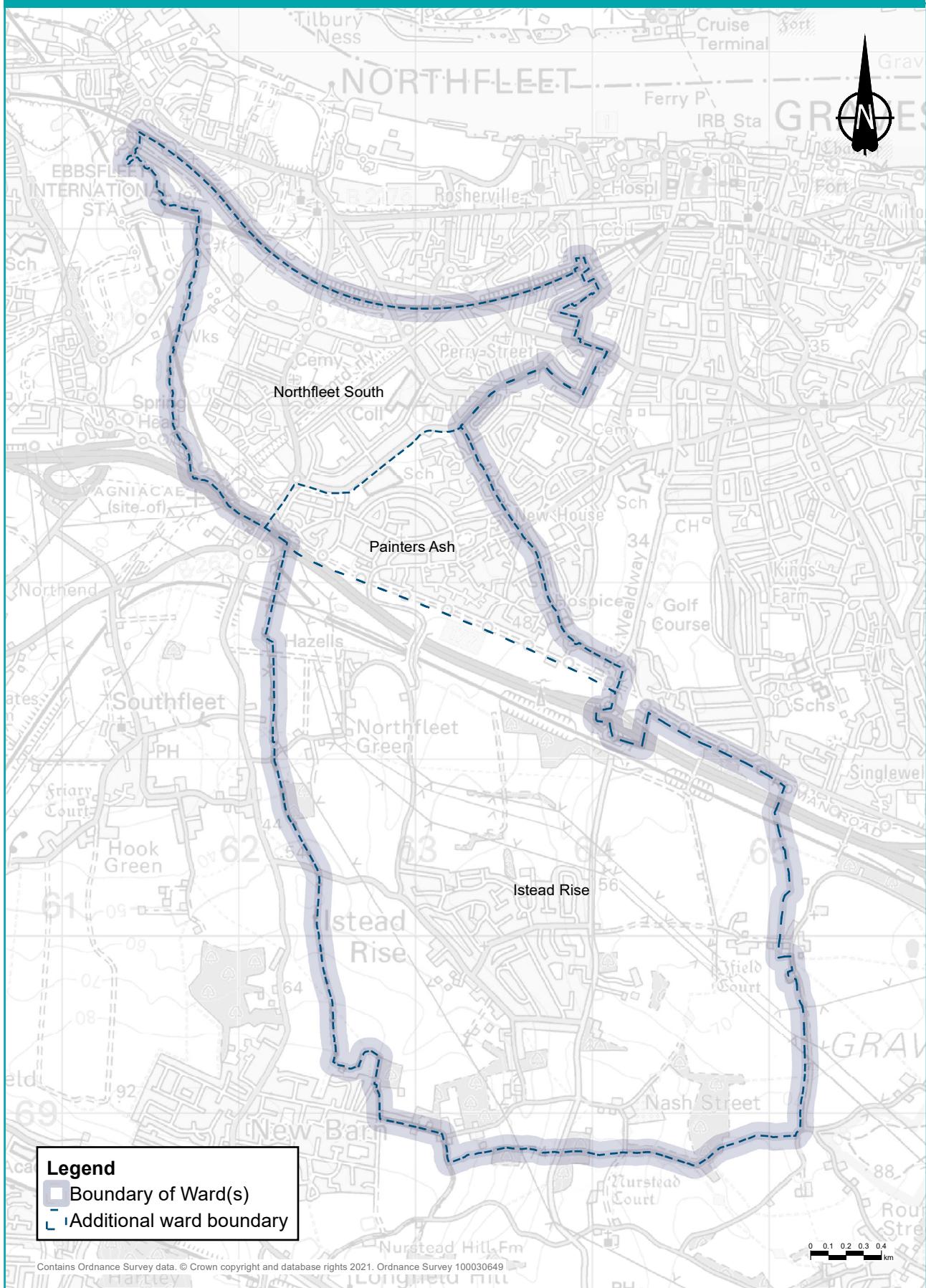


## Chapter 10: Northfleet South, Istead Rise and Painters Ash wards

This chapter summarises the activities in Northfleet South, Istead Rise and Painters Ash wards 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. The activities and impacts in these wards are presented together in one chapter because they are similar.

