

# 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

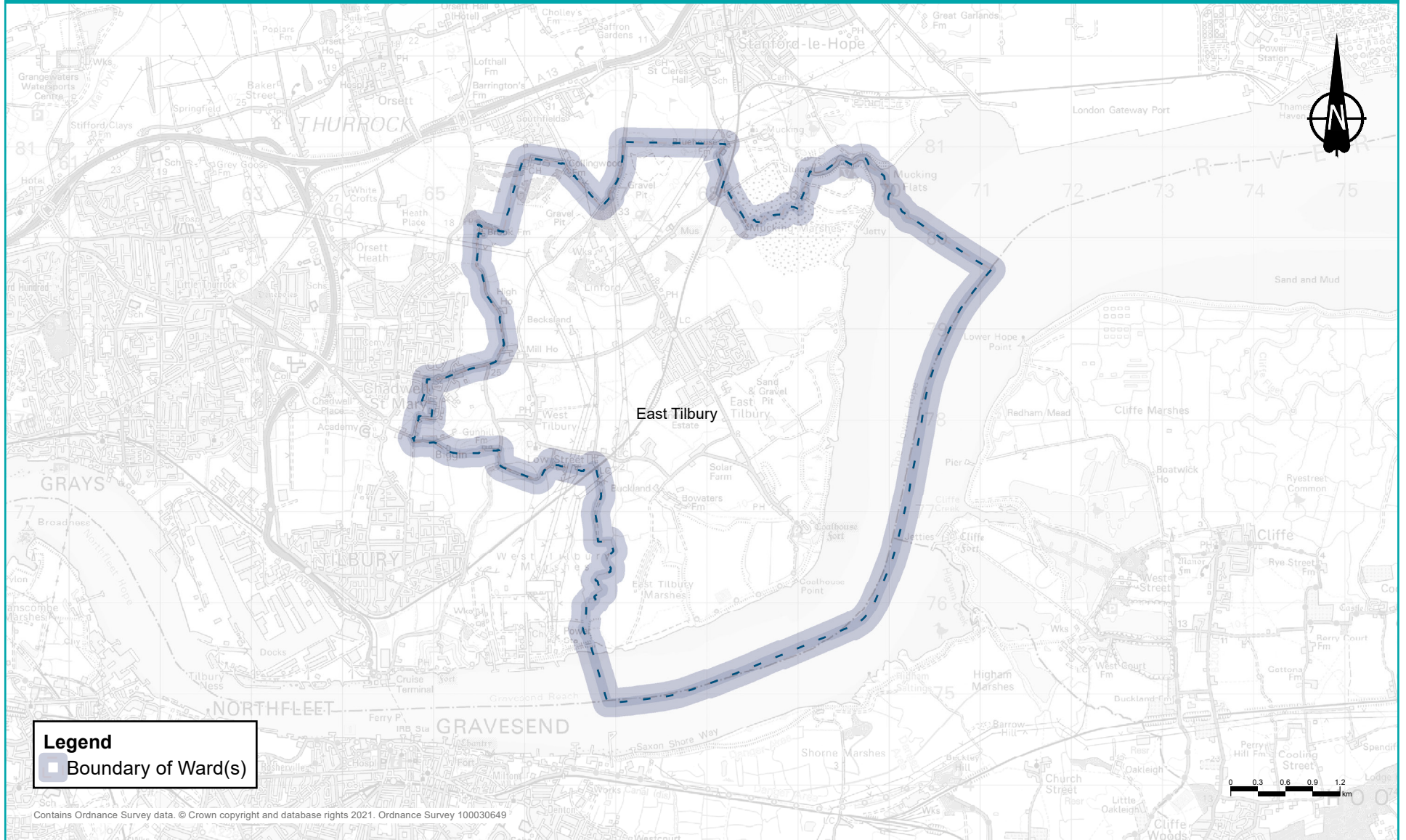
East Tilbury ward is located north of the River Thames, to the west of Tilbury Riverside and Thurrock Park ward. The ward has an area of around 17km<sup>2</sup> and an estimated population of 7,176<sup>1</sup>. The residential areas of East Tilbury and Linford are in the centre of the ward and are surrounded 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.

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<sup>1</sup> Office for National Statistics, 2018 ward-level population estimate

Figure 12.1: Ward boundary map for East Tilbury ward



## 12.1.2 Summary of impacts

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

Topic	Construction	Operations
<p><b>Traffic</b></p>	<p><b>Impacts</b></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><b>Mitigation</b></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><b>Impacts</b></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><b>Mitigation</b></p> <p>Once the project is operational, traffic impacts on the affected road network would be monitored, including local roads.</p>
<p><b>Public transport</b></p>	<p><b>Buses</b></p> <p>During construction, there may be some increases in journey times along local roads, which would impact the 374 bus route.</p> <p><b>Rail</b></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><b>Buses</b></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><b>Rail</b></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><b>Footpaths, bridleways and cycle routes</b></p>	<p><b>Impacts</b></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><b>Mitigation</b></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><b>Impacts</b></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><b>Mitigation</b></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><b>Visual</b></p>	<p><b>Impacts</b></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><b>Mitigation</b></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><b>Impacts</b></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><b>Mitigation</b></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><b>Noise and vibration</b></p>	<p><b>Impacts</b></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><b>Mitigation</b></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><b>Impacts</b></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><b>Mitigation</b></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><b>Air quality</b></p>	<p><b>Impacts</b></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><b>Mitigation</b></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><b>Impacts</b></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><b>Mitigation</b></p> <p>As our modelling shows there would be a minimal increase in NO<sub>2</sub> as a result of the operation of the project, no mitigation is proposed.</p>

Topic	Construction	Operations
<p><b>Health</b></p>	<p><b>Impacts</b></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><b>Mitigation</b></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><b>Impacts</b></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><b>Mitigation</b></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><b>Biodiversity</b></p>	<p><b>Impacts</b></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><b>Mitigation</b></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><b>Impacts</b></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><b>Mitigation</b></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><b>Built heritage</b></p>	<p><b>Impacts</b></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><b>Mitigation</b></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><b>Impacts</b></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><b>Mitigation</b></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><b>Contamination</b></p>	<p><b>Impacts</b></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><b>Mitigation</b></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><b>Impacts</b></p> <p>None identified.</p> <p><b>Mitigation</b></p> <p>None required.</p>

## 12.2 Project description

### 12.2.1 Construction

#### Construction activities

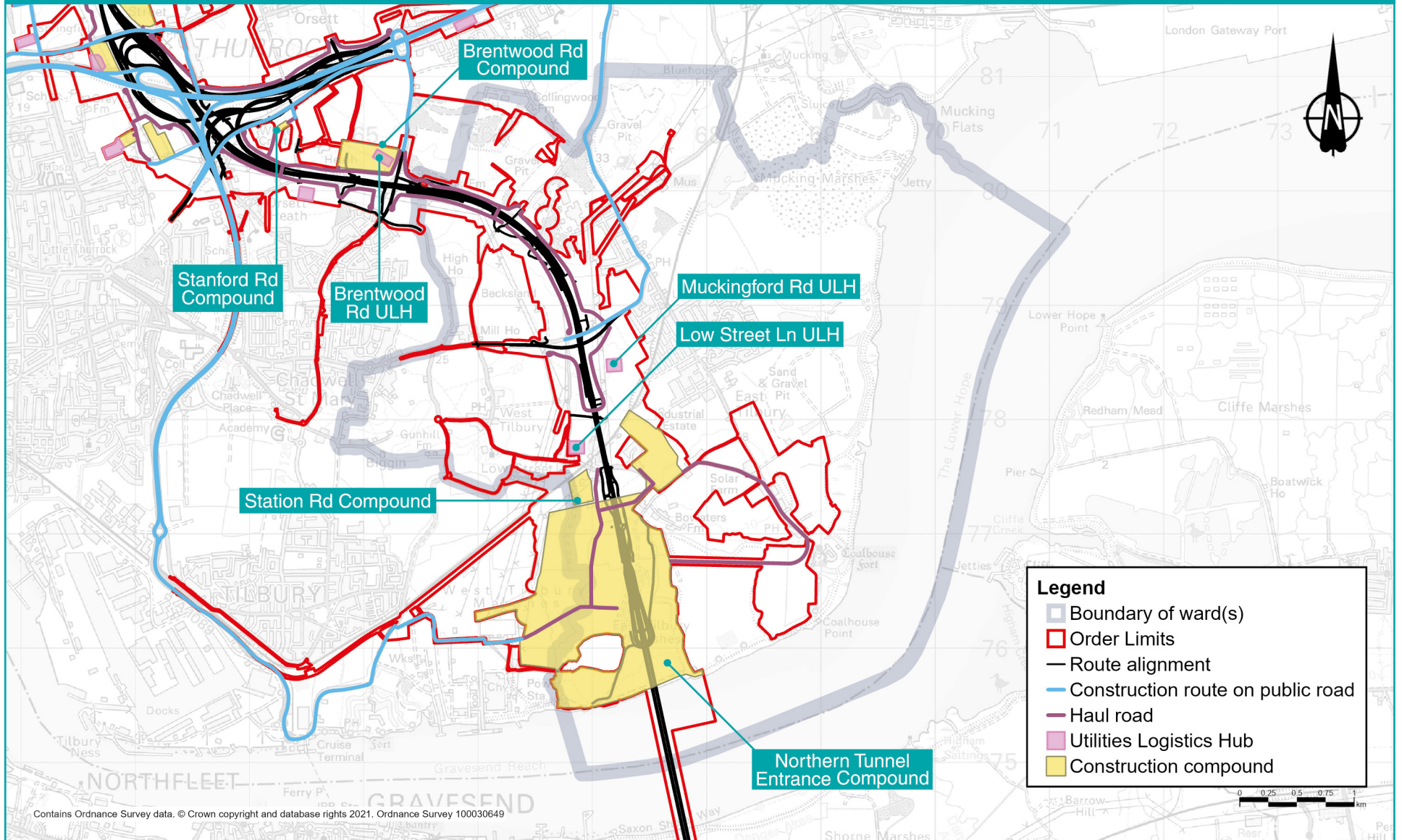
More information about how the area would look during construction, including visualisations, can be found in the Construction update. You can also view a video fly-through of the project during construction by visiting our consultation website.

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



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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
<b>Love Lane, Princess Margaret Road, Station Road</b>	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
<b>Coopers Shaw Road</b>	Lane closures and traffic lights in 300 metre sections	Modifications to local utility networks	4 months between September 2024 and February 2025
<b>Muckingford Road</b>	Lane closures and traffic lights in 300 metre sections	Modifications to local utility networks	6 months between March 2025 and October 2025
<b>Hoford Road</b>	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
<b>Hoford Road</b>	Closure	To carry out bridge and utilities works	Nights and weekends over short periods associated with specific works activities
<b>Hoford Road</b>	Closure	Switch to permanent alignment	Weekends between June and October 2025
<b>Coopers Shaw Road/Gun Hill/ Fort Road</b>	Three-way traffic lights	To facilitate utility modifications	2 weeks between September 2024 and February 2025
<b>Rectory Road/ Church Road/ Station Road</b>	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
<b>Station Road</b>	Lane closures and traffic lights	To carry out nearby works and remove equipment	Nights and weekends over short periods associated with specific works activities
<b>Muckingford Road</b>	Switchover	To align the old road to the new road	1 weekend June to October 2025
<b>Horford Road</b>	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.

