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Chapter 13: Tilbury Riverside and Thurrock Park ward

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

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

13.1 Overview

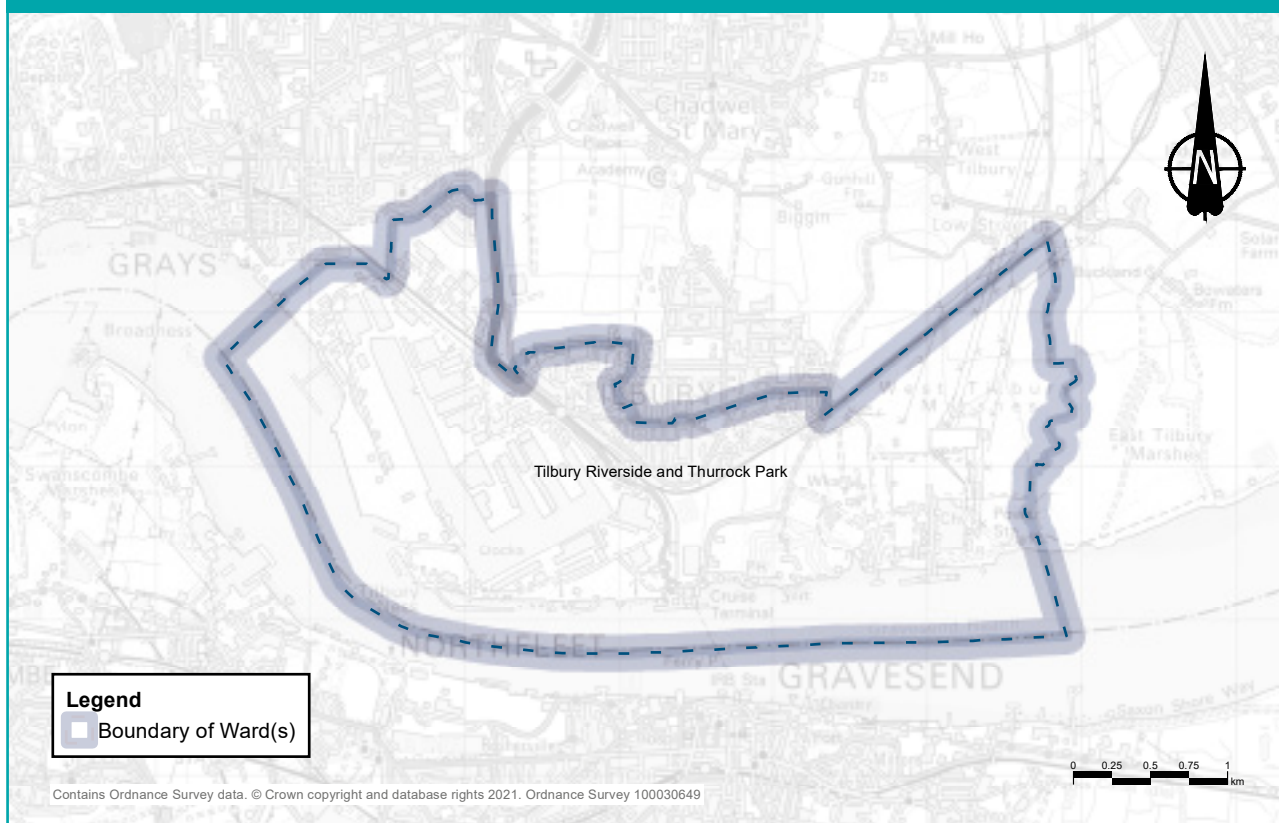
13.1.1 About this ward

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

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

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

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



13.1.2 Summary of impacts

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

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

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

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

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

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

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

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

13.2 Project description

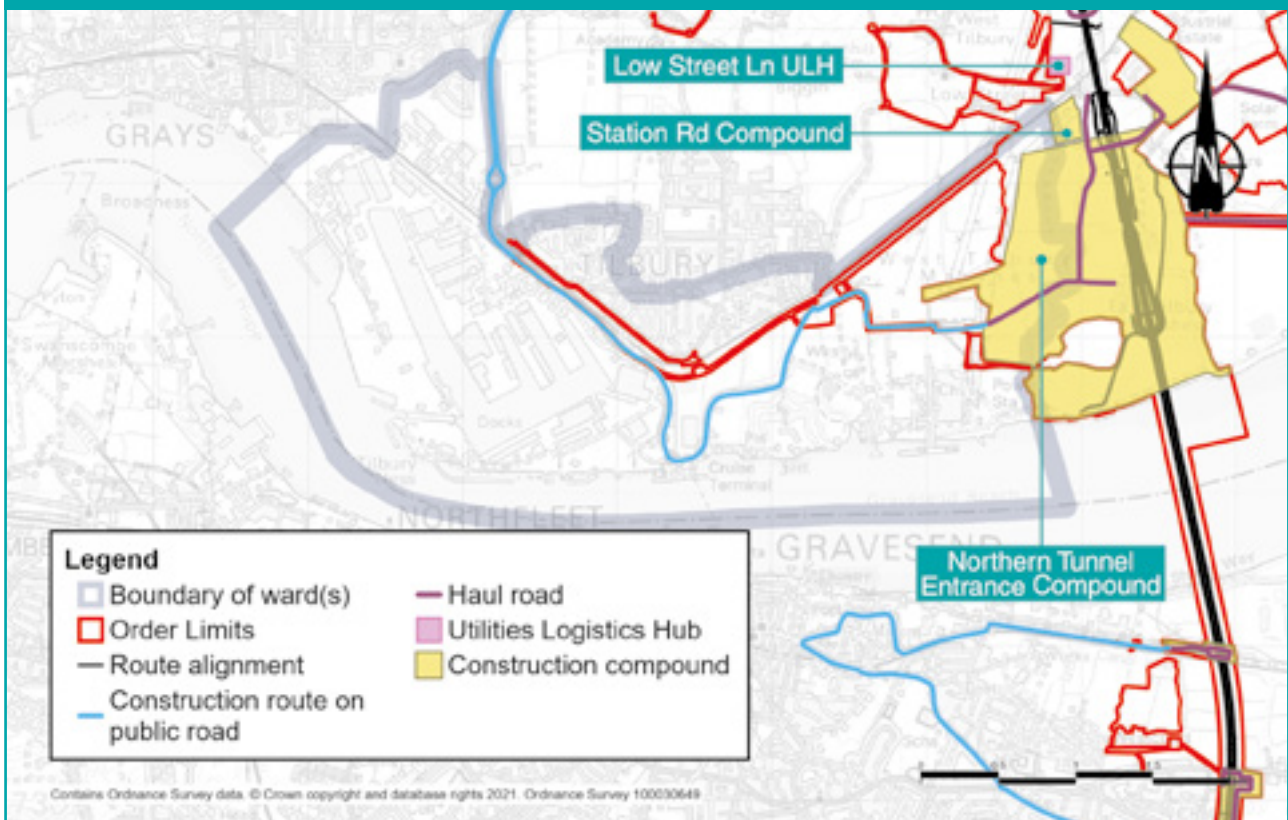
13.2.1 Construction

Construction activities

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

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

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



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

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

Construction compound

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

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

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

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

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

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

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

Utilities

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

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

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

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

Construction routes on public roads

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

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

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

Traffic management

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

