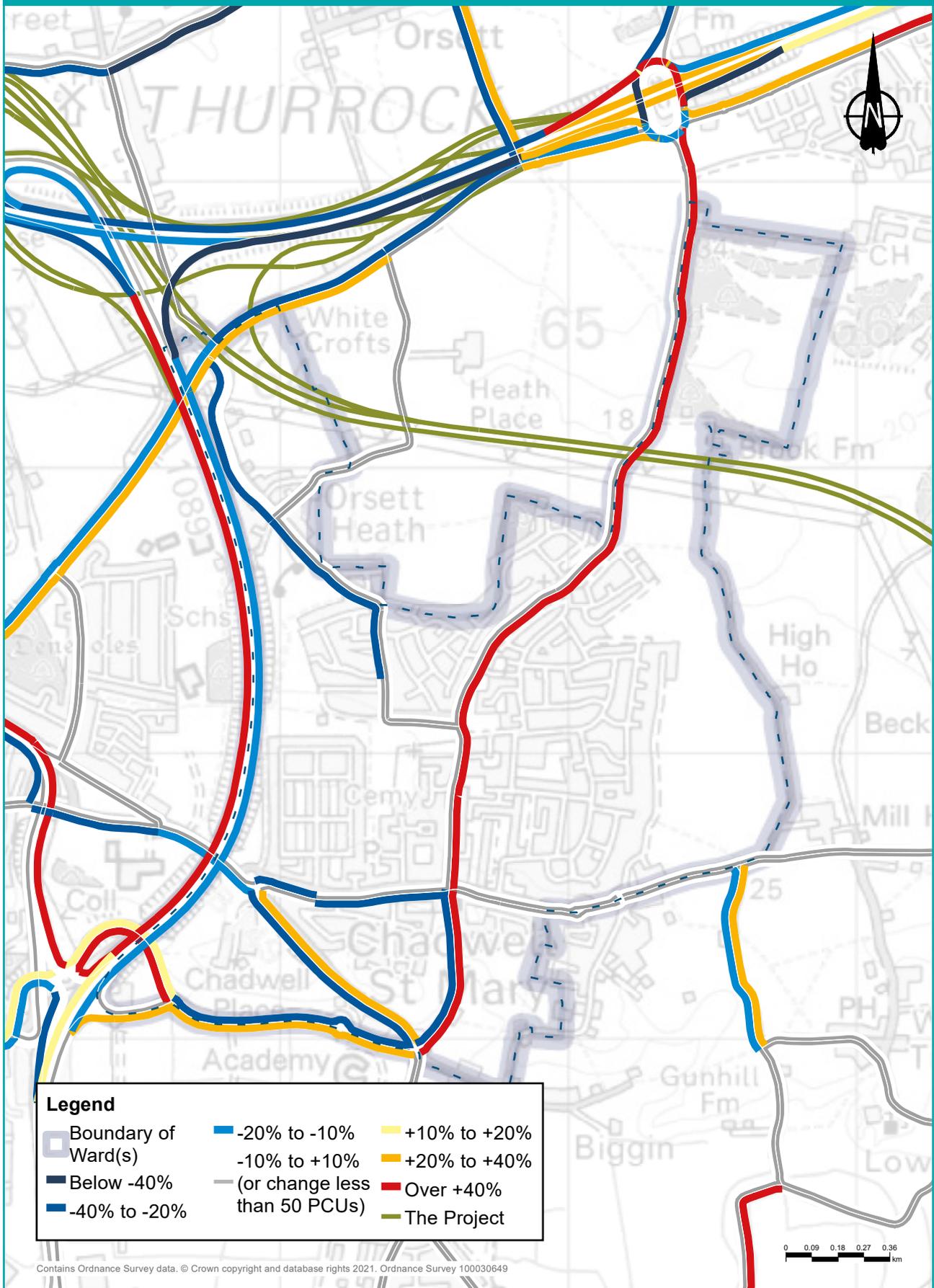


Figure 15.7: Predicted change in traffic flows (PCUs) with the project during the interpeak in 2029

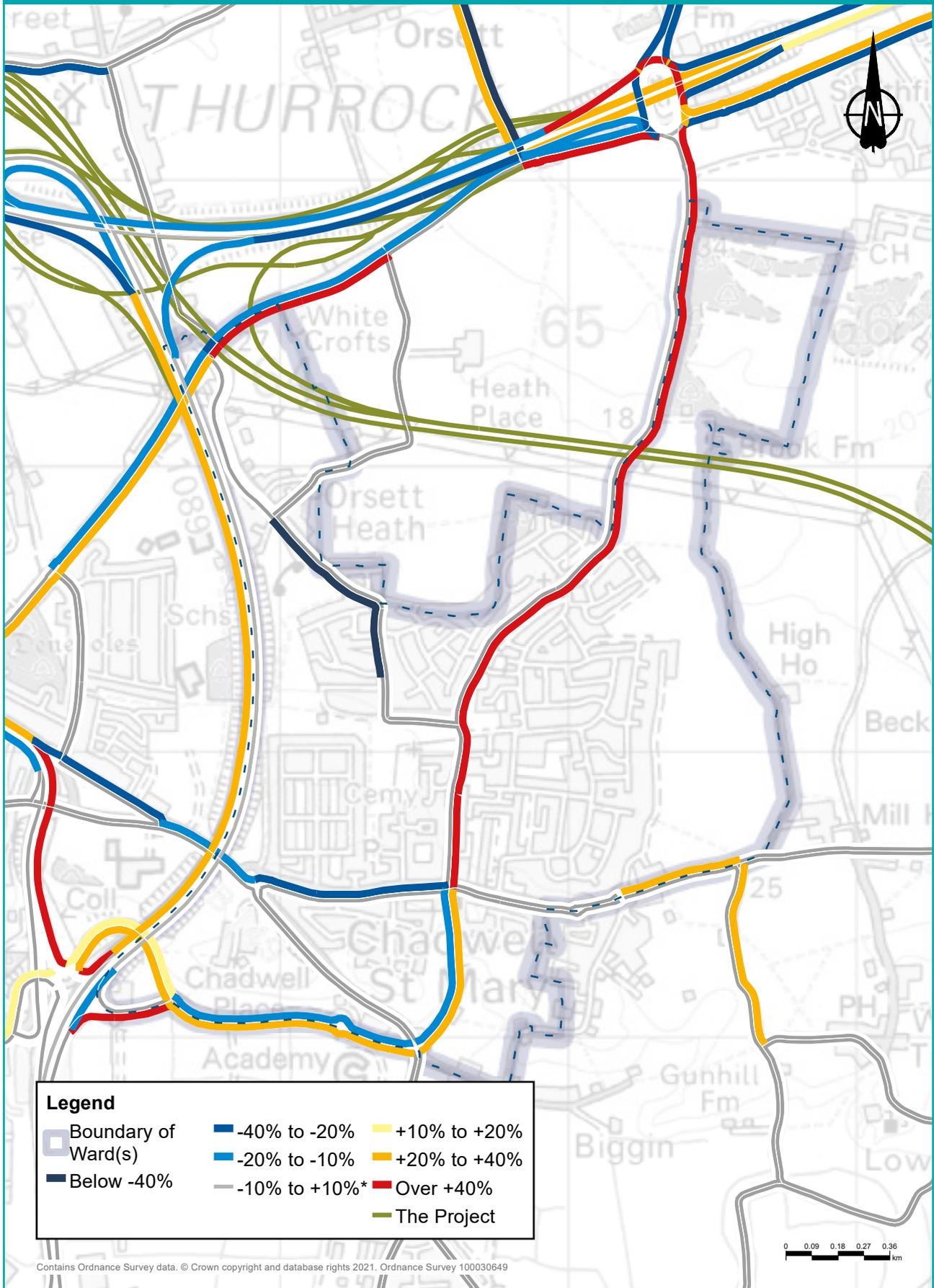


Figure 15.8: Predicted percentage changes to traffic flows during the interpeak in 2029

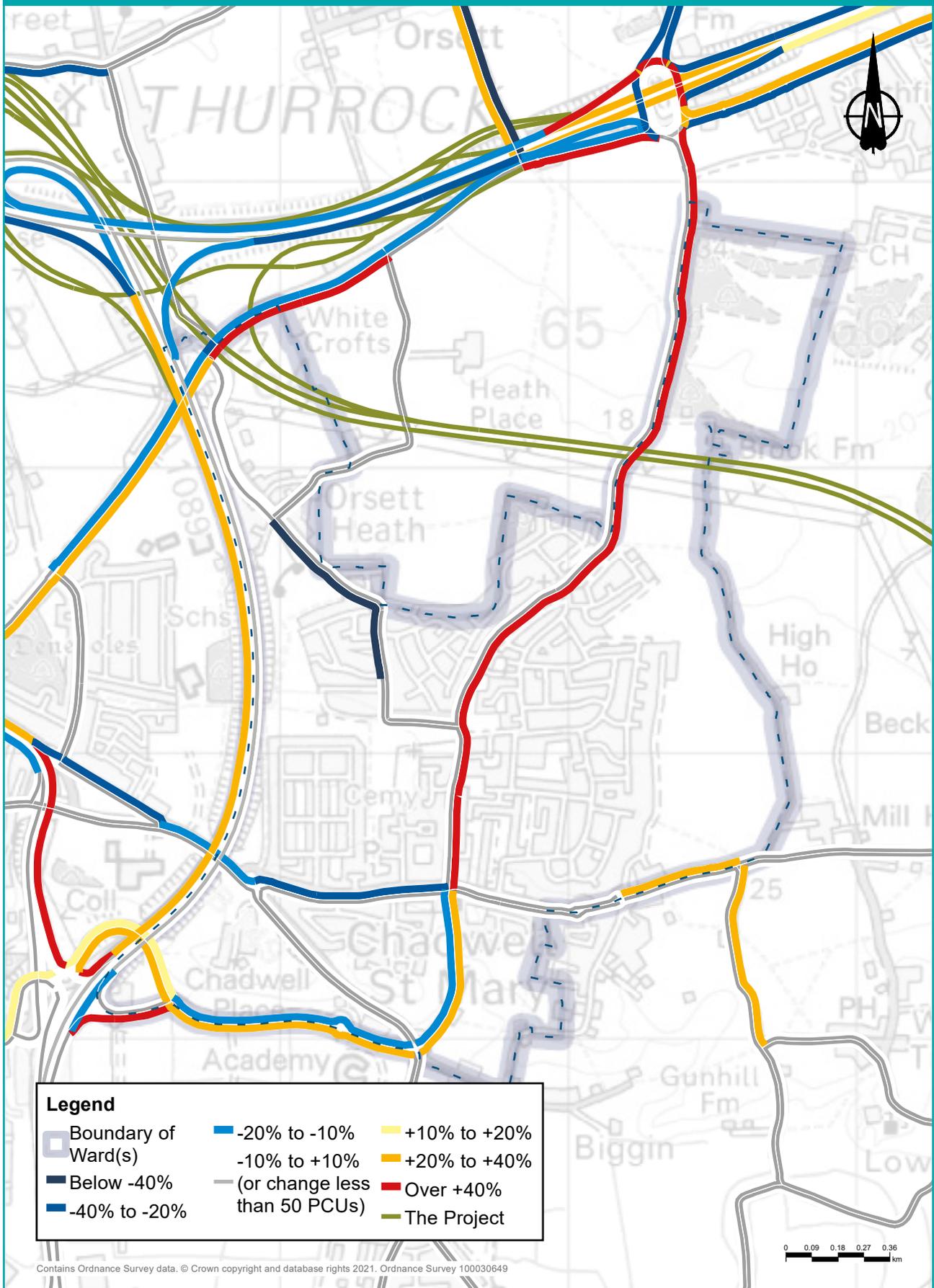


Figure 15.9: Predicted change in traffic flows (PCUs) with the project during the evening peak in 2029

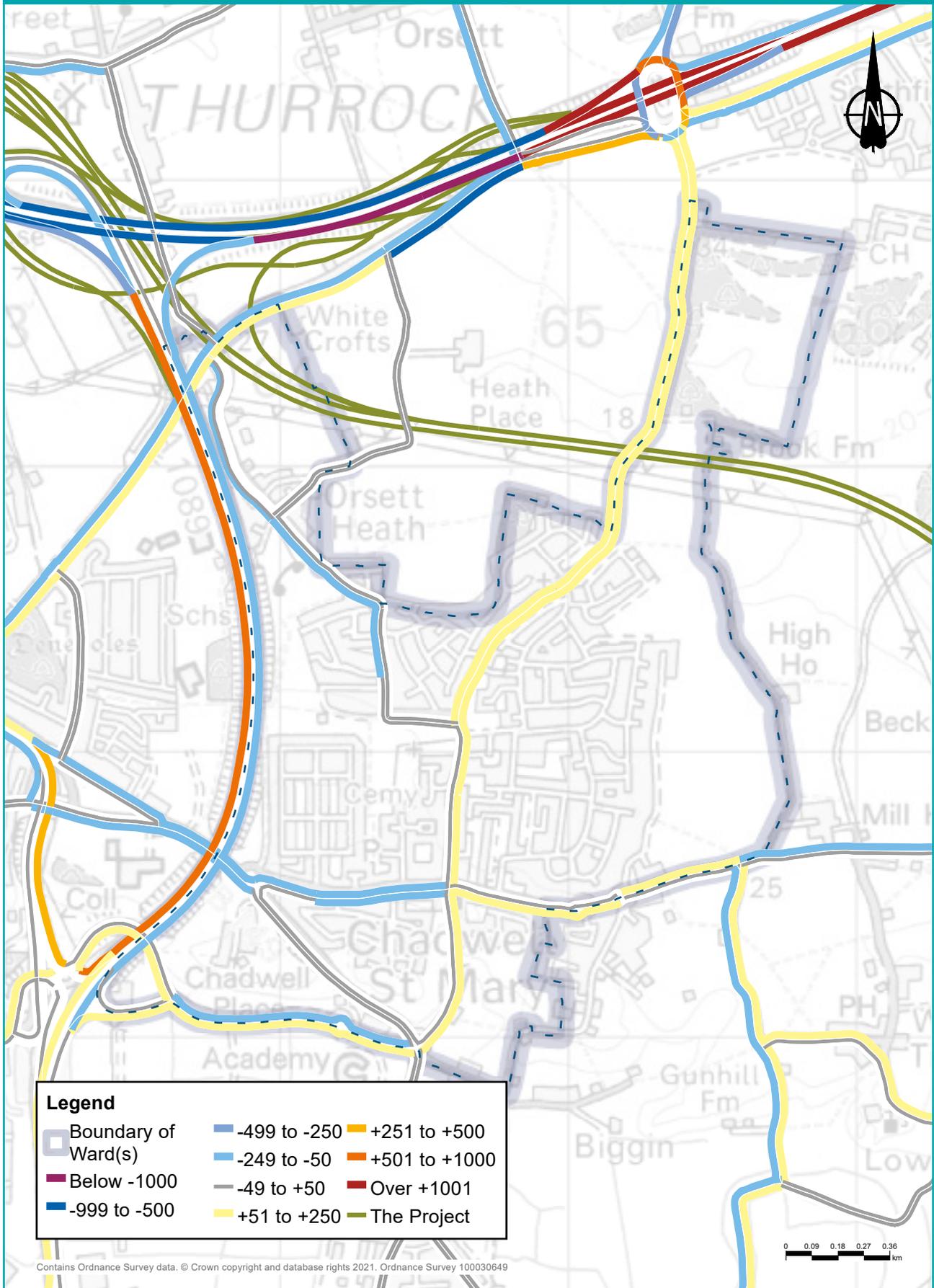
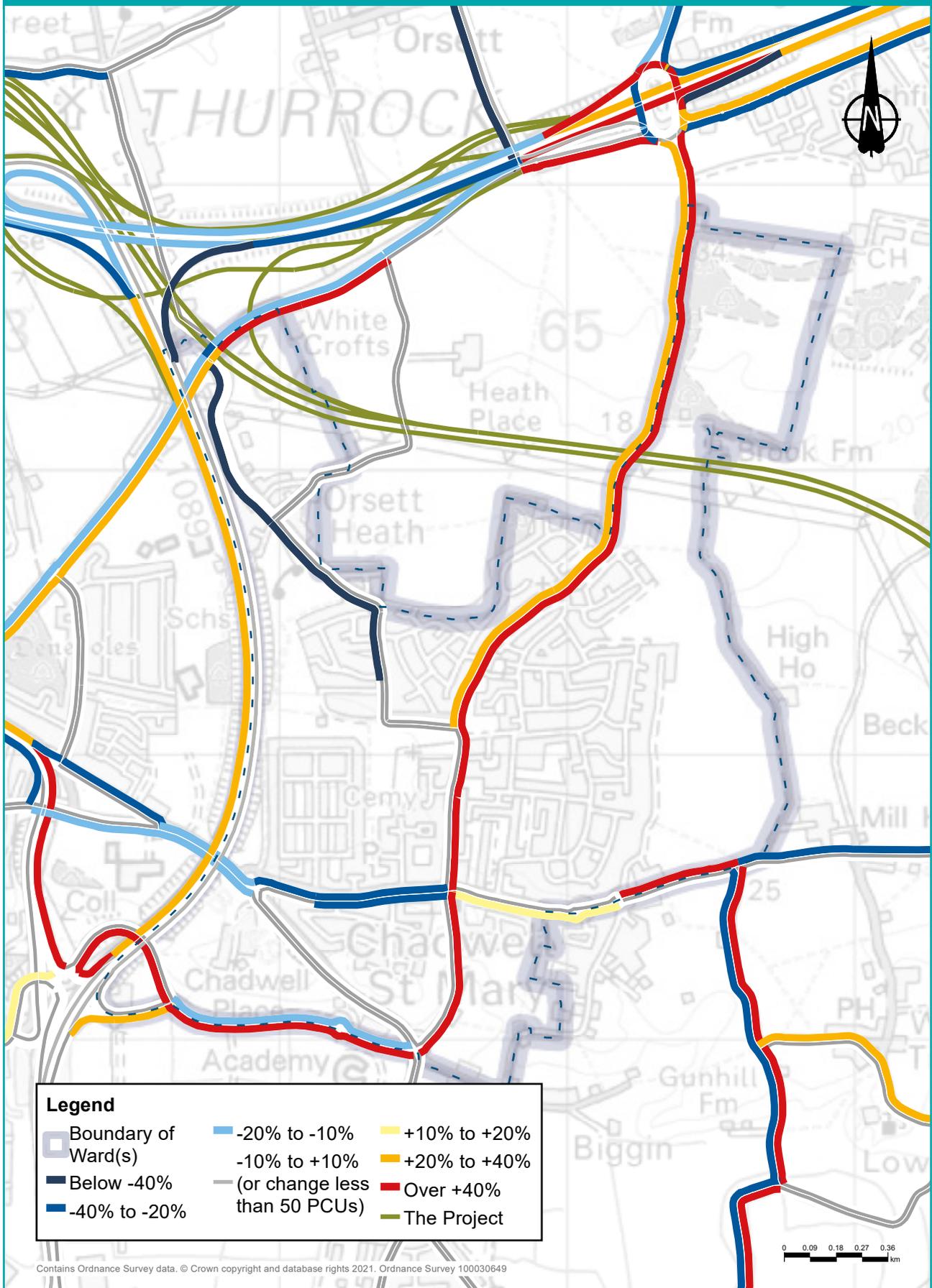


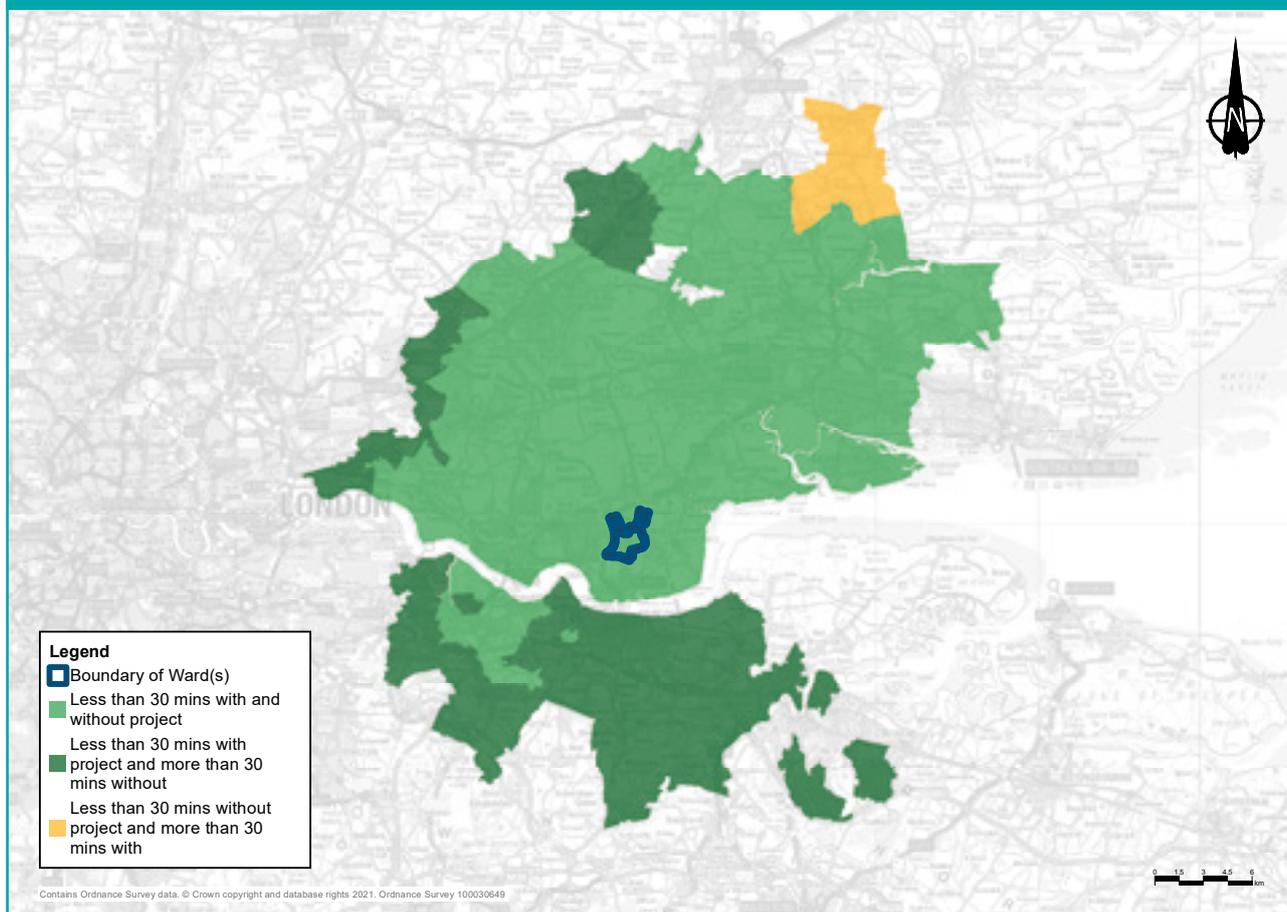
Figure 15.10: Predicted percentage changes to traffic flows during the evening peak in 2029



Changes to journey times

Figure 15.11 shows the change in the area that could be reached within a 30-minute drive from the centre of the ward both without the project and with the project. Figure 15.12 shows the change in areas that could be reached within a 60-minute drive. The areas have been calculated for the morning peak hour (7am-8am). The number of jobs within a 30-minute drive with the project in place would increase by 49%, which would mean access to an additional 181,000 jobs. Within a 60-minute drive, the number would increase by 18%, which would mean access to an additional 430,000 jobs.

Figure 15.11: Change in area that motorists could drive to within 30 minutes from Chadwell St Mary ward



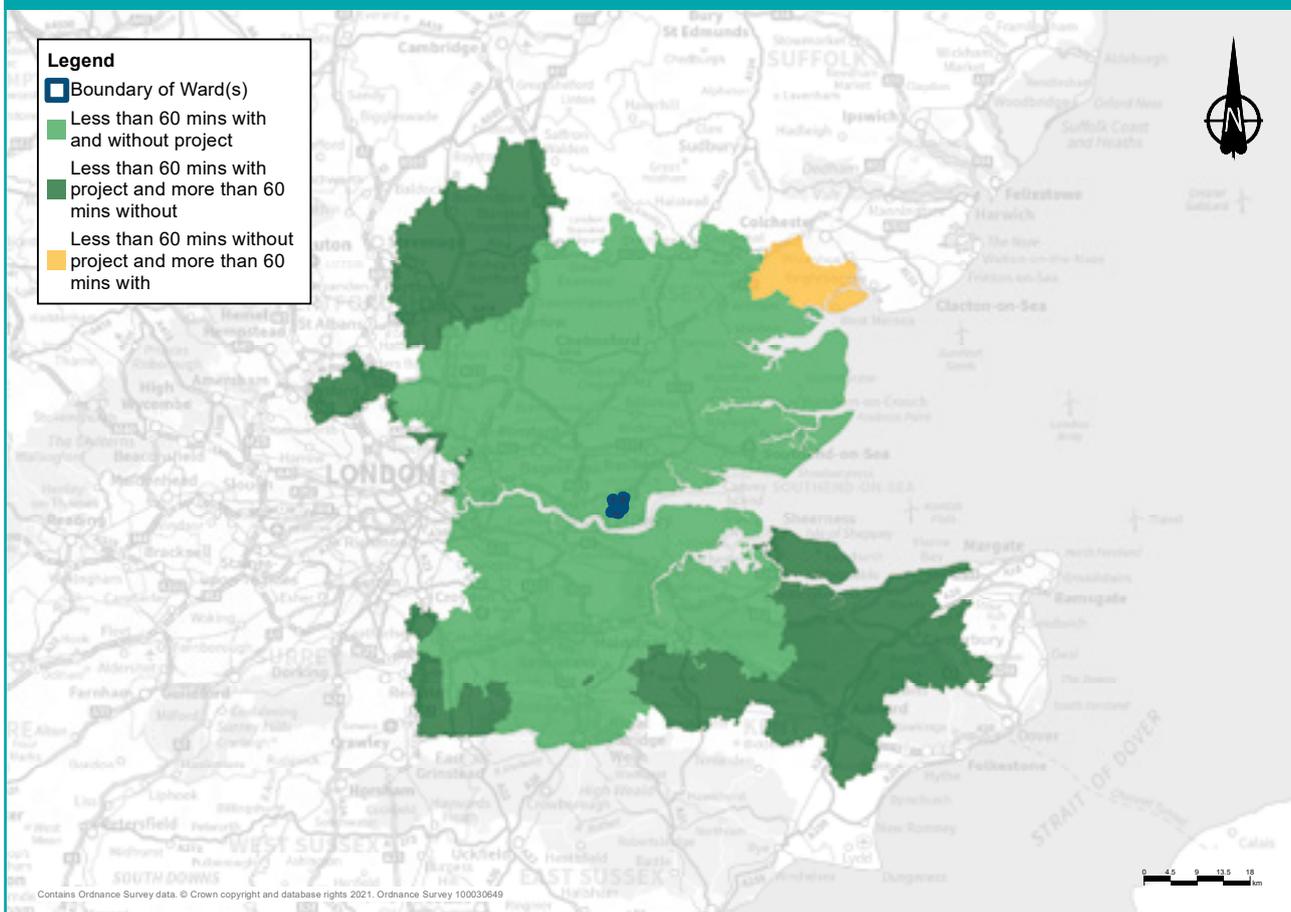
Operational traffic flows

The project has been designed to optimise its impacts on traffic, including the design of free-flowing connections with the A13/A1089 and the M25. In addition, the main route would have no traffic lights or roundabouts to ensure continuous traffic flow, although traffic lights or roundabouts would be necessary at some minor junctions away from the main route where traffic meets local roads. All new junctions would be designed to the latest safety standards.

An iterative design process, including successive stages of traffic modelling and extensive consultation and engagement, has ensured that only the optimal links to the existing road network would be provided. For more information about how the project has developed, see the You said, we did consultation document.

Once the project is operational, traffic impacts on the affected road network would be monitored, including local roads. Where appropriate, we would work with the relevant highway authority to seek funding from the Department for Transport for further interventions.

Figure 15.12: Change in area that motorists could drive to within 60 minutes from Chadwell St Mary



15.4 Public transport

Existing situation

There are no stations within Chadwell St Mary ward but Grays, Tilbury Town and East Tilbury stations are all nearby. These are serviced by c2c, with trains between London and destinations in Thurrock and Essex.

There are a number of bus routes in the ward, including the 5A, 5B, 5X, 7, 7A, 7B, 7C, 11, 51, 66, 66A, 73, 77, 77A, 83, 100, 374, 474, 475, and the Z1, which run through the ward, and the Z2 and Z4 which run along the A1089.

15.4.1 Construction

Rail

There would be a series of night time rail possessions of the Tilbury Loop railway line over a period of two months, in the adjacent East Tilbury ward while the Tilbury Viaduct is constructed. These possessions would be agreed with the network operator. It is intended that the works would take place outside train operational times, and so services would not be disrupted.

Throughout construction there may be some increases in journey times to Tilbury Town and East Tilbury stations, associated with increased traffic through the area and traffic management on local roads.

Buses

Additional traffic along the A1089 and traffic management measures on local roads may impact journey times for a number of local bus routes.

15.4.2 Operations

Rail

There would be no discernible change in local access times to Grays, Tilbury Town or East Tilbury stations and no change to the rail services at these stations. It would be quicker to access HS1 services at Ebbsfleet International Station from this ward, with the journey time decreasing by around six minutes in the morning and evening peaks.

Buses

It is expected that during the operational phase there would be a minor increase in journey time on certain sections of the route for these buses:

- Bus 5X from Wickford to Grays, there would be a predicted increase of around seven minutes on the time for this bus route, westbound in the morning peak. The other time periods and direction would not be affected. The 51 bus from Prittlewell to Grays and Chafford Hundred would have a predicted increased journey time of nearly seven minutes in the westbound direction in the morning peak hour. There would only be a slight change in other time periods and directions.
- The 73 bus runs from Tilbury through Grays to Lakeside Shopping Centre. The journey times westbound in the morning peak hour would decrease by around two minutes.
- The 83 bus from Chadwell St Mary through Grays to Lakeside would also run slightly quicker in the morning peak westbound, with a predicted decrease in journey time of 1-2 minutes.
- The Z4 service from the Amazon distribution centre to Basildon and Pitsea would take two minutes longer in the northbound direction in the evening peak hour.

15.5 Footpaths, bridleways and cycle routes

Existing situation

Chadwell St Mary is a largely suburban ward, surrounded by a more rural area. It is host to a network of footpaths and bridleways that connect Grays and East Tilbury. For other potential impacts, see the other topic areas in this chapter, such as Visual and Noise and vibration.

15.5.1 Construction

Due to the close proximity of construction works, there would be minor changes to the network of footpaths and bridleways in the Chadwell St Mary ward during the construction period. For more information about the proposed network of footpaths and bridleways in place once the project is complete (including a map), see the Operational impacts section below.

- Footpath FP78 would need to be closed for nine months for utility diversion works. Later, it would also be closed for three months to upgrade the route, creating part of a new bridleway link between High House Lane, Brentwood Road.
- Footpath FP79 would need to be closed for five years for utilities diversion works and construction of the Lower Thames Crossing main line. We are currently working on a potential temporary diversion for this route, so that some or all of the amenity currently provided would be retained during the construction period.
- Footpath FP95 would be impacted by works to divert overhead lines in the area and would need to be closed for intermittent periods over three years for this work before closure of less than a month while the path is resurfaced.
- The pedestrian-cycle track that runs along the south side of the A1013 Stanford Road would need to be closed for less than a week when traffic is diverted onto the new bridges over the project.

Figure 15.13: Footpaths, bridleways and cycle routes in the vicinity of the project in Chadwell St Mary Ward

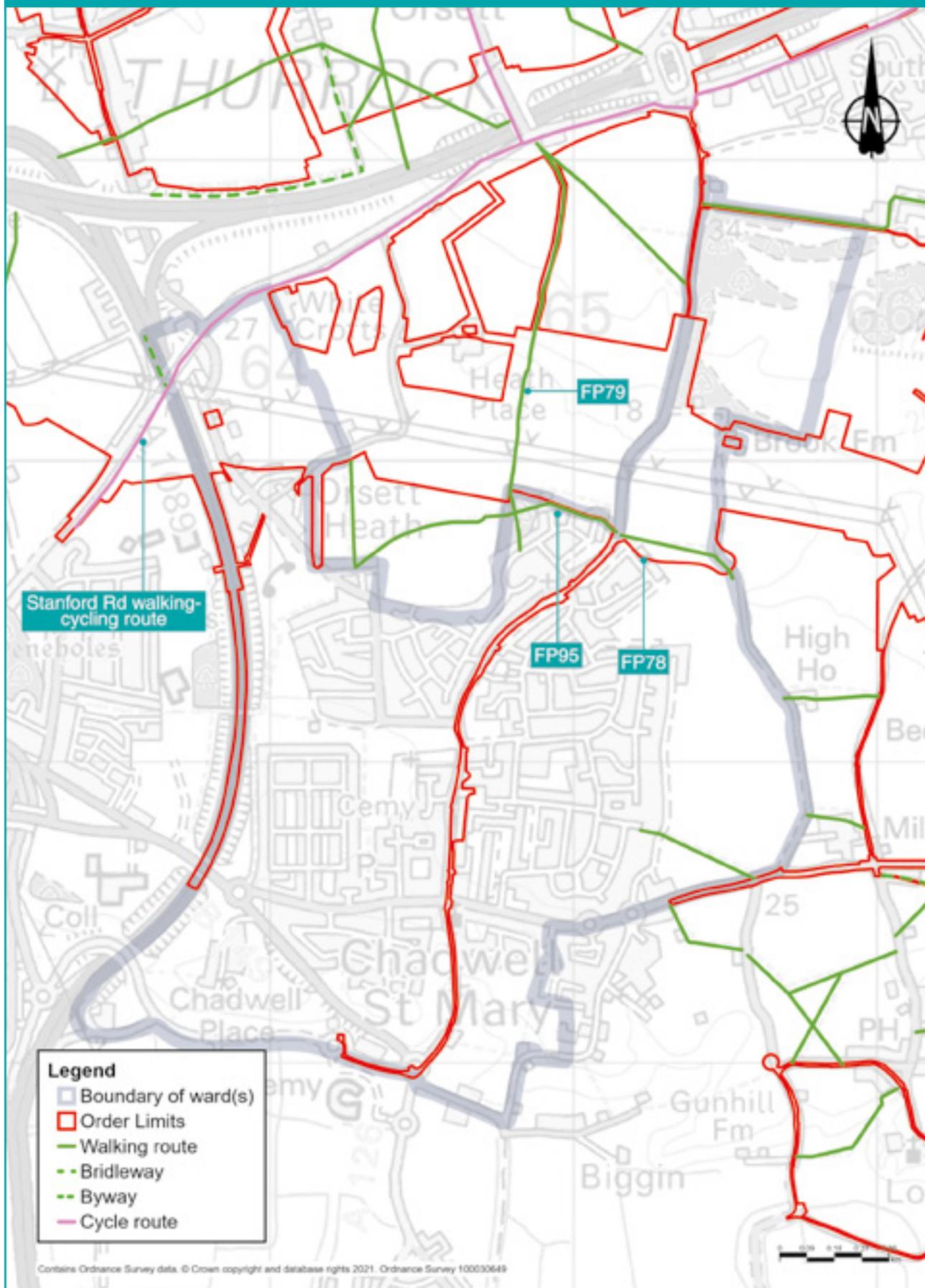
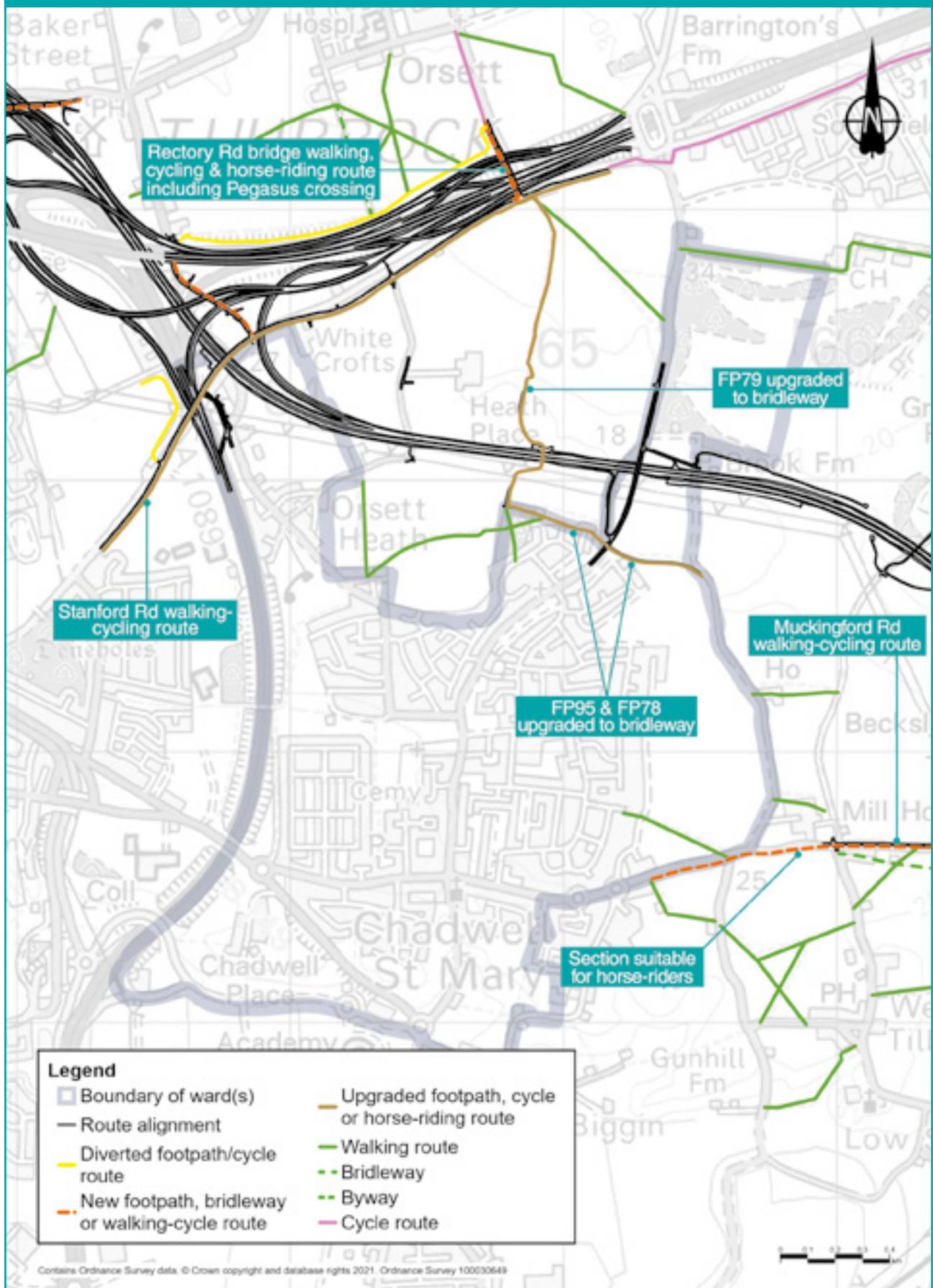


Figure 15.14: Proposed footpaths, bridleways and cycle routes



15.5.2 Operations

The project's proposals include the creation of over 46km of extended, diverted, upgraded or entirely new footpaths, bridleways and cycle routes. The proposals were developed after consultation with local communities and stakeholders, including walking, cycling and horse-riding groups. For information about changes to footpaths and bridleways across the project, see chapter 2 of the Operations update.

- Footpath FP78 would be realigned with High House Lane, which is to be permanently closed where it crosses the project route. The section south of the project route would be diverted to the west along the alignment of FP78 to join Brentwood Road. FP78 to be upgraded and designated as bridleway.
- Footpath FP79 would be realigned via a new bridge and resurfaced and designated as a bridleway as well as a footpath. The bridge over the project would be designed to equestrian standards.
- Footpath FP95 would reopen after resurfacing and upgraded to a bridleway from Old House Wood to Brentwood Road.
- There would be a new walking-cycling track parallel to the A1013 Stamford Road on its southern side. The section of Stamford Road between Rectory Road and the upgraded FP79 would include a grass verge for horse-riding use. The walking/cycling/horse-riding routes on Stamford Road would connect to Rectory Road bridge via a new Pegasus crossing (one suitable for horse-riders, as well as walkers and cyclists). Rectory Road bridge would include a walking-cycling track and a separate horse-riding surface.

15.6 Visual

Existing situation

More information about how the area would look during construction, including construction visualisations, can be found in the Construction update.

Views towards the land on which the project would be built from the main populated areas are mainly limited to residents living in the north and east edges of Chadwell St Mary. There are also likely to be views from the west part of Orsett Golf Course and from some local footpaths.

The current view of the land on which the project would be built from the northern edge of Chadwell St Mary is of large-scale, gently undulating arable farmland, crossed by two sets of prominent overhead lines. From the eastern edge of Chadwell St Mary, the view is of relatively flat farmland. Vegetation along the edge of the settlement and intervening field boundaries screens or filters some views towards the land on which the project would be built.

Views from local public rights of way are similar in character to those from homes in Chadwell St Mary, albeit slightly more open. Views from the west part of Orsett Golf Course towards the project are limited by trees.

15.6.1 Construction

Construction impacts

The main construction activities likely to be seen in Chadwell St Mary are:

- construction of the A13 junction and project route to the south
- construction of Brentwood Road bridge
- establishment and operation of the Brentwood Road and Stanford Road Compound
- establishment and operation of the Hornsby Lane and Brentwood Road Utility Logistics Hubs
- utilities works including overhead power line diversions.

More information about construction activities are provided in the project description section earlier.

There are likely to be close to mid-range views of construction activities from homes on the northern edge of Chadwell St Mary, including road construction, overhead power line diversions and multi-utility works. The Brentwood Road Compound, as well as the Hornsby Lane and Brentwood Road Utility Logistics Hubs, would also be visible from the north. From the eastern edge of Chadwell St Mary, there are likely to be distant views of road construction and overhead line diversion, partially filtered by existing vegetation.

Views of construction activities from local public rights of way are likely to be similar to those from homes on the north and eastern edges of Chadwell St Mary. There would be intermittent southerly views of road construction and overhead power line diversions from Orsett Golf Club and views of other utility works on its western edge.

Measures to reduce visual impacts of construction

Mitigation would include forming temporary earth bunding on the southern boundary of the Brentwood Road Compound, where reasonably practical, to reduce views of construction activity within the compound for homes within Chadwell St Mary.

The visual impacts of the project would be controlled through the range of good practice measures set out in the project's CoCP and the REAC. See chapter 1 of the Construction update for more information about this and the project's other control documents.

15.6.2 Operations

Operational impacts

By opening year, the former construction compounds and Utility Logistics Hubs would have been removed and the land restored.

Further details of the completed project are provided in the project description section above.

The changed views for homes along the northern edge of Chadwell St Mary would include the tops of HGVs and gantries above the new grassed slopes (called false cuttings), as well as views of Brentwood Road overbridge. The diverted overhead lines would be similar to those in existing views. A short section of the new crossing would be more prominent to the north-east, where the route emerges from the false cuttings and traffic would be visible. From properties along the eastern edge of Chadwell St Mary, there would also be filtered, distant views of the tops of HGVs and gantries, seen above grassed false cuttings (a landscaped mound placed alongside the new road to reduce views).

The project would be visible from local footpaths along the north and eastern edges of the settlement. A wide belt of proposed woodland planting would help screen views of the new road and infrastructure from Orsett Golf Course.

Measures to reduce visual impacts of the operational project

The primary mitigation in this ward would be the false cuttings to the north and east of Chadwell St Mary and landscape treatment along the project corridor, to screen views and integrate the new road into the surrounding landscape.

15.7 Noise and vibration

We have carried out noise and vibration assessments for both the construction and operational phases of the project. As explained in chapter 1, some of the assessments set out below are based on earlier versions of the project. The information provided still presents a reasonable representation of the likely effects from the proposals presented during this consultation.

Existing situation

The existing noise environment in Chadwell St Mary ward is mainly created by traffic noise from the A126, A1089, A1013 and the B149. There is also noise from other roads, agriculture and human activities.

As part of our environmental assessment process, we carried out surveys of background noise at two locations in the ward, which were agreed with the local authority. The levels monitored at these locations recorded average existing noise levels in the range of 54 to 59 dB(A)² in the day and 52 to 54 dB(A) during the night.

In order to understand how noise levels would vary with and without the new road, we have used noise modelling to predict what noise levels would be like in the project's proposed opening year if the new road was not built. We model this because we cannot assume that noise levels in future will be the same as they are now. For example, our assessment of the opening year noise levels accounts for predicted changes in traffic levels.

We also model the predicted noise levels for the opening year with the project in place. This provides a useful comparison as to how the road would change the noise levels in its opening year if it was built.

2 Decibel (dB) is the unit used to measure noise levels, with dB(A) being a standardised way of averaging noise levels that accounts for how humans hear sounds. The typical level of sounds in the environment ranges from 30 dB(A), which is a quiet night-time level in a bedroom, to 90 dB(A), which is how it would sound by a busy road. See chapter 1 for more information about what decibel levels mean.

In the opening year, noise levels without the new road are predicted to range from 41 to 77 dB(A) in the day and from 30 to 63 dB(A) during the night at the identified locations in the ward. As such, our noise assessments predict that by opening year noise levels will increase compared to the existing situation even if the road is not built. Information about how noise levels would change with the project in place, during its construction and operation, are presented below.

15.7.1 Construction

Daytime construction impacts

The main construction activities that are expected to create a slight increase in noise and vibration levels in this ward relate to the A1089 upgrade, main alignment and selected utilities works.

There would be no main works compounds or Utility Logistics Hubs (ULHs) located in this ward. For more information, see the project description section above.

Although not located in the ward, Stanford Road Compound, Brentwood Road Compound, Long Lane Compound A, Hornsby Lane ULH and Brentwood Road ULH may contribute to the noise in this ward as they would be located close to the ward boundary.

There would also be haul roads built and used during the construction period, these are shown in the project description.

Within the ward, there is one structure expected to be constructed using vibratory or percussive piling, but potential vibration impacts of the structure would be less than 10 days.

Construction noise levels have been predicted at six locations across the ward. These were chosen to convey the level of noise that communities could expect to experience during construction. For more information about how we carried out these assessments, see chapter 1.

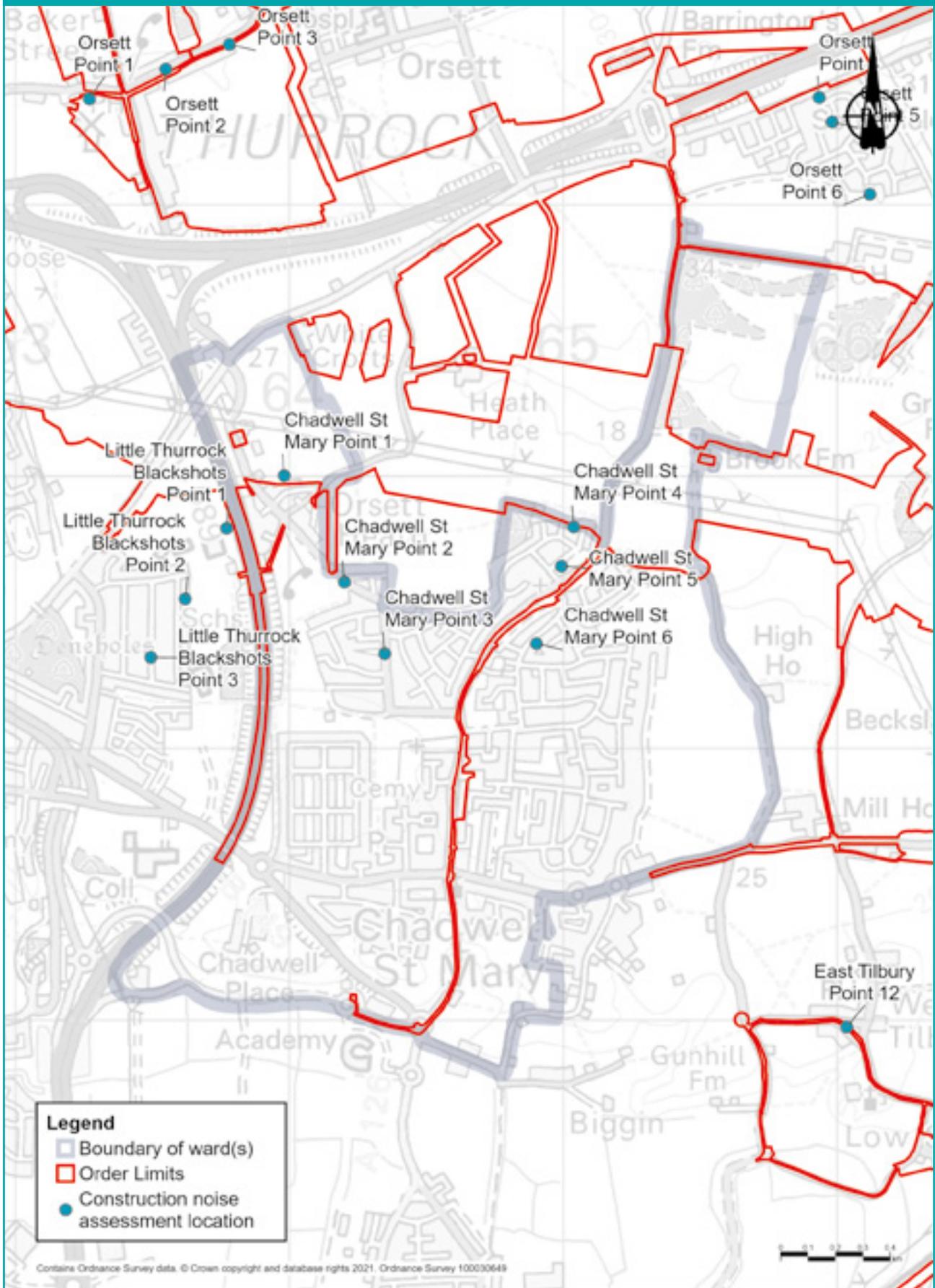
Noise levels are shown using the standard units for major projects, dB LAeq (12 hour), which represent the average noise level for the assessed 12-hour daytime period. While there might be short-term noises that are louder than the noise level shown during the assessed period, the averaged figure provides a fair representation of what the overall noise impacts would be.

Figure 15.15 shows the locations used to predict daytime construction noise during the new road's construction.

Each vertical bar in figures 15.16 and 15.17 shows the predicted noise levels for that month of the construction period (from month 1 to month 72). The horizontal green bar in each chart shows the existing background noise level at each assessment point without the project. The horizontal red line shows the level at which construction noise would exceed defined thresholds (see chapter 1 for more information about these thresholds). If noise is predicted to exceed acceptable levels, then specific measures would be implemented to reduce the noise.

The predicted construction noise levels show that higher noise levels and disturbance would be experienced closer to construction activity. Levels gradually diminish as a result of increased distance and additional buildings and other features screening the noise from more distant residential areas.

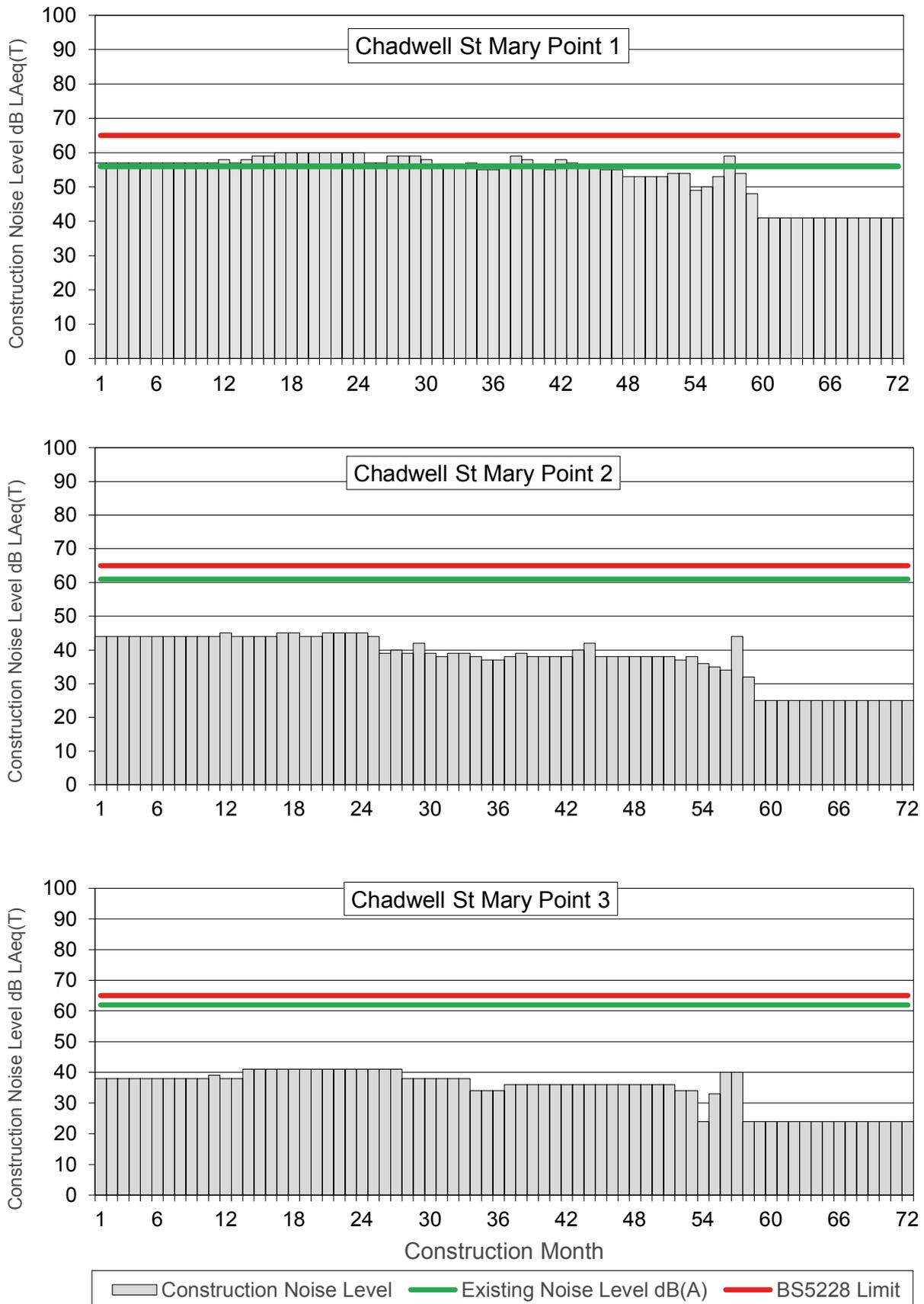
Figure 15.15: Construction noise assessment in Chadwell St Mary ward



With reference to figure 15.16 the following summarises the noise level changes over the construction period for points 1 to 3:

- At point 1, construction noise levels are predicted to range from 41 to 60 dB LAeq (12hour) during the six-year construction programme. Construction noise levels would exceed the existing background daytime noise level for approximately 36 months. However, they would not breach the defined threshold.
- At point 2, construction noise levels are predicted to range from 32 to 52 dB LAeq (12hour) during the six-year construction programme. Construction noise levels are not predicted to exceed the existing background noise levels at this assessment location.
- At point 3, construction noise levels are predicted to range from 31 to 48 dB LAeq (12hour) during the six-year construction programme. Construction noise levels are not predicted to exceed the existing background noise levels at this assessment location.

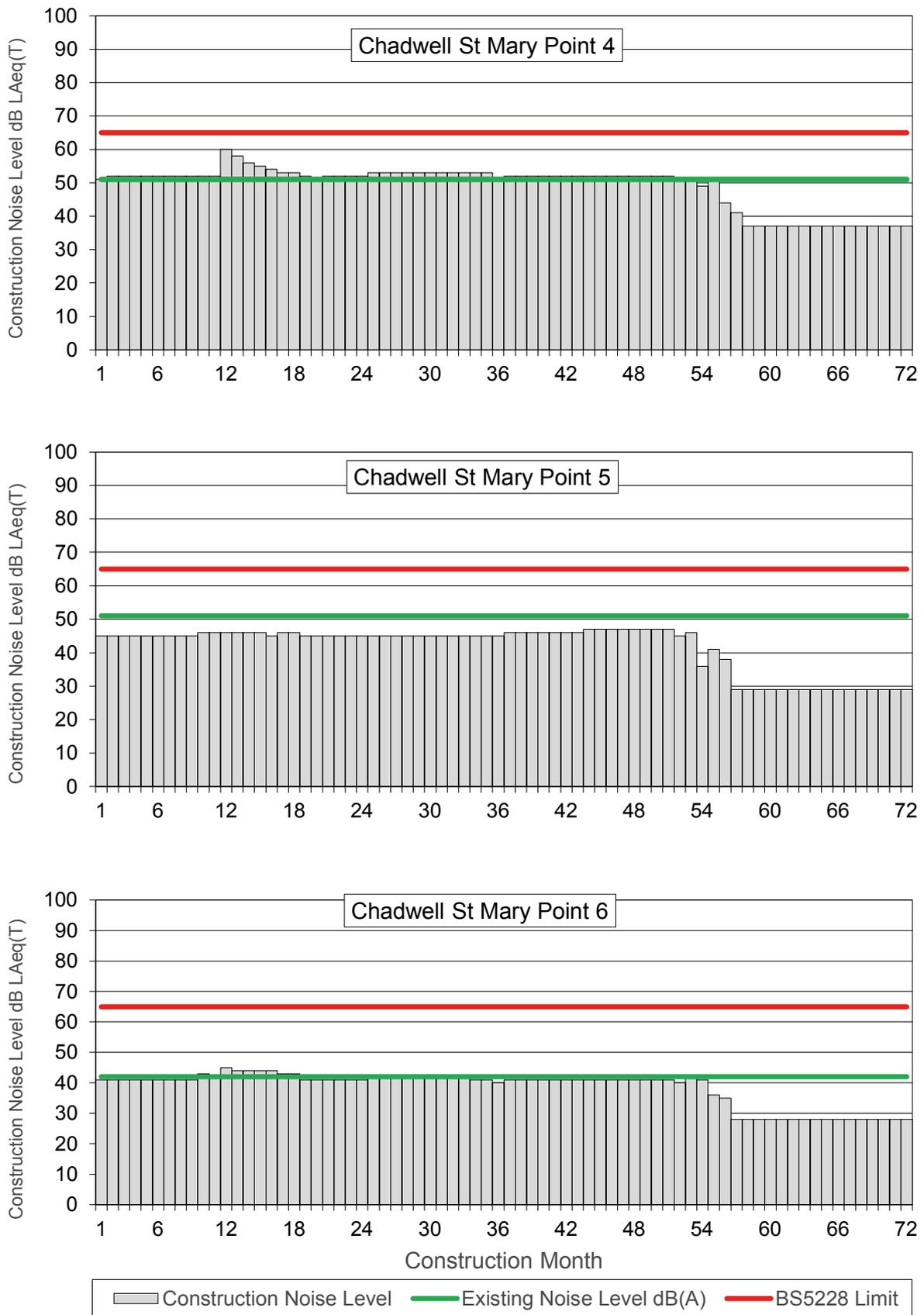
Figure 15.16: Construction noise by month for points 1-3 in Chadwell St Mary ward



With reference to figure 15.17 the following summarises the noise level changes over the construction period for points 4 to 6:

- At point 4, construction noise levels are predicted to range from 37 to 60 dB LAeq (12hour) during the six-year construction programme. Construction noise levels would exceed the existing background daytime noise level for approximately 48 months. However, they would not breach the defined threshold.
- At point 5, construction noise levels are predicted to range from 29 to 47 dB LAeq(12hour) during the six-year construction programme. Construction noise levels are not predicted to exceed the existing background noise levels at this assessment location.
- At point 6, construction noise levels are predicted to range from 28 to 45 dB LAeq (12hour) during the six-year construction programme. Construction noise levels would exceed the existing background daytime noise level for approximately eight months. However, they would not breach the defined threshold.

Figure 15.17: Construction noise by month for points 4-6 in Chadwell St Mary ward



24/7 construction working

In addition to the changes to the daytime noise impacts reported in the section above, 24-hour seven-day construction working is proposed at the locations shown in figure 15.18.

These works have been identified as they may need to be done at night to maintain safety and reduce disruption to road and utility networks. Night-time or weekend activity would also be necessary for highways and utilities works.

These works could affect local communities, and we would work with the local authority to manage these impacts.

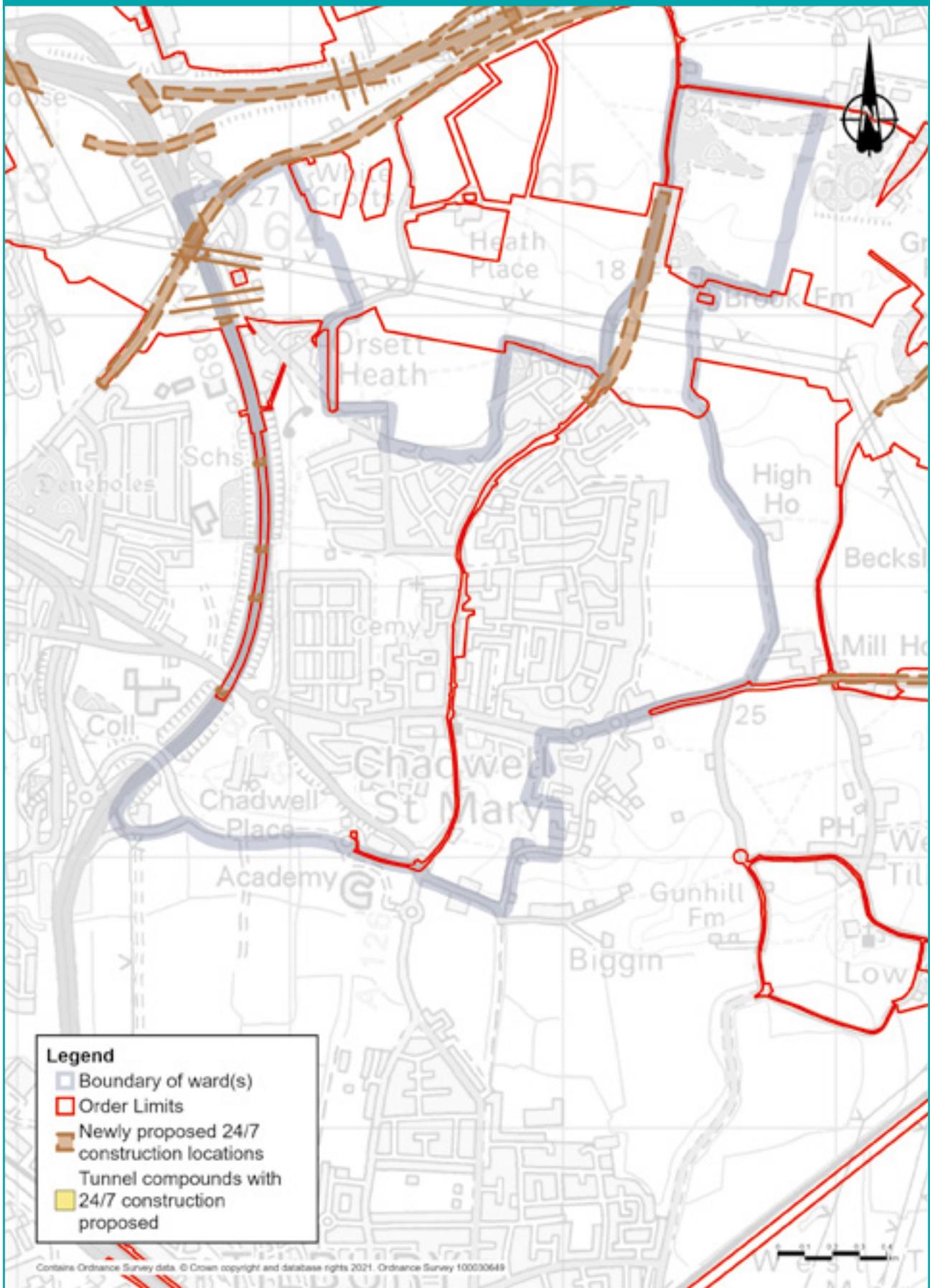
Construction traffic noise impacts

Maps showing the predicted change in road traffic noise within this ward during each year of construction can be found in the Construction update. Based on currently available traffic data (which offers a representative picture of what people within the ward are likely to experience) during the construction period there would be negligible changes in road traffic noise (less than 1dB change in noise levels), except along the roads where increases in noise levels are predicted. For more information about how we define noise impacts (negligible, minor, moderate and major), see chapter 1.

Table 15.4: Construction traffic noise impacts in Chadwell St Mary ward

Affected road(s)	Predicted noise impact	Construction year(s)
Hornsby Lane	Minor increase in noise levels	1
Westbound exit from A13 on to Dock Approach Road	Minor increase in noise levels	1 and 2

Figure 15.18: Newly proposed and tunnel 24/7 working locations in Chadwell St Mary ward



Construction mitigation

Construction noise levels would be controlled by using best available techniques (BAT), with specific measures at certain locations, such as:

- Installing temporary acoustic screening around the construction areas likely to generate noise
- Turning off plant and machinery when not in use
- Maintaining all vehicles and mobile plant so loose body fittings or exhausts do not rattle or vibrate
- Using silenced equipment where available, specifically silenced power generators and pumps
- Not playing music or radios for entertainment purposes outdoors on site
- Keeping construction vehicle traffic to a minimum by selecting local suppliers and a local workforce where possible, and reducing the transport of material for earthworks construction

All control measures, including those above, fall under the principles of BAT and are included in the REAC. For more information, see the sections NV001 to NV010, which set out how we would work under the supervision of the relevant local authorities to implement noise-reduction measures where these are needed.

The CoCP sets out additional measures that would be used to reduce Noise and vibration during the construction period.

15.7.2 Operations

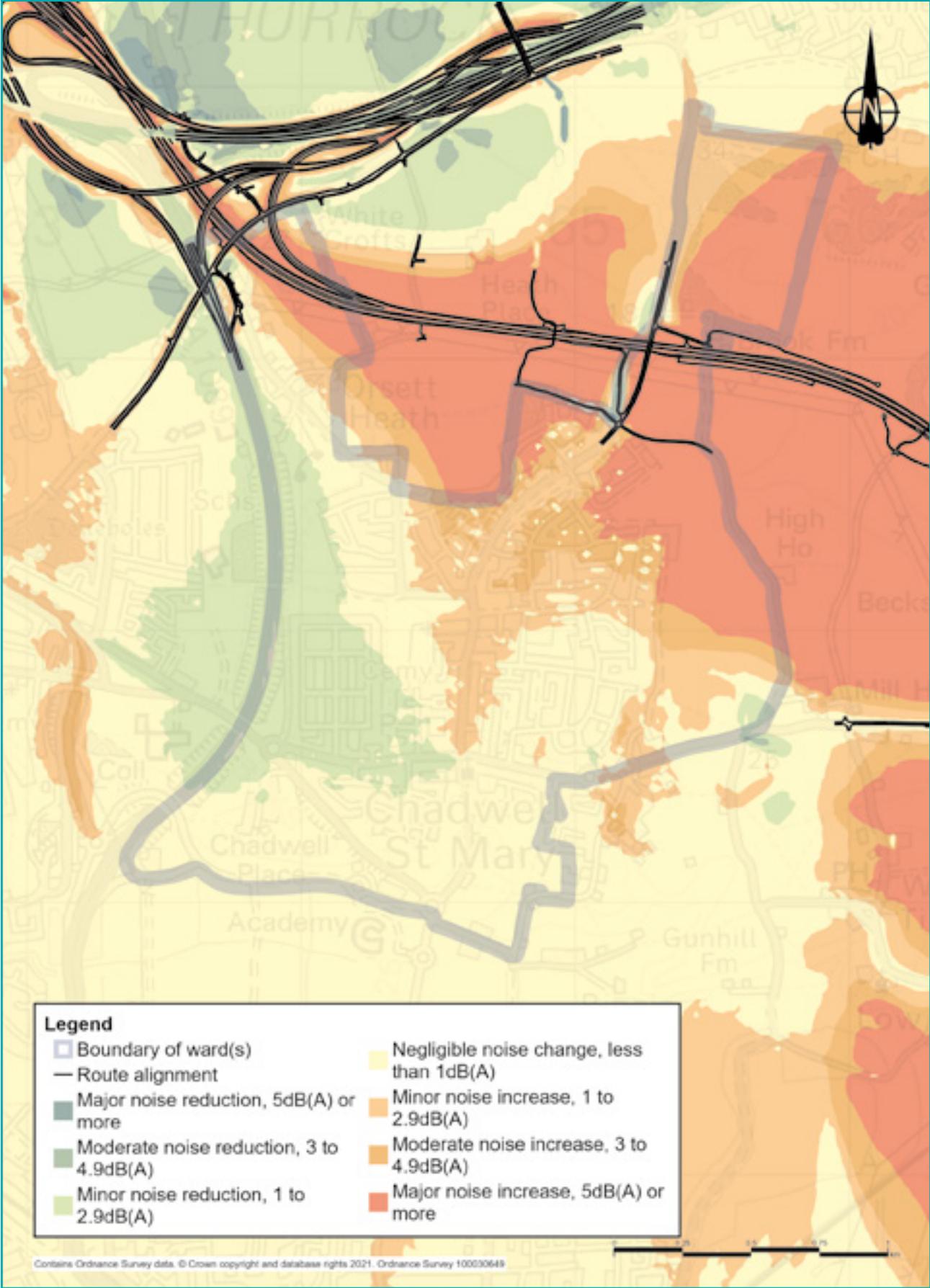
Operational impacts

Within this ward, the project route and the proposed improvements to the A13 junction runs through the northern part of the ward.

Direct noise impacts from the route, the proposed A13 junction and widening of the existing A13 would be experienced in the northern section of the ward. There would also be indirect noise impact as a result of changes in traffic flow, and traffic speed on the existing road network within the ward.

Figure 15.19 above shows the predicted changes in road traffic noise in the opening year of the project. Within the ward, changes in road traffic noise at identified noise sensitive receptors are predicted to range from moderate reductions in noise levels of between 3.0 and 4.9dB to major increases in noise levels of greater than 5dB. For more information about how we define noise impacts i.e. negligible, minor, moderate and major, see chapter 1.

Figure 15.19: Noise impacts during operation in Chadwell St Mary Ward



Measures to reduce impacts during operations

The main methods of controlling noise would be, where practical, to design the road within landscaped features such as cuttings and bunds (walls of earth). However, where noise impacts are greatest, we would install noise barriers (typically, wooden fences) in addition to these earthworks features. Proposed noise barriers are shown in chapter 5 of the Operations update. The use of low-noise surfacing would also reduce the traffic noise once the road is in use.

For more information about the proposed measures to reduce operational noise, see the REAC (including references NV011 and NV013).

15.8 Air quality

We have carried out air quality assessments for both the construction and operational phases of the project. As explained in chapter 1, some of the assessments set out here are based on earlier versions of the project. The information provided here still presents a reasonable representation of the likely effects from the proposals presented during this consultation.

Existing situation

Chadwell St Mary ward is not located within an Air Quality Management Area (AQMA). AQMAs are areas that have been identified by local authorities as areas of poor air quality that require additional monitoring and controls.

15.8.1 Construction

Construction impacts

Construction activities have the potential to affect nearby air quality through the release of dust and emissions from construction equipment and traffic. The areas most likely to be affected are those close to haul roads, compounds and soil storage areas.

Properties more than 200 metres from the worksite (most of the properties within this ward) are outside the area likely to be affected by construction dust or emissions. In this ward, there are only a few properties within 200 metres of the worksite, those along Brentwood Road. Air quality impacts on these properties during construction would be temporary and we would put in place measures to minimise the dust impacts (see below). The proposed measures to reduce dust and emissions have been proven to be effective when used on similar construction projects in the past. The change in air quality during the construction phase would be negligible, and there would be no discernible effect on health.

Our analysis of construction traffic predicts that the impact on most roads in this ward would be negligible, although there would be a temporary minor worsening in air quality in the area around the A1089 corridor (such as those on Badgers Mount, Farm Road and Longley Mews) as a result of traffic management in place from 2025 to 2027. More information about construction traffic impacts on air quality can be found in chapter 7 of the Construction update.

Measures to reduce air quality impacts of construction

The impact of construction machinery and traffic on air quality would be controlled through the range of good practice measures set out in the CoCP and the REAC. For example, there would be measures to suppress dust, such as damping down dry haul roads and spoil heaps, as well as the use of low-emission machinery and vehicles. We would put in place an air quality management plan to ensure the measures set out in the CoCP and the REAC would effectively monitor and control dust and exhaust emissions. The location and type of monitoring would be submitted in advance to Thurrock Council for consultation (see REAC entry AQ006).

15.8.2 Operations

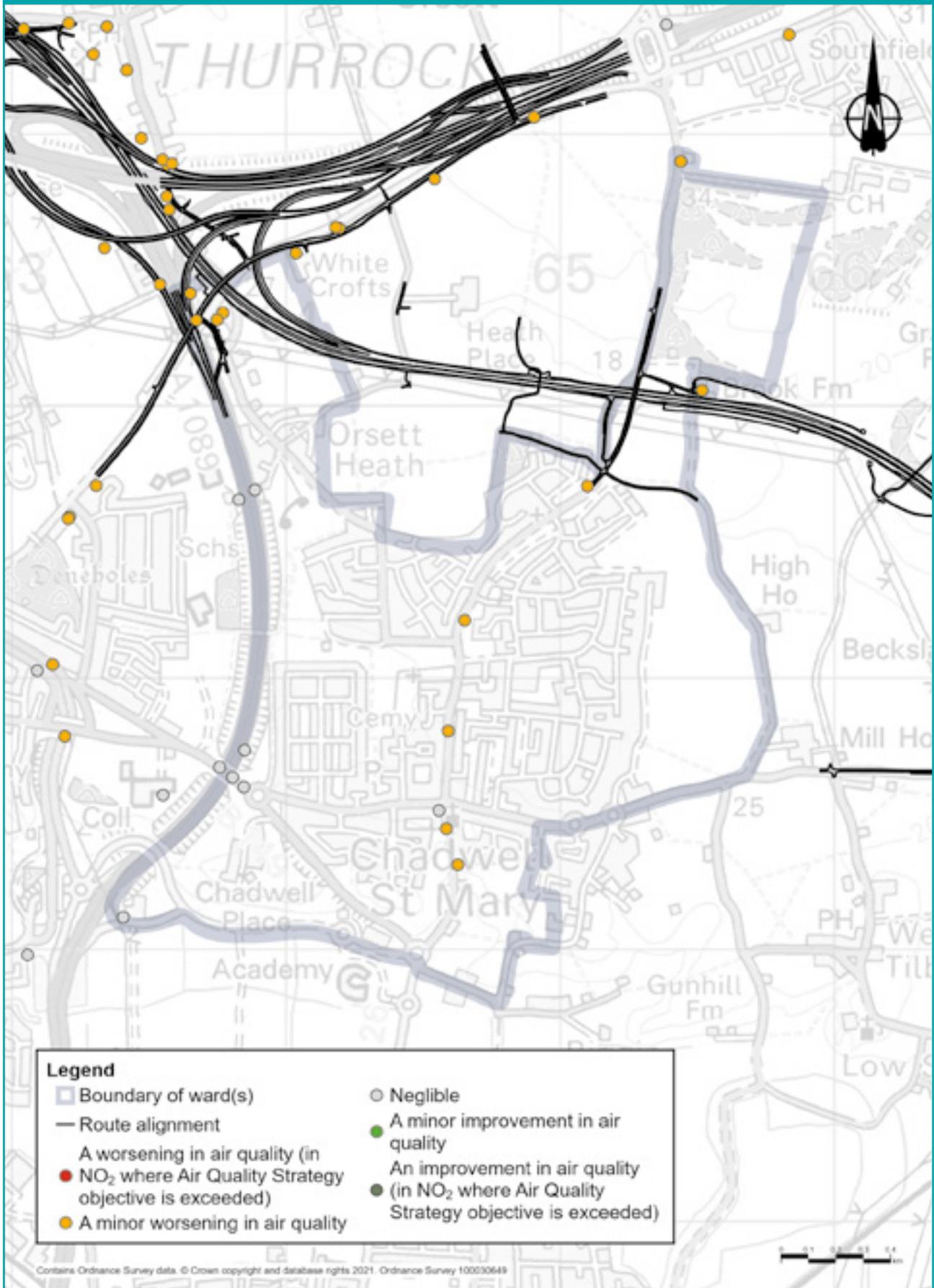
Operational impacts

We have carried out an assessment of the operational impacts of the new road on air quality. The assessment area includes a 200 metre buffer around the roads within the affected road network, with this area being the most likely to experience changes to air quality as a result of the new road. More information about air quality impacts once the road is open can be found in chapter 5 of the Operations update.

There are receptors (properties or habitats that are sensitive to changes in air quality) within the ward, along Brentwood Road that are predicted to experience a minor deterioration in the air quality for nitrogen dioxide (NO₂), the main traffic-related pollutant³. The highest modelled yearly average NO₂ concentration within this ward is 32.8 µg/m³, which is below the yearly average threshold of 40µg/m³. Our assessment is based on our opening year model, which represents a worst-case scenario, without accounting for the increase in less-polluting vehicles on our roads over time.

³ NO₂ levels are measured in 'micrograms per cubic metre', or µg/m³, where a microgram is one millionth of a gram.

Figure 15.20: Predicted changes in NO₂ levels within Chadwell St Mary ward once the new road is open



Furthermore, local air quality data shows an overall downward trend in NO₂ over recent years, which means that future air quality improvements at this location are likely (for example, through increased adoption of electric vehicles meaning a reduction in exhaust emissions).

In addition to our assessment of NO₂, our assessment predicts that PM₁₀ levels (small particles of dust, mainly from vehicle exhausts and brakes) are unlikely to exceed threshold levels across the assessed area.

Measures to reduce air quality impacts during operation

The assessed air quality impacts in this area as a result of the project would not trigger the need for additional monitoring or other mitigation measures once the road is open.

15.9 Health

Existing situation

A range of personal, social, economic and environmental factors influence our health. Different groups within the population may be more sensitive to these factors than others – for example, children, older people or those with pre-existing health conditions.

The Chadwell St Mary ward is characterised by a younger population, nearly a quarter of its residents are aged under 16 (24.6% compared to 24.2% for Thurrock and 20.3% for England). There are also more older people living alone than the average for Thurrock (14.9% compared to 10.2%).

Parts of Chadwell St Mary are within the top 10% most deprived in England. Economic activity is lower than for other Thurrock wards and lower than for Thurrock and England as a whole, (67.5%, 79.1% and 79.5% respectively). In addition, the number of people claiming benefits is higher than for Thurrock and England as a whole. The ward has a relatively high proportion of residents within social grade D and E, when compared to Thurrock and England as a whole (34.1%, 27.0%, 24.7% respectively). The area also has a higher proportion of social rented housing than Thurrock and England as a whole, (37.1%, 14.1% and 16.8% respectively). The ward has a high proportion of households without access to a car or van, when compared to Thurrock as a whole (23.3% and 20.1% respectively).

Self-reported health status is generally bad, with 7.4% of residents reporting bad health, compared to 4.7% for Thurrock as a whole. Chadwell St Mary has the highest proportion of residents across the whole of Thurrock who report that their day-to-day activities are limited a lot. Life expectancy at birth for residents of Chadwell St Mary is 76.7 for males and 80.8 for females (which is lower than the UK average life expectancy for 2017-2019 of 76.7 for males and 83.1 for females). Regarding deaths from all causes, there are high death rates from respiratory disease and cancer when compared to Thurrock and England as a whole.

15.9.1 Construction

Construction impacts

Construction activities affecting Chadwell St Mary ward residents are presented in the Overview section. Most of Chadwell St Mary ward is outside the Order Limits. However, there would be a significant amount of construction work carried out in the north of the ward, as shown in figure 15.2 above. Works would include construction of parts of the proposed A13/A1089 junction and a section of the main carriageway north of Chadwell St Mary. The proposed A13/A1089 junction with the project would replace the existing junction. This would involve building two underpasses, one to the east of the A1089 and another to the west. There are no construction compounds located within Chadwell St Mary ward. There would be no Utility Logistics Hubs in this ward. However, there would be substantial works in this area to divert utilities away from the area required for the new road. Access to Brentwood Road Utility Logistics Hub would be through Chadwell St Mary settlement along Brentwood Road. The A1089 on the eastern boundary of the ward would also be a construction route. These roads would be used by HGV and workforce construction traffic but would remain open to the public.