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

**Figure 10.1: Ward boundary map for Northfleet South, Istead Rise and Painters Ash wards**



## 10.1 Overview

### 10.1.1 About these wards

All three wards are located south of the River Thames in the borough of Gravesham.

Northfleet South ward lies to the west of Riverside ward, on the southern edge of Gravesend. It is around 2.3km<sup>2</sup> in area and has an estimated population of 8,773<sup>1</sup>. The central and eastern parts of the ward are residential and include public parks and a golf course. To the west of the ward is Sawyer's Lake, a reservoir. The HS1 railway line and North Kent Line railway pass through the north of the ward. High-voltage overhead power lines run across the centre of the ward from north to south. The A2 runs on part of the southern ward boundary.

Istead Rise ward is to the south of Painters Ash and Woodlands wards. It is approximately 7.4km<sup>2</sup> in area and has an estimated population of 3,324<sup>2</sup>. The ward is mostly agricultural with the village of Istead Rise at its centre. The A2 runs across the northern part of the ward.

Painters Ash ward is located to the west of Woodlands ward in the borough of Gravesham, forming part of Gravesend town. It is approximately 1.1km<sup>2</sup> in area and has an estimated population of 5,579<sup>3</sup>. The ward is mostly residential with some public parks. There is a high-voltage overhead electricity line in the south-west of the ward. The A2 is on part of the western ward boundary.

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

<sup>2</sup> Office for National Statistics, 2018 ward-level population estimate

<sup>3</sup> Office for National Statistics, 2018 ward-level population estimate

## 10.1.2 Summary of impacts

**Table 10.1: Summary of impacts during the project's construction and operation**

Topic	Construction	Operations
<b>Traffic</b>	<p><b>Impacts</b></p> <p>There will be some construction-related traffic (both HGVs and staff vehicles) on the section of the A2 that runs through these wards, going to and from the compounds in Gravesham.</p> <p><b>Mitigation</b></p> <p>To reduce the impact of the construction process, construction traffic would be limited to the A2 and local roads would not be used where possible.</p>	<p><b>Impacts</b></p> <p>There would be very little change in traffic flows on most roads in Northfleet South, Istead Rise and Painters Ash wards as a result of the new road opening. Changes are predicted, however, on the A2 in both directions. Further details of predicted changes can be found in the Traffic section of this chapter.</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>
<b>Public transport</b>	<p><b>Buses</b></p> <p>There may be some increases to journey times on coach services on the A2 due to construction activities in nearby wards.</p> <p><b>Rail</b></p> <p>During construction, there would be no noticeable changes in local journey times to Ebbsfleet International or Meopham stations, and no changes to the rail services at these stations.</p>	<p><b>Buses</b></p> <p>There would be no noticeable changes in local journey times to Meopham or Ebbsfleet International stations, or changes to rail services, once the road is open.</p> <p><b>Rail</b></p> <p>There would be no changes to bus routes through these wards once the road opens, or any noticeable changes to bus journeys. There would be, however, a slight increase in journey times expected on the 695 school bus from Rochester Grammar School via Cobham and Sole Street to Meopham School and on to Istead Rise.</p>

Topic	Construction	Operations
<b>Footpaths, bridleways and cycle routes</b>	<p><b>Impacts</b></p> <p>One bridleway and one cycle route would be impacted during the construction period to allow for utilities diversions works.</p> <p><b>Mitigation</b></p> <p>Closures of these two routes would be reduced as much as possible to reduce the impact on the local public rights of way network.</p>	<p><b>Impact</b></p> <p>The section of a cycle route which runs through these wards would be unaffected by the road when it opens, but would be affected in other sections of the route in neighbouring wards.</p> <p><b>Mitigation</b></p> <p>No mitigation would be required.</p>
<b>Visual</b>	<p><b>Impacts</b></p> <p>In Istead Rise, the widening of the A2 corridor, utility diversions and the erection of new tunnel entrance gantries would be visible from the Wealdway and nearby footpaths. From the Cyclopark, the utility works along the Roman Road would be visible.</p> <p><b>Mitigation</b></p> <p>The visual impacts would be controlled through good practice measures set out in the CoCP and REAC.</p>	<p><b>Impacts</b></p> <p>There would be minimal visual impact along the Wealdway, nearby footpaths and from the Cyclopark in Istead Rise.</p> <p><b>Mitigation</b></p> <p>Landscape restoration and screen planting would be the primary mitigation in Istead Rise.</p>