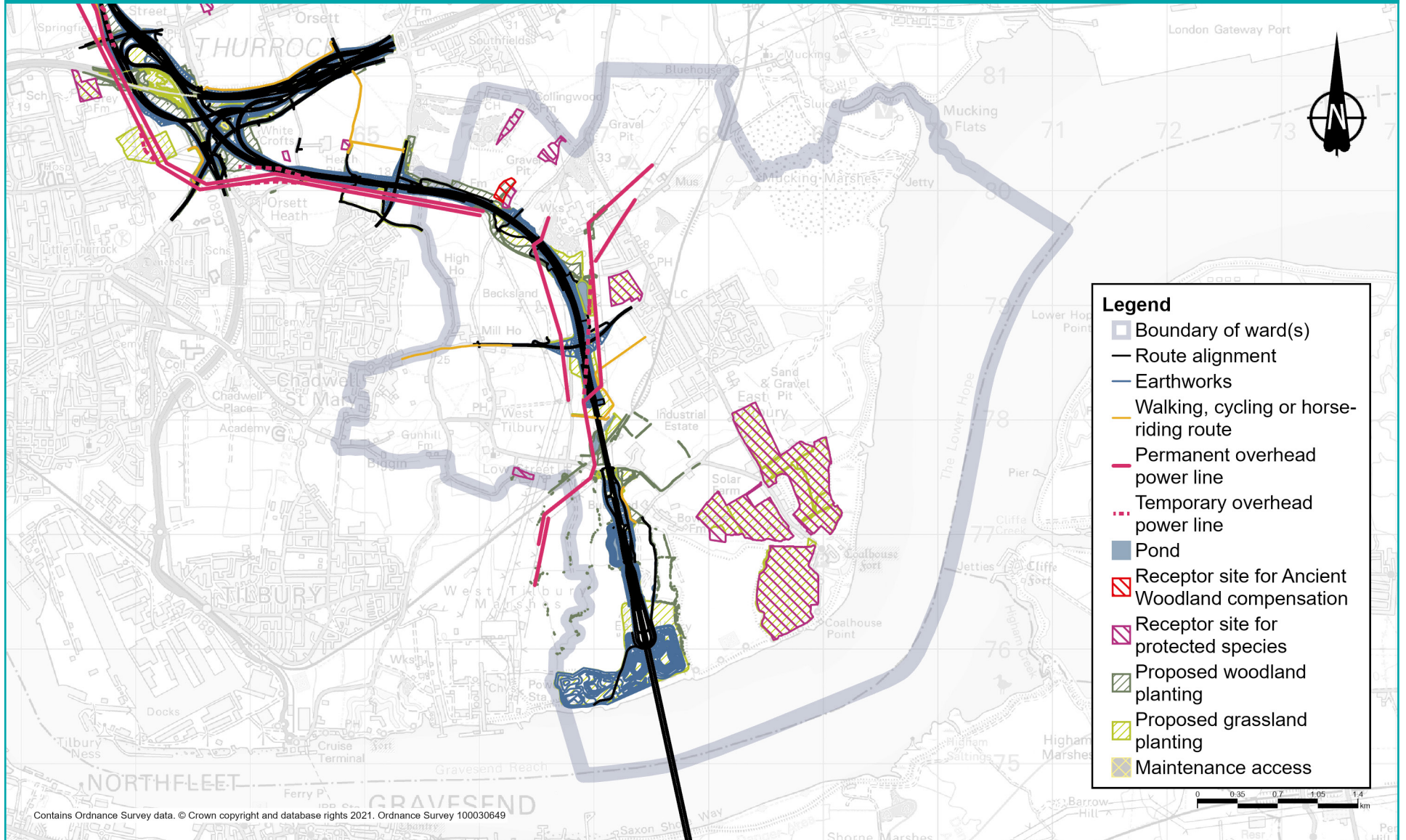
## **12.2.2 Operations**

### **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



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- 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 7,800m<sup>2</sup> against a total loss of approximately 7,400m<sup>2</sup>. Therefore, more land is replaced than lost, with a surplus balance of approximately 26m<sup>2</sup>. 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.

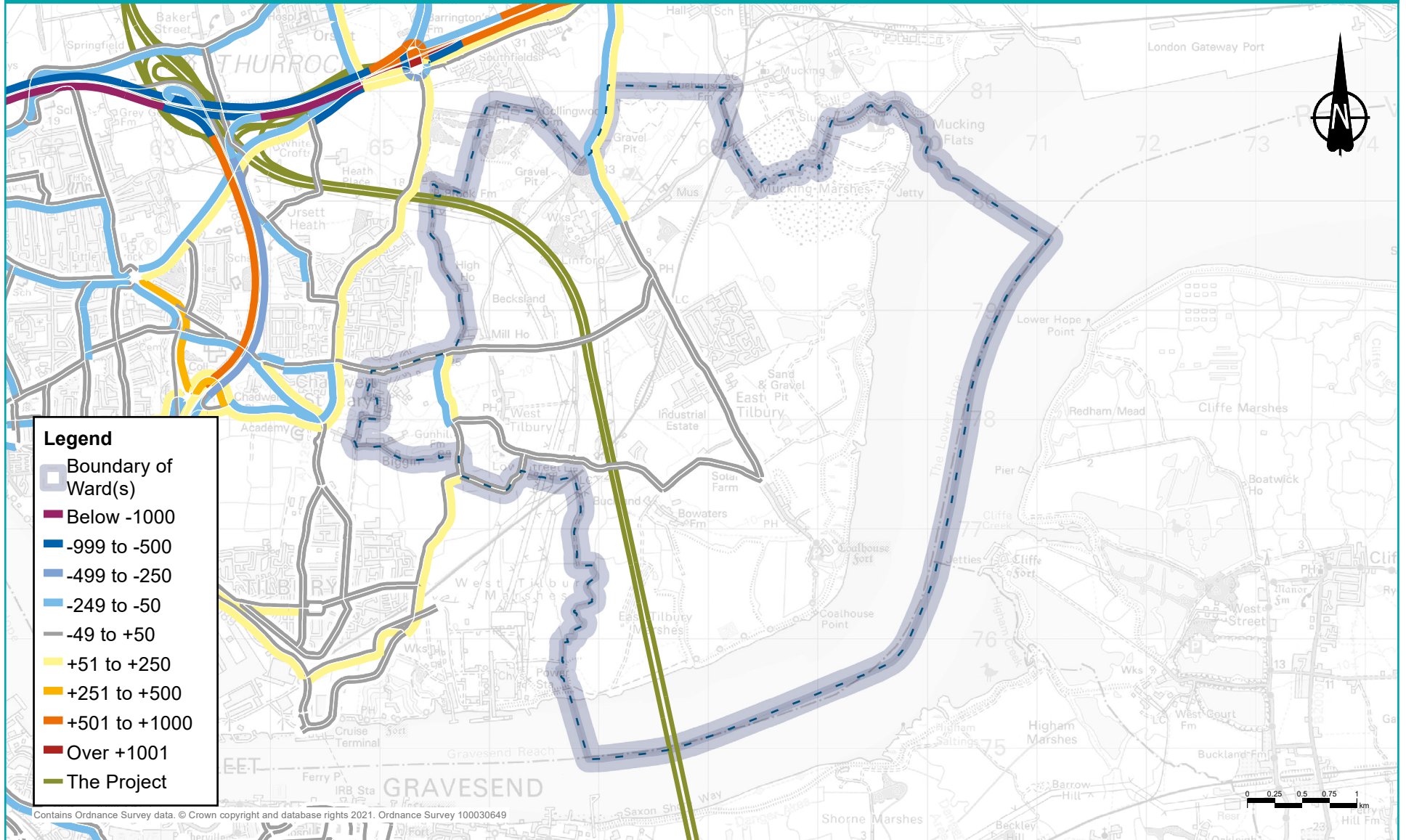
The project runs through East Tilbury. The highest flows would be on the main route itself in the morning peak, when there would be 4,200 PCUs northbound and 3,400 PCUs southbound. In the interpeak hour there would be around 3,500 PCUs northbound and 2,800 PCUs southbound. In the evening peak hour, there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



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

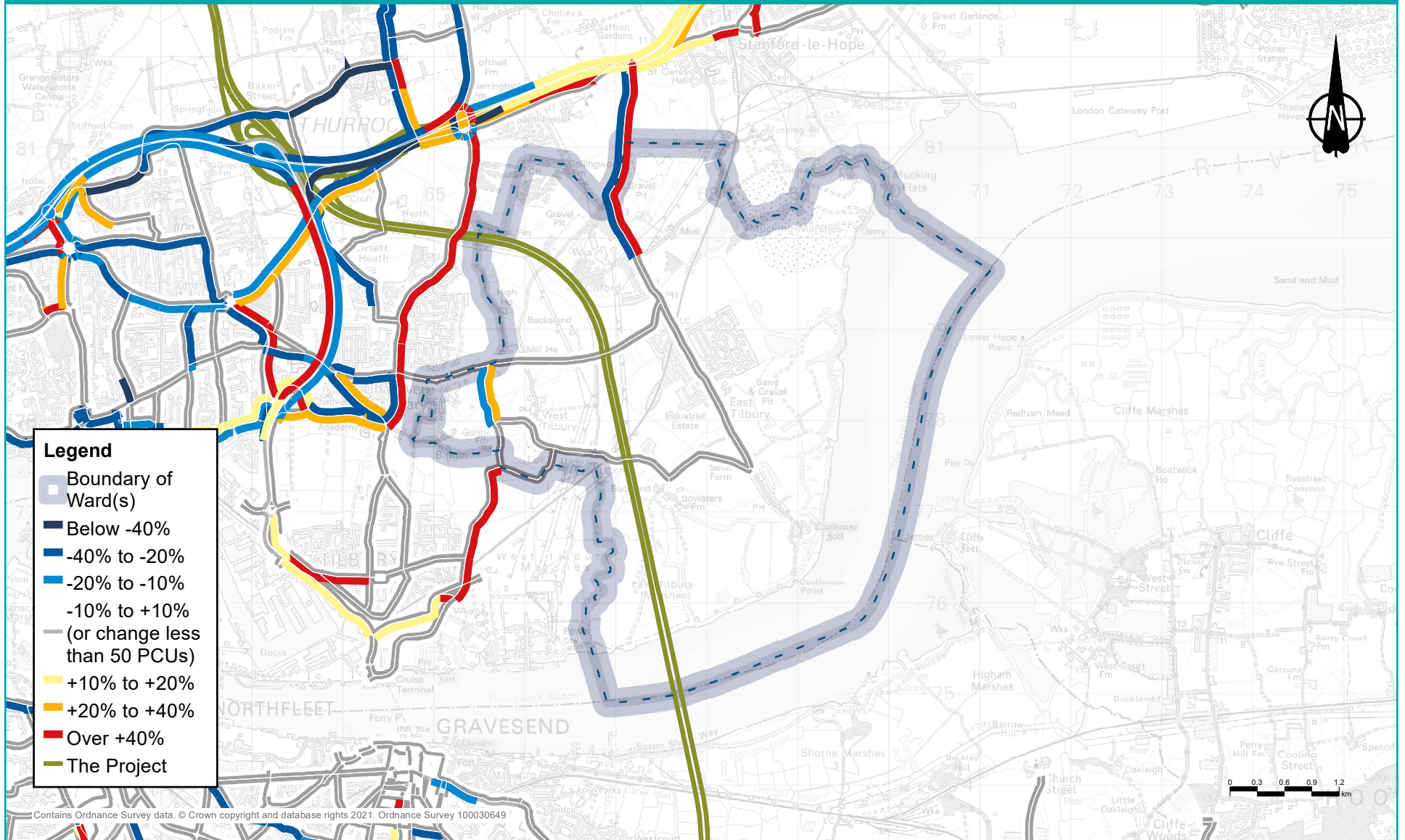


Figure 12.6: Predicted change in traffic flows (PCUs) with the project during the interpeak in 2029