Elements of each of these activities have the potential to impact health, whether this be the noise associated with construction activities or construction traffic, changes to air quality (dust emissions), potential severance caused by construction traffic, or through impacts on mental health and wellbeing.

There are both positive and negative potential impacts on people's health and wellbeing as a result of the construction stage. With good communication and engagement, mental health and wellbeing impacts associated with stress and anxiety related to the construction of the project would be reduced. Equally, some residents would see health and wellbeing benefits from improved access to work and training opportunities presented by construction activities (see the Traffic impacts section). The relationship between mental health and unemployment is bi-directional. Good mental health is a key influence on employability, finding a job and remaining in that job. Unemployment causes stress, which ultimately has long-term physiological health effects and can have negative consequences for people's mental health, including depression, anxiety and lower self-esteem.

As highlighted at the outset of this section, different groups of people within the population may be more sensitive to factors which potentially affect their health than others. Some of the changes identified as a result of construction activities may therefore only affect a small proportion of the population. Impacts may include:

- Changes in accessibility, which may impact people who are more dependent on public transport and have less choice about method and routes travelled.
- Significant adverse noise and vibration effects from construction, construction traffic and vibration caused by pile drivers. Given the relatively young population, these groups may be more susceptible to increases in noise levels.
- The majority of existing road traffic links in this ward would experience negligible changes of less than 1dB(A) with the exception of Heath Road and Hornsby Lane which would experience an increase in road traffic noise during the construction phase.
- Temporary visual impacts have been identified.
- There are likely to be mental health and wellbeing impacts associated with stress and anxiety relating to construction of the project.
- Residents located within 200 metres of construction activities may experience air quality impacts as a result of dust, emissions from equipment and traffic.
- Because most of the properties in the ward are more than 200 metres from the construction site, negative impacts from dust and emissions would be limited. However, those properties that are within 200 metres may experience air quality changes as a result of increased dust and emissions from nearby construction activities.

Measures to reduce impacts on health during construction

Proposed measures relating to health and wellbeing (including good practice for dust emissions, hours of working and visual screening) are described in the Visual, Noise and vibration, and Air quality sections above. Further information relating to mitigation measures for these areas is set out in the CoCP, the REAC and the package of traffic management plans. The commitments in the REAC include items such as adhering to Best Practicable Means (BPM) to reduce noise impacts (see NV007 in the REAC) and dust-management good practice (see AQ005 in the REAC).

Engagement and effective two-way communication with communities both prior to and during construction by providing information about the programme and impact of works is important to reduce mental health and wellbeing impacts associated with uncertainty, stress and anxiety. The CoCP sets out proposals for community engagement, including how we would make sure communities, stakeholders and any affected parties are kept informed of the construction works, their progress and associated programme.

15.9.2 Operations

Operational impacts

Information about the operational project in this ward is provided in the project description above.

The assessments undertaken for noise have shown that the project would result in significant adverse permanent noise effects with a number of receptors within the ward predicted to experience an increase in noise levels of 3dB or more. Given the relatively high proportion of younger people living in the area, they may be more susceptible to increase in noise levels. In addition, significant adverse visual impacts in the opening year have been identified. A proportion of residents may also experience anxiety or stress associated with perceptions of environmental change as a result of a major road project. As with the construction stage, different groups in Chadwell St Mary may be more susceptible to anxiety and stress than others.

A proportion of residents may also experience positive health benefits through accessibility improvements, better access to services, jobs (greater than 10%) and training, and to open space, including new recreational areas outside Chadwell St Mary, such as Tilbury Fields.

Measures to reduce health impacts of the operational project

Mitigation measures to address noise and visual impacts have been described above. No further impacts relating to health have been identified for this ward and consequently no specific additional measures are required.

15.10 Biodiversity

Existing situation

The main natural habitats in the parts of Chadwell St Mary ward that fall within the wider construction area are arable, with some pasture, scrub and rough grassland.

There are no designated sites of natural importance within 2km of the Order Limits within this ward. Within 500 metres, there is one non-designated site, the Mucking Heath Local Wildlife Site (LWS).

We carried out surveys across the project to set a baseline for assessment, and these identified the presence of a range of protected and notable species, including bats, badgers, terrestrial invertebrates and reptiles.

15.10.1 Construction

Construction impacts

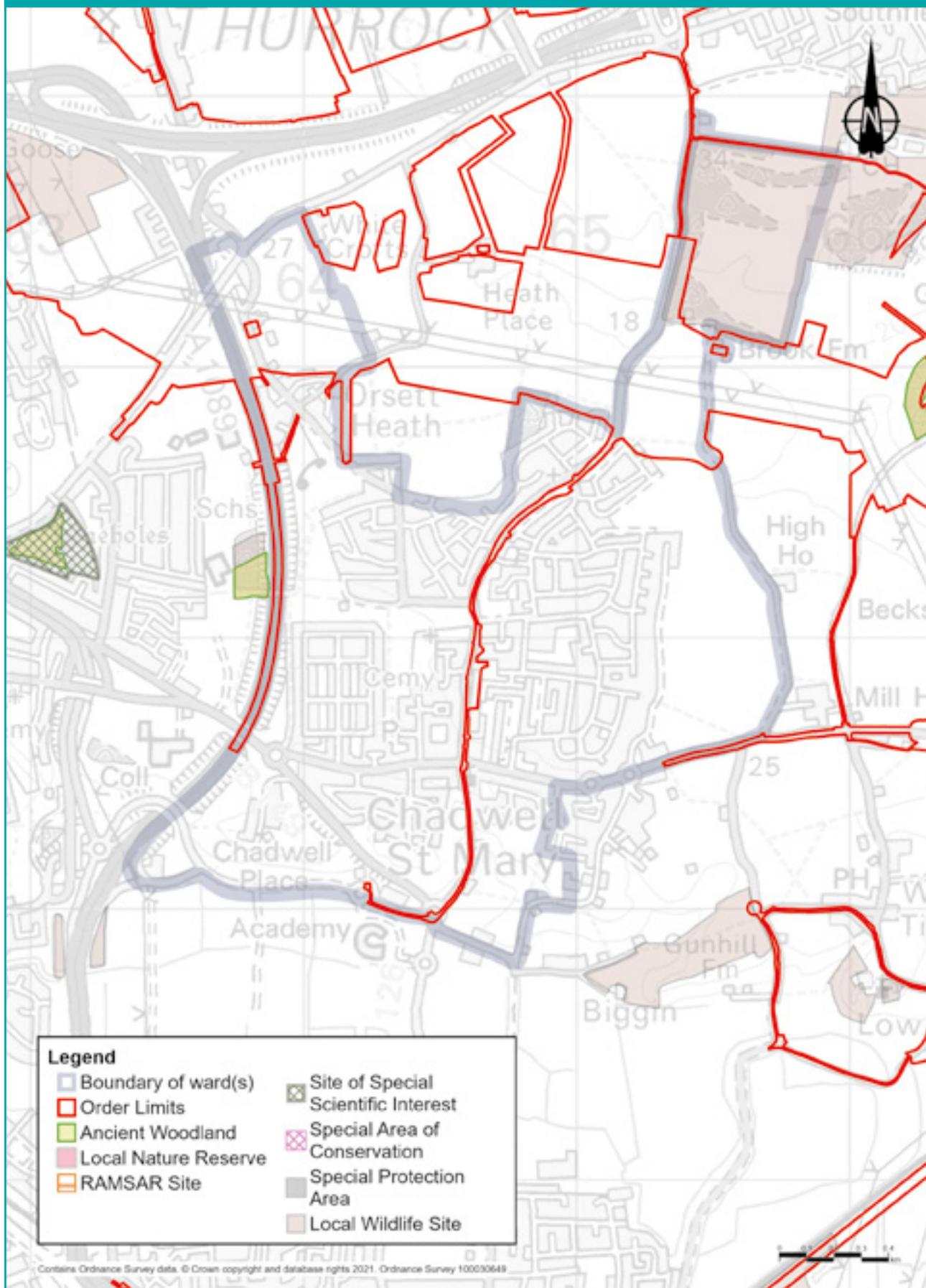
Construction work in this ward would require the removal of areas of habitat, both temporarily and permanently, from the proposed route. This habitat consists of areas of arable fields, pasture, rough grassland and scrub. It supports a range of protected and notable species which would be impacted by construction in terms of direct habitat loss (for example, the loss of badger setts, terrestrial invertebrates and reptile habitat); fragmentation of habitat and disturbance to retained habitat.

Measures to reduce biodiversity impacts of construction

Vegetation clearance would take place during the winter where practical to avoid any impacts on breeding birds. Where this is not practical, clearance would be supervised by an ecologist to ensure no nests are disturbed or destroyed. Where protected species are present, these would be moved away from the site prior to any construction activities either through habitat manipulation (for example strimming to reduce the height of vegetation and displace reptiles), or translocation. Where required, works affecting protected species would be carried out under a Natural England licence. Boxes to support birds and bats would be erected within the retained habitat. Habitat lost for temporary construction works would be reinstated following construction.

The impact of construction on biodiversity would be controlled through the range of good practice measures set out in the project's CoCP and the REAC. See chapter 1 of the Construction update for more information about this and the project's other control documents.

Figure 15.21: Designated and non-designated biodiversity sites in Chadwell St Mary ward



15.10.2 Operations

Operational impacts

Building the road tunnel has the potential for causing wildlife mortality, either through traffic accidents, destruction of habitat or noise disturbance.

Measures to reduce biodiversity impacts of the operational project

Landscape planting has been designed to provide strong links for animals to move and forage along, guiding them to safe crossing points over the new road, specifically the green bridge over Hoford Road to the east of the ward boundary. To reduce disturbance from traffic, the new road has been designed, where practicable, in a cutting or false cutting (types of landscaping), reducing the road's noise and visual impacts.

Newly created habitat would be managed to ensure that they provide high quality environment to support a broad range of different plant and animal species.

The impact of operation of the project on biodiversity in this ward would be controlled through good practice measures set out in the CoCP and REAC. See chapter 1 of the Construction update for more information about this and the project's other control documents.

15.11 Built heritage

Existing situation

There is one Grade I listed building (the Church of St Mary) and five Grade II listed buildings within the ward. These are all high value assets. The Grade II listed buildings are:

- Heath Cottage
- Chadwell Place
- Chadwell House
- 1 and 2 Grays Corner Cottages
- Sleepers Farmhouse

15.11.1 Construction

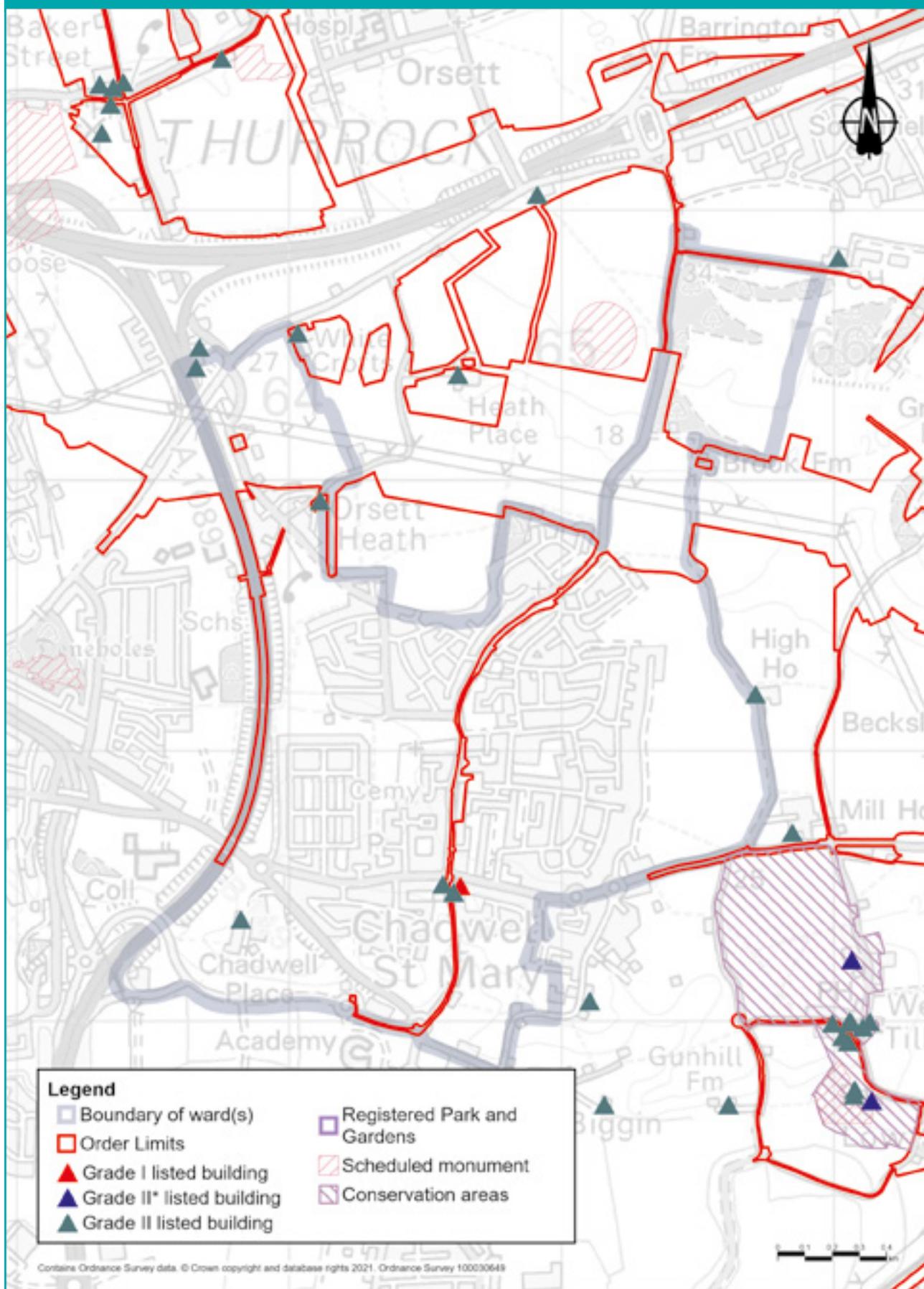
Construction impacts

Construction activities include the establishment of the main road alignment as well as associated earthworks, landscaping and utility diversions. Some existing roads within the ward would be used as utility works access routes, such as the Brentwood Road.

Construction of the project would result in the demolition of the Grade II listed 1 and 2 Grays Corner Cottages, which would have a considerable adverse effect on this high value asset. This would be mitigated by historic building recording in line with industry standards.

Construction activities would also have a temporary, non-physical impact on the Church of St Mary and to the three Grade II listed buildings (Heath Cottage, Chadwell House, Sleepers Farmhouse). This would be caused by construction activity/traffic within their setting and would result in temporary, barely perceivable effects on the setting of the buildings.

Figure 15.22: Built heritage locations within Chadwell St Mary ward



Measures to reduce built heritage impacts of construction

The design and layout of Long Lane Utility Logistics Hub would take in to account the setting of heritage assets, and avoid light glare, light spill and light pollution during night-time construction. More information can be found in the Design Principles (section S326). Long Lane Utility Logistics Hub would also be appropriately screened as set out in the CoCP. Dust and noise reduction measures are also relevant in mitigating the setting of heritage assets. Refer to the air quality, noise and vibration, and cultural heritage sections of the REAC.

15.11.2 Operations

Operational impacts

There would only be an impact to one Grade II listed building, Heath Cottage, as a result of the visible and audible changes to its setting caused by the operation of the road. This would result in a barely perceivable effect.

Measures to reduce impacts during operations

The impacts to the Grade II listed Heath Cottage would be mitigated by the establishment of earthworks alongside the road and the introduction of native hedgerows and trees. This mitigation forms part of the project design which is detailed in the project description section.

15.12 Contamination

Potential sources of contamination have been identified based on land uses from the review of desk-based sources (historical maps and environmental data). Within this ward, the following have been identified:

- A large gravel pit east of Courtney Road, excavated between 1955-67, and potentially infilled between 1973-1991.
- Infilled gravel pits east of Brentwood Road. These pits were excavated in approximately 1915. They were infilled between 1938 and 1954.

The overall impact from these contamination sources is considered to be low, given the mitigation proposed.

15.12.1 Construction

Construction activities in this ward would include topsoil stripping, earthworks/movements and excavations which could cause the mobilisation of contamination (if present).

Construction impacts

During construction, there is the possibility for existing contamination within the ground to become mobilised. There is also a potential risk of accidental oil, cement and fuel spills from construction traffic and the storage of materials.

Measures to reduce contamination during construction

To reduce the impact to an acceptable level, good practice measures would include appropriate storing of equipment and clear soil handling, storage of chemicals and re-use guidance. These would be used during construction to reduce the risk of spreading contamination and spillage or pollution.

To reduce the risk of accidental spillages, procedures would be in place such as designated areas to re-fuel plant, tanks would be bunded, spill kits would be available and incidents would be recorded and managed, with impacted soils being assessed and removed if necessary.

Essential mitigation such as the development of site-specific remediation, where contamination has been identified during ground investigation work, would be completed in consultation with the local authority. During the earthworks, workers would remain vigilant and any suspected contamination would be recorded and assessed accordingly via a watching brief protocol.

Contamination would be controlled through the range of good practice measures set out in the project's CoCP and the REAC. See chapter 1 of the Construction update for more information about this and the project's other control documents.

15.12.2 Operations

Measures to reduce contamination during operation

Verification reports would be prepared for the remediation that is undertaken in site-specific areas and provided to the local authority. During the operation of the road, should an incident occur, such as a traffic accident resulting in localised contamination, significantly affected soils would be assessed and, if necessary, removed to reduce the risk of contamination migrating across a wider area or entering controlled waters. For more information on these controls, see the REAC.

16

Chapter 16: Orsett ward

This chapter summarises the activities in Orsett ward relating to the project's construction and its operational phase (when the new road is open). It also explains the measures intended to reduce the project's impacts on local communities. For more information about the assessments in this chapter and other information available during this consultation, see chapter 1, which also includes a map showing all the wards described in this document.

Within this document, we sometimes advise where additional information can be found in other consultation documents, including the Construction update, Operations update, You said, we did, Register of Environmental Actions and Commitments (REAC), Code of Construction Practice (CoCP), Outline Traffic Management Plan for Construction (OTMPfC) and the Design principles. To find out more about these documents, see chapter 1. References to these documents provide an indication as to how our proposals to reduce the project's impacts will be secured within our application for development consent.

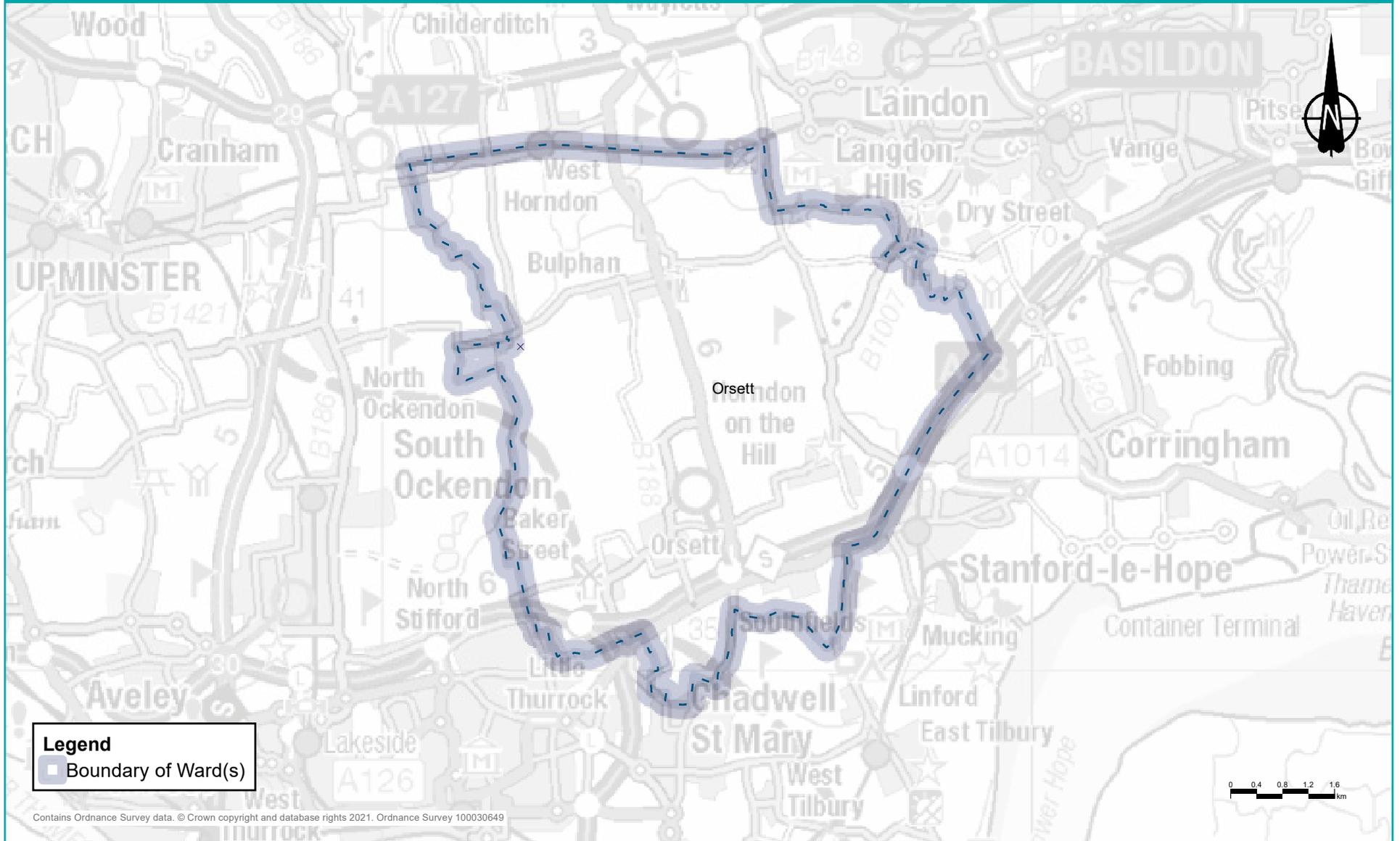
16.1 Overview

16.1.1 About this ward

Orsett ward is located to the north of Chadwell St Mary ward in the borough of Thurrock. It is a large ward, around 47km² in area with an estimated population of 6,090¹. The majority of the ward consists of agricultural land and fenland, although it also contains several population centres, including Orsett, Hordon-on-the-Hill and Bulphan. The Mardyke River runs along the western boundary of the ward and is an Environment Agency designated 'main river'. Main rivers run off the Mardyke across the centre of the ward. The A13 runs east-west across the southern part of the ward. There are high-voltage overhead power lines running through the ward and a high-pressure gas main running east to west, skirting the edge of Orsett village. The Whitecroft, a 56-bedroom care home, is situated on the southern boundary of Orsett ward, near the existing A13/A1089 junction.

¹ Office for National Statistics, 2018 ward-level population estimate

Figure 16.1: Ward boundary map for Orsett ward



16.1.2 Summary of impacts

Table 16.1: Summary of impacts during the project’s construction and operation

Topic	Construction	Operations
<p>Traffic</p>	<p>Impact</p> <p>Increased traffic on the A13 is likely to lead to a small decrease in speeds along the A13. Traffic management on local roads is likely to lead to increased journey times along the roads while the measures are in place. Road closures would lead to longer journeys.</p> <p>Mitigation</p> <p>There are several mitigation measures planned to reduce the impact of construction on local residents in Orsett ward such as a HGV ban on local roads, for example, Pike Lane between Ockendon Road and St Mary’s Lane and Pea Lane between Ockendon Road and Dennises Lane. For details of all the mitigation methods for Orsett ward see the Traffic section of this chapter.</p>	<p>Impact</p> <p>There would be impacts on several roads including increases in traffic at the Orsett Cock junction, the A13 east of the new junction with the project and other local roads. On the A13, there would be significant increases of over 1,000 PCUs in some time periods and directions. On Brentwood Road in the north of the ward there are forecast to be decreases in traffic flow as a result of traffic rerouting to use the A127 to travel west. Analysis of the traffic flow increases and impacts can be found in the traffic section.</p> <p>Mitigation</p> <p>Once the project is operational, traffic impacts on the affected road network would be monitored, including local roads.</p>

Topic	Construction	Operations
<p>Public transport</p>	<p>Buses</p> <p>Journey times on the Z4 bus will be longer due to both the increased traffic flows on the A13 and the traffic management along this route. Traffic management works will affect buses using the local roads, leading to increased journey times while the measures are in place. Affected buses would include the 5A, 5B, 11, 100, 265, and the Z4. The temporary closures of Baker Street and Rectory Road would require a diversion of the 11, 5B and 265 buses. Any diversions would be agreed with the bus operators.</p> <p>Rail</p> <p>Throughout construction there may be some increases in journey times to West Horndon station, associated with increased traffic through the area and traffic management on the local roads.</p>	<p>Buses</p> <p>There are minor increases on several bus routes predicted including: Bus 5A from Pitsea to Grays the 5X from Wickford to Grays, 51 from Prittlewell to Grays and Chafford Hundred, 265 from West Horndon to Grays, and the Z4 service from the Amazon distribution centre to Basildon and Pitsea.</p> <p>Rail</p> <p>There would be no discernible changes in local access times to West Horndon station predicted and no changes to services at the station.</p>
<p>Footpaths, bridleways and cycle routes</p>	<p>Impact</p> <p>Due to the construction of the A13 junction and the project route, there would be a high number of footpaths, bridleways and cycle routes impacted during the construction period in this ward.</p> <p>Mitigation</p> <p>Where footpaths, bridleways and cycle routes require temporary closure to allow the construction of the proposed A13/A1089 junction and the main route, these closures would be as short as possible.</p>	<p>Impact</p> <p>Three footpaths and one bridleway would be realigned once the project is operational. One footpath would be permanently closed where it intersects the new road. Five footpaths would be upgraded to bridleways. Three new pedestrian-cycle tracks would be opened.</p> <p>Mitigation</p> <p>The realigned footpaths, bridleways and cycle routes would be resurfaced and designated as bridleways in the case of existing footpaths. The diverted routes would cross the project by a new bridge designed to be safe for horse riding.</p>

Topic	Construction	Operations
<p>Visual</p>	<p>Impacts</p> <p>Homes on the south and west edge of Baker Street would have views of the construction of the Lower Thames Crossing/A13 junction. To the north there would be views of construction including Stifford Clays Road Compound East for some residential properties. The utilities work on Baker Street would be visible nearby. Road construction, compounds, Utility Logistics Hubs and utility diversions would be clearly visible from some footpaths and cycle routes and especially prominent from footpaths crossing Orsett Fen and Mardyke Way.</p> <p>Mitigation</p> <p>Taller facilities required within Stifford Clays Road Compound East would be located the maximum distance from homes on Stifford Clays Road and Baker Street where possible. The visual impacts would be controlled through a range of good practice measures in the CoCP and REAC.</p>	<p>Impacts</p> <p>Views from footpaths and local cycle routes south of the A13 and north of the A13 would include the new road/A13 junction and the viaduct crossing the Mardyke Valley. The diverted section of overhead power line would appear similar to the existing overhead line. Stanford Road (Southfields) Gas Valve Compound would be a permanent addition to views.</p> <p>Mitigation</p> <p>The landscaping in the design of the Lower Thames Crossing would help integrate the new road into the surrounding landscape. This includes planting along the Green Lane green bridge and woodland planting. Views from footpaths crossing Orsett Fen and Mardyke Way would be softened by woodland mitigation planting.</p>

Topic	Construction	Operations
<p>Noise and vibration</p>	<p>Impacts</p> <p>The construction of the new road, upgrading of the A1089/A13 junction, and utility works are expected to cause noise and vibration impacts. There are also seven compounds and five Utility Logistics Hubs proposed within the ward, which have the potential to cause noise impacts. There would also be 24-hour, seven-day construction working in some locations. There are six proposed structures expected to be constructed using vibratory or percussive piling in this ward. There would be negligible changes in noise from road traffic for a majority of roads within this ward, except along the roads listed in table 16.4.</p> <p>Mitigation</p> <p>Construction noise levels would be controlled by mitigation measures set out in the REAC. There are also measures presented in the CoCP.</p>	<p>Impacts</p> <p>There would be increased levels of noise in the south-western section of the ward as a result of the proposed A13/A1089 junction and widening of the existing A13.</p> <p>Mitigation</p> <p>Low-noise road surfaces would be installed on all new and resurfaced roads, plus noise barriers would be installed. The road has been kept low in the environment using cuttings and bunds.</p>

Topic	Construction	Operations
<p>Air quality</p>	<p>Impacts</p> <p>There is likely to be dust and emissions from construction equipment and traffic during the construction phase.</p> <p>Our analysis of construction traffic predicts that the impact on most roads in this ward would be negligible, although there would be a temporary minor worsening in air quality in the area around the A1089 and the A13 corridors. However, there would be a temporary minor improvement in air quality along the A128 Brentwood Road.</p> <p>Mitigation</p> <p>The contractor would follow good practice construction measures which are presented in the CoCP and REAC to minimise the dust. Construction vehicles would need to comply with emission standards. An air quality management plan would be designed in consultation with the relevant Local Authorities. The plan would include details of monitoring which would ensure measures are effectively controlling dust and exhaust emissions.</p>	<p>Impacts</p> <p>There are no predicted exceedances of NO₂ or PM₁₀.</p> <p>Mitigation</p> <p>No essential mitigation is required.</p>

Topic	Construction	Operations
<p>Health</p>	<p>Impacts</p> <p>The construction phase of the project would present opportunities to access work and training.</p> <p>There are likely to be changes in the area that may result in negative impacts on health, including mental health and wellbeing. These include changes in accessibility of local resources and delays to local journeys, amenities and open space. There are also likely to be changes in the levels of road traffic noise on Brentwood Road, Baker Street, Church Road, Stanford Road and High Road.</p> <p>Mitigation</p> <p>The negative impacts would be mitigated through the good practice construction measures presented in the CoCP and REAC relating to noise, working hours and visual screening, traffic management measures and community engagement.</p>	<p>Impacts</p> <p>Some residents may experience impacts on mental health and wellbeing as a result of the project (for example, anxiety around perceived changes to air quality or as a result of changes to the noise environment).</p> <p>There would also be both noise improvements and deteriorations at locations that are further detailed in the noise and vibration section below. There would also be visual impacts during the opening year of the road.</p> <p>Mitigation</p> <p>No essential mitigation is required for health other than those measures described in the noise and visual mitigation section.</p>

Topic	Construction	Operations
<p>Biodiversity</p>	<p>Impacts</p> <p>The construction of the project would involve the removal of areas of habitat, both temporarily and permanently for the new road. These habitats support a number of protected and notable species which would be impacted including badger setts, bat roosts, water vole, reptiles, great crested newts and invertebrate habitats.</p> <p>Mitigation</p> <p>Vegetation clearance would be undertaken in winter to avoid impacting breeding birds. Protected species would be relocated, carried out under a Natural England licence. Boxes to support bats and birds would be erected. Habitat lost for temporary construction works would be reinstated following construction. Areas of mixed habitats and new ponds would be created. A large area of wetland habitat would be created adjacent to the Mardyke. A green bridge would be constructed at Green Lane. Biodiversity impacts would also be mitigated through a range of good practice control measures set out in the project's CoCP and REAC.</p>	<p>Impacts</p> <p>There is the potential to cause mortality of species by encountering road traffic as well as habitat fragmentation and disturbance from traffic.</p> <p>Mitigation</p> <p>Landscape planting is designed to provide strong links for animal movement and foraging. Impacts would also be managed through the range of good practice measures set out in the CoCP and REAC. Newly created habitats would be managed to retain structure and function for the species present.</p>

Topic	Construction	Operations
<p>Built heritage</p>	<p>Impacts</p> <p>Murrells Cottages and Thatched Cottage (Grade II listed) would be demolished. Eleven Grade II listed buildings would be temporarily affected due to changes within their setting. Crop mark complex scheduled monument would be physically impacted during construction. The setting of two scheduled monuments would be temporarily impacted due to the noise and views of construction activities.</p> <p>Mitigation</p> <p>The demolition of the listed buildings would be entered into the historic building recording in line with industry standards. The design and layout of Brentwood Road Compound, Long Lane Compound, Stifford Clay Road Compound West and East and Mardyke Compound would avoid light pollution during night-time construction, as detailed in the Design Principles. Dust and noise would also be controlled through the reduction measures set out in the CoCP and REAC. The Crop mark complex scheduled monument would be excavated and recorded.</p>	<p>Impacts</p> <p>Nine Grade II listed buildings would have noise and light impacts on their setting caused by the operation of the new road.</p> <p>Mitigation</p> <p>Road lighting would be minimised where it is safe and practical to do so. The construction compounds would be reinstated after construction as detailed in the Design principles.</p>

Topic	Construction	Operations
<p>Contamination</p>	<p>Impacts</p> <p>There are potential sources of contamination that have been identified within this ward. There is the possibility for existing contamination within the ground to become mobilised. There is also a potential risk of accidental oil, cement and fuel spills from construction traffic and the storage of materials.</p> <p>Mitigation</p> <p>Essential mitigation such as the development of site-specific remediation, where contamination has been identified during ground investigation work, would be completed in consultation with the local authority. Procedures would be in place to reduce the risk of accidental spillages. Contamination would be controlled through the range of good practice measures set out in the CoCP and REAC.</p>	<p>Impacts</p> <p>None identified.</p> <p>Mitigation</p> <p>If during operation any incident were to occur which resulted in localised contamination, soils which had become significantly affected would be assessed and, if necessary, removed to reduce the risk of contamination migrating across a wider area or entering controlled waters.</p>

16.2 Project description

16.2.1 Construction

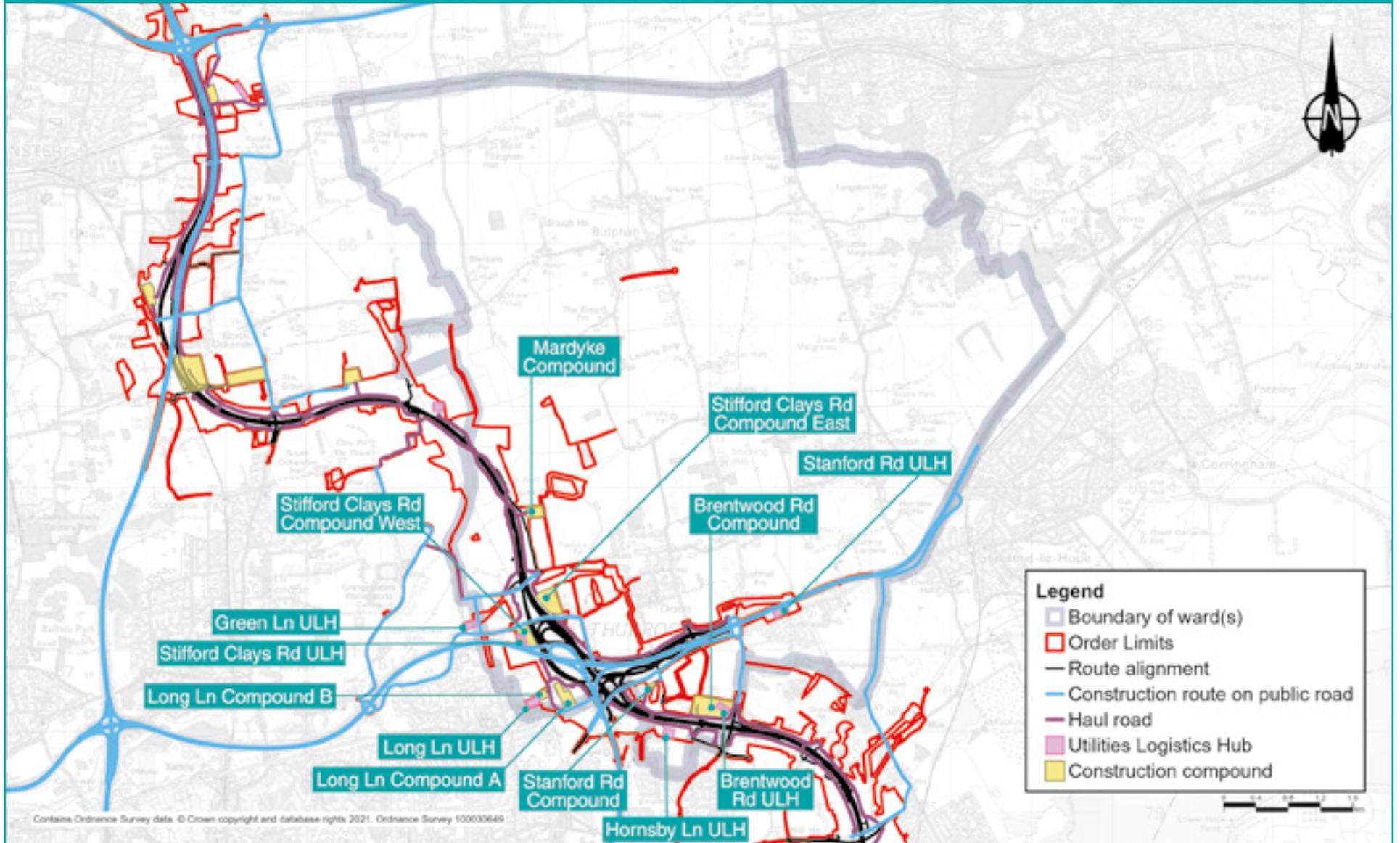
Construction activities

More information about how the area would look during construction, including visualisations, can be found in the Construction update. You can also view a video fly-through of the project during construction by visiting our consultation website.

Most of Orsett ward is outside the proposed Order Limits, but a large amount of construction activity essential to building the main route and the proposed A13/A1089 junction would take place in the south-west of the ward, near the existing A13/A1089 junction.

Utility diversions would be required to accommodate the new junction and road. Across the ward, construction would be coordinated to reduce its impacts on local communities. The haul roads within the worksite would take construction traffic off local roads for the onward delivery of plant, equipment and other materials. Centres of activity, such as construction compounds and Utility Logistics Hubs, would be located to minimise impacts on local communities wherever practicable, while still allowing for delivery of the complex construction process.

Figure 16.2: Main construction areas in Orsett ward



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The proposed A13/A1089 junction with the project would replace the existing junction. This would involve building two underpasses, one to the east of the A1089 and another to the west. Construction of the former would take place in the early phases of the construction period, taking up to two years. The underpass to the west would be built over an 18-to-22-month period, towards the end of the programme. Access to the worksite would be via Gammonfield Way. While both underpasses would be built next to existing roads, these existing roads would not be affected by long-term closures. Some short-term overnight closures would be required to connect the new roads to the existing later in the programme. Woodland planting would be designed around the A13/A1089 junction and within the area bounded by the junction to reduce the visual impacts on the local area. More information about how we would build this junction can be found in chapter 6 of the Construction update.

The bridge carrying Rectory Road over the A13 would need to be replaced, requiring the existing crossing to be closed for one year. While Rectory Road is closed, Baker Street would maintain local access either side of the A13, as would the route via Prince Charles Avenue and Brentwood Road. More information on the construction techniques for the new bridge is provided in chapter 3 of the Construction update. The new bridge would cross the slip roads connecting the A13 to the Orsett Cock junction, so short-term overnight or weekend closures would be needed when lifting the new bridge into place.

Temporary construction haul roads would be built along the Lower Thames Crossing's proposed alignment to manage the majority of construction traffic. A haul road would need to cross Rectory Road to access works to its east, so traffic management would be installed to manage the construction traffic across Rectory Road in the period before it is closed for works.

The A1013 would be realigned as part of the junction works, which would include building three new bridges. This would involve significant construction activity including piling and earthworks. Works would be phased to ensure the A1013 remains open during construction. Traffic restrictions would be needed in some areas along the road and signage would keep road users informed. While the A1013 would remain open, some short-term overnight and weekend closures would be necessary for works to tie-in to the existing road network. For more information, see the Traffic management section below.

The new viaduct would be built over Baker Street and the A1089, using construction methods explained in chapter 2 of the Construction update. These works are expected to last 18 to 22 months and would take place after the diversion of a gas main in this area.

- Bridge construction to facilitate the A13 connection works, north of the A13.
- Baker Street would be realigned south of the A13 to its connection with the A1013. The realignment would be mainly offline, and the aim would be for connecting works to happen while Baker Street is closed.

- The section of Heath Road 250 metres south of the A1013 would be realigned, requiring earthworks and carriageway construction. Heath Road and its connection to the A1013 would be open throughout construction, but some road-connection works would require short-term overnight or weekend closures.

The traveller site at Gammonfield Way would need to be relocated early on in the construction period to allow a new slip road to connect the A1089 northbound to the project's northbound route. This would involve earthworks and road construction. The new site would be next to the existing location and would be about 1.5 ha in size, with about 1.5 ha set aside for landscaping and access. The site would be next to its current location, with access off Gammonfield Way. For more information, see chapter 5 of the Construction update.

Stifford Clays Road would need to be realigned and two bridges built to allow the new alignment to pass over the Lower Thames Crossing. These works would take 12 to 14 months and be mostly offline, allowing Stifford Clays Road to remain open. Some short-term overnight or weekend closures would be required to connect new roads and bridges to existing roads. Further information on construction methods is provided in chapter 2 of the Construction update.

As with Stifford Clays Road, Green Lane would be realigned over a new bridge to allow it to pass over the new road. Green Lane would pass over the Lower Thames Crossing via a new green bridge, which would provide improved habitat connectivity compared with a standard bridge. The green bridge would be built alongside the existing road's alignment to allow Green Lane to stay open during the majority of the works, with only overnight or weekend closures needed to connect the new bridge to the existing road.

Green Lane and Stifford Clays Road would be used initially by construction vehicles to build the offline haul roads. On completion of the haul roads, Stifford Clays Road would be used infrequently by construction vehicles. It would, however, need to be crossed by construction traffic and this would require traffic management, such as traffic signals, until the new Stifford Clays Road bridges are in place. Green Lane would continue to be used for works access from Stifford Clays Road to the offline haul roads alongside the Lower Thames Crossing following the completion of the haul roads.

Works to construct the new road south of the A13/A1089 junction would be carried out without affecting the existing road network. They would involve substantial earthworks, with the route designed to be as low as possible, keeping within the natural valley of the landscape. False cuttings (building the road within landscaped earthworks) would provide visual screening for nearby properties and residents. Further information on this can be found in chapter 6 of the Construction update.

Within this ward, there are two areas of the Order Limits that are not connected to the rest of the Order Limits: one immediately south of Bulphan and another east of Orsett Fen. The former would be used for the replacement of some overhead power lines, while the latter area includes existing woodland (and the access routes to it) where we would install bat and bird boxes as part of our environmental mitigation plans.

Construction compounds

Construction compounds are fenced-off areas, accessible to construction traffic, which provide the facilities for our project to be built efficiently. For example, compounds would provide parking, storage for machinery and materials, offices, welfare facilities, refuelling, and vehicle and wheel-washing facilities to make sure vehicles leaving the Compound do not dirty local roads.

Seven construction compounds would be situated within Orsett ward to help deliver the project.

- The Brentwood Road Compound would be located west of Brentwood Road near Heath Place. It would support works south of the A13 towards the Tilbury Loop railway line and would be in place throughout the construction period. Construction traffic would use Brentwood Road between the Orsett Cock junction and the project route to access this compound and the haul roads. Construction traffic would travel no further south than the proposed new Brentwood Road bridge. Utility connections for this compound would be installed early in the construction programme taking up to a year. Traffic management would include traffic signals on Brentwood Road, south of the Orsett Cock junction. Brentwood Road Compound and Brentwood Road Utility Logistics Hub would use the same access on public roads. Construction traffic movements for both can be found in table 16.2.
- The Stanford Road Compound would be sited on Hornsby Lane near the A1013 Stanford Road. It would be used to support works between the A13 and the A1013. As part of the project, Hornsby Lane would be closed permanently either side of the haul road to allow construction vehicles to pass safely during the construction period and to accommodate the new road once it is complete. Prior to the closure of Hornsby Lane, areas would be built to allow local traffic to turn around on the two remaining sections of Hornsby Lane. A utility connection for the Compound would require works at the A1013 Stanford Road early in the construction programme for around two months. Traffic management would be necessary on the A1013 including single-lane closures and traffic signals.
- Long Lane Compound A would be located on the north side of Long Lane and would be used to allow construction of the south-west corner of the A13/A1089 junction. Access to this compound would be via Long Lane. Long Lane Utility Logistics Hub will use the same access on public roads. Construction traffic movements for both can be found in table 16.2.

- Stifford Clays Road West Compound would be sited on the south side of Stifford Clays Road to the east of the project and would be used for construction of the north-west section of the A13/A1089 junction. Stifford Clays Road would initially be used as a construction route to access this worksite and compound until a haul road is constructed from Stifford Clays roundabout and Medebridge Road. Once the haul road is in place, Stifford Clays Road would be used infrequently by construction traffic. However, Stifford Clays Road would still be crossed by construction vehicles. Traffic management, such as traffic lights, would be in place to maintain road safety as construction vehicles cross Stifford Clays Road to reach the haul road on the other side. The traffic management would be in place until the new Stifford Clays Road bridges are built and construction traffic can pass underneath. Stifford Clays Road West Compound and Green Lane Utility Logistics Hub would use the same access on public roads. Construction traffic movements for both can be found in table 16.2.
- A wastewater pipe would need to be connected with the existing network at Blackshots Lane. Traffic management, such as temporary traffic lights, may be necessary when the connection crosses Stifford Clays Road. A water pipeline would need to be installed, connecting to the local network at the Grangewaters Outdoor Education Centre. This means part of the centre's car park would be out of use for up to two weeks. Works would be completed during standard hours over nine months. Trenchless construction techniques could be used to minimise the impact on existing vegetation. We would also require a telecommunications connection with the network at Orsett village. Installation would involve traffic lights when the connection crosses Baker Street east.

- Stifford Clays Road East Compound would be sited on the north side of Stifford Clays Road to the east of the project. The Compound would support the construction of the proposed A13/A1089 junction and highways works south of the A13 towards the Mardyke River. It would be in place throughout construction. Facilities within the Compound higher than five metres would be sited as far west as possible away from residential properties on Stifford Clays Road and Fen Lane. Access would be via Stifford Clays Road until offline access is in place. Telecommunications would be supplied via the connection from Stifford Clays Road West Compound. Waste and water supply would require the temporary installation of a 100 metres pipeline to connect to the existing network on Stifford Clays Road. Works to supply this compound would be coordinated with those for Stifford Clays Road West Compound to minimise the impact on Stifford Clays Road.
- The Mardyke Compound would be on the eastern side of Green Lane. Any facilities higher than five metres would be sited to the Compound's north-east, as far away as possible from residential properties. Initially, access would be via Green Lane until temporary construction haul roads are in place. During the works, access would be required from Stifford Clays roundabout to these routes alongside the project.

The Compounds would be laid out in ways that keep noise and light generating activities as far as possible from nearby communities. At many compounds, 'bunds' (walls of earth) would be constructed on the boundary to further reduce effects on local communities. There would be controls on working hours, noise and light-generating equipment. Machinery and vehicles entering compounds and using public roads would be subject to strict emissions controls and dust-suppression measures to reduce air quality impacts.

Construction-related traffic would use the road network within Orsett ward to access the seven construction compounds and four Utility Logistics Hubs. The daily average number of vehicles going to these compounds is shown in table 16.2 below. These are the number of vehicles going to each compound and there would be the same number of vehicles, on an average weekday, leaving each compound. There would be less than 20 vehicles a day going to the Utility Logistics Hubs and staff would only be based at the Stanford Utility Logistics Hub. The staff vehicles associated with this hub are also shown in table 16.2 below.

Table 16.2: Average daily vehicle numbers going to compounds and Utility Logistics Hubs in Orsett ward

Time period	Brentwood Road Compound and Brentwood Road ULH		Stanford Road Compound and Hornsby Lane ULH		Long Lane Compound and Long Lane ULH		Stifford Clays Road West Compound, Stifford Clays Road ULH and Green Lane ULH		Stifford Clays Road East Compound		Mardyke Compound		Stanford Road ULH
	HGV	Cars	HGV	Cars	HGV	Cars	HGV	Cars	HGV	Cars	HGV	Cars	Cars
January to August 2024	52	57	22	41	0	9	0	33	20	129	0	0	27
September 2024 to February 2025	56	90	26	55	0	11	0	41	18	211	0	0	30
March to May 2025	76	52	28	55	0	11	0	41	26	211	12	24	30
June to October 2025	102	113	28	48	0	11	0	41	31	207	29	44	30
November 2025 to March 2026	99	140	8	44	10	28	8	48	38	185	30	61	29
April to August 2026	82	140	0	10	39	39	28	46	56	170	46	61	15
September 2026 to March 2027	82	140	0	6	47	49	25	46	56	170	52	53	0
April to November 2027	78	114	0	0	31	42	42	42	57	141	40	28	0
December 2027 to March 2028	45	68	0	0	16	22	35	27	30	46	0	0	0
April to July 2028	21	47	0	0	0	0	0	0	0	0	0	0	0
August 2028 to December 2029	0	0	0	0	0	0	0	0	0	0	0	0	0

Access routes to the compounds would be as follows:

- Brentwood Road Compound – via the A13 and Brentwood Road
- Stanford Road Compound – via the A1013 and Hornsby Lane, via the A13 and Brentwood Road, and via haul roads from other compounds
- Long Lane Compound A and Long Lane Compound B – via the A13, the A1013 and Gammonfield Way
- Stifford Clays Road Compound West – initially via the A13 and Stifford Clays Road, then once the haul roads are constructed from the south via the A13, and then on haul roads, or via the north from the M25 and then on haul roads

Utilities

In addition to the utility works required to provide services to the construction compounds, several Utility Logistics Hubs (ULHs) would also be sited in Orsett ward:

- Brentwood Road Utility Logistics Hub would be located within the Brentwood Road Compound, south of the A13 and north of the new road. It would be accessed from Brentwood Road and it shares an access route with Brentwood Road Compound.
- Hornsby Lane Utility Logistics Hub would be sited east of the A1089 and accessed from Hornsby Lane. It shares an access route with Stanford Road Compound.
- Long Lane Utility Logistics Hub would be west of the A1089, next to the Long Lane Compound and accessed from the haul road off Long Lane. It shares an access route with Long Lane Compound.
- Stifford Clays Road Utility Logistics Hub would largely overlap with Stifford Clays Road West Compound and would be accessed from the haul road.
- Stanford Road Utility Logistics Hub would be opposite Southfields, south of the A13 and east of Brentwood Road. It would be accessed from the A1013 Stanford Road.
- The Green Lane Utility Logistics Hub is located in the Stifford Clays ward and has access via Green Lane which separates Stifford Clays ward and Orsett ward. It shares an access route with Stifford Clays Road West Compound.

These ULHs would be used by utility companies working on diversions, including the following major works either in this ward or spanning several wards:

- Realignment of 400kV overhead power lines, around 1.7km in total length, with four new pylons, one of which would be in Orsett ward. Four existing pylons would be removed, including one in Orsett ward and one on the ward boundary with Chadwell St Mary.
- Realignment of 275kV overhead power lines, 3.2km in length, with eight pylons to be removed in total and 10 new pylons to be constructed, two of them temporary.
- High-pressure gas pipeline, 5.2km in length.
- New permanent high-pressure gas valve Compound and permanent access from Stamford Road.
- High-pressure gas pipeline, around 0.3km in length.

As well as the major utility works listed above, we are also proposing to carry out a substantial amount of works on the local road network within Orsett ward to relocate local utilities. Roads affected include Stifford Clays Road, Baker Street, Rectory Road, Orsett Cock junction, Heath Road, Hornsby Lane, Long Lane, the A1013 Stamford Road, High Road and Mill Lane. Chapter 2 of the Construction update provides an overview of how existing utilities would be affected by our plans to build the new road, with further detail including maps in chapter 5. Chapter 2 of the Operations update also describes the project's impacts on utilities, including a map showing the utilities that would be repositioned to accommodate the new road.

Construction schedule

Construction of the entire project is scheduled to last for around six years from 2024 to 2029. To deliver the construction programme efficiently, activities would be divided into packages of work and delivered in a coordinated way. More information about our proposed schedule, including maps and timelines, can be found in the Construction update.

Construction working hours

Most construction activity would take place during core construction hours. These are 7am-7pm on weekdays, and from 7am-4pm on Saturdays, with additional repair and maintenance periods (if required) from 8am-5pm on Sundays.

In addition to extended hours to support tunnelling works, there would be other circumstances when hours may be extended. Typically, this would be to reduce impact on road users by working at night when there is less traffic. Other activities that would involve longer working hours include implementing traffic management measures, realigning overhead power lines, diverting utilities under the A13 and A1089, joining new roads to existing ones, and resurfacing existing carriageways. For safety reasons, it would also be necessary to carry out some work close to railway lines outside core hours when trains are not in service.

In addition, there may be extended working hours for earthworks when days are longer (spring to autumn) and during fine weather. Typically, noisier works such as piling or bridge-building would not take place outside core hours. More information about working hours is set out in the Noise and vibration section below and in the CoCP.

Traffic management

The main traffic management measures within Orsett ward are set out in table 16.3 below.

Table 16.3: Main traffic management measures in Orsett ward

Road(s) affected	Proposed traffic management	Purpose	Duration
A13	Closure	To carry out specific works including bridge connection works and utilities	Occasional weekend or night closures for specific works during the construction period
A13	Eastbound off-slip closure	To carry out nearby works	Occasional weekend or night closures for specific works during the construction period
A13	Westbound on-slip closure	To carry out nearby works	Occasional weekend or night closures for specific works during the construction period
A13	Westbound on-slip closure	Connect new alignment	1 weekend between June and October 2025
A13	Closure	To undertake bridge works	Occasional weekend or night closures for specific works during the construction period
A13	Closure	To undertake bridge demolition works and modifications to local utility networks	Occasional weekend or night closures for specific works during the construction period
A13	Eastbound narrow lanes, 60mph speed limits	To carry out nearby works	3 months between April and June 2028
A13	Westbound narrow lanes and 60mph speed limits	To carry out nearby works	3 months between June and August 2025
A13	Closure	New alignment planned on the westbound on-slip at Orsett Cock	September 2025
A1013	Closure	To undertake specific works including bridge connection and utility works	Occasional weekend or night closures for specific works during the construction period
Brentwood Road	Lane closure and traffic lights	To facilitate construction access works and installation of temporary connections to Brentwood Road Compound	4 weeks between January and August 2024
Brentwood Road	Traffic lights	To allow construction vehicles to cross	Until access under overbridge between January 2024 and August 2026

Road(s) affected	Proposed traffic management	Purpose	Duration
Brentwood Road	Traffic lights and lane closures in 300m sections	To facilitate for modifications to utilities and the installation of temporary compound connections	6 months between January and August 2024
Brentwood Road	Lane closure and traffic lights	Installation of compound electricity supplies on the Brentwood Road south of the project alignment	12 months
Brentwood Road	Closure	Switch to permanent alignment	1 weekend October 2026
A1013	Traffic lights and lane closures	To facilitate construction of a new permanent access to and modifications of local utilities	1 month between January and August 2024
A1013	Closure	Switch to permanent alignment	1 weekend between December 2027 and March 2028
Orsett Cock junction	Lane restrictions	To allow for modifications to utilities	1 month between March 2025 and July 2028
Rectory Road	Closure	To allow for installation of new high-pressure gas pipeline	2 weeks between September 2024 and May 2025
Rectory Road	Traffic lights	To allow construction vehicles to cross	Until access under overbridge between January 2024 and March 2028
Rectory Road	Closure	To allow for bridge works	7 months between September 2027 and March 2028
Rectory Road	Closure	Switch to new alignment	1 weekend March 2028
A1013	Lane closures and traffic lights	To carry out nearby works and modifications to local utility networks	8 months between July 2025 and February 2026
Mill Lane	Traffic lights	To allow construction vehicles to cross	Until A13 connection works between January 2024 and July 2028
A1013	Closure	To carry out nearby works, modification to local utilities and installation of temporary utilities to Stanford Road Compound	Occasional weekend or night closures for specific works during the construction period
Hornsby Lane	Permanent closure	To move to new road alignment and modifications to local utilities	At the beginning of the construction period
A13 westbound to A1089 southbound	Closure	To allow for nearby works	Occasional weekend or night closures for specific works during the construction period

Road(s) affected	Proposed traffic management	Purpose	Duration
A13 westbound to A1089 southbound	Closure	Switch to new alignment	1 weekend in the middle of the construction period
A1089 northbound off-slip to A13 westbound	Closure	To allow for bridge works	Occasional weekend or night closures for specific works during the construction period
A1089	Closure	To allow for bridge works	Occasional weekend or night closures for specific works during the construction period
Baker Street	Lane closure and traffic lights	To install a telecommunications network	5 months between October 2026 and February 2027
Baker Street	Closure	To allow for nearby works	16 months between May 2026 and September 2027
Baker Street	Traffic lights	To allow construction vehicles to cross	Until A13 eastbound connection works
Baker Street	Traffic lights and lane closures in 300m sections	For modification to local utilities	7 months from January 2024 to February 2024 and July 2024 to November 2024
Baker Street	Closure	Switch to new alignment	1 weekend towards the end of the construction period
High Road	Traffic lights and lane closures in 300m sections	For modifications to local utilities and the installation of both temporary Stifford Clays Road Compounds	Occasional weekend or night closures for specific works during the construction period
Stifford Clays Road	Closure	To carry out nearby works, utility modifications and the installation of both temporary Stifford Clays Road Compounds	Occasional weekend or night closures for specific works during the construction period
Stifford Clays Road	Traffic lights and lane closures in 300m sections	For modifications to local utilities and the installation of both temporary Stifford Clays Road Compounds	4 months between January and August 2024
Stifford Clays Road	Traffic lights and lane closures	For construction access works, modifications to utilities and the installation of both temporary Stifford Clays Road Compounds	2 weeks between January and August 2024
Stifford Clays Road	Closure	To carry out nearby works and utilities modifications	Occasional weekend or night closures for specific works during the construction period

Road(s) affected	Proposed traffic management	Purpose	Duration
Stifford Clays Road	Traffic lights and lane closures	For construction access works and utilities modifications	1 week between January and August 2024
Stifford Clays Road	Traffic lights	To allow construction vehicles to cross	Until access overbridge between January 2024 and March 2027
Stifford Clays Road	Traffic lights and lane closures in 300m sections	For utilities modifications and the installation of temporary Stifford Clays Road West Construction Compound connections	Occasional weekend or night closures for specific works during the construction period
Stifford Clays Road	Closure	Switchover to new alignment	1 weekend January 2027
A13 eastbound off-slip to A1089 southbound	Closure	To carry out nearby works and utilities modifications	Occasional weekend or night closures for specific works during the construction period
Green Lane	Closure	For bridge and utility modifications, installation of Stifford Clays West Construction Compound CA09	Occasional weekend or night closures for specific works during the construction period
Green Lane	Crossing point	To allow construction vehicles to cross	Full period of construction between January 2024 and December 2029
Green Lane	Closure	Switchover to new alignment	1 weekend September 2027
Fen Lane/ Green Lane	Closure (in sections)	For installation of temporary connections to Mardyke Compound	9 months between March 2024 and November 2024
Mill Lane	Closure	For modifications to local utilities	2 weeks between September 2024 and February 2025
Hornsby Lane	Traffic lights and lane closures	For modifications to local utilities	2 months between January 2024 and February 2025
High Road	Traffic lights and lane closures	For modifications to local utilities and the installation of temporary connections to the east and west Stifford Clays Road Compounds	Six months

To explain these measures, a description of the works on key roads is set out below.

A13

Temporary narrow lanes and an associated reduced speed limit to 60mph are planned on the A13 westbound between the Orsett Cock junction and the A1089 for a three-month period between June 2025 and August 2025.

Temporary narrow lanes and an associated reduced speed limit to 60mph are planned on the A13 eastbound between the A1089 and the Orsett Cock junction for a three-month period between April 2028 and June 2028.

The switchover to the new alignment of the A13 westbound on slip at the Orsett Cock junction is scheduled for September 2025.

A1013

Stanford Road is proposed to be realigned as part of the works which include the construction of three new structures. The works around the area, particularly between the A1013 and A13 would be substantial. As a result, there would be significant construction activity within the area, from piling activities, earthworks to road construction.

Traffic restriction on the A1013 would be required in localised areas and would change during construction to allow construction vehicles and staff to access the works area around the road, predominantly to access the junction works between the A1013 and A13.

The A1013 is, however, envisaged to remain open throughout the works other than for specific works which would require several night closures and a few weekend closures.

Lane closures would be required on the A1013 to carry out these works and modifications to local utility networks. The lane closures would be required for eight months from July 2025 to February 2026. A second period of lane closure would be required on the A1013 for the construction of a new permanent access and modifications to local utility networks. The length of road that would be affected is 2.5km but the closed lane itself would be no more than 300 metres long at a time.

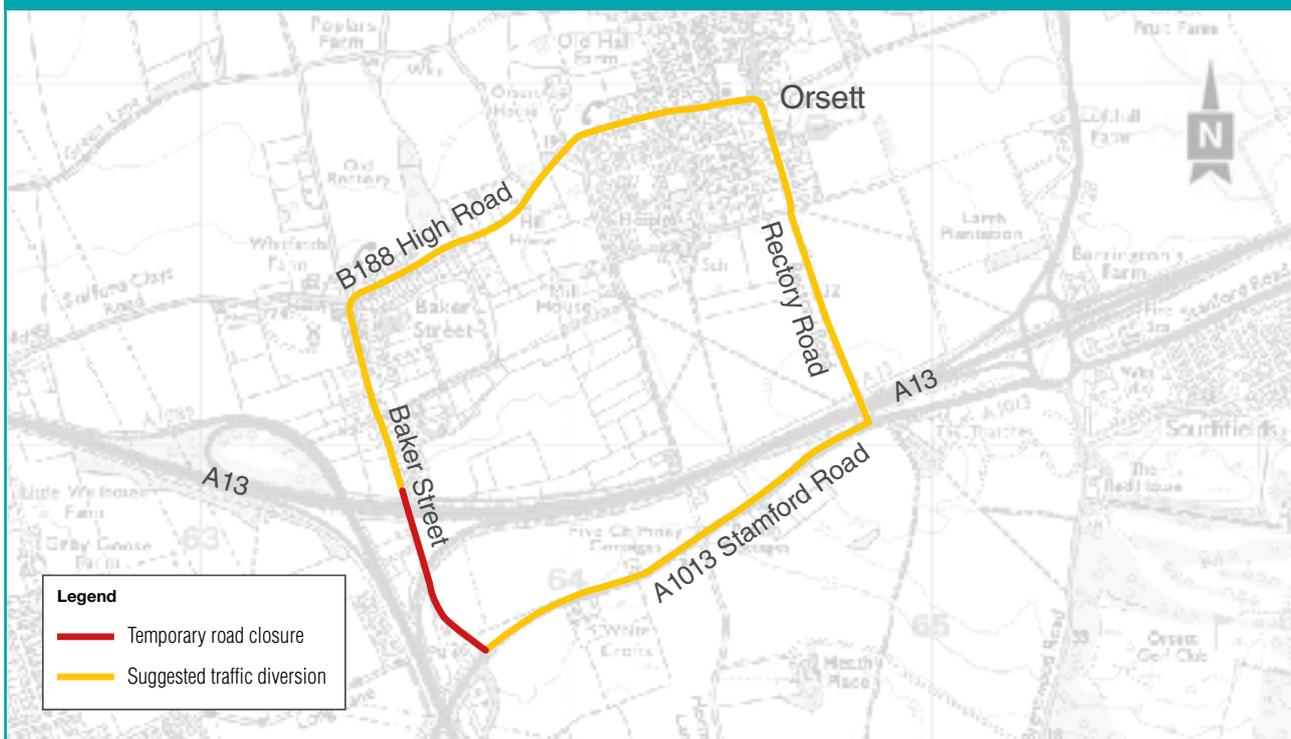
Baker Street

Lane closures would be required on Baker Street between Stifford Clays Road and the A13 underpass to carry out modifications to local utility networks. During the lane closures, a short section of road would be closed on one side, while the other side would remain open. Access to the open side of the road from each direction would be controlled by temporary traffic signals.

The lane closure would be required for seven months in total from January 2024 to February 2024 and July 2024 to November 2024. A second period of lane closure traffic management would be required on Baker Street to carry out modifications to local utility networks for the installation of a telecommunications network and an electrical network. The lane closures would be required for five months from October 2026 to February 2027.

A temporary road closure for the southern end of Baker Street is also planned for 16 months from May 2026 to September 2027. The possible diversion route is shown in figure 16.3 below. While Baker Street is closed Rectory Road would remain open and access from Stifford Clays Road to Baker Street would be remain available.

Figure 16.3: Suggested diversion during temporary closure of Baker Street



The switchover to the new permanent alignment of Baker Street is scheduled for September 2027. The switchover would likely require a night-time or weekend closure.

Brentwood Road

Lane closures would be required on Brentwood Road for construction access works and the installation of temporary connections to the Brentwood Road Compound. The lane closures would be required for four weeks at the start of the construction programme. A second period of lane closure traffic management would be required on Brentwood Road for modifications to local utility networks and the installation of temporary compound connections. This would be required for six months at the start of the construction programme.

Installation of compound electricity supplies on the Brentwood Road south of the project alignment may require the use of a lane closure for 12 months.

The stretch of Brentwood Road between the Orsett Cock junction and the Lower Thames Crossing alignment would be heavily used for the duration of the project. Traffic signals or similar would be required at the access to the Brentwood Road Compound to manage the construction and public traffic in this location.

Brentwood Road would be used for construction traffic to access the Brentwood Road Compound and the temporary offline haul roads. Once construction vehicles meet the project alignment, they would either go north or south using the temporary offline haul roads to access the various worksites. Construction traffic would not go further south than the proposed new Brentwood Road bridge, so it would not go through the residential areas of Chadwell St Mary.

Brentwood Road itself would need a slight alignment change to facilitate works on the new bridge. Brentwood Road would be closed for a number of weekends to tie-in the temporary alignment and also then to tie-in the permanent alignment. The switchover to the new permanent alignment of Brentwood Road is scheduled for late 2026 and would likely require a night-time or weekend closure.

Stifford Clays Road

Stifford Clays Road would be used as a construction route to access the construction sites Stifford Clays Road West and East compounds until a haul road running to the Compounds from the Stifford Clays junction has been built. This haul road would be available for construction vehicles about six months after the start of the construction programme. Once it is open, Stifford Clays Road would only be used infrequently.

There would however need to be a crossing point on the road as vehicles pass between the two Stifford Clays Road Compounds. The crossing point would be controlled by traffic signals or a similar arrangement. Once the new Stifford Clays Road overbridges are in place, construction vehicles would no longer need to use this crossing point and would instead pass between the sites by going under the new overbridges.

Stifford Clays Road would be realigned as part of the works to include two new bridges. The section of road which forms the realigned Stifford Clays Road and the new bridges would largely be constructed offline, allowing Stifford Clays Road to remain open while they are built. The switchover to the new permanent alignment of the Stifford Clays Road is scheduled for January 2027. The switchover event is likely to require a few night-time or weekend closures.

Lane closures would be required on Stifford Clays Road at various times for construction access works, making modifications to local utility networks, and the installation of temporary connections to the Brentwood Road Compound. The lane closures would be required for a four-month period, then a two-week period, a one-week period and a night/weekend. All works are programmed to be at the start of the construction programme.

There are currently high voltage electric cables located on pylons over Stifford Clays Road that would require works associated with the diversions. It is currently envisaged that works to these assets would not affect the use of Stifford Clays Road, however, night closures may be required on the grounds of safety to complete these works.

High Road

Lane closures would be required on the High Road to carry out modifications to local utility networks and the installation of temporary connections to the east and west Stifford Clays Road Compounds. The lane closures would be required for six months at the start of the construction programme.

Hornsby Lane

Lane closures would be required on Hornsby Lane to carry out modifications to local utility networks. The lane closures would be required for two months and is programmed to be early in the construction programme.

The permanent closure of the southern end of the north-to-south running section of Hornsby Lane is planned from the start of the construction programme.

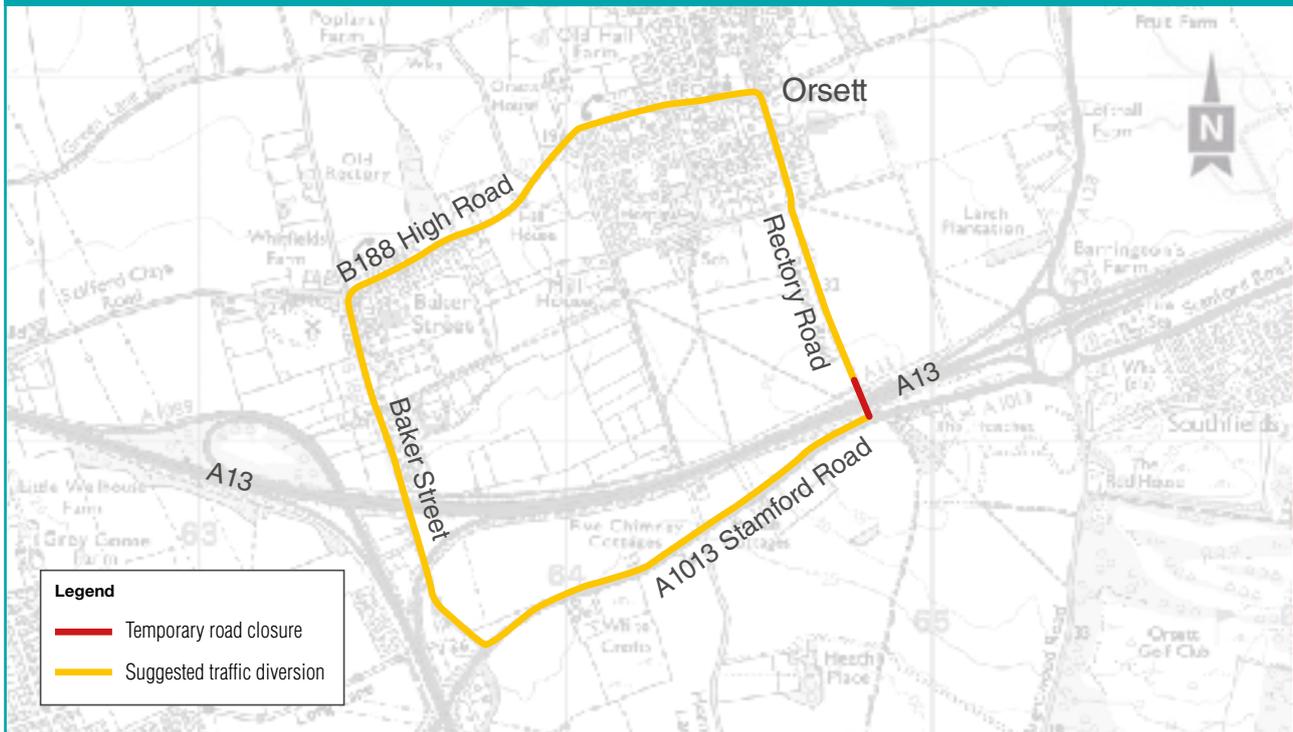
Rectory Road

A temporary road closure would be required on Rectory Road to carry out the installation of a new high-pressure gas pipeline. The closure is planned for two weeks and will be early in the construction programme.

A new bridge is proposed for Rectory Road which would cross the A13 and Lower Thames Crossing link roads and therefore would have to be longer than the existing one. In order to construct the new bridge, the existing bridge would have to first be demolished. This would require a closure of the current bridge over the A13, which is planned for seven months from September 2027 to March 2028. During this time Baker Street would be open and access from High Road and School Lane would be available. The proposed diversion route is shown in figure 16.4 below.

The switchover to the new permanent alignment for Rectory Road is scheduled for March 2028. The switchover event is likely to require a night-time or weekend closure.

Figure 16.4: Suggested diversion for traffic during temporary closure of Rectory Road



Rectory Road would be used by construction traffic for specific work only and would not be used as a through road for construction works. Temporary haul roads would be constructed along the Lower Thames Crossing link roads for use by most of the construction traffic. The haul road would need to cross Rectory Road to access works to the east of Rectory road and traffic signals or similar would be installed to manage the traffic across prior to the closure. The number of vehicles crossing Rectory Road to the works north of the A13 and east of Rectory Road would be low.

Fen Lane

Temporary road closures on Fen Lane and Green Lane would be required to carry out the installation of temporary connections to the Mardyke Compound. These closures would be required for nine months from March 2024 to November 2024. There would also be a need for lane closures while utilities are laid to the Compounds on Stifford Clays Road, if this work is required to start before the road closure.

Green Lane

Green Lane would be used by construction vehicles initially to facilitate the construction of offline haul roads. Once the haul roads are complete, a section of Green Lane would continue to be used as part of the access route from the Stifford Clays junction to the offline haul roads that will run alongside the project alignment.

Green Lane itself would need a slight temporary alignment change to facilitate works on the bridge. This work would mean that Green Lane would be closed for a number of weekends to tie-in the temporary alignment and also later to tie-in the permanent alignment. Other than these infrequent weekend closures the road would remain open. The switchover to the new permanent alignment for Green Lane is scheduled for September 2027.

A crossing point of Green Lane would be required to allow construction vehicles to travel north and south along the alignment. Stop/Go signs or similar would be required to manage the construction and public traffic during the construction period.

There are currently high voltage electric cables located on pylons over Green Lane that would require works associated with the diversions. It is currently envisaged that works to these assets would not affect the use of Green Lane, however, short-term closures may be required on the grounds of safety to complete these works.

Mill Lane

A road closure of Mill Lane would be required to undertake modifications to the local utility networks. The closure is planned for two weeks and would be early in the construction programme.

Orsett Cock junction

Temporary lane restrictions are planned at the Orsett Cock junction for the construction of a new permanent access and modifications to local utility networks. Two separate events of one month in duration are planned in 2025 and 2028 respectively.

The switchover of the A13 westbound to A1089 southbound slip road is scheduled for September 2025. This would end the access from the Orsett Cock junction to the A1089 southbound.

HGV bans during construction

HGV bans are planned on Rectory Road from School Lane to Prince Charles Avenue; on School Lane from Mill Lane to Rectory Road; on the B188 High Road from Mill Lane to Rectory Road; and on Prince Charles Avenue from Rectory Road to the A128 Brentwood Road.

An existing 7.5-tonne ban at the north end of Brentwood Road would be removed throughout the construction period to provide access to the Brentwood Road Compound.

We have sought to minimise traffic management measures wherever practical, but these would be necessary in some locations to allow construction traffic and local communities to move around safely, while providing construction workers with sufficient space to operate. An overview of the traffic management required across the project can be found in the Outline Traffic Management Plan for Construction. All traffic management measures are based on an indicative construction programme, which would be finalised by the appointed contractor. The contractor's final traffic management plans would be subject to approval by the Secretary of State for Transport, following consultation with the local highway authority.

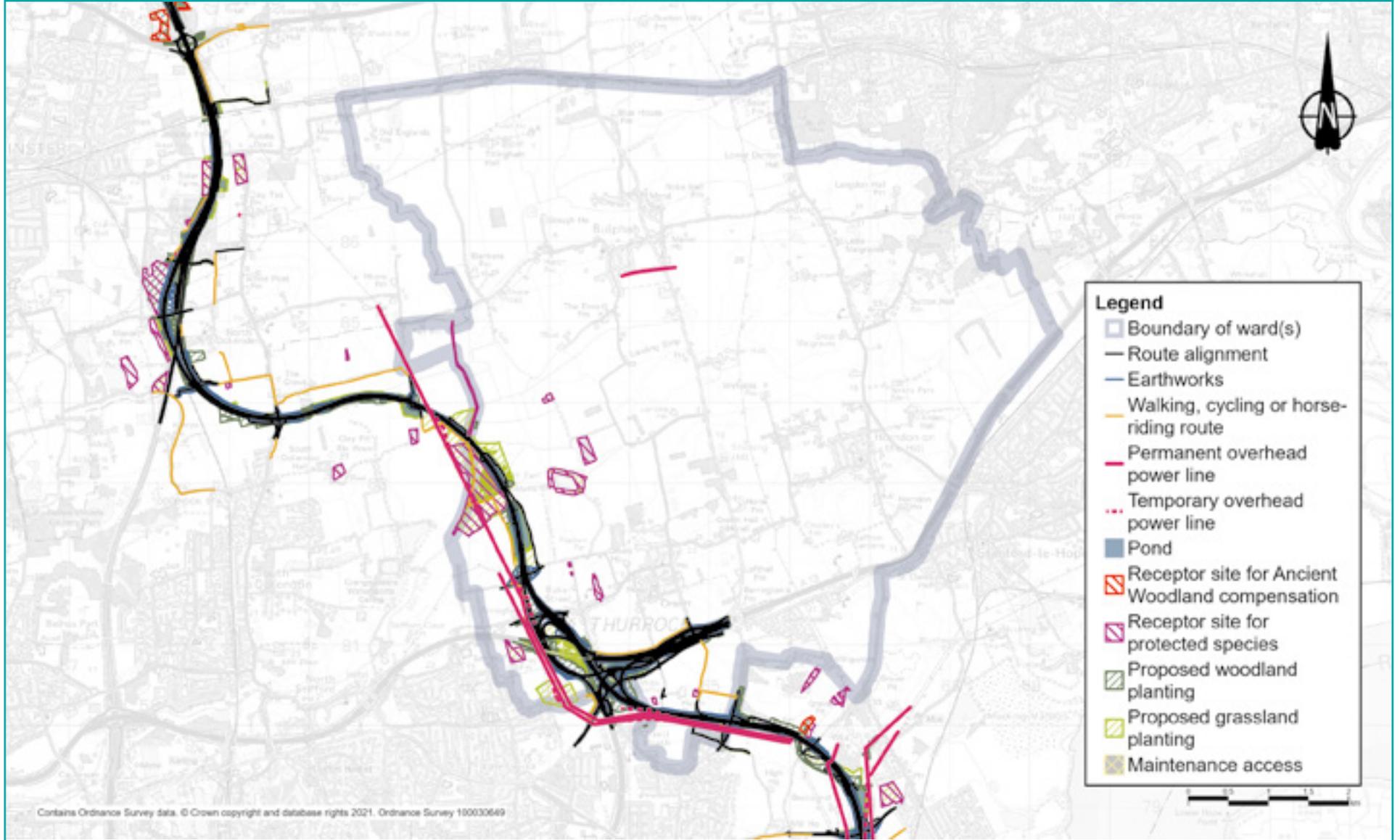
16.2.2 Operations

The completed project

For more information about the completed project, see the Operations update, as well as the figures in Map Book 1: General Arrangements. Below, we set out the main features of the project that would be within Orsett ward once it is operational.

- The landscaping around the new slip roads linking up with the A13 would be mostly woodland, including non-native species, with species-rich grassland running along the roads and the northern edge of the new roads to the woodland edges. The new slip roads would run underneath the existing Rectory Road bridge.
- The ancient woodland north of the High Road leading from Orsett would be a receptor site for translocated species, with bat boxes to be included at this location. This would allow for species whose habitats are being disturbed by the new route to remain locally.
- The southern half of the A13 junction would be mostly landscaped with mainly woodland, including non-native species, with species-rich grassland running along the roads and the edges of the junction to the woodland edges. The roads leading from the majority of roads that would form the new junction would be cut into the landscape to reduce visual impact and noise pollution, while the A13 would remain at its current height above the new roads. A flood mitigation pond would be built in the middle of the junction and accessed by a maintenance road. The landscaping and lowered height of the junction has been designed to reduce the impact on the local landscape as much as possible.
- The northern half of the A13 junction would be mostly landscaped with species-rich grassland, woodland including non-native species and woodland scrub. The new road parallel to Baker Street would be raised before passing under the raised Stifford Clays Road bridge, with the new road closest to Grays being lowered in a proposed cutting. The parcels of land north of, and between the Stifford Clays Road and A13, would be returned to agricultural use.
- The realigned 400kV overhead power lines would be a permanent feature, with one of four replacement pylons being in Orsett ward and one on the boundary with Chadwell St Mary ward.