Topic	Construction	Operations
<b>Noise and vibration</b>	<p><b>Impacts</b></p> <p>The construction activity associated with the A2 upgrade work and utilities work is expected to create noise in these wards. There would be no percussive or vibratory works in these wards. There would also be no 24-hour, seven-day working in any of the wards. There would be negligible changes in noise from road traffic.</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 set out in the CoCP.</p>	<p><b>Impacts</b></p> <p>There would be no direct noise impacts on any of the wards. There would be indirect noise as a result of changes in traffic flow, the number of HGVs and traffic speed on the existing roads in the wards. In Istead Rise, the indirect noise would also be as a result of physical alterations/upgrade work along the A2 in the north of the ward.</p> <p><b>Mitigation</b></p> <p>The use of low-noise surfacing would reduce the traffic noise once the road is open.</p>

Topic	Construction	Operations
<b>Air quality</b>	<p><b>Impacts</b></p> <p>There is likely to be dust and emissions from construction equipment and traffic during the construction phase on a few properties within 200 metres of the worksite.</p> <p>Analysis of the construction phase traffic flows show there would be a minor improvement in air quality around the A2 corridor from 2026 to 2028. There would be negligible changes in noise from road traffic.</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>There are no predicted exceedances of NO<sub>2</sub> or PM<sub>10</sub>. Within Northfleet South and Painters Ash wards, it is predicted there would be a minor improvement in air quality, and within Istead Rise ward there would be a negligible change in air quality for NO<sub>2</sub>.</p> <p><b>Mitigation</b></p> <p>No essential mitigation is required.</p>

Topic	Construction	Operations
<b>Health</b>	<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. There are also likely to be noticeable changes in the levels of noise from construction traffic.</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 noise, visual screening and community engagement.</p>	<p><b>Impacts</b></p> <p>Positive health outcomes may also be experienced by residents in these wards as a result of improvements to accessibility, access to work and training, and access to open spaces. There is expected to be a minimal visual impact in Istead Rise once the road is built.</p> <p><b>Mitigation</b></p> <p>No essential mitigation is required for health other than those measures described in the visual sections.</p>

Topic	Construction	Operations
<b>Biodiversity</b>	<p><b>Impacts</b></p> <p>The construction of the utility diversion in Northfleet South would require the removal of woodland and scrub habitat. In Istead Rise and Painters Ash wards, landscape planting and grassland habitat would need to be removed temporarily and some permanently.</p> <p><b>Mitigation</b></p> <p>Vegetation clearance would be carried out in winter to avoid impacting breeding birds. Protected species would be relocated, carried out under a Natural England licence. Any habitat lost temporarily would be reinstated after construction. Impacts would be controlled through the good practice measures set out in the CoCP and REAC.</p>	<p><b>Impacts</b></p> <p>None identified.</p> <p><b>Mitigation</b></p> <p>None identified, although newly created habitats would be managed to ensure they provide high-quality habitats to support a wide range of plants and animal species.</p>
<b>Built heritage</b>	<p><b>Impacts</b></p> <p>None identified.</p> <p><b>Mitigation</b></p> <p>None required.</p>	<p><b>Impacts</b></p> <p>None identified.</p> <p><b>Mitigation</b></p> <p>None required.</p>
<b>Contamination</b>	<p><b>Impacts</b></p> <p>None identified.</p> <p><b>Mitigation</b></p> <p>None required.</p>	<p><b>Impacts</b></p> <p>None identified.</p> <p><b>Mitigation</b></p> <p>None required.</p>

## **10.2 Project description**

### **10.2.1 Construction**

#### **Construction activities**

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

Part of our proposed Order Limits (the land we would need to build and operate the project) extends from the Marling Cross Compound in Singlewell ward to a National Grid site west of Hall Road, along Roman Road, which is a bridleway that runs parallel to the A2 to the north of it. This is to allow the proposed installation of four underground power cables from the National Grid site to a new primary substation near the A226. The power cables would pass through Northfleet South, Istead Rise and Painters Ash wards.