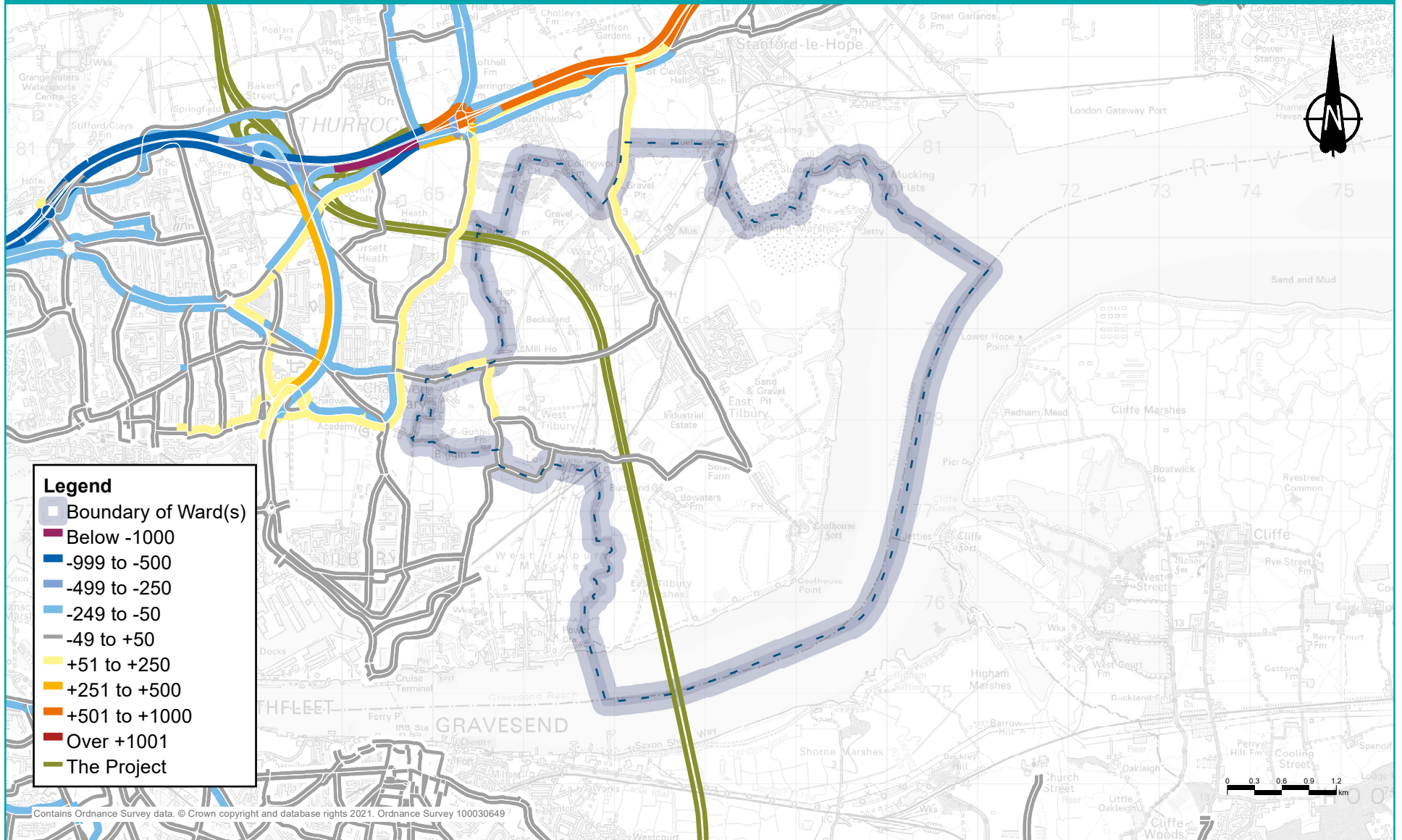


Figure 12.7: Predicted percentage change in traffic flows with the project during the interpeak in 2029

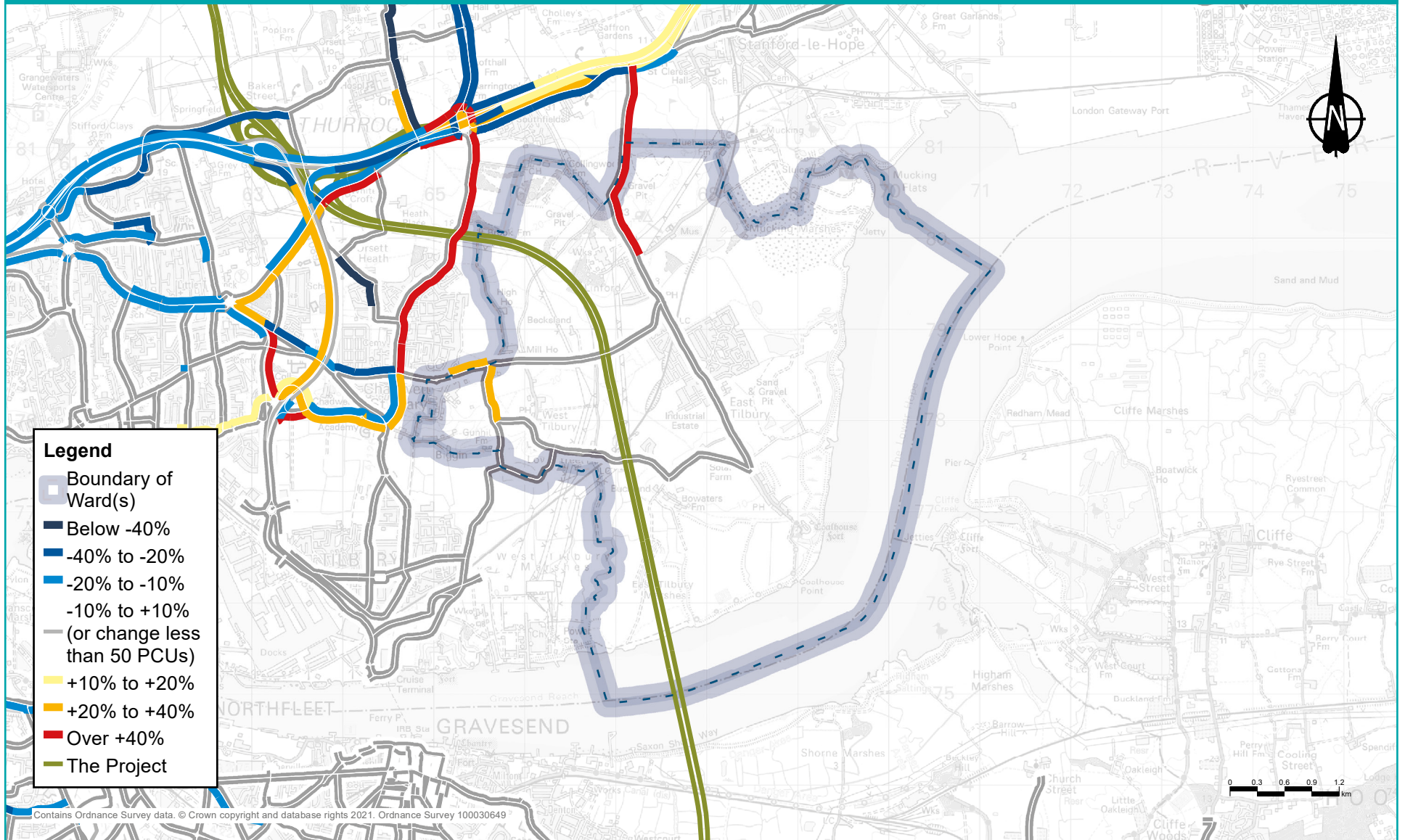
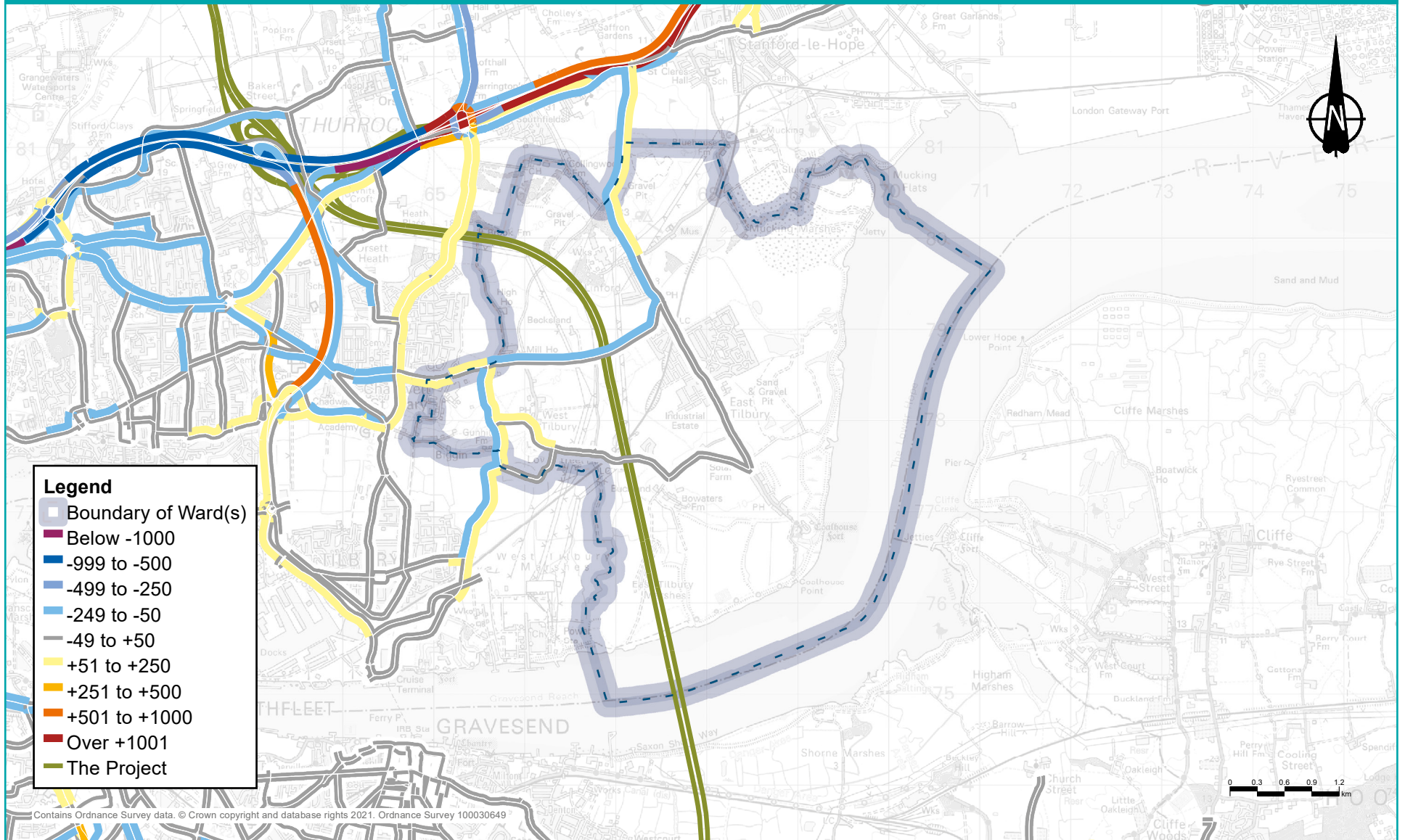
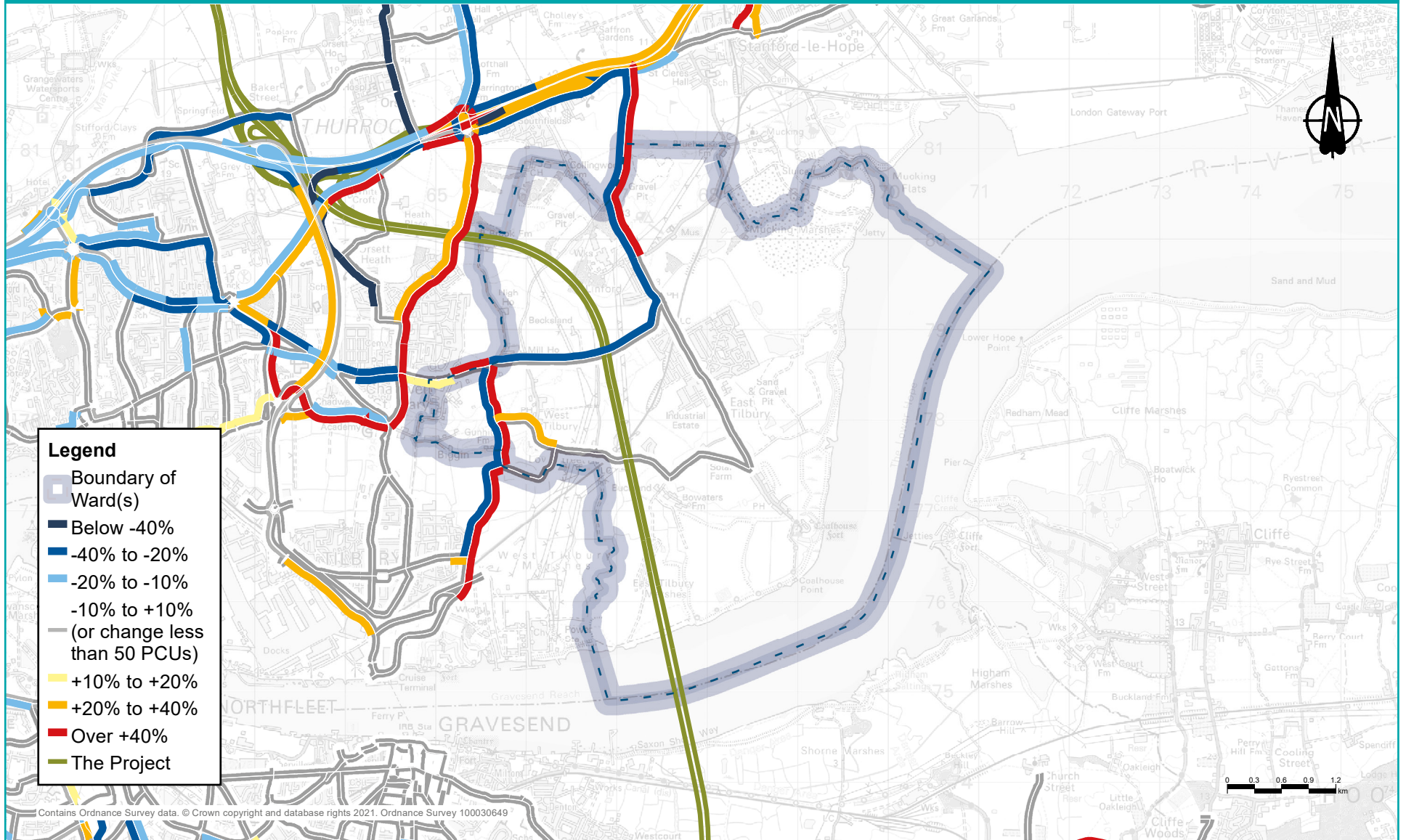