Figure 16.5: Main features of the completed project in Orsett ward



- The realigned 275kV overhead power lines would also form a permanent feature within this ward.
- Continuing north towards the M25 the new route would be landscaped with species-rich grassland, with woodland including non-native species and woodland scrub in-between the roads where they bisect underneath the Green Lane bridge. Further north flood mitigation ponds would be built running parallel with the north and southbound roads, with marsh and wet grassland edges landscaping. The area surrounding this section of the new road would be returned to agricultural use once the project is operational. The landscaping between the road and Mardyke River would be open grassland and then marsh and wet grassland – fen, with both sections being receptor sites for translocated species. A further flood mitigation pond would be built parallel with the southbound carriageway, accessible by a maintenance road which would be bordered by woodland include non-native species and marsh and wet grassland. All of this landscaping would be designed to be reflective of the existing ecology in these areas to mitigate against the impact on local wildlife.
- Some footpaths and bridleways would rerouted permanently as part of our proposals for over 46km of upgraded or entirely new walking paths, cycle routes and bridleways that would benefit communities along the route. For more information, see the Footpaths, bridleways and cycle routes section.
- The existing traveller site on Gammonfield Way would be relocated to an area next to its existing site and would be around 1.5 ha in size. For more information, see chapter 5 of the Construction update.

Changes to the project since our design refinement consultation

As part of our ongoing design development and discussions with utility companies, we have made the following changes to the project and its Order Limits within Orsett ward since our design refinement consultation in July 2020. More information about these proposed changes, including maps showing changes to the Order Limits, can be found in chapter 3 of the Operations update.

- It is proposed to remove the ‘spur’ of the Order Limits that runs north-south through the Ron Evans Memorial Field as a result of utilities works being conducted elsewhere. Two small new areas of land are proposed to the north for a utilities working area and as an ecological receptor site.
- Four residential properties on Woolings Close, owned by Highways England, have been removed from the Order Limits following local feedback.
- Following landowner and stakeholder feedback the Cadent high-pressure gas pipeline diversion has been pushed further south along the northern edge of the A13. This has enabled a reduction to the Order Limits, reducing impact on the Orsett Showground and fields currently used for football pitches by Orsett Park Royals Football Club.
- We have removed land to the north west of Orsett that contains existing vegetation but added additional adjacent land for a working area and installation of a pipeline.
- The land requirements at Stanford Road have changed, with the current power network diversion severing an agricultural field, which could restrict its use. We propose realigning the power network so it runs closer to the property boundary, reducing the restrictions that may apply to the field. This would see the addition of a small area of new land to the Order Limits and the removal of land for several diversions south of Stanford Road.
- We also propose to locate utility networks in Orsett Cock roundabout until Rectory Road Bridge is built. This proposal has reduced the land in this area too.
- The flood compensation area at Orsett Fen is no longer fully required and can be reduced, removing land at Green Lane from within Order Limits with the exception of an access track. This results in a reduction of approximately 7.8 ha of land.

- As a result of the new developments, there is now a need for increased capacity on the roads linking the project road to the A13 eastbound and Orsett Cock roundabout. We are therefore proposing a modification to the junction in this area, with an extra lane on the link road extending from where the road passes Baker Street through to the Orsett Cock roundabout. Please see chapter 3 of the Operations update for more detail.

Impacts on open space and common land

Within Orsett ward we propose to permanently acquire part of the Ron Evans Memorial Field for a new section of road and landscaping. In response to stakeholder feedback, we have amended our proposal for replacement open space land that was presented at the previous design refinement consultation. We are proposing to acquire two areas of replacement land to the south and west of the existing site. This replacement land would be landscaped and connected to the area of the memorial field to be retained, and adjacent areas of proposed environmental mitigation to the north of Long Lane.

We are also proposing to permanently acquire Orsett Fen common land within the Order Limits for new road, landscaping and environmental mitigation through the Mardyke Valley. In response to stakeholder feedback, we have amended our proposal for replacement common land that was presented at the previous design refinement consultation. We are now proposing to provide replacement land to the north and south of the existing common land. This replacement area would be designated as common land and benefit from the same rights of access and common rights as the existing and retained common land.

More information about our proposals for compensating for impacts on open space and common land (which includes special category and recreational land), including proposals we have consulted on previously, can be found in chapter 3 of our Operations update.

Impacts on private recreational facilities

Within Orsett ward we are proposing to divert a gas pipeline to the south and east of the Orsett Park Royals Football Club pitches. There may be some impact on the area currently used for the smaller pitch during the diversion works which we would seek to mitigate.

More information about our proposals for private recreational facilities can be found in chapter 3 of our Operations update.

16.3 Traffic

We carried out traffic assessments to understand how construction and operation of the new road would affect nearby roads, compared with the situation if the project was not implemented. For more information, see chapter 4 of the Operations update.

16.3.1 Construction

Construction impacts

The traffic flows on the A13 would be higher as this is the main route that would be used by much of the construction traffic in Orsett ward. This is likely to lead to a small decrease in speeds along the A13. The length of time for which narrow lanes are required would be kept to a minimum and the works would be designed so that a 60 mph speed limit, rather than the usual 50mph can operate on this section. This would reduce the impact of the narrow lanes on the capacity of the A13 and the journey times of vehicles using the road.

The early construction of haul roads along the alignment of the project will mean that many of the construction HGVs would be able to use these roads from the A13 rather than use the local road network for the last part of their journey to the Compounds.

Elsewhere the presence of traffic management would increase the journey times of vehicles using the affected stretches of road, including in particular Stanford Road, Baker Street, Rectory Road, Brentwood Road, Stifford Clays Road, Fen Lane and Green Lane.

The temporary closures of Baker Street, Rectory Road, Fen Lane and Green Lane would result in longer journey times for the vehicles that usually use these roads.

Measures to reduce construction traffic impacts

During the design and development of the project, our approach to construction has been refined continually after extensive investigations and feedback from the public and stakeholders, with the aim of reducing construction traffic impacts. A summary of measures proposed to reduce the volume of construction materials transported in and out by road during the construction period can be found in chapter 2 of the Construction update

To reduce the construction traffic impacts on Orsett ward we would implement the following measures:

- Minimise the use of the local road network as far as reasonably practicable through the construction of temporary slip roads from the M25 which would provide direct access from the strategic road network to the construction site. These temporary slip roads would be constructed at the earliest opportunity to maximise the benefit.
- Our proposals allow for re-use of excavated materials, and would substantially reduce the need to dispose of excavated material via the road network, thereby reducing the number of HGV movements from the public road network during the construction period.
- Construction of temporary haul roads within the Order Limits, at the earliest opportunity, to provide improved access to the strategic road network for construction traffic and allow materials to be moved offline.
- Following discussion with key stakeholders, HGVs associated with construction of the project would be banned from using some local roads wherever practicable. Proposed road bans for construction vehicles (with the exception of very specific works, which include limited utility and road-connection works) include:
 - Rectory Road from School Lane to Prince Charles Avenue
 - School Lane from Mill Lane to Rectory Road
 - B188 High Road from Mill Lane to Rectory Road
 - Prince Charles Avenue from Rectory Road to the A128 Brentwood Road.

Note that an existing 7.5-tonne ban at the north end of Brentwood Road would be removed throughout the construction period to provide access to the Brentwood Road Compound.

- Where practicable, new bridge structures have been designed so that they can be built offline to avoid the need to close local roads for extended periods. Where offline construction is not possible and space is available to do so, the existing road would be temporarily realigned to facilitate construction of new bridges.
- Stockpile material within the Order Limits to allow material to be managed on-site rather than offsite, reducing the number of HGV journeys needed.

16.4.2 Operations

Operational impacts

Traffic modelling has been carried out to predict the change in traffic flows on roads in the area, including those within or on the boundary with Orsett ward for the first year of operation, 2029.

Figures 16.6, 16.8 and 16.10 below show the predicted changes in traffic in the morning peak (7am to 8am), interpeak (an average hour between 9am and 3pm) and evening peak (5pm to 6pm) measured in Passenger Car Units (PCUs per hour), where 1 PCU is equivalent to a car, and 2.5 PCUs is equivalent to an HGV. Figures 16.7, 16.9 and 16.11 below show the predicted percentage changes in traffic flow during the morning, interpeak and evening peak. For information about how we assessed operational traffic impacts, see chapter 1. For more information about how we carried out our traffic modelling, see chapter 4 of the Operations update.

The project runs through the south-west of the ward. South of the A13, the predicted traffic flows on the project in 2029 northbound are 4,200 PCUs in the morning peak, 3,500 PCUs in the interpeak and 3,600 PCUs in the evening peak hour. Southbound, the predicted flow is 3,400 PCUs in the morning peak, 2,800 PCUs in the interpeak and 4,100 PCUs in the evening peak hour.

North of the A13, the predicted traffic flows on the project in 2029 northbound is 4,000 PCUs in the morning peak, 2,700 PCUs in the interpeak and 2,500 PCUs in the evening peak hour. Southbound the predicted flow is 2,200 PCUs in the morning peak, 2,100 PCUs in the interpeak and 2,700 PCUs in the evening peak hour.

There is a predicted increase in traffic levels at the Orsett Cock junction, along the A13 east of the new junction with the project, along Stanford Road, which runs alongside and to the south of the A13, Brentwood Road running southbound from the Orsett Cock junction and Buckingham Hill Road, carrying traffic that has left the A13 at the Manorway junction.

The A13 runs across the ward from west to east. There are currently free-flow connections with the A1089 close to the Orsett Cock junction. At this junction there are connections between the A13, the A127 Brentwood Road which runs north of the A13 towards Bulpan, the A1013 Stanford Road which runs parallel to the A13 on its southern side, and the Brentwood Road running south of the A13 towards Chadwell St Mary. Further east, the Manorway interchange connects the A13 with the B1007 North Road towards Horndon-on-the-Hill; the A1014 Manorway for access to Stanford-le-Hope, Corringham and the London Gateway Port; and the A1013 Stanford Road, which runs parallel to and south of the A13 to the Orsett Cock junction.

Traffic levels are predicted to decrease west of the proposed junction of the project with the A13. Westbound, the decrease would be over 1,000 PCUs in the morning peak hour and between 500 and 1,000 PCUs in the interpeak and evening peak hour. In all time periods, the decrease is between 10% and 20% of the traffic levels without the project. Eastbound, the decrease in traffic flows is between 500 and 1,000 PCUs in all modelled time periods. This is a decrease in traffic of between 10% and 20% in the morning peak and the interpeak period and between 0% and 10% in the evening peak hour.

Traffic levels are predicted to increase to the east of the proposed junction of the project with the A13. East of the Orsett Cock junction the increase in traffic flows would be between 500 and 1,000 PCUs westbound in the morning peak hour and the interpeak period. This is an increase of between 10% and 20%. In the evening peak hour, the increase in traffic is over 1,000 PCUs, an increase of between 20% and 40%. There would be an increase in traffic of between 500 and 1,000 PCUs eastbound in all the modelled time periods, which is an increase of between 10% and 20% in the morning peak hour and the interpeak and an increase of between 20% and 40% in the evening peak hour.

On the A13 east of the Manorway junction, traffic flows would increase. Westbound, the increase in flows would be between 250 and 500 PCUs in the morning peak hour and the interpeak. This is an increase of between 10% and 20%. In the evening peak hour, the increase in flows would be between 50 and 250 PCUs, an increase of between 0% and 10%. Eastbound, the increase in flows would be between 50 and 250 PCUs (between 0% and 10%) in the morning peak hour, between 250 and 500 PCUs (between 10% and 20% increase) in the interpeak, and between 500 and 1,000 PCUs (between 10% and 20%) in the evening peak hour.

There would be a connection provided between the A1089 and the project northbound. The flows on this connection in 2029 would be over 1,000 PCUs in the morning and evening peak hours and between 500 and 1,000 PCUs in the interpeak period. There would be a decrease in traffic flows on the slip roads between the A13 and the A1089 of between 500 and 1,000 PCUs in the morning peak hour, and a decrease of between 250 and 500 PCUs in the interpeak period and the evening peak hour. In each time period, this is a decrease of between 20% and 40%. On the slip from the A1089 northbound on to the A13 eastbound, the decrease in traffic levels is predicted to be within 50 and 250 PCUs in each of the modelled time periods. This is a decrease of between 10% and 20%.

The A1013 Stanford Road in Orsett ward runs parallel to the A13 to its south, joining with the A13 at the Manorway junction. On the A1013 as it passes under the A1089 there would be an increase in flows westbound of between 50 and 250 PCUs in each modelled time period. This would be an increase of between 20% and 40% in the morning peak hour and over 40% in the interpeak period and the evening peak hour. Eastbound, there would be a decrease in traffic flows of between 50 and 250 PCUs in each modelled time period. This is a decrease of between 20% and 40% in the morning peak hour and between 10% and 20% in the interpeak period and the evening peak hour.

On the A1013 between the Orsett Cock junction and the junction with the Buckingham Hill Road, there would be a decrease in traffic of between 50 and 250 PCUs westbound in the interpeak period and the evening peak hour. This is a decrease of between 20% and 40%. Eastbound there would be an increase in traffic flows of between 50 and 250 PCUs during all modelled time periods. This is an increase of over 40% in the morning peak hour and between 20% and 40% in the interpeak and evening peak hour. On the final section of the A1013 west of the Manorway interchange, there would be an increase in flows of between 50 and 250 PCUs in the morning peak hour, which is an increase of between 20% and 40%. Eastbound, there would be an increase in traffic flows of between 50 and 250 PCUs in the morning peak hour and the interpeak period. This is an increase of between 20% and 40%.

On North Hill, the B1007, just north of the Manorway interchange, there would be a decrease in traffic northbound of 50 to 250 PCUs (a decrease of between 10% and 20%) in the morning peak hour and an increase of between 50 and 250 PCUs in the evening peak hour (which is an increase of between 20% and 40%). Southbound, there would also be an increase in flows in the evening peak hour of between 50 and 250 PCUs, an increase of between 20% and 40%. On the B1007 north of Horndon on the Hill, there would be an increase in traffic in the evening peak period of between 50 and 250 PCUs (between 20% and 40%) both northbound and southbound.

On Buckingham Hill Road, on the section just south of the A13 within the Orsett ward, there is a decrease in flows northbound in the morning peak and evening peak hours of between 50 and 250 PCUs, a decrease of between -20% and -40%. Southbound there is an increase in flows of between 50 and 250 PCUs in each of the modelled time periods, in each case an increase of over 40%.

Brentwood Road, the A128, runs vertically through the middle of Orsett ward. North of the A13 it runs from the Orsett Cock junction up to the A127 in the north of the ward. At the northern end of the Brentwood Road, north of Bulphan, there is a decrease in traffic flows. Northbound the decrease is between 250 and 500 PCUs (between 20% and 40%) in the morning peak hour on the section of the A128 between Bulphan and the A127. In an average interpeak hour and the evening peak hour the decrease in traffic flows is between 50 and 250 PCUs an hour, a decrease of between 20% and 40%. Southbound, there would be a decrease in traffic flows of between 50 and 250 PCUs (between 20% and 40%) in the morning peak hour, and a decrease of between 250 and 500 PCUs in an average interpeak hour and the evening peak hour. In an average interpeak hour, this is a decrease of over 40% and in the evening peak hour this is a decrease of between 20% and 40%.

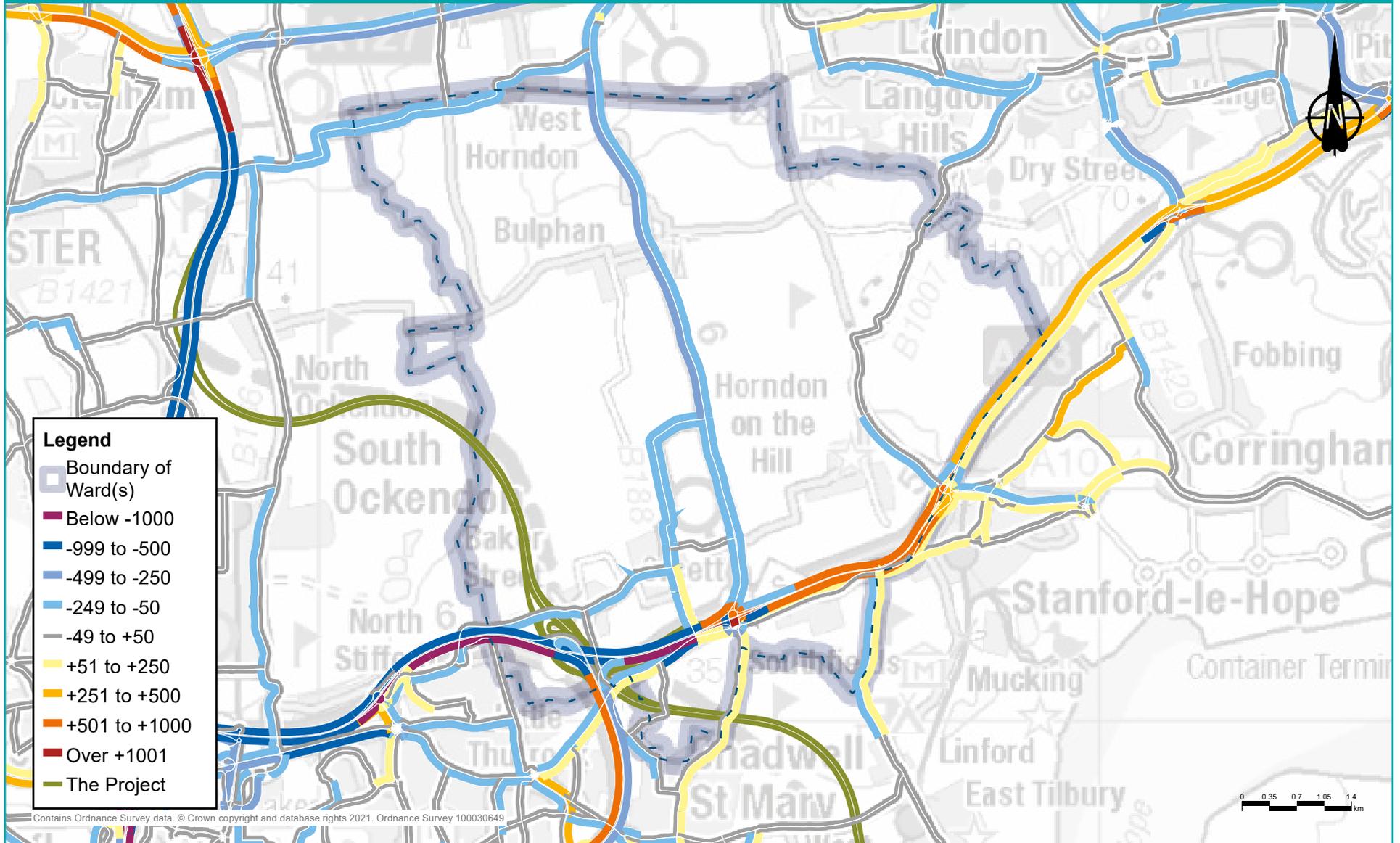
Just north of the Orsett Cock junction, on Brentwood Road there would be a decrease in traffic flows northbound of between 50 and 250 PCUs in all the modelled time periods. In the morning peak hour and an average interpeak hour this is a decrease of between 20% and 40%. In the evening peak hour, there would be a decrease of between 10% and 20%. Southbound, there would also be a decrease in flows of between 50 and 250 PCUs in the morning peak hour and an average interpeak hour. In the evening peak hour, the decrease in traffic would be between 250 and 500 PCUs. This is a decrease of between 0% and 10% in the morning peak hour and a decrease of between 20% and 40% in the interpeak and evening peak hour. The decrease in traffic may be associated with the additional flows on the A13.

South of the Orsett Cock junction the traffic flows on the A128 Brentwood Road would increase in both directions, particularly in the southbound direction. Northbound, the increase in flows is between 50 and 250 PCUs (between 20% and 40%) in the evening peak hour. Southbound, the flows would increase in all modelled time periods by between 50 and 250 PCUs in the morning peak hour and an average interpeak hour, and by between 250 and 500 PCUs in the evening peak hour. This is an increase of over 40% in all of the modelled time periods.

When the new road opens, it would not be possible to reach the A1089 from the Orsett Cock roundabout by using a short section of the A13. All other movements would remain available, including the free-flow slip-road from the A13 westbound on to the A1089, but the slip-road would no longer be able to be reached from the Orsett Cock roundabout.

Rectory Road currently has a bridge over the A13, which would be replaced during the construction of the project. The traffic flows over the new bridge northbound would decrease by between 50 and 250 PCUs an hour in the morning and evening peak hours in 2029, a decrease of over 40%. Southbound, there would be an increase in flows of between 50 and 250 PCUs (20% to 40%) in the morning peak hour and a decrease of between 50 and 250 PCUs (a decrease of greater than 40%) in an average interpeak hour.

Figure 16.6: Predicted change in traffic flows (PCUs) with the project during the morning peak in 2029



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Figure 16.7: Predicted percentage changes to traffic flow during the morning peak in 2029

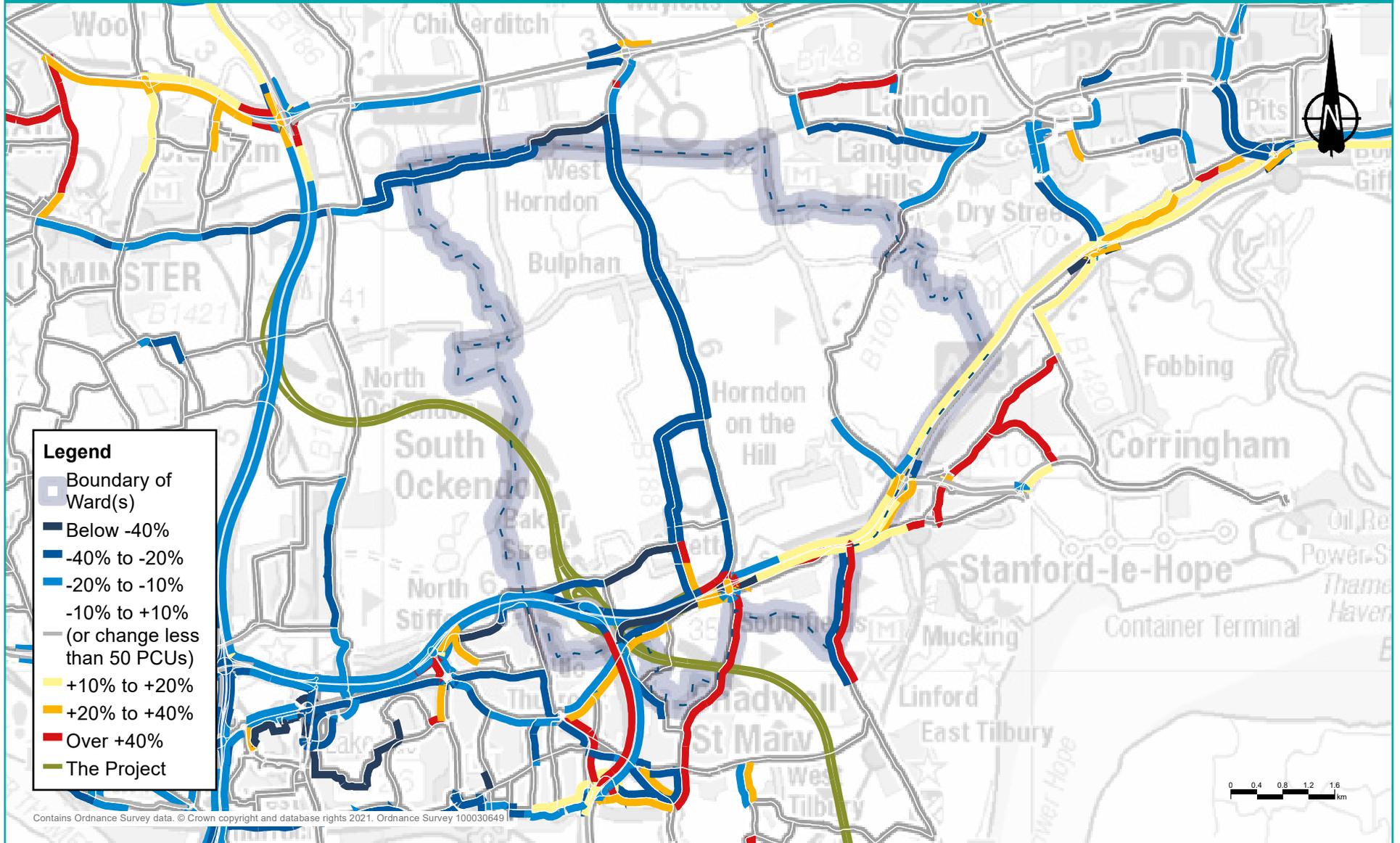


Figure 16.8: Predicted change in traffic flows (PCUs) with the project during the interpeak in 2029

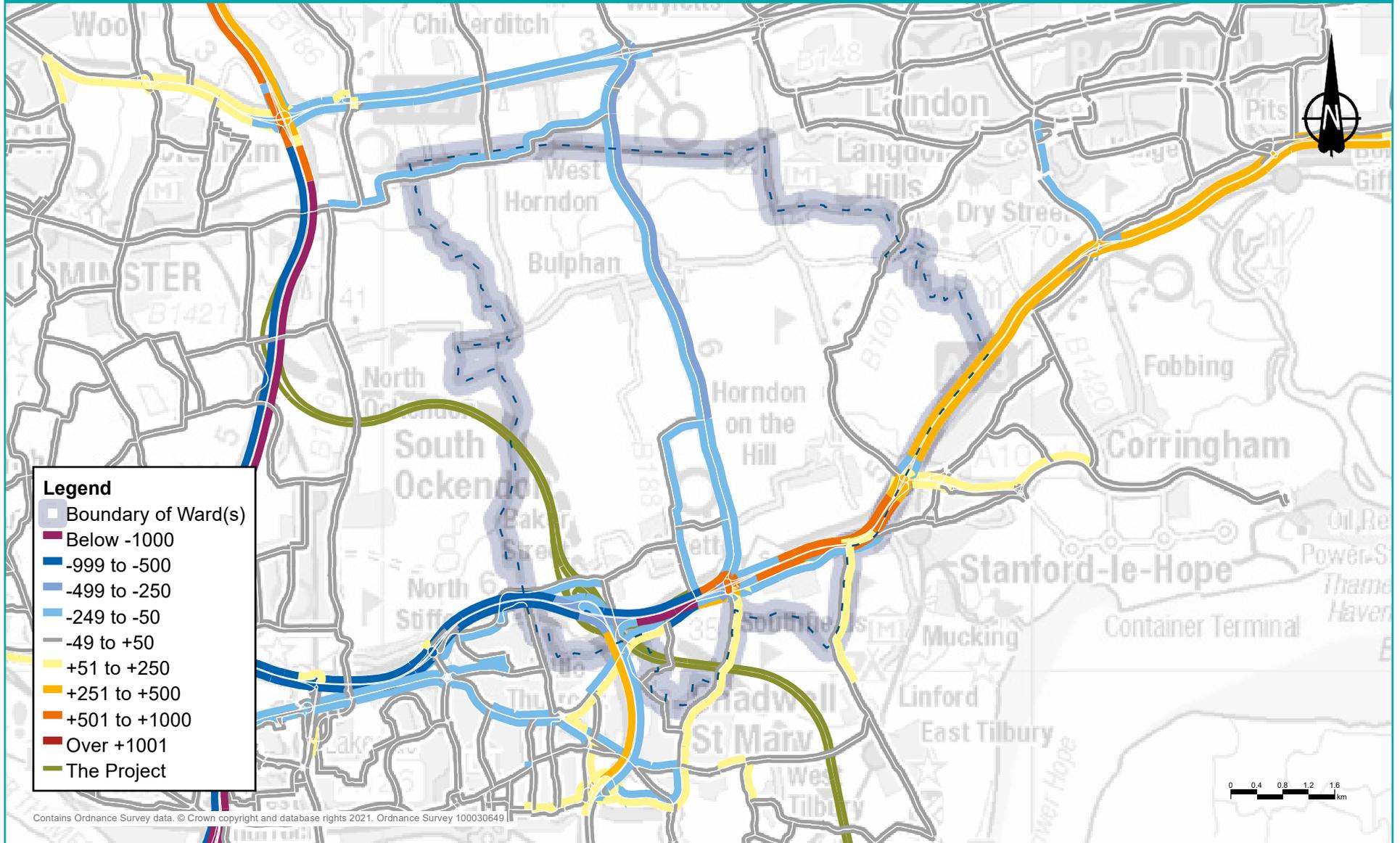


Figure 16.9: Predicted percentage changes to traffic flow during the interpeak in 2029

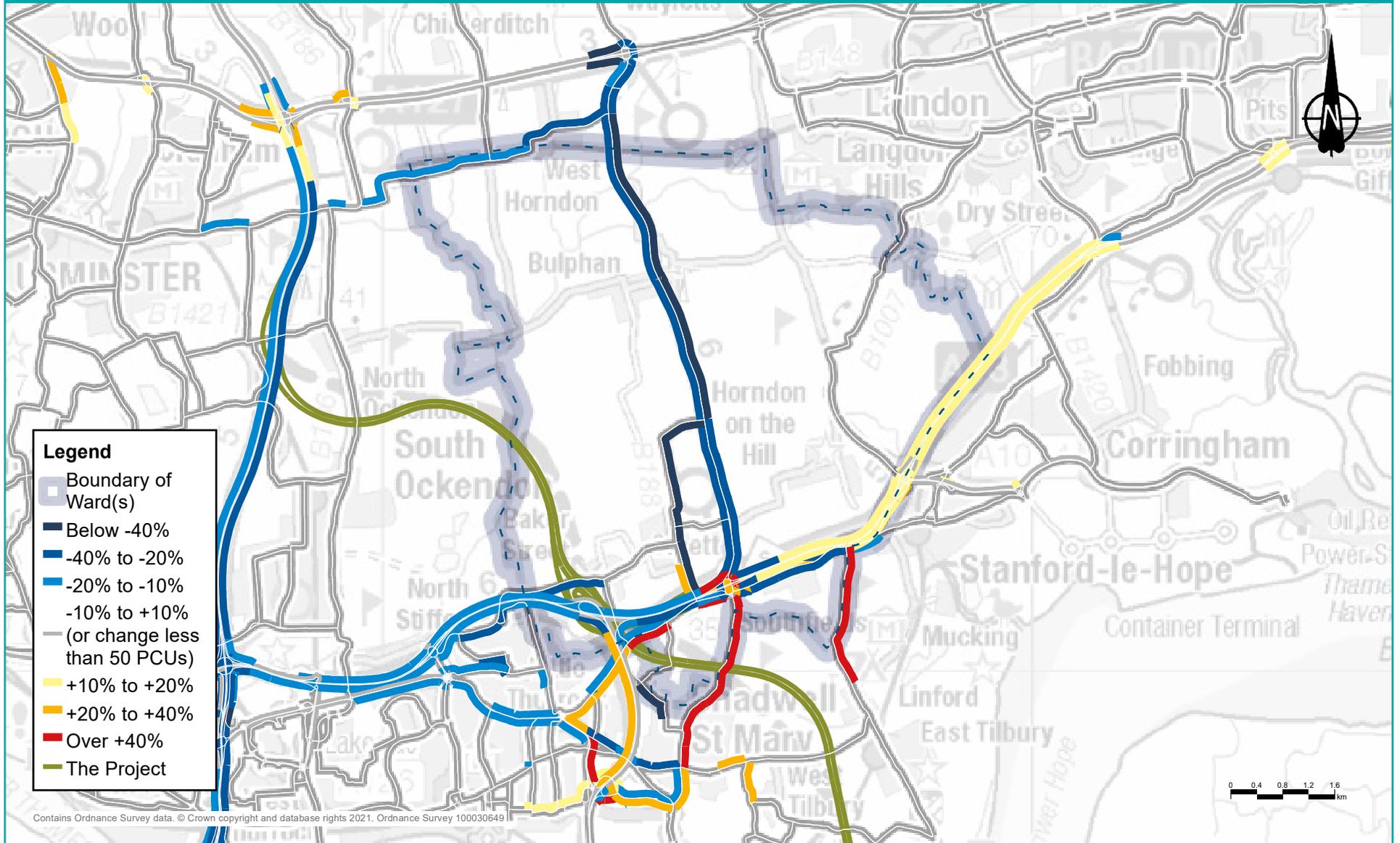
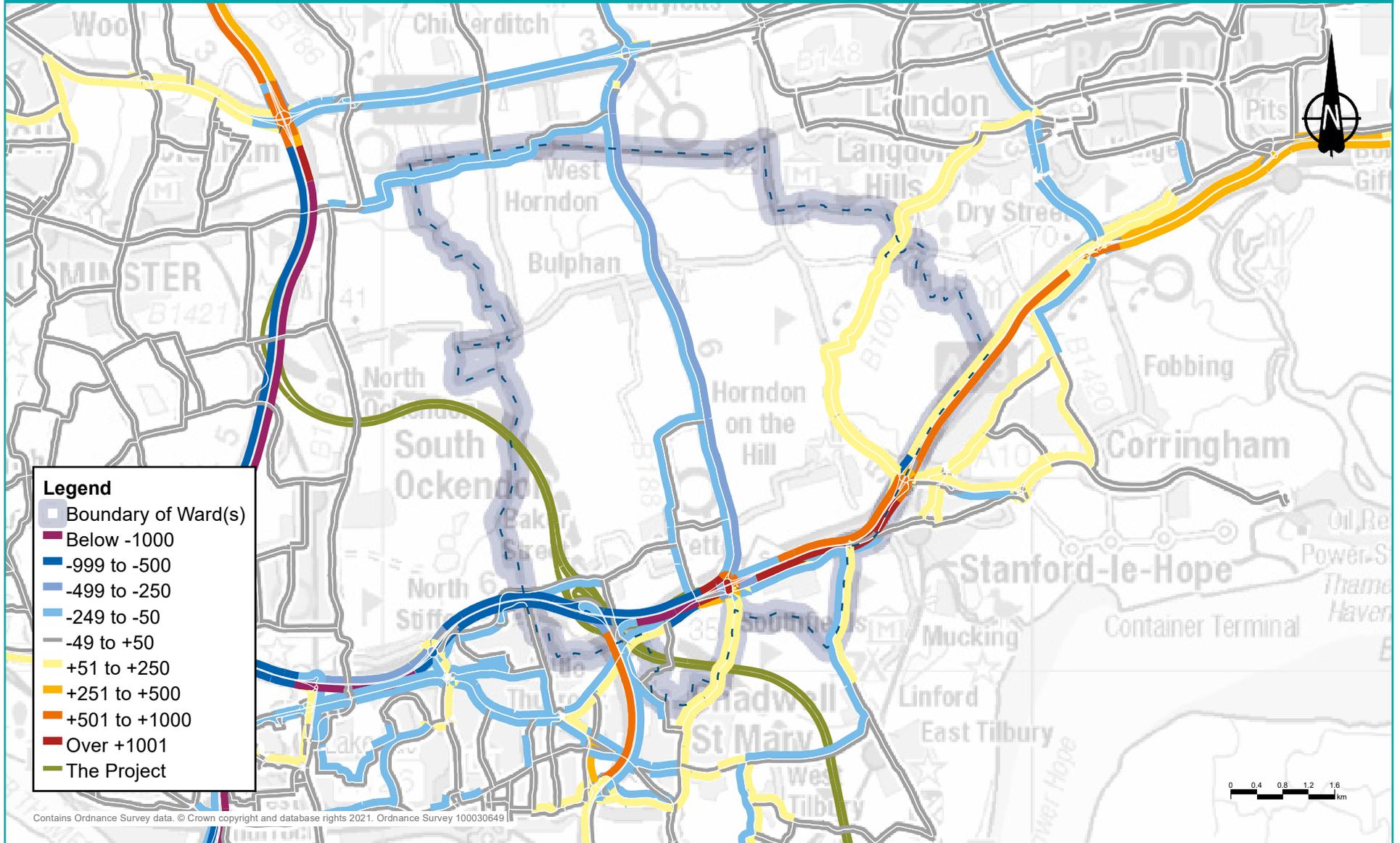


Figure 16.10: Predicted change in traffic flows (PCUs) with the project during the evening peak in 2029



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Figure 16.11: Predicted percentage changes to traffic flow during the evening peak in 2029

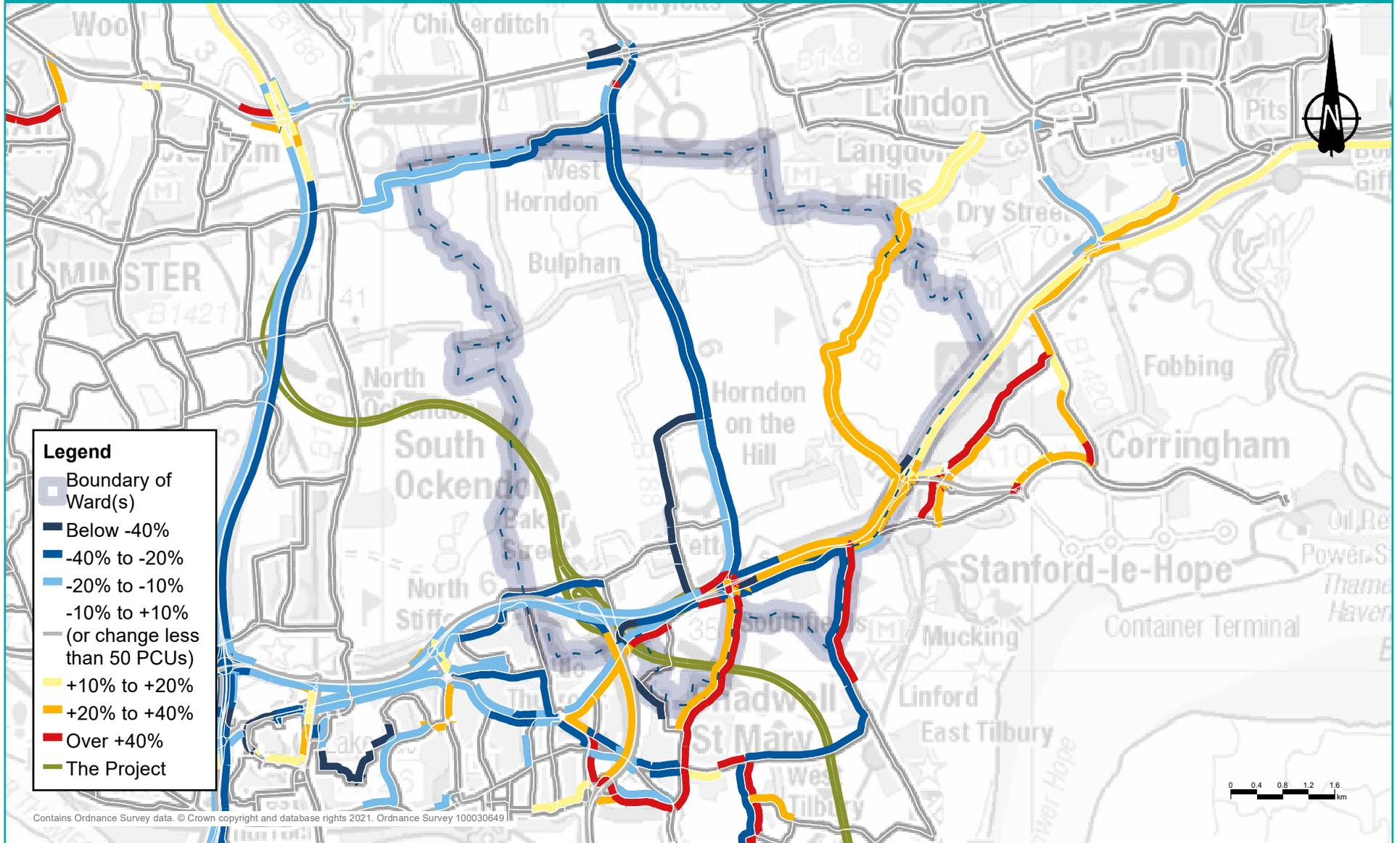
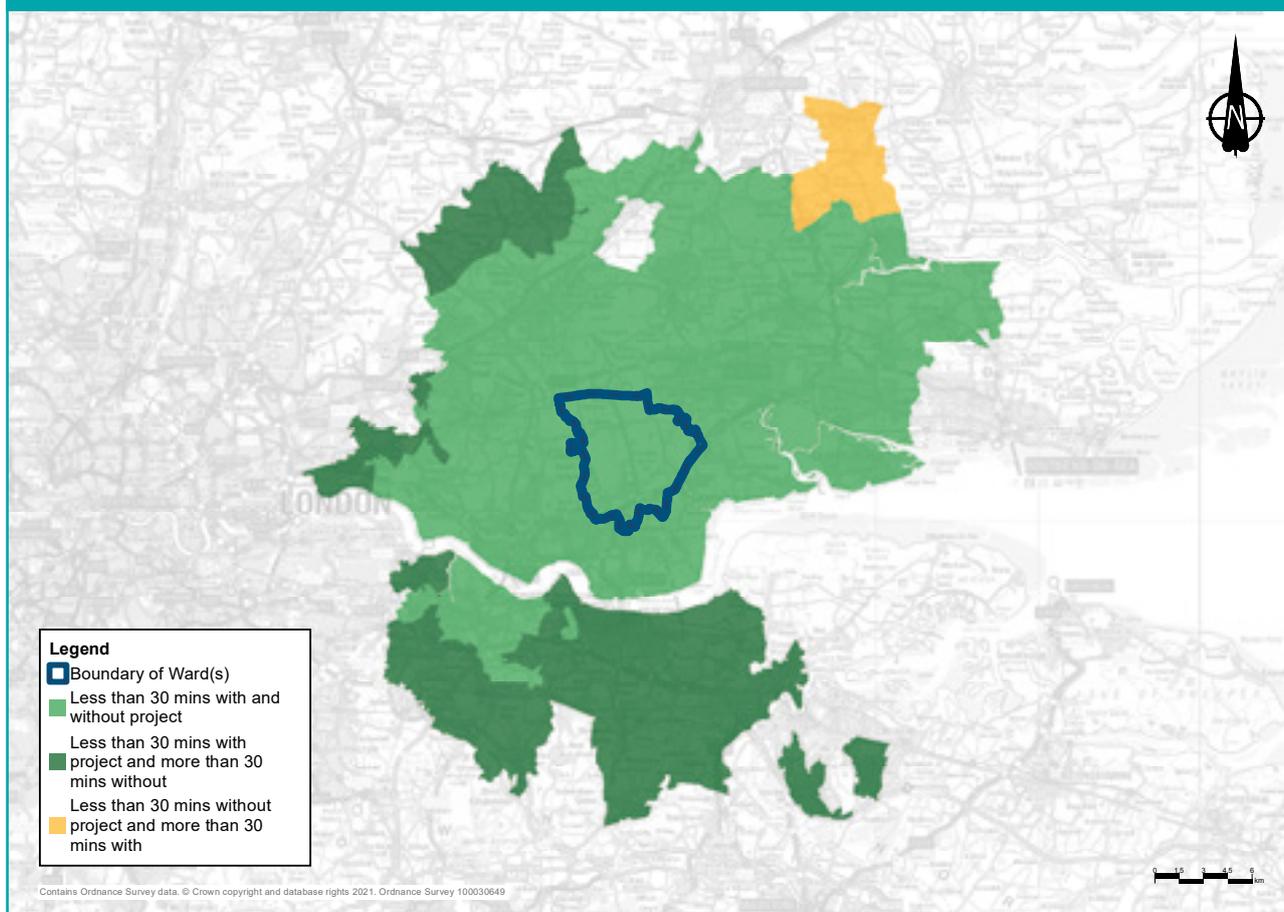


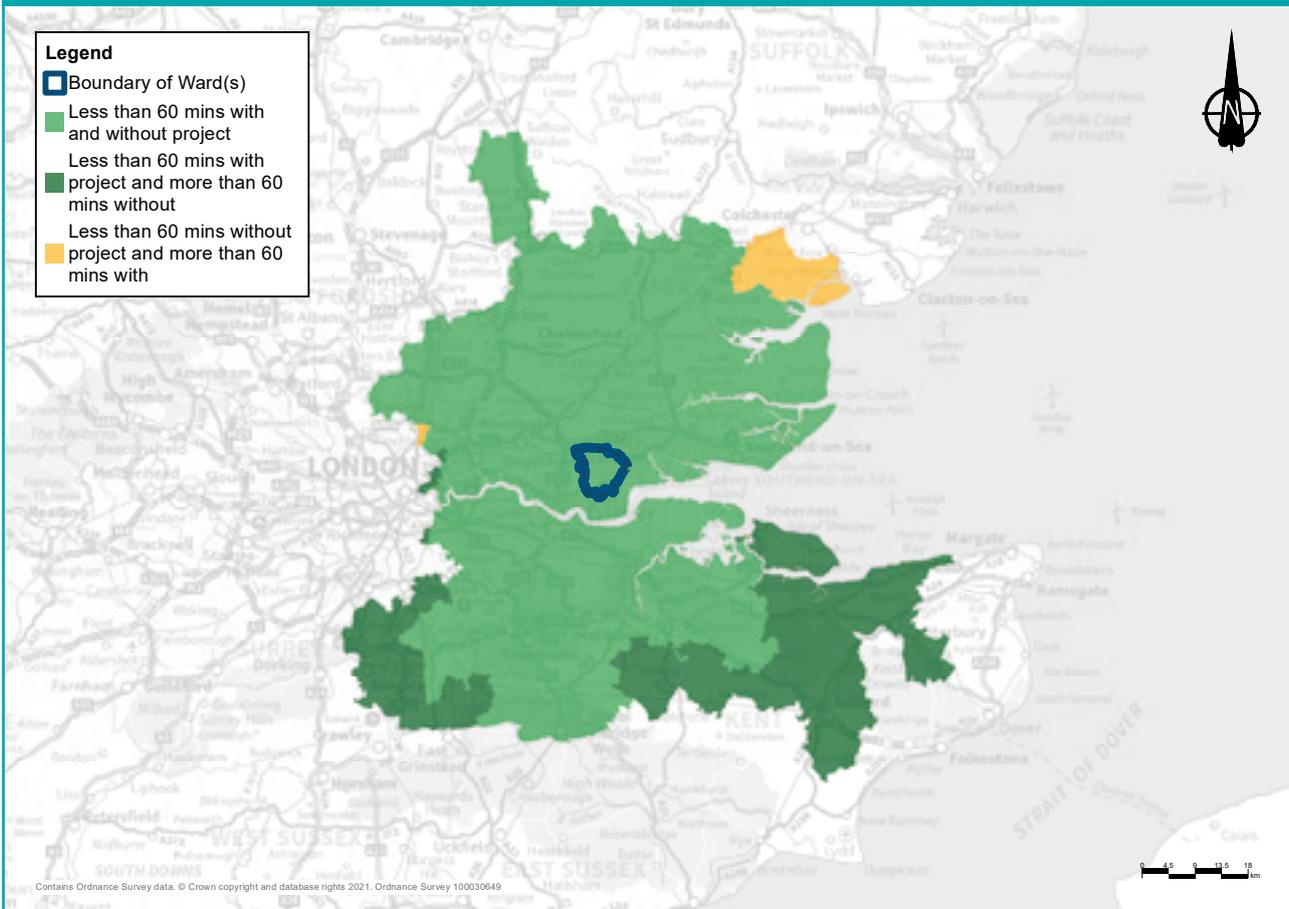
Figure 16.12: Change in area that motorists could drive to within 30 minutes from Orsett ward



Changes to journey times

Figure 16.12 shows the change in the area that could be reached within a 30-minute drive from the centre of the ward both with and without the project. Figure 16.13 shows the change in areas that can be reached within a 60-minute drive. The areas have been calculated for the morning peak hour (7am-8am). The number of jobs within a 30-minute drive would increase by 37%, which would provide access to an additional 145,900 jobs. The number within a 60-minute drive would increase by 16%, which would provide access to an additional 375,500 jobs. Despite the project providing a substantial net gain in access for motorists within Orsett ward, there are areas (shown in orange on the maps) that would no longer be accessible by car within 30 or 60 minutes because of changes to traffic flows on the wider road network.

Figure 16.13: Change in area that motorists could drive to within 60 minutes from Orsett ward



Operational traffic flows

The project has been designed to optimise its impacts on traffic, including the design of free-flowing connections with the A13/A1089 and the M25. In addition, the main route would have no traffic lights or roundabouts to ensure continuous traffic flow. However, traffic lights or roundabouts would be necessary at some minor junctions away from the main route where traffic meets local roads. All new junctions would be designed to the latest safety standards, with high consideration for efficiency.

An iterative design process, including successive stages of traffic modelling and extensive consultation and engagement, has ensured that only the optimal links to the existing road network would be provided. For more information about how the project has developed, see the You said, we did consultation document.

Once the project is operational, traffic impacts on the affected road network would be monitored, including local roads. Where appropriate, we would work with the relevant highway authority to seek funding from the Department for Transport for further interventions.

16.4 Public transport

Existing situation

The northern boundary of the ward contains West Horndon station which, is served by c2c rail services between Southend, Shoeburyness and London Fenchurch Street.

A number of buses serve Orsett ward, including the 5A, 5B, 5X, 7, 7A, 7B, 7C, 11, 51, 100, 265, 475, X1, Z2, and the Z4.

16.4.1 Construction

Rail

Rail services to West Horndon station would be unaffected by the works.

Throughout construction there may be some increases in journey times to West Horndon station, associated with increased traffic through the area and traffic management on the local roads.

Buses

Journey times on the Z4 bus may increase due to the increased traffic flows on the A13 and the traffic management along this route.

Traffic management works may affect buses using local roads, leading to increased journey times while the measures are in place.

The temporary closures of Baker Street and Rectory Road would require a diversion of the 11, 5B, 265 and 475 buses. Any diversions would be agreed with the bus operators.

16.4.2 Operations

Operational impacts

Rail

There would be no discernible change in local access times to West Horndon station and no change to the rail services at that station. It would be quicker to access HS1 services at Ebbsfleet International Station, with the journey time to that station predicted to decrease by around six minutes in the morning and evening peaks.

Buses

It is predicted that during the operational phase there would be minor increases in journey times on certain sections of these bus routes:

- Bus 5A from Pitsea to Grays: There would be a predicted increase of around two minutes westbound in the morning peak. There are no predicted impacts for other time periods or directions.
- Bus 5X from Wickford to Grays: There is a predicted increase of around seven minutes westbound in the morning peak. There are no predicted impacts during the other time periods or directions.
- 51 bus from Prittlewell to Grays and Chafford Hundred: There is a predicted increase of nearly seven minutes westbound in the morning peak hour. There would be slight changes in other time periods and directions.
- 265 bus from West Horndon to Grays: This bus is predicted to operate two minutes quicker for southbound journeys in the evening peak hour.
- Z4 service from the Amazon distribution centre to Basildon and Pitsea: There is a predicted increase in travel time of two minutes northbound in the evening peak hour.

16.5 Footpaths, bridleways and cycle routes

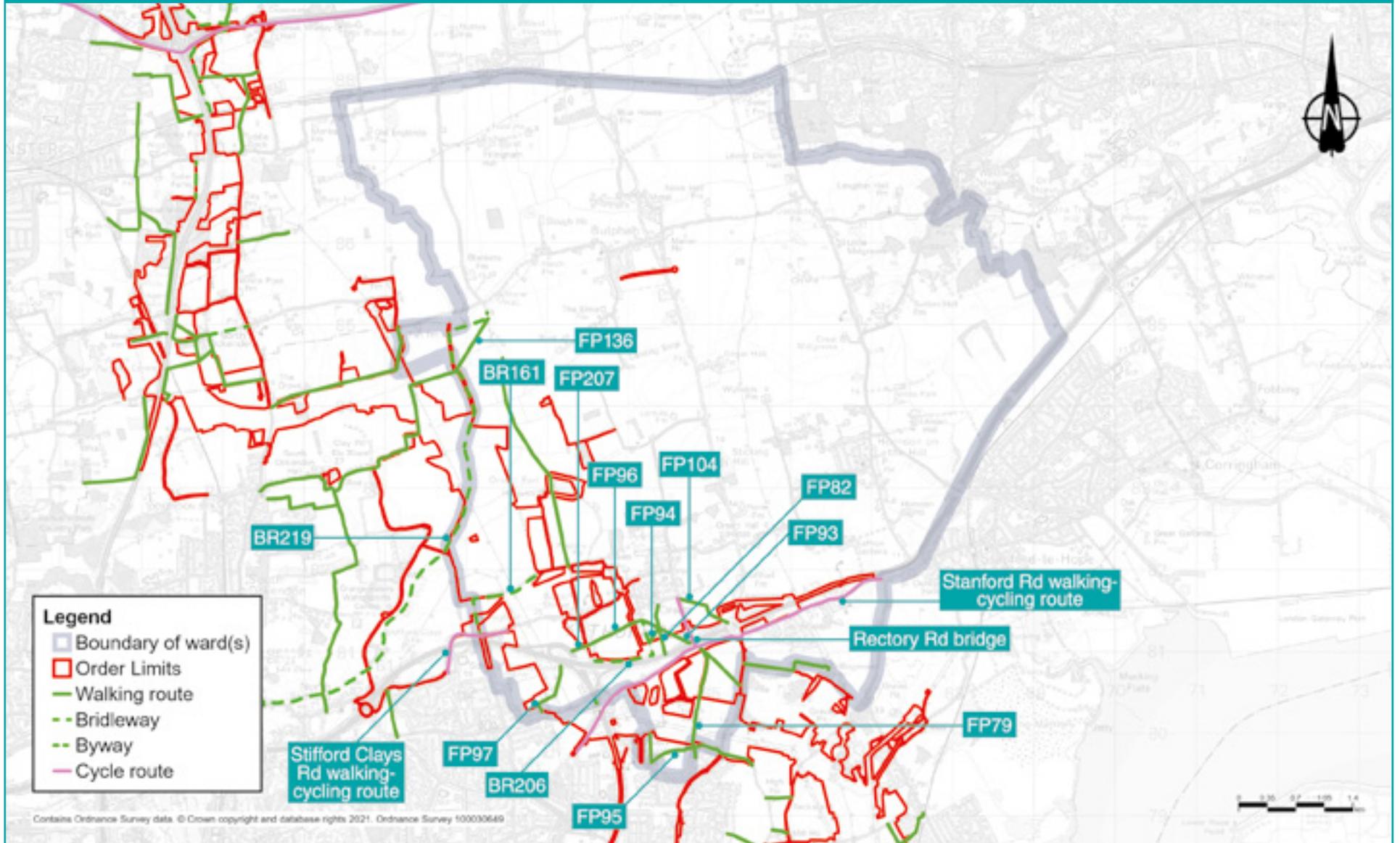
Existing situation

Orsett ward is a large and rural ward with a network of footpaths and bridleways that connect the residential areas of Stanford-le-Hope, Horndon-on-the-Hill, Bulphan, South Ockendon and Grays. For potential additional impacts, see the other topic areas in this chapter, such as Visual and Noise and vibration.

16.5.1 Construction

Due to the construction works in this ward, there would be significant changes to the network of footpaths and bridleways during the construction period. For more information about the proposed network of footpaths and bridleways once the new road is complete (including a map), see the Operational impacts section below.

Figure 16.14: Footpaths, bridleways and cycle routes in the vicinity of the project in Orsett ward



- Footpath FP79 would be impacted by the project and would need to be closed for five years to allow utilities diversion works and construction of the Lower Thames Crossing main line. We are currently working on a potential temporary diversion for this route, so that some or all of the amenity currently provided would be retained during the construction period.
- Footpath FP82 would need to be closed for five years to allow for overhead utility works and construction activities.
- Footpath FP93 would need to be closed for five years to allow utilities diversion works and construction.
- Footpath FP94 would need to be closed for eight months to allow for utilities works.
- Footpath FP95 would be impacted by works to divert overhead lines in the area and would need to be closed for intermittent periods over three years to facilitate this work before closure of less than a month while the path is resurfaced.
- Footpath FP96 would need to be closed for eight months to allow utilities diversion works.
- Footpath FP97 would need to be closed for eight months to allow utilities works. A section of the route would be permanently closed, shortening the path at the A13 end.
- Footpath FP104 would need to be closed for eight months to allow utilities works.
- Footpath FP136 would need to be closed for three years to allow utilities diversion works and main construction works.
- A short section of footpath FP207 would need to be permanently closed where it meets the new road. This footpath has already been severed by the existing A13 junction.
- Bridleway BR161 (Green Lane) would be closed for six months to allow overhead power line works. The bridleway would be realigned along a new green bridge over the new road. The new bridge would be built alongside the existing one to reduce the length of time the bridleway would need to be closed.
- Bridleway BR206 would need to be closed for five years to allow utilities diversion works and main works.
- A section of Bridleway BR219 that would cross the project route (just north-west of Orsett Fen) would need to be closed for five years to allow utilities diversion works and the construction of the Mardyke Viaduct. We are currently working on a potential temporary diversion for this route, so that some or all of the amenity currently provided would be retained during the construction period.

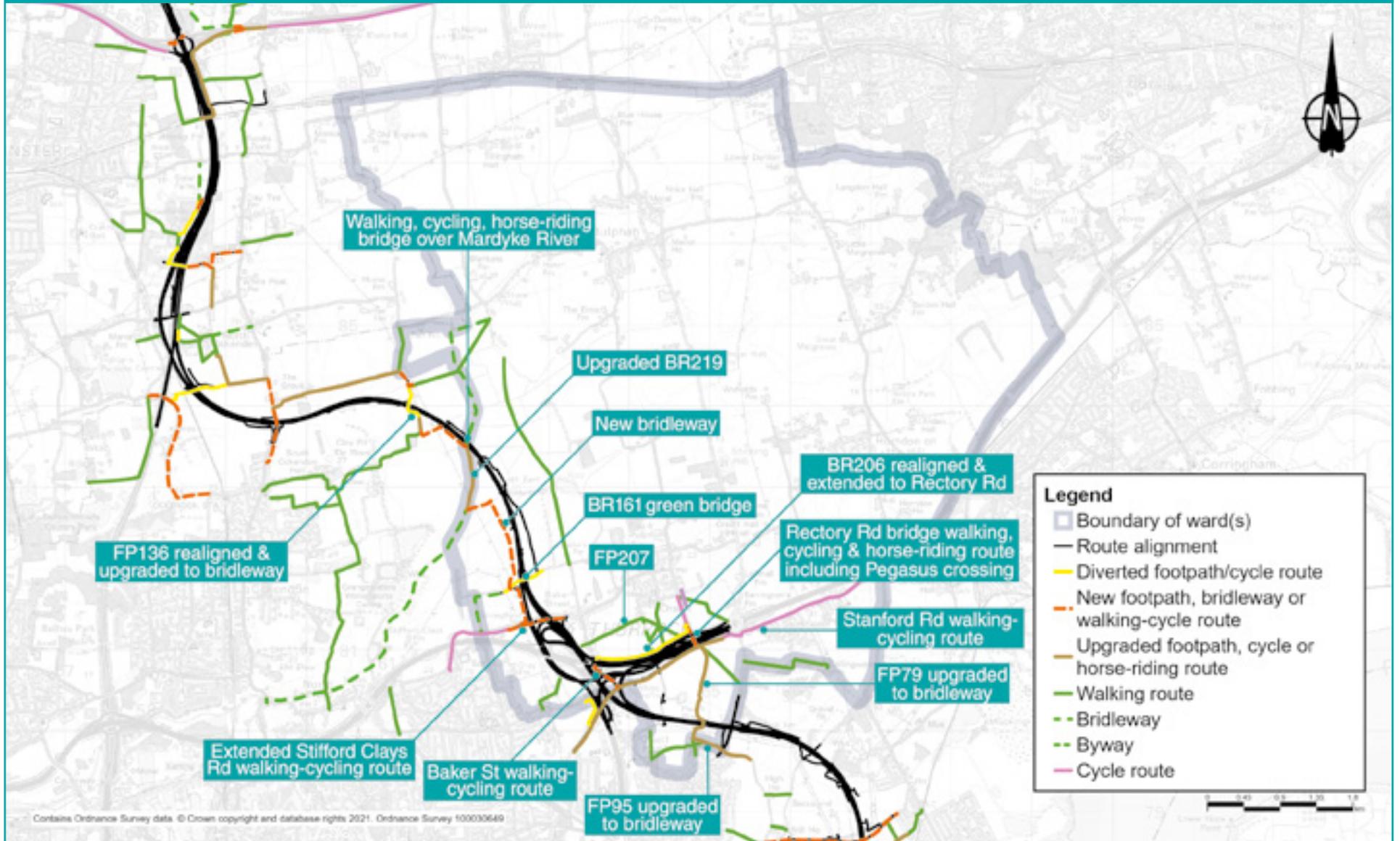
- Baker Street would be closed south of the A13 for five years while the road is realigned and used as an access route for construction vehicles. A diversion route for vehicles to the north of Baker Street would be created.
- The pedestrian-cycle track that runs along the south side of the A1013 Stanford Road would need to be closed for less than a week when traffic is diverted onto the new bridges over the project.
- The Stifford Clays Road would remain open throughout construction via a diversion adjacent to the existing road to allow the construction of two new bridges over the project and to realign the Stifford Clays Road, including provision of new off-road cycle track would require temporary closure of the route.
- Rectory Road bridge would need to be closed for one year during the construction of the new bridge that would cross the A13 affecting the walking-cycling route.

16.5.2 Operations

Overall, the proposals for walking, cycling, and horse riding include more than 46km of new, diverted, extended or upgraded footpaths, bridleways and cycle routes. These would provide greatly improved connections across the project. We developed our proposals after consultation and engagement with local communities and stakeholders. For an overview of the proposed improvements to footpaths and bridleways across the Lower Thames Crossing, see chapter 2 of the Operations update.

- Footpath FP79 would be permanently realigned locally over the project by means of a new bridge and would be resurfaced and designated as a bridleway. The bridge crossing the project would include parapets made to equestrian standard.
- A section of footpath FP95 would be resurfaced and upgraded to a bridleway.
- Footpath FP97 would see a shortening of the path at the A13 end.
- A section of footpath FP136 would be upgraded to a bridleway, including a new footbridge, suitable also for horse-riders, taking the bridleway over the new road. The new section of bridleway would connect to BR219.

Figure 16.15: Proposed footpaths, bridleways and cycle routes Orsett ward



- Footpath FP207 would be permanently closed where this path clashes with the project. This footpath was severed by the existing A13 junction when this was constructed and appears to no longer be accessible. No diversion route would be provided.
- Bridleway BR161 (Green Lane) would be realigned over a new green bridge over the new road. The bridge would be suitable for walking, cycling and horse-riding.
- Bridleway BR206 would be realigned and extended as far as Rectory Road.
- Bridleway BR219 would be upgraded and resurfaced prior to reopening. The route would include a new bridge over the Mardyke for equestrian and cycle use connecting to new bridleway connection to FP136 (upgraded to a bridleway), and from Stifford Clays Road, across Green Lane up to the Mardyke BR219.
- Baker Street would reopen along a new realignment and include construction of a new off-road pedestrian-cycle track parallel to and east of Baker Street with road and surface improvements.
- Once operational a new off-road cycle track parallel to, and south of A1013 Stanford Road, would be opened with an adjacent grass verge for horse-riding. This cycle route would cross the project via a new pegasus crossing (suitable for horse-riders, as well as walkers and cyclists) connecting A1013 cycle track and Rectory Road bridge cycle track.
- The Stifford Clays Road would reopen with new pedestrian-cycle track connections over the newly constructed bridges. This new provision would connect to the existing network west of Stifford Clays Road, including new pedestrian-cycle track route that would connect into new bridleway connection from Green Lane to Stifford Clays Road.
- Rectory Road bridge would reopen widened to include segregated pedestrian-cycle and equestrian tracks connecting to the realigned A1013 and Rectory Road cycle tracks. The new walking cycling horse-riding routes over Rectory Road would connect to the extended routes BR206 to FP79, which would both be designated as bridleways.

16.6 Visual

Existing situation

Views towards the land on which the project would be built from the main populated area are mostly limited to homes on the south and west edges of Orsett and settlement of Baker Street.

Other views towards the land on which the project would be built are from the local footpath network, public rights of way crossing Orsett Fen, Mardyke Way, and local cycle routes along Stanford Road and Stifford Clays Road/B188 through Baker Street.

Current views north and west from Baker Street towards the land on which the project would be built are over relatively flat agricultural land, punctuated by woodland belts and overhead lines, and softened by garden or boundary vegetation. There are filtered views from the edge of Orsett over playing fields to the south and relatively flat agricultural landscape to the west.

Views from the public rights of way south of the A13 towards the land on which the project would be built encompass gently rolling agricultural land crossed by prominent overhead lines. Views from the public rights of way network immediately north of the A13 are mostly of flat agricultural land, with small scale pastoral fields and paddocks adjoining Baker Street. South of Orsett, views from the public rights of way network include playing fields, allotments and agricultural land.

Views towards the land on which the project would be built from public rights of way crossing Orsett Fen and from Mardyke Way, reveal a mainly flat and open landscape of large arable fields bounded by hedgerows and trees, and crossed by an overhead power line.

16.6.1 Construction

More information about how the area would look during construction, including visualisations, can be found in the Construction update. You can also view a video fly-through of the project during construction by visiting our consultation website.

The main construction activities likely to be seen in this ward are:

- Highway works to the A13
- Construction of the proposed A13/A1089 junction and the project's main road
- Construction of Green Lane green bridge
- Establishment and operation of the Brentwood Road Compound, Long Lane Compound A, Long Lane Compound B, Stifford Clays Road Compound West, Stifford Clays Road Compound East and Mardyke Compound
- Establishment and operation of the Green Lane, Stanford Road, Stifford Clays Road, Long Lane, Hornsby Lane and Brentwood Road ULHs
- Utilities works, including overhead power line diversions

Further information on construction activities are provided in the Project description section above.

Construction impacts

Views from homes on the south and west edge of Baker Street would include construction of the Lower Thames Crossing/A13 junction, partially softened by existing vegetation. To the north, there would also be views of construction, including sight of Stifford Clays Road compound East for a small number of homes. Utilities works within the Baker Street settlement are also likely to be visible, with construction activities occurring within the road corridor of the B188 and Stifford Clays Road.

Homes on the southern edge of Orsett are likely to have a limited view of road construction due to the intervening vegetation along the settlement edge or outlying fields. There may be some views of gas diversion works to the west of Orsett, however, these activities would be partially screened by vegetation along Mill Lane.

Road construction would be clearly visible from some public rights of way and the local cycle route along Stanford Road to the south of the A13. Views from here would include construction compounds, Utility Logistics Hubs, and utilities works including overhead power line diversion work. From the public rights of way network immediately north of the A13 and local cycle route along Stifford Clays Road/B188, the A13 junction construction would be visible, including the A13 widening and distant views of overhead line diversion works.

From the public rights of way crossing Orsett Fen and from Mardyke Way, views of the Lower Thames Crossing construction would be prominent.

Measures to reduce visual impacts of construction

These would include locating construction compound facilities greater than six metres in height within Stifford Clays Road Compound East, to maximise the distance from residential properties on Stifford Clays Road and Baker Street, where possible.

The visual impacts of the project would be controlled through the range of good practice measures set out in the CoCP and the REAC.

16.6.2 Operations

When the Lower Thames Crossing opens, the new A13/A1089 junction and associated widening of the A13 would be complete, including the Orsett Fen and Mardyke Viaducts. The former construction compounds and Utility Logistics Hubs would have been restored to the landowner or to agricultural use.

Further information on the completed project are provided in the Overview section above.

Operational impacts

The main visual impacts from Baker Street would be sight of the completed new road/A13 junction including prominent road embankments. However, a false cutting would help screen views of traffic. From Orsett, there are likely to be limited views of the completed new road which would be largely screened by proposed planting.

When the road opens, views from the public rights of way and local cycle route along Stanford Road to the south of the A13 would include the completed Lower Thames Crossing/A13 junction, softened by proposed planting. The diverted section of overhead line would appear similar to the existing overhead line.

From the public rights of way network immediately north of the A13 and local cycle route along Stifford Clays Road/B188, there would be views of the Lower Thames Crossing/A13 junction within a generally flat rural landscape. Planting on the Green Lane green bridge would help to integrate the structure into this surrounding landscape.

From the public rights of way crossing Orsett Fen and from Mardyke Way, there would be views of the Lower Thames Crossing and the Orsett Fen and Mardyke Viaducts. However, these would be partially softened by woodland mitigation planting.

Measures to reduce visual impacts of the operational project

The primary mitigation measures within this ward include screen planting and false cuttings, helping to screen views of the new road and traffic and integrate the project into the surrounding landscape.

16.7 Noise and vibration

We have carried out noise and vibration assessments for both the construction and operational phases of the project. As explained in chapter 1, some of the assessments set out below are based on earlier versions of the project. The information provided still presents a reasonable representation of the likely effects from the proposals presented during this consultation.

Existing situation

The existing noise environment in Orsett ward is mainly a result of road traffic noise from the A13, A128, A1089 and the A1013. There is also noise from other roads, agriculture and other human activities.

As part of our environmental assessment process, we carried out surveys of existing background noise at 10 locations in the ward, which were agreed with the local authority. The levels monitored at these locations recorded average existing noise levels in the range of 46 to 71 dB(A)² during the day and 41 to 58 dB(A) during the night.

In order to understand how noise levels would vary with and without the project, we use noise modelling to predict what noise levels would be like in the project's proposed opening year if the project was not built. We modelled this because we cannot assume that noise levels in future will be the same as they are now. For example, our assessment of the opening year noise levels accounts for predicted changes in traffic levels.

We also modelled the predicted noise levels for the opening year with the project in place. This provides a useful comparison as to how the project would change the noise levels in the project's opening year if it were implemented.

In the opening year (2029), noise levels without the project are predicted to range, on average, from 40 to 77 dB(A) during the day and from 29 to 62 dB(A) during the night at the identified locations within the ward. As such, our noise assessments predict that by opening year there will be a noticeable change compared to the existing situation even if the road is not built. Information about how noise levels would change with the project in place, during its construction and operation, are presented below.

2 Decibel (dB) is the unit used to measure noise levels, with dB(A) being a standardised way of averaging noise levels that accounts for how humans hear sounds. The typical level of sounds in the environment ranges from 30 dB(A), which is a quiet night-time level in a bedroom, to 90 dB(A), which is how it would sound by a busy road. See chapter 1 for more information about what decibel levels mean.

16.7.1 Construction

Daytime construction noise impacts

The main construction activities that are expected to create a slight increase in noise and vibration levels in this ward are those associated with A1089 upgrade works, A13 junction upgrade works and main alignment and as well as selected utilities works.

There would be seven main works compounds and five Utilities Logistics Hubs located in Orsett ward. These are described in the Project description section above.

Although not located within the ward, the Green Lane Utility Logistics Hub may contribute to the noise impacts experienced within this ward due to how close it is to the ward boundary.

There would also be project haul roads built and used during the construction period, these are shown in the Project description.

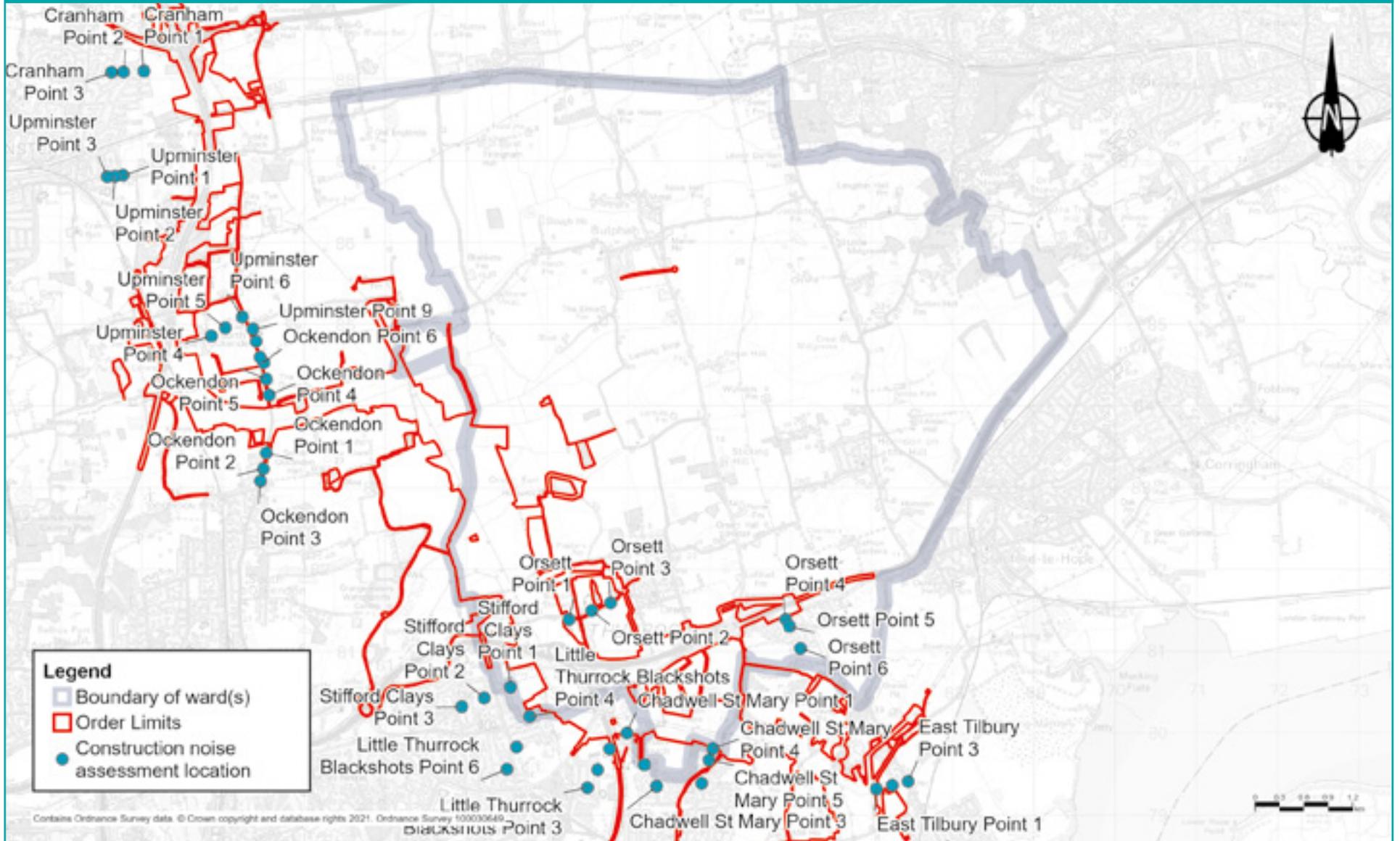
Within the ward there are six proposed structures expected to be constructed using vibratory or percussive piling, but potential vibration impacts of these structures would be less than 10 days.

Construction noise levels have been predicted at six locations across this ward, chosen to provide a representative level of noise communities are expected to experience during construction. For more information about how we carried out these assessments, see chapter 1.

Noise levels are shown using the standard units for major projects, dB LAeq (12 hour), which represent the average noise level for the assessed 12-hour daytime period. While there might be short-term noises that are louder than the noise level shown during the assessed period, the averaged figure provides a fair representation of what the overall noise impacts would be.

Figure 16.16 below shows the locations at which we have predicted the daytime construction noise during the project's construction period.

Figure 16.16: Construction noise assessment locations in Orsett ward



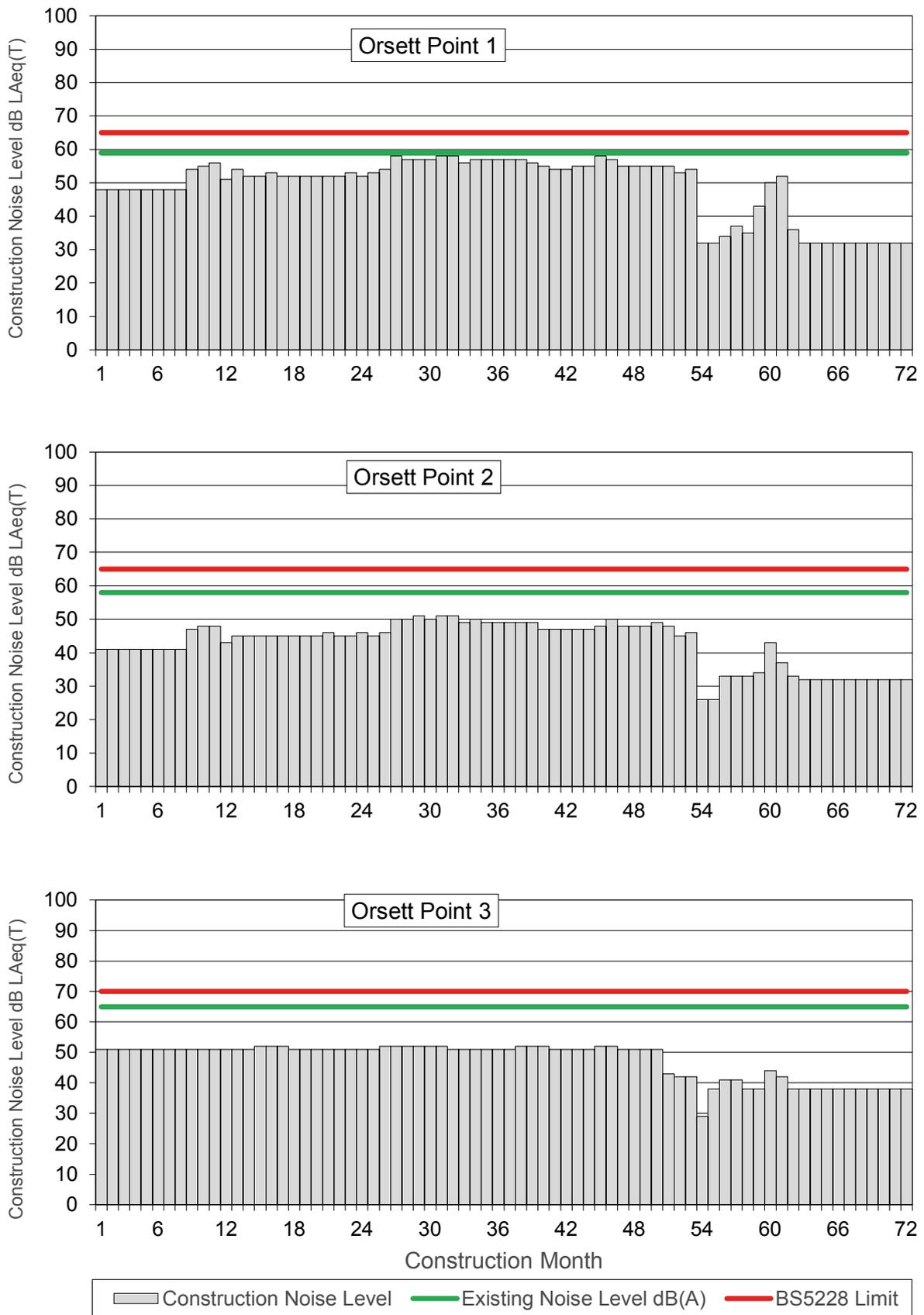
Each vertical bar in figure 16.17 and in figure 16.18 show the predicted noise levels for that month of the construction period (from month 1 to month 72). The horizontal green line in each chart represents the existing background noise level at each assessment point without the project. The horizontal red line shows the level at which construction noise would exceed defined thresholds (see chapter 1 for more information about these thresholds). If noise is predicted to exceed acceptable levels, then specific measures would be implemented to reduce it.

The predicted construction noise levels show that higher noise levels and disturbance would be experienced closer to construction activity. Levels gradually diminish as a result of increased distance and additional buildings and other features screening the noise from more distant residential areas.

With reference to figure 16.17 the following summarises the noise level changes over the construction period for points 1 to 3:

- At point 1, construction noise levels are predicted to range from 32 to 58dB LAeq (12hour) during the six-year construction programme. Construction noise levels are not predicted to exceed the existing background noise levels at this assessment location.
- At point 2, construction noise levels are predicted to range from 26 to 51dB LAeq (12hour) during the six-year construction programme. Construction noise levels are not predicted to exceed the existing background noise levels at this assessment location.
- At point 3, construction noise levels are predicted to range from 29 to 52dB LAeq (12hour) during the six-year construction programme. Construction noise levels are not predicted to exceed the existing background noise levels at this assessment location.