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

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

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

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

Construction schedule

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

Construction working hours

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

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

13.2.2 Operations

The completed project

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

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

Changes to the project since our design refinement consultation

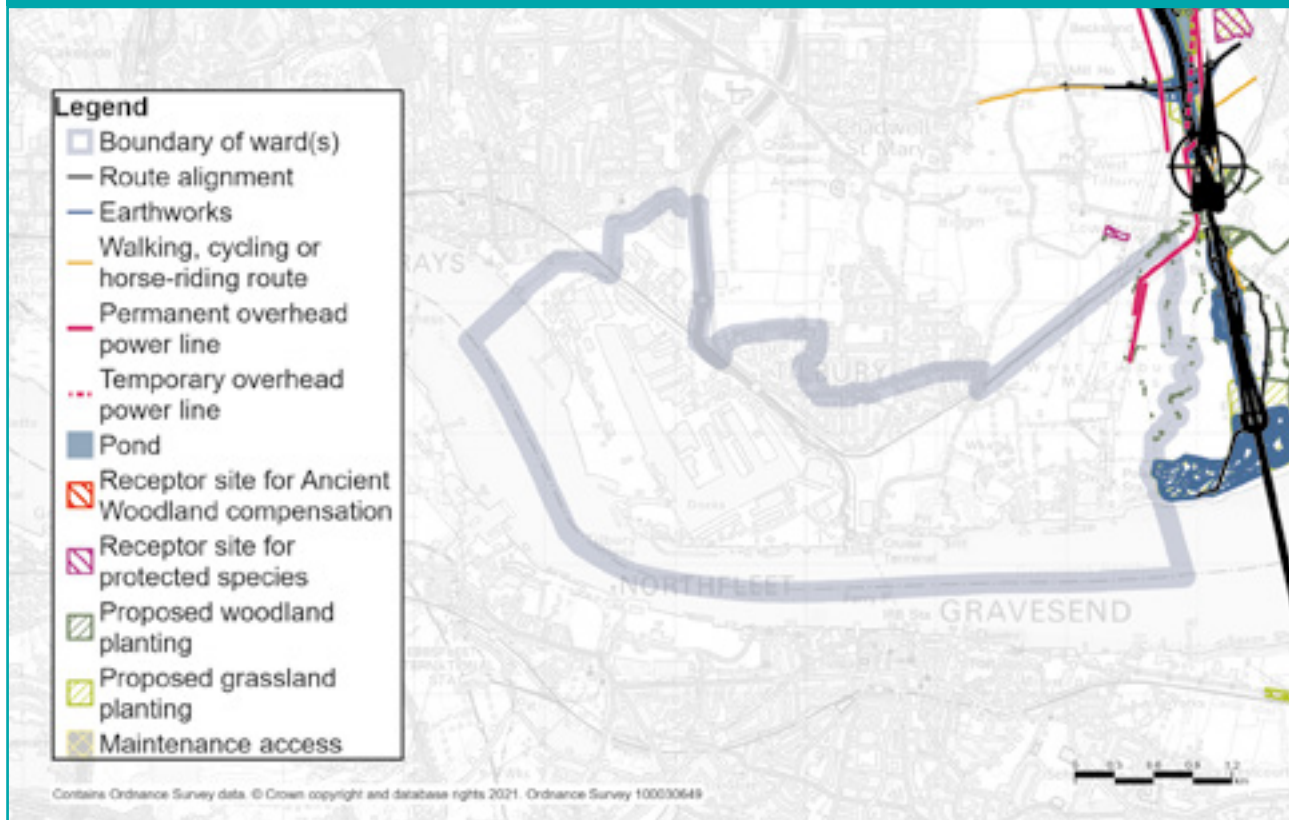
As part of our ongoing design development, including discussions with utility companies, we have made several proposed changes to the project and its Order Limits (the area of land required to construct and operate the project, formerly known as the development boundary), since our design refinement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

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

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

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

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



Impacts on open space and common land

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

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

13.3 Traffic

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

13.3.1 Construction

Construction impacts

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

Measures to reduce construction traffic impacts

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

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

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

13.3.2 Operations

Operational impacts

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

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

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

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

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

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

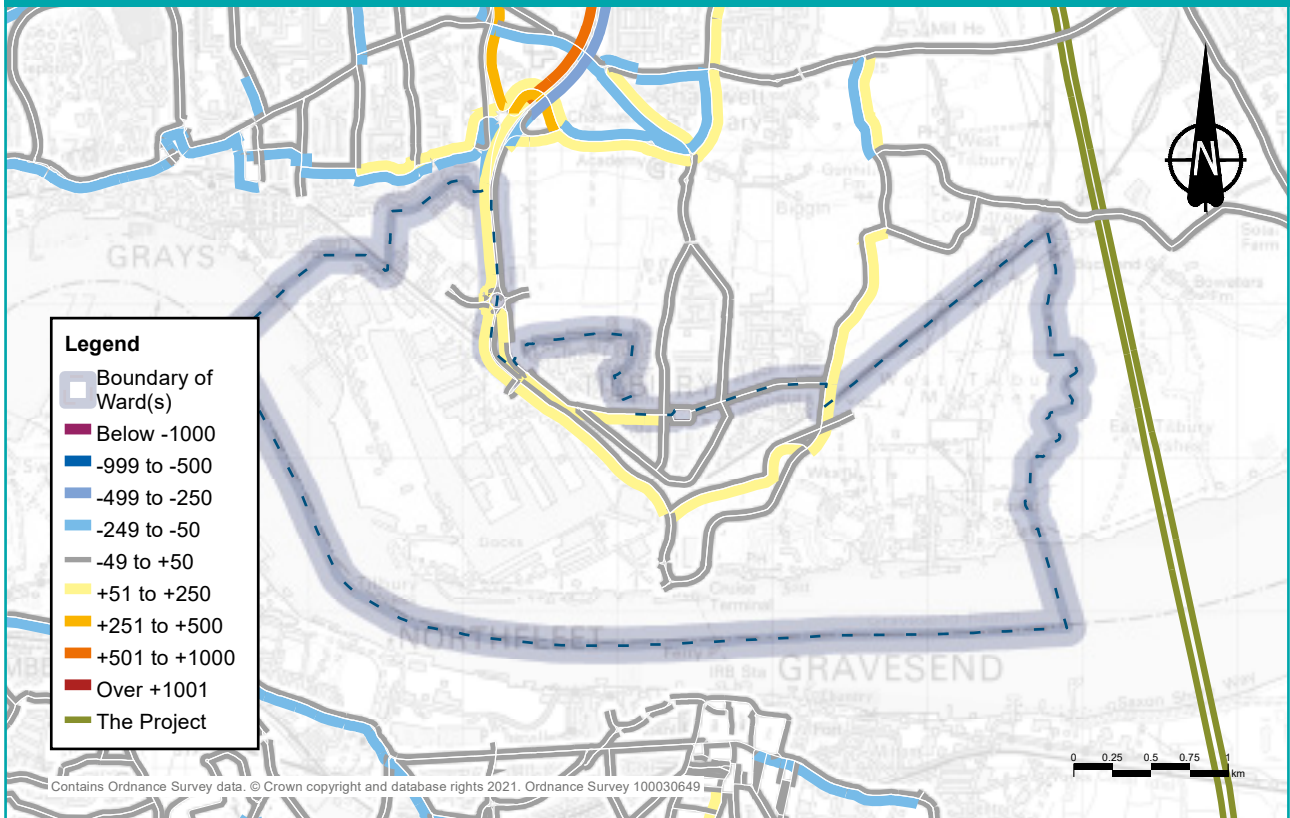


Figure 13.5: Predicted percentage changes to traffic flows during the morning peak in 2029