Figure 12.8: Predicted change in traffic flows (PCUs) with the project during the evening peak in 2029



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

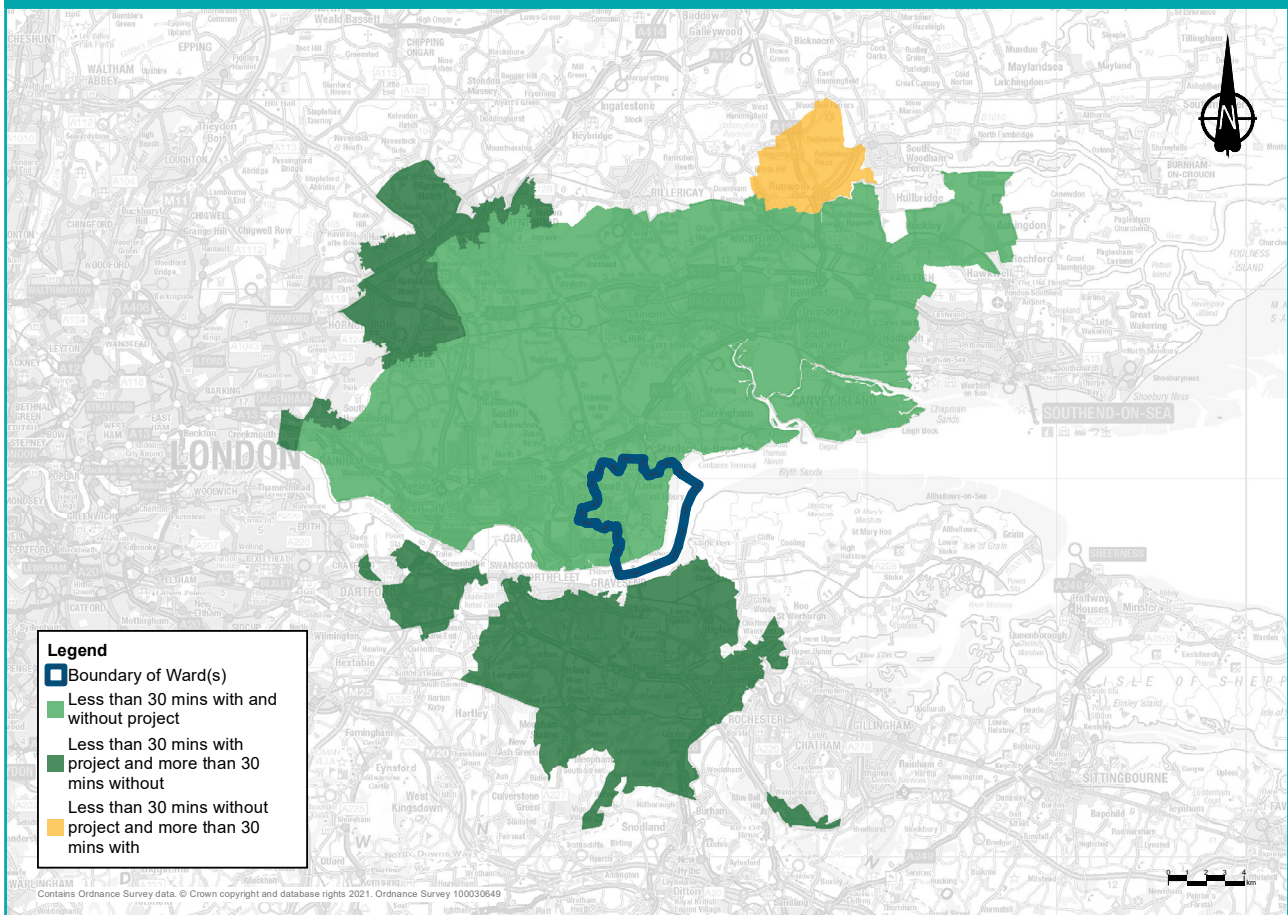




## Changes to journey times

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

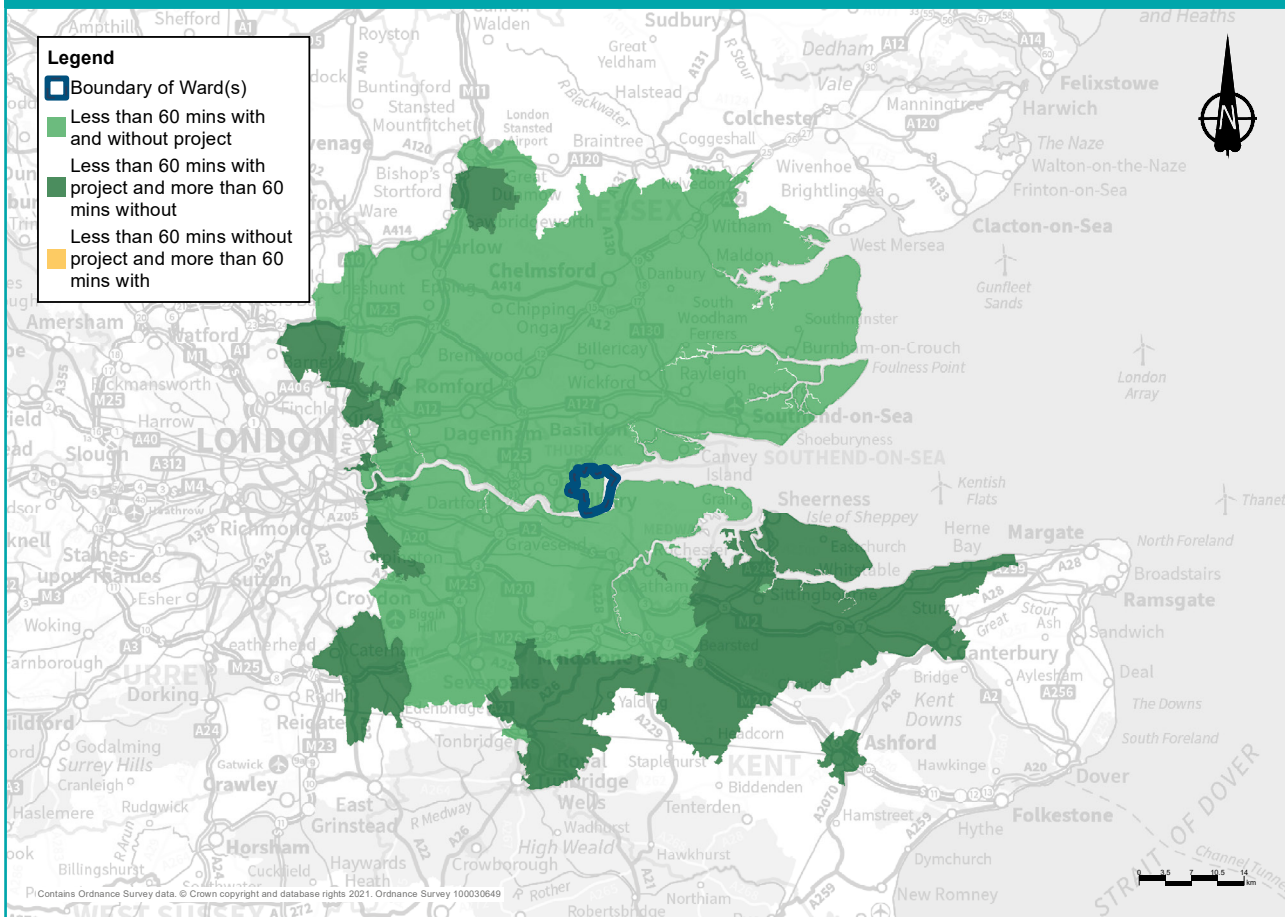
The project has been designed to improve traffic flows, including the design of free-flowing connections with the A13 and A1089. In addition, the main route would have no traffic lights or roundabouts to ensure continuous traffic flow. However, traffic lights or roundabouts would be necessary at some 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.