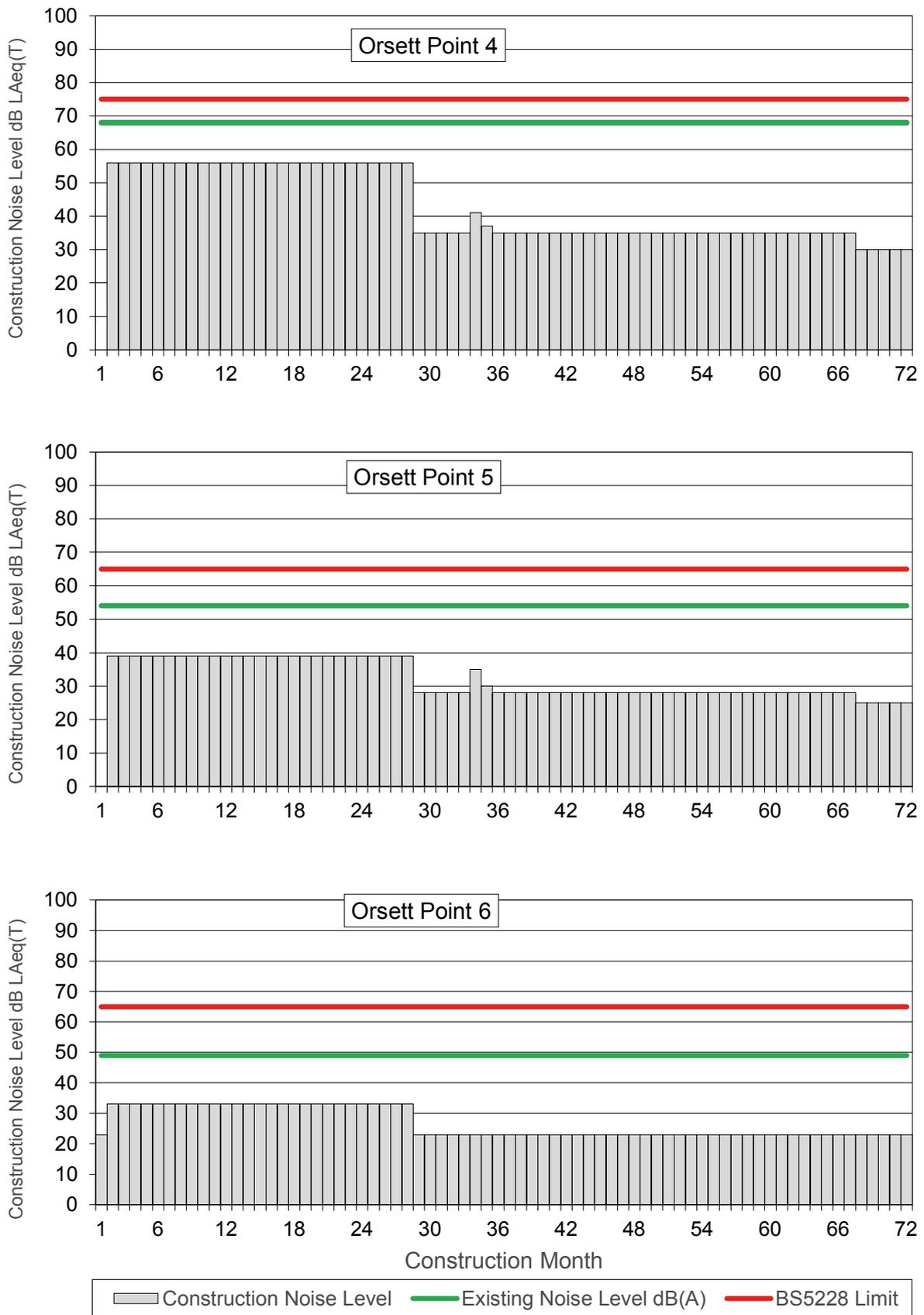
Figure 16.17: Construction noise by month for points 1, 2 and 3 in Orsett



With reference to figure 16.18, the following summarises the noise level changes over the construction period for points 4 to 6:

- At point 4, construction noise levels are predicted to range from 30 to 56dB LAeq (12hour) during the six-year construction programme. Construction noise levels are not predicted to exceed the existing background noise levels at this assessment location.
- At point 5, construction noise levels are predicted to range from 25 to 39dB LAeq (12hour) during the six-year construction programme. Construction noise levels are not predicted to exceed the existing background noise levels at this assessment location.
- At point 6, construction noise levels are predicted to range from 23 to 33dB LAeq (12hour) during the six-year construction programme. Construction noise levels are not predicted to exceed the existing background noise levels at this assessment location.

Figure 16.18: Construction noise by month for points 4, 5 and 6 in Orsett



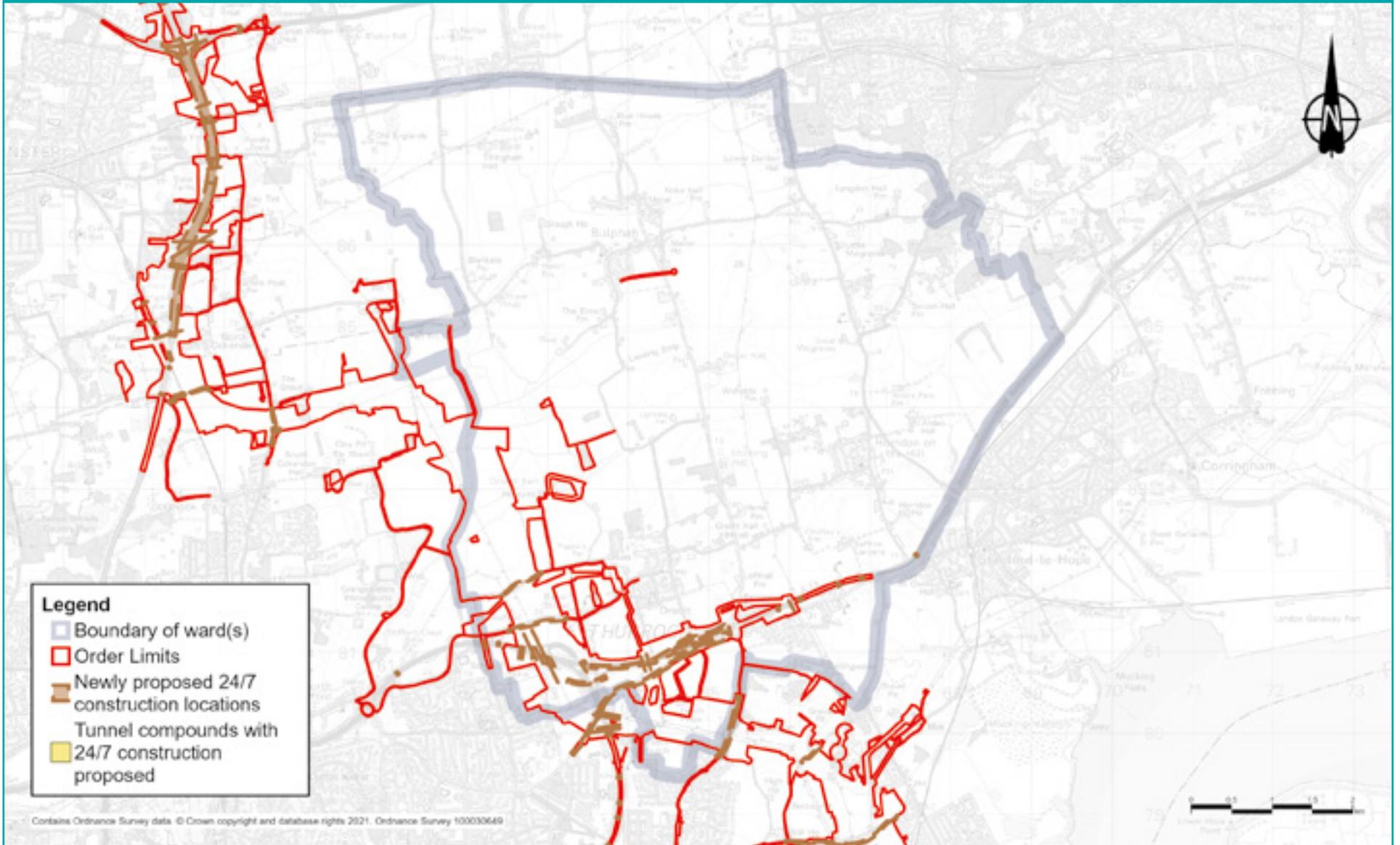
24/7 construction working

In addition to the changes to the daytime noise impacts reported in the section above, 24-hour seven-day construction working is proposed at the locations shown in figure 16.19.

These works have been identified as they may need to be undertaken at night to maintain safety and reduce disruption to road and utility networks. The duration for the works within this area is anticipated to be night-time or weekend possessions (for example, road closures) for highways and utilities works. Examples of activities that may be required during additional working hours include surface tie-ins, road resurfacing, bridge works, highway technology installations, utilities installations and erection and removal of overhead line equipment.

These works could have an impact on local communities, and we would work with the local authority to manage these impacts.

Figure 16.19: Newly proposed and tunnel 24/7 working locations in Orsett ward



Construction traffic noise impacts

Maps showing the predicted change in road traffic noise within this ward during each year of construction can be found in chapter 7 of the Construction update. Based on the currently available traffic data (which offers a representative picture of what receptors within the ward are likely to experience) during the construction period there would be negligible changes in road traffic noise (less than 1dB change in noise levels) during all construction years, except along the roads where increases in noise levels have been predicted. For more information about how we define noise impacts, for example, negligible, minor, moderate and major, see chapter 1.

Table 16.4: Construction traffic noise impacts in Orsett ward

Affected road(s)	Predicted noise impact	Construction year(s)
Baker Street	Minor increase in noise levels	2 and 3
Prince Charles Avenue	Minor increase in noise levels	2
High Road	Minor increase in noise levels	2
Rectory Road	Minor increase in noise levels	1
Conway's Road	Minor increase in noise levels	1
Hornsby Lane	Moderate increase in noise levels	4
Hornsby Lane	Major increase in noise levels	1, 2 and 5
Westbound exit from the A13 onto Dock Approach Road	Minor increase in noise levels	2

Measures to reduce construction noise and vibration

Construction noise levels would be controlled by using Best Available Techniques (BAT), with specific measures used at certain locations such as:

- installing and maintaining hoarding around the construction compounds
- installing temporary acoustic screening around the construction areas likely to generate noise
- keeping site access routes in good condition with condition assessments onsite to inspect for defects such as potholes
- turning off plant and machinery when not in use
- maintaining all vehicles and mobile plant so loose body fittings or exhausts do not rattle or vibrate
- using silenced equipment where available, in particular silenced power generators and pumps
- no music or radios would be played for entertainment outdoors onsite
- site layout would be planned to ensure that reversing is kept to a practicable minimum. Required reversing manoeuvres would be managed by a trained banksman/vehicle marshal to ensure they are conducted safely and concluded quickly to reduce the noise from vehicle reversing warnings
- non-percussive demolition techniques would be adopted where reasonably practicable to reduce noise and vibration impact
- careful consideration of the location and layout of compounds to separate noise-generating equipment from sensitive receptors, and the use of mains electricity as opposed to generators, where possible
- minimisation of construction vehicle traffic by using a selection of local suppliers along the project route, using local workforces and by minimising material transportation for earthworks construction along the project

All control measures, including those above, fall under the principles of BAT and are secured in the REAC. For more information, see the sections NV001 to NV010, which set out how we would work under the supervision of the relevant local authorities to implement noise-reduction measures where appropriate.

The CoCP sets out additional measures that would be implemented to reduce noise and vibration during the construction period.

16.7.2 Operations

Operational impacts

Within this ward, the project route and the proposed improvements to the A13 junction are located at the south western part of the ward.

Direct noise impacts from the route, the proposed A13 junction and widening of the existing A13 would be experienced in the south-western section of the ward. There would also be indirect noise impact as a result of changes in traffic flow and traffic speed on the existing road network within the ward.

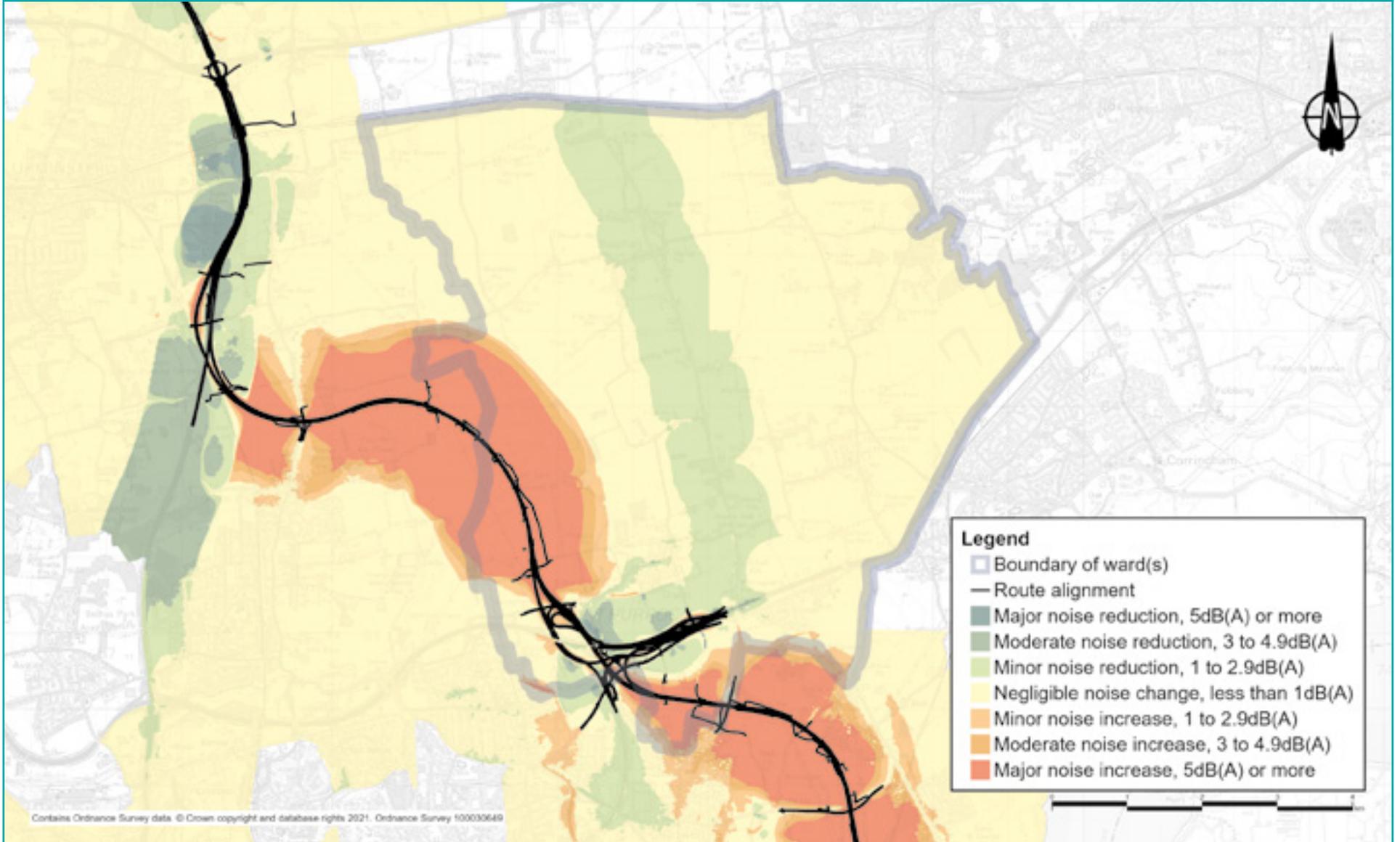
Figure 16.20 shows the predicted changes in road traffic noise in the opening year of the project. Within the ward, changes in road traffic noise at identified noise sensitive receptors are predicted to range from major decreases in noise levels of greater than 5dB to major increases in noise levels of greater than 5dB.

Measures to reduce impacts during operations

The main methods of controlling noise would be, where practicable, to design the road within landscaped features such as cuttings and bunds (walls of earth). However, where noise impacts are greatest, we would install noise barriers (typically, wooden fences) in addition to these earthworks features. Proposed noise barriers are shown in the Project description section above. The use of low-noise surfacing would also reduce the traffic noise once the road is in use.

For more information about the proposed measures to reduce operational noise, see the REAC (including references NV011 and NV013).

Figure 16.20: Noise impacts during operation in Orsett ward



16.8 Air quality

We have carried out air quality assessments for both the construction and operational phases of the project. As explained in chapter 1, some of the assessments set out here are based on earlier versions of the project. The information provided here still presents a reasonable representation of the likely effects from the proposals presented during this consultation.

Existing situation

Orsett ward is not located within an Air Quality Management Area (AQMA). AQMAs are areas that have been identified by local authorities as areas of poor air quality that require additional monitoring and controls.

16.8.1 Construction

Construction impacts

Construction activities have the potential to affect nearby air quality through the release of dust and emissions from construction equipment and traffic. The areas most likely to be affected are those close to haul roads, compounds and soil storage areas.

Properties more than 200 metres from the worksite, which is the majority of properties within this ward, are outside the area likely to be affected by construction dust or emissions from the worksite. In this ward, there are only a few properties within 200 metres of the worksite, including those in the A1089 and the A13 corridors. Air quality impacts on these properties during construction would be temporary and we would put in place measures to minimise the dust impacts (see below). The proposed measures to reduce dust and emissions are ones that have been proven to be effective when used on similar construction projects in the past. The change in air quality during the construction period would be negligible, and there would be no discernible effect on health.

Our analysis of construction traffic predicts that the impact on most roads in this ward would be negligible, although there would be a temporary minor worsening in air quality in the area around the A1089 and the A13 corridors as a result of traffic management in place from 2025 to 2027. However, there would be a temporary minor improvement in air quality along the A128 Brentwood Road as a result of a traffic management in place in 2024. More information about construction traffic impacts on air quality can be found in chapter 7 of the Construction update.

Measures to reduce air quality impacts during construction

The impact of construction machinery and traffic on air quality would be controlled through the range of good practice measures set out in the CoCP and the REAC. For example, there would be measures to suppress dust, such as damping down dry haul roads and spoil heaps, as well as the use of low-emission machinery and vehicles. We would put in place an air quality management plan to ensure the measures set out in the CoCP and the REAC would effectively monitor and control dust and exhaust emissions. The location and type of monitoring would be submitted in advance to Thurrock Council for consultation (see REAC entry AQ006).

16.8.2 Operations

Operational impacts

We have carried out an assessment of the operational impacts of the new road on air quality. The assessment area includes a 200-metre buffer within the affected road network, with this area being the most likely to experience changes to air quality as a result of the new road. More information about air quality impacts once the road is open can be found in chapter 5 of the Operations update.

There are receptors (properties or habitats that are sensitive to changes in air quality) within the ward, close to east of the A1089 and Baker Street and along the Stanford Road A1013 that are predicted to experience a minor worsening in the air quality for nitrogen dioxide (NO₂), the main traffic-related pollutant³. The highest modelled yearly average NO₂ concentration within this ward is 31.3 µg/m³ (namely, Stanford Road A1013), which is below the yearly average threshold of 40µg/m³. Our assessment is based on our opening year model, which represents a worst-case scenario, without accounting for the increase in less-polluting vehicles on our roads over time.

Furthermore, local air quality data shows an overall downward trend in NO₂ over recent years, which means that future air quality improvements at this location are likely (for example, through increased adoption of electric vehicles meaning a reduction in exhaust emissions).

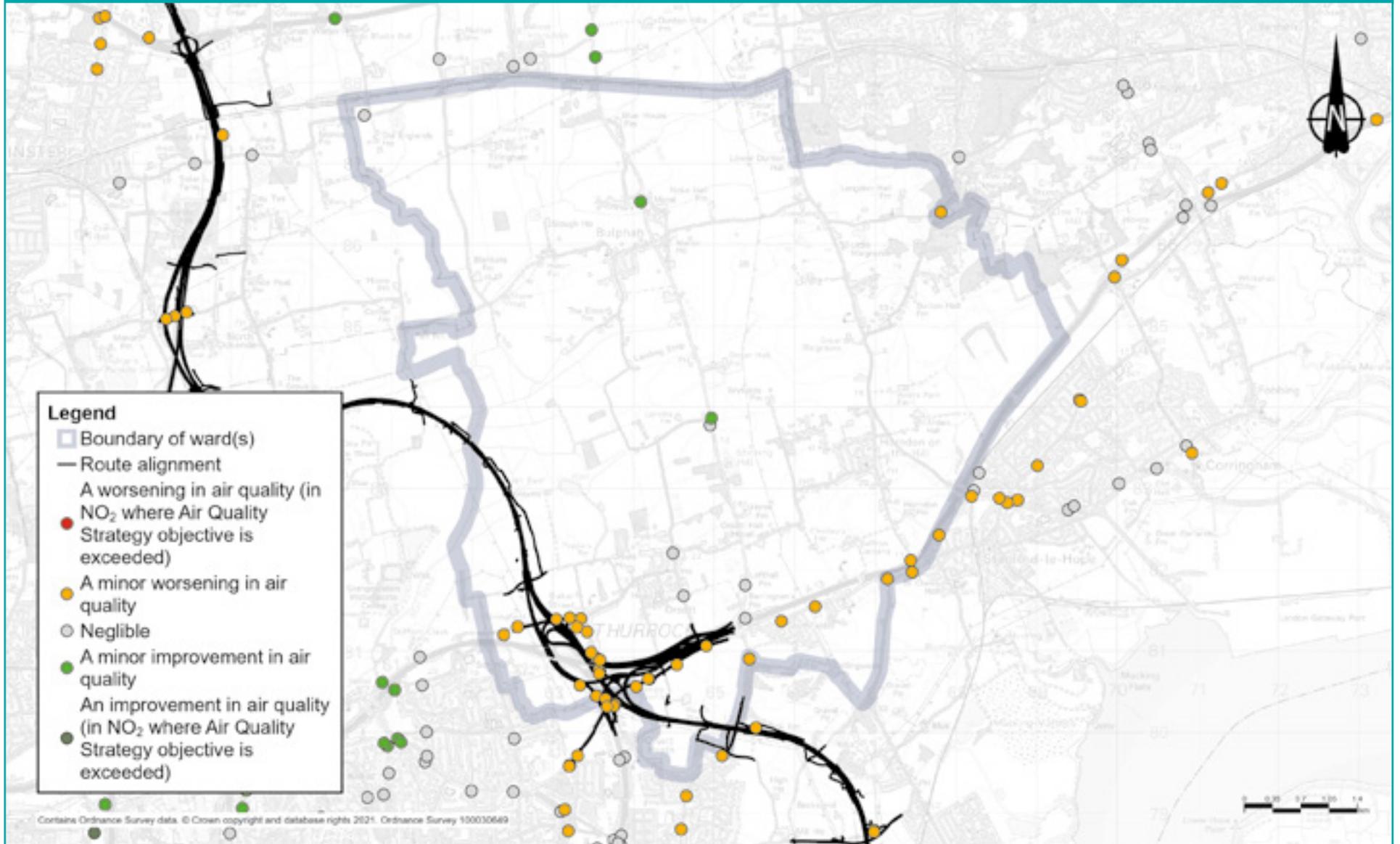
³ NO₂ levels are measured in 'micrograms per cubic metre', or µg/m³, where a microgram is one millionth of a gram.

In addition to our assessment of NO₂, our assessment predicts that PM₁₀ levels (small particles of dust, mainly from vehicle exhausts and brakes) are unlikely to exceed threshold levels across the assessed area.

Measures to reduce air quality impacts during operation

The assessed air quality impacts in this area as a result of the project would not trigger the need for additional monitoring or other mitigation measures once the road is open.

Figure 16.21: Predicted changes in NO₂ levels within Orsett ward once the new road is open



16.9 Health

Existing situation

A range of personal, social, economic and environmental factors influence our health. Different groups within the population may be more sensitive to these factors than others – for example, children, older people or those with pre-existing health conditions.

The Orsett ward is characterised by an older population (nearly a third of its residents are aged over 60 – a significantly higher proportion than for Thurrock as a whole and nationally). Compared to wards throughout Thurrock, Orsett has a low ethnically diverse population, with a significantly higher proportion of white residents compared to the England average, 94.6% and 85.4% respectively.

As a whole, Orsett has very low rates of deprivation. However, an area to the south-east of the ward is among the top 10% most deprived in England, according to the Government's Barriers to Housing and Services domain which measures barriers to housing and key local services. Economic activity rates in Orsett are relatively low, compared to Thurrock as a whole, 67.5% and 79.1% respectively. The proportion of benefit claimants are also comparatively low compared to Thurrock and wards throughout Thurrock. This reflects the high proportion of elderly people in Orsett who are at retirement age. It also has the highest proportion of privately owned households compared to Thurrock as a whole. In addition, Orsett has a significantly lower proportion of households with no car or van compared to Thurrock as a whole, 6.7% and 20.1% respectively.

Orsett residents generally report high rates of very good health, the highest of all the wards across Thurrock, and the highest proportion of residents who state that their day-to-day activities are not limited. Male and female life expectancy at birth is higher here than for Thurrock, and similar to England. Deaths from respiratory complications, heart diseases and cancer are lower than rates in Thurrock and similar to rates in England as a whole.

16.9.1 Construction

Construction impacts

Construction activities affecting Orsett ward residents are presented in the Overview section and relate to: the construction of the route and the creation and operation of the associated compounds, utility diversions, the proposed A13/A1089, a new bridge over the A13, works to the A1013, the Orsett Heath Viaduct, works to Baker Street between the A13 and A1013, the relocation of Gammon Field Way travellers' site. In addition, seven construction compounds would be situated within Orsett.

Elements of all these activities have the potential to affect human health, whether through noise associated with construction activities or construction traffic, air quality (as a result of dust emissions), severance caused by construction traffic, road or footpath closures, or through impacts on mental health and wellbeing.

There are both positive and negative potential impacts on people's health and wellbeing as a result of the construction stage. Through good communications and engagement, providing people with information about when construction works would be taking place and its impacts, then negative impacts on people's mental health and wellbeing would be reduced. Equally, some residents would see health and wellbeing benefits from improved access to work and training opportunities presented by construction activities (see the Traffic impacts section). The relationship between mental health and unemployment is bi-directional. Good mental health is a key influence on employability, finding a job and remaining in that job. Unemployment causes stress, which ultimately has long-term physiological health effects and can have negative consequences for people's mental health, including depression, anxiety and lower self-esteem.

As highlighted at the outset of this section, different groups of people within the population may be more sensitive to factors which potentially affect their health than others. Some of the changes identified as a result of construction activities may therefore only affect a small proportion of the population. Impacts may include:

- Changes in accessibility. Orsett residents are likely to be
- affected by changes in accessibility and delays to local journeys due to temporary road closures during construction and the permanent closure of Hornsby Lane
- This may be the case for people who are more dependent on public transport and have less choice about method and route travelled
- There are few properties in the Orsett ward within 200 metres from the Order Limits and are therefore unlikely to be affected by dust or emissions during construction. Those properties within 200 metres may experience air quality changes as a result of increased dust and emissions from nearby construction
- Based upon reasonable worst case assumptions, there are likely to be construction noise impacts on Nos. 1-3, Five Chimney Cottages, Stanford Road
- There are likely to be significant adverse effects for construction traffic noise predicted in Orsett – particularly along Brentwood Road, Baker Street, Church Road, Stanford Road and High Road
- Temporary adverse visual effects have been identified in Orsett

Measures to reduce impacts on health during construction

Proposed measures relating to health and wellbeing (including good practice for dust emissions, hours of working and visual screening) are described in this chapter in section 16.6 (Visual impacts), section 16.7 (Noise and vibration impacts) and section 16.8 (Air quality impacts). Further information relating to mitigation measures for these areas is set out in the CoCP, the REAC and the package of traffic management plans. The commitments in the REAC include items such as adhering to Best Practicable Means (BPM) to reduce noise impacts (see NV007 in the REAC) and dust-management good practice (see AQ005 in the REAC). For more information about these documents, see chapter 1 of the Construction update.

Engagement and effective two-way communication with communities both prior to and during construction by providing information about the programme and impact of works is important in order to reduce mental health and wellbeing impacts associated with uncertainty, stress and anxiety. The CoCP sets out proposals for community engagement, setting out how we would continue to liaise with local communities, stakeholders and any affected parties to make sure they are kept informed of our construction works, their progress and associated programme.

16.9.2 Operations

Operational impacts

The assessments undertaken for air quality show that the operation of the new road would result in deteriorations and improvements in local air quality as a result of changes in traffic flow and the works associated with the project's construction. However, those properties modelled within the Orsett ward are predicted to be well below the air quality thresholds for the key traffic related pollutants, namely nitrogen dioxide (NO₂) and particulate matter. The project is not expected to result in significant air quality changes.

The assessments undertaken for noise have shown that there would be direct adverse noise impacts as a result of the project for people in the Orsett ward. Conversely, beneficial changes in road traffic noise levels have also been identified in Orsett. In respect of visual impacts, significant adverse visual impacts in the opening year of the new road have been identified.

A proportion of residents may experience anxiety or stress associated with perceptions of environmental change as a result of a major road project. As with the construction stage, different groups in the Orsett population may be more susceptible to anxiety and stress than others.

Measures to reduce health impacts of the operational project

Mitigation measures to address noise and visual impacts have been described above. No further impacts relating to health have been identified for this ward and consequently no specific additional measures are required.

16.10 Biodiversity

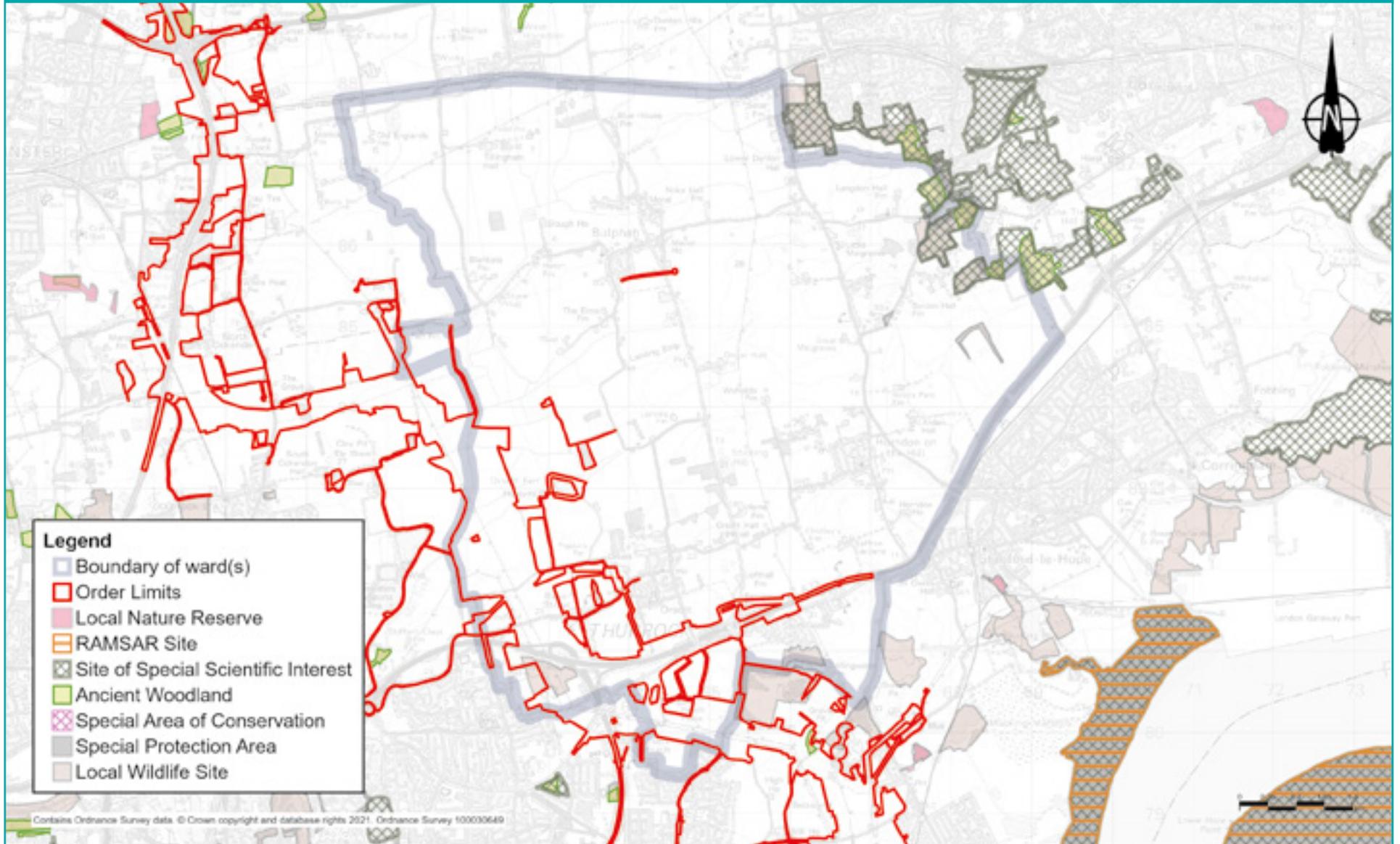
Existing situation

In Orsett, the main habitats within the Order Limits are areas of arable farmland with a large number of watercourses. There are also areas of pasture, rough grassland, scrub and woodland.

There are no designated sites in Orsett within 2km of the Order Limits. Within 500 metres of the Order Limits, the non-designated sites are Mucking Heath Local Wildlife Site (LWS) and Blackshots Nature Area LWS.

We carried out surveys across the project to set a baseline for assessment, and these identified the presence of a range of protected and notable species including bats, badgers, water vole, otter, terrestrial invertebrate species, great crested newts and reptiles.

Figure 16.22: Designated and non-designated biodiversity sites in Orsett ward



16.10.1 Construction

Construction impacts

Project construction would require temporary and permanent removal of areas of habitat from the route alignment. This habitat consists of arable fields, scrub, rough grassland and watercourses and supports a range of protected and notable species. These would be affected by construction through direct habitat loss (the loss of badger setts, including a main sett, bat roosts, water vole, reptiles, great crested newts and invertebrate habitat); fragmentation of habitat (which includes the loss of three bat commuting routes); and disturbance to the retained habitat.

Measures to reduce biodiversity impacts of construction

Vegetation clearance would take place during the winter where possible, to avoid disturbing breeding birds. Where this is not practicable, clearance would be supervised by an ecological clerk of works to ensure no nests are disturbed or destroyed. Where protected species are present, these would be moved away from the site before construction either through habitat manipulation (for example strimming to reduce the height of vegetation and displace reptiles), or translocation. Where required, works affecting protected species would be carried out under a Natural England licence. Mitigation measures would include the creation of an artificial badger sett to replace the loss of the main sett. Boxes to support bats and birds would be set up within retained habitat.

Areas of open mosaic habitat (mixture of bare ground, scrub and grassland with areas of aggregates (mixture of gravel/excavated materials) that have been landscaped to provide south-facing slopes) would be created to provide good quality habitat for a number of species, particularly invertebrates, reptiles and amphibians including great crested newts. This habitat would also be suitable for the breeding bird assemblage in this area. Ponds would be included to further diversify the habitats, and provide suitable conditions for breeding great crested newts. A large area of wetland habitat would be created adjacent to the Mardyke. This would include areas of ditch and reed bed habitat suitable for a number of species, and designed for use by water voles. These are shown in a map in the General Arrangement drawings.

To provide habitat connectivity, the project would be on a viaduct in a number of areas to allow animals to commute under the new road. In addition, a green bridge would be constructed at Green Lane which has been designed at the location of a key bat commuting route.

The impact of construction on biodiversity would be controlled through the range of good practice measures set out in the project's CoCP and the REAC. See chapter 1 of the Construction update for more information about this and the project's other control documents.

16.10.2 Operations

Operational impacts

The operation of the new road has the potential to cause mortality as species would encounter road traffic, habitat fragmentation, and noise disturbance from traffic.

Measures to reduce biodiversity impacts of the operational project

Landscape planting has been designed to provide strong links for animals to move and forage along, guiding them to safe crossing points across the new road. For example, the green bridge mentioned above and the areas under the viaduct.

Newly created habitat, including that specifically created to support animals moved from the construction area, would be managed to ensure that they provide high quality habitat to support a broad range of different plant and animal species.

The impact of operation on biodiversity would be controlled through the range of good practice measures set out in the Project's CoCP and the REAC. See chapter 1 of the Construction update for more information about this and the project's other control documents.

16.11 Built heritage

Existing situation

Conservation areas

Orsett Conservation Area is located within the ward.

Listed buildings

There are two Grade I listed buildings, two Grade II* listed buildings and 49 Grade II listed buildings within the ward. Fifteen of the Grade II listed buildings and one Grade I listed building are located within Orsett Conservation Area.

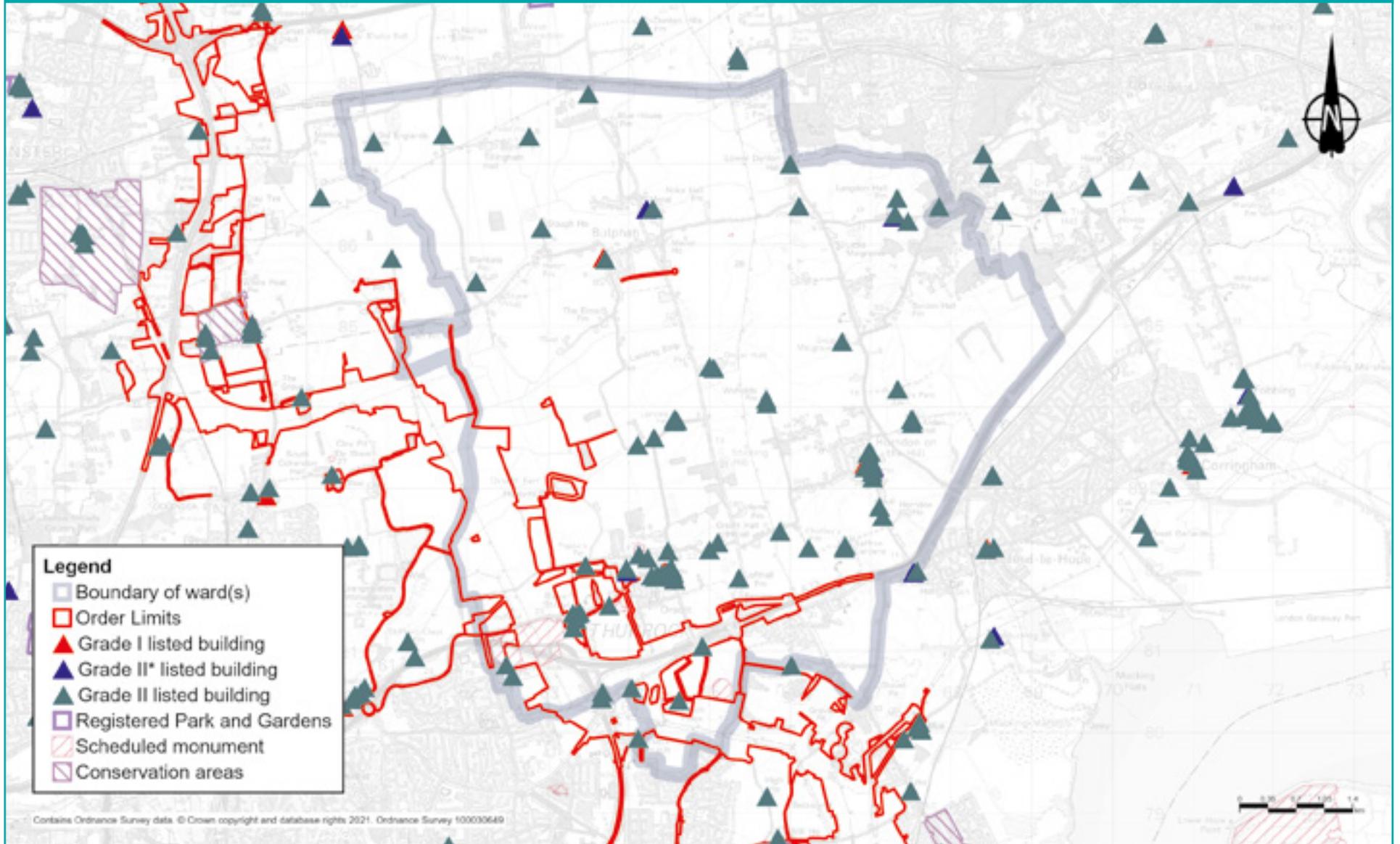
Scheduled monuments

There are five scheduled monuments within the ward.

Structures of historical relevance

The ward contains one historic structure, Orsett Post Mill Roundhouse, which is not a listed building and is of medium value.

Figure 16.23: Built heritage locations in Orsett ward



16.11.1 Construction

Construction impacts

Construction activities include the main road alignment as well as associated earthworks, landscaping and utility diversions. Construction activity would result in physical damage to listed buildings and a scheduled monument.

Listed buildings

Two Grade II listed buildings would be deconstructed and removed, these are Murrells Cottages and Thatched Cottage. This would result in considerable adverse effects to these high value assets.

Eleven Grade II listed buildings would be temporarily affected due to changes within their setting during construction. These high value assets are:

- Whitecrofts Farmhouse (barely perceivable effect)
- Greygoose Farmhouse (barely perceivable effect)
- Heath Place (barely perceivable effect)
- Slades Hold Cottages (barely perceivable effect)
- Thatched Barn at Whitfields (barely perceivable effect)
- The Wilderness (barely perceivable effect)
- Mill House (barely perceivable effect)
- Baker Street Windmill (perceivable effect)
- Whitfields (barely perceivable effect)
- Poplars Farmhouse (barely perceivable effect)

Scheduled monuments

Crop mark complex: this Orsett scheduled monument would receive physical impacts during construction and this high value asset would be considerably affected.

Two scheduled monuments of high value would receive non-physical temporary impacts due to visible and audible construction work within their setting, creating perceivable adverse effects. These are:

- Causewayed Enclosure and Anglo-Saxon cemetery 500 metres east-northeast of Heath Place
- Springfield style enclosure and Iron Age enclosures south of Hill House, Baker Street

Structures of historical relevance

As a result of visible and audible changes within its setting, Orsett Post Mill Roundhouse would receive a barely perceivable and temporary non-physical effect during construction.

Measures to reduce impacts of construction on built heritage

The design and layout of Brentwood Road Compound, Long Lane Compound, Stifford Clay Road Compound West, Stifford Clay Road Compound East and Mardyke Compound would take in to account the setting of heritage assets and avoid light glare, light spill and light pollution during night-time construction. More information can be found in the Design Principles (section S326). The Compounds would also be appropriately screened as set out in the CoCP. Dust and noise reduction measures are also relevant in protecting the setting of heritage assets. Please refer to air quality, noise and vibration and heritage asset section of the REAC measures.

The dismantling of the Grade II listed Murrells Cottages and Thatched Cottage would be mitigated by historic building recording in line with industry standards.

Mitigation in the form of archaeological excavation and recording would take place for the scheduled monument Crop mark complex, Orsett. Refer to the cultural heritage asset section of the REAC measure.

16.11.2 Operations

Operational impacts

Nine Grade II listed buildings would receive non-physical impacts such as light and noise due to changes within their setting caused by the operation of the new road. The presence of the project would increase traffic noise and at night increase the background lighting of the area. The buildings are:

- Whitecrofts Farmhouse (barely perceivable effect)
- Greygoose Farmhouse (barely perceivable effect)
- Heath Place (barely perceivable effect)
- Thatched Barn at Whitfields (barely perceivable effect)
- The Wilderness (barely perceivable effect)
- Mill House (barely perceivable effect)
- Baker Street Windmill (perceivable effect)
- Whitfields (barely perceivable effect)
- Little Wellhouse (barely perceivable effect)

Measures to reduce built heritage impacts of the operational project

Our engineering and landscape designs seeks to avoid or reduce negative impacts to heritage assets. Impacts can be physical or result from changes in their surroundings. In these circumstances the impact occurs as the asset's surroundings contribute to the value of the heritage asset. To preserve the rural and historic character of the landscape, road lighting would be minimised where it is safe and practical, and complies with relevant standards (Design Principle LST.02 and LST.03). The Brentwood Road Compound, Long Lane Compound, Stifford Clay Road Compound West, Stifford Clay Road Compound East and Mardyke Compound would be reinstated after construction to reflect existing field patterns and the surrounding landscape character as outlined under Design Principle S3.05.

16.12 Contamination

Potential sources of contamination have been identified based on land uses, from the review of desk-based sources (historical maps and environmental data). Within this ward, the following have been identified;

- Millers sand and gravel pit landfill. Historical landfill (1948-1965), commercial and household wastes. This gravel pit was excavated in approximately 1938-1955, and removed from historical maps during 1965-1975.
- Welcome Villa petrol filling station (PFS), a former PFS (approximately 1960 onwards) is now residential property. Tanks may still be present.
- Vehicle repair and maintenance garage at A13/A128 junction. This former garage and PFS from approximately 1938-1954, has buildings still present at the site.

The overall impact from these contamination sources is considered to be low, given the mitigation proposed.

16.12.1 Construction

Construction impacts

Construction activities in this ward could include utility diversions, topsoil stripping, earthworks/movements and excavations which could cause the mobilisation of contamination (if present).

There are a number of construction compounds within the ward and stockpiling of soils may occur, along with the storage of materials/chemicals.

During construction, there is the possibility for existing contamination within the ground to become mobilised. There is also a potential risk of accidental oil, cement and fuel spills from construction traffic and the storage of materials.

Some utility diversions would take place close to areas identified as potential sources of contamination. The utility trenches may create pathways for existing contamination to migrate into the wider area.

Measures to reduce contamination management impacts of construction

To reduce the impact to an acceptable level, good practice measures include appropriate storing of equipment and clear soil handling, storage of chemicals and re-use guidance. These would be used during construction to reduce the risk of spreading contamination and spillage or pollution.

To reduce the risk of accidental spillages, procedures would be in place such as designated areas to re-fuel plant, tanks would be bunded, spill kits would be available and incidents would be recorded and managed, with impacted soils being assessed and removed if necessary.

Essential mitigation such as the development of site-specific remediation, where contamination has been identified during ground investigation work, would be completed in consultation with the local authority. During the earthworks, workers would remain vigilant and any suspected contamination would be recorded and assessed accordingly via a watching brief protocol.

For the utility diversions, to reduce the risk of existing contaminant migration, the design of utility works would use ground investigation data should any site-specific remediation be required.

Contamination would be controlled through the range of good practice measures set out in the project's CoCP and the REAC. See chapter 1 of the Construction update for more information about this and the project's other control documents.

16.12.2 Operations

Measures to reduce contamination management impacts of the operational project

Verification reports would be prepared for the remediation that is undertaken in site-specific areas and this would be provided to the local authority. During the operation of the road, should an incident occur, for example, a traffic accident resulting in localised contamination, significantly affected soils would be assessed and if necessary removed to reduce the risk of contamination migrating across a wider area or entering controlled waters. For more information on these controls, see the REAC.

Chapter 17: Little Thurrock Blackshots and Little Thurrock Rectory wards

This chapter summarises the activities in Little Thurrock Blackshots and Little Thurrock Rectory wards relating to the project's construction and its operational phase (when the new road is open). It describes the construction, operation activities and impacts on these wards, which are situated in the borough of Thurrock. It also explains the proposed measures to reduce the project's impacts on local communities. For more information about the assessments in this chapter and other information available during this consultation, see chapter 1, which also includes a map showing all the wards described in this document.

The activities within and impacts on these two wards are presented together in one chapter because both wards are on the fringes of the area directly affected by the project and the impacts on the wards are similar.

Within this document, we sometimes advise where additional information can be found in other consultation documents, including the Construction update, Operations update; You said, we did; Register of Environmental Actions and Commitments (REAC); Code of Construction Practice (CoCP); Outline Traffic Management Plan for Construction (OTMPfC); and Design principles. To find out more about these documents, see chapter 1. References to these documents provide an indication as to how our proposals to reduce the project's impacts will be secured within our application for development consent.

17.1 Overview

17.1.1 About these wards

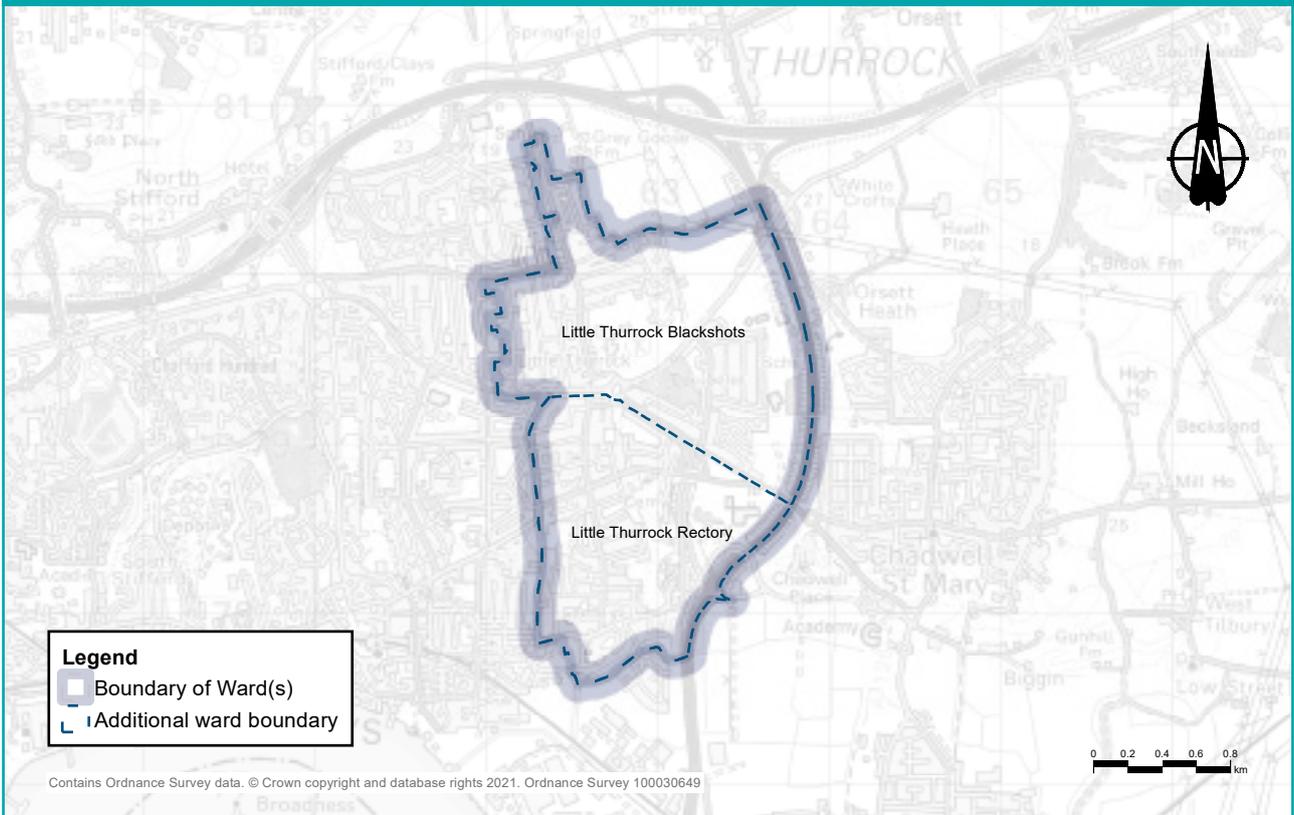
Little Thurrock Blackshots ward is located north of Little Thurrock Rectory ward, to the west of Chadwell St Mary ward, and south of Orsett ward. The ward is around 2.2km² in area and has an estimated population of 6,708¹. The ward is mostly residential with some open space at the centre of the ward including Hangman's Wood to the south-east of Stanford Road, King George's Field to the north of Stanford Road and Terrel's Heath to the west of the A1089.

Little Thurrock Rectory ward is located south of Little Thurrock Blackshots and west of Tilbury St Chads. The ward is 1.6km² in area and has an estimated population of 6,172². It is mostly residential with some open space to the east of the ward including Delafield Open Space and various playing fields. The A1089 (Dock Approach Road) runs north-south along the western ward boundary.

1 Office of National Statistics, 2018 ward-level population estimate

2 Office of National Statistics, 2018 ward-level population estimate

Figure 17.1: Little Thurrock Blackshots and Little Thurrock Rectory wards



17.1.2 Summary of impacts

Table 17.1: Summary of impacts during the project's construction and operation

Topic	Construction	Operations
<p>Traffic</p>	<p>Impact</p> <p>The most noticeable traffic impact in the ward is likely to be from the contraflow on the A1013 which will be in place for around 8 months. Further details about the impacts of the construction process on the wards can be found in the Traffic section of this chapter.</p> <p>Mitigation</p> <p>There are several mitigation measures to reduce the impact of the construction process on local residents, including avoiding using local roads where possible. For further details about the mitigation measures, see the traffic section of this chapter.</p>	<p>Impact</p> <p>There would be little change in predicted traffic in these two wards, except on the route from the Orsett Cock junction along the A1013 Stanford Road southbound, at Daneholes Roundabout and Wood View and the Old Dock Approach Road.</p> <p>Mitigation</p> <p>Regular monitoring would take place once the road is open. Further details about the mitigation measures for Little Thurrock Blackshots and Little Thurrock Rectory wards can be found in the traffic section of this chapter.</p>
<p>Public transport</p>	<p>Buses</p> <p>Due to additional traffic on the A1089, journey times for the Z2 and Z4 buses may increase. When traffic management is place on other roads, there may be delays to buses using those routes.</p> <p>Rail</p> <p>During construction, there may be some increases in journey times to Tilbury Town and East Tilbury stations as a result of increased traffic through the area and traffic management on local roads. There would be some night-time closures of the Tilbury Loop railway line but these are not expected to affect services.</p>	<p>Buses</p> <p>There are changes predicted to the 5A bus from Pitsea to Grays, the 73 from Tilbury through Grays to Lakeside Shopping Centre, and the 83 from Chadwell St Mary through Grays to Lakeside.</p> <p>Rail</p> <p>There are no discernible changes in access times to Grays station or changes in rail services expected once the road opens. It would, however, become easier to access Ebbsfleet International Station.</p>

Topic	Construction	Operations
<p>Footpaths, bridleways and cycle routes</p>	<p>Impact</p> <p>One footpath, one bridleway and one pedestrian-cycle track would be impacted during the construction of the project. Closures range from less than a week to five years to allow for road realignment, utilities works and construction activities.</p> <p>Mitigation</p> <p>Where routes need to be closed to allow for construction of the project, closures would be kept to a minimum to reduce disruption.</p>	<p>Impacts</p> <p>The footpath, bridleway and pedestrian-cycle track affected by the project during construction would be shortened or permanently diverted and link up with the existing public right of way network in this ward when the road is open. One path would be shortened near the A13.</p> <p>Mitigation</p> <p>Realignments of existing paths would be as close as is practical to the current alignments, while the new routes would link up to the local public right of way network.</p>
<p>Visual</p>	<p>Impacts</p> <p>Views towards construction activities from residential properties on the north-east edge of Little Thurrock Blackshots would include the construction of the proposed A13/A1089 junction, viewed beyond the Utility Logistics Hub, construction compounds and diversion of two overhead power lines, which would feature noticeably in view from Thurrock Rugby Football Club. Similar views would be seen from the footpath in this area.</p> <p>Views towards construction activities are screened by mature roadside vegetation from Little Thurrock Rectory, so there would be no visual effects from the project.</p> <p>Mitigation</p> <p>The visual impact of the project would be controlled through a range of good practice measures set out in the CoCP and REAC.</p>	<p>Impacts</p> <p>Elevated structures of the Lower Thames Crossing/A13 junction and associated traffic, gantries and lighting would be visible. The diverted section of overhead lines would move slightly closer to residential properties and the replacement of pylons would be more visibly intrusive.</p> <p>Mitigation</p> <p>Elevated structures would be softened by false cuttings on the south side of the proposed A13/A1089 junction, along with woodland planting. This would screen views of the new road and traffic, and help integrate it into the surrounding landscape.</p>

Topic	Construction	Operations
<p>Noise and vibration</p>	<p>Impacts</p> <p>The construction activity associated with the A13/A1089 junction upgrade, main alignment and utility works is expected to create noise and vibration in this ward. There would also be 24-hour, seven-day construction working in some locations. There would be negligible changes in noise from road traffic for most roads in the ward during the construction period, except for Dock Approach Road and Stifford Clays Road, where minor increases in road traffic noise are predicted.</p> <p>Mitigation</p> <p>Construction noise levels would be controlled through the mitigation measures set out in the REAC. There are also measures set out in the CoCP.</p>	<p>Impacts</p> <p>Once the road is completed, there would be direct noise impacts from both the road and the proposed improvements to Stanford Road and Dock Approach Road in the north-eastern section of Little Thurrock Blackshots. As Little Thurrock Rectory is approximately 1.5km west of the new road, it would not be audible from this ward. In both wards, there would be an indirect noise impact from the changes in traffic flow and speed on the existing road network.</p> <p>Mitigation</p> <p>Low-noise road surfaces would be installed on all new and affected resurfaced roads, plus noise barriers would be fitted.</p>

Topic	Construction	Operations
<p>Air quality</p>	<p>Impacts</p> <p>There is likely to be dust and emissions from construction equipment and traffic during the construction phase.</p> <p>Our analysis of construction traffic predicts that the impact on most roads in these wards would be negligible, although there would be a temporary minor worsening in air quality in the area around the A1089 and along the A126 Marshford Road, Chadwell Road and the B149 Wood View. Also, there would be a temporary minor improvement in air quality in the area around Stanford Road, Lodge Lane and Southend Road.</p> <p>Mitigation</p> <p>The contractor would follow the good practice construction measures presented in the CoCP and REAC to minimise the dust. Construction vehicles would need to comply with emission standards. An air quality management plan would be designed in consultation with the relevant local authorities. The plan would include details of monitoring that would ensure measures are effectively controlling dust and exhaust emissions.</p>	<p>Impacts</p> <p>There would be no exceedance of NO₂ and PM₁₀.</p> <p>Mitigation</p> <p>No mitigation is required.</p>

Topic	Construction	Operations
<p>Health</p>	<p>Impacts</p> <p>The construction phase of the project would present opportunities to access work and training.</p> <p>There are likely to be changes in the area that may result in negative impacts on health, including mental health and wellbeing. There is also likely to be perceivable changes in noise levels from the construction of the new road, utility works and construction traffic.</p> <p>There would also be temporary visual impacts in Little Thurrock Blackshots, as set out earlier in this table, and changes in accessibility.</p> <p>Mitigation</p> <p>The negative impacts would be mitigated through the good practice construction measures, presented in the CoCP and REAC, relating to dust emissions, working hours, noise and visual screening, traffic management measures and community engagement. This includes establishing Community Liaison Groups.</p>	<p>Impacts</p> <p>The new road would improve access to work and training, open spaces, and local resources and amenities.</p> <p>Some residents may experience impacts on mental health and wellbeing (such as anxiety around perceived changes to air quality, or from changes to noise levels).</p> <p>There would be no adverse impacts from noise, air quality or visual changes in Little Thurrock Rectory.</p> <p>Mitigation</p> <p>No essential mitigation is required for health other than those measures described in the Noise mitigation and Visual sections.</p>

Topic	Construction	Operations
<p>Biodiversity</p>	<p>Impacts</p> <p>The construction of the road would involve the removal of habitat areas, both temporarily and permanently. The removal of hedgerows would result in the loss of badger setts and reptile habitat.</p> <p>Mitigation</p> <p>Vegetation clearance would be carried out in winter to avoid impacting breeding birds. Protected species would be relocated, under a Natural England licence. Boxes to support bats and birds would be erected. Habitat lost temporarily for construction works would be reinstated.</p>	<p>Impacts</p> <p>There is the potential to cause mortality of species by encountering road traffic as well as habitat fragmentation and disturbance from traffic.</p> <p>Mitigation</p> <p>Newly created areas of habitat would be managed to ensure they provide high quality habitat to support a broad range of plant and animal species. Impacts would also be managed through the range of good practice measures set out in the CoCP and REAC.</p>
<p>Built heritage</p>	<p>Impacts</p> <p>None identified.</p> <p>Mitigation</p> <p>No mitigation would be required.</p>	<p>Impacts</p> <p>None identified.</p> <p>Mitigation</p> <p>No mitigation would be required.</p>
<p>Contamination</p>	<p>Impacts</p> <p>None identified.</p> <p>Mitigation</p> <p>No mitigation would be required.</p>	<p>Impacts</p> <p>None identified.</p> <p>Mitigation</p> <p>During the operation of the road, should an incident occur, for example, a traffic accident resulting in localised contamination, significantly affected soils would be assessed and if necessary removed to reduce the risk of contamination migrating across a wider area or entering controlled waters. For more information on these controls, see the REAC.</p>

17.2 Project description

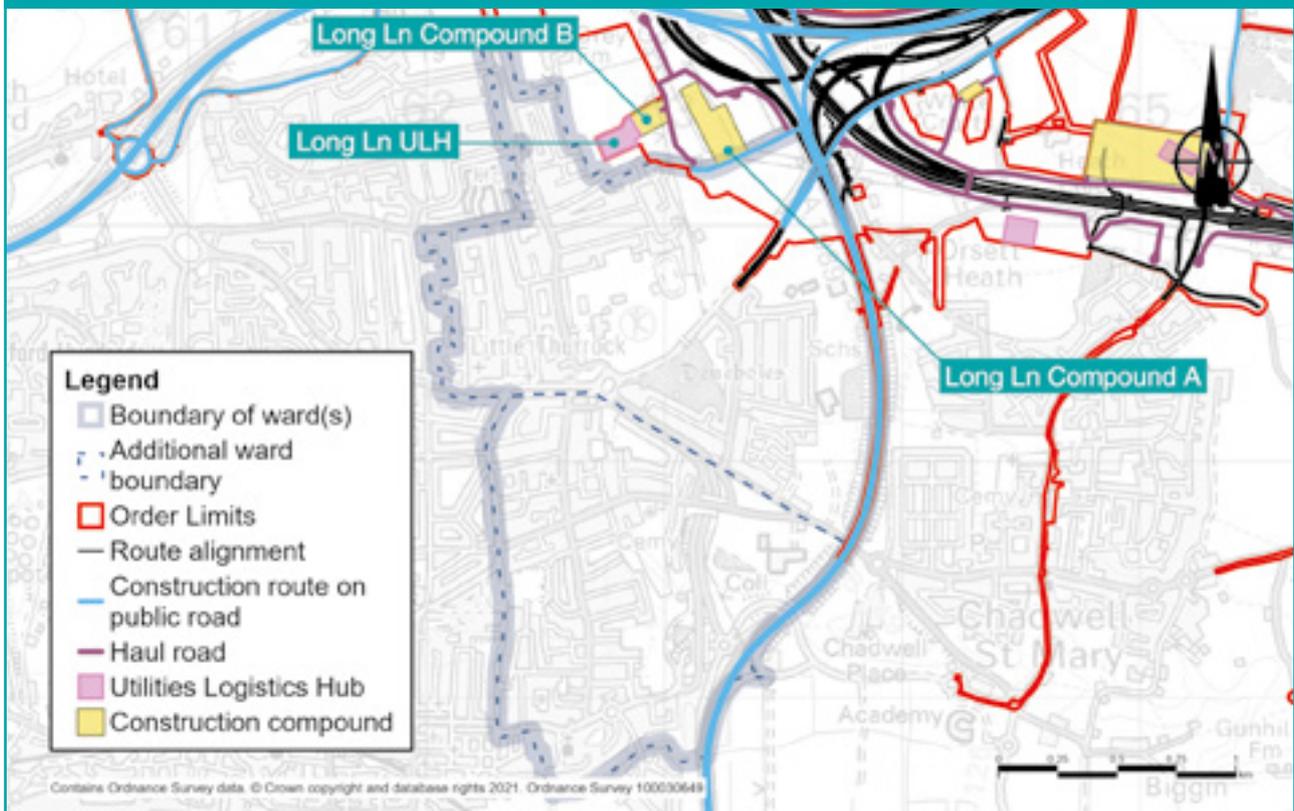
17.2.1 Construction

Construction activities

More information about how the area would look during construction, including visualisations, can be found in the Construction update. You can also view a video fly-through of the project during construction by visiting our consultation website.

Construction works would take place on the north-eastern side of Little Thurrock Blackshots ward, with works on the proposed A13/A1089 junction, works along the A1089, and the diversion of overhead power lines south of Long Lane. Substantial works to realign utilities under the A1089 would be required, as would works to divert utilities along the A1013. There would be part of a construction haul road in the north-east corner of Little Thurrock Blackshots ward, which would be used to transport equipment and materials around the worksite away from public roads.

Figure 17.2: Main construction areas in Little Thurrock Blackshots and Little Thurrock Rectory wards



Construction compounds and Utility Logistics Hubs

Construction compounds are fenced-off areas, accessible to construction traffic, which provide the facilities for our project to be built efficiently. For example, compounds would provide parking, storage for machinery and materials, offices, welfare facilities, refuelling, and vehicle and wheel-washing facilities to make sure vehicles leaving the compound do not dirty local roads

There are no construction compounds or Utility Logistics Hubs (ULHs) in these wards. For information about the Long Lane A and B compounds and the Long Lane ULH, which are located just outside Little Thurrock Blackshots ward on the north side of Long Lane, see chapter 16 about Orsett ward.

Construction related traffic

There will be additional traffic on the A1089 going to the Northern tunnel entrance compound, the Station Road compound.

Construction routes on public roads

The A1089 and part of the A1013 Stanford Road would be designated construction routes. This means they would be used by construction traffic, including HGVs and workforce vehicles. The roads would remain open to the public during the construction period, except if specific traffic management measures are needed.

Construction schedule

Construction of the whole project is scheduled to last for around six years from 2024 to 2029/30. To deliver our construction programme efficiently, we would divide activities into coordinated packages of work. Maps and programmes for the packages in this ward can be found in chapter 6 of the Construction update.

Construction working hours

Most construction activities in this ward would take place during core hours, from 7am to 7pm on weekdays, and 7am to 4pm on Saturdays. However, there would be times when our working hours would need to be extended – for example, when realigning overhead power lines, diverting utilities under existing roads, and connecting new roads to existing ones. These works would be done when the road is less busy for the safety of roads users and construction workers. Working outside core hours would also benefit road users by reducing the need for traffic management measures during busy times. More information about working hours can be found in the Noise and vibration section and in the CoCP.

Traffic management

The main traffic management measures for Little Thurrock Blackshots and Little Thurrock Rectory wards are below.

All traffic management measures are based on an indicative construction programme, which would be finalised by the appointed contractor. The contractor's final traffic management plans will be subject to final approval by the Secretary of State for Transport, following consultation with the local highways authority.

Table 17.2: Main traffic management measures in Little Thurrock Blackshots and Little Thurrock Rectory wards

Road(s) affected	Traffic management	Purpose	Duration
A1013	Lane reduction and traffic lights	Works on the A1013 and utility diversions	8 months between June 2025 and March 2026
A1013	Closure	Works on the A1013 including utility diversions	Occasional weekend or night closures for specific works during the construction period
A1089 northbound	Closure	Works to divert the overhead power line	Occasional weekend or night closures for specific works during the construction period
Long Lane	Closure	Works including utility connections to Long Lane A and B Compounds and overhead power line realignment	Occasional weekend or night closures for specific works during the construction period
A1013	Closure	Connecting new roads to existing roads	Occasional weekend or night closures for specific works during the construction period
A13 westbound to 1089 southbound	Closure	Switchover to permanent alignment	One weekend in August 2025

Measures required across the project would include narrow lanes, reduced speed limits, lane closures and temporary traffic lights. We have sought to minimise traffic management measures wherever practical. However, they would be necessary in some places to allow construction traffic and local communities to travel safely, while providing construction workers with sufficient space to operate. An overview of the traffic management required across the project can be found in the Outline Traffic Management Plan for Construction. All traffic management measures are based on an indicative construction programme, which would be finalised by the appointed contractor. The contractor's final traffic management plans will be subject to final approval by the Secretary of State for Transport, following consultation with the local highways authority.

17.2.2 Operations

The completed project

For more information about the completed project, see the Operations update, as well as the figures in Map book 1: General Arrangements. Below, we set out the main features of the new road in Little Thurrock Blackshots and Little Thurrock Rectory wards once the new road is open:

- The A1013 Stanford Road would have a cycle route diversion parallel to the southbound carriageway connecting to Little Thurrock and Grays.
- Overhead power lines would follow a new route through the north-east of Little Thurrock over the A1013 Stanford Road.
- Several public rights of way would be rerouted permanently. For more information, please see the Footpaths, bridleways and cycle routes section.

Changes to the project since our design refinement consultation

As part of our ongoing design development and following discussions with utility companies, we have made a change to the project and Order Limits (the area of land required to construct and operate the project, formerly known as the development boundary) in these wards since our design refinement consultation in July 2020.

- Additional land would be needed around the A13/A1089 junction to allow permanent access to diverted utilities for maintenance and operation.

More information about our proposed changes, including updated maps of the Order Limits, can be found in chapter 3 of the Operations update.

Impacts on open space and common land

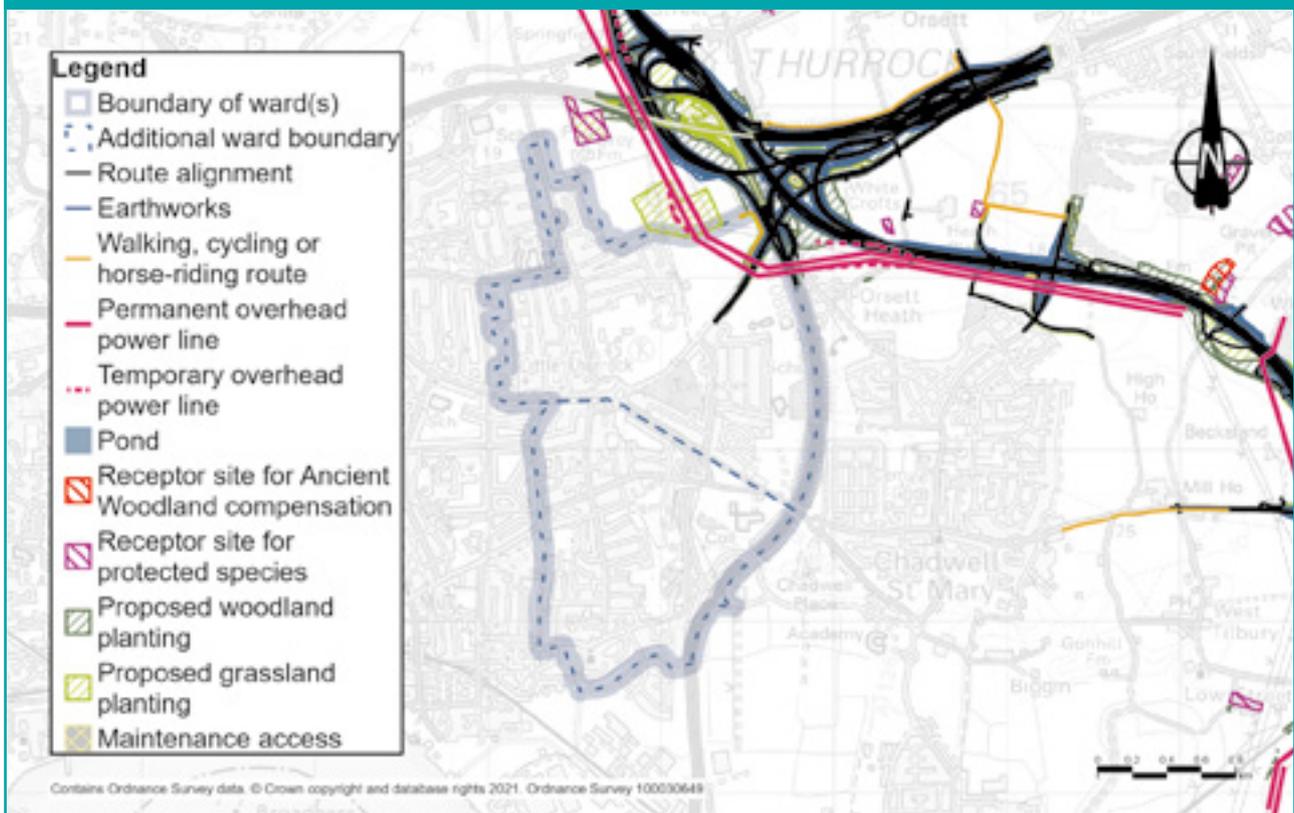
Within Little Thurrock Blackshots and Little Thurrock Rectory wards, there are no changes to our proposals to remove or replace open space land. More information about our proposals for compensating for impacts on open space land (which includes special category and recreational land), including proposals we have consulted on previously, can be found in chapter 3 of our Operations update.

Impacts on private recreational land

Within Little Thurrock Blackshots and Little Thurrock Rectory wards we propose to use a small area to the north-east of the Thurrock Rugby Football Club to divert overhead electricity transmission lines. The works are not expected to cause any impact on the use of the rugby club. Permanent rights would be acquired over the area affected for the operation and maintenance of those utilities.

More information about the project's impacts on private recreational land can be found in chapter 3 of the Operations update.

Figure 17.3: The main features of the completed project in Little Thurrock Blackshots and Little Thurrock Rectory wards



17.3 Traffic

We carried out traffic assessments to understand how construction and operation would affect nearby roads, compared with the situation if the project was not implemented. For more information, see chapter 4 of the Operations update.

17.3.1 Construction

Construction impacts

Information about construction activities in these wards, including construction routes on public roads, can be found in the project description section earlier, with table 17.2 setting out the proposed construction traffic management.

The most noticeable traffic impact in the ward is likely to be from the contraflow on the A1013 which will be in place for around 8 months.

Measures to reduce construction traffic impacts

Our approach to construction has been refined after further investigations and feedback. A summary of the proposed measures to reduce the volume of construction materials transported in and out by road can be found in chapter 2 of the Construction update. To reduce the construction traffic impacts in Little Thurrock Blackshots and Little Thurrock Rectory, we would carry out measures such as the following:

- Minimising use of the local road network as far as practical through construction of temporary offline haul routes directly from the strategic road network.
- Our proposals allow for re-use of excavated materials, and would substantially reduce the need to dispose of excavated material via the road network, thereby reducing the number of HGV movements from the public road network during the construction phase.
- Where practical, designing new bridge structures so that they can be built offline. This would avoid closing local roads for extended periods. Where this is not possible and space is available to do so, the existing road would be temporarily realigned to enable the construction of new bridges.
- Banning HGVs associated with the road's construction from using some local roads where possible, following discussion with key stakeholders.
- Stockpiling material within the Order Limits to allow material to be managed on site rather than off site, reducing the number of HGVs journeys needed.

17.3.2 Operations

Operational traffic impacts

We have carried out traffic modelling in the wards to predict changes in traffic on the roads, including those within or on the boundary with these wards for the first year of the project's operation.

Figures 17.4, 17.6 and 17.8 below show the predicted changes in traffic in the morning peak (7am to 8am), interpeak (an average hour between 9am and 3pm) and evening peak (5pm to 6pm) measured in Passenger Car Units (PCUs per hour), where 1 PCU is equivalent to a car, and 2.5 PCUs is equivalent to an HGV. Figures 17.5, 17.7 and 17.9 show the predicted percentage changes in traffic flow during the morning, interpeak and evening peak. For information about how we assessed operational traffic impacts, see chapter 1. For more information about how we carried out our traffic modelling, see chapter 4 of the Operations update.

The largest change in traffic flows in the ward would occur on the northern section of the A1089, between the Marshfoot roundabout and the A13, on the western boundary of the ward. In the northbound direction, the traffic flows would increase by between 500 and 1,000 PCUs an hour in the morning and evening peak hour, and by between 250 and 500 PCUs an hour in an interpeak hour. This represents an increase of over 40% in the morning peak hour and between 20% and 40% in the interpeak and evening peak hour. The change would be a result of some traffic from the Stifford Clays and Grays area changing their routes, for example by driving eastwards to use the A1089 rather than joining the A13 at the Stifford interchange.

There would be a decrease in traffic flows southbound on the A1089, between the A13 and Marshfoot roundabout. This would be a reduction of between 250 and 500 PCUs (between 10% and 20%) in the morning peak hour, and between 50 and 250 PCUs (a decrease of under 10%) in the interpeak and evening peak, compared with the predicted flow on the A1089 if the road was not built.

At the Daneholes roundabout, traffic flows on some roads coming into the junction would increase, but on other links they would reduce. On the A1013 Stanford Road, the traffic flows northbound would fall by between 50 and 250 PCUs in the morning peak hour, a drop of between 10% and 20% in each peak hour. Southbound, coming from the Orsett Cock roundabout, would see a rise of between 50 and 250 PCUs in the morning peak hour, the interpeak hours and the evening peak hour. This is an increase of between 20% and 40% in each of the modelled time periods.

On Woodview, which runs from Daneholes roundabout to the Marshfoot interchange, the traffic flows would decrease westbound (towards Daneholes roundabout) by between 50 and 250 PCUs in each modelled time period. This is a reduction of between 20% and 40% in the morning and evening peak hours and between 10% and 20% in an average interpeak hour. Eastbound traffic flows (towards the Marshfoot interchange) would increase by between 250 and 500 PCUs in the morning peak hour, a rise of over 40%. In an average interpeak hour and the evening peak hour the increase would be between 50 and 250 PCUs an hour – a rise of between 20% and 40%.

On Lodge Lane, the traffic flows would decrease in both directions. Westbound the reduction would be between 50 and 250 PCUs an hour in each modelled time period – a fall of between 10% and 20%. Eastbound traffic flows would decrease in the interpeak period and the evening peak hour, by between 50 and 250 PCUS – a reduction of between 10% and 20%.

On Blackshots Lane, there would be a reduction in traffic flows westbound in the morning and evening peak hours of between 50 and 250 PCUs an hour – a decrease of between 20% and 40%.

At the Marshfoot interchange, the traffic flows on the A126 Marshfoot Road northbound (towards Chadwell St Mary) would increase by between 50 and 250 PCUs (between 10% and 20%) in the morning peak hour and an average interpeak hour. Eastbound traffic flows would increase by between 250 and 500 PCUS in the morning peak hour – a rise of over 40%. In the interpeak period the average increase in traffic flows per hour would be between 50 and 250 PCUs an hour – a rise of between 20% and 40%. In the evening peak hour, the rise would be between 50 and 250 PCUs – an increase of over 40%.

On the northbound slip road onto the A1089, traffic flows would increase by over 500 PCUs an hour in the morning and evening peak hours – a rise of over 40%. In the interpeak period, the average increase in traffic flows would be between 250 and 500 PCUs an hour – also a rise of over 40%.

On the northbound slip road from the A1089 to the Marshfoot interchange, the traffic flows would decrease by between 50 and 250 PCUs in the morning peak hour. This is a fall of between 20% and 40%.

Dock Road runs west-east across Little Thurrock Rectory ward. At its junction with the Marshfoot interchange there would be a drop in traffic flows westbound of between 50 and 250 PCUs in the morning peak hour. This is a decrease of between 10% and 20%. Eastbound traffic flows would increase by between 50 and 250 PCUs in each modelled time period – a rise of between 10% and 20%.

The Old Dock Approach Road runs from the Marshfoot interchange towards the Deneholes roundabout. Northbound the change in traffic flows would be less than 50 PCUs an hour. Southbound traffic flows (towards the Marshfoot interchange) would increase by between 250 and 500 PCUs an hour – a rise of over 40% in the morning and evening peak hours. In an average interpeak hour, the increase would be between 50 and 250 PCUs an hour. This is also a rise of over 40% compared to the level of traffic without the new road.

The A1013 Southend Road lies on the western boundary of the Little Thurrock Rectory, the traffic flows would decrease northbound by between 50 and 250 PCUs an hour, a fall of between 10% and 20% in the evening peak hour. Southbound, the reduction in traffic occurs in the morning peak hour – a decrease of between 50 and 250 PCUs an hour (between 10% and 20%) in the evening peak hour.