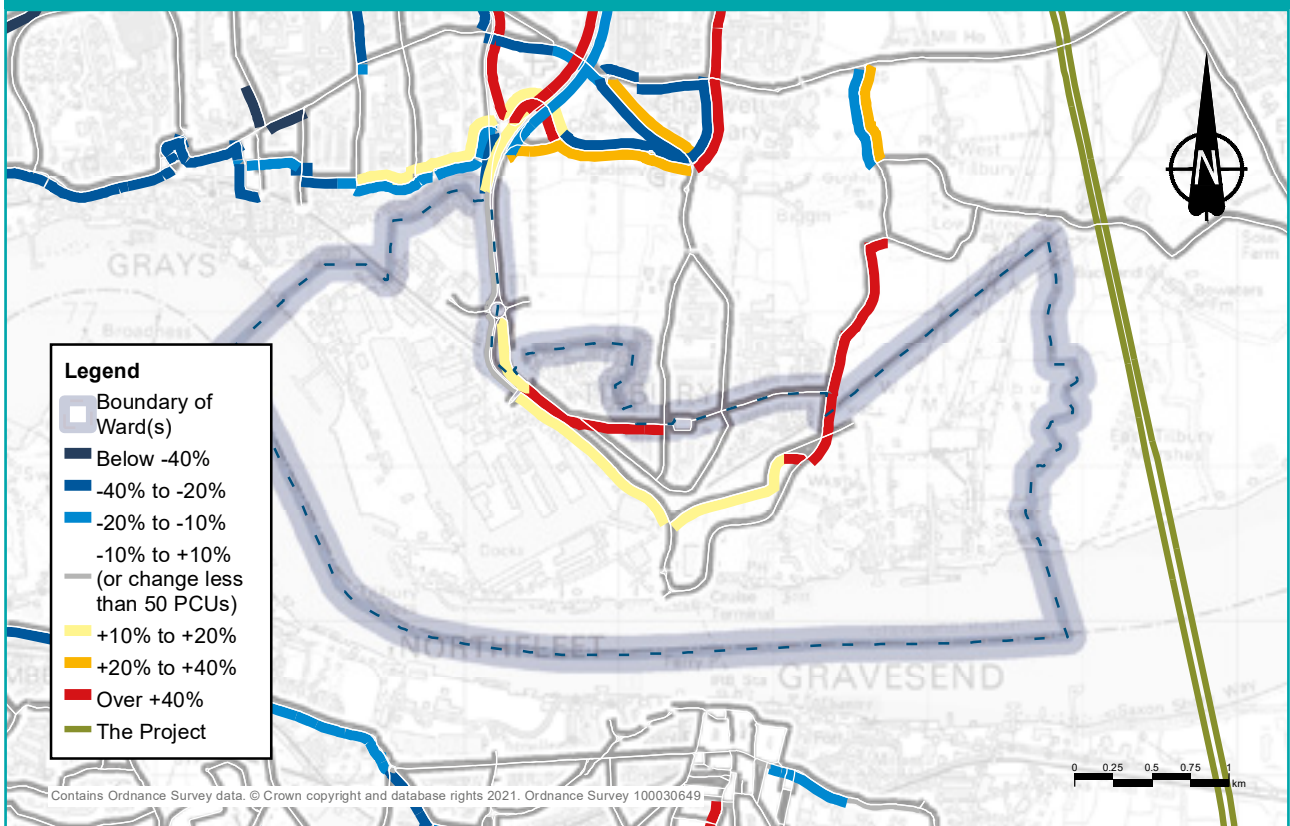


Figure 13.6: Predicted change in traffic flows with the project during the interpeak in 2029

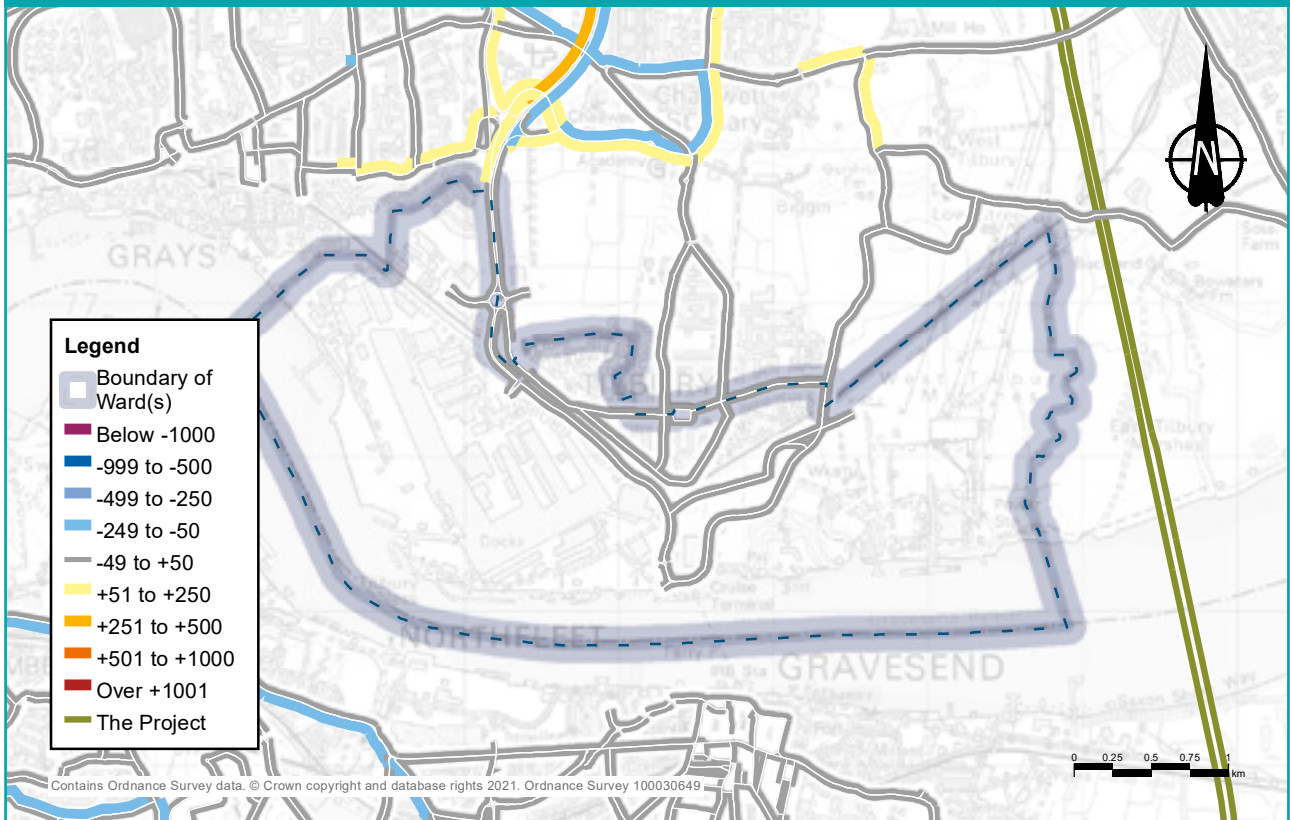


Figure 13.7: Predicted percentage changes to traffic flows during the interpeak in 2029