The power cables would be installed using trenchless methods under Hall Road and Wrotham Road, which would mean digging underneath the road without damaging the existing road surface. The remainder, along the Roman Road bridleway, would be mostly open cut and delivered in sections, with barriers moving as work progressed. Chapter 2 of the Construction update provides an overview of how existing utilities would be affected by our plans to build the new road, with further detail including maps in chapter 3. 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.

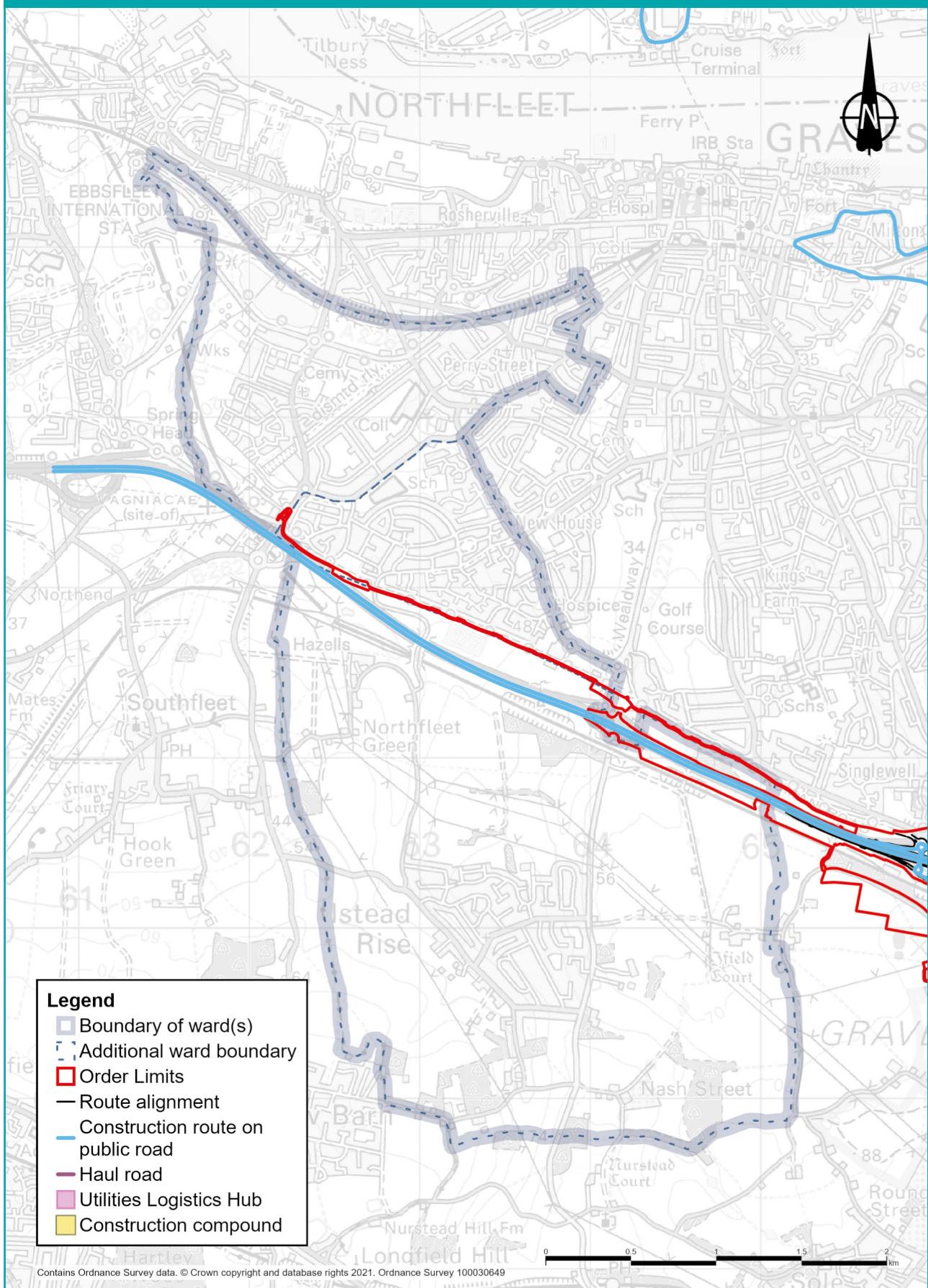
### **Construction compounds and Utility Logistics Hubs**