Long Lane is in the west of the Little Thurrock Blackshots ward. Here traffic flows would increase westbound in the morning and evening peak hours by between 50 and 250 PCUs, a rise of between 20% and 40%.

Figure 17.4: Predicted change in traffic flows (PCUs) with the project during the morning peak in 2029/30

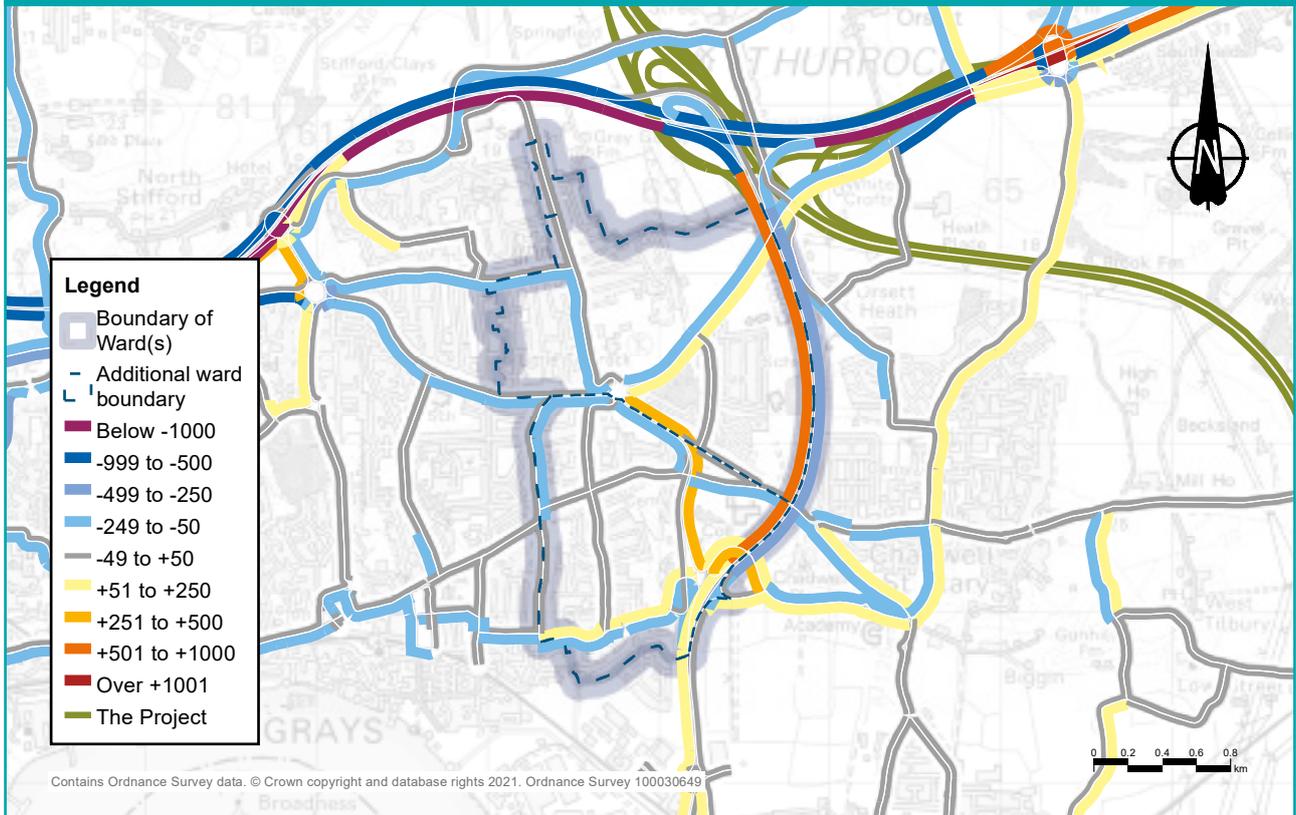


Figure 17.5: Predicted percentage change in traffic flows with the project during the morning peak in 2029/30

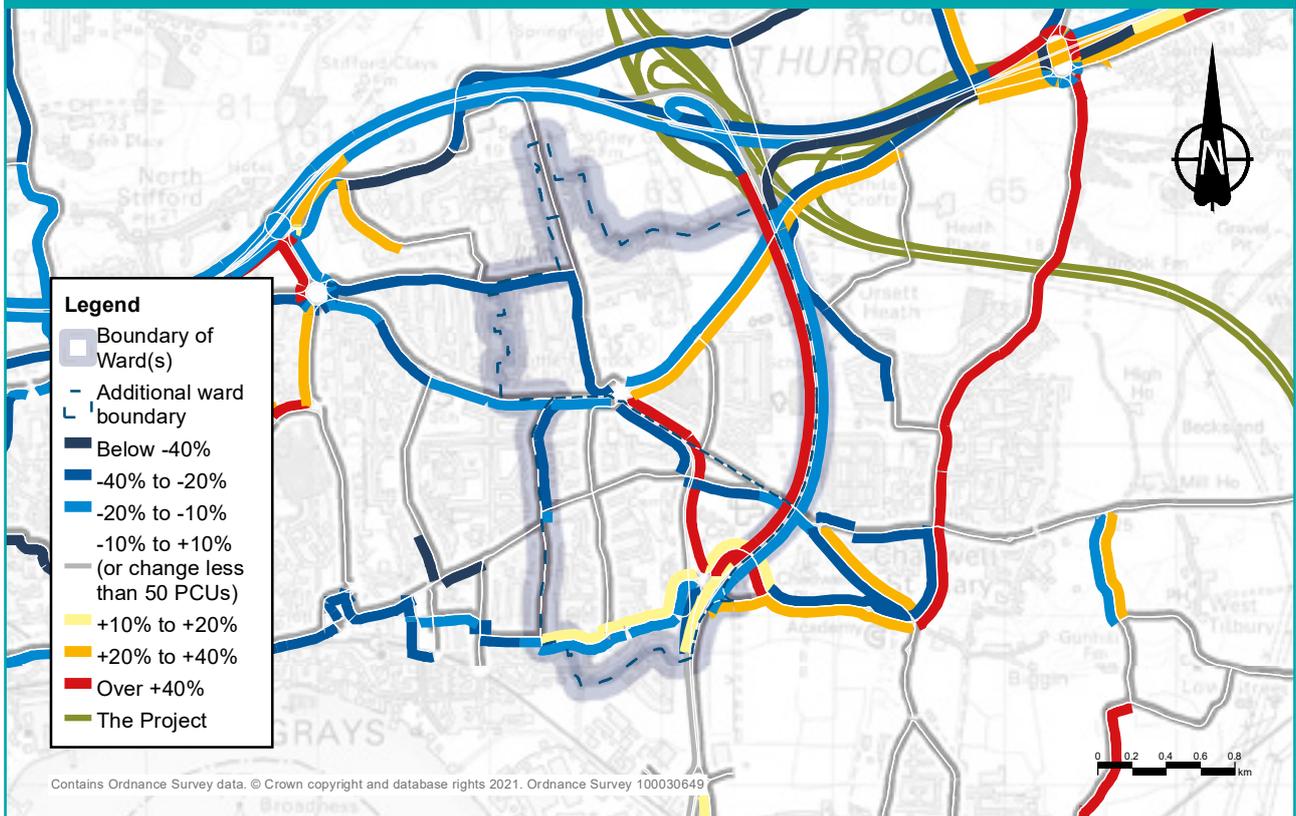


Figure 17.6: Predicted change in traffic flows (PCUs) with the project during the interpeak in 2029/30

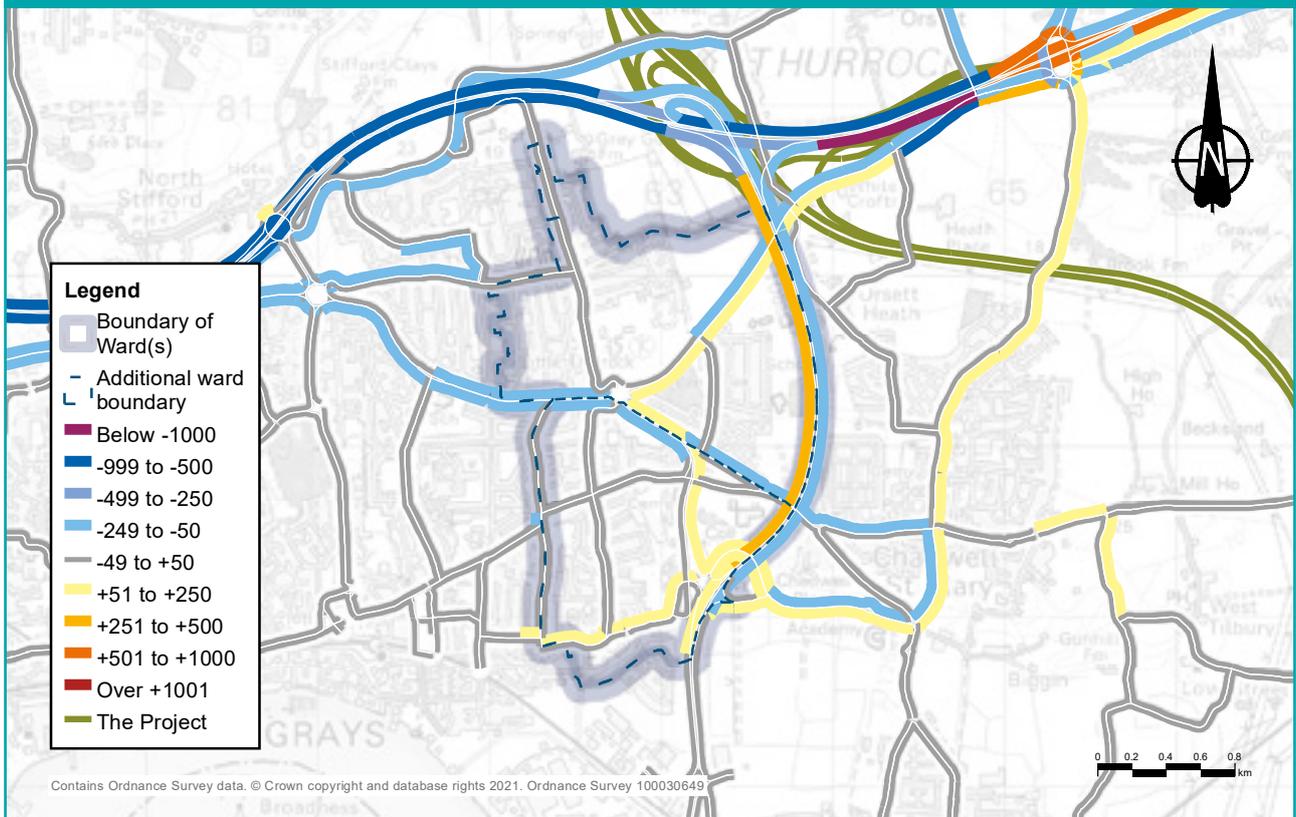


Figure 17.7: Predicted percentage change in traffic flows with the project during the interpeak in 2029/30

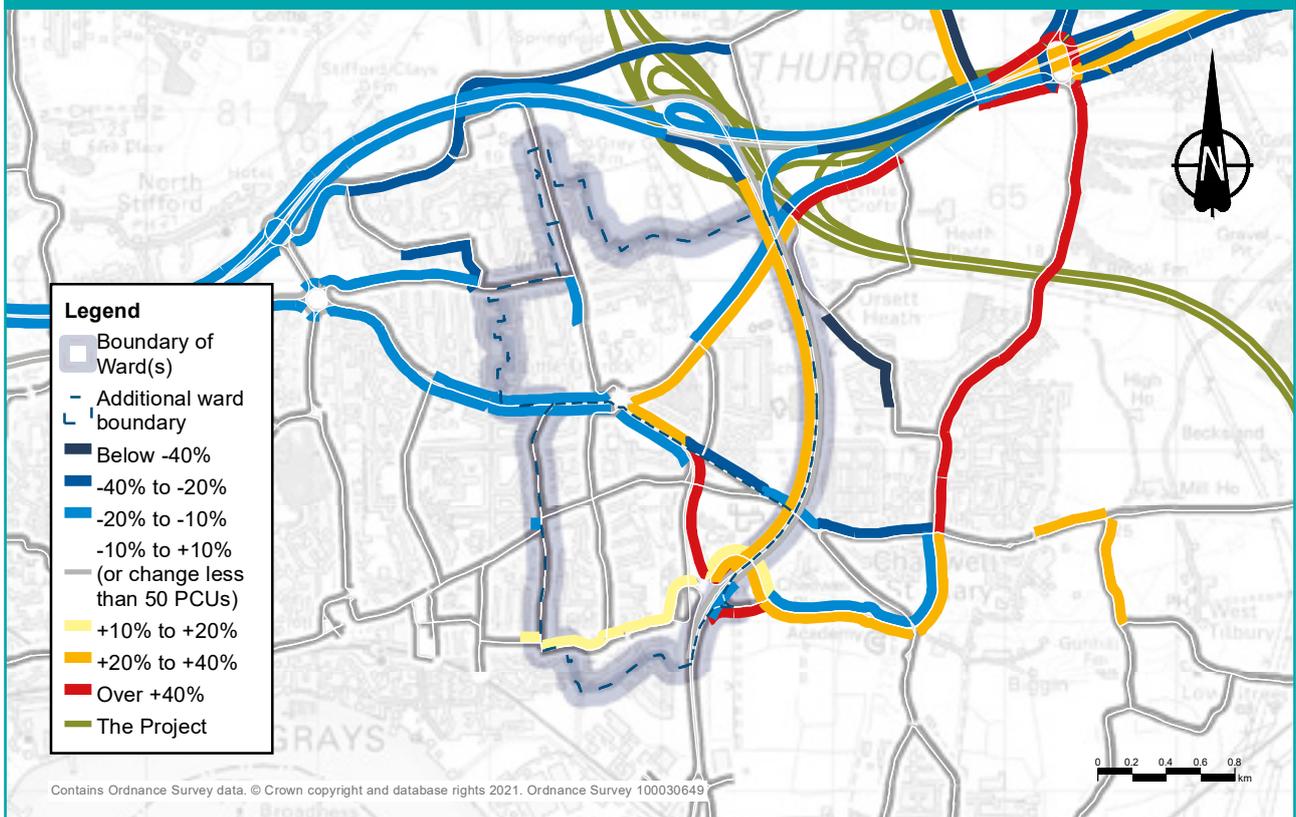


Figure 17.8: Predicted change in traffic flows (PCUs) with the project during the evening peak in 2029/30

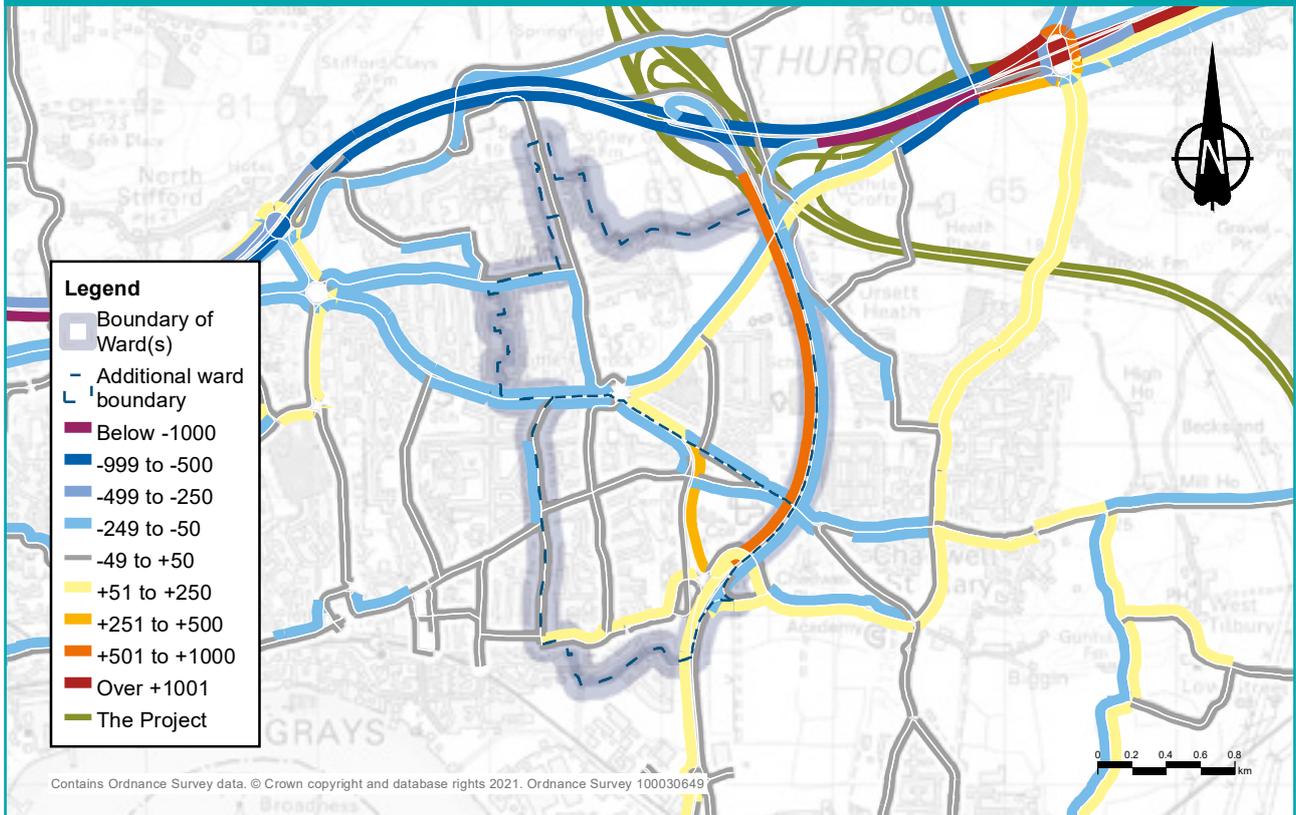
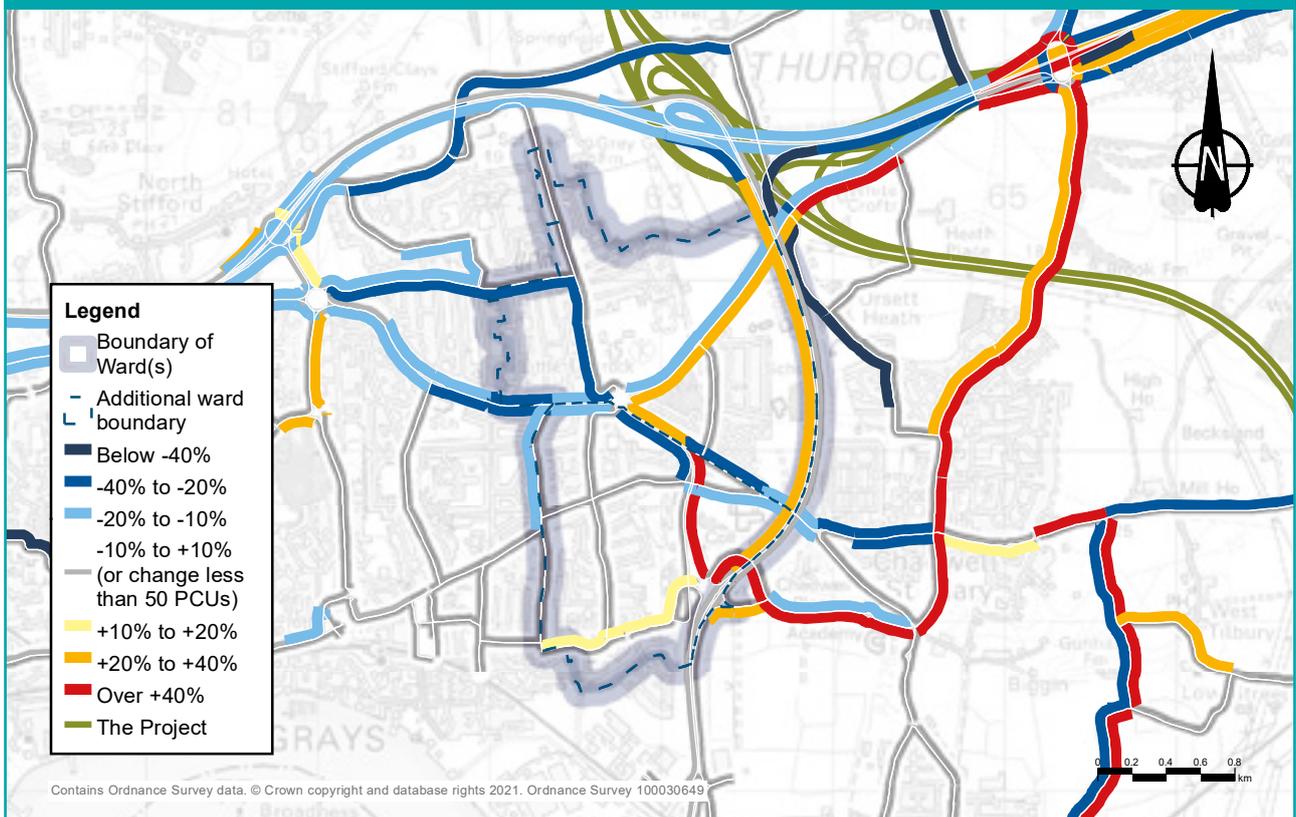


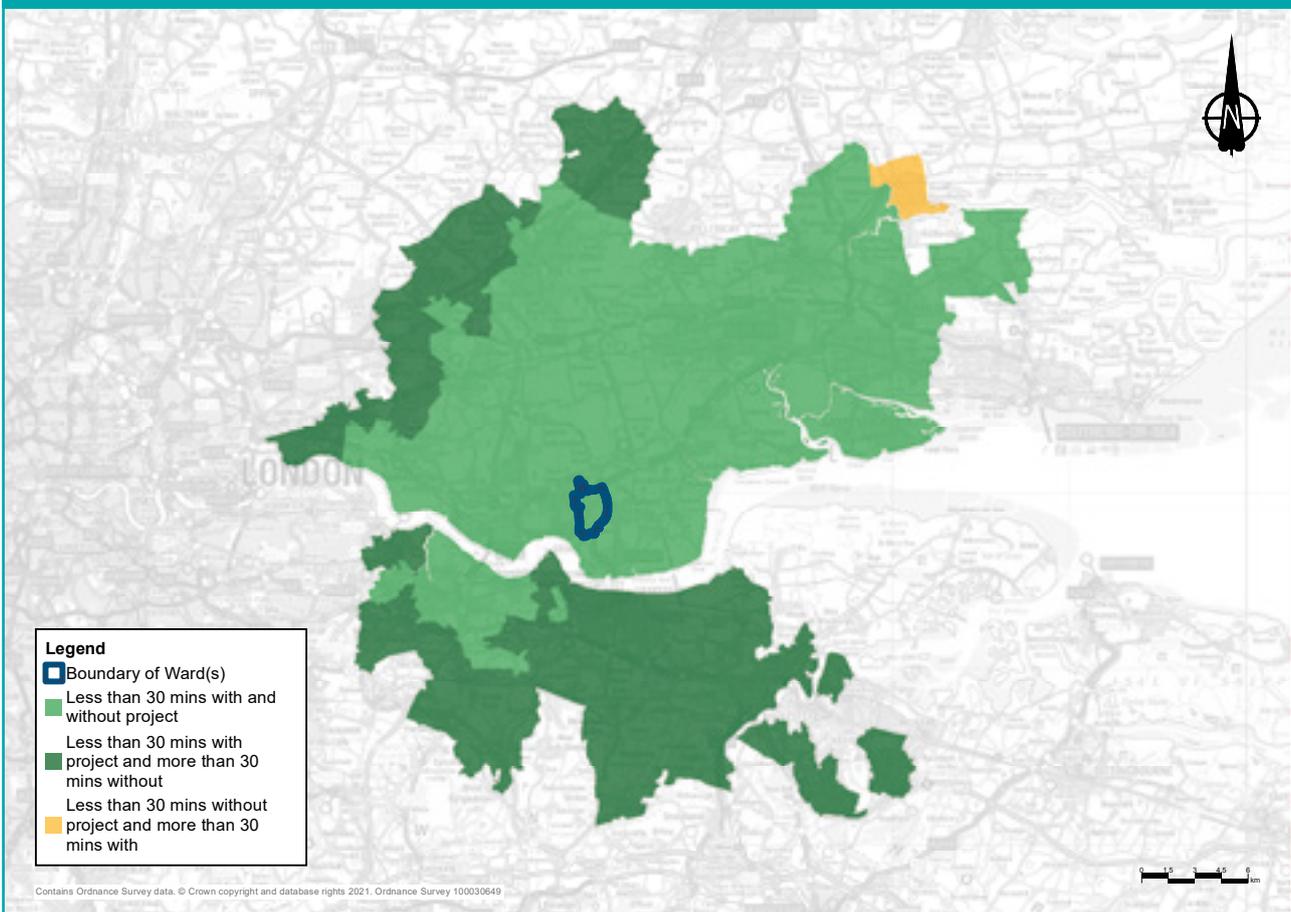
Figure 17.9: Predicted percentage change in traffic flows with the project during the evening peak in 2029/30



Changes to journey times

Figure 17.10 shows the change in the area that could be reached within a 30-minute drive from the centre of the ward both with and without the new road. Figure 17.11 shows the change in area that can be reached within a 60-minute drive. The areas have been calculated for the morning peak hour (7am-8am). The number of jobs within a 30-minute catchment area would increase by 56% with the new road providing access to an additional 193,300 jobs. The number within a 60-minute drive would rise by 26%, which would provide access to an extra 598,000 jobs. Despite the project providing a substantial net gain in access for motorists within these wards, there is an area (shown in orange on the map below) that would no longer be accessible by car within 30 minutes because of changes to traffic flows on the wider road network.

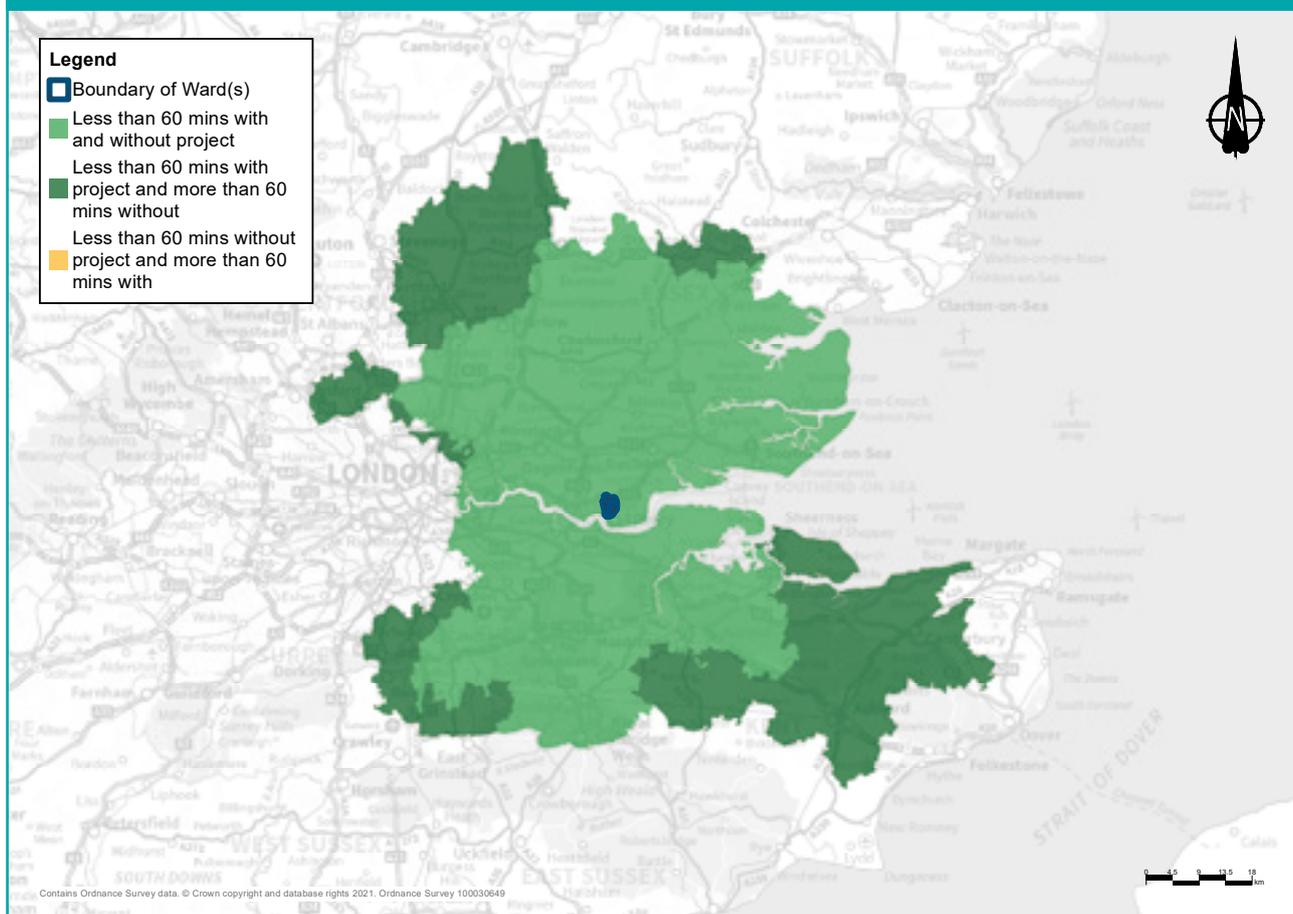
Figure 17.10: Change in the area that motorists could drive to within 30 minutes from Little Thurrock Blackshots and Little Thurrock Rectory wards



Operational traffic flows

Once the new road is open, traffic impacts on the affected road network would be monitored, including on the local roads. Where appropriate, we would work with the relevant highway authority to seek funding from the Department for Transport for further interventions.

Figure 17.11: Change in the area that motorists could drive to within 60 minutes from Little Thurrock Blackshots and Little Thurrock Rectory wards



17.4 Public transport

Existing situation

Little Thurrock Blackshots and Little Thurrock Rectory wards are served by the Tilbury Loop railway line, but there are no stations in these wards. The nearest stations are Grays, in South Stifford ward, and Tilbury Town in Tilbury Riverside and Thurrock Park ward.

The wards are serviced by several bus routes, including: 474; 475; 10; 100; 11; 265; 269; 374; 51; 5A; 5B; 5X; 66; 66A; 7; 73; 77; 77A; 77B; 7B; 7C; 83; 88; 88A; Z1; Z2; and Z4.

17.4.1 Construction

Rail

There would be a series of night-time rail closures of the Tilbury Loop railway line over a period of two months, in the adjacent East Tilbury ward while the Tilbury Viaduct is constructed. These possessions would be agreed with the network operator. It is intended that the works would take place outside train operational times, and so services would not be disrupted.

Throughout construction, there may be some increases in journey times to Grays and Tilbury Town stations, associated with increased traffic through the area and traffic management on local roads.

Buses

Due to the additional traffic on the A1089, the journey times of the Z2 and Z4 buses may increase. When traffic management is placed on other roads, there may be delays to buses using those roads, including the 5A, 11, 66, 73, 73a, 77, 77a, 83, 100 and the Z1.

17.4.2 Operations

Rail

There would be no discernible change in local access times to nearby stations and no change to the rail services at those stations. It would be quicker to access HS1 services at Ebbsfleet International station with the journey time decreasing by around six minutes in the morning and evening peaks.

Buses

The following bus services would be affected by changes in traffic levels on local roads once the new road is open:

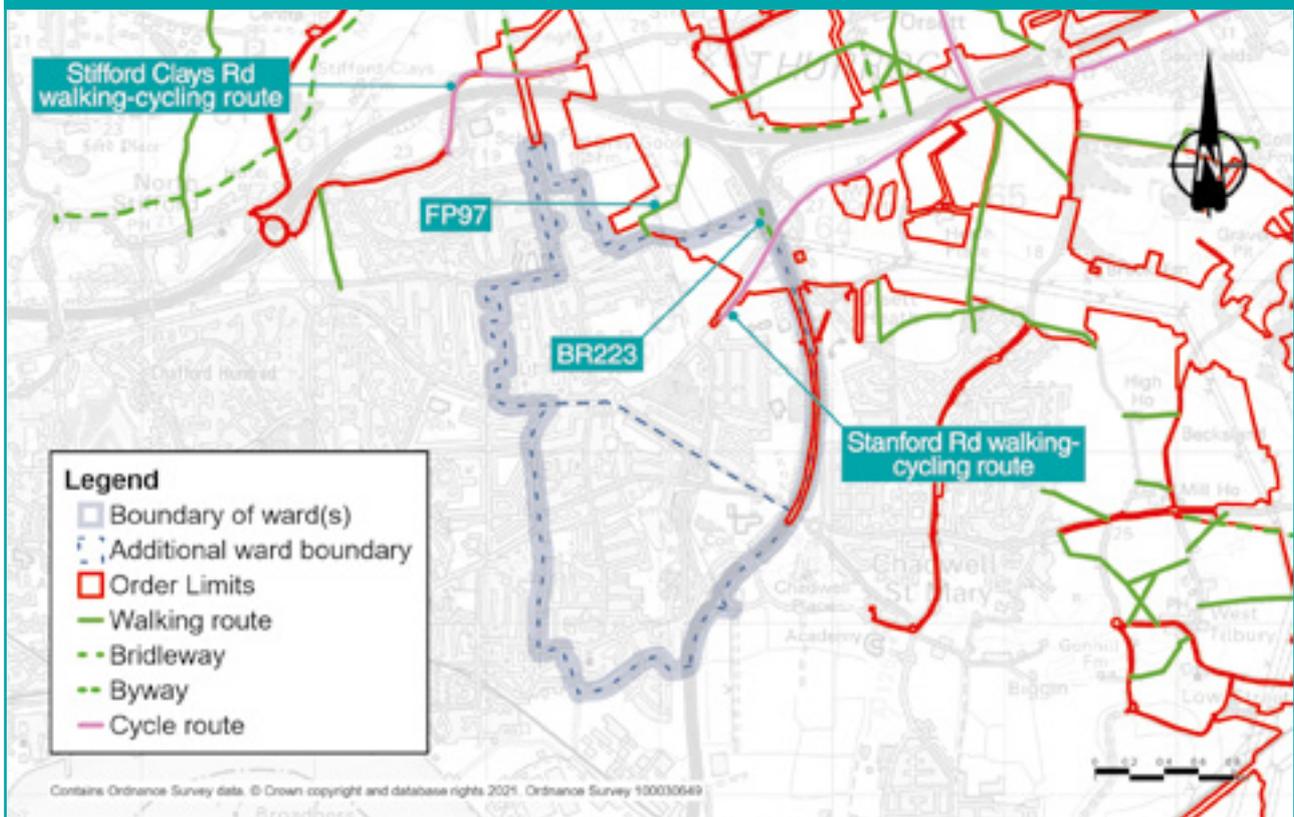
- Bus 5A from Pitsea to Grays. There would be an increase of around two minutes on the travel time for this bus route, westbound in the morning peak. The other time periods and eastbound services would not be affected.
- The 73 bus runs from Tilbury through Grays to Lakeside Shopping Centre. The journey times westbound in the morning peak hour would decrease by around two minutes.
- The 83 bus from Chadwell St Mary through Grays to Lakeside would also run slightly quicker in the morning peak westbound, with a decrease in journey time of between one to two minutes.

17.5 Footpaths, bridleways and cycle routes

Existing situation

Little Thurrock Blackshots and Little Thurrock Rectory wards include a footpath near the A13/A1089 junction and a shared cycling-walking route alongside the A1013 Stamford Road. These would be directly affected by the project. These are set out below, while other impacts, such as visual, and noise and vibration, are covered in other sections of this chapter.

Figure 17.12: Existing footpaths, bridleways and cycle routes in the vicinity of the project in Little Thurrock Blackshots and Little Thurrock Rectory wards



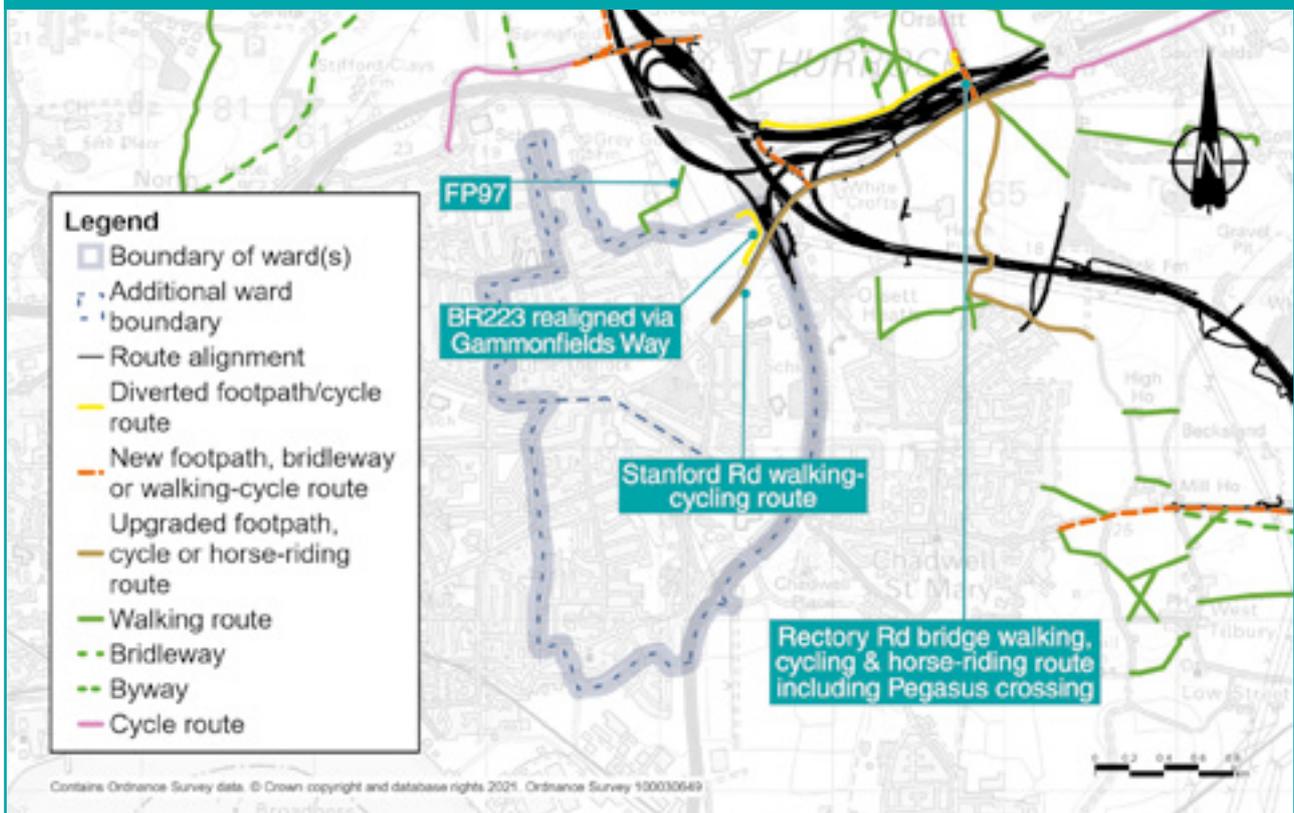
17.5.1 Construction

Construction impacts

There would be a small number of changes to the network of footpaths and bridleways during construction. More information about the proposed network of footpaths, bridleways and cycle routes after completion of the project can be found in the Operational impacts section.

- Footpath FP97 would need to be closed for eight months for utilities works. A section of the route would be closed permanently, shortening the path at the A13 end.
- Bridleway BR223 would need to be closed for five years for utilities diversion works and construction activities.
- The pedestrian-cycle track that runs along the south side of the A1013 would need to be closed for less than a week while traffic is diverted onto the new bridges over the project.

Figure 17.13: Proposed footpaths, bridleways and cycle routes in the vicinity of the project in Little Thurrock Blackshots and Little Thurrock Rectory wards



17.5.2 Operations

Operational impacts

Overall, the proposals for walking, cycling, and horse riding include more than 46km of new, diverted, extended or upgraded footpaths, bridleways and cycle routes. These would provide greatly improved connections across the project. We developed our proposals after consultation and engagement with local communities and stakeholders. For more information, see chapter 7 of the Operations update.

- Footpath FP97 would be shortened at the A13 end.
- Bridleway BR223 would be permanently diverted along the realigned Gammonfields Way.
- Once operational, a new off-road cycle track parallel to, and south of, A1013 Stanford Road would be opened with an adjacent grass verge for horse-riders to use. This cycle route would cross the project via a new pegasus crossing (suitable for horse-riders, as well as walkers and cyclists) connecting A1013 cycle track and Rectory Road bridge cycle track.

17.6 Visual

More information about how the area would look during construction, including visualisations, can be found in the Construction update. You can also view a video fly-through of the project during construction by visiting our consultation website.

Existing situation

The northern and eastern edges of Little Thurrock Blackshots have views towards the land on which the road would be built. Other views towards the road would be from the footpath between the north-east edge of Little Thurrock and A13 junction with the A1089, and from Thurrock Rugby Football Club (Thurrock RFC) and adjoining playing fields.

Current views from homes on the north-east edge of Little Thurrock Blackshots towards the proposed road are mostly of a flat, arable landscape bounded by mature hedgerows. Overhead power lines feature prominently, with glimpsed views of traffic along the A13 and A1089 beyond, partially screened by vegetation. Similar views are seen from the footpath between the north-east edge of Little Thurrock and A13 junction with the A1089.

Views from Thurrock RFC and the neighbouring playing fields are similar to those from nearby homes on the north-east edge of Little Thurrock Blackshots. However, a line of mature trees along the southern boundary and vegetation along Stanford Road, limits easterly views towards the project.

Views towards the new road bounding the A1089 corridor, in the eastern tip of the Little Thurrock Rectory ward, are screened by mature roadside vegetation. Consequently, there would be no visual effects from the project in Little Thurrock Rectory ward.

17.6.1 Construction

Construction impacts

The main construction activities likely to be seen from Little Thurrock Blackshots ward are:

- construction of the proposed A13/A1089 junction
- construction and operation of the Long Lane A and B Compounds
- construction and operation of the Long Lane Utility Logistics Hub
- utilities works, including overhead power line diversions

More information about construction activities can be found in the Project description section.

Views of construction activities from homes along the north-east edge of Little Thurrock Blackshots would include construction of the proposed A13/A1089 junction, which would be seen beyond the Utility Logistics Hub, construction compounds and the works to divert two overhead power lines. Similar views would be seen from the footpath between the north-east edge of Little Thurrock Blackshots and the A13 junction with the A1089, becoming more prominent the closer to the works.

From Thurrock RFC and the playing fields, there would be views to elements of works outside these wards, including the building of Stanford Road overbridge, construction compounds and more distant views towards construction of the proposed A13/A1089 junction. The overhead line diversion works would feature noticeably in views from Thurrock RFC.

Measures to reduce visual impacts during construction

No specific measures are proposed.

The visual impacts of the road would be controlled through the range of good practice measures set out in the CoCP and the REAC. See chapter 1 of the Construction update for more information about this and the project's other control documents.

17.6.2 Operations

By opening year we would have restored the former construction compounds and Utility Logistics Hub to their original use. Further information about the completed project is provided in the Project description section.

Operational impacts

Changes to the view from the north-east edge of Little Thurrock Blackshots would include elevated structures of the Lower Thames Crossing/A13 junction and associated traffic, gantries and lighting. However, this would be softened by false cutting (a landscape mound alongside the new road to reduce views of the road and traffic) and proposed woodland planting. The diverted section of overhead line would be slightly closer to some homes, and replacement of two existing suspension pylons with four angle pylons would be more visually intrusive.

From Thurrock RFC and the adjacent playing fields, there would be views of the Stanford Road overbridge and more distant views towards the Lower Thames Crossing/A13 junction, softened by woodland planting mitigation. The diverted and reconfigured section of overhead line would be slightly closer to Thurrock RFC.

Measures to reduce visual impacts during operation

The false cutting on the south side of the Lower Thames Crossing/A13 junction and associated woodland planting would be our main measures to screen the views of the new road and traffic, and integrate the Lower Thames Crossing/A13 junction into the surrounding landscape.

17.7 Noise and vibration

We have carried out noise and vibration assessments for both the construction and operational phases of the project. As explained in chapter 1, some of the assessments set out below are based on earlier versions of the project. The information provided still presents a reasonable representation of the likely effects from the proposals presented during this consultation.

Existing situation

The existing noise environment in Little Thurrock Blackshots and Little Thurrock Rectory wards is mainly as a result of traffic where the A1089, A1013, A126 and the B149 pass through the wards. There is also noise from other roads including the A13 at the northern end of the wards, agriculture and human activity.

As part of the environmental assessment process, we carried out surveys of existing background noise at three locations in these wards, which were agreed with the local authority. The levels monitored at these locations recorded average existing noise levels in the range of 49 to 53 dB(A)³ during the day and 47 to 52 dB(A) during the night.

To understand how noise levels would vary with and without the project, we use noise modelling to predict what noise levels would be like in the road's proposed opening year if it was not built. We model this because we cannot assume that noise levels when the road opens would be the same as they are now. For example, our assessment of the opening year noise levels takes into account predicted changes in traffic levels.

We also model the predicted noise levels for the opening year with the project in place. This provides a useful comparison as to how the road would change the noise levels if it were to be built.

3 Decibel (dB) is the unit used to measure noise levels, with dB(A) being a standardised way of averaging noise levels that accounts for how humans hear sounds. The typical level of sounds in the environment ranges from 30 dB(A), which is a quiet night-time level in a bedroom, to 90 dB(A), which is how it would sound by a busy road. See chapter 1 for more information about what decibel levels mean.

In the opening year (2029/30), noise levels without the road are predicted to range, on average, from 40 to 76 dB(A) during the day and from 30 to 61 dB(A) during the night-time period at identified locations within this ward. As such, our noise assessments predict that by opening year, noise levels would increase even if the road is not built. Information about noise levels with the project, during its construction and operation, are presented below.

17.7.1 Construction

Daytime construction noise impacts

The main construction activities that are expected to make noise and vibration in these wards relate to the A13/A1089 junction upgrade, main roads works and utilities works. There are no main works compounds or Utility Logistics Hubs currently proposed within the wards. We would also build haul roads for use during construction, with one of these partially within Little Thurrock Blackshots ward and others nearby. These are described in the Project description section above.

Within these wards, there would be no percussive or vibratory works proposed.

Although not located in Little Thurrock Blackshots or Little Thurrock Rectory wards, Long Lane Compound A, Long Lane Compound B and Long Lane Utility Logistics Hub may affect noise levels in these wards as they are close to the boundary.

Construction noise levels have been predicted at six locations across these wards. These sites were chosen to provide a representation of the level of noise communities are expected to experience during construction. For more information about how we carried out these assessments, see chapter 1.

Noise levels are shown using the standard units for major projects, dB LAeq (12-hour), which represent the average noise level for the assessed 12-hour daytime period. While there might be short-term noises that are louder than the noise level shown during the assessed period, the averaged figure provides a fair representation of what the overall noise impacts would be.

Figure 17.14. shows the locations at which we have predicted the daytime construction noise during the project's construction period.

Each vertical bar in figure 17.15 and 17.16 below shows the predicted noise levels for that month of the construction period (from month one to month 72). The horizontal green line in each chart shows the existing background noise level at each assessment point without the new road. The horizontal red line shows the level at which construction noise would exceed defined thresholds (see chapter 1 for more information about these thresholds). If noise is predicted to exceed acceptable levels, then specific measures would be introduced to reduce the noise.

The predicted construction noise levels show that higher noise levels and disturbance would be experienced closer to construction activity. Levels gradually diminish with increased distance and additional buildings and other features screening the noise from more distant residential areas.

Figure 17.14: Construction noise assessment locations in Little Thurrock Blackshots and Little Thurrock Rectory wards

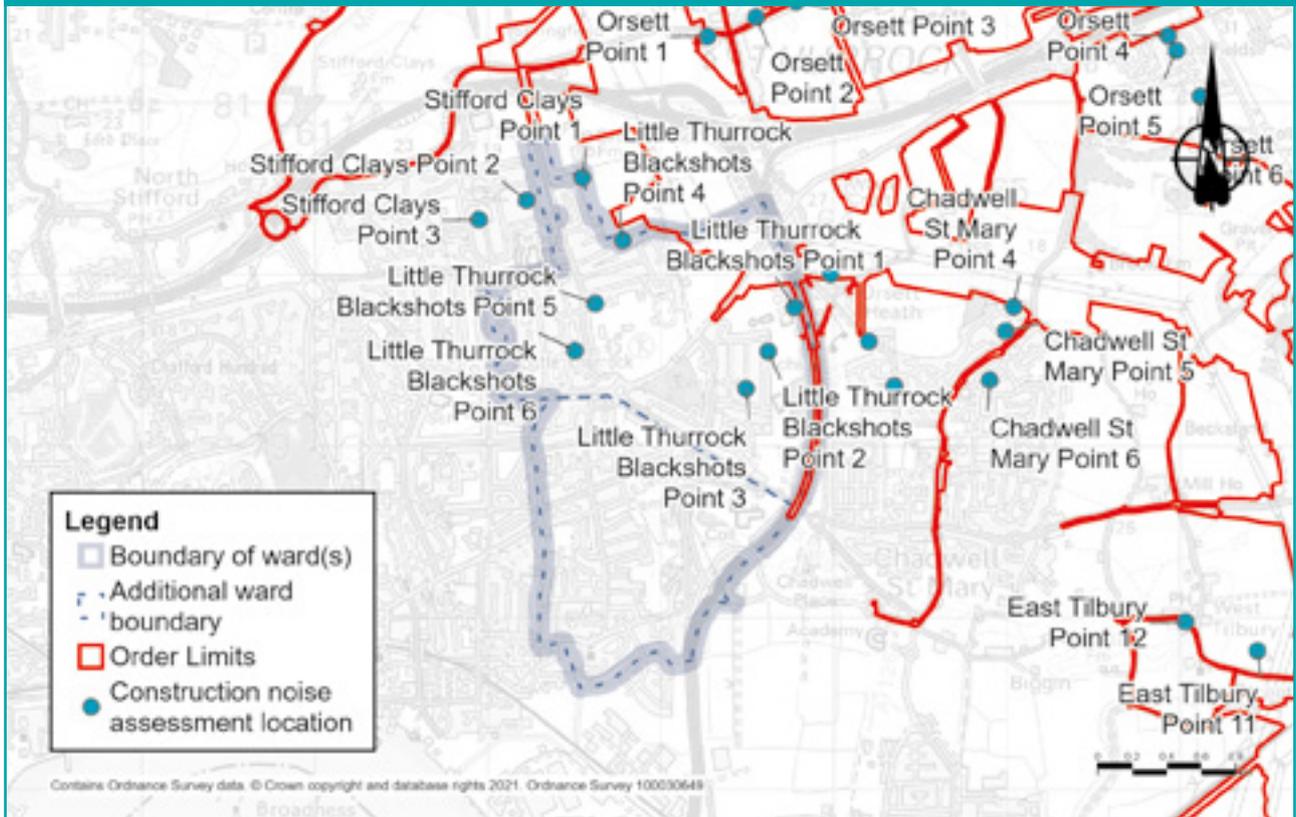
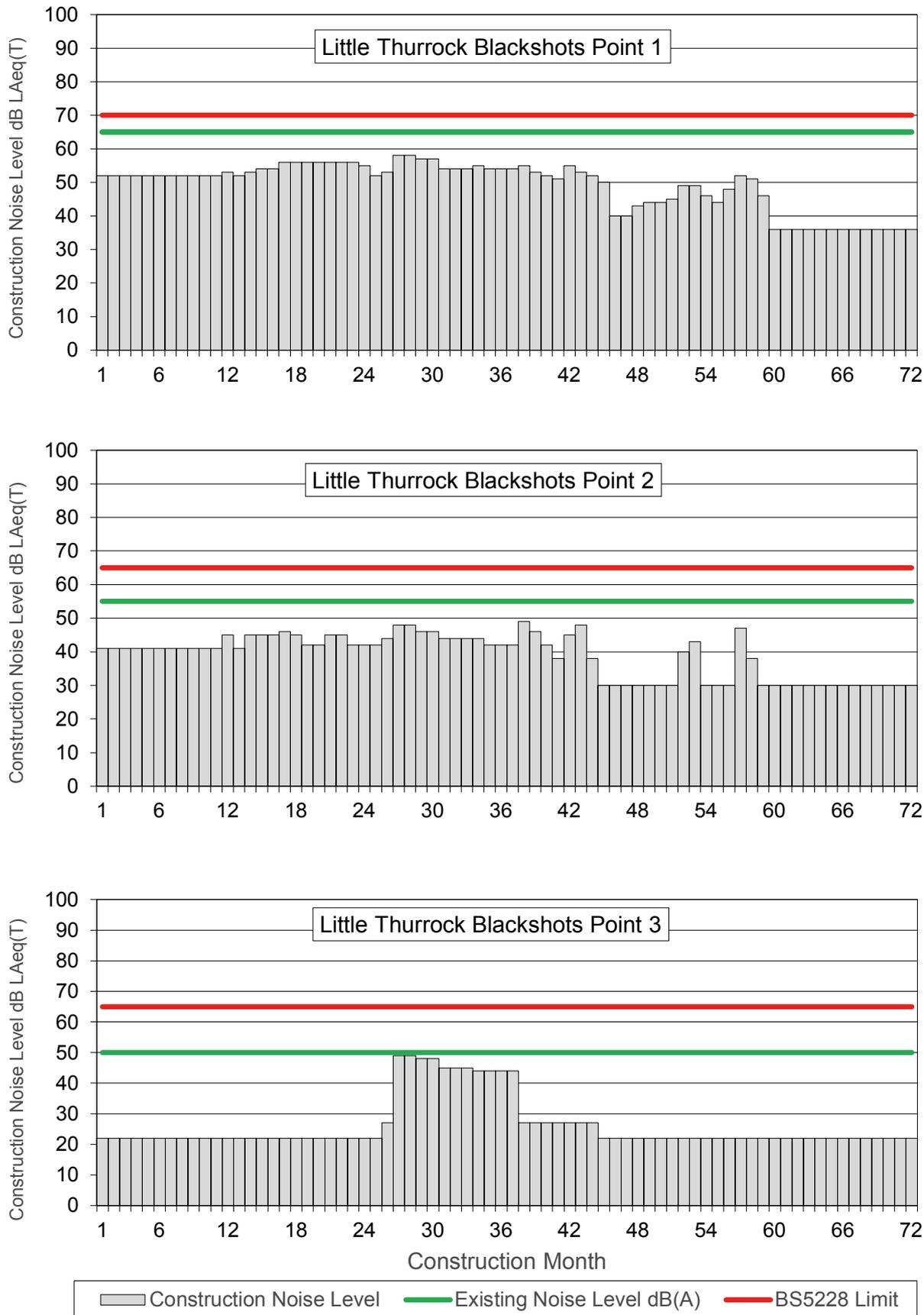


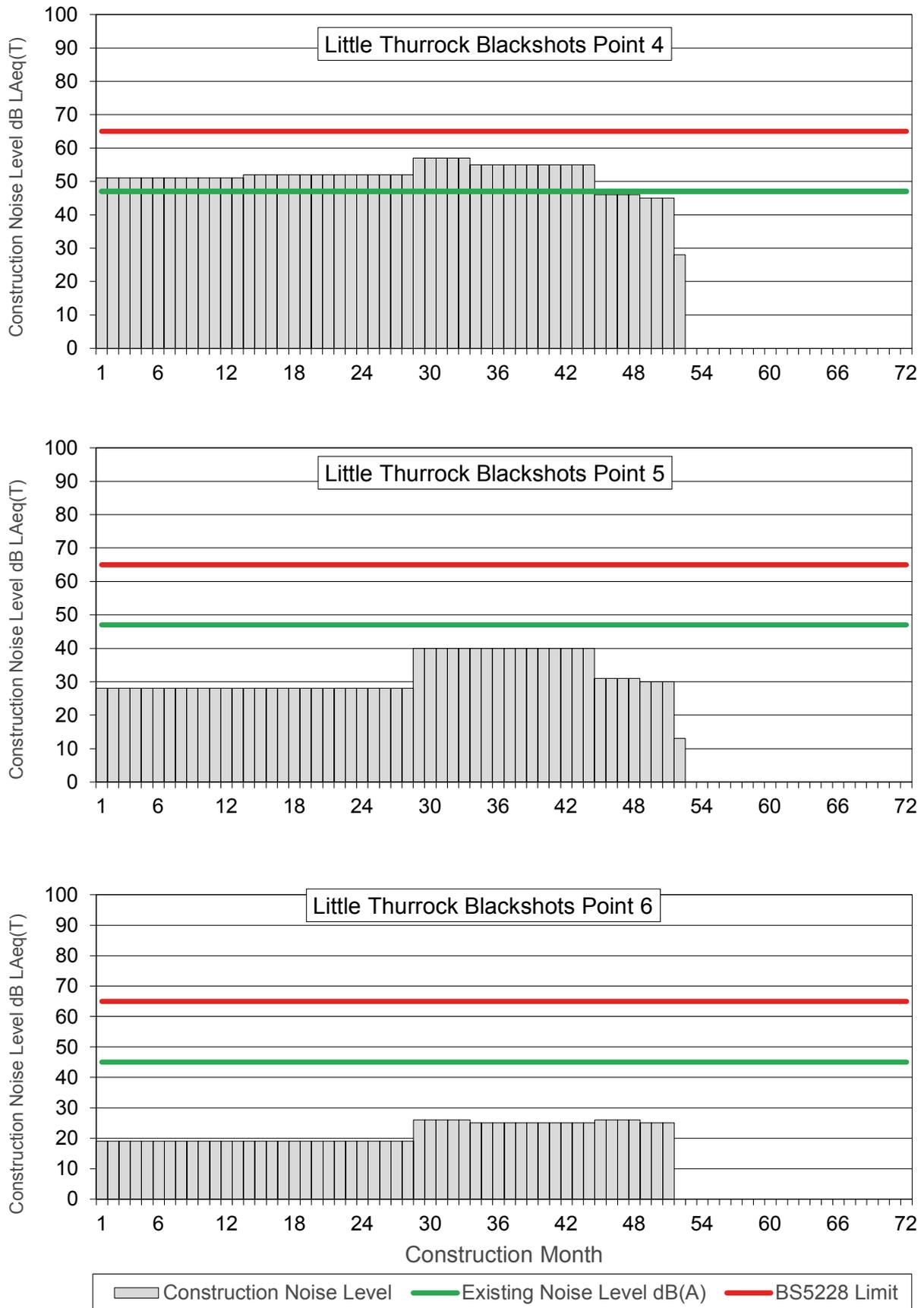
Figure 17.15: Construction noise by month for points 1, 2 and 3 in Little Thurrock Blackshots ward



With reference to figure 17.15 the following summarises the noise level changes over the six-year construction period for points 1 to 3. The construction noise levels are not predicted to exceed existing background noise levels at these assessment locations:

- at point 1, construction noise levels are predicted to range from 36 to 58dB LAeq (12-hour).
- at point 2, construction noise levels are predicted to range from 30 to 49dB LAeq (12-hour).
- at point 3, construction noise levels are predicted to range from 22 to 49dB LAeq (12-hour).

Figure 17.16: Construction noise by month for points 4, 5 and 6 in Little Thurrock Blackshots ward



With reference to figure 17.16 the following summarises the noise level changes over the construction period for points 4 to 6:

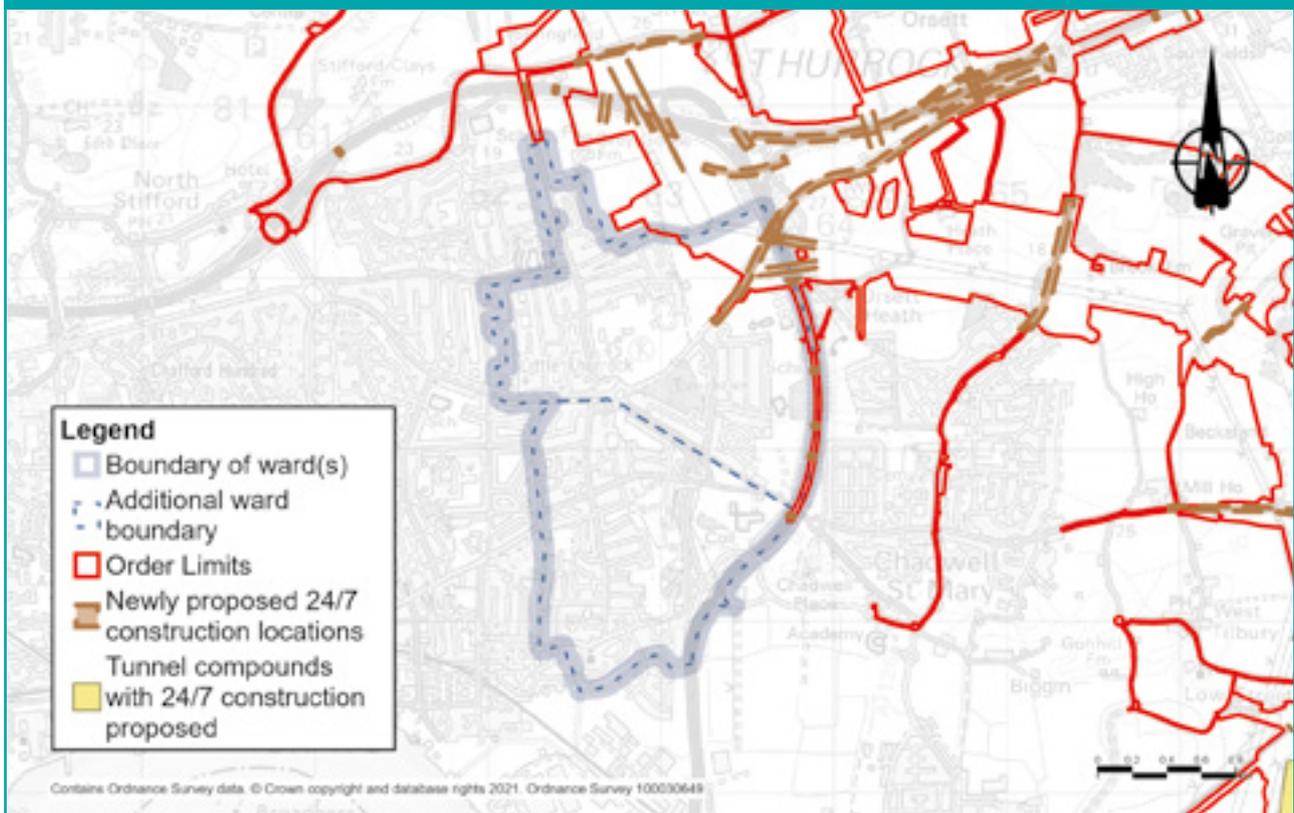
- At point 4, construction noise levels are predicted to range from 28 to 57dB LAeq (12-hour) during the construction programme. Construction noise levels would exceed the existing background daytime noise level for approximately 44 months. However, they would not breach the defined threshold.
- At point 5, construction noise levels are predicted to range from 13 to 40dB LAeq (12-hour) during the construction programme. Construction noise levels are not predicted to exceed the existing background noise levels at this assessment point.
- At point 6, construction noise levels are predicted to range from 19 to 26dB LAeq (12-hour) during the construction programme. Construction noise levels are not predicted to exceed the existing background noise levels at this assessment point.

24/7 construction working

In addition to the changes to daytime noise presented in the section above, 24-hour seven-day construction working is proposed at the locations shown in figure 17.17 below.

These locations are where works may need to be carried out at night to maintain safety and reduce disruption to road and utility networks. The works in this area are expected to be night-time or weekend highways works. These works could have an impact on local communities, and we would work with the local authority to manage these impacts.

Figure 17.17: Newly proposed and tunnel 24/7 working locations in Little Thurrock Blackshots and Little Thurrock Rectory wards



Construction traffic noise impacts

Maps showing the predicted changes in road traffic noise within these wards during each year of construction can be found in chapter 7 of the Construction update. Based on currently available traffic data (which offers a representative picture of what people within the wards are likely to experience) during the construction period, there would be negligible changes in road traffic noise (less than 1dB change in noise levels), except along the roads where increases in noise levels (less than 3dB change in noise levels) have been predicted. For more information about how we define noise impacts (negligible, minor, moderate and major), see chapter 1.

Table 17.3: Construction traffic noise impacts in Little Thurrock Blackshots and Little Thurrock Rectory wards

Affected road(s)	Predicted noise impact	Construction year(s)
Dock Approach Road	Minor increase in noise levels	2
Stifford Clays Road	Minor increase in noise levels	2

Measures to reduce construction noise and vibration

Construction noise levels would be mostly controlled by using Best Available Techniques (BAT), with specific measures at certain locations such as:

- installing and maintaining hoarding around the construction compounds
- installing temporary acoustic screening around the construction areas likely to generate noise
- keeping site access routes in good condition with condition assessments onsite to inspect for defects such as potholes
- turning off plant and machinery when not in use
- maintaining all vehicles and mobile plant so that loose body fittings or exhausts do not rattle or vibrate
- using silenced equipment where available, in particular power generators and pumps
- no music or radios would be played for entertainment purposes outdoors onsite
- site layout would be planned to ensure that reversing is kept to a practical minimum. Required reversing manoeuvres would be managed by a trained banksman/vehicle marshal to ensure they are conducted safely and concluded quickly to reduce the noise from vehicle reversing warnings

- Non-percussive demolition techniques would be adopted where reasonably practicable to reduce noise and vibration impact
- Careful consideration of the location and layout of compounds to separate noise-generating equipment from sensitive receptors, and the use of mains electricity as opposed to generators, where possible
- Minimisation of construction vehicle traffic by, where practical, selection of local suppliers along the project route, using local workforces and by minimising material transportation for earthworks construction.

All control measures, including those above, fall under the principles of BAT and are included in the REAC. For more information, see the sections NV001 to NV010 which set out how we would work under the supervision of relevant local authorities to implement noise-reduction measures where these are needed.

The CoCP sets out additional measures that we would use to reduce noise and vibration during the construction period.

17.7.2 Operations

Operational noise impacts

Little Thurrock Blackshots ward is located approximately 200 metres to the south-west of the proposed new road. Direct noise from the new road and the proposed improvements to Stanford Road and Dock Approach Road would be audible in the north-eastern section of Little Thurrock Blackshots ward.

Little Thurrock Rectory ward is located around 1.5km west of the new roads so direct noise from it wouldn't be heard in the ward.

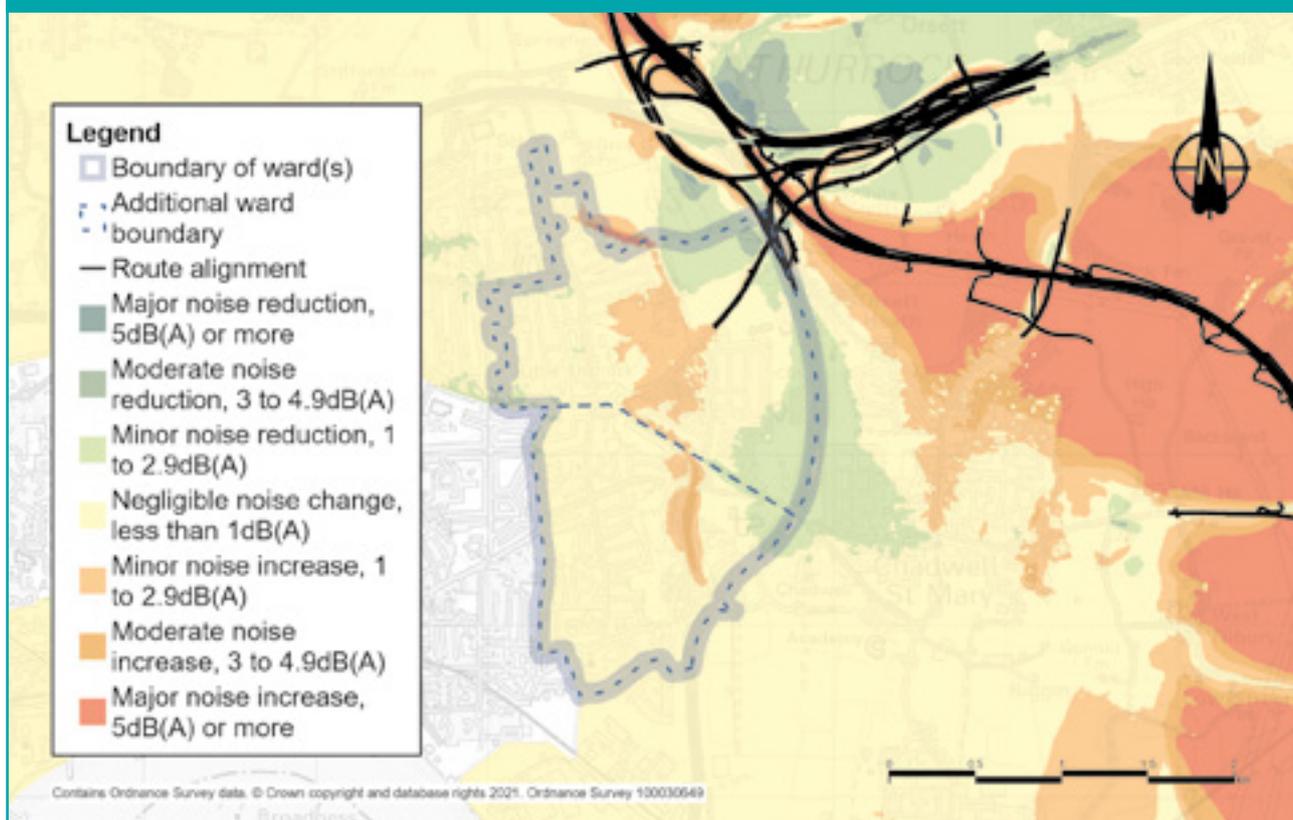
In both wards, there would also be changes to noise levels as a result of changes in traffic flow, the number of HGVs, and traffic speed on other roads in the wards.

Figure 17.18 shows the changes in noise levels for roads in these wards in the opening year of the project:

- In Little Thurrock Blackshots ward, predicted changes in traffic noise at identified locations are predicted to range from a moderate decrease in noise levels of between 3.0 and 4.9dB to (in a small area) a major increase of more than 5dB.
- In Little Thurrock Rectory ward, predicted changes in traffic noise at identified locations are predicted to range from a minor decrease in noise levels of between 1.0 and 2.9dB to moderate increases of between 3.0 and 4.9dB.

For more information about how we define noise impacts (negligible, minor, moderate and major), see chapter 1.

Figure 17.18 Noise impacts during operation in Little Thurrock Blackshots and Little Thurrock Rectory wards



Measures to reduce traffic noise and vibration during operation

The main methods of controlling noise would be, where practicable, to design the road within landscaped features such as cuttings and bunds (walls of earth). The use of low-noise surfacing would also reduce the traffic noise once the road is in use.

For more information about the proposed measures to reduce operational noise, see the REAC (including references NV011 and NV013).

17.8 Air quality

We have carried out air quality assessments for both the construction and operational phases of the project. As explained in chapter 1, some of the assessments set out here are based on earlier versions of the project. The information provided here still presents a reasonable representation of the likely effects from the proposals presented during this consultation.

Existing Situation

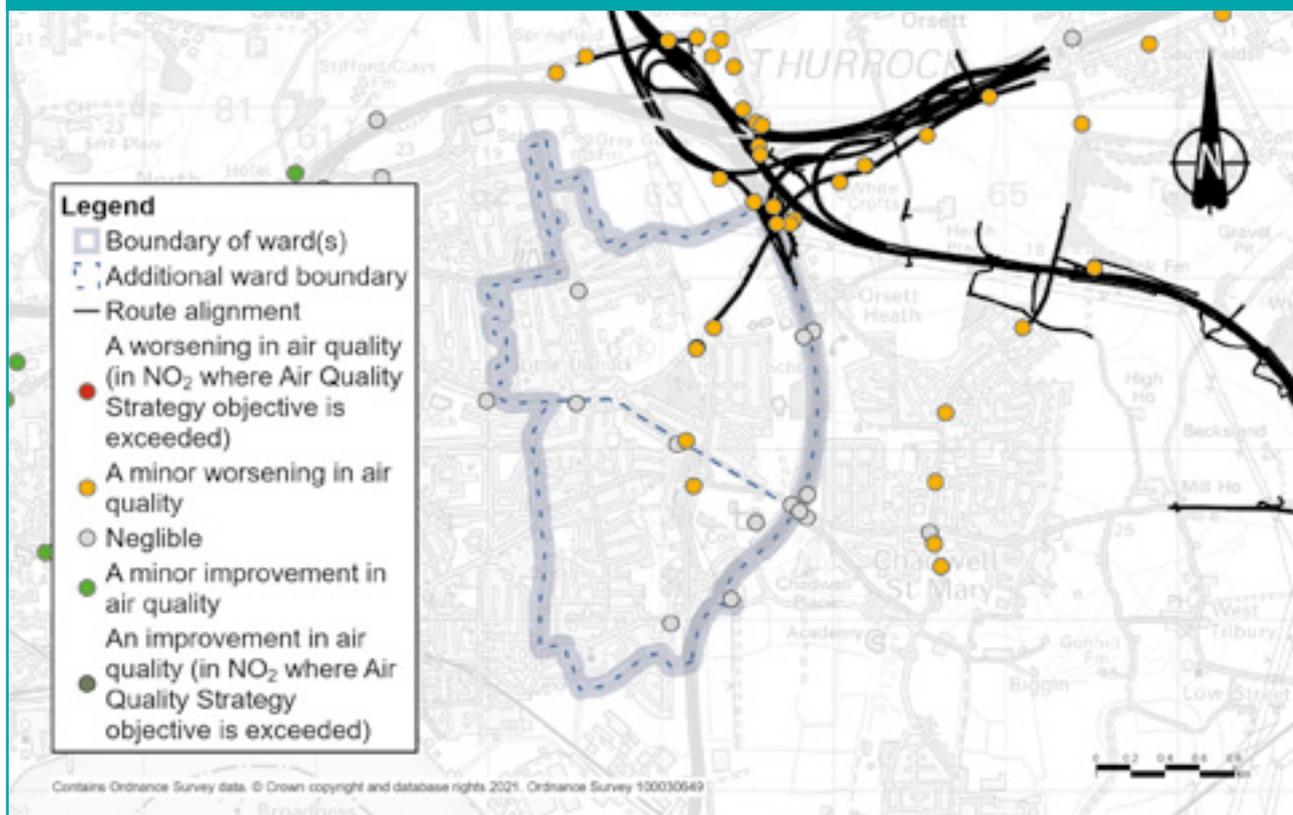
Little Thurrock Rectory ward and Little Thurrock Blackshots ward are not located within an Air Quality Management Area (AQMA). AQMAs are areas that have been identified by local authorities as areas of poor air quality that require additional monitoring and controls.

17.8.1 Construction

Construction impacts

Construction activities have the potential to affect nearby air quality through the release of dust and emissions from construction equipment and traffic. The areas most likely to be affected are those close to haul roads, compounds and soil storage areas.

Figure 17.19: Predicted changes in NO₂ levels within Little Thurrock Rectory ward and Little Thurrock Blackshots ward once the new road is open



Properties more than 200m from the worksite, which is the majority of properties within these wards, are outside the area likely to be affected by construction dust or emissions from the worksite. In these wards, there are only a few properties within 200m of the worksite, including those to the north-east of Little Thurrock such as A1013 Stanford Road and south of Ashley Gardens. Air quality impacts on these properties during construction would be temporary and we would put in place measures to minimise the dust impacts (see below). The proposed measures to reduce dust and emissions are ones that have been proven to be effective when used on similar construction projects in the past. The change in air quality during the construction phase would be negligible, and there would be no discernible effect on health.

Our analysis of construction traffic predicts that the impact on most roads in these wards would be negligible, although there would be a temporary minor worsening in air quality in the area around the A1089 (from 2025 to 2027) and along the A126 Marshford Road, the Chadwell Road and B149 Wood View (2025) as a result of traffic increase. Also, there would be a temporary minor improvement in air quality in the area around the Stanford Road, Lodge Lane and Southend Road as a result of the traffic management in place in 2025. More information about construction traffic impacts on air quality can be found in chapter 7 of the Construction update.

Measures to reduce air quality impacts during construction

The impact of construction machinery and traffic on air quality would be controlled through the range of good practice measures set out in the CoCP and the REAC. For example, there would be measures to suppress dust, such as damping down dry haul roads and spoil heaps, as well as the use of low-emission machinery and vehicles. We would put in place an air quality management plan to ensure the measures set out in the CoCP and the REAC would effectively monitor and control dust and exhaust emissions. The location and type of monitoring would be submitted in advance to Thurrock Council for consultation (see REAC entry AQ006).

17.8.2 Operations

Operational impacts

We have carried out an assessment of the operational impacts of the new road on air quality. The assessment area includes a 200m buffer around the roads within the affected road network, with this area being the most likely to experience changes to air quality as a result of the new road. More information about air quality impacts once the road is open can be found in chapter 5 of the Operations update.

There are receptors (properties or habitats that are sensitive to changes in air quality) within the wards, that are predicted to experience a minor worsening in the air quality for nitrogen dioxide (NO₂), the main traffic-related pollutant. The highest modelled yearly average NO₂ concentration within Little Thurrock Blackshots ward is 25.2 µg/m³, and in Little Thurrock Rectory ward is 26.0 µg/m³, which is below the yearly average threshold of 40µg/m³. Our assessment is based on our opening year model, which represents a worst-case scenario, without accounting for the increase in less-polluting vehicles on our roads over time.

Furthermore, local air quality data shows an overall downward trend in NO₂ over recent years, which means that future air quality improvements at this location are likely (for example, through increased adoption of electric vehicles meaning a reduction in exhaust emissions).

In addition to our assessment of NO₂, our assessment predicts that PM₁₀ levels (small particles of dust, mainly from vehicle exhausts and brakes) are unlikely to exceed threshold levels across the assessed area.

Measures to reduce air quality impacts during operation

The assessed air quality impacts in this area as a result of the project would not trigger the need for additional monitoring or other mitigation measures once the road is open.

17.9 Health

Existing situation in Little Thurrock Blackshots

A range of personal, social, economic and environmental factors influence our health. Different groups within the population may be more sensitive to these factors than others – for example, children, older people or those with pre-existing health conditions.

Little Thurrock Blackshots ward has a noticeably older population than is the case for Thurrock as a whole and nationally, with a higher proportion of people aged 60 and over (27.0%, compared to 18.3% for Thurrock and 23.6% for England). When compared to Thurrock and other neighbouring wards, Little Thurrock Blackshots has a less ethnically diverse population, with a significantly higher proportion of white residents compared to the England average, 92.3% and 85.4% respectively. However, Little Thurrock Blackshots has a high proportion of residents who are Asian, compared to other wards throughout Thurrock, 2.1%.

As a whole, Little Thurrock Blackshots has low rates of deprivation. However, an area to the north-east of the ward is in the top 20% most deprived in England. Economic activity rates here are relatively low, compared to Thurrock as a whole, 69.5% and 79.1% respectively. Benefit claimant rates are also comparatively low compared to wards throughout Thurrock, which reflects the high proportion of elderly people in the ward. Little Thurrock Blackshots has a higher proportion of residents in social grade AB (16%) than is the case for Thurrock as a whole (15%). The area has a significantly higher proportion of households which are owned outright compared to Thurrock and England as a whole, 81.7%, 66.2% and 63.3% respectively. In terms of car or van availability, Little Thurrock Blackshots has a significantly lower proportion of households with no cars or vans compared to Thurrock as a whole, 16.9% and 20.1% respectively.

Ward residents generally have slightly lower rates of self-reported very good health compared to Thurrock and England as a whole, 45.2%, 48.2% and 47.2% respectively. The ward also has a high proportion of residents who state that their day-to-day activities are 'limited a lot' and 'limited a little', compared to Thurrock as a whole, 8.1% and 7.2% respectively.

When looking at life expectancy and causes of death, Little Thurrock Blackshots has better rates than Thurrock as a whole across a number of measures, including life expectancy at birth, deaths from respiratory and coronary heart disease, from cancer and from all causes.