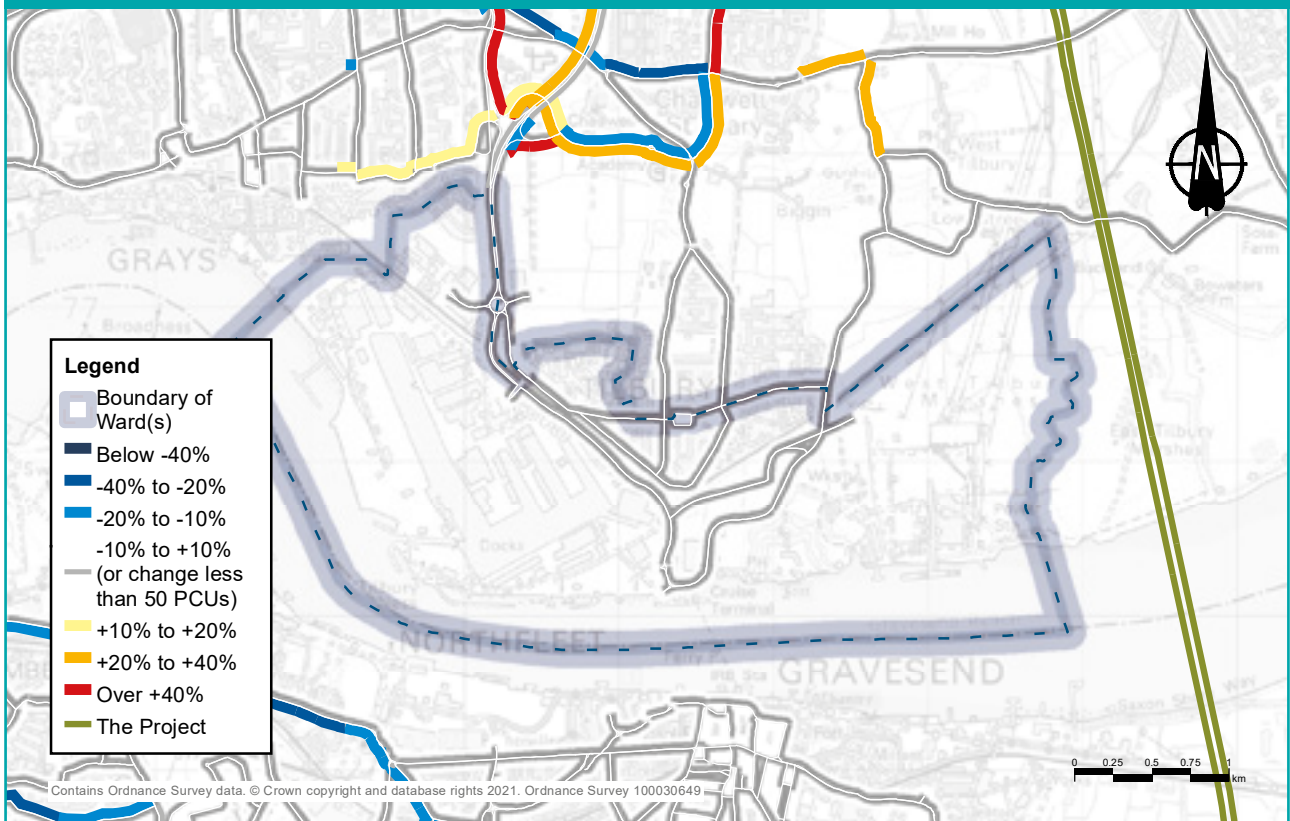


Figure 13.8: Predicted change in traffic flows with the project during the evening peak in 2029

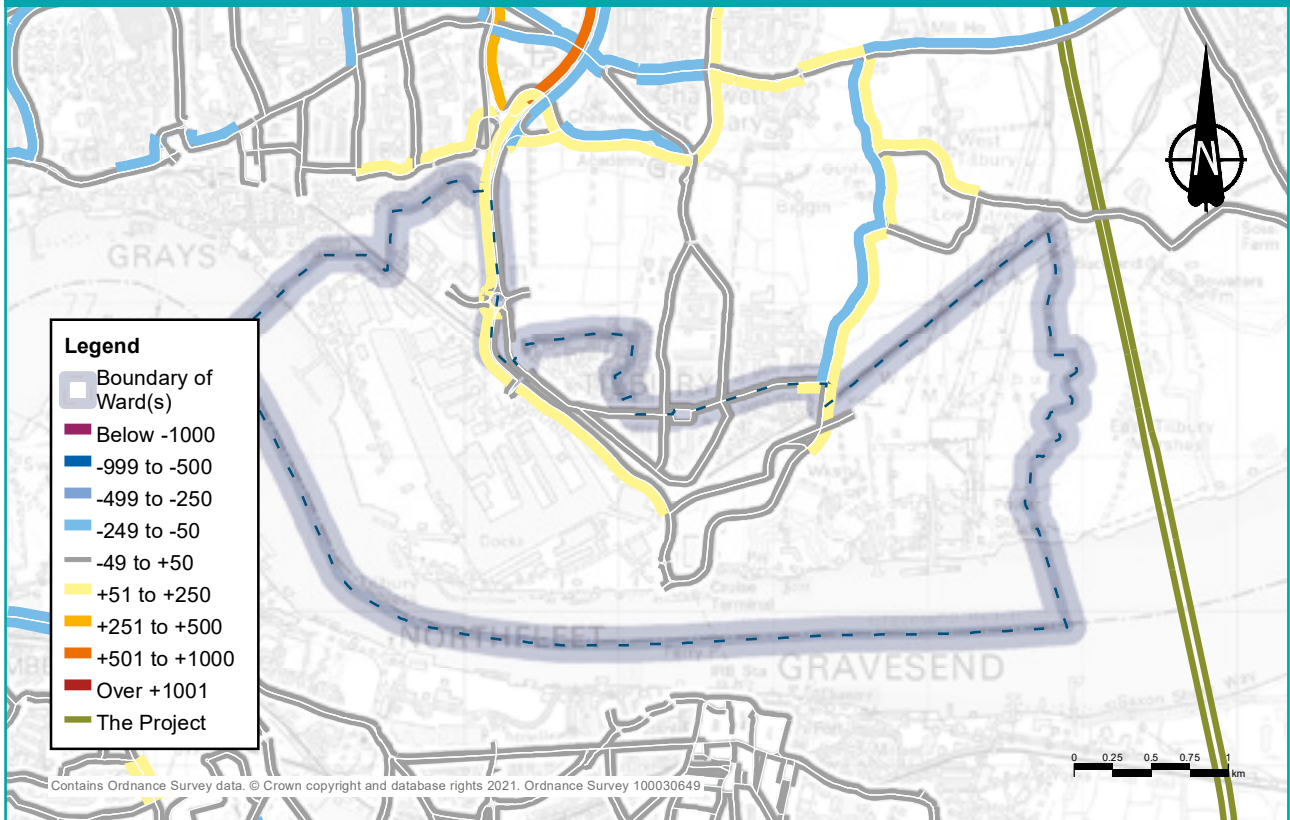
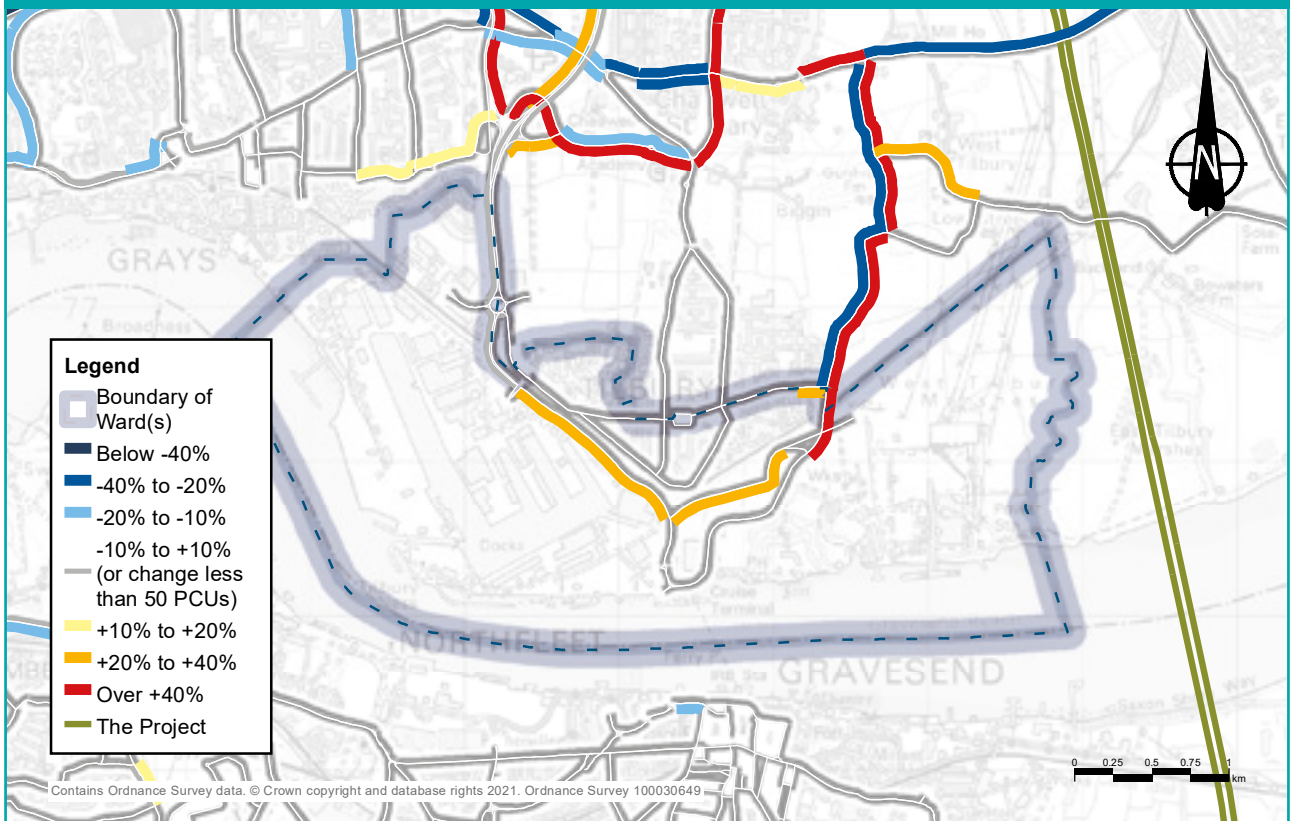