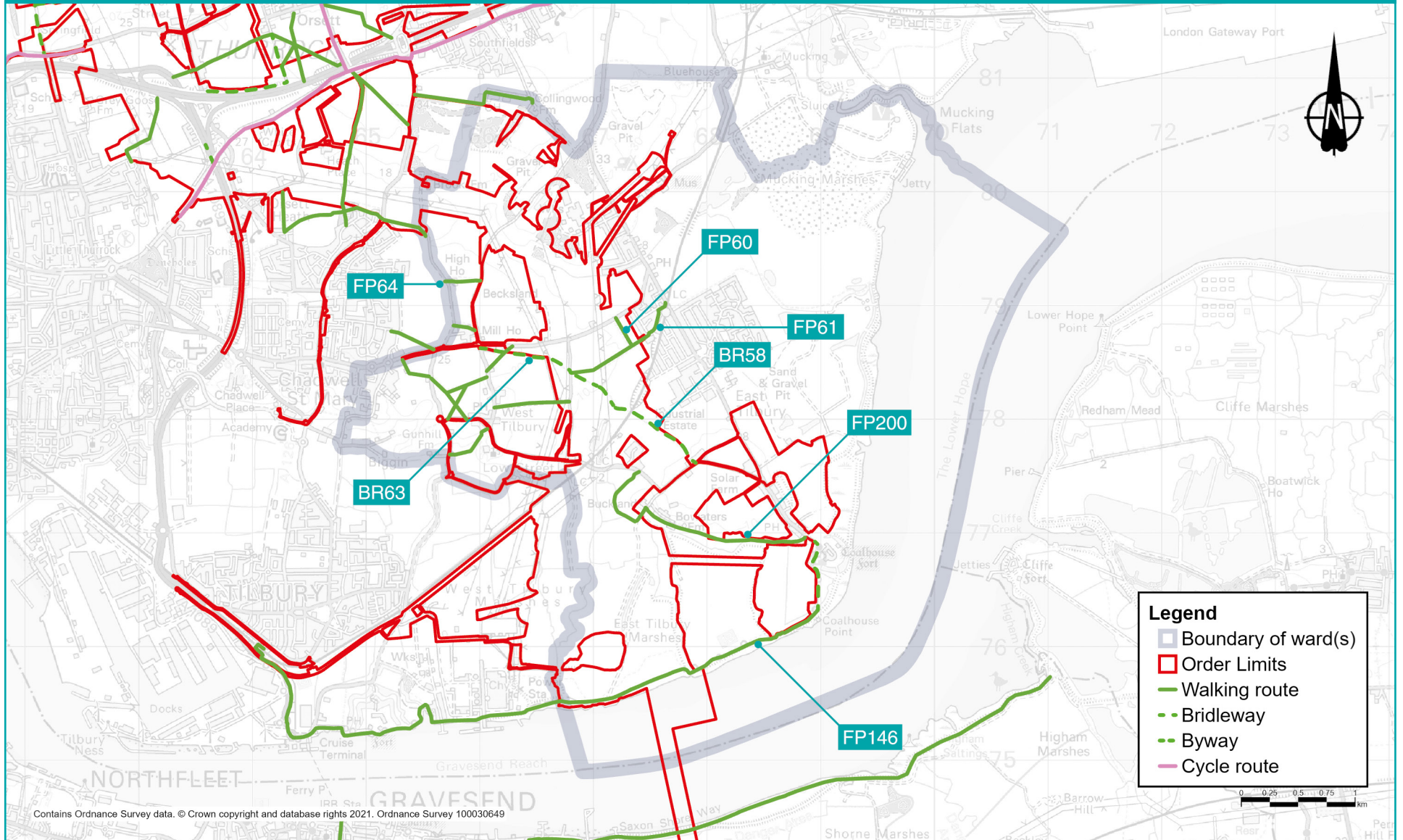
### 12.5.1 Construction

#### 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.

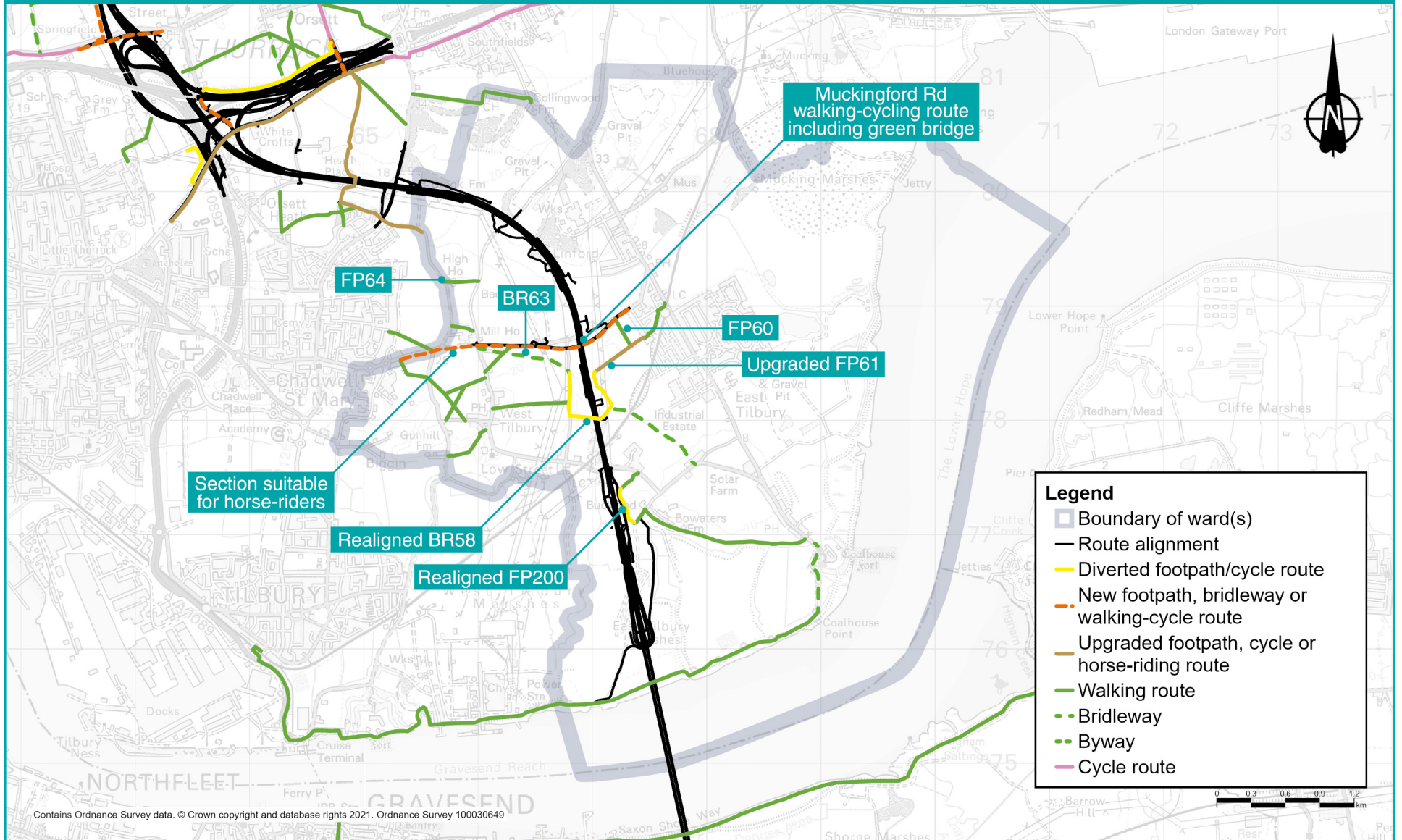
- Bridleway BR58 would need to be closed for five years to allow for overhead power line works and road construction until a realignment south of the existing bridleway opens to re-establish the link under the new Tilbury Viaduct. We are currently working on a potential temporary diversion for this route, 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



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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)<sup>2</sup> during the day and 43 to 54 dB(A)<sup>2</sup> 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.

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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**

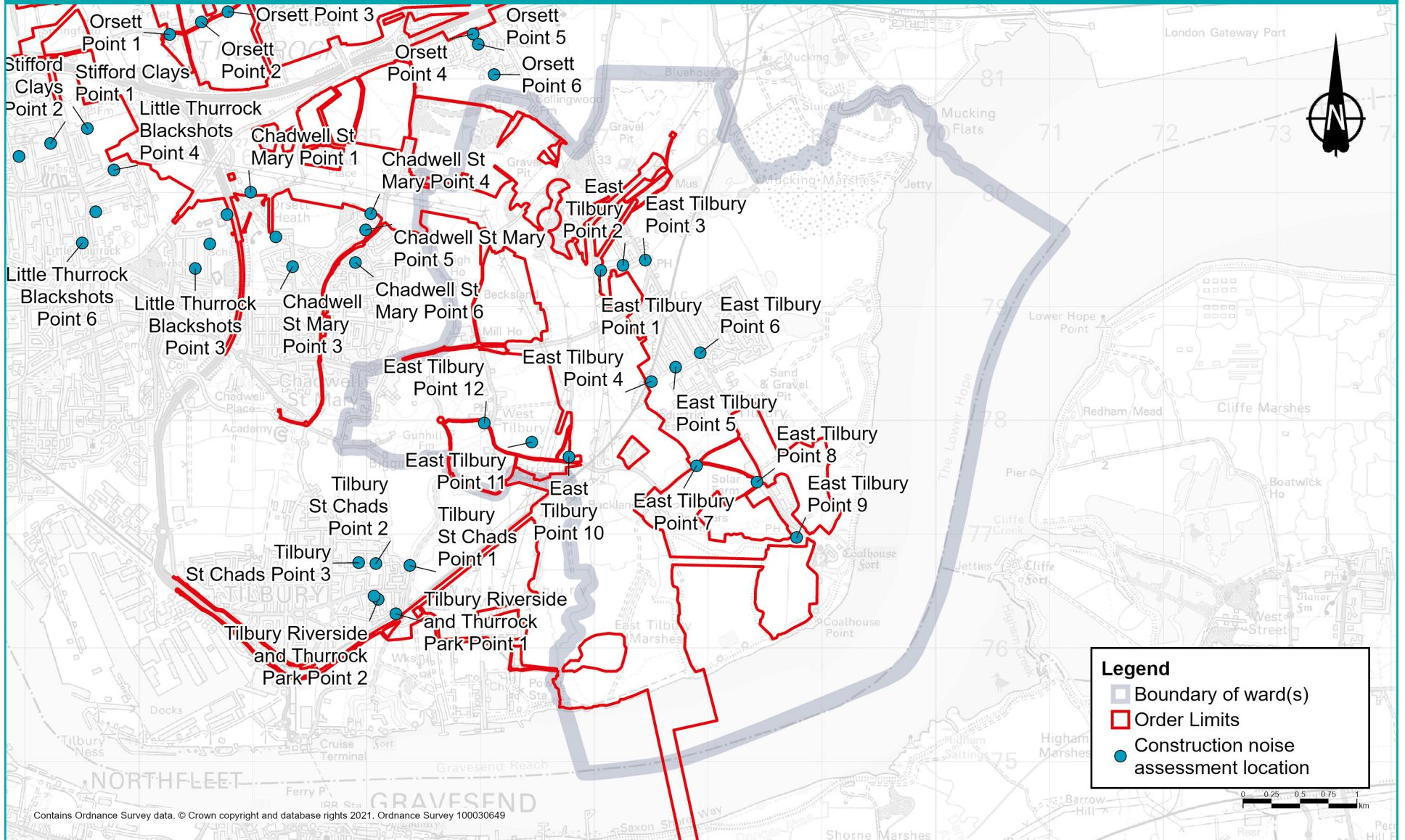
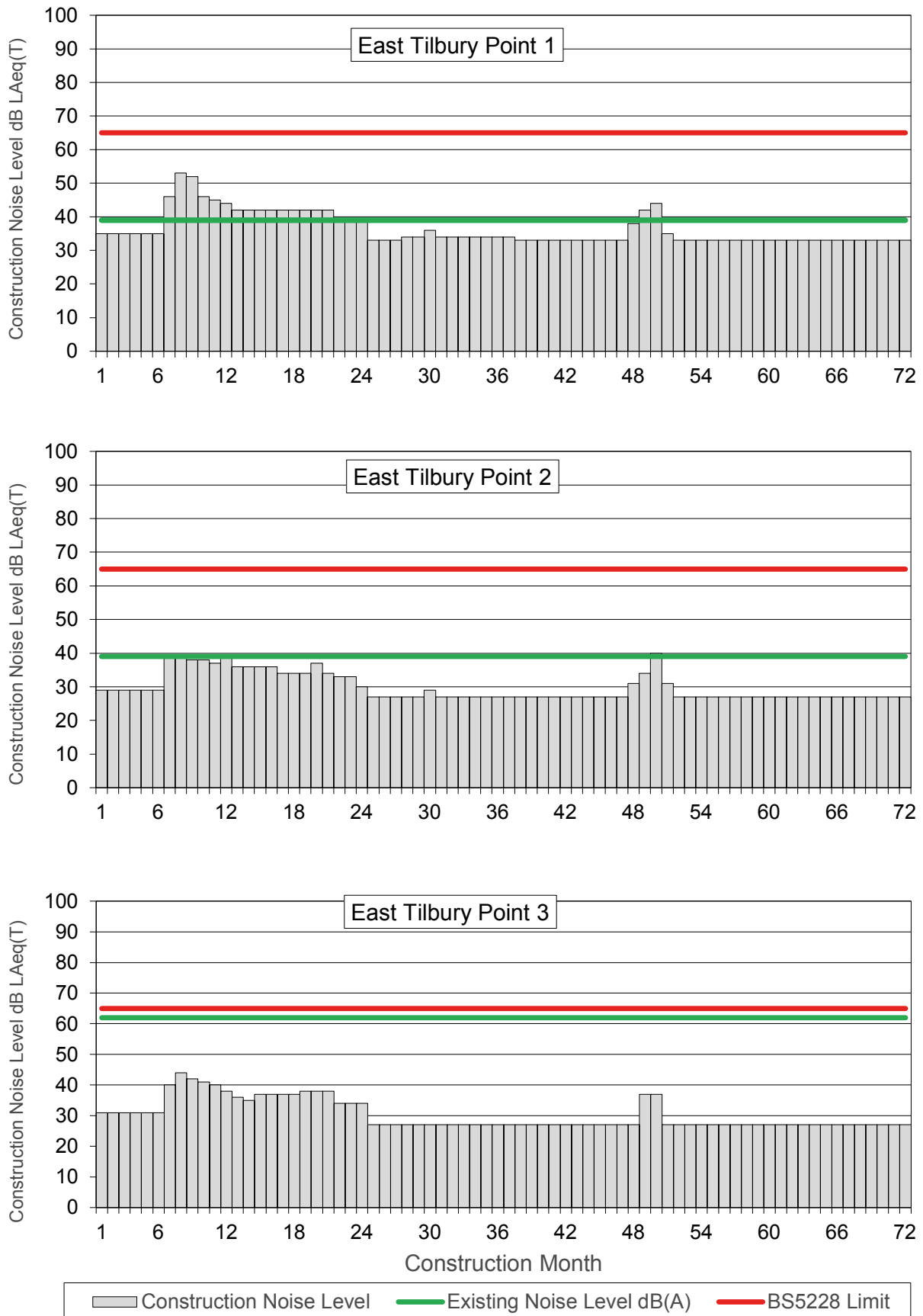