Existing situation in Little Thurrock Rectory

Little Thurrock Rectory has an older population than is the case for Thurrock as a whole, with a higher proportion of people aged 60 and over (23.4% compared to 18.3% for Thurrock). The ward has an ethnically diverse population, with a high proportion of Asian residents compared to Thurrock as a whole, 5.0% and 3.8% respectively.

Little Thurrock Rectory has very low rates of deprivation, with the ward among the least 30% deprived in the whole of England. Economic activity rates are relatively high here, compared to other wards throughout Thurrock, with claimant counts also relatively low compared to wards throughout Thurrock. Little Thurrock Rectory has a higher proportion of residents in social grade AB (16.6%) than is the case for Thurrock as a whole (15.0%). The area has a significantly higher proportion of households which are owned outright compared to Thurrock and England as a whole, 81.8%, 66.2% and 63.3% respectively. In terms of car or van availability, Little Thurrock Rectory has a significantly lower proportion of households with no cars or vans compared to Thurrock as a whole, 16.5% and 20.1% respectively.

Little Thurrock Rectory residents generally have higher rates of self-reported very good health compared to Thurrock and England as a whole, 49.8%, 48.2% and 47.2% respectively. The ward also has a relatively low proportion of residents who state that their day-to-day activities are 'limited a lot' compared to Thurrock and England as a whole, 6.4%, 7.2% and 8.3% respectively.

When looking at life expectancy and causes of death, Little Thurrock Rectory has better rates than for Thurrock as a whole across a number of measures, including life expectancy at birth, deaths from respiratory and coronary heart disease, from cancer and from all causes. In fact, Little Thurrock Rectory has better rates than England for life expectancy for men at birth and deaths from all causes and cancer.

17.9.1 Construction

Construction impacts

Construction activities affecting Little Thurrock Blackshots and Little Thurrock Rectory are outlined in the Project description section, and mostly relate to the construction of the proposed A13/A1089 junction, and the formation and operation of the associated compounds Long Lane Compound A and Long Lane Compound B and the ULH.

Elements of these activities have the potential to effect health, whether from noise associated with construction activities, traffic, changes to air quality (dust emissions), severance caused by construction traffic, or through impacts on mental health and wellbeing.

There are likely to be both positive and negative effects on people's health and wellbeing as a result of our construction. To reduce the negative effects on people's mental health and wellbeing, we would make sure good communications and local engagement provides people with essential information about when construction works would begin and their likely effects. Equally, some residents would enjoy health and wellbeing benefits from improved access to work and training opportunities as a result of our construction activities (see the Traffic impacts section). The relationship between mental health and unemployment is bi-directional. Good mental health is a key influence on employability, finding a job and remaining in that job. Unemployment causes stress, which ultimately has long-term physiological health effects and can have negative consequences for people's mental health, including depression, anxiety and lower self-esteem.

Construction impacts in Little Thurrock Blackshots

Little Thurrock Blackshots residents may experience:

- Changes in accessibility. This may be the case for people who are more dependent on public transport and have less choice about method and route travelled.
- Positive health outcomes may be experienced by residents as a result of access to work and training opportunities presented by construction activities.
- There are likely to be mental health and wellbeing impacts associated with stress and anxiety relating to construction of the project.
- There are few properties in the Little Thurrock Blackshots ward within 200 metres from the Order Limits and are therefore unlikely to be affected by dust or emissions from the project's construction. Those properties that are within 200 metres have the potential to experience air quality impacts as a result of increased dust and emissions from nearby construction activities.
- Views of construction activities would be largely constrained by the urban area of Grays and mostly limited to residential areas and Thurrock Rugby Football Club and adjoining playing fields on the north-east edges of the settlement.
- The main construction activities that are expected to give rise to noise and vibration impacts in this ward are associated works to construct the new road and utilities works. However, during core daytime hours, construction noise is unlikely to present any impacts over and above the existing background noise in the area.
- 24-hour, seven-day construction working is proposed along Stanford Road. At this location, works may need to be carried out at night to maintain safety and reduce disruption to road and utility networks. These works could have an impact on local communities.
- Although not located in Little Thurrock Blackshots, Long Lane Compound A, Long Lane Compound B and Long Lane Utility Logistics Hub may effect noise levels as they are close to the ward boundary.

Construction impacts in Little Thurrock Rectory

Little Thurrock Rectory residents may experience:

- Positive health outcomes may be experienced by residents as a result of access to work and training opportunities presented by construction activities.
- There are few properties in the Little Thurrock Rectory ward within 200 metres from the Order Limits and are therefore unlikely to be affected by dust or emissions from construction.
- There are likely to be mental health and wellbeing impacts associated with stress and anxiety relating to construction of the project.
- There are no main construction works or activities that are expected to give rise to construction noise and vibration impacts on this ward.
- Although not located in Little Thurrock Rectory, Long Lane Compound A, Long Lane Compound B and Long Lane Utility Logistics Hub may effect noise levels as they are close to the ward boundary.
- Increases in road traffic noise during the construction period are predicted to be negligible (less than 1dB) on all roads within this ward except along those roads where a minor increase in noise levels (less than 3dB change) is predicted. See the section on Construction traffic noise impacts above for more information.

Measures to reduce construction health impacts

Proposed measures relating to health and wellbeing (including good practice for dust emissions, hours of working and visual screening) are described in this chapter in the Visual, Noise and vibration and Air quality sections. Further information relating to mitigation measures for these areas is set out in the CoCP and the REAC. The commitments in the REAC include items such as adhering to Best Practicable Means (BPM) to reduce noise impacts (see NV007 in the REAC) and dust-management good practice (see AQ005 in the REAC). For more information about these documents, see chapter 1 of the Consultation Guide.

Engagement and effective two-way communication with communities both prior to and during construction by providing information about the programme and impact of works is important in order to reduce mental health and wellbeing impacts associated with uncertainty, stress and anxiety. The CoCP sets out proposals for community engagement, including how we would make sure communities, stakeholders and any affected parties are kept informed of the construction works, their progress and associated programme. This includes setting up Community Liaison Groups.

17.9.2 Operations

Information about the operational project in the wards is provided in the Project description section above.

Operational health impacts in Little Thurrock Blackshots

Direct noise from the new road and the proposed improvements to Stanford Road and Dock Approach Road would be audible in the north-eastern section of Little Thurrock Blackshots ward. Conversely, changes in traffic noise at identified locations are predicted to range from a barely perceivable decrease in noise levels.

The operation assessment study area includes 200m buffer from roads within the affected road network. The air quality modelling shows that the operation of the Project is predicted to cause a barely perceivable change in the air quality for nitrogen dioxide, the main traffic related pollutant. Those properties modelled within the Little Thurrock Blackshots ward are predicted to be well below the Air Quality thresholds for the key traffic related pollutants nitrogen dioxide and particulate matter.

Changes to the view from the north-east edge of Little Thurrock Blackshots would include elevated structures of the Lower Thames Crossing/A13 junction and associated traffic, gantries and lighting. However, this would be softened by false cutting (a landscape mound alongside the new road to reduce views of the road and traffic) and proposed woodland planting. The diverted section of overhead power line would be slightly closer to some homes and replacement of two existing suspension pylons with four angle pylons would be more visually intrusive.

From Thurrock Rugby Football Club and the adjacent playing fields, there would be views of the Stanford Road overbridge and more distant views towards the Lower Thames Crossing/A13 junction, softened by woodland planting mitigation. The diverted and reconfigured section of overhead line would be slightly closer to Thurrock RFC.

Positive health outcomes may be experienced by residents as a result of improvements to accessibility, access to work and training, and access to open space. The newly created Tilbury Fields would provide residents with a new recreational resource which could encourage physical activity.

Operational health impacts in Little Thurrock Rectory

The assessment undertaken for noise, air quality and visual impacts have shown that no adverse impacts are anticipated as a result of the project for people in Little Thurrock Rectory ward. A proportion of residents may also experience positive health benefits through accessibility improvements, better access to jobs and training, and to open space, including new recreational areas outside the ward, such as Tilbury Fields, near Gravesend.

Measures to reduce operational health impacts

Mitigation measures have been incorporated into the project design to reduce adverse effects in Little Thurrock Blackshots ward:

- The false cutting on the south side of the project's junction with the A13 and associated woodland planting mitigation, comprise the primary mitigation in this ward, helping to screen views of the new road and traffic, and integrate the project's junction with the A13 into the surrounding landscape.
- While our main method of controlling noise is to use more 'natural'-looking measures such as cuttings and bunds (earthworks) to reduce the effects of noise on the local area, we would also install noise barriers where appropriate.

Mitigation measures have been incorporated into the project design to reduce adverse effects in Little Thurrock Rectory ward:

- The impact of construction and changes in traffic on local air quality would be controlled and minimised through the range of good practice measures set out in the project's CoCP and the REAC.
- While our main method of controlling noise is to use more 'natural'-looking measures such as cuttings and bunds (earthworks) to reduce the effects of noise on the local area, we would also install noise barriers where appropriate.

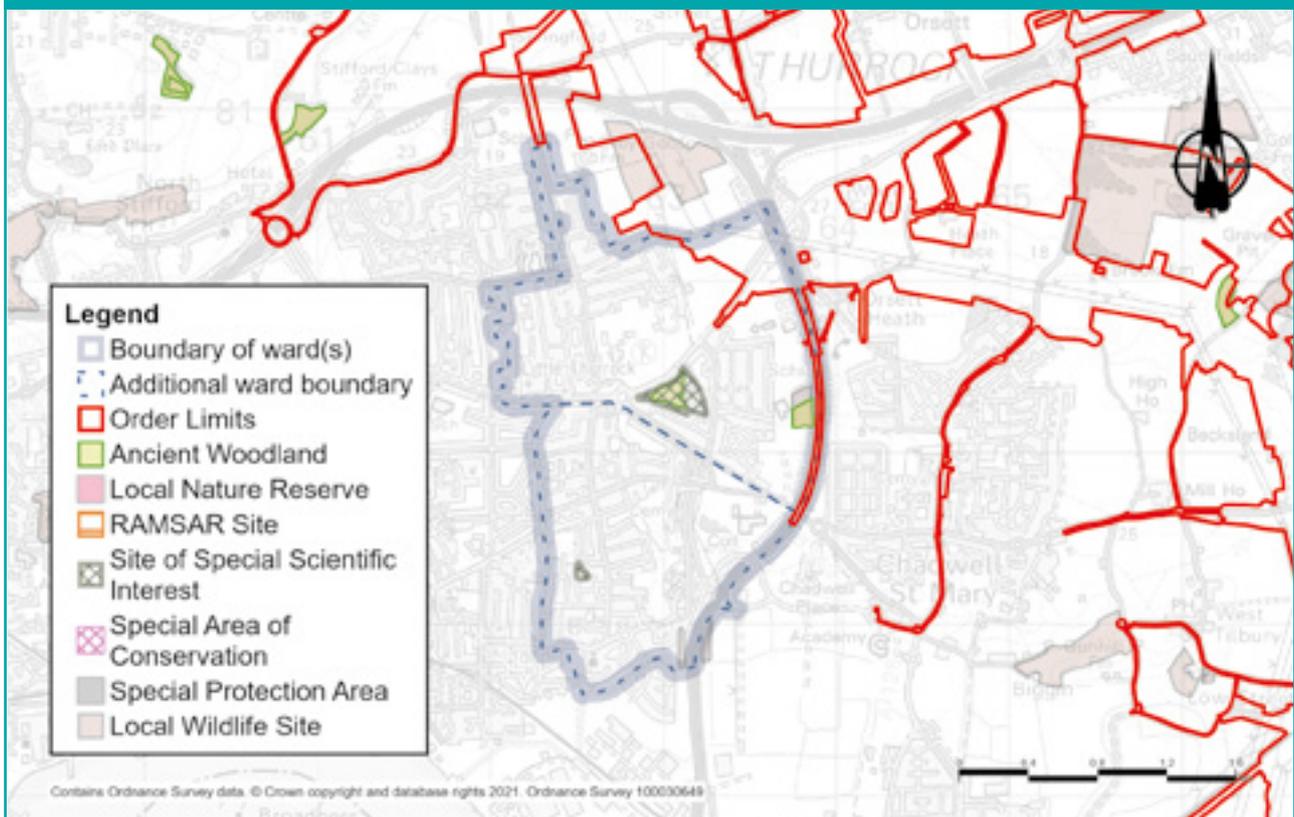
17.10 Biodiversity

Existing situation

Only a small area of the Little Thurrock Blackshots ward falls within the Order Limits. The main habitat type is arable fields, with some hedgerows. Little Thurrock Blackshots ward contains the designated site Hangman's wood and Deneholes SSSI and the non-designated sites of Terrels Heath Grays Local Wildlife Sites (LWS) and Chadwell Wood Ancient Woodland.

We carried out surveys across the project to set a baseline for assessment, and these identified the presence of a range of protected and notable species. A number of badger outlier setts were identified and reptiles are present, and Hangman's Wood and Deneholes SSSI is a known bat roost. No other protected species were identified.

Figure 17.20 Designated and non-designated biodiversity sites in Little Thurrock Blackshots and Little Thurrock Rectory wards



Only a small area of the Little Thurrock Rectory ward falls within the project Order Limits, and where it does, the Order Limits are restricted to a small area of landscape adjacent to the A1089. Little Thurrock Rectory ward contains Globe Pit SSSI. However, this is not designated for its terrestrial biodiversity interest and is not discussed further in this section. No non-designated sites are located within Little Thurrock Rectory ward. For marine biodiversity, please refer to chapter 7 of the Construction update.

Surveys to establish a baseline for assessment were undertaken within the Order Limits and relevant buffer zones, with no presence of protected and notable species identified.

17.10.1 Construction

Construction impacts

Construction of the project would require the removal of areas of habitat, both temporarily and permanently from the route alignment and compound locations. Removal of the hedgerows would cause the loss of badger setts and reptile habitat and cause disturbance to retained habitats.

A small area of landscape planting would be removed adjacent to the A1089.

Measures to reduce biodiversity impacts during construction

Vegetation clearance would be undertaken during the winter where possible to avoid the impacts on breeding birds. Where this is not practicable, clearance would be supervised by an Ecological Clerk of Works (ECoW) to ensure no nests are disturbed or destroyed. Where protected species are present, these would be moved away from the site prior to any construction activities either through habitat manipulation (for example, strimming to reduce the height of vegetation to displace reptiles) or translocation. Where required, works affecting protected species would be carried out under a Natural England licence. Boxes to support bats and birds would be erected within retained habitat. Habitat lost for temporary construction works would be reinstated following construction.

The landscape planting removed from the A1089 would be reinstated during the construction process.

The impact of construction on biodiversity would be controlled through the range of good practice measures set out in the project's CoCP and the REAC. See chapter 1 of the Construction update for more information about this and the project's other control documents.

17.10.2 Operations

Operational impacts

Operation of the project has the potential to cause mortality of species by encountering road traffic, habitat fragmentation, and noise disturbance from traffic. It should be noted that in this location the existing A13 and the A1089 already cause these impacts on the terrestrial biodiversity, and it is not anticipated that the impacts from the new road would add to these.

Measures to reduce biodiversity impacts during operation

Newly created areas would be managed to ensure that they provide high quality habitat to support a broad range of different plant and animal species.

The impact of operation on biodiversity would be controlled through the range of good practice measures set out in the project's CoCP and the REAC. See chapter 5 of the Consultation guide for more information about this and the project's other control documents.

17.11 Built heritage

Existing situation

There is a scheduled monument in Little Thurrock Blackshots. The scheduled monument is of high heritage value and comprises a group of 'dene holes' in Hangman's Wood. These are located around 420 metres south of the project. Dene holes are underground structures consisting of a number of small chalk caves entered by a vertical shaft. The holes at Hangman's Wood are believed to have been created by medieval and post-medieval mining for either chalk or flint. Only three of this group of holes are now visible, and only one is open. Extensive exploration of these dene holes was made by Essex Field Club in 1880s. They were shown to have shafts 80ft deep with chalk cut chambers, three on each side of the shaft. There were originally more than 70 dene holes in the wood but most of these are now poorly preserved. The scheduled group of holes are known to be some of the best-preserved of their kind.

There are no Listed Buildings or other structures of historical relevance within Little Thurrock Blackshots ward.

Figure 17.21 Built heritage in Little Thurrock Blackshots and Little Thurrock Rectory wards



17.11.1 Construction

Construction impacts

Construction activities affecting Little Thurrock Blackshots ward relate to the establishment and operation of the construction Long Lane Compound A, Long Lane Compound B and Long Lane Utilities Logistics Hub in the adjacent ward.

There would be no physical impacts on scheduled monuments. Construction activities would temporarily introduce additional noise, lighting and visible construction activity and machinery in the vicinity of Long Lane compounds A and Long Lane compounds B and increases in noise/traffic along construction access routes including A1809 Dockyard Approach Road, Long Lane, and A1013 Stanford Road. However, due to distance from construction activity and secluded nature of Hangman's Wood, the scheduled monument would not be impacted by the project

Measures to reduce impacts during construction

No mitigation required as heritage not impacted.

17.11.2 Operations

Operational impacts

No operational impacts.

Measures to reduce the impacts during operation

No mitigation required.

17.12 Contamination

Construction

From the review of desk-based sources (historical maps and environmental data), there are no known medium or high-risk sources of contamination that could be disturbed during construction of the project within the Little Thurrock Blackshots and Little Thurrock Rectory wards.

By following a construction management plan and ensuring that, where potential sources of contamination are used (e.g. oils, lubes, mechanical plant), that appropriate spill containment and emergency response procedures are in place to prevent adverse environmental impacts from occurring.

Operation

During the operation of the road, should an incident occur for example a traffic accident resulting in localised contamination, significantly affected soils would be assessed and if necessary removed to reduce the risk of contamination migrating across a wider area or entering controlled waters. For more information on these controls, see the REAC.

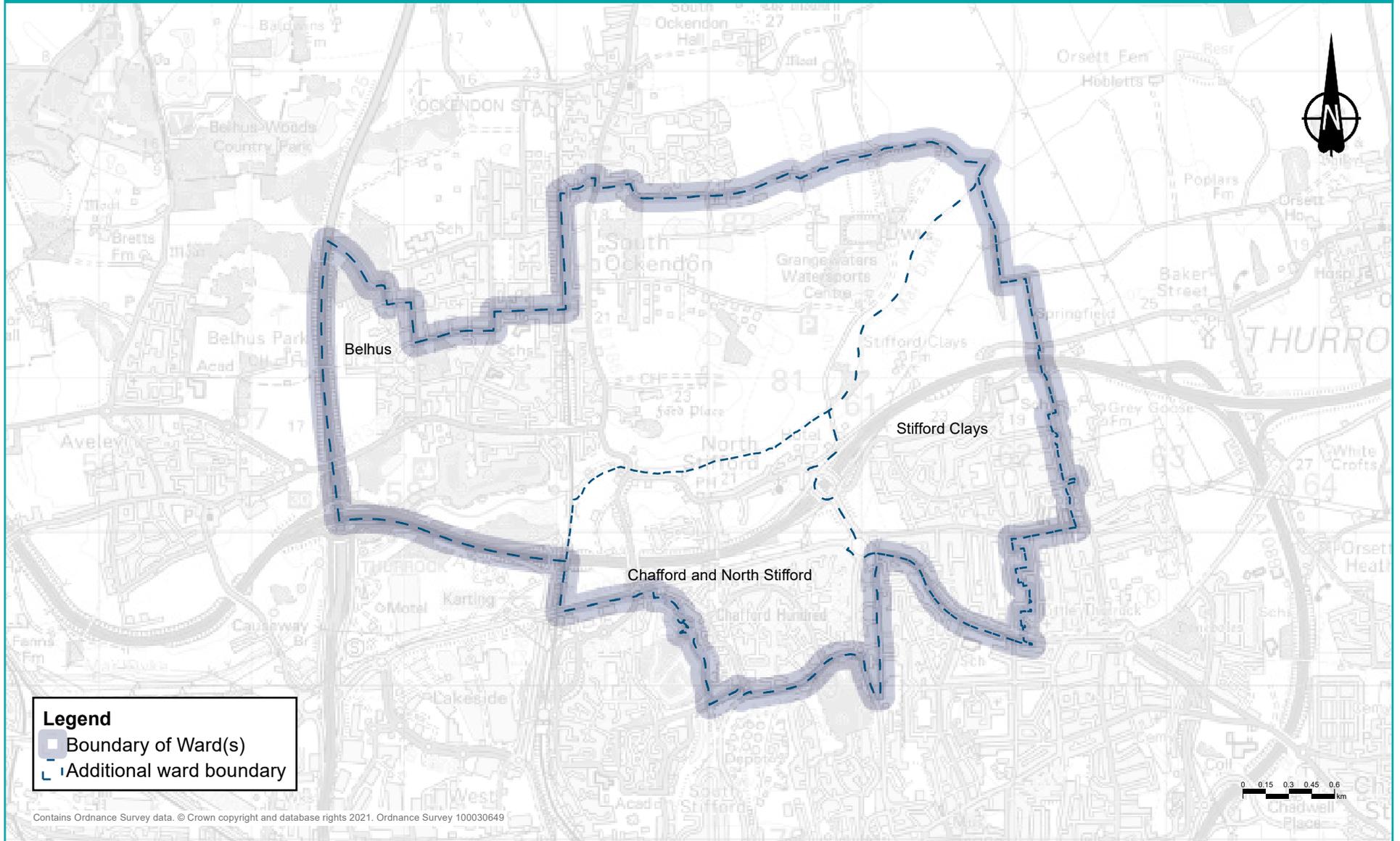
Chapter 18: Stifford Clays, Chafford and North Stifford, and Belhus wards

This chapter summarises the project's construction and operational activities in Stifford Clays, Chafford and North Stifford, and Belhus wards, which are situated in the borough of Thurrock. It also explains the measures intended to reduce the project's impacts on local communities. For more information about the assessments in this chapter and other information available during this consultation, see chapter 1, which also includes a map showing all the wards described in this document.

The activities within and impacts on these three wards are presented together in one chapter because these wards are on the fringes of the area directly affected by the project and the impacts on the wards are similar.

Within this document, we sometimes advise where additional information can be found in other consultation documents, including the Construction update, Operations update, You said, we did, Register of Environmental Actions and Commitments (REAC), Code of Construction Practice (CoCP), Outline Traffic Management Plan for Construction (OTMPfC) and Design principles. To find out more about these documents, see chapter 1. References to these documents provide an indication as to how our proposals to reduce the project's impacts will be secured within our application for development consent.

Figure 18.1: Ward boundary map for Stifford Clays, Chafford and North Stifford, and Belhus wards



18.1 Overview

18.1.1 About these wards

Stifford Clays ward is located to the west of Little Thurrock Blackshots and Orsett wards. The ward has an area of around 2.8km² and an estimated population of 6,754¹. To the south of Stifford Clays Road it is predominantly residential, and there are agricultural fields north of the road. A section of Cats Mede, a Local Wildlife Site (LWS), is situated to the north-west of the ward. The Mardyke River, an Environment Agency designated main river, runs along the northern boundary of the site and through it. High-pressure gas mains and overhead power lines are located in agricultural fields to the north of the ward. The A13 runs east-west through the ward.

Chafford and North Stifford ward is west of Stifford Clays and south of Belhus ward. It has an area of around 2.3km² and an estimated population of 8,257². The ward is residential to the south of the A13, which runs east-west through the ward. North of the road is the A13, with further residential housing to the north along High Road, Clockhouse Lane, Stifford Hill and Guardian Avenue. The majority of the area to the north of the A13 is made up of open space. The Mardyke runs along the ward's northern boundary. A high voltage overhead electricity line is on land immediately south of the A13. The A13 runs east-west through the ward.

Belhus ward is north of Chafford and North Stifford ward and west of Stifford Clays ward. It has an area of around 6.3km² and an estimated population of 10,696³. The ward is residential in the west, with agricultural land to the east. The Mardyke River runs along the southern boundary. Buckles Lane traveller site is in the east of the ward, north of the Mardyke Valley Golf Club. It is made up of nine distinct 'sub-yards' containing a total of 109 plots. A high-voltage overhead power line is on land immediately south of the A13. The A13 runs along the southern ward boundary.

1, 2, 3 Office of National Statistics, 2018 ward-level population estimate

18.1.2 Summary of impacts

Table 18.1: Summary of impacts during the project’s construction and operation

Topic	Construction	Operations
<p>Traffic</p>	<p>Impacts</p> <p>The traffic impacts in the ward are likely to be restricted to the roads where there are traffic management measures in place and the A13. Further details about the proposed traffic management can be found in the Construction section of this chapter.</p> <p>Mitigation</p> <p>There are several mitigation measures to reduce the impact of the construction process on local residents, including avoiding using local roads where possible. More information about the mitigation measures can be found in the Traffic section of this chapter.</p>	<p>Impacts</p> <p>Within these wards, there would be decreases in traffic flows on the M25 north of junction 30 in both northbound and southbound directions and on the A13 eastbound and westbound. There would also be changes in traffic flow on local roads such as Stifford Clays Road, the A1012 and the West Thurrock Arterial Way. See the Traffic section for more information.</p> <p>Mitigation</p> <p>Regular reporting would take place once the project is operational. Further details about the mitigation measures for Stifford Clays, Chafford and North Stifford and Belhus wards can be found in the traffic section of this chapter.</p>
<p>Public transport</p>	<p>Buses</p> <p>Journey times on the Z2 bus may increase due to the increased traffic flows on the A13. Traffic management may affect buses using local roads.</p> <p>Rail</p> <p>During construction, there may be some increases in journey times to Grays and Ockendon stations, associated with increased traffic through the area and traffic management on the local roads.</p>	<p>Buses</p> <p>While there would be no impacts on journey times for most bus routes, there would be changes to journey times for three buses: the 25 from Stifford Clays through Grays to Purfleet, the 51 from Prittlewell to Grays and Chafford, and the 265 from West Horndon to Grays.</p> <p>Rail</p> <p>There would be no discernible change in access times to Ockendon station and no change to rail services once the project is operational.</p>

Topic	Construction	Operations
<p>Footpaths, bridleways and cycle routes</p>	<p>Impacts</p> <p>Two bridleways and one footpath would need to be closed during the construction period, while one cycle route would be affected by the realignment of the Stifford Clays Road.</p> <p>Mitigation</p> <p>Where closures of footpaths and bridleways are necessary to allow for construction works, these closures would be reduced as much as possible. The Stifford Clays Road would be diverted adjacent to the existing road, which would remain open other than a short period when the road is realigned and bridges over the project constructed.</p>	<p>Impacts</p> <p>One bridleway and one cycle route impacted by construction would have been upgraded and have new connections, once the project is operational.</p> <p>Mitigation</p> <p>No mitigation is required.</p>

Topic	Construction	Operations
<p>Visual</p>	<p>Impacts</p> <p>Construction traffic using Stifford Clays Road would be visible from the northern edge of Stifford Clays. From the local cycle route along Stifford Clays Road and the bridleway along Green Lane there would be views of Green Lane Utility Logistics Hub and more distant views towards Stifford Clays Road West and East compounds, overhead line diversion works and construction of Green Lane green bridge. From Mardyke Way, there would be distant views of road construction and Orsett Fen Viaduct, as well as construction traffic using Medebridge Road.</p> <p>Mitigation</p> <p>The visual impacts of the project would be controlled through the range of good practice measures set out in the CoCP and the REAC.</p>	<p>Impacts</p> <p>From Mardyke Way, there would be views of the Lower Thames Crossing and Orsett Fen Viaduct. The diverted section of overhead line would be similar to the current view and glimpses of traffic on the A13/A1089 junction would be possible from the bridleway along Green Lane.</p> <p>Mitigation</p> <p>False cuttings and landscaping would help to screen the views of the new road and traffic, integrating the project in to the surrounding landscape.</p>

Topic	Construction	Operations
<p>Noise and vibration</p>	<p>Impacts</p> <p>The construction activity associated with upgrades to the A13/A1089 junction and utilities works is expected to create noise in these wards. Within Stifford Clay ward, there is anticipated to be night-time or weekend road closures for highways works. There would be negligible changes in noise from road traffic for most roads in the ward during the construction period, except for Stifford Clays Road and High Road where major increases in road traffic noise are predicted. In these wards there would be no percussive or vibratory works.</p> <p>Mitigation</p> <p>Construction noise levels would be controlled through the mitigation measures set out in the REAC. There are also measures presented in the CoCP.</p>	<p>Impacts</p> <p>Once the project is built, there would be noise impacts from the road in the north-eastern edge of the Stifford Clays and the eastern edge of Belhus. There would be no noise impacts on Chafford and North Stifford. In all wards there would be an indirect noise impact from the changes in traffic flow and speed on the existing road network.</p> <p>Mitigation</p> <p>Low-noise road surfaces would be installed on all new and affected resurfaced roads, plus noise barriers would be installed.</p>

Topic	Construction	Operations
<p>Air quality</p>	<p>Impacts</p> <p>Properties more than 200 metres from the worksite, which is the majority of properties within these wards, are outside the area likely to be affected by construction dust or emissions from the worksite. There are only a few properties within 200 metres of the worksite in the Stifford Clays and Chafford and North Stifford wards. Analysis of the construction phase traffic flows associated with the project indicate a temporary minor worsening in air quality around the A13 corridor (Stifford Clays and Chafford and North Stifford wards) and a temporary minor improvement around the M25 (within Belhus ward).</p> <p>Mitigation</p> <p>The contractor would follow good practice construction measures which are presented in the CoCP and REAC to minimise the dust. Construction vehicles would need to comply with emission standards. An air quality management plan would be designed in consultation with the relevant local authorities. The plan would include details of monitoring which would ensure measures are effectively controlling dust and exhaust emissions.</p>	<p>Impacts</p> <p>There would be no exceedance of NO₂ and PM₁₀.</p> <p>Mitigation</p> <p>No mitigation is required.</p>

Topic	Construction	Operations
<p>Health</p>	<p>Impacts</p> <p>The construction phase of the project would present opportunities to access work and training. There are likely to be changes in the area that may result in negative impacts on health, including mental health and wellbeing. There is also likely to be perceivable changes in the levels of noise from the construction of the new road and construction traffic. There would also be temporary visual impacts as set out in this table earlier and changes in accessibility.</p> <p>Mitigation</p> <p>The negative impacts would be mitigated through the good practice construction measures presented in the CoCP and REAC relating to dust emissions, working hours, noise and visual screening, traffic management measures and community engagement. This includes the establishment of Community Liaison Groups.</p>	<p>Impacts</p> <p>The project would improve access to work and training, and access to open space and accessibility of local resources and amenities. Potential noise impacts have been identified within Stifford Clays ward.</p> <p>Mitigation</p> <p>No essential mitigation is required for health other than those measures described in the Noise mitigation and Visual sections.</p>

Topic	Construction	Operations
<p>Biodiversity</p>	<p>Impacts</p> <p>The construction of the project would involve the removal of areas of habitat, both temporarily and permanently for the new road. This habitat supports a range of protected and notable species (reptiles and potential bat roosts).</p> <p>In Chafford and North Stifford, a small area of scrub would be removed next to Stifford Clays Road and Medebridge Road, and another next to Medebridge Road. This would cause the loss of a small area of reptile habitat.</p> <p>Mitigation</p> <p>Vegetation would be cleared during the winter where possible to avoid any impact on breeding birds.</p> <p>Protected species would be relocated, carried out under a Natural England licence. Boxes to support bats and birds would be erected. Habitat lost temporarily (including the scrub) for construction works would be reinstated.</p>	<p>Impacts</p> <p>There is the potential to cause mortality of species by encountering road traffic as well as habitat fragmentation and disturbance from traffic.</p> <p>Mitigation</p> <p>Mitigation measures include landscape planting, which has been designed to allow animals to move and forage, and guides them to safe crossing point such as the green bridge over Green Lane. Newly created habitats would be managed to ensure they provide high quality habitat to support a broad range of plant and animal species.</p> <p>Impacts would also be managed through the range of good practice measures set out in the CoCP and REAC.</p>

Topic	Construction	Operations
Built heritage	There would be no impacts to built heritage.	
Contamination	There are no known medium or high-risk sources of contamination that could be at risk of disturbance during construction of the project within the Stifford Clays, Chafford and North Stifford and Belhus wards.	<p>Impacts None identified.</p> <p>Mitigation Once the road opens, if an incident occurs that results in localised contamination (for instance a traffic accident), we would assess and if necessary remove any affected soils to reduce the risk of further contamination across a wider area or entering water courses. More information on these controls can be found in the REAC.</p>

18.2 Project description

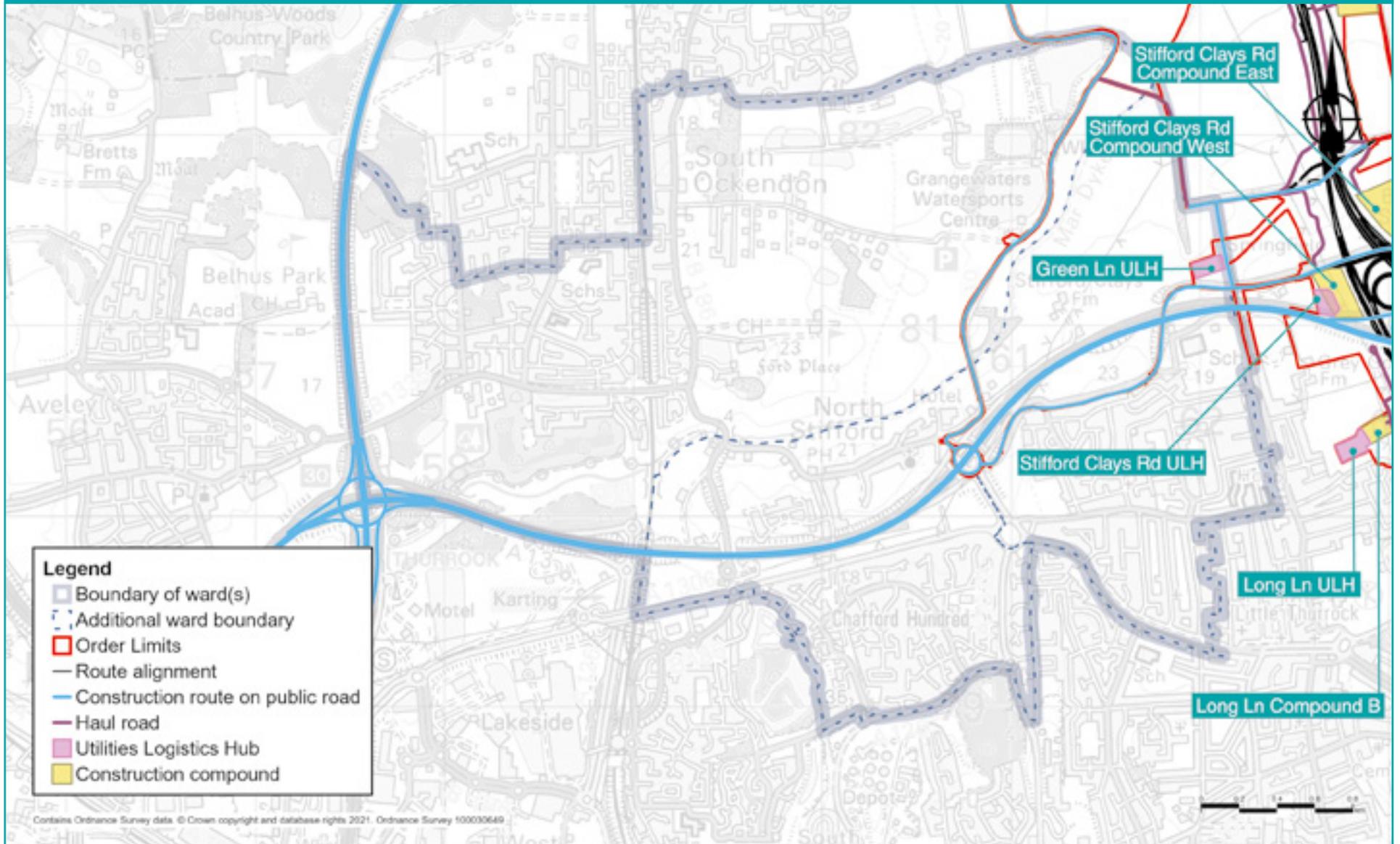
18.2.1 Construction

Construction activities

More information about how the area would look during construction, including visualisations, can be found in the Construction update.

Construction activities in these three wards would include the provision of roads for construction traffic to access the worksite, which lies to the east and north-east of Belhus and Stifford Clays wards.

Figure 18.2: Main construction areas in Stifford Clays, Chafford and North Stifford, and Belhus wards



We would also carry out the installation of temporary utilities along Medebridge Road to allow the Stifford Clays Road West Compound to operate and we would divert existing telecommunications networks along Stifford Clays Road to accommodate this compound.

We are proposing to use Medebridge Road to allow construction traffic to access the worksite, with part of that road passing through Belhus ward. The only construction activity within the ward would be the creation and subsequent removal of a temporary haul road off Medebridge Road to provide this access. Once in place, this haul road would help keep construction traffic delivering equipment and materials off local roads, reducing the impact on nearby communities.

Stifford Clays and Chafford and North Stifford are included within our Order Limits, (the area of land required to construct and operate the project, formerly known as the development boundary), because Medebridge Road is accessed via Stifford Clays Road, which runs through both wards. Whilst no construction activity is proposed within Stifford Clays or Chafford and North Stifford wards, a temporary water pipeline installation from Grangewater to Stifford Clays Road Compound West is proposed within Belhus ward.

Construction compounds and Utility Logistics Hubs

Construction compounds are fenced-off areas, accessible to construction traffic, which provide the facilities for our project to be built efficiently. For example, compounds would provide parking, storage for machinery and materials, offices, welfare facilities, refuelling, and vehicle and wheel-washing facilities to make sure vehicles leaving the compound do not dirty local roads.

There are no construction compounds in any of these wards. The Green Lane Utility Logistics Hub (ULH) would be located in Stifford Clays ward. Access to it would be via Stifford Clays Road and Green Lane. This ULH would provide an area from which utility diversions could be organised and delivered, including the diversion of two high-pressure gas pipelines, one north of Green Lane and one around the north of the A13. It would share an access route with Stifford Clays Road Compound West in Orsett ward.

Construction related traffic

There will be a few HGVs going to the Green Lane ULH but this will be less than 20 vehicles a day.

Construction routes on public roads

Medebridge Road, Stifford Clays Road and Green Lane would be used for construction traffic. Where these roads are currently part of the public road network, they would remain open to the public during the construction period, except for periods when specific traffic management measures are required (see below). Part of Medebridge Road is privately owned and would remain off limits to the public.

Construction schedule

Construction of the entire project is scheduled to last for around six years from 2024 to 2029. To deliver the construction programme efficiently, activities would be divided into packages of work and delivered in a coordinated way. Maps and programmes can be found in chapter 5 of the Construction update.

Construction working hours

Most construction activities in this ward would take place during core hours, from 7am to 7pm on weekdays and 7am to 4pm on Saturdays. However, there would be circumstances when our working hours would need to be extended. For example, widening roads and connecting new roads to existing ones would be carried out when there is less traffic, so it is safer for both construction workers and road users. Working outside of the core hours can also benefit road users by reducing the need for traffic management measures during peak times. More information about working hours is set out in the Noise and Vibration section below and in the CoCP.

Traffic management

The following traffic management measures would impact Stifford Clays ward and Chafford and North Stifford ward. There would be no traffic management affecting Belhus ward.

Table 18.2: Main traffic management measures in Stifford Clays, Chafford and North Stifford, and Belhus wards

Road(s) affected	Traffic management	Purpose	Duration
Medebridge Road	Lane restrictions	Install traffic measures for construction vehicles	4 months between January and August 2024
Stifford Clays Road	Lane reductions and traffic lights (in 300 metre sections)	Utility diversions and installation of utility connections to Stifford Clays Road West Compound	Nights and weekends only between January and August 2024

Measures required across the project would include narrow lanes, reduced speed limits, lane closures and temporary traffic lights. We have sought to minimise traffic management measures wherever practical. However, they would be necessary in some places to allow construction traffic and local communities to travel safely, while providing construction workers with sufficient space to operate.

An overview of the traffic management required across the project can be found in the Outline Traffic Management Plan for Construction. All traffic management measures are based on an indicative construction programme, which would be finalised by the appointed contractor. The contractor's final traffic management plans will be subject to final approval by the Secretary of State for Transport, following consultation with the local highways authority.

18.2.2 Operations

The completed project

There would be no operational activities in Stifford Clays, Chafford and North Stifford, or Belhus wards once the new road is open.

For more information about the completed project, see the Operations update, as well as the large-scale figures in Map Book 1: General Arrangements.

Changes to the project since our design refinement consultation

There have been no changes to the project or Order Limits in Stifford Clays, Chafford and North Stifford, or Belhus wards since our design refinement consultation in July 2020.

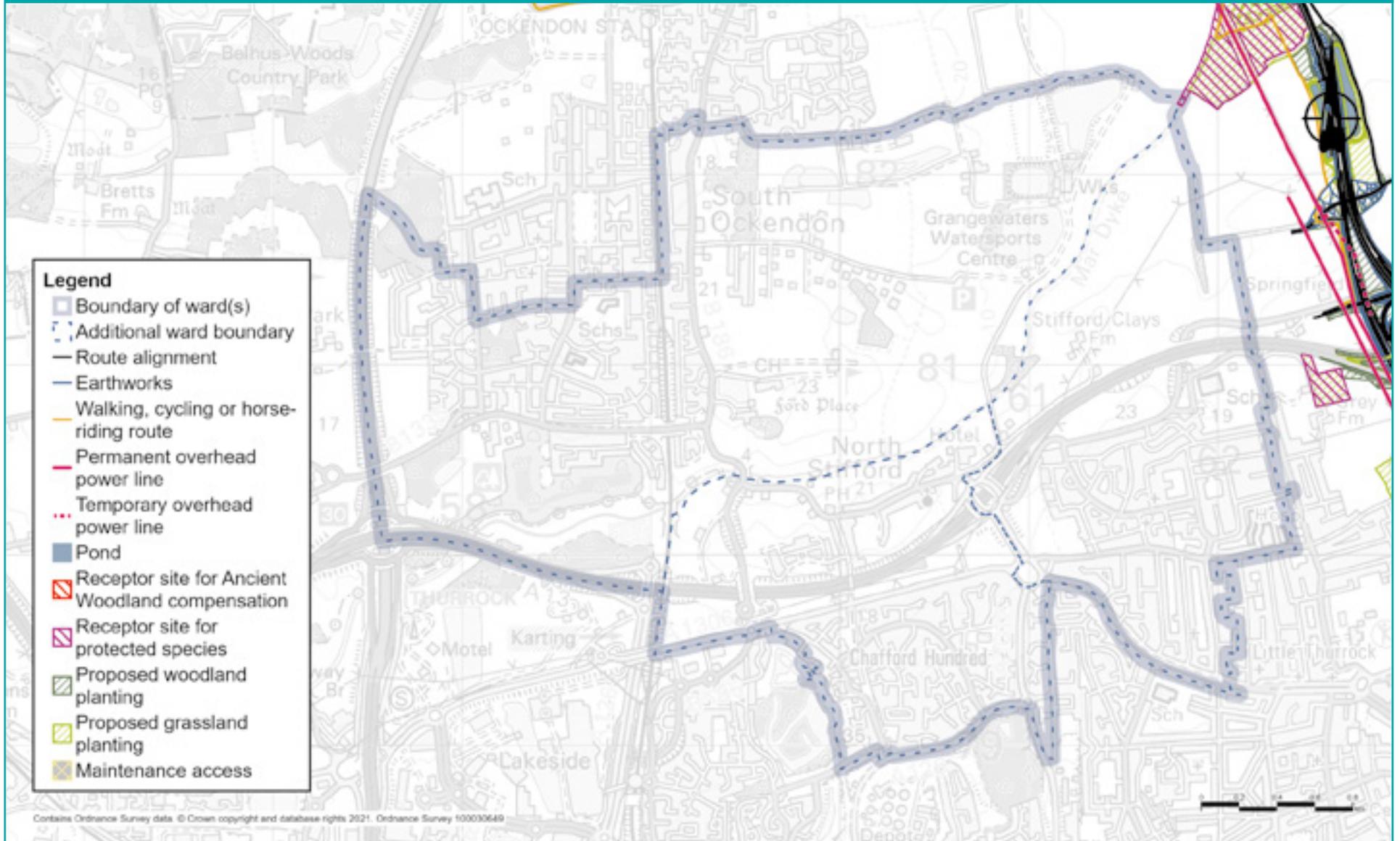
Impacts on open space and common land

Within Stifford Clays, Chafford and North Stifford and Belhus wards, there are no proposals to remove or replace open space land. More information about our proposals for compensating for impacts on open space land (which includes special category and recreational land), including proposals we have consulted on previously, can be found in chapter 3 of our Operations update.

Impacts on private recreational facilities

Within Stifford Clays, Chafford and North Stifford and Belhus wards we propose to use an area of the Grangewaters Outdoor Education Centre car park for utility connection works. The use of the car park would be temporary while the connection is established and we would keep disruption to a minimum. This means some of the car park bays would be out of use for a short period of time.

Figure 18.3: The main features of the project once it is operational



18.3 Traffic

We carried out traffic assessments to understand how construction and operation would affect nearby roads, compared with the situation if the project was not implemented. For more information, see chapter 4 of the Operations update.

18.3.1 Construction

The traffic impacts in the ward are likely to be restricted to the roads where there are traffic management measures in place. There will be additional traffic on the A13 in these wards, both HGVs and staff cars but much of this traffic will not be in the same direction as the main morning peak traffic westbound into London and evening peak traffic out of London eastbound.

Measures to reduce construction traffic impacts

Our approach to construction has been refined after further investigations and feedback. A summary of the proposed measures introduced to reduce the volume of construction materials transported in and out by road can be found in chapter 2 of the Construction update. To reduce the construction traffic impacts in Stifford Clays, Chafford and North Stifford and Belhus, we would carry out measures such as the following:

- Minimise use of the local road network as far as possible through construction of temporary offline haul routes directly from the strategic road network.
- Our proposals allow for re-use of excavated materials, and would substantially reduce the need to dispose of excavated material via the road network, thereby reducing the number of HGV movements from the public road network during the construction phase.
- Where practical, new bridge structures have been designed so that they can be built offline to avoid extended road closures. Where offline construction is not possible and space is available to do so, the existing road would be temporarily realigned to facilitate construction of new bridges.
- Following discussion with key stakeholders, and where possible, HGVs associated with construction of the project would be banned from using some local roads.
- Stockpile material within the Order Limits to allow material to be managed on-site rather than offsite, reducing the number of HGVs journeys needed.

18.3.2 Operations

Operational impacts

The project's primary purpose is to relieve congestion at the Dartford Crossing and on its approach roads by providing a new free-flowing, north-south crossing over the River Thames. It would also make the Thames crossings, and key sections of the strategic road network, safer and more resilient.

Traffic modelling has been carried out to predict the change in traffic flows on roads in the area, including those within or on the boundary with these wards for the first year of operation (2029).

Figures 18.4, 18.6 and 18.8 below show the predicted changes in traffic in the morning peak (7am to 8am), interpeak (an average hour between 9am and 3pm) and evening peak (5pm to 6pm) measured in Passenger Car Units (PCUs per hour), where 1 PCU is equivalent to a car, and 2.5 PCUs is equivalent to an HGV. Figures 18.5, 18.7 and 18.9 below show the predicted percentage changes in traffic flow during the morning, interpeak and evening peak. For information about how we assessed operational traffic impacts, see chapter 1. For more information about how we carried out our traffic modelling, see chapter 4 of the Operations update.

In Belhus ward the largest change in traffic flows on the local road network is predicted to be on the B186 South Road, where the traffic flows will decrease northbound by between 50 and 250 PCUs in the morning peak hour. This is a decrease of between 20% and 40%.

On the M25 north of junction 30, the decrease in traffic flow would be between 500 and 1,000 PCUs northbound and southbound in the morning peak hour, and over 1,000 PCUs per hour in the interpeak period and the evening peak.

On the A13, east of the M25 between the motorway and the Stifford interchange, there are predicted to be major decreases in traffic levels. Westbound traffic flows would decrease by between 500 and 1,000 PCUs in the morning peak hour and interpeak period and by over 1,000 PCUs in the evening peak hour. In each time period this represents a decrease of between 10% and 20%. Eastbound, the decrease would be between 500 and 1,000 PCUs per hour in the morning and evening peak hours and between 250 and 500 PCUs in an average interpeak period. This is a decrease of between 10% and 20% in the peak periods and between 0% and 10% in the interpeak period.

Further east on the A13 between the Stifford interchange and the junction with the project, the decrease in traffic westbound is predicted to be over 1000 PCUs in the morning peak period and between 500 and 1000 PCUs in the interpeak and evening peak period. This is a decrease of between 10% and 20% in each of these time periods. Eastbound the decrease is between 500 and 1000 PCUs in each modelled time period. This is a decrease of between 10% and 20% in the morning peak hour and the interpeak and a decrease of between 0% and 10% in the evening peak period.

On Stifford Clays Road there would be a decrease in flows of between 50 and 250 PCUs westbound in each time period which is a decrease of over 40% in the morning peak period and between 20% and 40% in the interpeak and the evening peak hour. The change eastbound in all time periods is less than 50 PCUs.

On the local road network in the Stifford Clays ward there would be a decrease in traffic on Crammavil Street northbound of between 50 and 250 PCUs (over 40%) in the morning peak hour. On Long Lane there is a decrease in traffic flows of between 50 and 250 PCUs westbound in the morning and evening peak hour. This is a decrease of between 20% and 40%. Eastbound the decrease is between 50 and 250 PCUs (between 10% and 20%) in an average interpeak hour and the evening peak hour.

Lodge Lane is predicted to have a decrease in traffic flows in all time periods and both directions. Westbound the decrease is between 50 and 250 PCUs for each modelled hour, which is a decrease of between 20% and 40% in the morning peak hour and between 10% and 20% in the interpeak and evening peak hours. Eastbound there is a decrease of between 50 and 250 PCUs (10% to 20%) in the evening peak hour.

A1012 south of Stifford Clay interchange there is an increase in traffic flows northbound in the morning peak hour of between 250 and 500 PCUs (an over 40% increase) and a decrease of between 50 and 250 PCUs (a 0% to 10% decrease) in the evening peak hour. Southbound on this road, there is a decrease in the morning peak hour of between 50 and 250 PCUs (a 10% to 20% decrease) and an increase in the evening peak hour of between 50 and 250 PCUs (an increase of between 10% and 20%).

Westbound on the West Thurrock Arterial Way, there is a predicted decrease in flows of between 500 and 1000 PCUs in the morning peak, a decrease of between 20% and 40%. In the interpeak and the evening peak the decrease is predicted to be between 50 and 250 PCUs an hour, a decrease of between 10% and 20%.

Figure 18.4: Predicted change in traffic flows (PCUs) with the project during the morning peak in 2029

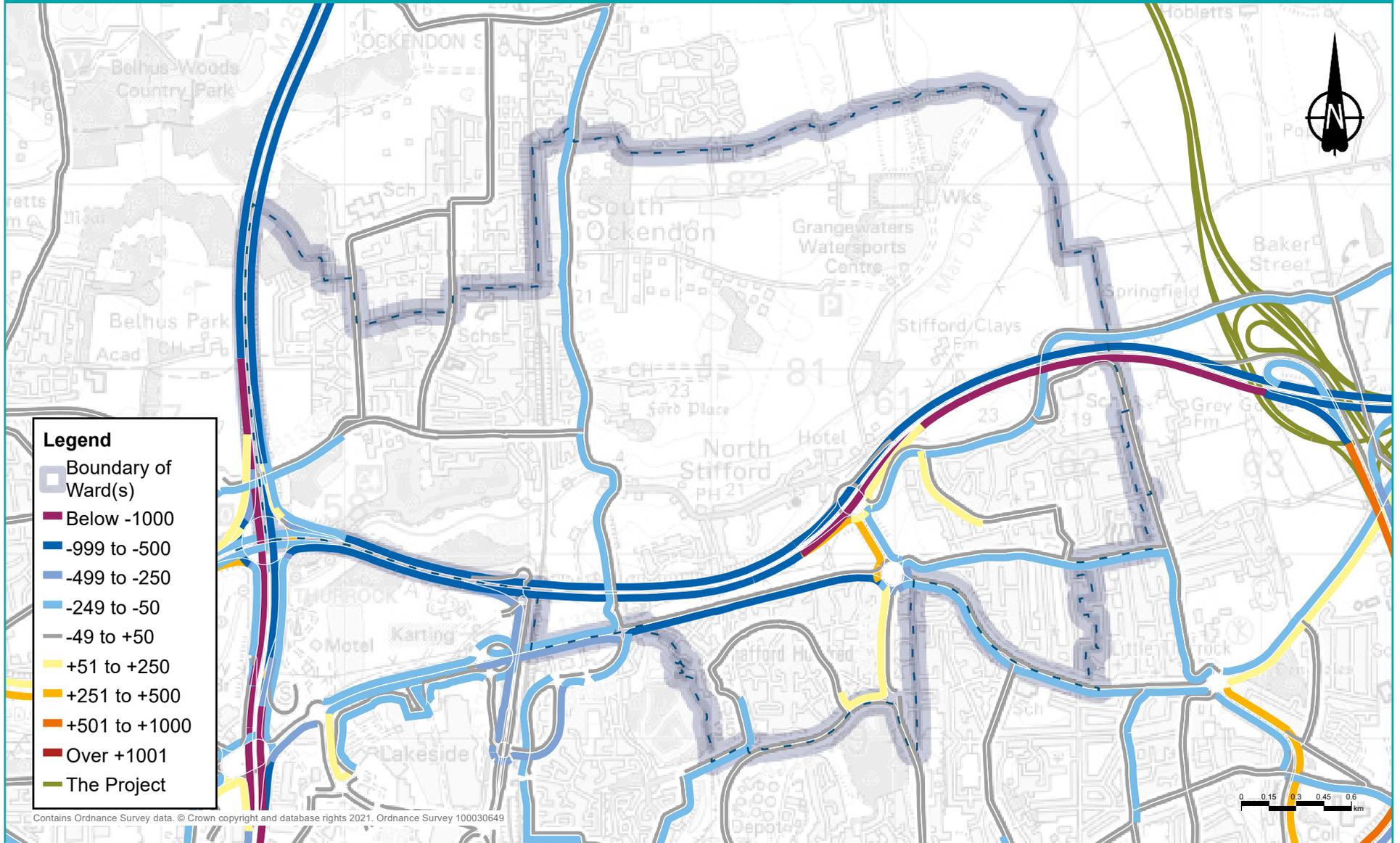


Figure 18.5: Predicted percentage change in traffic flows with the project during the morning peak in 2029

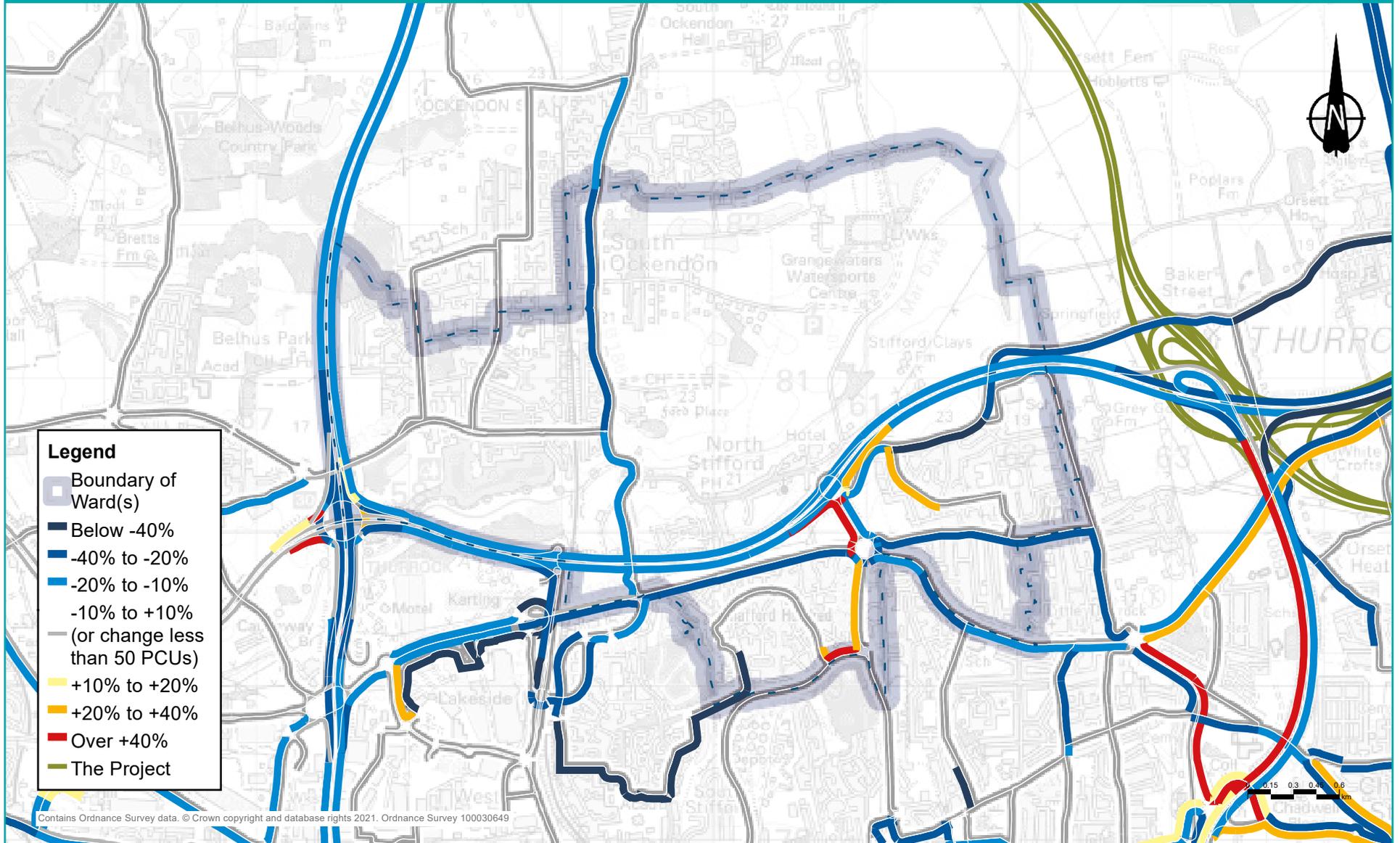


Figure 18.6: Predicted change in traffic flows (PCUs) with the project during the interpeak in 2029

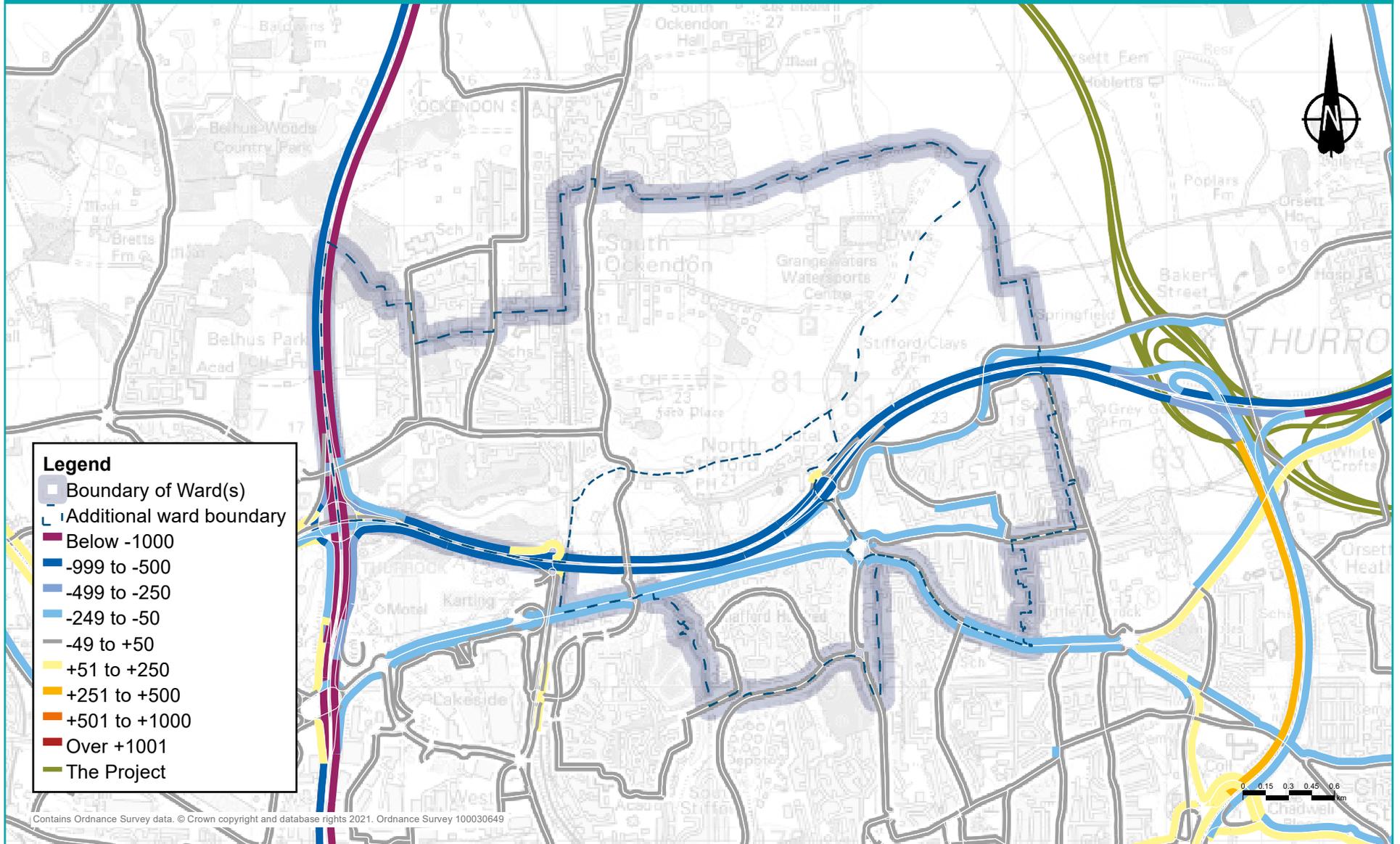


Figure 18.7: Predicted percentage change in traffic flows with the project during the interpeak in 2029

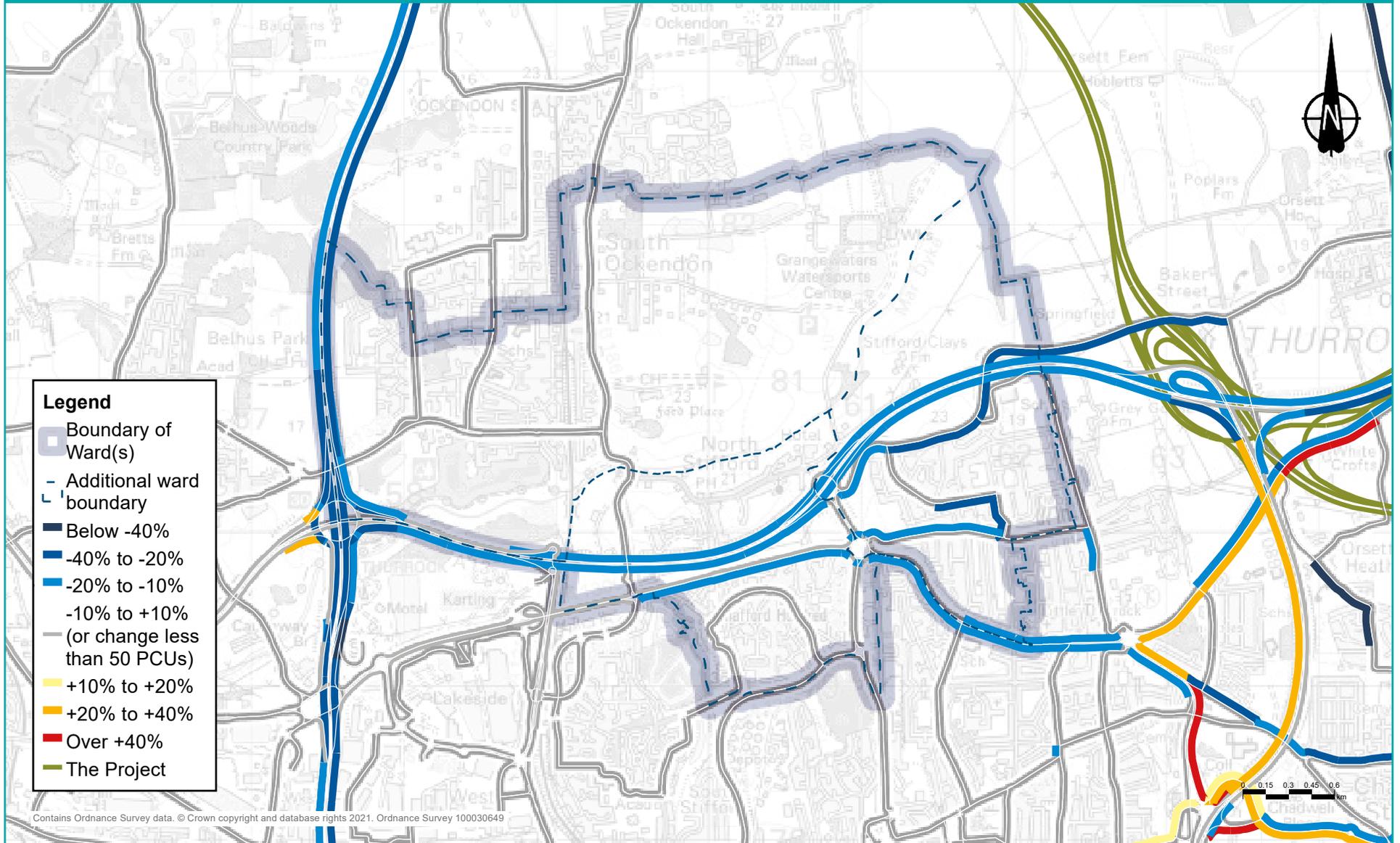


Figure 18.8: Predicted change in traffic flows (PCUs) with the project during the evening peak in 2029

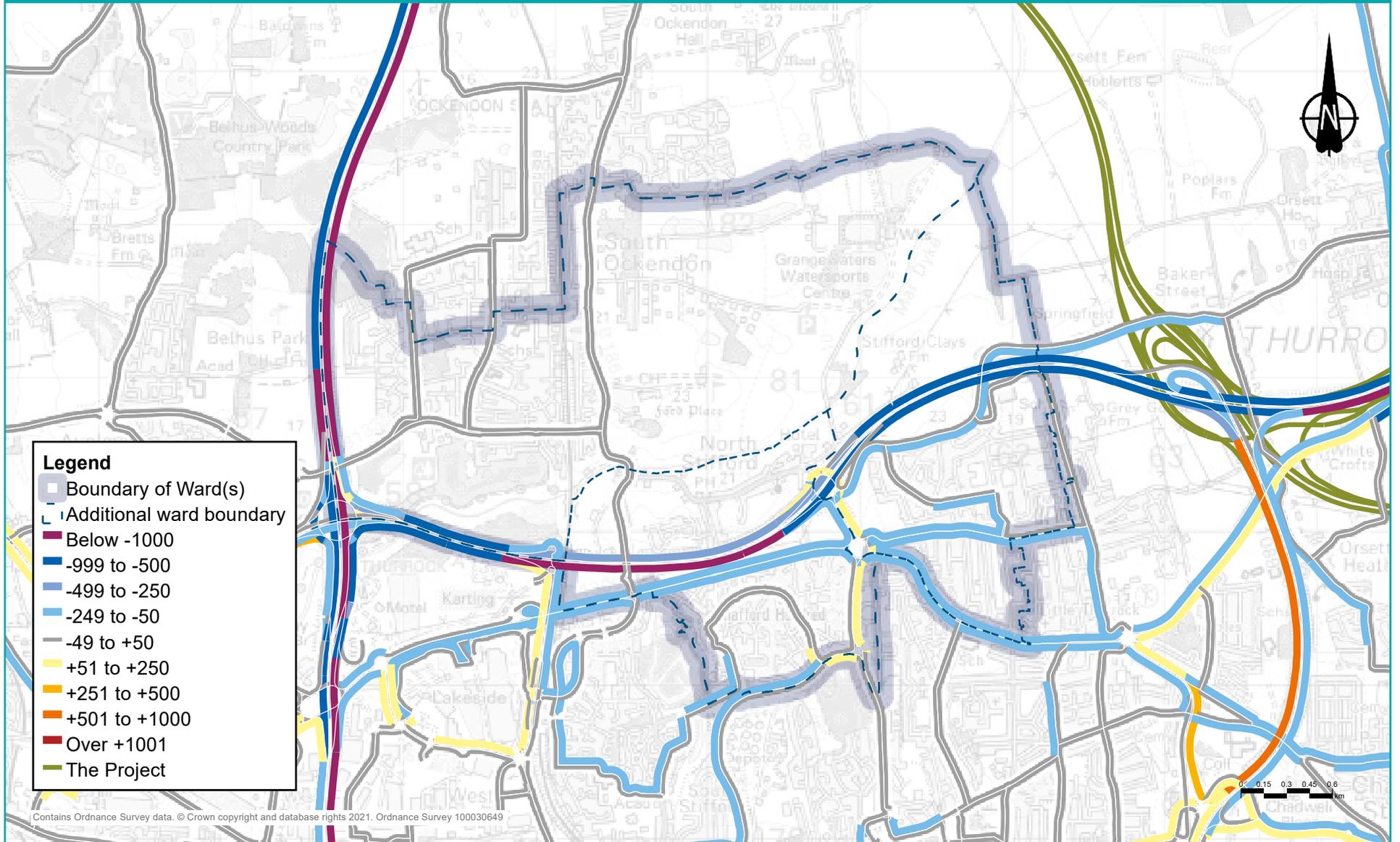
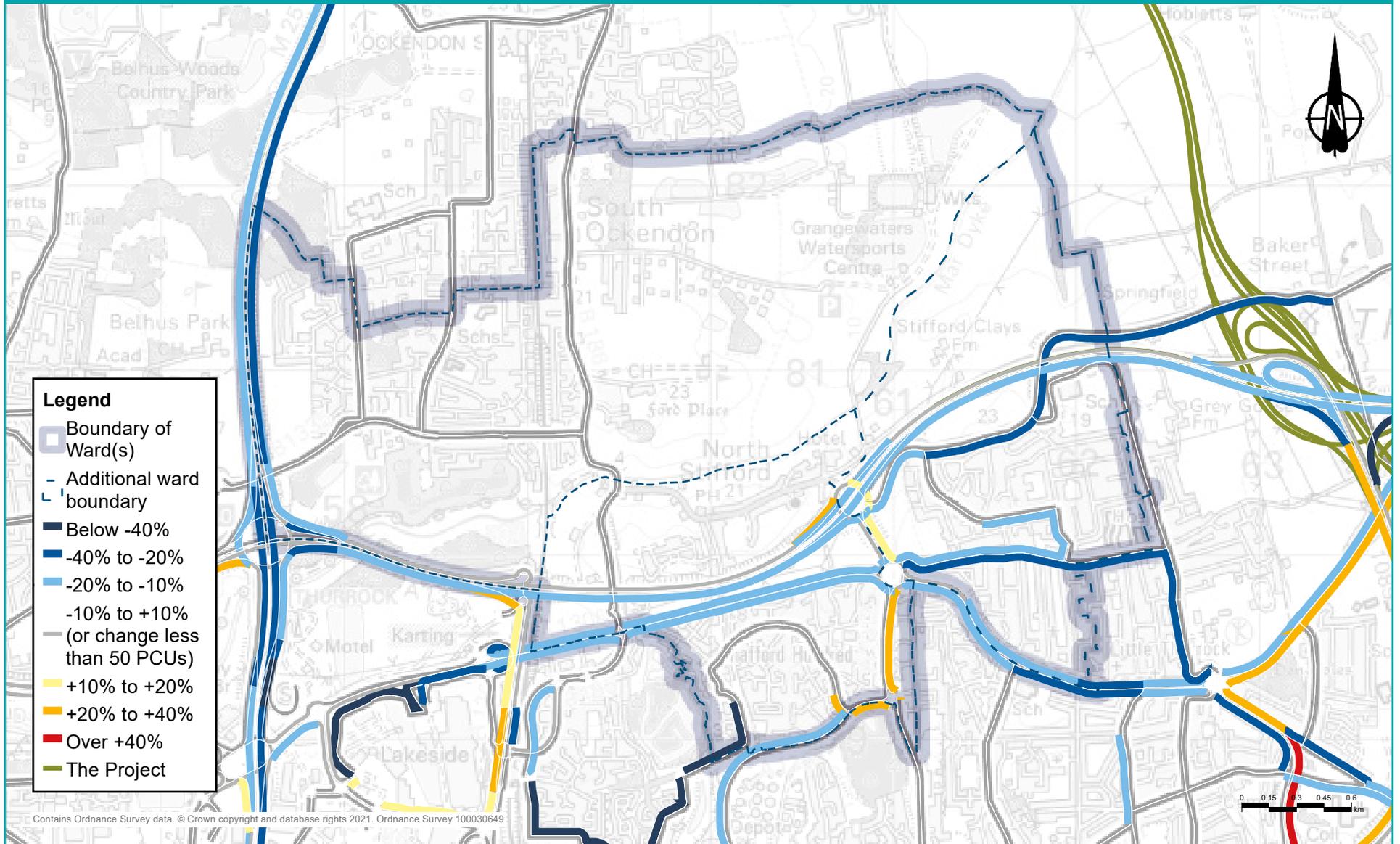


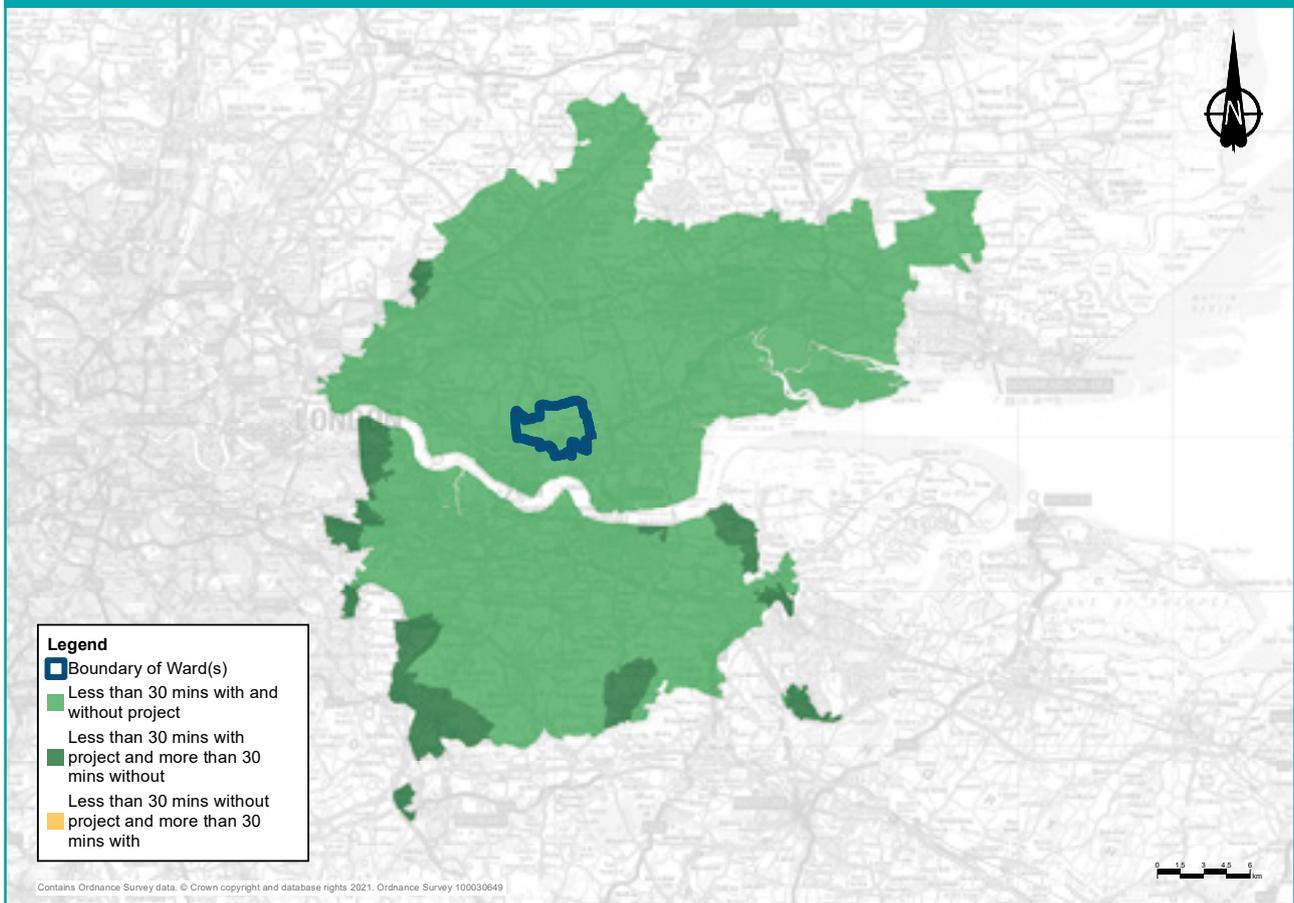
Figure 18.9: Predicted percentage change in traffic flows with the project during the evening peak in 2029



Changes to journey times

Figure 18.10 below shows the change in the area that could be reached within a 30-minute drive from the centre of the ward both without the project and with the project. Figure 18.11 shows the change in area that can be reached within a 60-minute drive. The areas have been calculated for the morning peak hour (7-8am). The number of jobs within a 30-minute catchment area would increase by 8% with the project which would provide access to 42,800 additional jobs. The number within a 60-minute drive would decrease by 1%, which would provide access to 35,000 fewer jobs. Despite the project providing a substantial net gain in access for motorists within these wards, there is an area (shown in orange in Figure 18.11) that would no longer be accessible by car within 60 minutes because of changes to traffic flows on the wider road network.