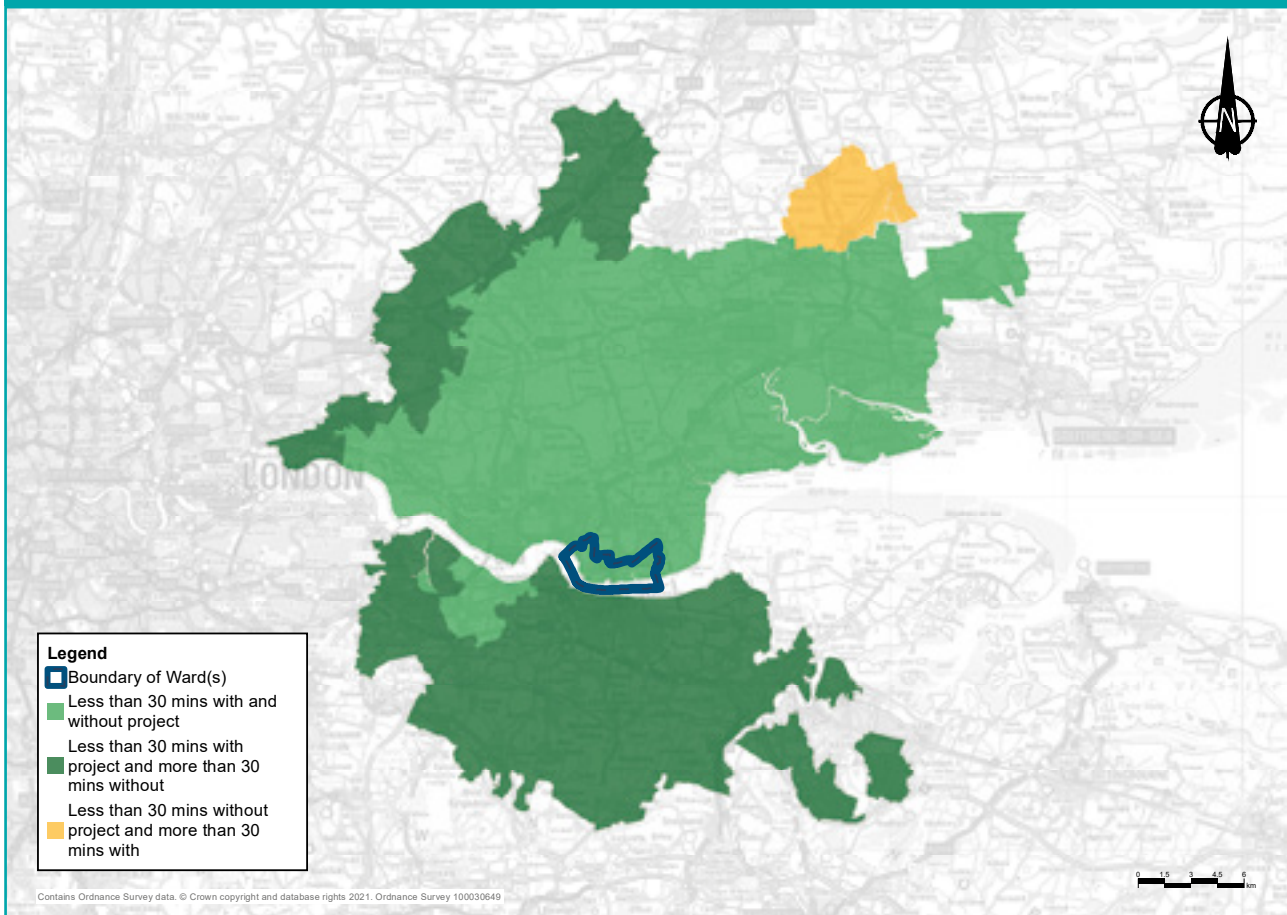
Figure 13.9: Predicted percentage changes to traffic flows during the evening peak in 2029



Changes to journey times

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

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



Measures to reduce impacts on traffic flow

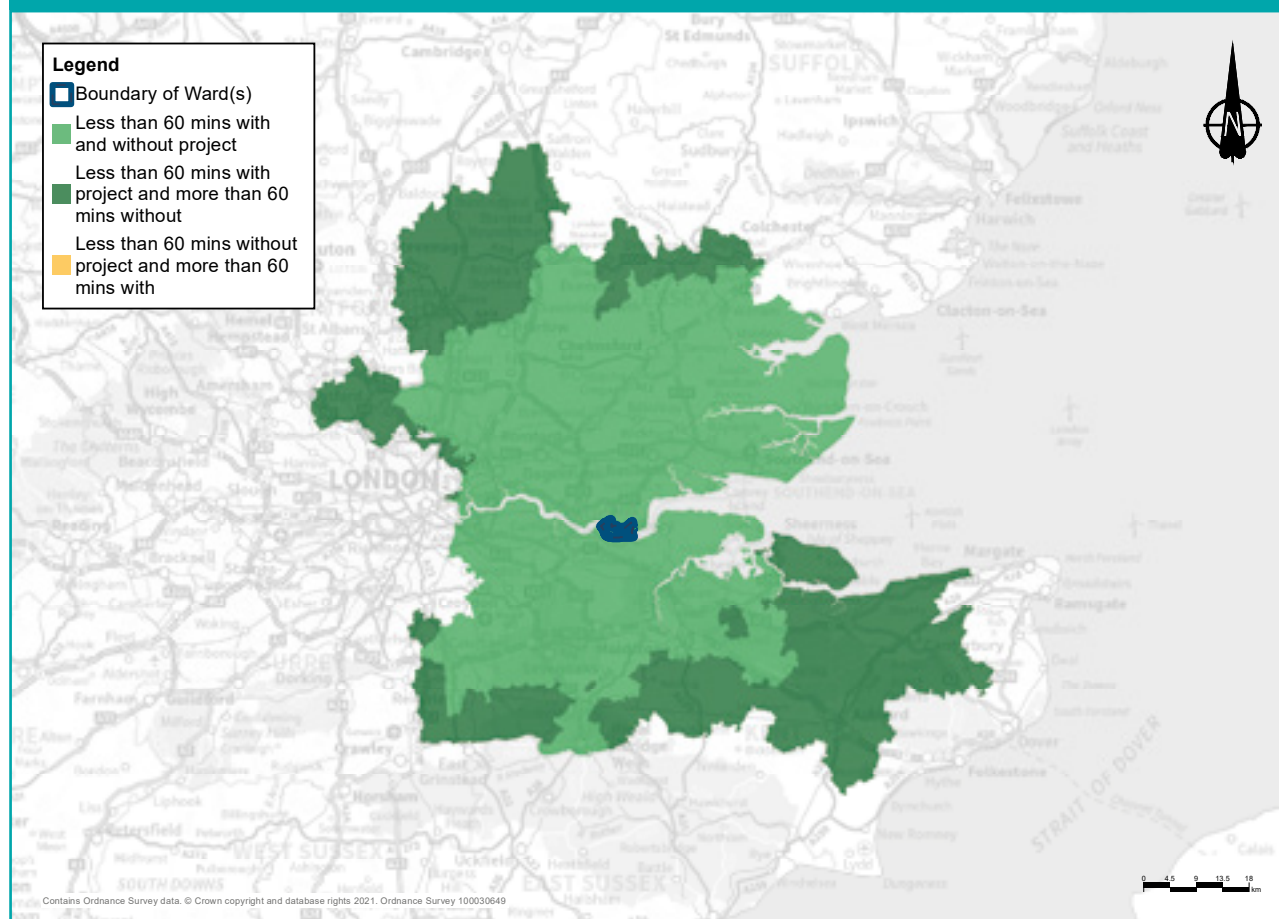
The project has been designed to optimise its impacts on traffic, including the design of free-flowing connections with the A13 and A1089. In addition, the main route would have no traffic lights or roundabouts to ensure continuous traffic flow, although traffic lights or roundabouts would be necessary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