Chapter 2 of the Construction update provides an overview of how existing utilities would be affected by our plans to build the new road, with further detail including maps in chapter 3. 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 compounds are fenced-off areas, accessible to construction traffic, which provide the facilities for our project to be built efficiently. For example, compounds would provide parking, storage for machinery and materials, offices, welfare facilities, refuelling, and vehicle and wheel-washing facilities to make sure vehicles leaving the compound do not dirty local roads.

There are no compounds or Utility Logistics Hubs located in the Northfleet South, Istead Rise and Painters Ash wards.

**Figure 10.2: Main construction areas in Northfleet South, Istead Rise and Painters Ash wards**



## **Construction routes on public roads**

The A2 would be designated as a construction route.

## **Construction schedule**

Construction of the project is scheduled to last for six years from 2024 to 2029. The works to install the power cables would take around 15 months, which would be carried out early in the construction period. To deliver the construction programme efficiently, activities would be divided into packages of work and delivered in a coordinated way. Maps and programmes of the work packages in Kent can be found in chapter 3 of the Construction update.

## **Construction working hours**

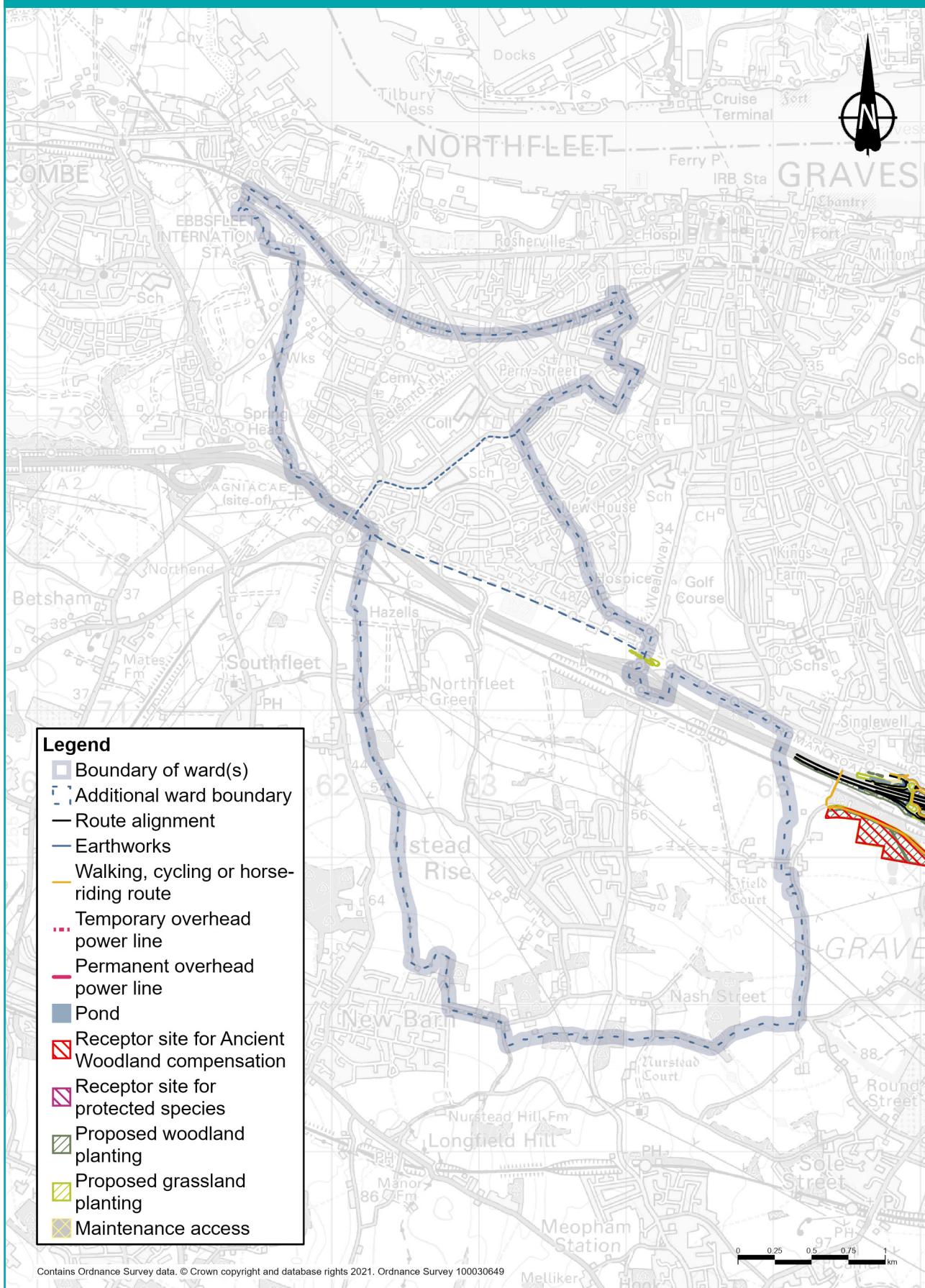
Most construction activities in Northfleet South, Istead Rise and Painters Ash wards would take place during core hours, from 7am to 7pm on weekdays and 7am to 4pm on Saturdays. However, there would be circumstances when our working hours would need to be extended. For example, connecting new roads to existing ones would be carried out when there is less traffic, so it is safer for both construction workers and roads users. Working outside the core hours can also benefit road users by reducing the need for traffic management measures during peak times. More information about working hours is set out in the Noise and vibration section below and in the CoCP.

## **Traffic management**

There are no construction traffic management measures planned in the Northfleet South, Istead Rise and Painters Ash wards.