Figure 18.10: Change in the area that motorists could drive to within 30 minutes

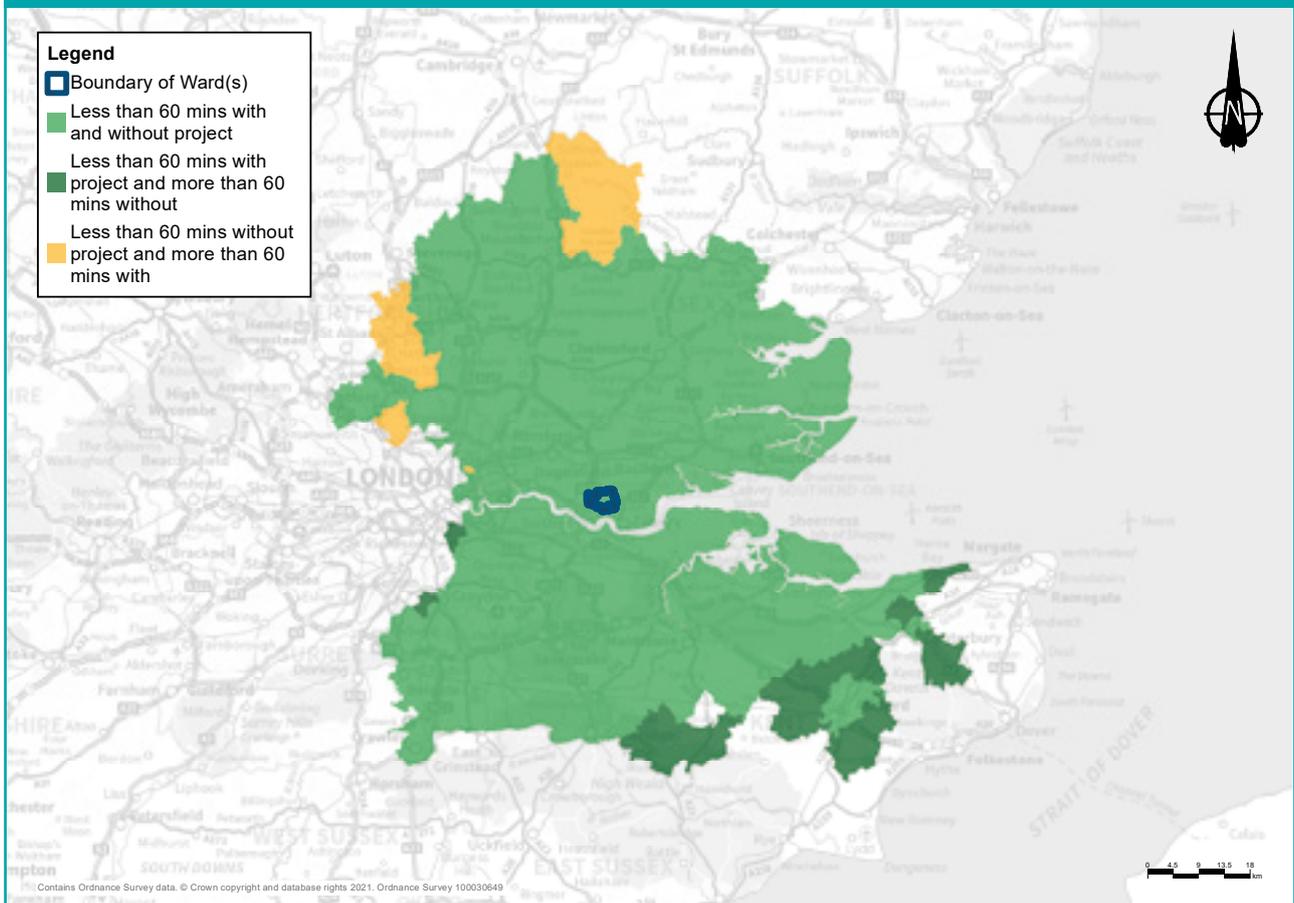


Operational traffic flows

The new road has been designed with fast, free-flowing junctions connecting to the strategic road network, including at the A13 and A1089, which would help maintain traffic flow. There would be no roundabouts or traffic lights on the main route, although these would be necessary when connecting to the local road network, such as at the Orsett Cock junction. Connections between the project and the local road network have been limited to those that would provide the optimum balance between maximising economic benefits and minimising traffic impacts for local communities.

Once the project is operational, traffic impacts on the affected road network would be monitored, including on local roads. Where appropriate, we would work with the relevant highway authority to seek funding from the Department for Transport for further interventions.

Figure 18.11: Change in the area that motorists could drive to within 60 minutes



18.4 Public transport

Existing situation

Rail

The Tilbury Loop railway line skirts the edge of Chafford and North Stifford ward, while passing through Belhus ward. The nearest stations are Ockendon and Grays.

Buses

There are several bus routes that run within these wards including: 10; 11; 22; 25; 265; 269; 33; 370; 37A; 51; 77; 77A; 7A; 7B; 7C; 88; 88A; X1; X80; Z1 and Z2.

18.4.1 Construction

Buses

Journey times on the Z2 bus may increase due to the increased traffic flows on the A13.

Traffic management works may affect buses using local roads, leading to increased journey times while the measures are in place. Affected buses would include the 11, 25, 88, and the 269.

Rail

There would be a series of night-time rail possessions of the Tilbury Loop railway. These possessions would be agreed with the network operator. It is intended that the works will take place outside train operational times, and so services to Grays and Ockendon stations would not be disrupted.

Throughout construction there may be some increases in journey times to Grays and Ockendon stations, associated with increased traffic through the area and traffic management on the local roads.

18.4.2 Operations

Rail

There would be no discernible change in local access times to Ockendon or Grays stations and no change to the rail services at those stations.

Buses

There would be no changes to bus routes through these wards once the new road opens and no discernible change to most bus journey times. The following buses would experience changes to journey times:

- The 25 bus from Stifford Clays through Grays to Purfleet. Westbound services would be predicted to experience a quicker journey time by up to two minutes in the morning peak hour.
- The 51 bus from Prittlewell to Grays and Chafford Hundred would have an increased journey time of nearly seven minutes in the westbound direction along the entire route in the morning peak hour. There would only be a slight change in other time periods and directions.
- The 265 bus from West Horndon to Grays would run around two minutes quicker southbound in the evening peak hour.

18.5 Footpaths, bridleways and cycle routes

Existing situation

Stifford Clays, Chafford and North Stifford and Belhus wards are characterised by suburban and rural areas with a small network of local footpaths connecting to South Ockendon and Bulphan. The following sections set out how these would be affected by construction of the project and which routes would be in place once construction is complete. For other potential impacts, see the other topic areas in this chapter, such as Visual and Noise and vibration.

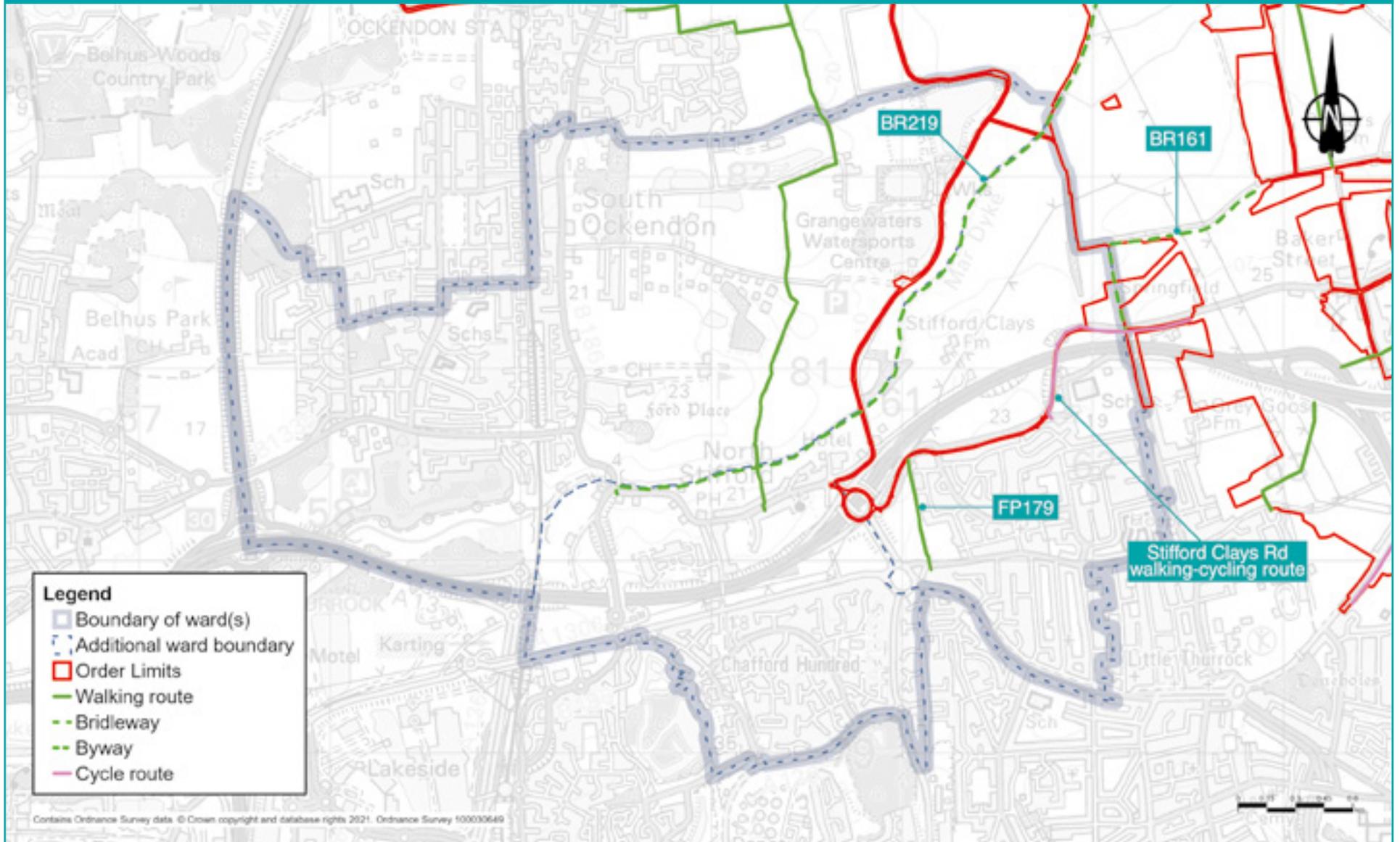
18.5.1 Construction

Construction impacts

Due to the proximity of these wards to the A13 junction works, there would be a small amount of disruption during construction. More information about the proposed network of footpaths, bridleways and cycle routes after completion of the project can be found in the Operational impacts section.

- Bridleway BR161 would need to be closed for six months for overhead power line realignment works.
- A section of Bridleway BR219 to the north-east of the ward would need to be closed for five years to allow utilities diversion works and the construction of the Mardyke Viaduct. See chapters 16 and 20 for more information. We are currently working on a potential temporary diversion for this route, so that some or all of the amenity currently provided would be retained during the construction period.
- Stifford Clays Road would remain open along its existing alignment for the majority of the construction period. We would build the bridges carrying Stifford Clays Road over the new road alongside the existing route to minimise impacts on the road and its walking-cycling facilities.

Figure 18.12 Footpaths, bridleways and cycle routes in the vicinity of the project in Stifford Clays, Chafford and North Stifford, and Belhus wards



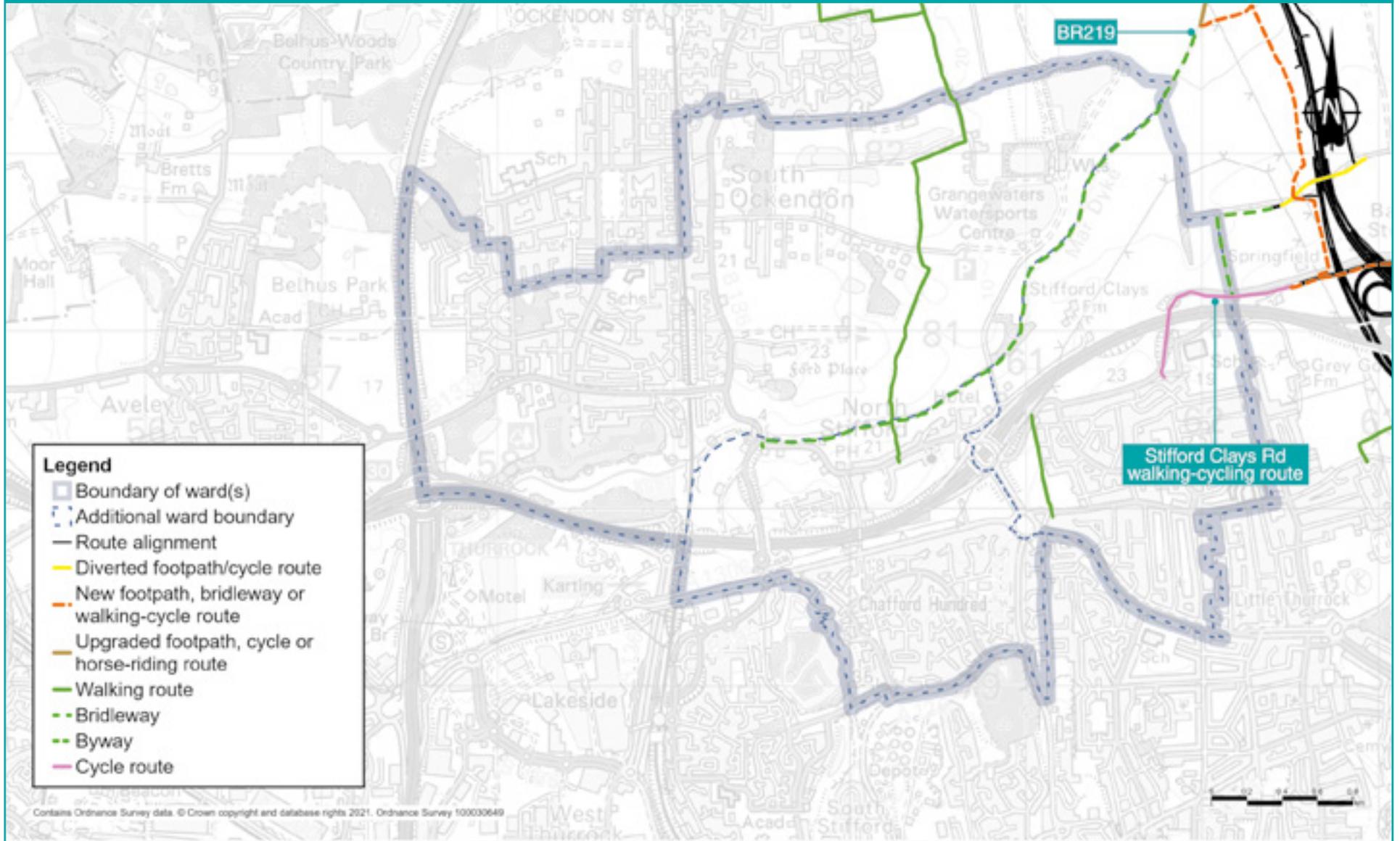
18.5.2 Operations

Operational impacts

Overall, proposals for walkers, cyclists, and horse riders include more than 46km of new, diverted, extended or upgraded footpaths, bridleways and cycleways. These would provide much improved connectivity across the project. The proposals were developed following consultation and engagement with local communities and stakeholders. For an overview of the proposed improvements to footpaths and bridleways, see chapter 2 of the Operations update.

- A section of bridleway BR219 north-east of Belhus ward would be upgraded and resurfaced, with a new bridge over the Mardyke River, suitable for walking, cycling and horse-riding. See chapter 16 and 20 for more information.
- The existing walking-cycling route on Stifford Clays Road would connect to a new walking-cycling route to the east. This would continue over the newly constructed bridges over the new road.

Figure 18.13: Proposed footpaths, bridleways and cycle routes



18.6 Visual

More information about how the area would look during construction, including visualisations, can be found in the Construction update.

Existing situation

Stifford Clays ward

Of the main populated areas, only the northern edge of the Stifford Clays urban area would have views towards the land on which the project would be built. Other views would come from a bridleway along Green Lane, a section of local cycle route along Stifford Clays Road, and from the Mardyke Way bridleway.

Existing views towards the land on which the project would be built are set out below:

- From homes along Stifford Clays Road, on the northern boundary of Stifford Clays, there are views of arable land bounded by roadside vegetation along the A13 corridor.
- From the local cycle route along Stifford Clays Road, and from the bridleway along Green Lane, views are of flat, open arable landscape, punctuated by woodland and crossed by overhead power lines.
- From Mardyke Way, the view is of largely flat, open arable land and overhead power lines. There are also views towards Medebridge Road.
- Views towards the proposed new road, encompassing the A13 roundabout junction in the north-east of Chafford and North Stifford ward, are screened by mature roadside vegetation.

Belhus ward

Views towards the land on which the project would be built from Belhus ward are limited to the eastern edge of the ward, primarily experienced from Mardyke Way.

- From Mardyke Way, views are of a largely flat, open arable landscape and overhead power lines. There are also views towards Medebridge Road.

Chafford and North Stifford ward

There would be no views of the land on which the project would be built from this ward.

18.6.1 Construction

Construction impacts

More information about how the area would look during construction can be found in the Construction update consultation document. There are visualisations of the construction period in chapter 8.

The main construction activities likely to cause visual impacts on these wards are:

- building the project's main route
- building the proposed A13/A1089 junction
- construction of Orsett Fen Viaduct
- constructing the Green Lane green bridge
- establishing and operating the Stifford Clays Road East and West Compounds
- establishing and operating Green Lane ULH and Stifford Clays Road ULH
- utilities works, including overhead power line diversion

More information about construction activities can be found in the Project description section of this and adjacent wards.

Views from the northern edge of the Stifford Clays urban area would be limited to construction traffic using Stifford Clays Road. Views from the local cycle route along Stifford Clays Road and from the bridleway along Green Lane would include Green Lane ULH, as well as more distant views towards construction of the Stifford Clays Road West and Stifford Clays Road East Compounds, overhead power line diversion works, and construction of Green Lane green bridge.

From Mardyke Way, there would be distant views of road construction, including the taller elements within the Stifford Road East Compound, and building of the Orsett Fen Viaduct. Construction traffic using Medebridge Road would also be visible.

Measures to reduce visual impacts during construction

Due to the limited nature of views, and types of receptors affected, specific construction mitigation was not deemed appropriate. The visual impacts of the project would be controlled through the range of good practice measures set out in the CoCP and the REAC.

18.6.2 Operations

When the new road opens, construction of the Lower Thames Crossing/A13 junction, the project route to the north and Green Lane green bridge would be complete. The construction compounds and ULHs would have been removed and the land restored to its former use.

More information about the completed project can be found in the Project description section above.

There would be no visual impacts from the local cycle route along Stifford Clays Road. The main visual impacts from this, and the bridleway along Green Lane, would be limited to glimpsed traffic on the proposed A13/A1089 junction, with the junction and Green Lane green bridge made substantially less intrusive by proposed planting. The diverted section of overhead line would be similar to the current view.

From Mardyke Way, there would be views of the project and Orsett Fen Viaduct, partially softened by woodland mitigation planting.

The main visual impacts from Mardyke Way would be views of the project and Orsett Fen Viaduct, again partially softened by woodland planting.

Measures to reduce visual impacts during operation

False cutting (earthworks to partially hide the road) and landscaping along the route would be the primary mitigation measures in these wards. This would help to screen views of the new road and traffic and integrate the project into the surrounding landscape.

18.7 Noise and vibration

We have carried out noise and vibration assessments for both the construction and operational phases of the project. As explained in chapter 1, some of the assessments set out below are based on earlier versions of the project. The information provided still presents a reasonable representation of the likely effects from the proposals presented during this consultation.

Existing situation

The existing noise environment in these wards is mainly traffic noise within:

- Stifford Clays, from the A13 and the A1012
- Chafford and North Stifford, from the A1306, A13, A126 and the A1012
- Belhus, from the M25, A13, B186 and the B1335

There is also noise from railways in Belhus and Chafford and North Stifford wards.

As part of our environmental assessment process, we carried out surveys of existing background noise at seven locations in these wards, which were agreed with the local authority:

- Stifford Clays – at two locations, we recorded average noise levels in the range of 60 to 77 dB(A)² during the day.
- Chafford and North Stifford – at two locations, we recorded average noise levels in the range of 54 to 60 dB(A) during the day.
- Belhus – at three locations, we recorded average noise levels in the range of 47 to 53 dB(A) during the day and 46 to 47 dB(A) during the night.

² Decibel (dB) is the unit used to measure noise levels, with dB(A) being a standardised way of averaging noise levels that accounts for how humans hear sounds. The typical level of sounds in the environment ranges from 30 dB(A), which is a quiet night-time level in a bedroom, to 90 dB(A), which is how it would sound by a busy road. See chapter 1 for more information about what decibel levels mean.

In order to understand how noise levels would vary with and without the project, we use noise modelling to predict what noise levels would be like in the project's proposed opening year if the project was not built. We model this because we cannot assume that noise levels when the project opens would be the same as they are now. For example, our assessment of the opening year noise levels take into account predicted changes in traffic levels.

We also model the predicted noise levels for the opening year with the project in place. This provides a useful comparison as to how the project would change the noise levels in the project's opening year if it were implemented.

In the opening year (2029), noise levels without the project are predicted to range, on average:

- from 41 to 75 dB(A) during the day, and from 30 to 60 dB(A) during the night, at the locations within the Stifford Clays ward
- from 40 to 79 dB(A) during the day, and from 29 to 65 dB(A) during the night, at the locations within the Chafford and North Stifford ward
- from 49 to 73 dB(A) during the day, and from 34 to 59 dB(A) during the night, at the locations within the Belhus ward

As such, our noise assessments predict that by opening year noise levels would increase compared to the existing situation even if the road is not built. Information about noise levels with the project, during its construction and operation, are presented below.

18.7.1 Construction

Daytime construction noise impacts

The main construction activities expected to create a slight increase in noise and vibration levels in these wards relate to the A13/A1089 junction upgrades and utilities works.

There are no main works compounds and only one ULH located in the Stifford Clays, Chafford and North Stifford and Belhus wards. These are described in the project description section above.

There would also be project haul roads built and used during the construction period, these are presented in the project description.

Within these wards, there wouldn't be percussive or vibratory works proposed to be undertaken.

Construction noise levels have been predicted at three locations across the Stifford Clays ward only (the other two wards do not have population centres close to construction activities), chosen to provide a representation of the level of noise communities are expected to experience during construction. For more information about the methodology, see chapter 1.

Noise levels are shown using the standard units for major projects, dB LAeq(12 hour), which represent the average noise level for the assessed 12-hour daytime period. While there might be short-term noises that are louder than the noise level shown during the assessed period, the averaged figure provides a fair representation of what the overall noise impacts would be.

Figure 18.14: Construction noise assessment locations in Stifford Clays ward

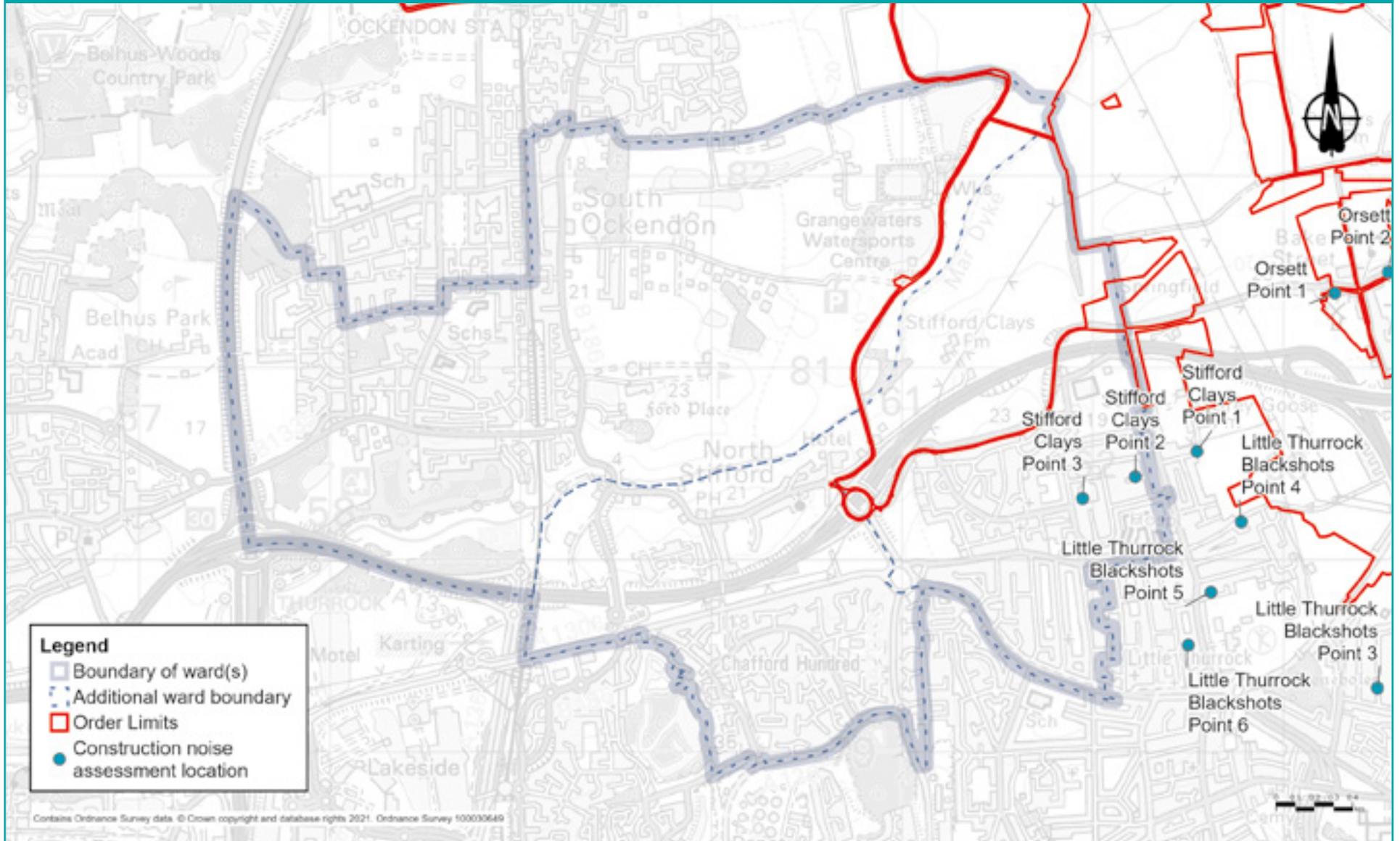


Figure 18.14 shows the locations at which we have predicted daytime construction noise levels.

Each vertical bar in Figure 18.15 shows the predicted noise levels for that month of the construction period (months 1 to 72). The horizontal green line in each chart shows the existing background noise level at each assessment point without the project. The horizontal red line shows the level at which construction noise would exceed defined thresholds (see chapter 1 for more information about these thresholds). If noise is predicted to exceed acceptable levels, then specific measures would be implemented to reduce the noise.

The predicted construction noise levels show that higher noise levels and disturbance would be experienced closer to construction activity. Levels gradually diminish as a result of increased distance and additional buildings and other features screening the noise from more distant residential areas.

With reference to figure 18.15 the following summarises the noise level changes over the construction period for points 1 to 3:

- At Point 1, construction noise levels are predicted to range from 20 to 52dB LAeq (12hour). Construction noise is not expected to exceed the existing background noise levels.
- At Point 2, construction noise levels are predicted to range from 15 to 36dB LAeq (12hour). Construction noise is not expected to exceed the existing background noise levels.
- At Point 3, construction noise levels are predicted to range from 12 to 40dB LAeq (12hour). Construction noise would exceed the existing background daytime noise level for approximately eight months. However, it would not breach the defined threshold.

Figure 18.15: Construction noise by month for points 1, 2 and 3 in Stifford Clays ward

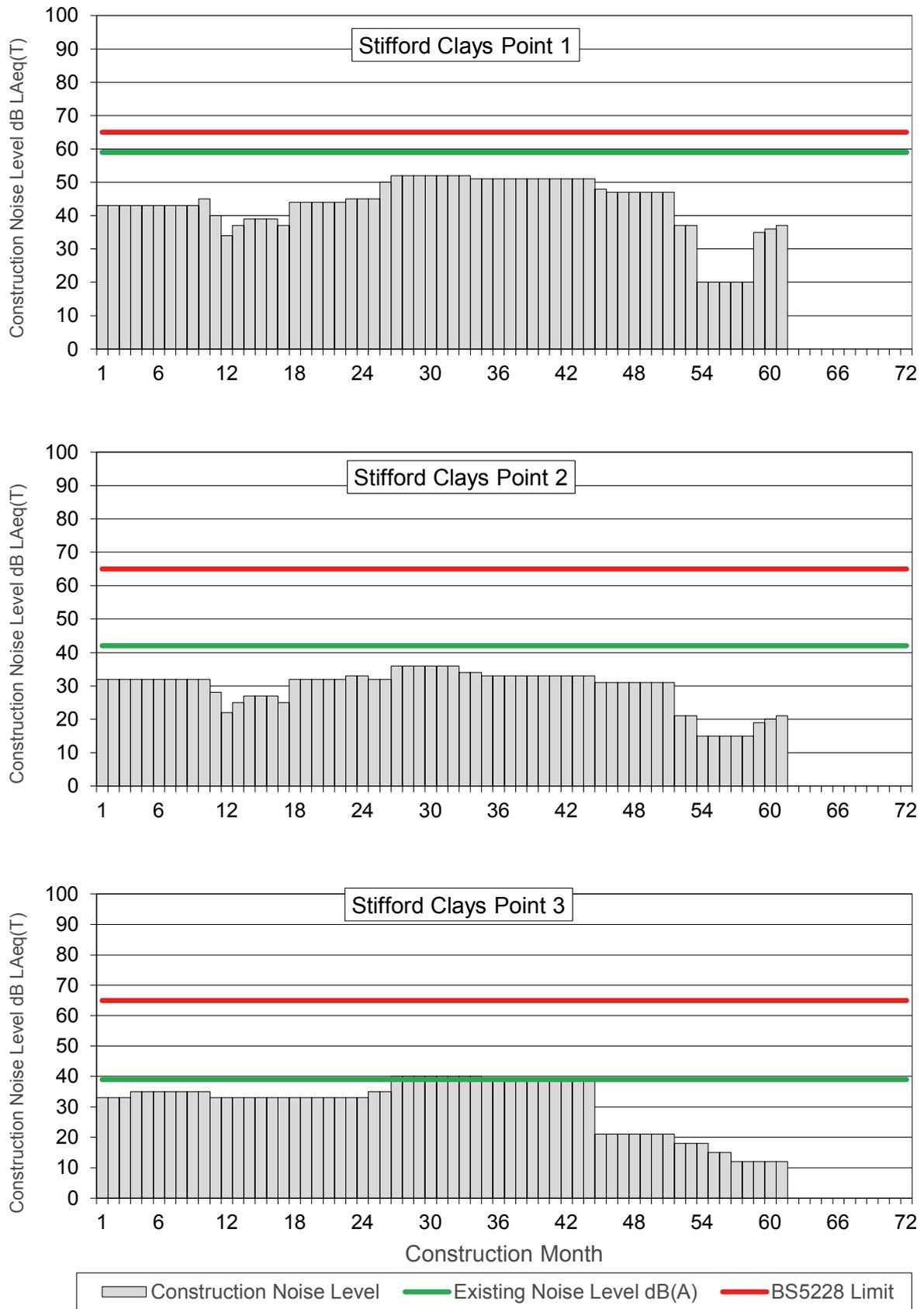
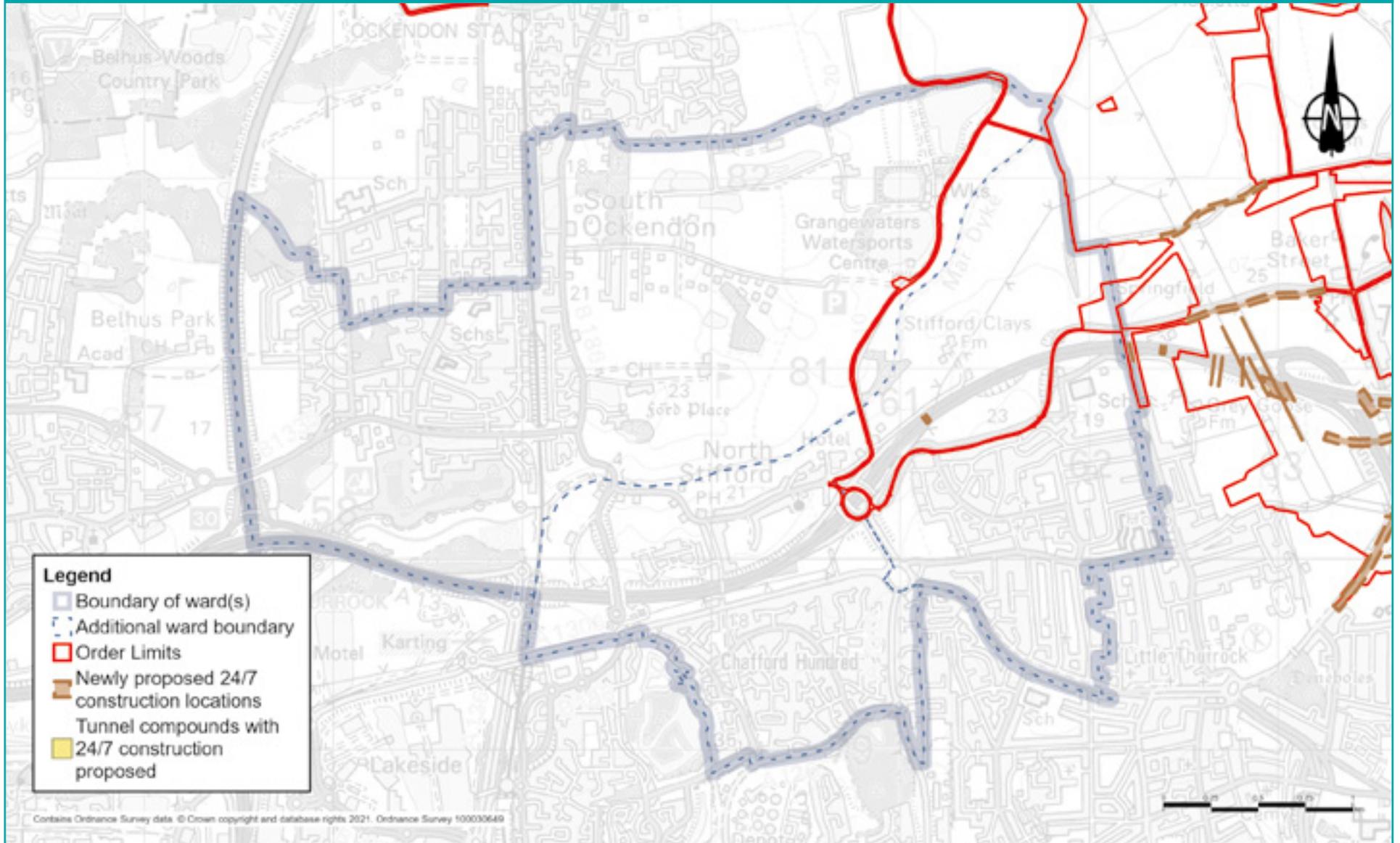


Figure 18.16: Newly proposed and tunnel 24/7 working locations in Stifford Clays, Chafford and North Stifford and Belhus wards



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24/7 construction working

In addition to the changes to daytime noise presented in the section above, 24-hour seven-day construction working is proposed at the locations shown in figure 18.16 above.

These works have been identified as they may need to take place at night to maintain safety and reduce disruption to road and utility networks. The duration for the works is anticipated to be night-time or weekend road closures for highways works within Stifford Clays ward only. These works could have an impact on local communities and we would work with the local authority to manage these impacts.

Construction traffic noise impacts

Maps showing predicted changes in road traffic noise within the Stifford Clays, Chafford and North Stifford and Belhus wards during each year of construction can be found in chapter 7 of the Construction update. Based on currently available traffic data (which offers a representative picture of what people within the ward are likely to experience), there would be negligible changes in road traffic noise (less than 1dB change in noise levels), except along the roads where increases in noise levels have been predicted. For more information about how we define noise impacts (negligible, minor, moderate and major), see chapter 1.

Table 18.3: Construction traffic noise impacts in Stifford Clays, Chafford and North Stifford, and Belhus wards

Ward	Affected road(s)	Predicted noise impact	Construction year(s)
Chafford and North Stifford ward	Stifford Clays Road	Major increase in noise levels	1, 2, 3, 4, 5 and 6
Stifford Clays ward	High Road	Major increase in noise levels	1, 2, 3, 4, 5 and 6
Belhus ward	Stifford Clays Road	Major increase in noise levels	1, 2, 3, 4 and 5

Measures to reduce construction noise and vibration

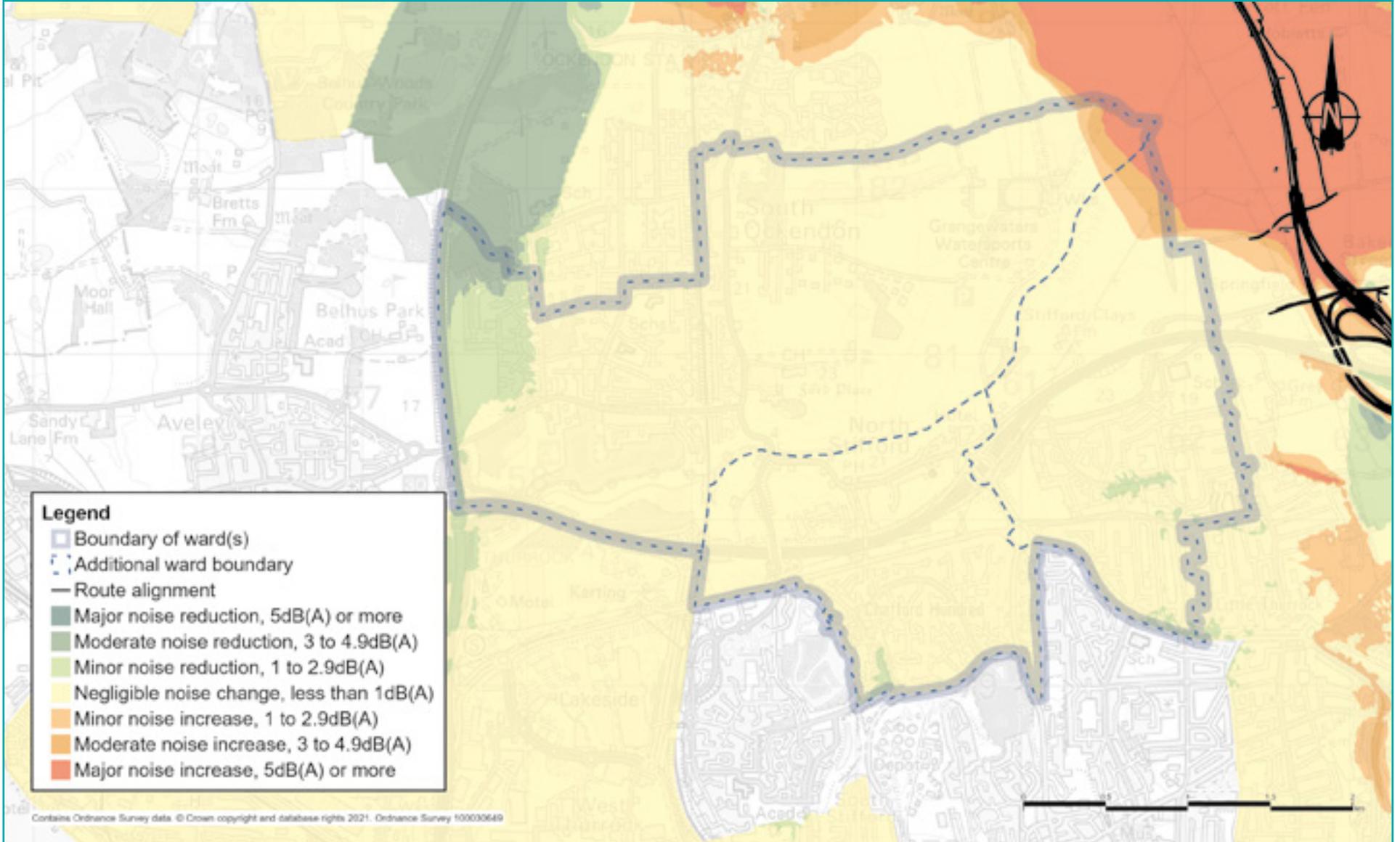
Construction noise levels would be controlled by using Best Available Techniques (BAT), with specific measures used at certain locations such as:

- installing and maintaining hoarding around the construction compounds
- installing temporary acoustic screening around the construction areas likely to generate noise
- keeping site access routes in good condition with condition assessments onsite to inspect for defects such as potholes
- turning off plant and machinery when not in use
- maintaining all vehicles and mobile plant such that loose body fittings or exhausts do not rattle or vibrate
- using silenced equipment where available, in particular silenced power generators and pumps
- no music or radios would be played for entertainment purposes outdoors onsite
- site layout would be planned to ensure that reversing is kept to a practicable minimum. Required reversing manoeuvres would be managed by a trained banksman/vehicle marshal to ensure they are conducted safely and concluded quickly to reduce the noise from vehicle reversing warnings
- non-percussive demolition techniques would be adopted where reasonably practicable to reduce noise and vibration impact
- careful consideration of the location and layout of compounds to separate noise-generating equipment from sensitive receptors, and the use of mains electricity as opposed to generators, where possible
- minimisation of construction vehicle traffic by, where practicable, selection of local suppliers along the project route, using local workforces and by minimising material transportation for earthworks construction along the project

All control measures, including those above, fall under the principles of BAT and are secured in the REAC. For more information, see the sections NV001 to NV010, which set out how we would work under the supervision of the relevant local authorities to implement noise-reduction measures where appropriate.

The CoCP sets out additional measures that would be implemented to reduce noise and vibration during the construction period.

Figure 18.17 Noise impacts during operation in Stifford Clays, Chafford and North Stifford and Belhus wards



18.7.2 Operations

Operational traffic noise and vibration impacts

Stifford Clays ward

This ward is approximately 700 metres to the west of the project route. Noise impacts from the new road would be confined to the north-eastern edge of the ward.

Chafford and North Stifford ward

Located around 2km to the west of the route, there wouldn't be any noise impacts from the project route.

Belhus ward

This ward is approximately 700 metres to the west of the project route. There would be noise impacts in the eastern edge of the ward.

There would be noise impacts as a result of changes in traffic flow and speed on the existing roads in Stifford Clays, Chafford and North Stifford and Belhus wards.

Figure 18.17 above shows predicted noise level changes within these wards for the opening year of the project:

- In Stifford Clays ward, predicted changes in traffic noise at identified locations are predicted to range from a moderate decrease in noise levels of between 1.0 and 2.9dB to a major increase in noise levels of greater than 5.0dB.
- In Chafford and North Stifford ward, predicted changes in traffic noise at identified locations are predicted to range from a moderate decrease in noise levels of between 1.0 and 2.9dB to a minor increase in noise levels of less than 1.0dB.
- Belhus – from a major decrease in noise levels of greater than 5.0dB to a major increase in noise levels of greater than 5.0dB.

For more information about how we define noise impacts (negligible, minor, moderate and major), see chapter 1.

Measures to reduce traffic noise and vibration during operation

The main methods of controlling noise would be, where practicable, to design the road within landscaped features such as cuttings and bunds (walls of earth). The use of low-noise surfacing would also reduce the traffic noise once the road is in use.

For more information about the proposed measures to reduce operational noise, see the REAC (including references NV011 and NV013).

18.8 Air quality

We have carried out air quality assessments for both the construction and operational phases of the project. As explained in chapter 1, some of the assessments set out here are based on earlier versions of the project. The information provided here still presents a reasonable representation of the likely effects from the proposals presented during this consultation.

Existing situation

Within Chafford and North Stifford ward, the A13 and A1306 have been declared an Air Quality Management Area (AQMA) due to annual levels of airborne pollution being above accepted standards. No other areas within the ward have been identified as AQMA.

Within Belhus ward, Thurrock AQMA No.15 lies near the M25. It has also been declared an AQMA due to its yearly levels of airborne pollution being above accepted standards. No other areas within the ward have been identified as AQMA.

Stifford Clays ward is not located within an AQMA.

AQMAs are areas that have been identified by local authorities as areas of poor air quality that require additional monitoring and controls.

18.8.1 Construction

Construction impacts

Construction activities have the potential to affect nearby air quality through the release of dust and emissions from construction equipment and traffic. The areas most likely to be affected are those close to haul roads, compounds and soil storage areas.

Properties more than 200 metres from the worksite, which is the majority of properties within this ward, are outside the area likely to be affected by construction dust or emissions from the worksite. In the Stifford Clays and Chafford and North Stifford wards, there are only a few properties within 200 metres of the worksite, including the south of Stifford Clays Road. There are no properties in the Belhus ward within the 200-metre buffer. Air quality impacts on these properties during construction would be temporary and we would put in place measures to minimise the dust impacts (see below). The proposed measures to reduce dust and emissions are ones that have been proven to be effective when used on similar construction projects in the past. The change in air quality during

the construction phase would be negligible, and there would be no discernible effect on health.

Our analysis of construction traffic predicts that the impact on most roads in these wards would be negligible, although there would be a temporary minor worsening in air quality in the area around the A13 corridor as a result of traffic increase from 2025 to 2027 and a temporary minor improvement in air quality in the area around the M25 corridor as a result of traffic decrease from 2025 to 2028. More information about construction traffic impacts on air quality can be found in chapter 7 of the Construction update.

Measures to reduce air quality impacts during construction

The impact of construction machinery and traffic on air quality would be controlled through the range of good practice measures set out in the CoCP and the REAC. For example, there would be measures to suppress dust, such as damping down dry haul roads and spoil heaps, as well as the use of low-emission machinery and vehicles. We would put in place an Air Quality Management Plan to ensure the measures set out in the CoCP and the REAC would effectively monitor and control dust and exhaust emissions. The location and type of monitoring would be submitted in advance to Thurrock Council for consultation (see REAC entry AQ006).

18.8.2 Operations

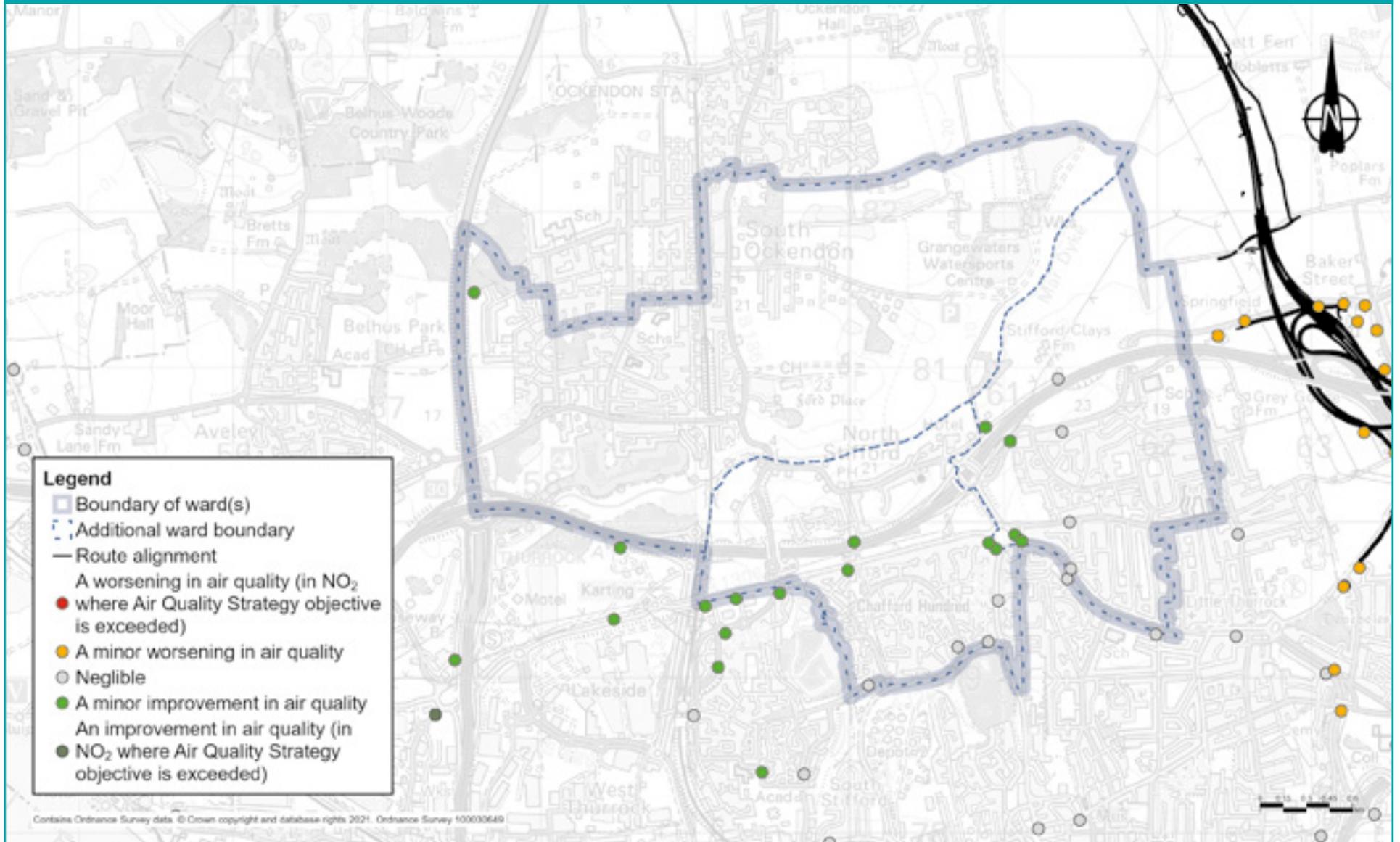
Operational impacts

We have carried out an assessment of the operational impacts of the new road on air quality. The assessment area includes a 200-metre buffer around the roads within the affected road network, with this area being the most likely to experience changes to air quality as a result of the new road. More information about air quality impacts once the road is open can be found in chapter 5 of the Operations update.

At all locations within the ward, there are no predicted exceedances of air quality thresholds. There are receptors (properties or habitats that are sensitive to changes in air quality) within the Stifford Clays, Chafford and North Stifford and Belhus wards. These are predicted to experience from a negligible change to minor improvement in air quality for nitrogen dioxide (NO₂), the main traffic-related pollutant³.

³ NO₂ levels are measured in 'micrograms per cubic metre', or µg/m³, where a microgram is one millionth of a gram.

Figure 18.18: Predicted changes in nitrogen dioxide levels within Stifford Clays, Chafford and North Stifford, and Belhus wards once the new road is open



- Stifford Clays – the highest modelled yearly average NO₂ concentration within this ward is 32.9 µg/m³, which is below the yearly average threshold of 40µg/m³.
- Chafford and North Stifford – the highest modelled yearly average NO₂ concentration within this ward is 30.3 µg/m³, which is also below the yearly average threshold.
- Belhus - the highest modelled yearly average NO₂ concentration within this ward is 23.2 µg/m³ which, like the other wards, is well below the yearly average threshold of 40µg/m³.

Our assessment is based on our opening year model, which represents a worst-case scenario, without accounting for the increase in less-polluting vehicles on our roads over time.

Furthermore, local air quality data shows an overall downward trend in NO₂ over recent years, which means that future air quality improvements at this location are likely (for example, through increased adoption of electric vehicles meaning a reduction in exhaust emissions).

In addition to our assessment of NO₂ our assessment predicts that PM₁₀ levels (small particles of dust, mainly from vehicle exhausts and brakes) are unlikely to exceed threshold levels across the assessed area.

Measures to reduce air quality impacts during operation

The assessed air quality impacts in this area as a result of the project would not trigger the need for additional monitoring or other mitigation measures once the road is open.

18.9 Health

A range of personal, social, economic and environmental factors influence our health, and different groups may be more sensitive to these – for example, children, older people or those with pre-existing health conditions.

Existing situation – Stifford Clays

When compared with Thurrock as a whole, the Stifford Clays ward has:

- a higher proportion of people aged 60 and over (26.4% compared with 18.3% for Thurrock)
- more white residents (91.3% and 85.9% respectively)
- a higher proportion of residents from an Asian background (4.0% and 3.8% respectively)

Economic activity rates are relatively low in Stifford Clays, when compared with other wards in Thurrock, and Thurrock as a whole (71.1% and 79.1% respectively). However, the number of benefit claimants are also comparatively low when compared with Thurrock overall and its other wards. This reflects the high proportion of older people in Stifford Clays. The ward also has a higher proportion of residents in social grade AB (16.1%) than Thurrock as a whole (15%), with more homes owned outright compared with Thurrock and England as a whole (71.3%, 66.2% and 63.3% respectively). Stifford Clays also has a relatively high proportion of households without a car or van, when compared with Thurrock overall (21.9% and 20.1% respectively).

Stifford Clays residents generally have lower rates of self-reported very good health status, when compared with Thurrock and England (43.9%, 48.2% and 47.2% respectively). In addition, the ward has a relatively high proportion of residents who report their health as 'bad' and 'very bad', when compared to Thurrock and England as a whole (6%, 4.7% and 5.4% respectively). Regarding life expectancy and causes of death, Stifford Clays has better rates than Thurrock across a number of measures. These include higher life expectancy rates, and lower rates of death from respiratory and coronary heart disease, from cancer and from all causes. Using the same measures, Stifford Clays has very similar rates to England as a whole.

Existing situation – Belhus

Belhus has a younger population than Thurrock as a whole and England, with more children aged under 16 (25.2% compared with 24.2% and 20.3% respectively). It also has a more ethnically diverse population, with a higher proportion of black residents than Thurrock (9.6% and 7.8% respectively).

Economic activity rates are relatively low when compared with other wards in Thurrock, and Thurrock as a whole (71.9% and 79.1% respectively) while the number of benefit claimants are significantly higher (4.8%, 3.0% and 2.7% respectively).

Belhus residents generally have lower rates of self-reported very good health when compared with Thurrock and England as whole (45.9%, 48.2% and 47.2% respectively). The ward also has a relatively high proportion of residents who report their health as 'bad' or 'very bad', when compared with Thurrock and England (6.5%, 4.7% and 5.4% respectively). In addition, Belhus has more residents who report that their day-to-day activities are limited a lot when compared to Thurrock as a whole (9.3% and 7.2% respectively). In looking at life expectancy and causes of death, with the exception of life expectancy at birth for males, Belhus performs worse than Thurrock for female life expectancy and deaths from respiratory and coronary heart diseases, cancer and from all causes.

Existing situation – Chafford and North Stifford

Chafford and North Stifford is characterised by a younger population (27% of the population are under the age of 16). Economic activity rates are relatively high when compared to other wards in Thurrock and for Thurrock as a whole. A high proportion of residents own their own home, while the majority of the remaining homes are privately rented.

Chafford and North Stifford generally have very good rates of self-reported health status when compared to Thurrock as a whole (91.8% of residents report very good health and good health, compared to 82.9% for Thurrock as a whole). Regarding life expectancy and causes of death, Chafford and North Stifford has higher rates of life expectancy at birth for men and lower rates of deaths from cancer when compared to Thurrock as a whole. Other measures are similar to that of Thurrock.

18.9.1 Construction

Construction impacts

Construction activities affecting Stifford Clays, Belhus and Chafford and North Stifford are presented in the Project description section.

Primarily, they relate to establishing and operating the following construction compounds:

- Long Lane Compound A
- Long Lane Compound B
- Stifford Clays Road West Compound

Elements of these activities have the potential to impact human health (including mental health and wellbeing), whether this is through noise associated with construction activities or construction traffic, air quality (as a result of dust emissions), severance caused by construction traffic, or road or footpath closures.

There could be both positive and negative potential impacts on people's health and wellbeing. Through good communications and engagement, providing people with information about when construction works would be taking place and its impacts, then negative impacts on people's mental health and wellbeing would be reduced.

Equally, some residents would see health and wellbeing benefits from improved access to work and training opportunities (see the Traffic section above).

The relationship between mental health and unemployment is two-way. Good mental health is a key influence on employability and finding and keeping a job. Unemployment causes stress, which ultimately has long-term physiological effects and can lead to depression, anxiety and lower self-esteem.

As highlighted at the start of this section, different groups of people may be more sensitive to factors that potentially affect their health. Some of the impacts of our construction activities may, therefore, only affect a small proportion of the population.

Potential impacts include across all wards:

- There are likely to be health benefits as a result of access to work and training opportunities.
- Accessibility (for example, people who are more dependent on public transport and have less choice about how they travel and the route they take).
- Severance (where road and footpath closures may affect some people's ability to access services or facilities).
- Access to open space (people without access to private cars may have fewer alternatives within a reasonable travel time).
- There are likely to be mental health and wellbeing impacts associated with stress and anxiety relating to construction of the project.

Stifford Clays ward

- Construction noise levels have been predicted at three locations across the Stifford Clays ward only (the other two wards do not have populations centres close to construction activities). They provide a representation of the noise communities would be expected to experience. For more information about the methodology, see chapter 1.
- There are only a few properties in the Stifford Clays ward within 200 metres of the Order Limits, which reduces the impact on air quality of increased dust or emissions from construction. However, those properties that are within 200 metres could be affected.
- Views from the northern edge of the Stifford Clays urban area would be limited to construction traffic using Stifford Clays Road.
- Views from the local cycle route along Stifford Clays Road and from the bridleway along Green Lane would include Green Lane ULH, as well as more distant views towards construction of the Stifford Clays Road West and Stifford Clays Road East Compounds, overhead power line diversion works, and construction of Green Lane green bridge.
- From Mardyke Way, there would be distant views of road construction, including the taller elements within the Stifford Road East Compound, and building of the Orsett Fen Viaduct. Construction traffic using Medebridge Road would also be visible.
- From Mardyke Way, there would be distant views of construction, including the taller elements within the Stifford Clays Road Compound East, and construction of the Orsett Fen Viaduct. Construction traffic along Medebridge Road would also be visible.

- Construction activities have the potential to affect local air quality through the release of dust and emissions from equipment and traffic. Air quality impacts of construction would be temporary, and our assessment is considered to be worst-case. The change in air quality during this time would not be noticeable and there would be no discernible effects on health.

Chafford and North Stifford ward:

- There are few properties in the Chafford and North Stifford ward within 200 metres from the Order Limits and are therefore unlikely to be affected by dust or emissions from the project's construction. Those properties that are within 200 metres have the potential to experience air quality impacts as a result of increased dust and emissions from nearby construction activities.
- There are no main construction works or activities that are expected to cause noise and vibration impacts on this ward.
- The majority of existing road traffic links within this ward would experience negligible changes of less than 1dB(A) with the exception of Stifford Clays Road, which would experience an increase in road traffic noise during the construction phase.
- There would be no views of Lower Thames Crossing construction activities from Chafford and North Stifford.

Belhus ward

- Views of construction activities would be limited to the eastern edge of the ward, primarily from Mardyke Way on the ward boundary.
- There are no properties in the Belhus ward that are within 200 metres of the Order Limits and would likely be affected by dust or emissions from construction. Properties along the M25 corridor could potentially experience a temporary beneficial impact on air quality.
- By the opening year, construction of the junction with the Lower Thames Crossing and the A13, the route to the north and Green Lane green bridge would be complete.
- There are no main construction works or activities that are expected to give rise to construction noise and vibration impacts on this ward.
- Most existing road traffic links in this ward would experience negligible changes of less than 1dB(A). The exception is Stifford Clays Road, which would see an increase in road traffic noise during the construction phase.

Measures to reduce impacts on health during construction

Proposed measures relating to health and wellbeing (including good practice for dust emissions, hours of working and visual screening) are described in the Visual impacts, Noise and vibration impacts and Air quality sections. Further information relating to mitigation measures for these areas is set out in the CoCP, REAC and the package of traffic management plans. The commitments in the REAC include adhering to Best Practicable Means to reduce noise impacts (see NV007 in the REAC) and dust-management good practice (see AQ005 in the REAC). See chapter 1 of the Construction update for more information about this and the project's other control documents.

Engagement and effective two-way communication with communities before and during construction, including sharing information about the programme and impact of works, is important to reduce mental health and wellbeing impacts associated with uncertainty, stress and anxiety. The CoCP sets out proposals for how we would make sure communities, stakeholders and any affected parties are updated about the construction works and their progress.

18.9.2 Operations

Operational impacts

Information about the operational project in these wards can be found in the Project description section.

Both positive and negative health outcomes may be experienced by residents of Stifford Clays.

- There would be improvements to accessibility, work and training opportunities, and access to open space. Tilbury Fields is a new recreational area that could encourage physical activity.
- Potential noise impacts have been identified within Stifford Clays ward. This could result in adverse health effects, ranging from greater annoyance and sleep disturbance to more serious conditions (typically associated with larger increases).

- The conclusion of the air quality assessment is that particulate matter (PM₁₀ or PM_{2.5}) levels at receptors are unlikely to exceed threshold levels across the study area. Our assessments have shown that there would be a barely noticeable change in air quality.
- Air quality assessments conclude that the project would not result in significant air quality effects.
- There would be no lasting visual impacts from the local cycle route along Stifford Clays Road. The main visual impacts from this, and the bridleway along Green Lane, would be limited to glimpsed traffic on the Lower Thames Crossing and A13 junction. Any intrusion from the junction and Green Lane green bridge would be substantially reduced through proposed planting mitigation. The diverted section of overhead line would look similar to the existing one. From Mardyke Way, there would be views of the Lower Thames Crossing and Orsett Fen Viaduct and, as before, these would be partially softened by woodland planting.

Both positive and negative health outcomes may be experienced by residents of Chafford and North Stifford:

- There would be improvements to accessibility, work and training opportunities, and access to open space. Tilbury Fields is a new recreational area that could encourage physical activity.
- Modelling shows that air quality is predicted to remain well below the thresholds for the key traffic related pollutants NO₂ and particulate matter.
- Air quality assessments conclude that the project would not result in significant air quality effects. This will be confirmed in the Environmental statement following an assessment based on updated traffic data for the opening year.
- Views towards the Order Limits, encompassing the A13 roundabout junction in the north-east of the ward, are screened by mature roadside vegetation. There would, therefore, be no material visual effects.

Positive and negative health outcomes may be experienced by residents of Belhus ward:

- Benefits associated with noise reduction, better access to open space and education and employment opportunities are anticipated.
- Air quality assessments conclude that the project would not result in significant air quality effects.
- The main visual impacts from Mardyke Way (the Lower Thames Crossing and Orsett Fen Viaduct) would be partially softened by woodland mitigation planting.
- Some residents may experience anxiety or stress associated with perceptions of environmental change.

Measures to reduce operational health impacts

False cutting and landscaping along the main route are the primary mitigation measures. They would help to screen views of the new road and traffic and would integrate the Lower Thames Crossing into the surrounding landscape.

The impact of construction and changes in traffic on local air quality would be controlled and minimised through good practice measures set out in the project's CoCP and REAC.

18.10 Biodiversity

Existing situation

We carried out surveys across the project to set a baseline for assessment, and these identified the presence of a range of protected and notable species.

Stifford Clays

Within the Order Limits the main habitats here are arable, with some hedgerows.

There are no designated sites within 2km of the Order Limits. There is one non-designated site within 500 metres, Cats Mede LWS.

Our survey identified a range of protected and notable species including water vole, badgers and reptiles.

Chafford and North Stifford, and Belhus

Only a small area of the Chafford and North Stifford, and Belhus wards falls within the Order Limits, which is restricted to scrub next to Stifford Clays Road and Medebridge Road. These wards contain no designated sites within 2km of the Order Limits. Within 500 metres of the Order Limits in the Chafford and North Stifford ward the non-designated sites are Mardyke LWS, Cats Mede LWS, Palmer's Shaw LWS, Sheepfold Wood ancient woodland and Great Palmer's Shaw ancient woodland.

The survey identified water vole and common reptiles within the Belhus ward, and no presence of protected and notable species within the Chafford and North Stifford ward.

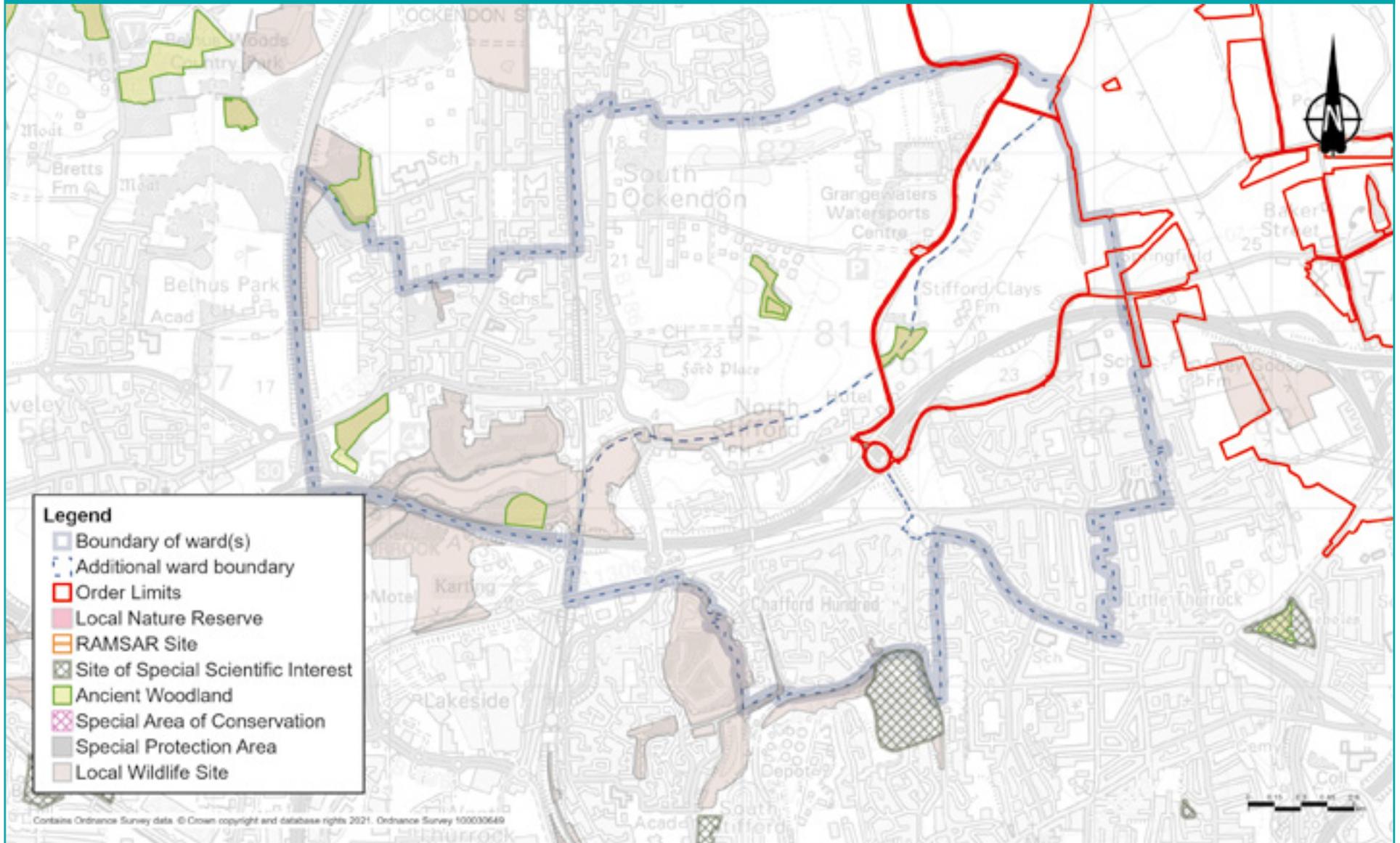
18.10.1 Construction

Construction impacts

To build the new road, areas of habitat (arable fields and hedgerow) would have to be removed temporarily and permanently. This habitat supports a range of protected and notable species that would be impacted by construction through direct habitat loss (reptile habitat and potential bat roosts); and disturbance to retained habitat.

A small area of scrub would be removed next to Stifford Clays Road and Medebridge Road, and another next to Medebridge Road. This would cause the loss of a small area of reptile habitat.

Figure 18.19: Designated and non-designated biodiversity sites in Stifford Clays, Chafford and North Stifford, and Belhus wards



Measures to reduce biodiversity impacts during construction

Stifford Clays ward

Vegetation would be cleared during the winter where possible to avoid any impact on breeding birds. Where this isn't practical, clearance would be supervised by an Ecological Clerk of Works (ECoW) to ensure no nests are disturbed or destroyed. Where protected species are present, such as reptiles, they would be moved from the site before any construction activities take place, either through habitat manipulation (for example strimming to reduce the height of vegetation and displace reptiles) or translocation. Where required, works affecting protected species would be carried out under a Natural England licence. Boxes to support birds and bats would be installed within retained habitat. Any habitat lost for temporary construction works would be reinstated after construction.

Chafford and North Stifford ward

Vegetation clearance would take place during the winter where possible to avoid the impacts on breeding birds. Where this wasn't possible, clearance would be supervised by an ECoW to ensure no nests are disturbed or destroyed. The scrub removed would be reinstated during the construction process.

Belhus ward

Vegetation clearance would be carried out during the winter where possible to avoid the impacts on breeding birds. Where this wasn't possible, clearance would be supervised by an ECoW to ensure no nests are disturbed or destroyed. Where protected species are present, these would be moved away from the site prior to any construction activities either through habitat manipulation or translocation. The scrub removed would be reinstated during the construction process.

The impact of construction on biodiversity would be controlled through the range of good practice measures set out in the CoCP and REAC. See chapter 1 of the Construction update for more information about this and the project's other control documents.

18.10.2 Operations

Operational impacts

The new road has the potential to cause species mortality through the separation of habitats as well as exposure to, and noise disturbance from, road traffic. However, as the A13 already causes these impacts on terrestrial biodiversity, it is not anticipated that the project would add any additional operational impacts.

Measures to reduce biodiversity impacts during operation

Landscape planting has been designed to enable animals to move and forage and would guide them to safe crossing points over the new road, specifically the green bridge over Green Lane to the east of the ward boundary. To mitigate traffic disturbance, the new road would be in cutting or false cutting reducing noise and visual impacts.

Newly created areas would be managed to ensure that they provide high quality habitat to support a broad range of different plant and animal species.

The impact of operation on biodiversity would be controlled through good practice measures set out in the CoCP and REAC. See chapter 1 of the Construction update for more information about these and the project's other control documents.

18.11 Built heritage

Existing situation

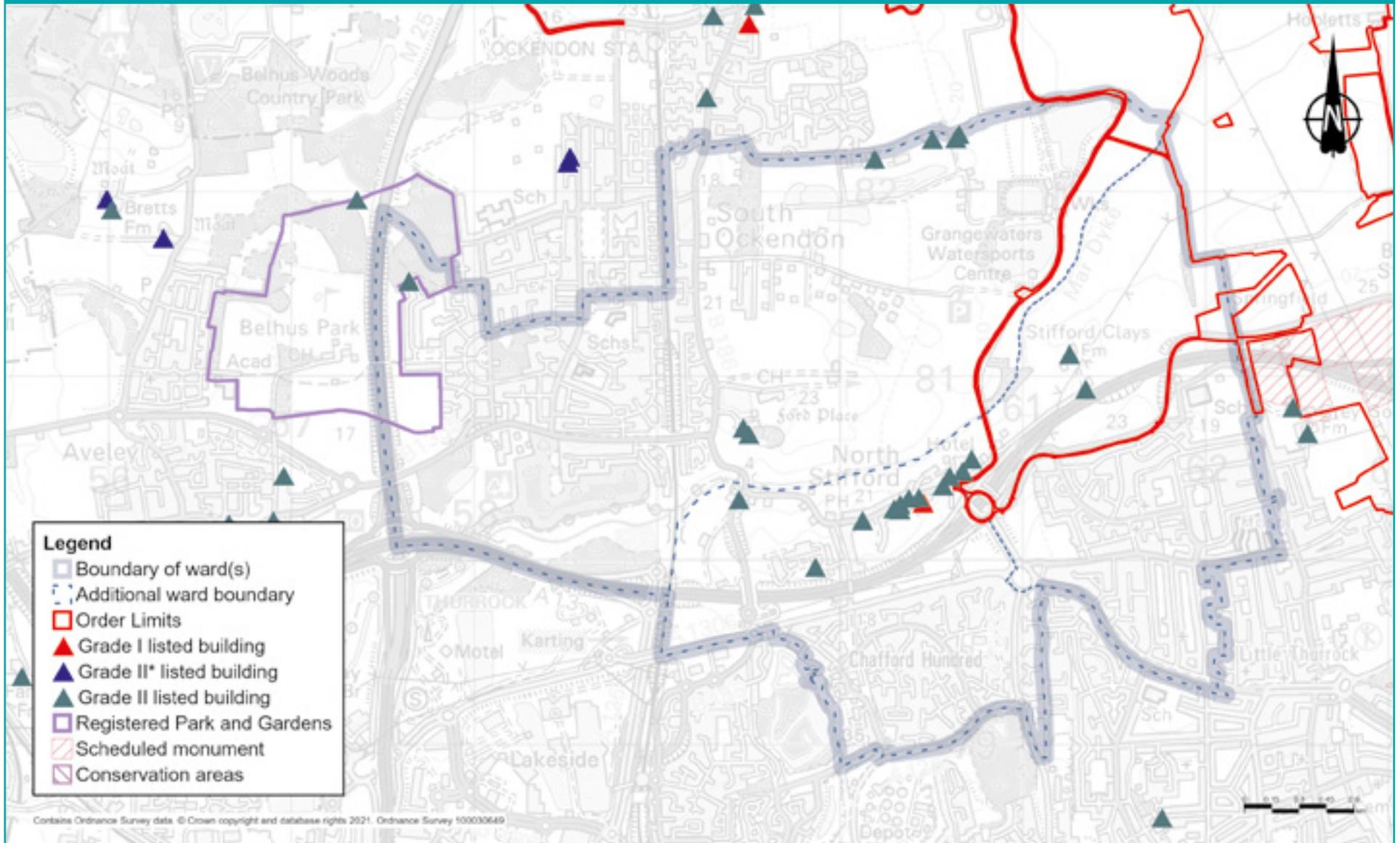
Two listed buildings have been identified within Stifford Clays ward in relation to the project:

- Stifford Clays Farmhouse is a Grade II listed building of high heritage value. It is located immediately north of the A13 West Thurrock Arterial Road, around 330 metres north of the project. It dates back to the early 19th century. An earlier farm once existed 300 metres to the north of the farmhouse but only a thatched barn has survived (see below).
- The thatched barn at Stifford Clays Farmhouse is also a Grade II listed building of high heritage value. It is to the north of the A13 West Thurrock Arterial Road, around 450 metres east of the project and dates to the 17th century. It is the only surviving building of a post-medieval farm that predated Stifford Clays Farmhouse to the south.

A total of 12 listed buildings have been identified within Chafford and North Stifford ward in relation to the project (11 are Grade II listed and one is Grade I listed):

- The Church of St Mary The Virgin (Grade I), which is of high heritage value and is located on High Road along with several other listed buildings. It dates back to the 12th century (the nave), and features 13th, 14th and 19th century alterations and extensions. The church would have been a focal point of the medieval settlement of North Stifford.
- A former granary (now a house) north of Coppid Hall (Grade II)
- Lilac, Viola and Wren Cottages (Grade II)
- Barcris and Honeysuckle Cottages (Grade II)
- Caira Fircot (Grade II)
- Coppid Hall (Grade II)
- Laburnam, Middle Cottage, Old Post Office (Grade II)
- The Thatched Cottage (Grade II)
- Europa Hotel (Grade II)
- A wall enclosing a kitchen garden to the east of Europa Hotel (Grade II)
- Churchview Cottages (Grade II)
- War memorial (Grade II)

Figure 18.20 Built heritage in Stifford Clays, Chafford and North Stifford and Belhus wards



There are four listed buildings of historic relevance within Belhus ward (in relation to the project):

- Little Mollands
- Great Mollands
- Weatherboarded Granary at Great Mollands
- Red Brick Barn at Great Mollands

18.11.1 Construction

Construction impacts

Construction activities affecting these wards relate to establishing the main project route and operating Long Lane compounds A and B and Stifford Clays Road compound west. However, no construction compounds would be located within these wards itself. Activities would also include a construction access route along the existing A13 and Medebridge Road.

There would be no physical impacts in Stifford Clays ward. The closest construction activity to the two listed buildings would relate to the access route along the existing A13 and Medebridge Road, which would not directly or indirectly impact the setting (the surroundings in which a heritage asset is located) of the historic buildings.

Also, there would be no physical impacts in Chafford and North Stifford ward. Construction activities may lead to a slight increase in road traffic, noise and dust but this would not impact the setting.

Measures to reduce impacts during construction

Construction mitigation is not required as there would be no impact to built heritage. For general information about heritage mitigation measures, please refer to Design Principle (S326), the CoCP, and the air quality, noise and vibration and heritage sections of the REAC.

18.11.2 Operations

Please refer to the Project description Operations section of this chapter.

Operational impacts

No built heritage would be impacted by the project.

Measures to reduce impacts during operation

Mitigation is not required as no built heritage would be affected by the project.

18.12 Contamination

Construction

From a desk-based review of historical maps and environmental data, there are no known medium or high-risk sources of contamination that could be at risk of disturbance during construction of the project within the Stifford Clays, Chafford and North Stifford and Belhus wards. By following a construction management plan and ensuring that, where potential sources of contamination are used (for example oils, lubricants, mechanical plant), that appropriate spill containment and emergency response procedures are in place to prevent adverse environmental impacts from occurring.

Operation

Once the road opens, if an incident occurs that results in localised contamination (for instance a traffic accident), we would assess and if necessary remove any affected soils to reduce the risk of further contamination across a wider area or entering water courses. More information on these controls can be found in the REAC.

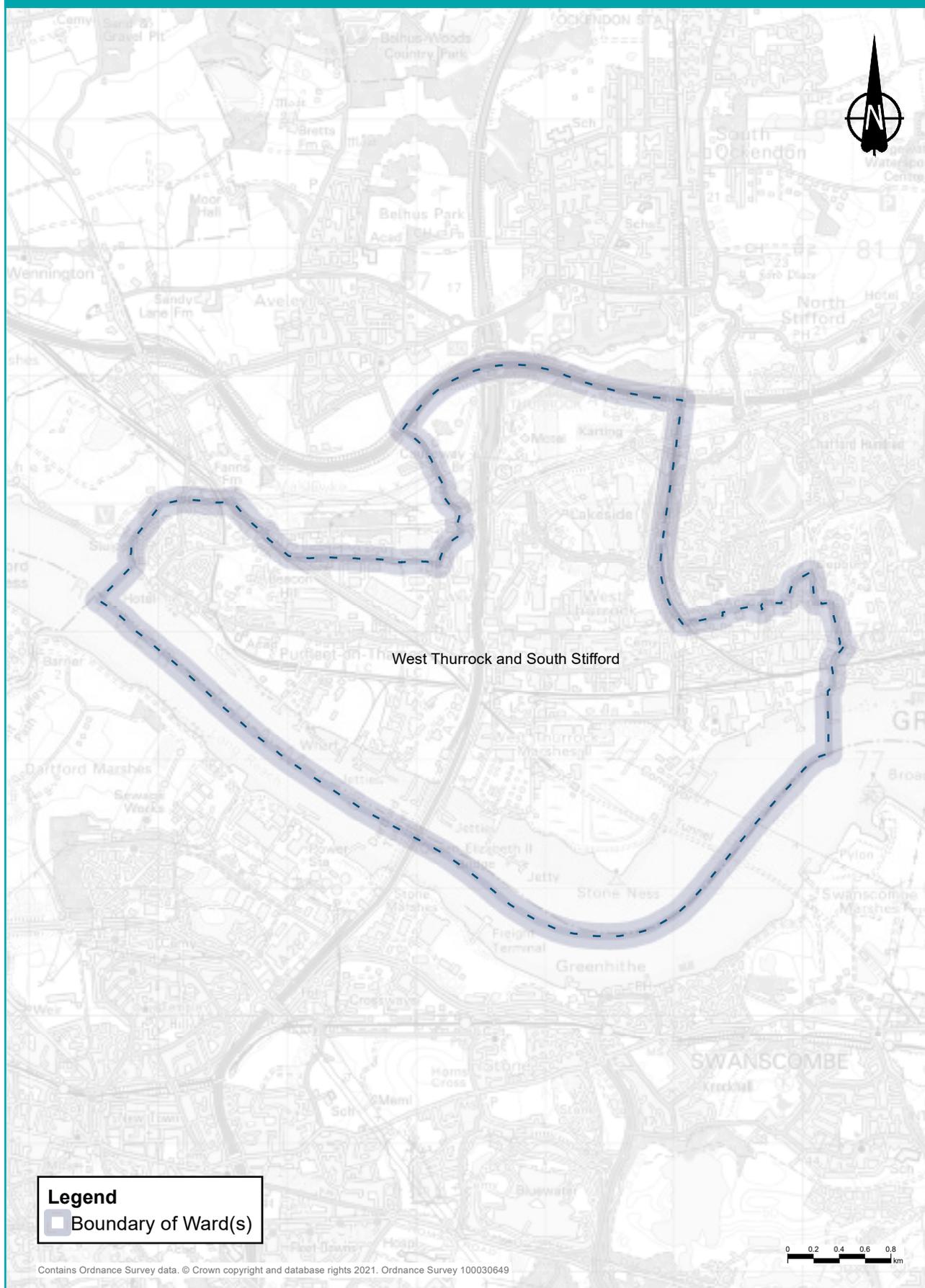
Chapter 19: West Thurrock and South Stifford ward

This chapter summarises the activities in West Thurrock and South Stifford ward relating to the project's construction and its operational phase (when the new road is open). It also explains the measures intended to reduce the project's impacts on local communities. For more information about the assessments in this chapter and other information available during this consultation, see chapter 1, which also includes a map showing all the wards described in this document.