Figure 12.15: Construction noise by month for points 1, 2 and 3 in East Tilbury ward



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.

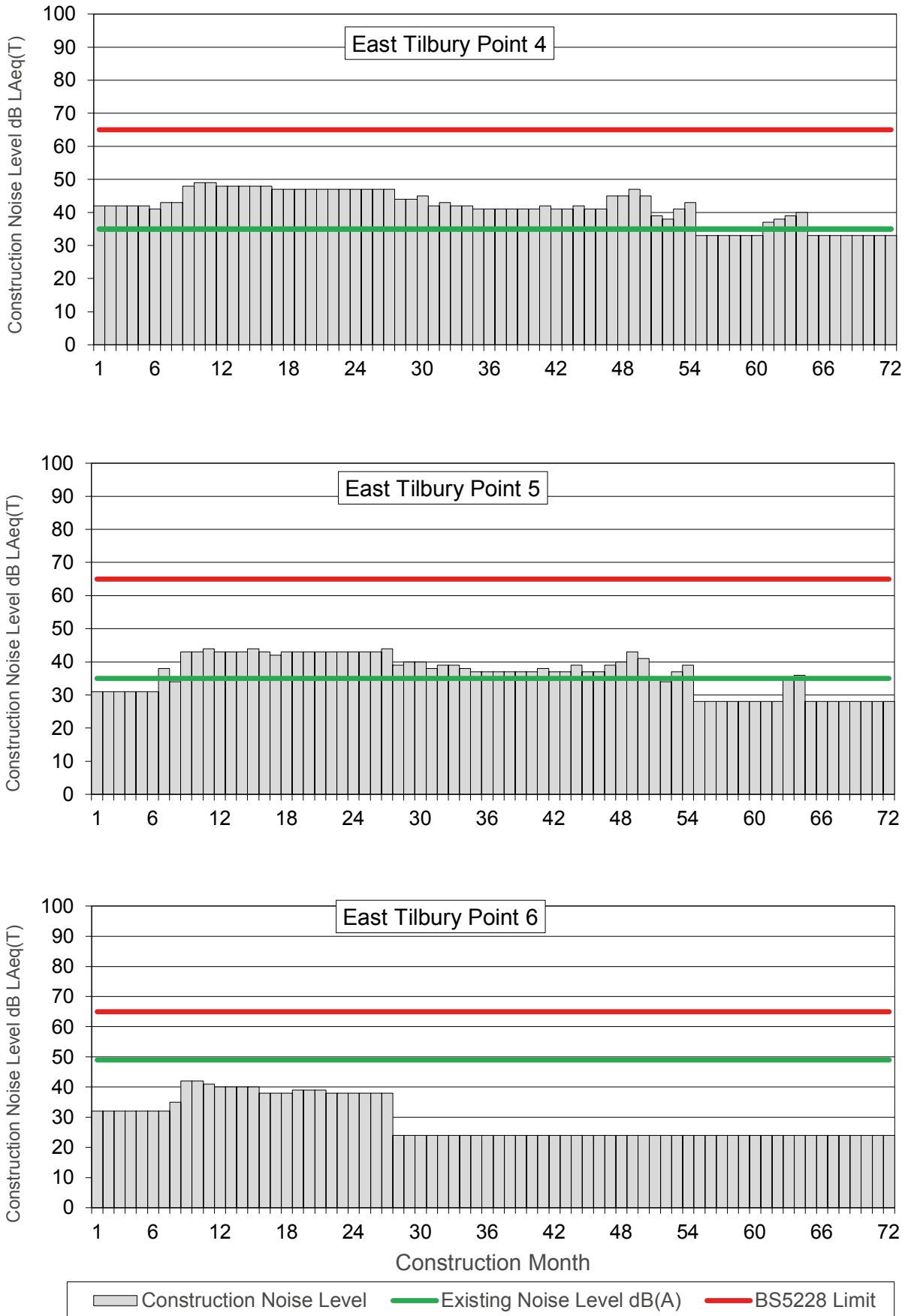
The predicted construction noise levels show that higher noise levels and disturbance would be experienced closer to construction activity. Levels gradually diminish as a result of increased distance and additional buildings and other features screening the noise from more distant residential areas.

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.



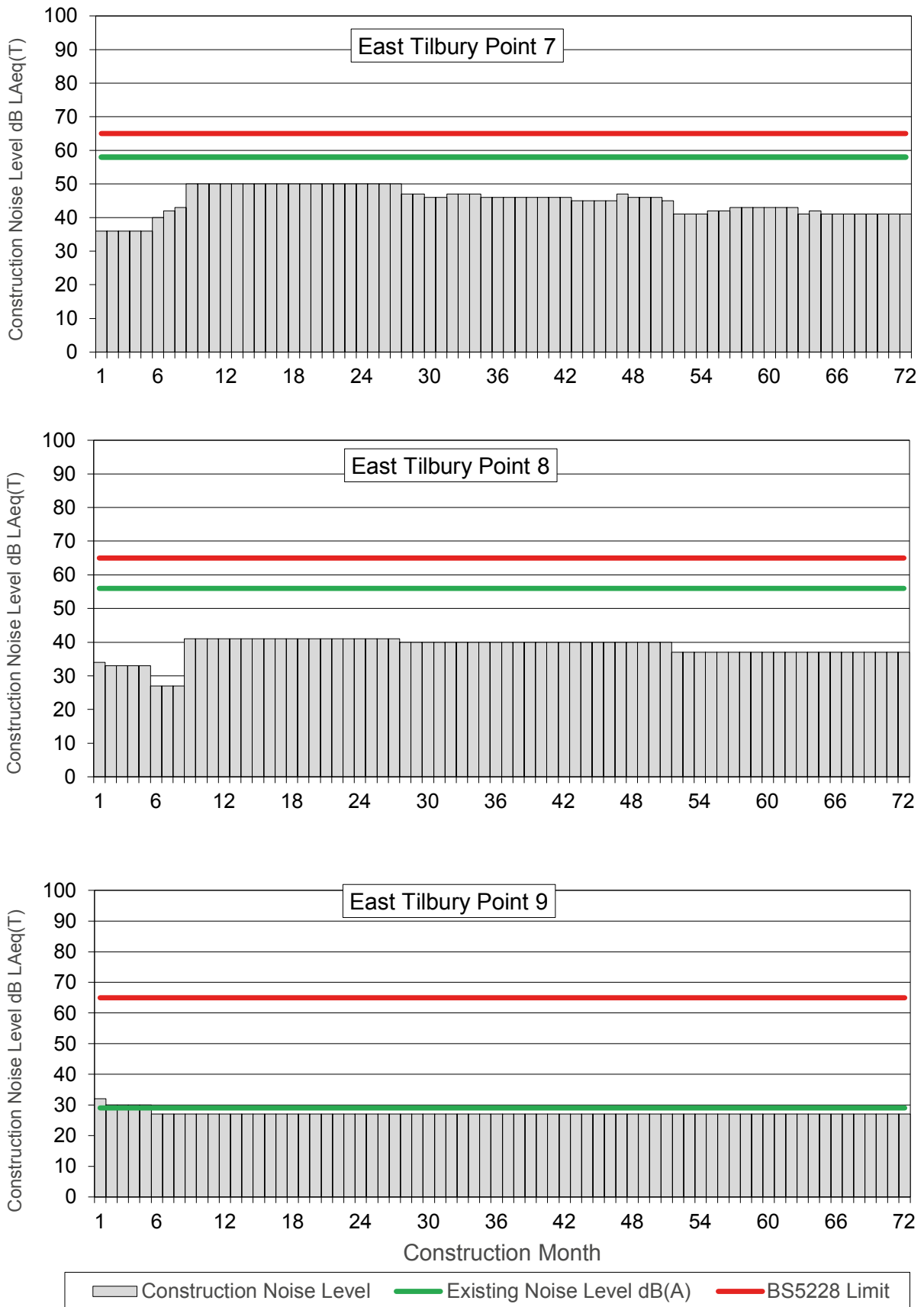
Figure 12.16: Construction noise by month for points 4, 5 and 6 in East Tilbury ward



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.