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

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

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

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



13.4 Public transport

Existing situation

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

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

13.4.1 Construction

Rail

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

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

Buses

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

13.4.2 Operations

Rail

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

Buses

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

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

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

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

13.5 Footpaths, bridleways and cycle routes

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

13.6 Visual

Existing situation

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

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

13.6.1 Construction

Construction impacts

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

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

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

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

Measures to reduce visual impacts of construction

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

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

13.6.2 Operations

Operational impacts

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

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

Measures to reduce visual impacts of the operational project

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

13.7 Noise and vibration

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

Existing situation

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

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

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

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

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

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

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

13.7.1 Construction

Daytime construction noise impacts

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

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

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

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

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

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

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

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

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

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

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

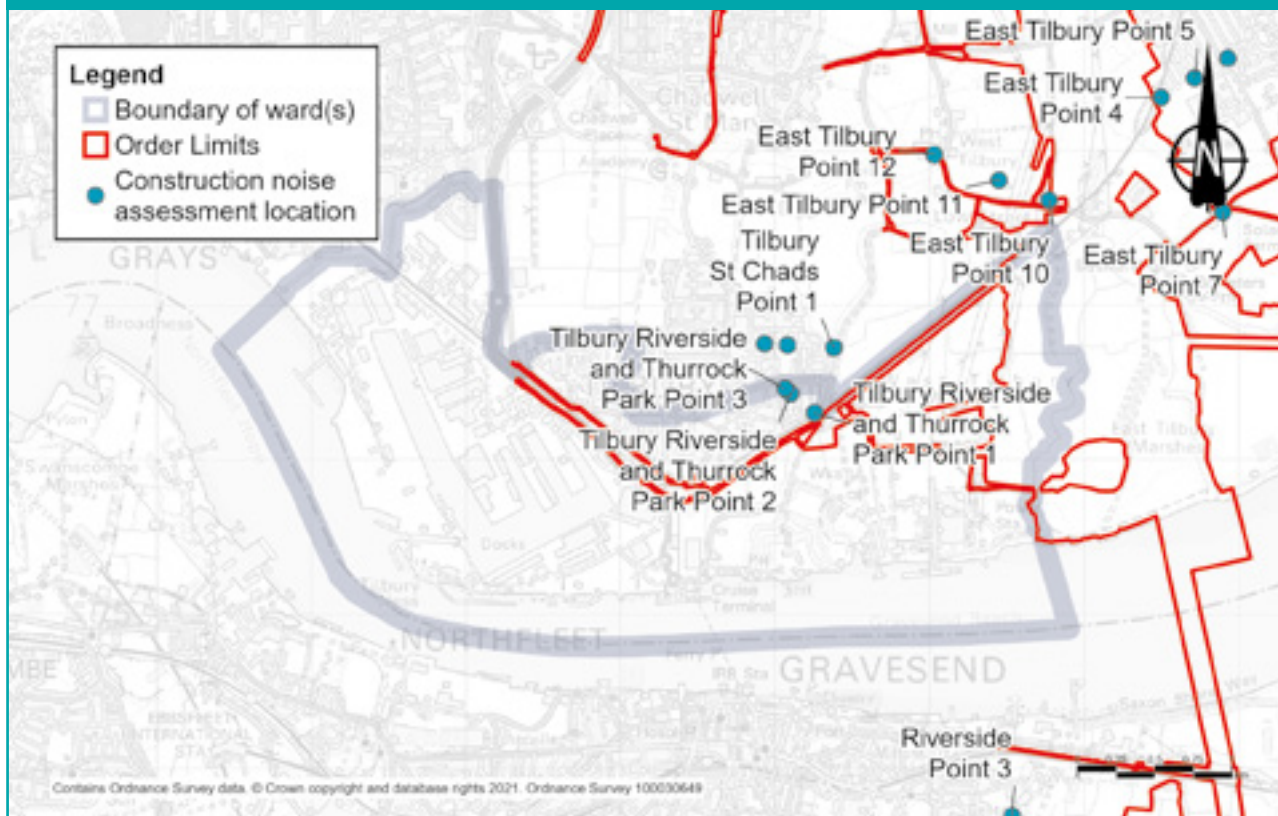
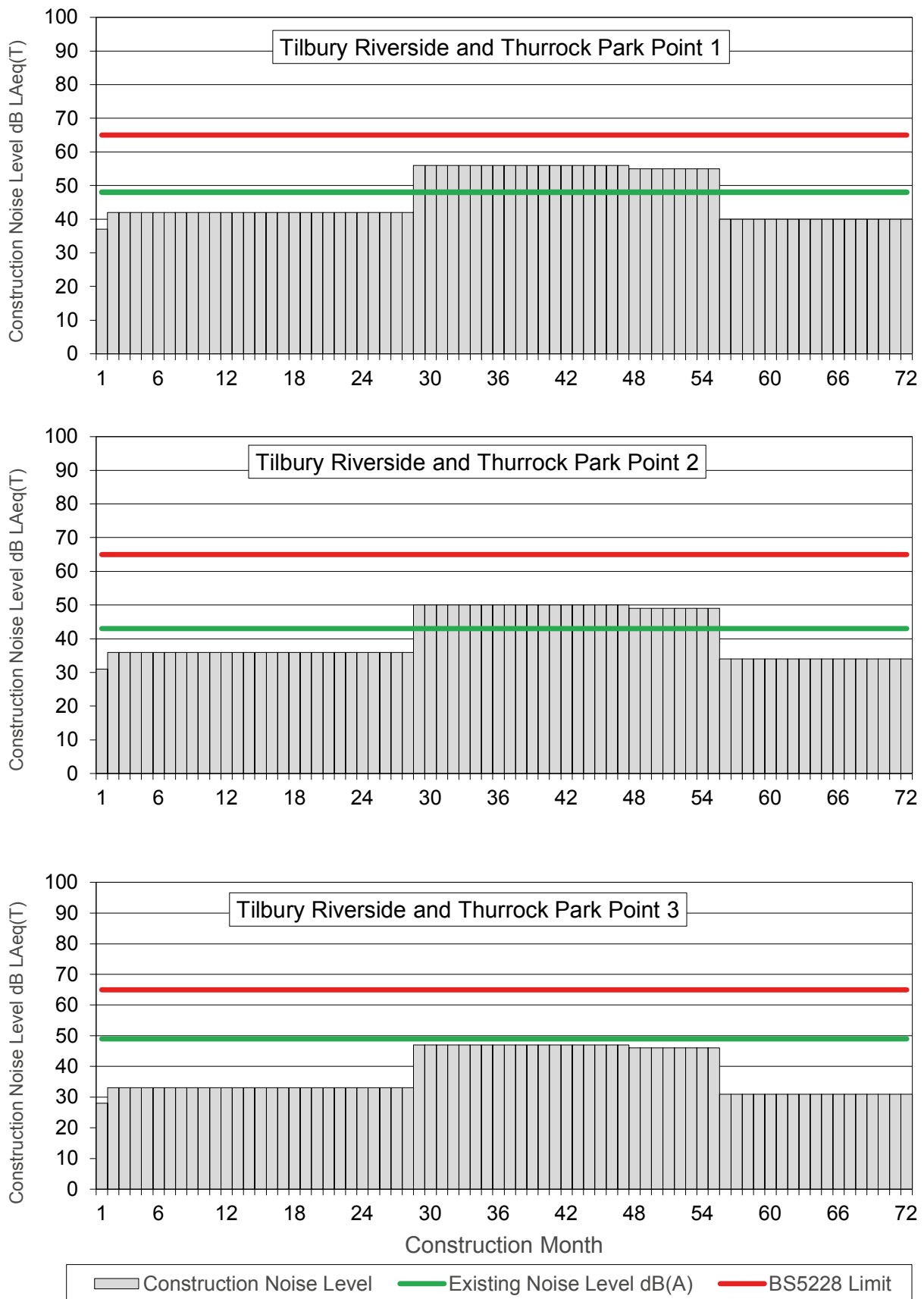