West Thurrock and South Stifford ward does not include any elements of the project's construction or operation. It has been included in our Ward impact summaries because it would experience impacts due to changes in traffic flows at the Dartford Crossing that are a result of the implementation of the Lower Thames Crossing. We predict a reduction in traffic flow at the Dartford Crossing of 21% in 2029, the project's opening year, which would have an impact on journey times, noise and air quality in this ward. The reduction in traffic at the Dartford Crossing is one of the key objectives of the project.

Within this document, we sometimes advise where additional information can be found in other consultation documents, including the Construction update, Operations update, You said, we did, Register of Environmental Actions and Commitments (REAC), Code of Construction Practice (CoCP), Outline Traffic Management Plan for Construction (OTMPfC) and Design principles. To find out more about these documents, see chapter 1. References to these documents provide an indication as to how our proposals to reduce the project's impacts will be secured within our application for development consent.

Figure 19.1: Ward boundary map for West Thurrock and South Stifford ward



19.1 Overview

19.1.1 About this ward

There is no construction activity or elements of the completed project in this ward. It has been included because the project would result in substantial changes to traffic flow, in particular traffic using the Dartford Crossing. This would have beneficial outcomes for local communities.

West Thurrock and South Stifford is the ward that includes the northern side of the Dartford Crossing. The ward is predominantly industrial with some residential properties in the west, near Purfleet.

The ward has an area of around 11km² and an estimated population of 14,021¹. The M25-A282 passes through the ward north-south, with the Queen Elizabeth II Bridge carrying traffic southwards over the River Thames. The Dartford Tunnel carries traffic from the south to the north of the river.

The High Speed 1 (HS1) railway line runs north-west to south-east through this ward, while the London, Tilbury and Southend railway line runs through the ward east to west with Purfleet station, off London Road, and Chafford Hundred station near the Lakeside Shopping Centre.

Lakeside Shopping Centre is the tenth-largest shopping centre in the UK. It expanded substantially in 2019 and a planning application has been submitted for additional growth.

Purfleet-on-Thames is a major regeneration project being taken forward by Purfleet Centre Regeneration Ltd. It is located on the northern banks of the River Thames near the Dartford Crossing, about 5km west of the area in which the Lower Thames Crossing is being built. Outline planning permission was granted by Thurrock Council in April 2019 for up to 2,850 homes, a new town centre, and employment uses.

The Mardyke River runs along the ward's western northern boundary, and travels through it again in the east.

¹ Office for National Statistics, 2018 ward-level population estimate

19.1.2 Summary of impacts

Table 19.1: Summary of impacts during the project’s construction and operation

Topic	Construction	Operations
<p>Traffic</p>	<p>Impacts</p> <p>The construction of the project should not result in any noticeable impacts on the performance of the highway network in the ward.</p> <p>Mitigation</p> <p>There are several mitigation measures to reduce the impact of the construction process on local residents including reducing the use of local roads by construction vehicles. Further details on the mitigation measures can be found in the traffic section of this chapter.</p>	<p>Impacts</p> <p>Changes to traffic flows and journey times are predicted on several key roads within the ward. Further details can be found in the traffic section of this chapter.</p> <p>Mitigation</p> <p>Regular reporting would take place once the project is operational. Further details about the mitigation measures for West Thurrock and South Stifford ward can be found in the traffic section of this chapter.</p>
<p>Public transport</p>	<p>Buses</p> <p>There would no impacts on buses during construction.</p> <p>Rail</p> <p>There would no impacts on rail services or journeys to stations during construction.</p>	<p>Buses</p> <p>It is predicted that most bus journeys would not be impacted once it is operational. There would, however, be a reduction in journey times on the 25 bus from Stifford Clays through Grays to Purfleet, the 44, the X80 from Bluewater, the 73 from Tilbury through Grays to Lakeside Shopping Centre, and the 83 from Chadwell St Mary through Grays to Lakeside.</p> <p>Rail</p> <p>There are no discernible changes predicted for access times to the railway station, nor impacts on rail services.</p>
<p>Footpaths, bridleways and cycle routes</p>	<p>No footpaths, bridleways or cycle routes would be affected in this ward during construction or operation of the project.</p>	

Topic	Construction	Operations
Visual	There would be no views towards the land on which the project would be built, so there would be no visual effects experienced from this ward.	
Noise and vibration	<p>There are no construction activities within 300 metres of the ward boundary so there are no noise and vibration impacts expected during construction.</p> <p>There would be negligible changes in traffic noise during all construction years.</p>	<p>This ward is located approximately 4.5km south of the project and so no direct noise impacts would be experienced.</p> <p>There would be indirect noise impacts, ranging from minor decreases to minor increases in noise levels as a result of changes in traffic flow and speed on the existing road network, especially along the M25 and A282 across the Dartford Crossing.</p>
Air quality	<p>Impacts</p> <p>As there are no properties within 200 metres of the worksite, properties are unlikely to be affected by dust or emissions during construction activities. There would be negligible changes in air quality as a result of construction traffic, and no change in air quality as a result of traffic management.</p> <p>Mitigation</p> <p>All impacts would be controlled through the range of good practice measures set out in the CoCP and the REAC.</p>	<p>Impacts</p> <p>There would be no exceedance of NO₂ and PM₁₀.</p> <p>Mitigation</p> <p>No mitigation is required.</p>

Topic	Construction	Operations
<p>Health</p>	<p>Impacts</p> <p>There are likely to be health benefits as a result of access to work and training opportunities.</p> <p>Mitigation</p> <p>There would be engagement and effective two-way communication with communities before and during construction, including sharing information about the programme and impact of works, to reduce mental health and wellbeing impacts associated with uncertainty, stress and anxiety.</p>	<p>Impacts</p> <p>There are likely to be minor improvements to noise and air quality levels in the ward due to the reduction in volume of traffic using the Dartford Crossing, which would lead to positive health outcomes.</p> <p>Mitigation</p> <p>No mitigation would be required.</p>
<p>Biodiversity</p>	<p>The project would have no impacts on biodiversity in this ward during construction or operation.</p>	
<p>Built heritage</p>	<p>The project would have no impacts on built heritage in this ward during construction or operation.</p>	
<p>Contamination</p>	<p>The project would have no impacts on contamination in this ward during construction or operation.</p>	

19.2 Project description

19.2.1 Construction

Construction activities

No construction activity would take place within this ward, apart from the use of the M25 and the A13 as routes for construction traffic accessing the project. There would be no traffic management measures within this ward.

Construction compounds and Utilities Logistics Hubs

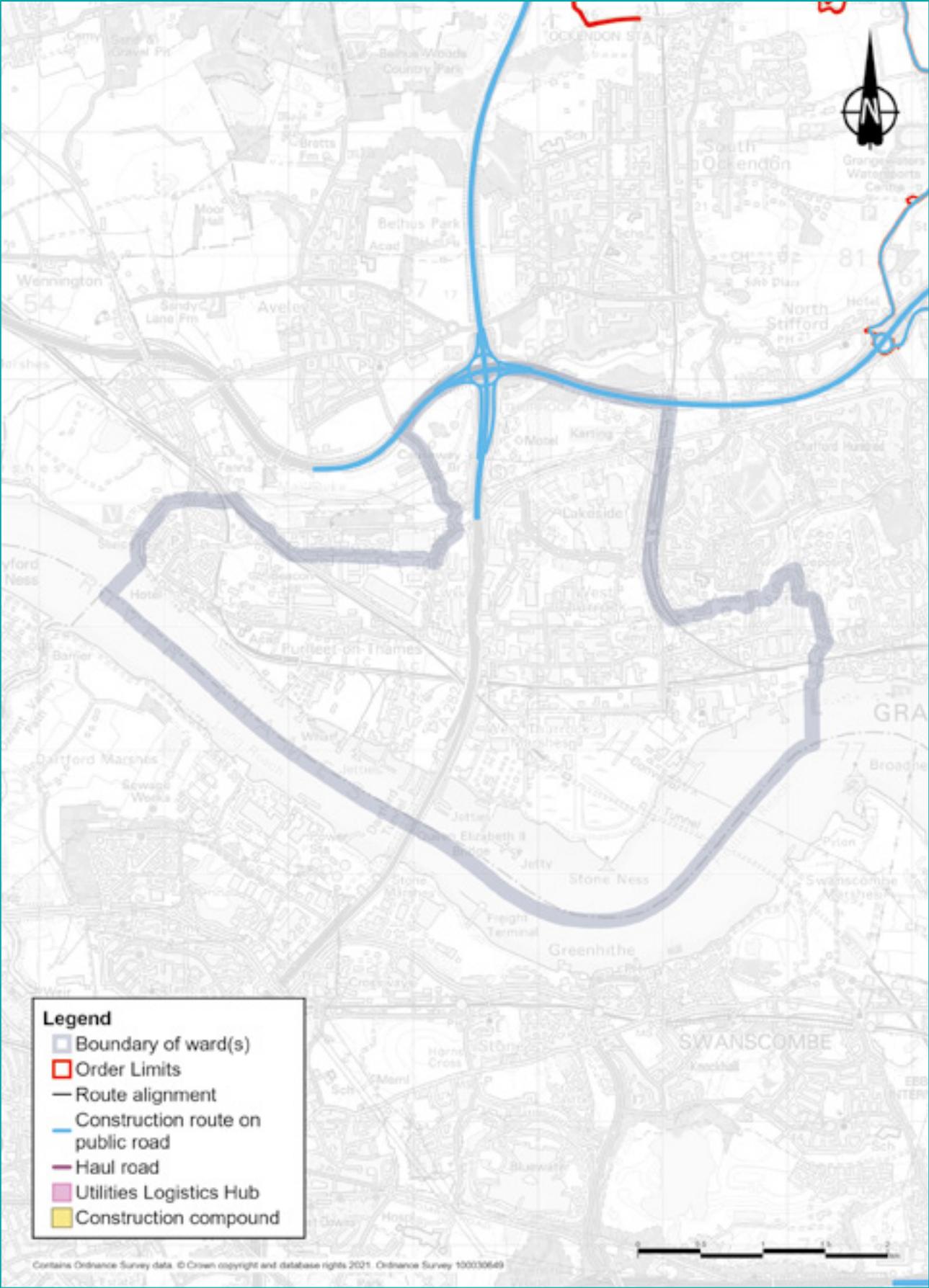
Construction compounds are fenced-off areas, accessible to construction traffic, which provide the facilities for our project to be built efficiently. For example, compounds would provide parking, storage for machinery and materials, offices, welfare facilities, refuelling, and vehicle and wheel-washing facilities to make sure vehicles leaving the compound do not dirty local roads.

There are no construction compounds or Utility Logistics Hubs located within the ward of West Thurrock and South Stifford.

Construction related traffic

The construction related traffic will be mainly using the M25 and A13 through the ward. The local road network would be used by any staff who live in the ward and are working at any of the construction compounds or Utility Logistics Hubs.

Figure 19.2: Main construction areas in West Thurrock and South Stifford ward



Traffic management

There are no traffic management measures planned within the ward of West Thurrock and South Stifford.

Measures required across the project would include narrow lanes, reduced speed limits, lane closures and temporary traffic lights. We have sought to minimise traffic management measures wherever practical. However, they would be necessary in some places to allow construction traffic and local communities to travel safely, while providing construction workers with sufficient space to operate. An overview of the traffic management required across the project can be found in the Outline Traffic Management Plan for Construction. All traffic management measures are based on an indicative construction programme, which would be finalised by the appointed contractor. The contractor's final traffic management plans will be subject to final approval by the Secretary of State for Transport, following consultation with the local highways authority.

19.2.2 Operations

Operational activities

There are no elements of the operational project in this ward.

19.3 Traffic

We carried out traffic assessments to understand how construction and operation would affect nearby roads, compared with the situation if the project was not implemented. For more information, see chapter 4 of the Operations update.

19.3.1 Construction

Construction impacts

The construction of the project would not result in any noticeable impacts on the performance of the highway network in the ward.

Measures to reduce construction traffic impacts

Our approach to construction has been refined after further investigations and feedback. A summary of the proposed measures introduced to reduce the volume of construction materials transported in and out by road can be found in chapter 2 of the Construction update. To reduce the construction traffic impacts in West Thurrock and South Stifford, we would carry out measures such as the following:

- Minimise use of the local road network as far as possible through construction of temporary offline haul routes directly from the strategic road network.
- Our proposals allow for re-use of excavated materials, and would substantially reduce the need to dispose of excavated material via the road network, thereby reducing the number of HGV movements from the public road network during the construction phase.
- Stockpile material within the Order Limits to allow material to be managed on-site rather than offsite, reducing the number of HGVs journeys needed.

19.3.2 Operations

Operational impacts

Traffic modelling has been carried out to predict the change in traffic flows on roads in the area, including those within or on the boundary with West Thurrock and South Stifford ward for the first year of operation (2029).

Figures 19.3, 19.5 and 19.7 below show the predicted changes in traffic in the morning peak (7am to 8am), interpeak (an average hour between 9am and 3pm) and evening peak (5pm to 6pm) measured in Passenger Car Units (PCUs per hour), where 1 PCU is equivalent to a car, and 2.5 PCUs is equivalent to an HGV. Figures 19.4, 19.6 and 19.8 below show the predicted percentage changes in traffic flow during the morning, interpeak and evening peak. For information about how we assessed operational traffic impacts, see chapter 1. For more information about how we carried out our traffic modelling, see chapter 4 of the Operations update.

Within this ward, there would be a major decrease in traffic predicted on the M25. On the M25 between the Dartford Crossing and junction 31, there would be a predicted decrease of over 1,000 PCUs per hour in the morning and evening peaks and the interpeak period in both directions.

As drivers travel east on the A13 to take advantage of the new road instead of using the Dartford Crossing, on the A13 west of the M25, there would be increases in predicted traffic flows westbound of just between 250 and 500 PCUs in the morning peak hour and between 50 and 205 PCUs in an average interpeak hour and the evening peak hour. These increases are all between 0% and 10% of the predicted traffic flows without the project. Eastbound the increase in traffic is between 50 and 250 PCU, an increase of between 0% and 10% in each of the modelled time periods.

Road users taking advantage of the new connection would also lead to forecast increases in traffic flows at the following locations:

- Increases of between 50 and 250 PCUs in the morning and evening peak hours on the northbound off-slip from the M25 at junction 31.
- Increases of between 50 and 250 PCUs per hour (an increase of between 10% and 20%) on Botany Way, south of the A1090 Arterial Road Purfleet, in the morning peak period northbound and southbound.
- Increases of between 50 and 250 PCUs southbound in the evening peak, which is an increase of between 0% and 10%.

The new crossing would relieve congestion on the Dartford Crossing and the approach roads, leading to a decrease in forecast traffic flows of between 500 and 1000 PCUs on the A13 east of the M25 in each direction in the morning, interpeak and evening peak hours. Westbound this is a decrease of between 10% and 20%. Eastbound the decrease is between 10% and 20% in the morning peak hour and between 0% and 10% in the interpeak hours and the evening peak hour.

South of the A13 on the eastern side of the M25, there would be a decrease in traffic flows northbound in the morning peak hour of between 250 and 500 PCUs on the A125 which runs on the eastern side of the Lakeside Shopping Centre up to the A13. This is a decrease of between 20% and 40%. In the evening peak hour, there would be an increase in traffic flows of between 50 and 250 PCUs, which is an increase of between 20% and 40%. Southbound there would be a decrease of between 50 and 250 PCUs an hour in the evening peak period, a decrease of between 0% and 10%.

There is also a predicted decrease in traffic westbound in the evening peak on the West Thurrock Arterial Road between junction 31 and the West Thurrock Way. On the West Thurrock Way, there would be an increase of traffic southbound between the A1306 and the first junction south of between 50 and 250 PCUs per hour in the morning and evening peaks. There would be an increase of between 50 and 250 PCUs northbound on this stretch of road during the evening peak hour.

Figure 19.3: Predicted change in traffic flows (PCUs) with the project during the morning peak in 2029

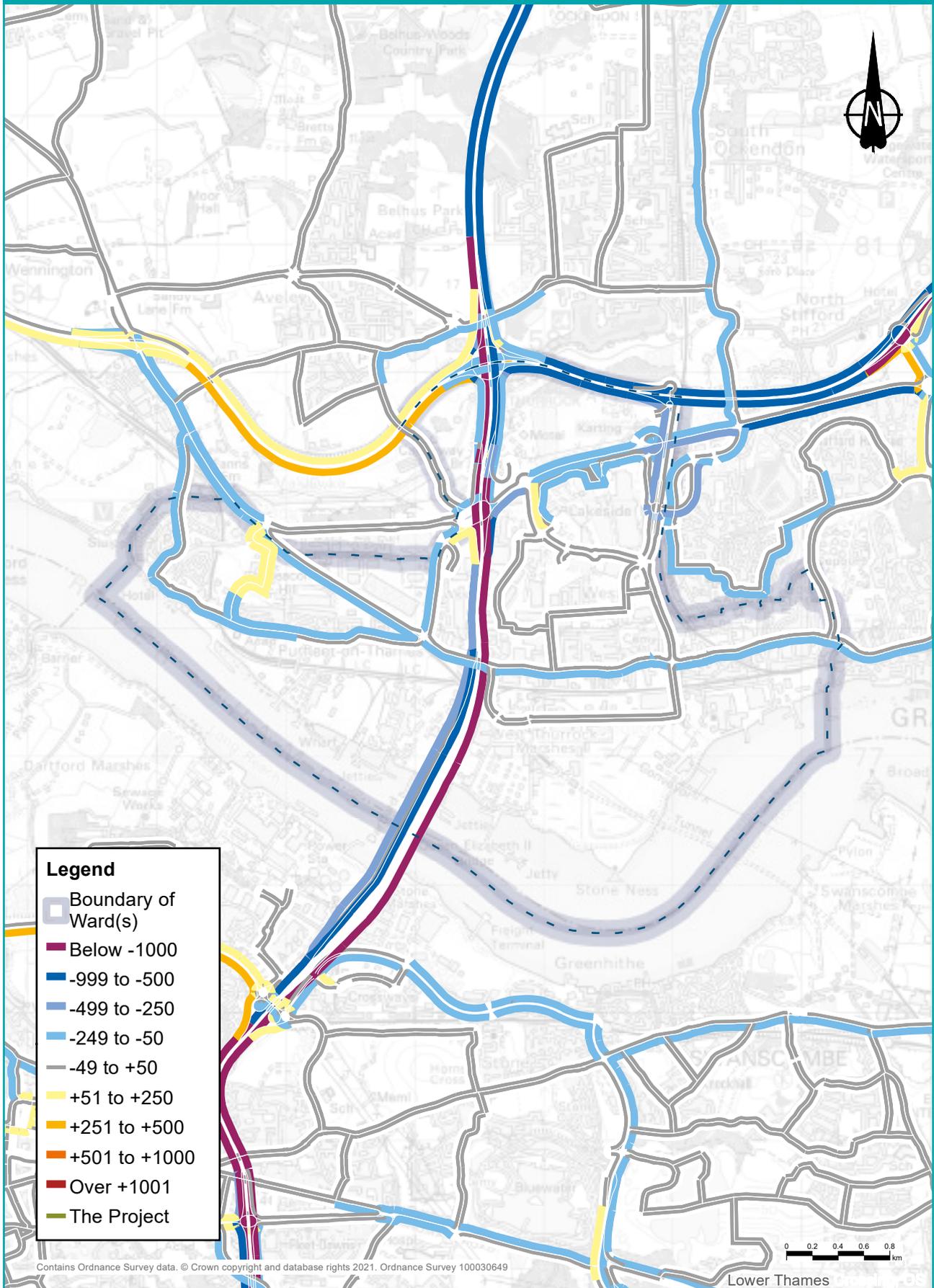


Figure 19.4: Predicted percentage change in traffic flows with the project during the morning peak in 2029

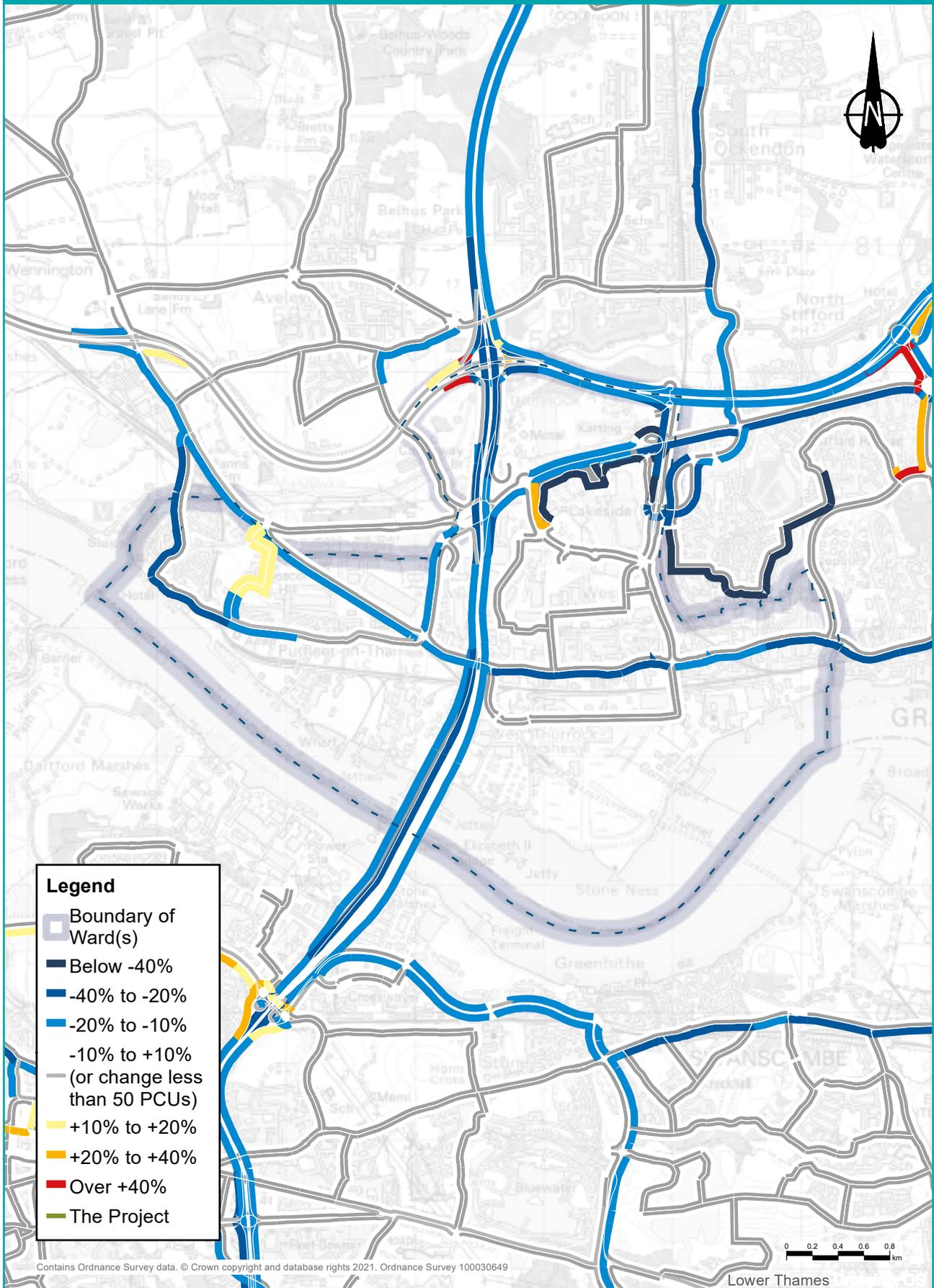


Figure 19.5: Predicted change in traffic flows (PCUs) with the project during the interpeak in 2029

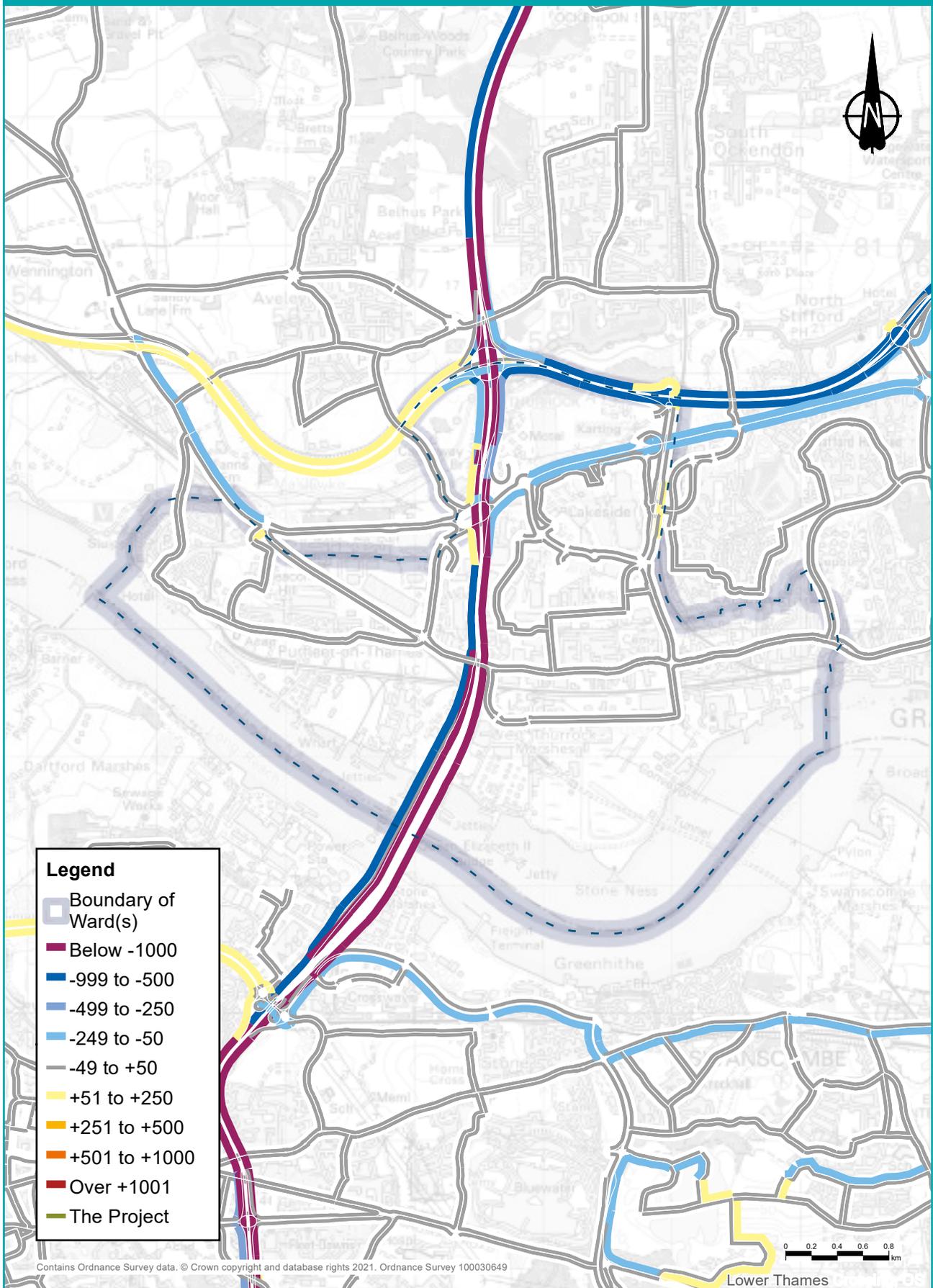


Figure 19.6: Predicted percentage change in traffic flows with the project during the interpeak in 2029

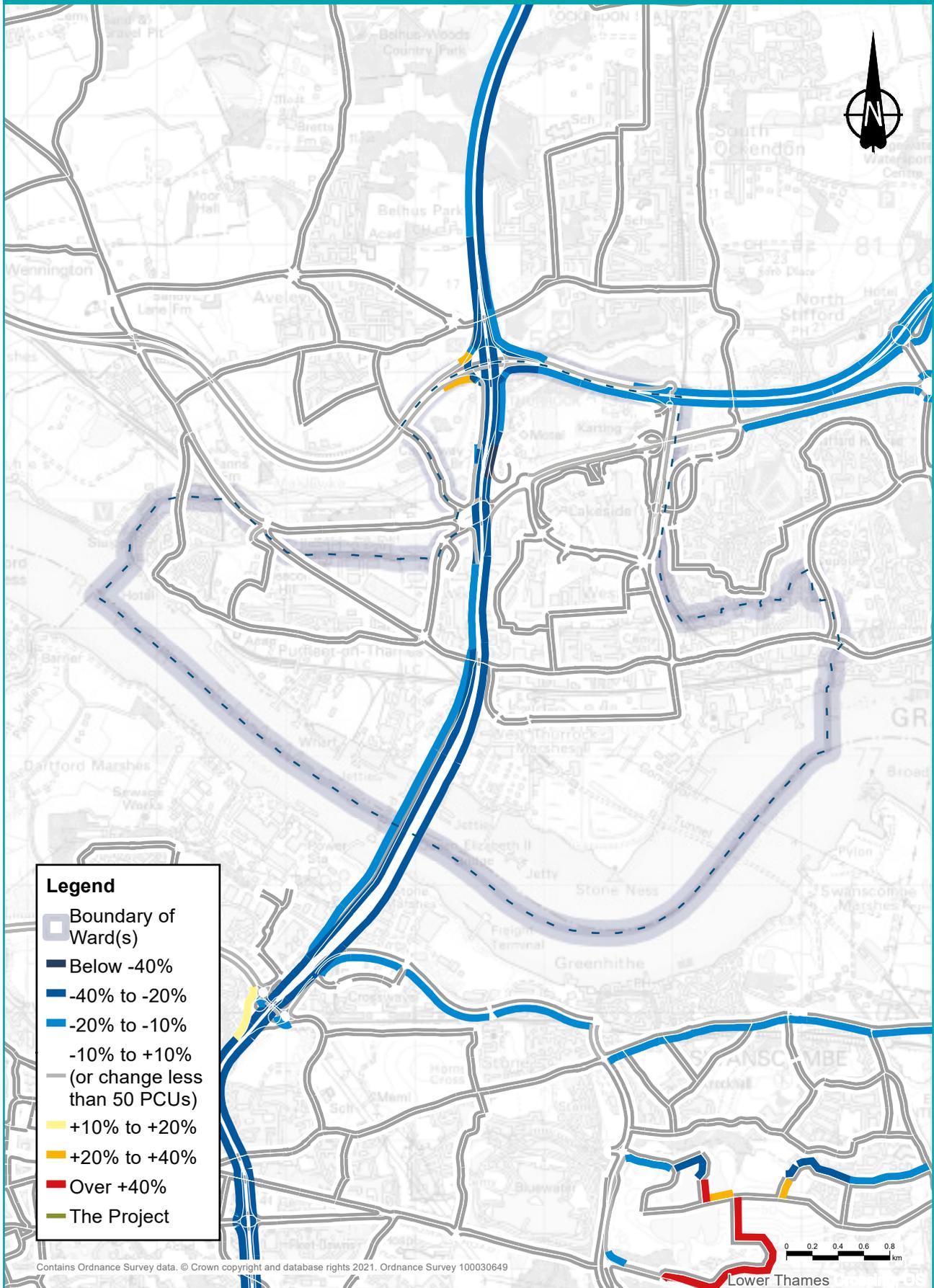


Figure 19.7: Predicted change in traffic flows (PCUs) with the project during the evening peak in 2029

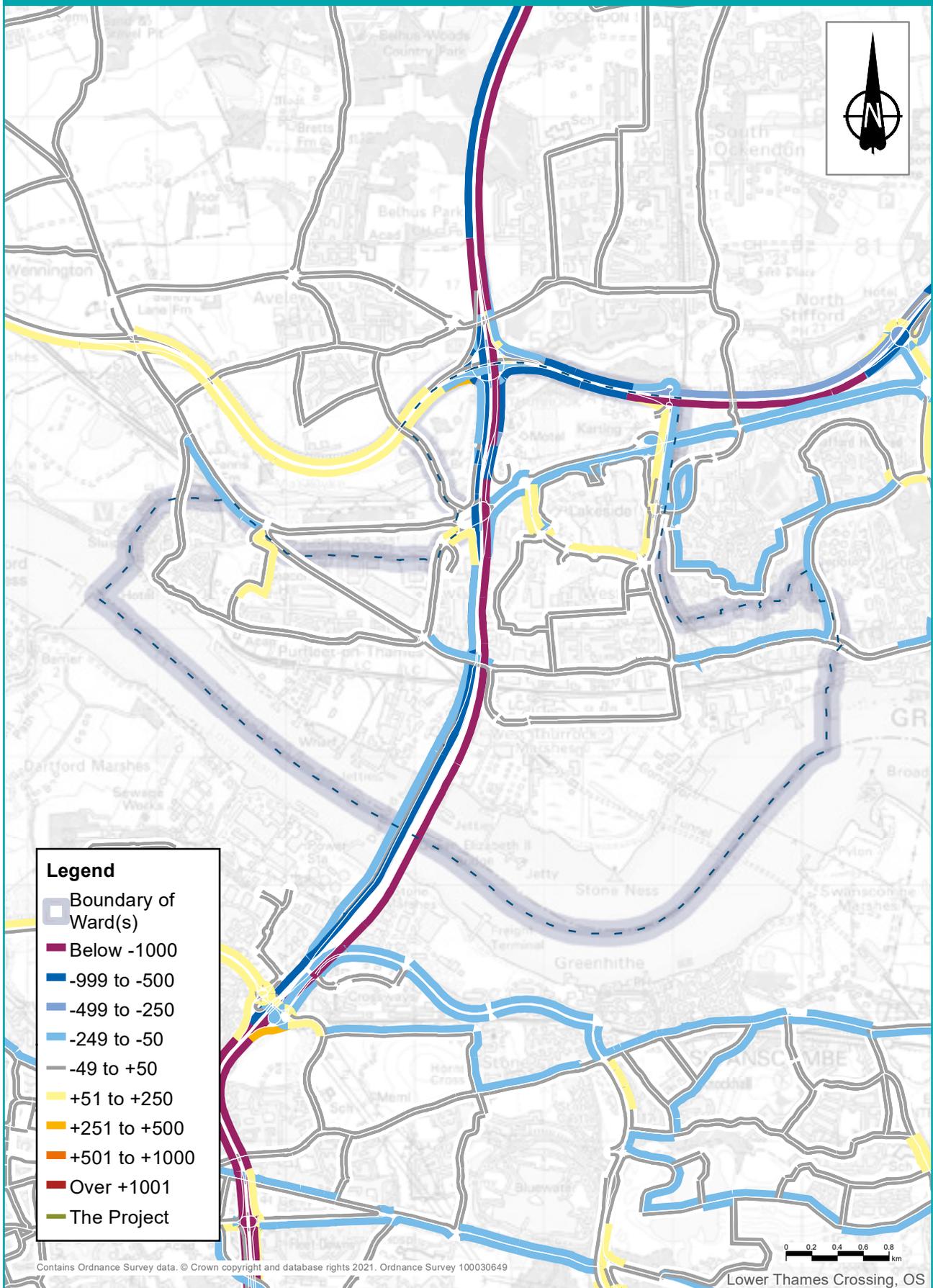
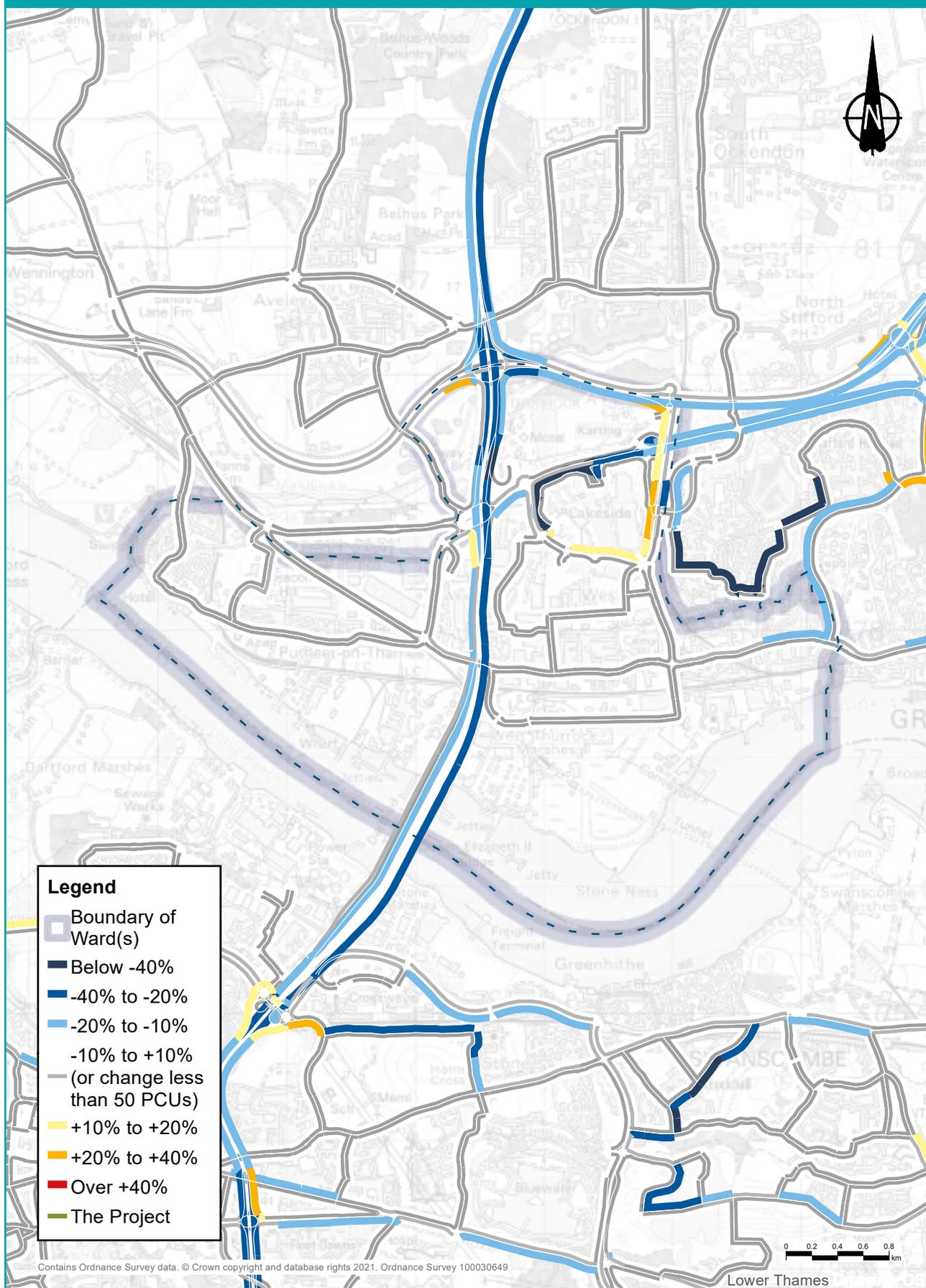


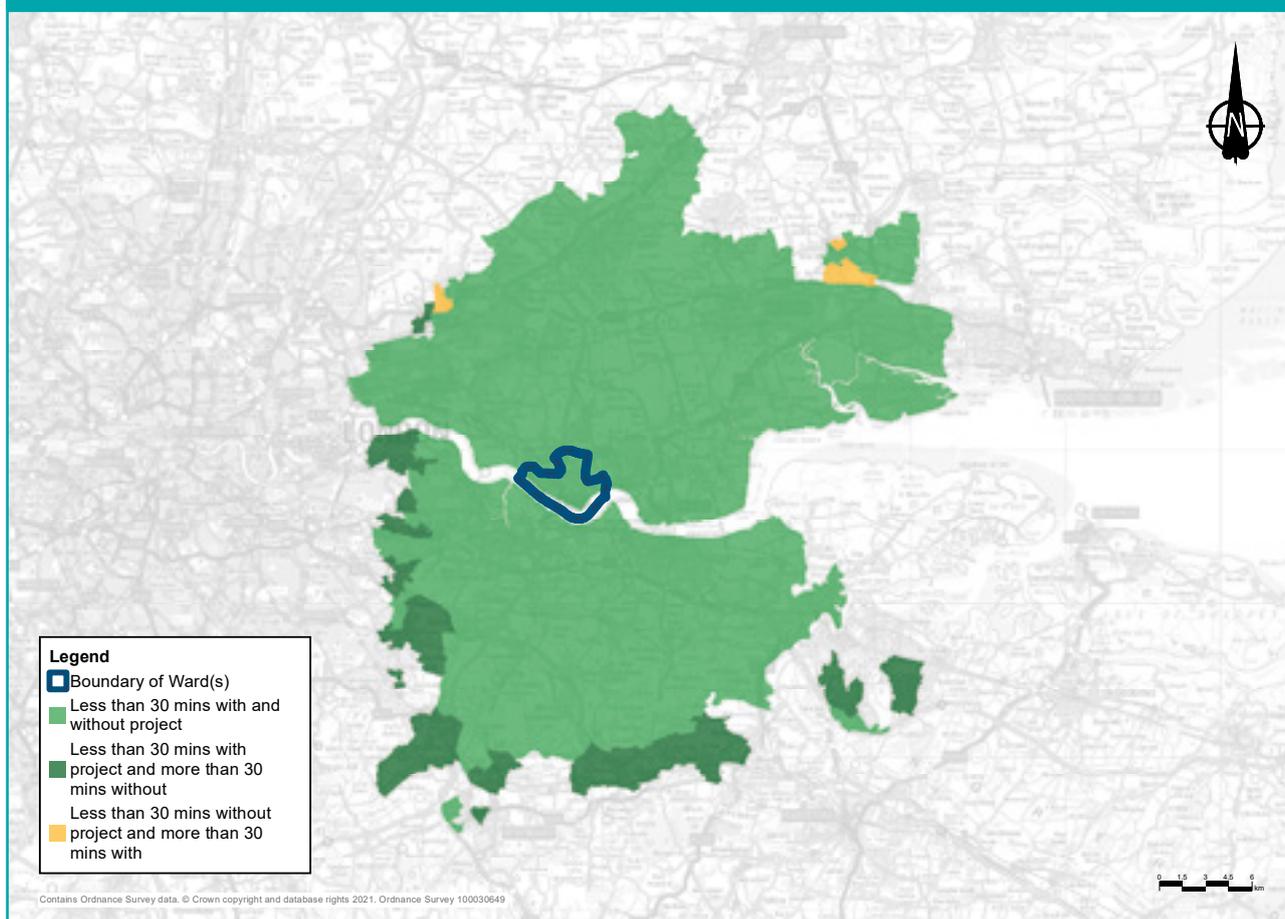
Figure 19.8: Predicted percentage change in traffic flows with the project during the evening peak in 2029



Changes to journey times

Figure 19.9 below shows the change in the area that could be reached within a 30-minute drive from the centre of the ward both with and without the project. Figure 19.10 shows the change in area that can be reached within a 60-minute drive. The areas have been calculated for the morning peak hour (7am-8am). The number of jobs within a 30-minute catchment area would increase by 10% with the project, providing access to 61,600 additional jobs. The number within a 60-minute drive would decrease by 2%, providing access to 82,000 fewer jobs. Despite the project providing a substantial net gain in access for motorists within West Thurrock and South Stifford ward, there are areas (shown in orange on the maps) that would no longer be accessible by car within 30 and 60 minutes because of changes to traffic flows on the wider road network.

Figure 19.9: Change in the area that motorists could drive to within 30 minutes from West Thurrock and South Stifford ward

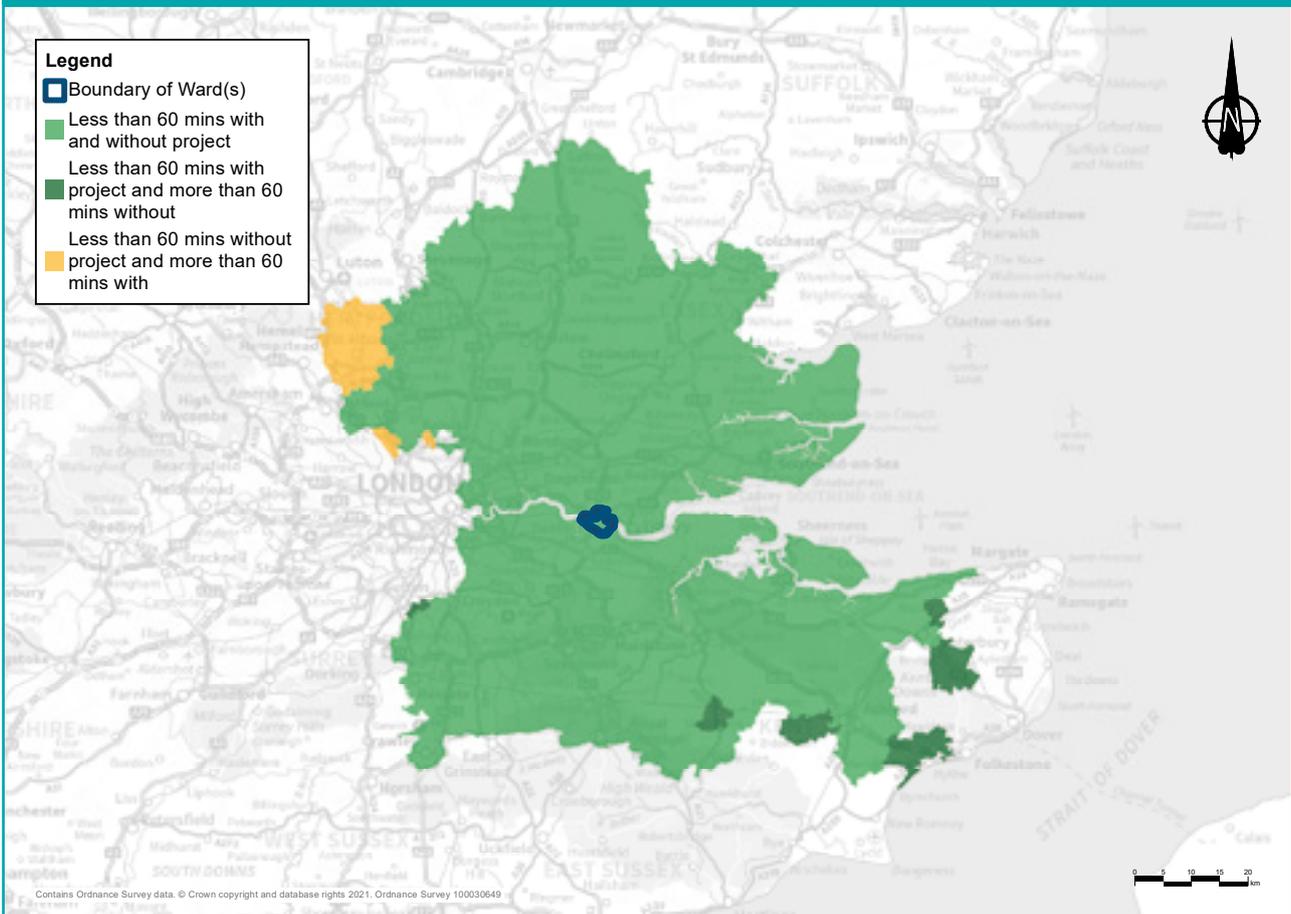


Operational traffic flows

Traffic flow in this ward would improve as a result of the implementation of the Lower Thames Crossing over the River Thames. This would have benefits for the Dartford Crossing itself, as well as other roads in the vicinity of the crossing that currently become congested.

Once the project is operational, traffic impacts on the affected road network would be monitored, including local roads. Where appropriate, we would work with the relevant highway authority to seek funding from the Department for Transport for further interventions.

Figure 19.10: Change in the area that motorists could drive to within 60 minutes from West Thurrock and South Stifford ward



19.4 Public transport

Existing situation

Rail

Purfleet train station is within West Thurrock and South Stifford ward, it is serviced by the c2c services between Shoeburyness/Southend and London Fenchurch Street.

Buses

There are several bus routes that run through this ward including: 100; 11; 22; 25; 32; 370; 372; 44; 66A; 73; 77; 77A; 83; 88A; X1; X80; Z1; and Z2.

19.4.1 Construction

There are no anticipated impacts on public transport associated with the construction of the project in this ward.

19.4.2 Operations

Rail

There would be no discernible change in local access times to the station and no change to the rail services at the station.

Buses

There would be no changes to bus routes through the ward once the project opens. The 25 bus runs from Stifford Clays through Grays to Purfleet and the westbound services would experience a quicker journey time by up to two minutes in the morning peak hour. The 44 bus would also run around a minute quicker in the morning peak hour.

The main change in bus journey times would be for the hourly X80 service which runs from Bluewater, over the Dartford Crossing, to Lakeside and Chafford Hundred station. This would experience a reduction in journey times of around five minutes throughout the day for the northbound route and around three to four minutes in the peak hours southbound.

The 73 bus runs from Tilbury through Grays to Lakeside Shopping Centre. The journey times westbound in the morning peak hour would decrease by around two minutes.

The 83 bus from Chadwell St Mary through Grays to Lakeside would also run slightly quicker in the morning peak westbound, with a decrease in journey time of one to two minutes.

19.5 Footpaths, bridleways and cycle routes

No footpaths, bridleways or cycle routes would be affected during construction or operation in West Thurrock and South Stifford ward.

19.6 Visual

There are no views towards the land on which the project would be built from West Thurrock and South Stifford and therefore no visual effects would be experienced from this ward. More information about how the area would look during construction, including visualisations, can be found in the Construction update. You can also view a video fly-through of the project showing proposed construction activities by visiting our consultation website.

19.7 Noise and vibration

We have carried out noise and vibration assessments for both the construction and operational phases of the project. As explained in chapter 1, some of the assessments set out below are based on earlier versions of the project. The information provided still presents a reasonable representation of the likely effects from the proposals presented during this consultation.

Existing situation

The existing noise environment in West Thurrock and South Stifford ward is mainly a result of traffic noise from the M25, A13, A282, A126, A1306 and the A1090 roads. There is also noise from other roads, railways and other human activity.

As part of our environmental assessment process, we carried out surveys of existing background noise at one location in the ward, which was agreed with the local authority. The levels monitored at this location recorded average existing noise level of 66 dB(A)² during the day.

2 Decibel (dB) is the unit used to measure noise levels, with dB(A) being a standardised way of averaging noise levels that accounts for how humans hear sounds. The typical level of sounds in the environment ranges from 30 dB(A), which is a quiet night-time level in a bedroom, to 90 dB(A), which is how it would sound by a busy road. See chapter 1 for more information about what decibel levels mean.

In order to understand how noise levels would vary with and without the project, we use noise modelling to predict what noise levels would be like in the project's proposed opening year if the project was not built. We model this because we cannot assume that noise levels when the project opens would be the same as they are now. For example, our assessment of the opening year noise levels takes into account predicted changes in traffic levels.

We also model the predicted noise levels for the opening year with the project in place. This provides a useful comparison as to how the project would change the noise levels in the project's opening year if it were implemented.

In the opening year (2029), noise levels without the project are predicted to range, on average, from 47 to 77 dB(A) during the day and from 36 to 63dB (A) during the night at the identified locations within the ward. As such, our noise assessments predict that by opening year noise levels would increase compared to the existing situation even if the road is not built. Information about noise levels with the project, during its construction and operation, are presented below.

19.7.1 Construction

Daytime construction noise impacts

There are no construction activities within 300 metres of the ward. There are no main works compounds or Utility Logistics Hubs currently proposed to be located within the West Thurrock and South Stifford ward, nor are there any haul roads proposed within this ward.

There are no percussive or vibratory works proposed in this ward.

Construction traffic noise impacts

Maps showing predicted changes in road traffic noise on roads within West Thurrock and South Stifford ward during each year of construction can be found in chapter 7 of the Construction update. Based on the currently available traffic data (which offers a representative picture of what receptors within the ward are likely to experience), during the construction period there would be negligible changes in road traffic noise (less than 1dB change in noise levels) during all construction years.

Measures to reduce construction noise and vibration

No specific measures would be required to reduce noise and vibration in West Thurrock and South Stifford ward during construction.

19.7.2 Operations

Operational noise impacts

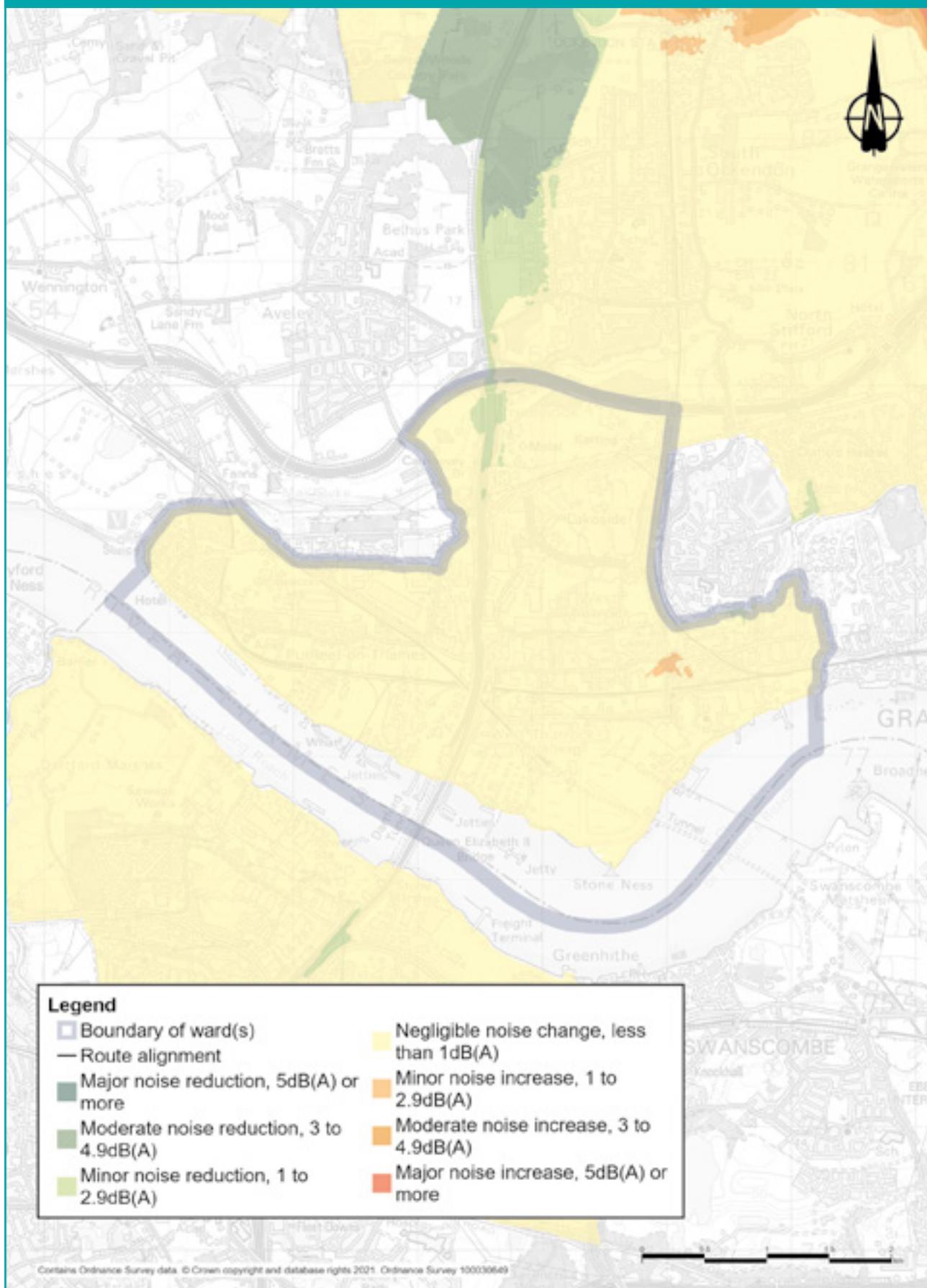
West Thurrock and South Stifford ward is located approximately 4.5km to the south of the main project route and, as such, there would be no direct noise impacts from the project in the ward. Noise impacts within this ward would be as a result of changes in traffic flow, the number of HGVs, and traffic speeds on the existing road network within the ward and because of changes along the M25 and A282 across the Dartford Crossing.

Figure 19.11 shows the predicted changes in traffic noise in the opening year of the project. Within the ward, changes in road traffic noise at identified noise sensitive locations (such as nearby properties) are predicted to range from a minor decrease in noise levels of between 1.0 and 2.9dB to a minor increase in noise levels of between 1.0 and 2.9dB. For more information about how we define noise impacts (negligible, minor, moderate and major), see chapter 1.

Measures to reduce traffic noise and vibration during operation

There are no proposed measures in this ward.

Figure 19.11: Noise impacts during operation in West Thurrock and South Stifford ward



19.8 Air quality

We have carried out air quality assessments for both the construction and operational phases of the project. As explained in chapter 1, some of the assessments set out here are based on earlier versions of the project. The information provided here still presents a reasonable representation of the likely effects from the proposals presented during this consultation.

Existing situation

Within West Thurrock and South Stifford ward, close to the A282 has been declared an Air Quality Management Area (AQMA) due to annual levels of airborne pollution being above accepted standards. AQMAs are areas that have been identified by local authorities as areas of poor air quality that require additional monitoring and controls. No other areas within the ward have been identified as AQMA.

19.8.1 Construction

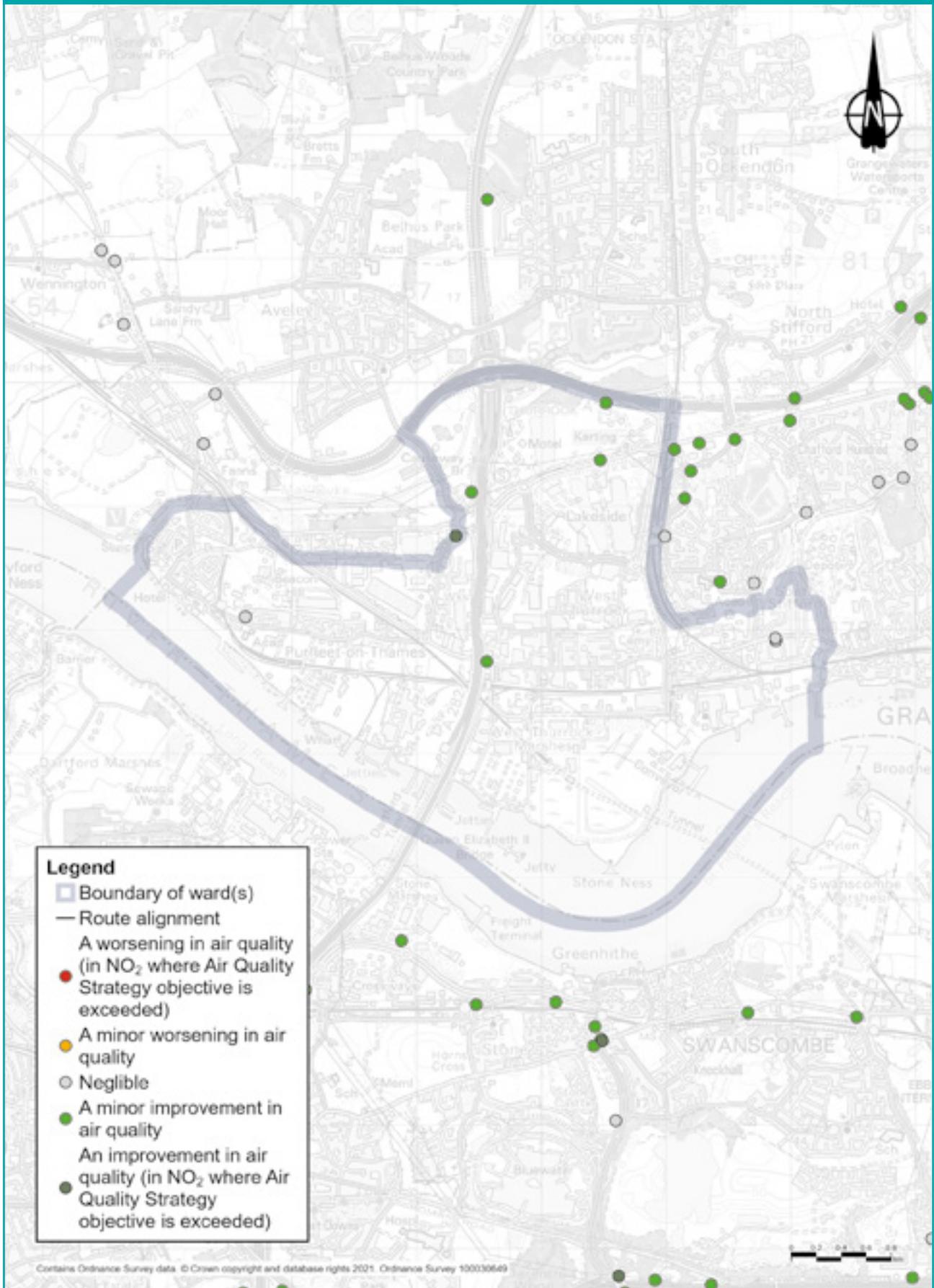
Construction impacts

Construction activities have the potential to affect nearby air quality through the release of dust and emissions from construction equipment and traffic. The areas most likely to be affected are those close to haul roads, compounds and soil storage areas.

Properties more than 200 metres from the worksite, which is the majority of properties within this ward, are outside the area likely to be affected by construction dust or emissions from the worksite. In this ward, there are no properties within 200 metres of the worksite.

Our analysis of construction traffic predicts that the impact on most roads in this ward would be negligible, although there would be no changes in air quality in the area as a result of traffic management in place from 2024 to 2029. More information about construction traffic impacts on air quality can be found in chapter 7 of the Construction update.

Figure 19.12: Predicted changes in NO₂ levels within West Thurrock and South Stifford ward once the new road is open



Measures to reduce air quality impacts during construction

The impact of construction machinery and traffic on air quality would be controlled through the range of good practice measures set out in the CoCP and the REAC. For example, there would be measures to suppress dust, such as damping down dry haul roads and spoil heaps, as well as the use of low-emission machinery and vehicles. We would put in place an Air Quality Management Plan to ensure the measures set out in the CoCP and the REAC would effectively monitor and control dust and exhaust emissions. The location and type of monitoring would be submitted in advance to Thurrock Council for consultation (see REAC entry AQ006).

19.8.2 Operations

Operational impacts

We have carried out an assessment of the operational impacts of the new road on air quality. The assessment area includes a 200 metre buffer around the roads within the affected road network, with this area being the most likely to experience changes to air quality as a result of the new road. More information about air quality impacts once the road is open can be found in chapter 5 of the Operations update.

At all locations within the ward, there are no predicted exceedances of air quality thresholds. There are receptors (properties or habitats that are sensitive to changes in air quality) within the ward, along the A282 that are predicted to experience a minor improvement in the air quality for nitrogen dioxide (NO₂), the main traffic-related pollutant³. The highest modelled yearly average NO₂ concentration within this ward is 38.1µg/m³, which is below the yearly average threshold of 40µg/m³. Our assessment is based on our opening year model, which represents a worst-case scenario, without accounting for the increase in less-polluting vehicles on our roads over time.

Measures to reduce air quality impacts during operation.

The assessed air quality impacts in this area as a result of the project would not trigger the need for any monitoring or other mitigation measures once the road is open.

³ NO₂ levels are measured in 'micrograms per cubic metre', or µg/m³, where a microgram is one millionth of a gram.

19.9 Health

Existing situation

A range of personal, social, economic and environmental factors influence our health. Different groups may be more sensitive to these – for example, children, older people or those with pre-existing health conditions.

West Thurrock and South Stifford is characterised by a younger population, with a higher proportion of children under the aged of 16 (28.3% compared with 24.2% for Thurrock and 20.3% for England).

Economic activity rates are very similar to that of Thurrock, as are the number of people claiming benefits. West Thurrock and South Stifford has a lower proportion of residents in social grade AB (13.2%) than is the case for Thurrock (15.0%). West Thurrock and South Stifford has a significantly lower proportion of households that are owned outright (51%), compared to Thurrock (66.2%).

West Thurrock and South Stifford residents generally have higher rates of self-reported 'very good' health when compared to Thurrock and England as a whole (50.5%, 48.2% and 47.2% respectively).

Life expectancy at birth for men and women is slightly better in West Thurrock and South Stifford than is the case for Thurrock as a whole. However, rates are significantly worse in West Thurrock and South Stifford than for Thurrock for deaths from all causes (these are causes where all or most deaths could potentially be prevented by public health interventions in the broadest sense) respiratory diseases, coronary heart diseases and cancer.

19.9.1 Construction

Construction impacts

There are no construction activities directly affecting West Thurrock and South Stifford ward, apart from construction routes along the M25 and A13.

There are likely to be health benefits as a result of access to work and training opportunities.

Measures to reduce construction health impacts

Engagement and effective two-way communication with communities before and during construction, including sharing information about the programme and impact of works, is important to reduce mental health and wellbeing impacts associated with uncertainty, stress and anxiety. The CoCP sets out proposals for how we would make sure communities, stakeholders and any affected parties are kept updated about the construction works, their progress and associated programme.

19.9.2 Operations

Operational impacts

West Thurrock and South Stifford ward is located approximately 4.5km to the south of the main project route and, as such, there would be no direct noise impacts from the project in the ward. Noise impacts within this ward would be as a result of changes in traffic flow, the number of HGVs, and traffic speeds on the existing road network within the ward and because of changes to the M25 and A282 across the Dartford Crossing.

Within the ward, changes in road traffic noise at identified noise sensitive locations (such as nearby properties) are predicted to range from a minor decrease in noise levels of between 1.0 and 2.9dB to a minor increase in noise levels of between 1.0 and 2.9dB.

Measures to reduce operational health impacts

No essential mitigation measures that specifically address health outcomes have been identified within this ward except that relating to noise and visual impacts described elsewhere.

19.10 Biodiversity

The project would have no adverse effects on biodiversity in this ward during construction or operation. The reduction in traffic flow through this ward as a result of the project's operation would see an improvement in air quality, in the form of a reduction in nitrogen deposition, at West Thurrock Lagoon and Marshes SSSI.

19.11 Built heritage

The project would have no impacts on built heritage in this ward during construction or operation.

19.12 Contamination

The project would have no impacts on contamination in this ward during construction or operation.

How to have your say

Please let us know your views on our community impacts consultation. All the information, including the response form, is available at www.highwaysengland.co.uk/ltcconsultation

The easiest way to comment is by filling out our online consultation response form, but you can submit a response by using any of the methods listed below. Please note, we cannot guarantee that responses sent to any other address will be considered. Responses will be accepted until 23.59 on 8 September 2021.

If you would like to comment on aspects of our proposals from earlier consultations, please use the 'Other comments' section on the response form.

Online

Fill in the survey at www.highwaysengland.co.uk/ltcconsultation

Post

Send your response form, or comments, to **FREEPOST
LTC CONSULTATION**

The Freepost address is the only text needed on the envelope, and you don't need a stamp.

Email

Send your comments to
LTC.CONSULTATION@TRAVERSE.LTD

Telephone surgery

You can book a call back from a member of the project team to discuss any questions or provide comments on the proposal.

From 14 July 2021, call us on **0300 123 5000** (weekdays between 9am and 5pm) to book an appointment

Home delivery

If you do not have access to the internet, from 14 July 2021 you can order printed copies of this guide to consultation, a feedback form and Freepost return envelope, maps and other documents.

Please call us on **0300 123 5000** to request a consultation pack.

These will be delivered free of charge – there is a limit of one pack per household.

Data privacy notice

We are committed to protecting your personal information.

Whenever you provide this information, we are legally obliged to use it in line with all applicable laws concerning the protection of personal data, including the General Data Protection Regulation (GDPR).

How will Highways England use the information we collect about you?

We will use your personal data collected via this consultation to:

- analyse your feedback to the consultation
- produce a summary report, based on our analysis of responses (individuals will not be identified in our Consultation Report)
- write to you with updates about the results of the consultation and other developments
- keep up-to-date records of our communications with individuals and organisations

Any personal information you include in this form will be available to, or used by:

- Highways England
- Traverse (an independent company we are using to analyse feedback to the consultation)
- the Planning Inspectorate (the Government agency that will consider our application for permission to build the Lower Thames Crossing)
- the Secretary of State for Transport (who will decide on our application)
- our legal advisers
- consultants working on the Lower Thames Crossing project

It is also possible that trusted third-party providers, for example construction companies, may later use your contact details to communicate with you about this project.

Under the terms of the GDPR, you have certain rights over how your personal data is retained and used by Highways England. For more information, see our full data privacy statement at www.highwaysengland.co.uk/our-work/lower-thames-crossing/privacy-notice/

Glossary

Term	Explanation
2029 Opening year	A modelled year in the LTC traffic model in which flows are estimated for each option
2044 Design year	A modelled year in the LTC traffic model. The design year is typically 15 years after opening - for LTC the design year is 2044.
AADT	Average Annual Daily Traffic
Affected Road Network	This comprises the area within which roads could be considered within the air quality model (selection of the roads within the model depends upon a number of criteria such as changes in Heavy Duty Vehicle flows).
Alignment	The alignment is the horizontal and vertical route of a road, defined as a series of horizontal tangents and curves or vertical crest and sag curves, and the gradients connecting them.
AM	07:00 to 10:00
AOD	Above ordnance datum, vertical datum used by an ordnance survey as the basis for delivering altitudes on maps.
AONB	Area of Outstanding Natural Beauty: Statutory designation intended to conserve and enhance the ecology, natural heritage and landscape value of an area of countryside.
APTR	All-purpose trunk road
AQMA	Air Quality Management Area: an area, declared by a local authority, where air quality monitoring does not meet Defra's national air quality objectives.
AQSO	Air Quality Strategy Objective: Objective set by the Air Quality Strategy for England, Scotland, Wales and Northern Ireland to improve air quality in the UK in the medium term. Objectives are focused on the main air pollutants to protect health.
BAT	Best Available Techniques used for controlling construction noise levels
Best Practicable Means	Practicable relates to local conditions, circumstances, the current knowledge and understanding of technical aspects with consideration to financial implications. The means to be employed ("Means") include the design, installation, maintenance, and manner and periods of operation of plant and machinery.
Bluewater	Bluewater Shopping Centre, an out of town shopping centre in Stone, Kent
Chart Datum	The level of water from which charted depths displayed on a nautical chart are measured.

Term	Explanation
CoCP	Code of Construction Practice - provides a framework to manage construction and operational activities so that environmental mitigation commitments are met.
Dart Charge	The Dartford Crossing free-flow electronic number plate recognition charging system (operates between 0600 and 2200).
DCO	Development Consent Order
Defra	Department for Environment, Food and Rural Affairs: the government department responsible for environmental protection, food production and standards, agriculture, fisheries and rural communities in the United Kingdom of Great Britain and Northern Ireland.
Design principles	Guidance that underpins the design measures that integrate the new road into the local landscape and establishes parameters that must be met in the final design of the road.
DfT	Department for Transport: the government department responsible for the English transport network and a limited number of transport matters in Scotland, Wales and Northern Ireland that have not been devolved.
Disbenefit	A disadvantage or loss resulting from something.
DMRB	Design Manual for Roads and Bridges: A comprehensive manual (comprising 15 volumes) which contains requirements, advice and other published documents relating to works on motorway and all-purpose trunk roads for which one of the Overseeing Organisations (Highways England, Transport Scotland, The Welsh Government or the Department for Regional Development (Northern Ireland)) is highway authority. The DMRB has been developed as a series of documents published by the Overseeing Organisations of England, Scotland, Wales and Northern Ireland. For the Lower Thames Crossing the Overseeing Organisation is Highways England.
EA	Environment Agency: The Environment Agency was established under the Environment Act 1995, and is a Non-Departmental Public Body of Defra. The Environment Agency is the leading public body for protecting and improving the environment in England and Wales. The organisation is responsible for wide-ranging matters, including the management of all forms of flood risk, water resources, water quality, waste regulation, pollution control, inland fisheries, recreation, conservation and navigation of inland waterways.

Term	Explanation
Ecological Clerk of Works	This person(s) would provide advice about ecological and environmental issues during the construction period, monitor the work to ensure site-based construction activities are delivered in accordance with wildlife law and ensure that any necessary permits or licensing is acquired.
EIA	Environmental Impact Assessment
ES	Environmental Statement
ESL – Eastern Southern Link	The Eastern Southern Link (ESL) is an alternative for shortlist Routes 2, 3 and 4 to the south of the River Thames. The route would connect into Junction 1 of the M2 and would pass to the east of Shorne and then northwest towards Church Lane and Lower Higham Road. This route could connect into any of the Routes 2, 3 and 4 north of the river utilising all of the crossing options for these route options.
Fastrack	A bus rapid transit scheme operating in the Thames Gateway area of Kent, operated by Arriva Southern Counties.
FCTP	Framework Construction Travel Plan - sets out a framework to reduce the impact of the project's construction workforce on the road network as a result of travel to and from construction areas and compounds.
GHG	Greenhouse gas emissions are emissions of greenhouse gases that cause climate change by creating a greenhouse effect in the earth's atmosphere.
GIS	Geographic information system: an integrated collection of computer software and data used to view and manage information about geographic places, analyse spatial relationships, and model spatial processes.
HGV	Heavy Goods Vehicle
HRA	Habitats Regulations Assessment: A tool developed by the European Commission to help competent authorities (as defined in the Habitats Regulations) to carry out assessment to ensure that a project, plan or policy will not have an adverse effect on the integrity of any Natura 2000 or European sites (Special Areas of Conservation, Special Protection Areas and Ramsar sites), (either in isolation or in combination with other plans and projects), and to begin to identify appropriate mitigation strategies where such effects were identified.
HS1	High Speed 1 rail line (formerly Channel Tunnel Rail Link (CTRL))
Inter-peak	10:00 to 16:00

Term	Explanation
Jacked box tunnelling	Jacked box tunnelling is a method of construction that enables engineers to create underground space at shallow depth in a manner that avoids disruption of valuable infrastructure and reduces impact on the human environment.
Lakeside	Lakeside Shopping Centre, branded as Intu Lakeside, is a large out-of-town shopping centre located in West Thurrock, in the borough of Thurrock, Essex just beyond the eastern boundary of Greater London.
Location A	The location for LTC route options close to the existing Dartford crossing.
Location C	The location for LTC route options connecting the A2/ M2 east of Gravesend with the A13 and M25 (between Junctions 29 and 30) north of the River Thames.
London Gateway	A new deep-water port, able to handle the biggest container ships in the world, and part the London Gateway development on the north bank of the River Thames in Thurrock, Essex, 20 miles (32 km) east of central London.
London Resort	A proposed theme park and entertainment precinct on the Swanscombe peninsula, Kent, being developed by London Resort Company Holdings. Construction could begin in 2022 with the opening estimated for 2024.
LTC	Lower Thames Crossing: a proposed new crossing of the Thames estuary linking the county of Kent with the county of Essex, at or east of the existing Dartford Crossing.
LWS	Local wildlife site
Mainline	The through carriageway of a road as opposed to a slip road or a link road at a junction Mardyke A small river, mainly in Thurrock, that flows into the River Thames at Purfleet, close to the QEII Bridge.
NCR	National Cycle Route: a cycle route part of the National Cycle Network created by Sustrans to encourage cycling throughout Britain.
NMU	Non-motorised user, e.g. pedestrians, cyclists, equestrians.
NO₂	Nitrogen dioxide.
NPSNN	National Policy Statement for National Networks: The NPSNN sets out the need for, and Government's policies to deliver, development of nationally significant infrastructure projects on the national road and rail networks in England. It provides planning guidance for promoters of nationally significant infrastructure projects on the road and rail networks, and the basis for the examination by the Examining Authority and decisions by the Secretary of State.

Term	Explanation
NSIP	Nationally significant infrastructure project: major infrastructure developments in England and Wales, such as proposals for power plants, large renewable energy projects, new airports and airport extensions, major road projects etc.
OLEMP	Outline Landscape and Ecology Management Plan - sets out the management regimes, management expectations and monitoring requirements for parcels of land that perform specific landscape and ecological mitigation functions for the project, such as habitat creation or visual screening.
oMHP	Outline Materials Handling Plan - sets out the approach and high-level principles for handling construction materials and waste.
ONS	Office for National Statistics: the executive office of the UK Statistics Authority, a non-ministerial department which reports directly to the UK Parliament.
oSWMP	Outline Site Waste Management Plan - sets out the overarching principles and procedures that would be applied for the management of waste during the construction of the project.
oTMPfc	Outline Traffic Management Plan for construction - outlines the approach to carrying out temporary traffic management for the safe construction of the project and the management measures to reduce the impact on local communities.
pcu	passenger car units. This is a metric to allow different vehicle types within traffic flows in a traffic model to be assessed in a consistent manner. Typical pcu factors are: 1 for a car or light goods vehicle; 2 for a bus or heavy goods vehicle; 0.4 for a motorcycle; and 0.2 for a pedal cycle.
PEIR	Preliminary Environmental Information Report
PLA	Port of London Authority: a self-funding public trust established by The Port of London Act 1908 to govern the Port of London. Its responsibility extends over the Tideway of the River Thames and its continuation (the Kent/ Essex strait). It maintains and supervises navigation and protects the river's environment.
PM	16:00 to 19:00
PM₁₀	Particulate matter (in this example, particulates smaller than 10µm that can cause health problems).
PoTLL	Port of Tilbury London Limited, operator of the Port of Tilbury

Term	Explanation
PRow	Public Right of Way: A right possessed by the public, to pass along routes over land at all times. Although the land may be owned by a private individual, the public may still gain access across that land along a specific route. The mode of transport allowed differs according to the type of public right of way which consist of footpaths, bridleways and open and restricted byways.
Ramsar	A wetland of international importance, designated under the Ramsar convention.
REAC	Register of Environmental Actions and Commitments - identifies good practice and essential mitigation that will be adopted during the construction and operation of the project.
RSPB	Royal Society for the Protection of Birds: A charitable organisation that works to promote conservation and protection of birds and the wider environment through public awareness campaigns, petitions and through the operation of nature reserves throughout the United Kingdom.
SAC	Special Area of Conservation: defined in the European Union's Habitats Directive (92/43/EEC), also known as the Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora. SACs are to protect the 220 habitats and approximately 1000 species listed in annex I and II of the directive which are considered to be of European interest following criteria given in the directive.
Setting	This is defined in the National Planning Policy Framework as 'The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of the asset, may affect the ability to appreciate that significance or may be neutral.'
SPA	Special Protection Area: A designation under the European Union Directive on the Conservation of Wild Birds.
SPZ	Source protection zone: EA-defined groundwater sources (2000) such as wells, boreholes and springs used for public drinking water supply. These zones show the risk of contamination from any activities that might cause pollution in the area.
SRN	Strategic Road Network, the core road network, managed in England by Highways England.
SSSI	Site of Special Scientific Interest: A conservation designation denoting an area of particular ecological or geological importance.
SuDS	A sustainable drainage system designed to reduce the potential impact of new and existing developments with respect to surface water drainage discharges.

Term	Explanation
TAG	Transport Analysis Guidance: national guidance document produced by the Department for Transport.
TBM	Tunnel boring machine, machine used to excavate tunnels with a circular cross section.
tCO2e	Tonnes of carbon dioxide equivalent; a standard unit for measuring carbon footprints. The idea is to express the impact of each different greenhouse gas in terms of the amount of CO2 that would create the same amount of warming.
TfL	Transport for London: created in 2000, the integrated body responsible for London's transport system.
ULH	Utilities Logistics Hubs
V/C	Volume over Capacity (volume/capacity)
VMS	Variable Message Sign, typically mounted on a portal gantry.
WNIMMP	Wider Network Impacts Management and Monitoring Plan - summarises the work undertaken to date to identify and assess areas of the road network where monitoring and potential interventions may be necessary to better manage additional traffic as a result of the project.
WSL - Western Southern Link	The Western Southern Link (WSL) is an alternative for shortlist Routes 2, 3 and 4 to the south of the River Thames. The route would connect into the A2 to the east of Gravesend and would go to the west of Thong and Shorne and east of Chalk towards Church Lane and Lower Higham Road. This route could connect into any of the Routes 2, 3 and 4 north of the river utilising all of the crossing options for these route options.

If you need help accessing this or any other Highways England information, please call **0300 123 5000** and we will help you.

The wards covered in this summary are:

East Tilbury

Tilbury Riverside and Thurrock Park

Tilbury St Chads

Chadwell St Mary

Orsett

Little Thurrock Blackshots, Little Thurrock Rectory

Stifford Clays, Chafford and North Stifford, Belhus

West Thurrock and South Stifford

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