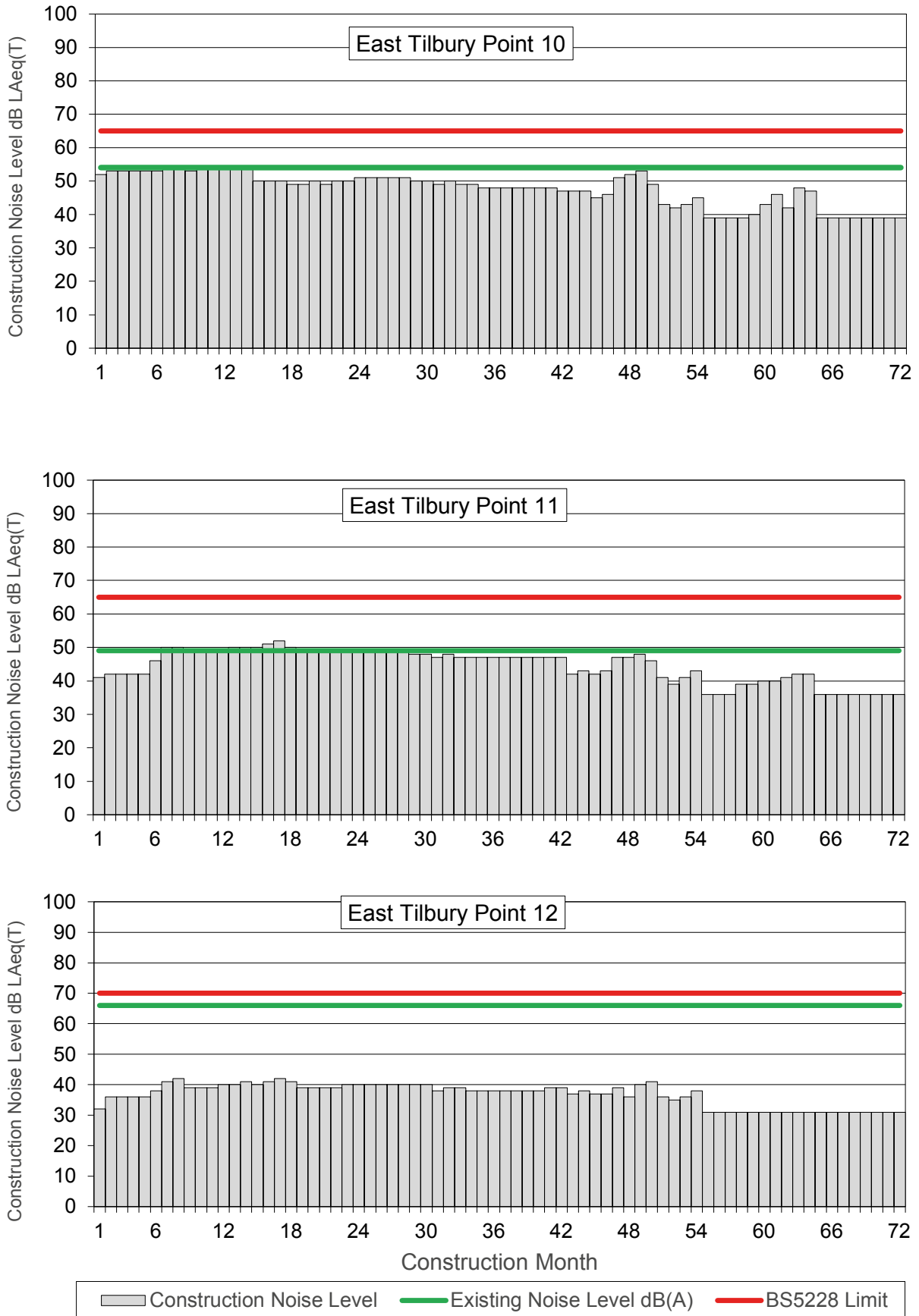
Figure 12.17: Construction noise by month for points 7, 8 and 9 in East Tilbury ward



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.

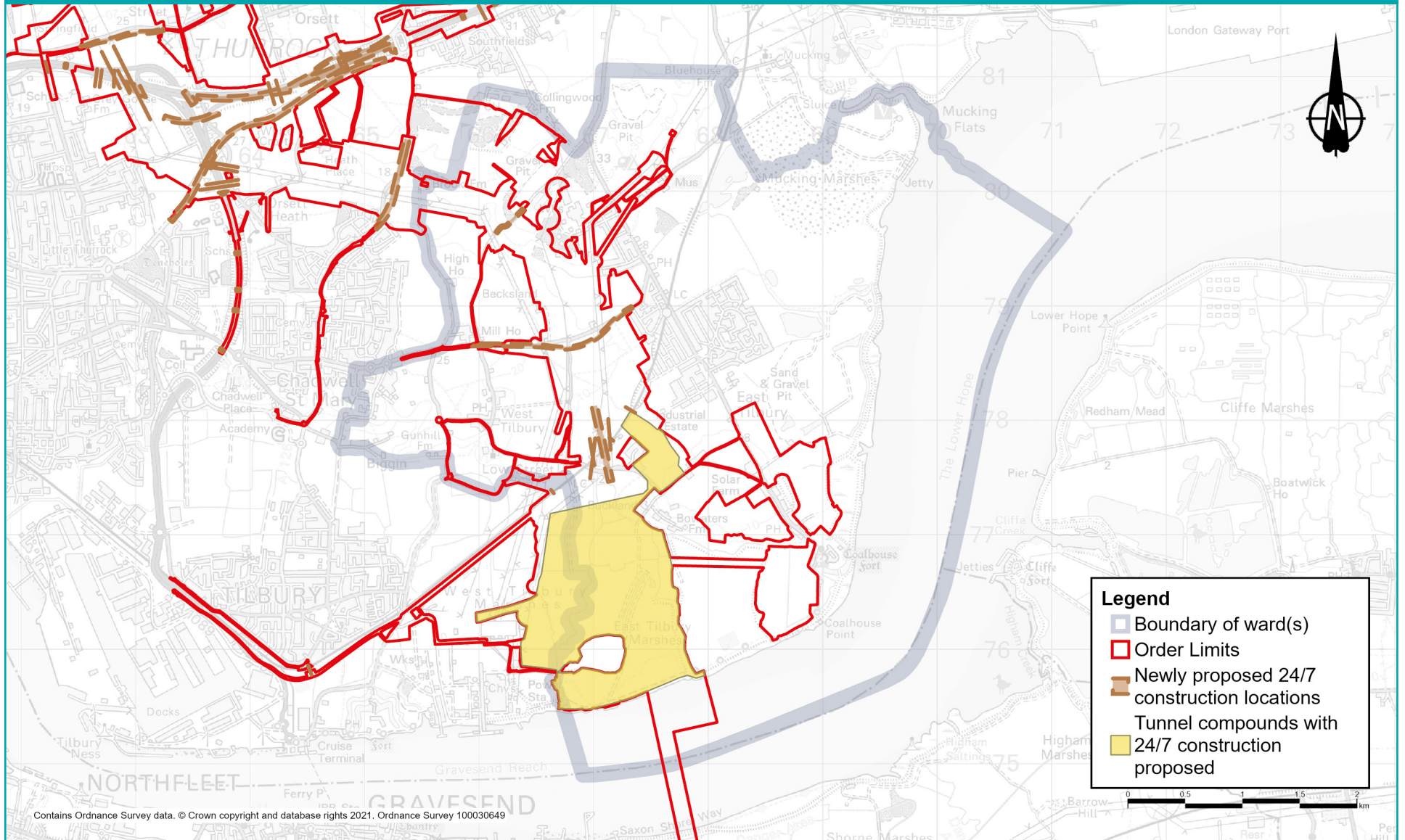
**Figure 12.18: Construction noise by month for points 10, 11 and 12 in East Tilbury ward**



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.

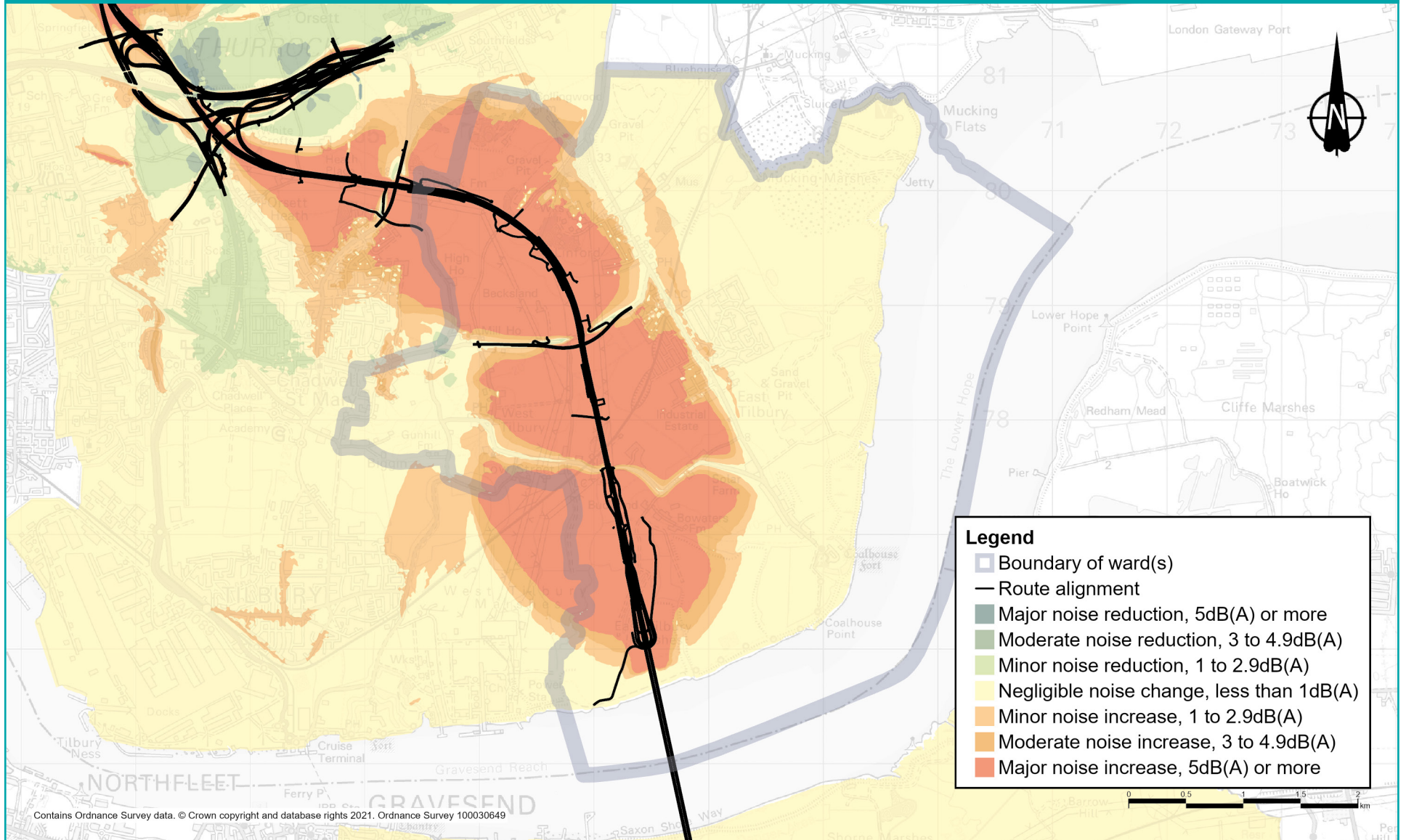
Figure 12.20 shows the predicted changes in road traffic noise in the opening year of the project. Within the ward, changes in road traffic noise at identified noise sensitive receptors (such as nearby properties) are predicted to range from negligible reductions in noise levels of less than 1.0 dB to 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



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## 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.