Measures required across the project would include narrow lanes, reduced speed limits, lane closures and temporary traffic lights. We have sought to minimise traffic management measures wherever practical. However, they would be necessary in some places to allow construction traffic and local communities to travel safely, while providing construction workers with sufficient space to operate. An overview of the traffic management required across the project can be found in the Outline Traffic Management Plan for Construction (OTMPfC). All traffic management measures are based on an indicative construction programme, which would be finalised by the appointed contractor. The contractor's final traffic management plans will be subject to final approval by the Secretary of State for Transport, following consultation with the local highways authority.

**Figure 10.3: The main features of the completed project**



## **10.2.2 Operations**

### **The completed project**

For more information about the completed project, see chapter 1 of the Construction update and the large-scale figures in Map Book 1: General Arrangements. Below, we outline the main features of the project that would be in Northfleet South, Istead Rise and Painters Ash wards once the road is open.

- We would acquire permanent rights over a strip of land along Roman Road to maintain newly installed underground power cables, although there would be no visible elements of the project.
- Some footpaths, bridleways and cycle routes in Istead Rise would be re-routed permanently. For more information, see the Footpaths, bridleways and cycle routes section below.

### **Changes to the project since our design refinement consultation**

The amount of land within the Order Limits needed for works in the Cyclopark (see below) has been made smaller, reducing the temporary impact on this recreational site.

### **Impacts on open space and common land**

We proposed to permanently install an underground power cable along or adjacent to the existing footpath in the Cyclopark. We would acquire permanent rights over the strip of land to allow the cable to be maintained. The use of the land as open space would be unaffected and the land would be reinstated once works are complete.

More information about our proposals for compensating for impacts on open space land (which includes special category and recreational land), including proposals we have consulted on previously, can be found in chapter 3 of our Operations update.