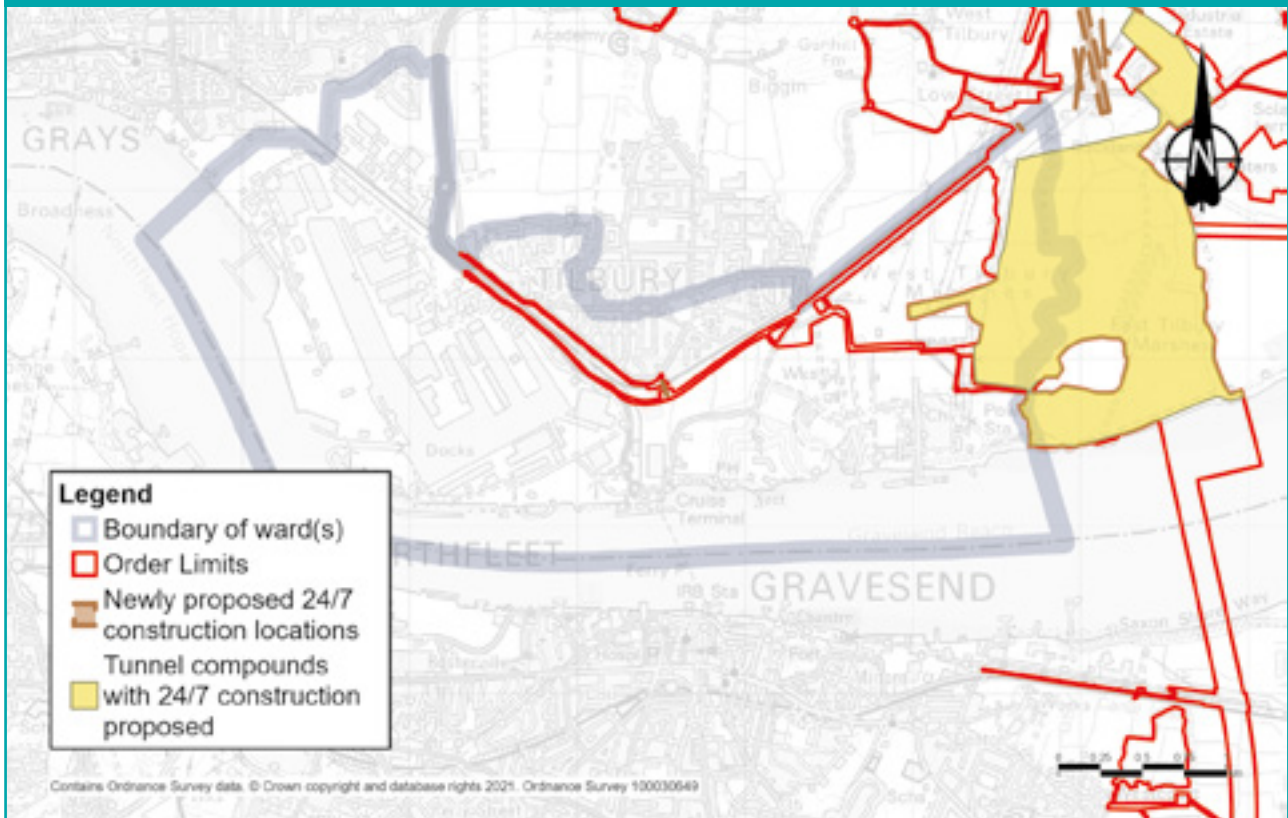
Figure 13.13: Construction noise by month for points 1, 2 and 3 in Tilbury Riverside and Thurrock Park ward