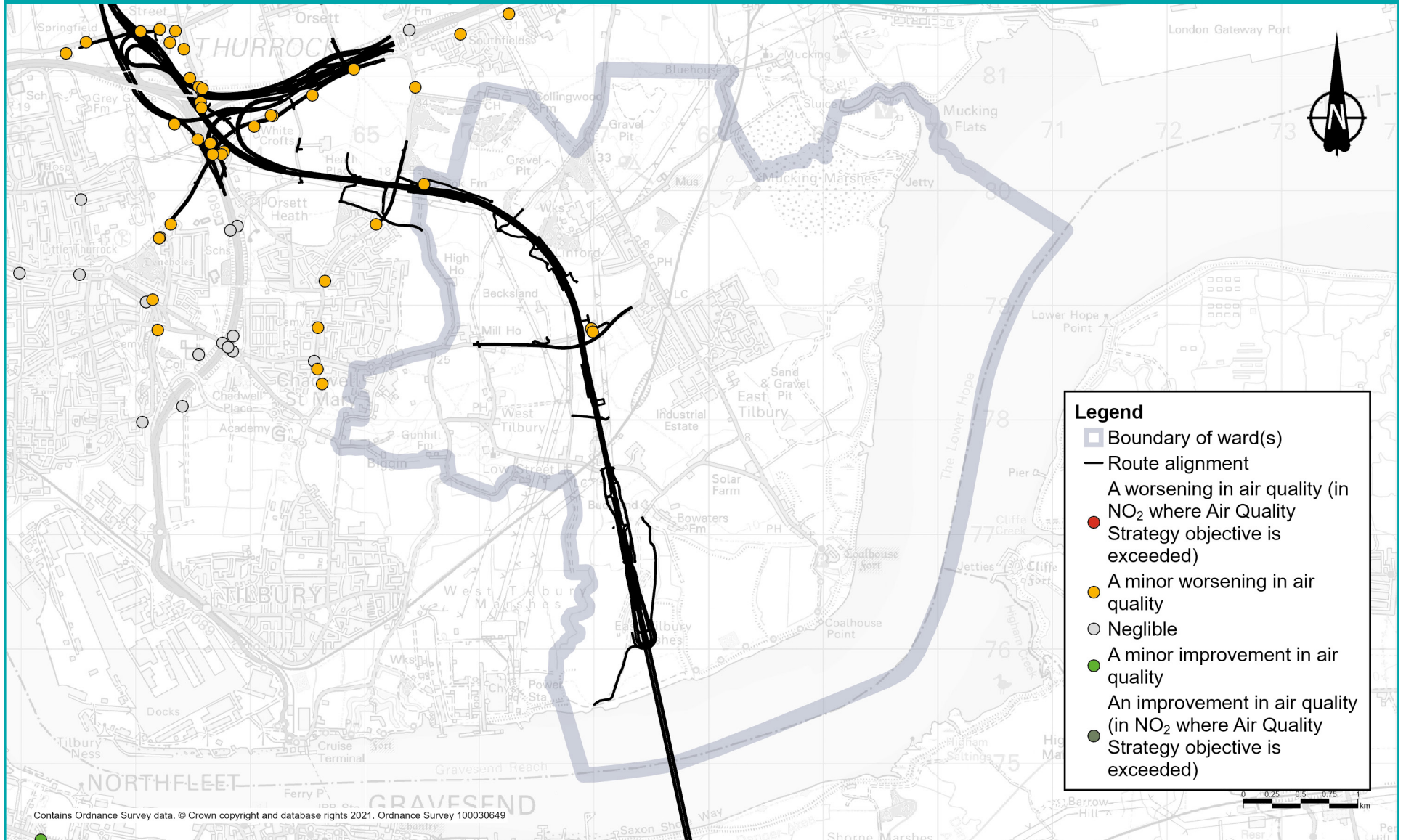
Properties more than 200 metres from the worksite, which is the majority of properties within this ward, are outside the area likely to be affected by construction dust or emissions from the worksite. In this ward, there are only a few properties within 200 metres of the worksite, including those along 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 NO<sub>2</sub> 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 (NO<sub>2</sub>), the main traffic-related pollutant<sup>3</sup>. The highest modelled yearly average NO<sub>2</sub> concentration within this ward is 24.6 µg/m<sup>3</sup> (on the Muckingford Road), which is below the yearly average threshold of 40µg/m<sup>3</sup>. 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 NO<sub>2</sub> our assessment predicts that PM<sub>10</sub> 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.

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<sup>3</sup> NO<sub>2</sub> levels are measured in 'micrograms per cubic metre', or µg/m<sup>3</sup>, 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.

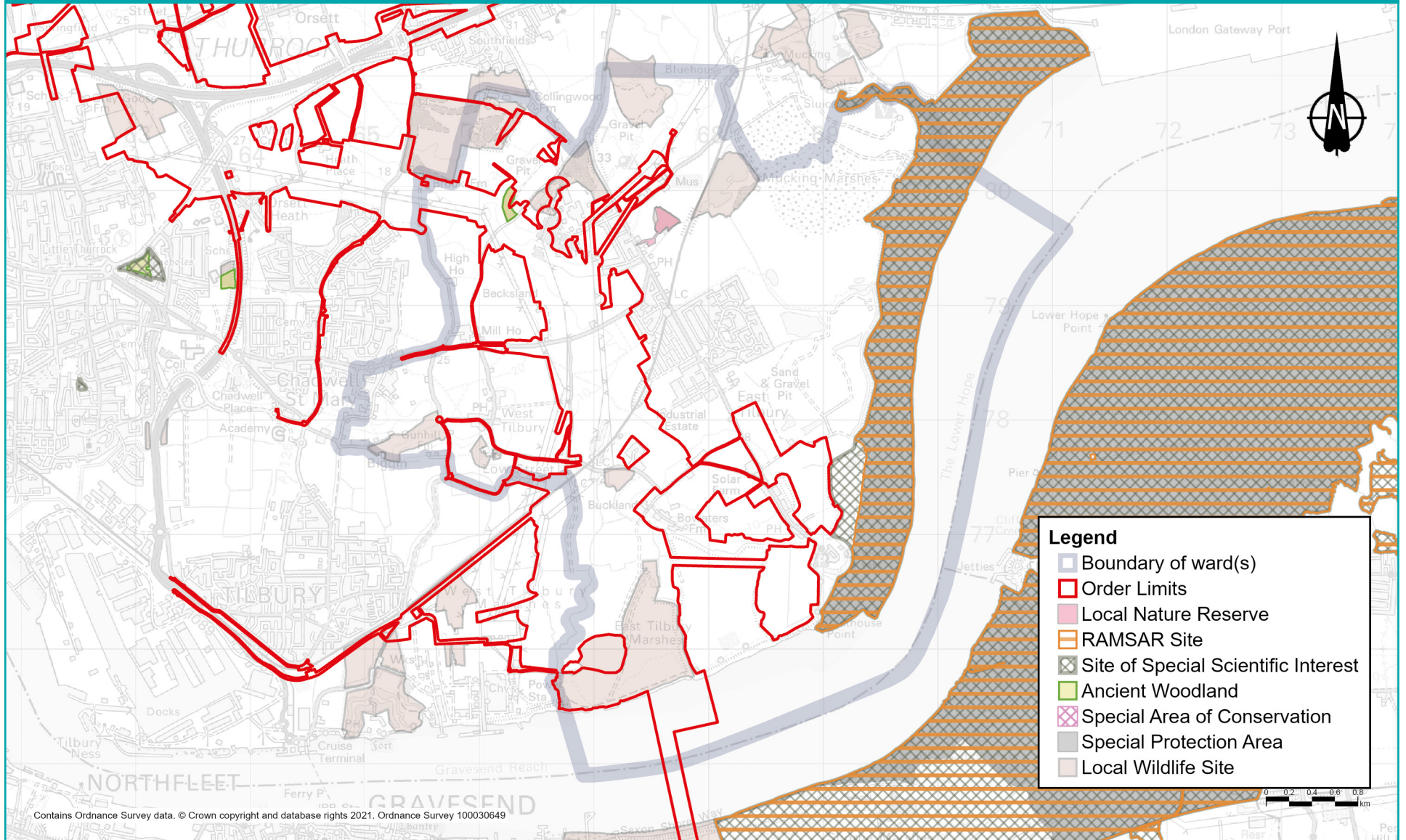
## 12.10 Biodiversity

### 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



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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.

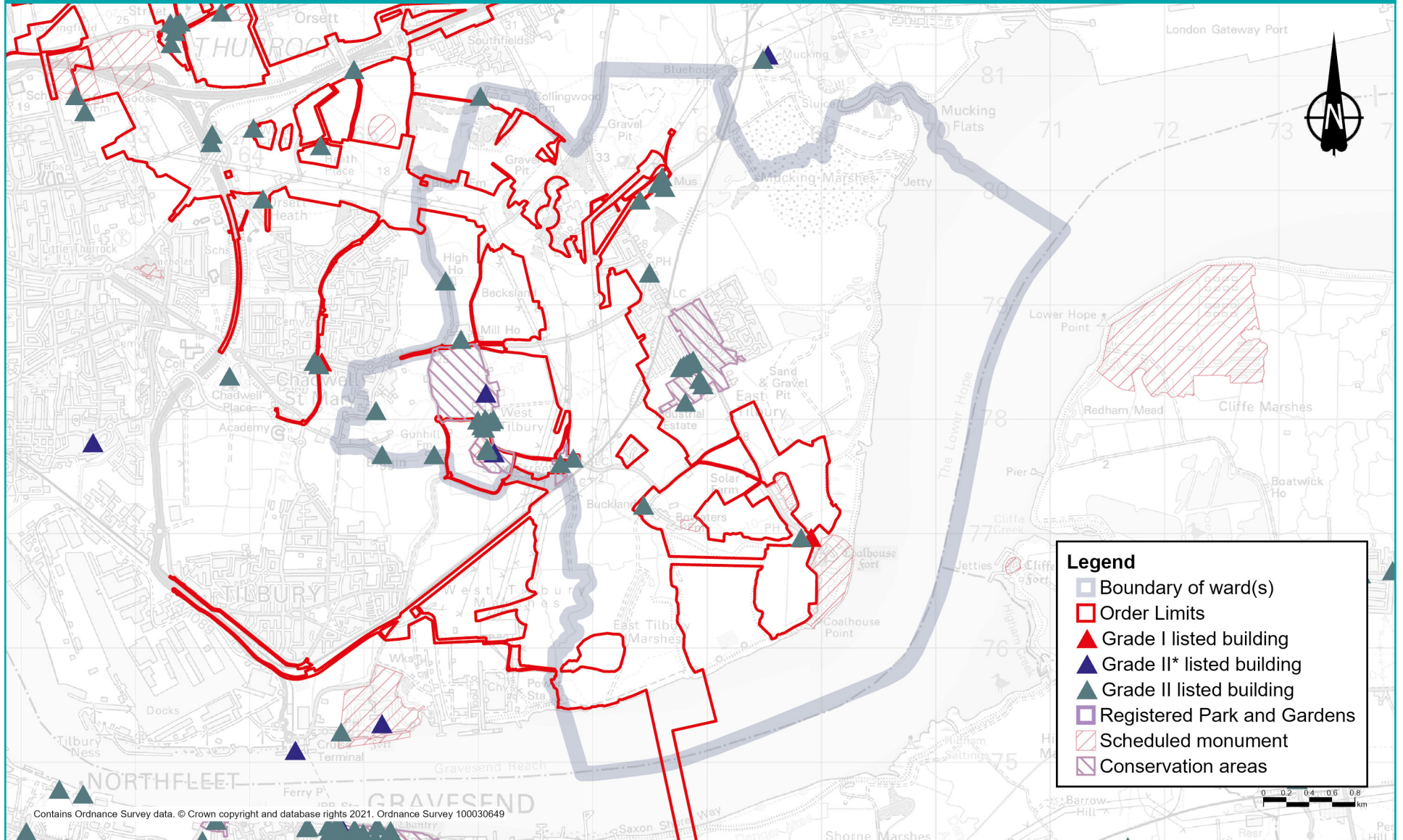
One of the listed buildings is Grade I, two are Grade II\* and the remaining are Grade II.

### 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



## 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.