## **10.3 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.

### **10.3.1 Construction**

#### **Construction impacts**

Information about construction activities in these wards, including construction routes on public roads, can be found in the Project description section above.

There will be some construction-related traffic (both HGVs and staff vehicles) on the section of the A2 that runs through these wards, going to and from the compounds in Gravesham.

#### **Measures to reduce construction traffic impacts**

Within these wards, construction traffic would be limited to the A2. Where possible, we have reduced the volume of construction traffic that would use this road during the construction period. A summary of our proposed measures to reduce the amount of construction material transported in and out of the project by road can be found in chapter 2 of the Construction update.

### **10.3.2 Operations**

#### **Operational impacts**

Traffic modelling has been carried out to predict the change in traffic flows on the roads in the area, including those within or on the boundary of these wards for the first year of operation (2029).

Figures 10.4, 10.6 and 10.8 below show the predicted changes in traffic in the morning peak (7am to 8am), interpeak (an average hour between 9am and 3pm) and evening peak (5pm to 6pm) measured in Passenger Car Units (PCUs per hour), where 1 PCU is equivalent to a car, and 2.5 PCUs is equivalent to an HGV. Figures 10.5, 10.7 and 10.9 below show the predicted percentage changes in traffic flow during the morning, interpeak and evening peak. For information about how we assessed operational traffic impacts, see chapter 1. For more information about how we carried out our traffic modelling, see chapter 4 of the Operations update.

There would be very little change in traffic flows on most local roads in Northfleet South, Istead Rise and Painters Ash wards as a result of the new road opening.

South of the A2, there would be an increase in traffic of between 50 and 250 PCUs in the morning peak northbound on Wrotham Road between Istead Rise and the A2. This is an increase of between 20% and 40%. southbound, there would be an increase of between 50 and 250 PCUs in the evening peak period, an increase of between 10% and 20%.

Along the A2 between the Gravesend East and Tollgate (Wrotham Road) junctions – Westbound, there would be a reduction in traffic of between 500 and 1,000 PCUs per hour in the morning (a 0% to 10% decrease). In an average interpeak hour, the decrease in traffic would be over 1,000 PCUs, a decrease of between 20% and 40%. In the evening peak hour, the decrease in flows would be between 500 and 1,000 PCUs, a decrease of between 10% and 20%. Eastbound on the A2, the decrease in flows would be over 1,000 PCUs in the morning peak hour and an average interpeak hour. This is a decrease of between 20% and 40%. In the evening peak hour, the decrease in traffic flows would be between 500 and 1,000 PCUs, a decrease of between 0% and 10%.

On the A2 between the Tollgate junction and the Pepper Hill junction, there would also be a large decrease in traffic flows. Westbound, the decrease would be between 500 and 1,000 PCUs (0% to 10%) in the morning peak hour, over 1,000 PCUs an hour in an average interpeak hour (a decrease of between 20% and 40%) and in the evening peak hour the change in traffic flows would be a decrease of between 500 and 1,000 PCUs (between 10% and 20%). Eastbound, the decrease would be over 1,000 PCUs, a reduction of between 20% and 40% in the morning peak hour and an average interpeak hour. In the evening peak, the reduction would be between 500 and 1,000 PCUs (between 0% and 10%).

Within Painters Ash ward on the A227 between the A2 and Coldharbour Road, there is predicted to be an increase in traffic westbound of between 50 and 250 PCUs in the morning and evening peak hour. This is an increase of between 10% and 20% in the morning peak hour and between 0% and 10% in the evening peak hour. Eastbound, there would be an increase of between 50 and 250 PCUs in the evening peak hour, which is an increase of between 0% and 10%.