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

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

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



24/7 construction working

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

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

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

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

Construction traffic impacts

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

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

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

Measures to reduce construction noise and vibration

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

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

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

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

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

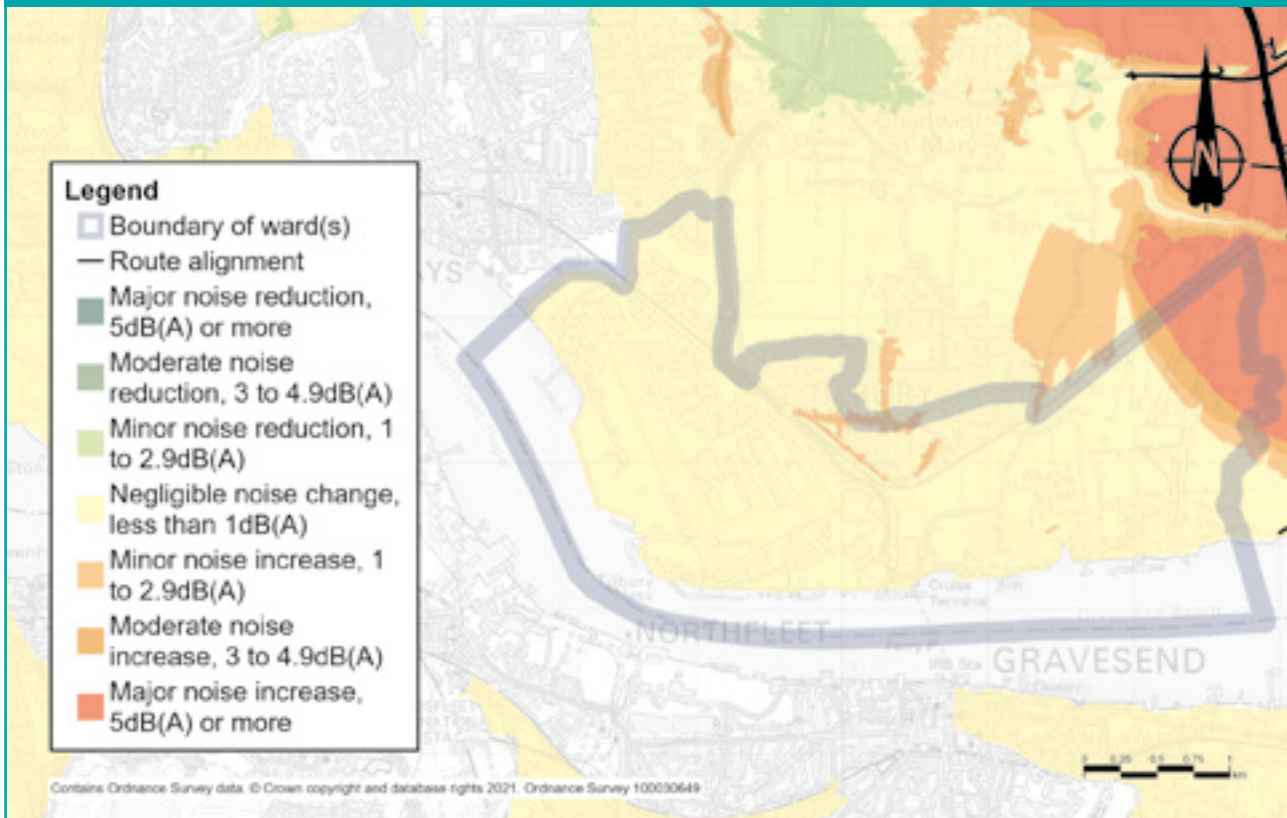
13.7.2 Operations

Operational impacts

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

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

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



Operational traffic flows

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

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

13.8 Air quality

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

Existing situation

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

13.8.1 Construction

Construction impacts

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

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

Measures to reduce air quality impacts of construction

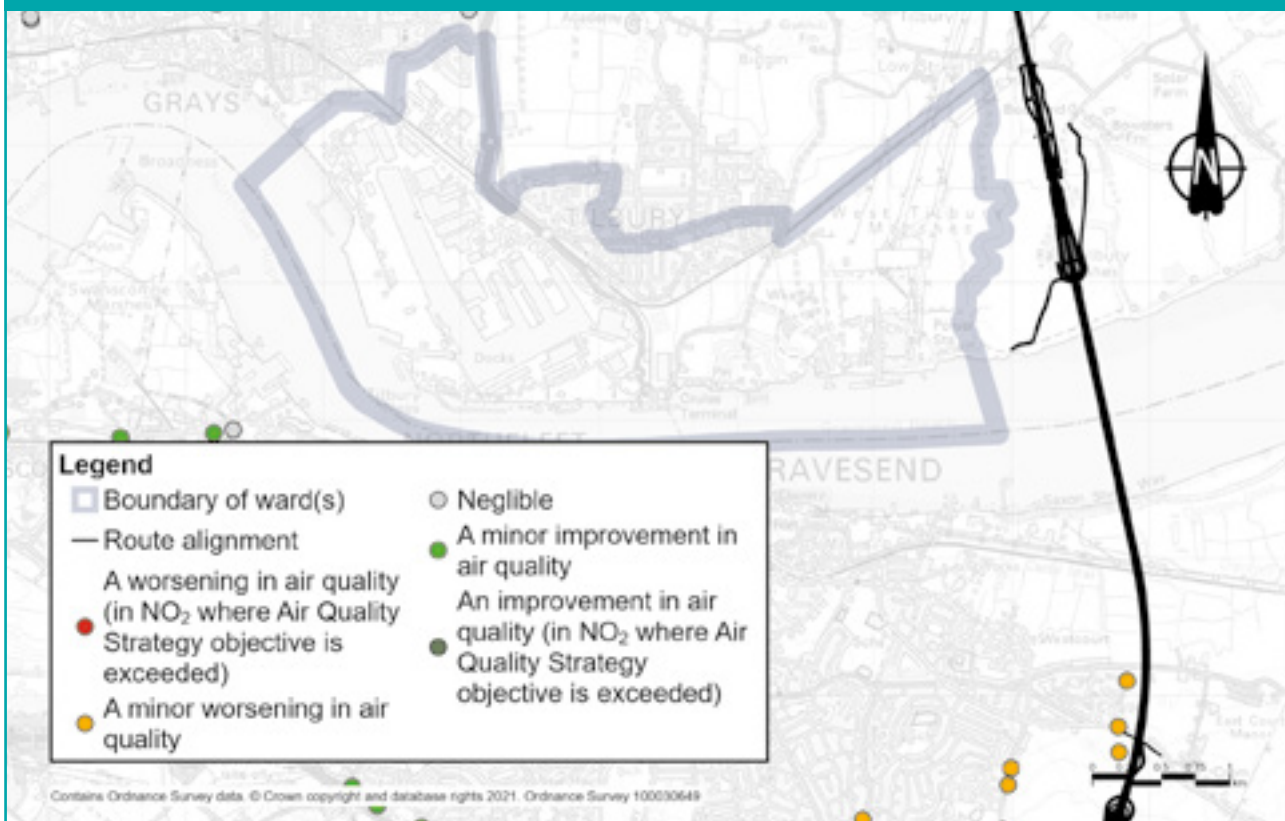
The impact of construction machinery and traffic on air quality would be controlled through the range of good practice measures set out in the CoCP and the REAC. For example, there would be measures to suppress dust, such as damping down dry haul roads and spoil heaps, as well as the use of low-emission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

13.8.2 Operations

Operational impacts

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

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



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

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

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

Measures to reduce air quality impacts of the operational project

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

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

13.9 Health

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

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

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

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

13.9.1 Construction

Construction impacts

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

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

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

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

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

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

Measures to reduce impacts on health during construction

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

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

13.9.2 Operations

Operational health impacts

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

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

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

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

Measures to reduce health impacts of the operational project

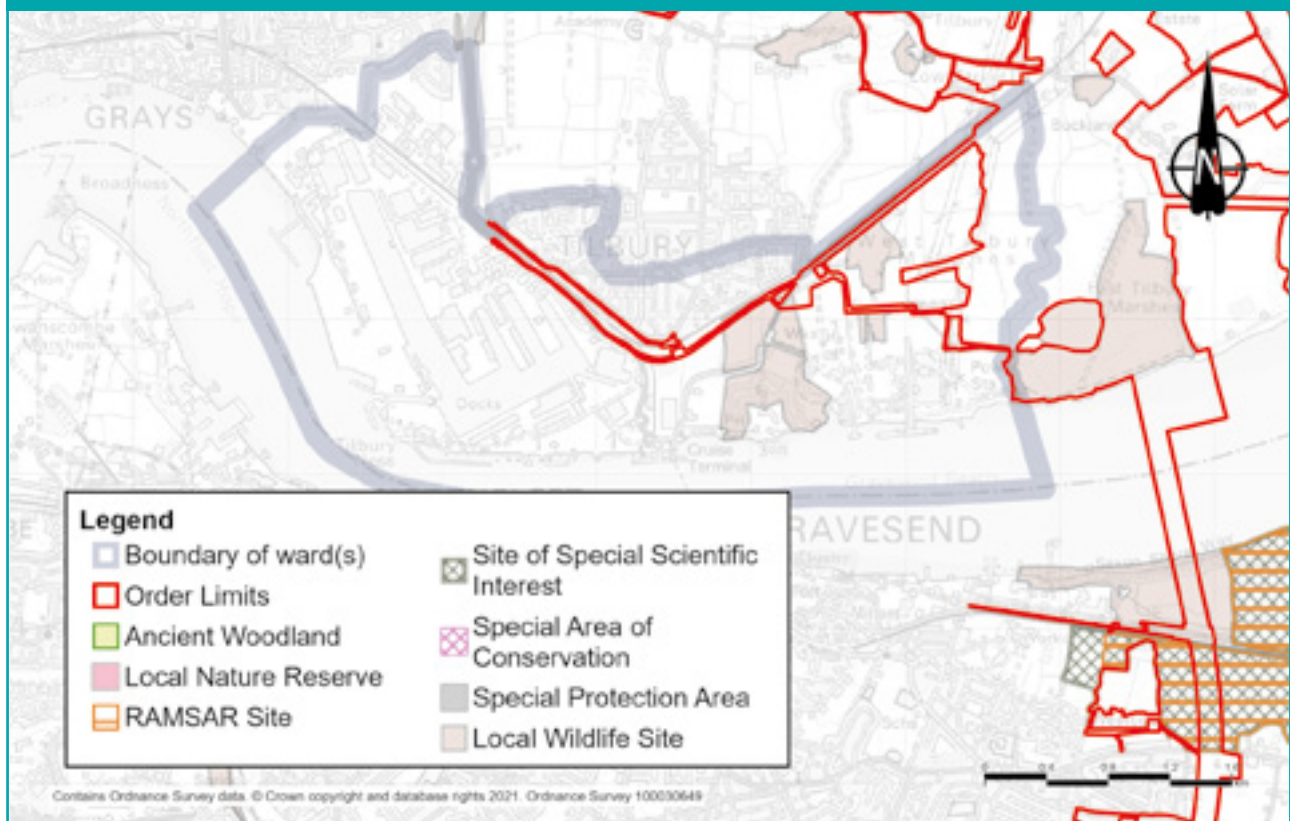
Mitigation measures to address noise and visual impacts have been described above. No further impacts relating to health have been identified for this ward and consequently no specific additional measures are required.

13.10 Biodiversity

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

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

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



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

13.10.1 Construction

Construction impacts

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

Measures to reduce biodiversity impacts of construction

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

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

13.10.2 Operations

Operational impacts

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

Measures to reduce biodiversity impacts of the operational project

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

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

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

13.11 Built heritage

Existing situation

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

Scheduled monument

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

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



Listed buildings

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

Other buildings/structures of historical relevance

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

13.11.1 Construction

Construction impacts

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

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

Measures to reduce construction impacts

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

13.11.2 Operations

Operational impacts

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

Measures to reduce operational impacts

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

13.12 Contamination

Existing situation

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

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

13.12.1 Construction

Construction impacts

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

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

Measures to reduce contamination management impacts of the project

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

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

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

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

13.12.2 Operation

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