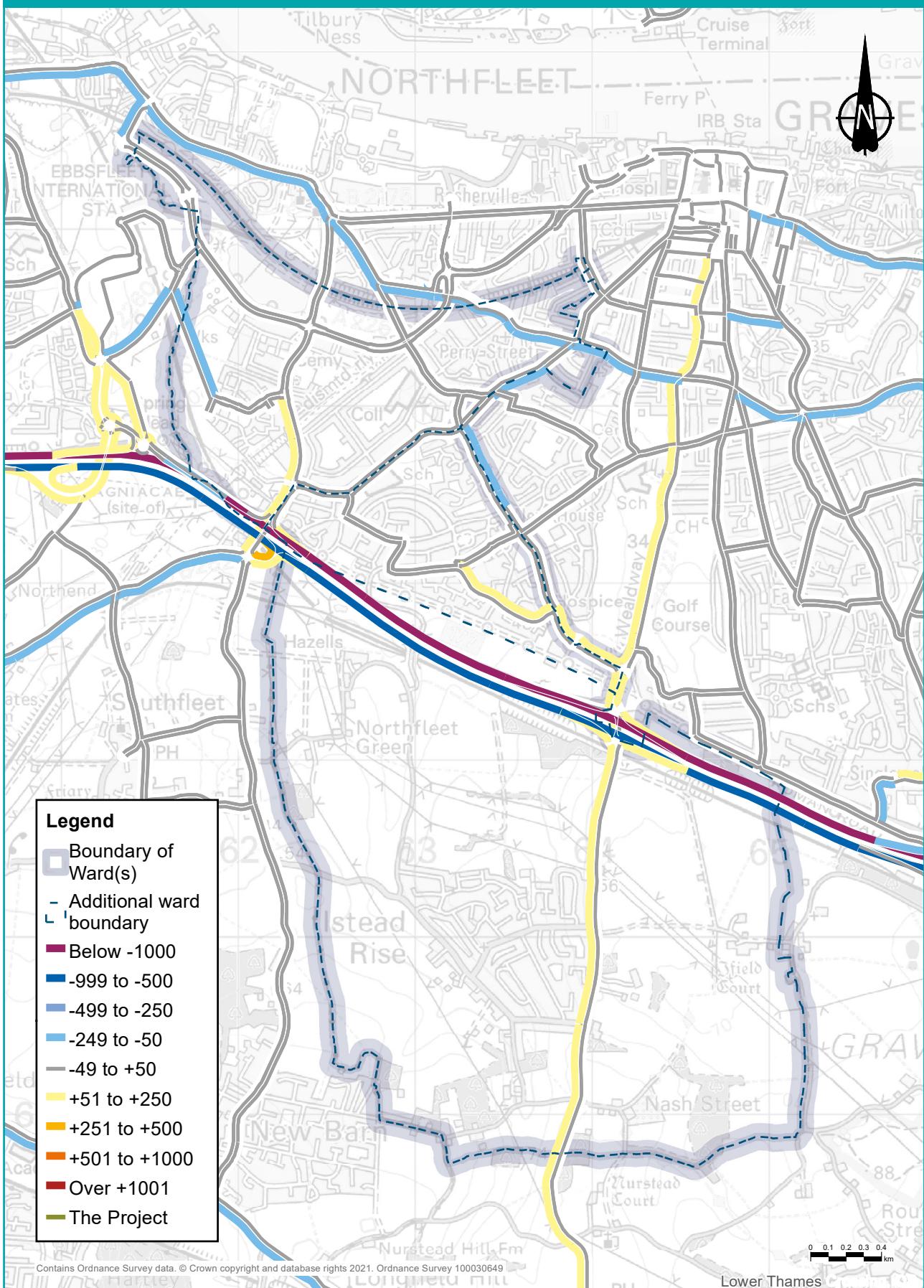
There would be a slight increase in traffic along Mulberry Road eastbound, of between 50 and 250 PCUs, a 40% increase in the morning peak hour, but a decrease of a similar number of vehicles in the evening peak hour. Further west, there would be a small decrease in traffic flows, along Landseer Avenue and Gainsborough Drive. This would be due to some traffic re-routing and using the A2 Tollgate junction rather than the Pepper Hill junction.

There would also be a small decrease in traffic, of between 50 and 250 PCUs southbound on Coldharbour Road near the junction with Hall Road in the morning and evening peak hours. This is a decrease of between 20% and 40%.

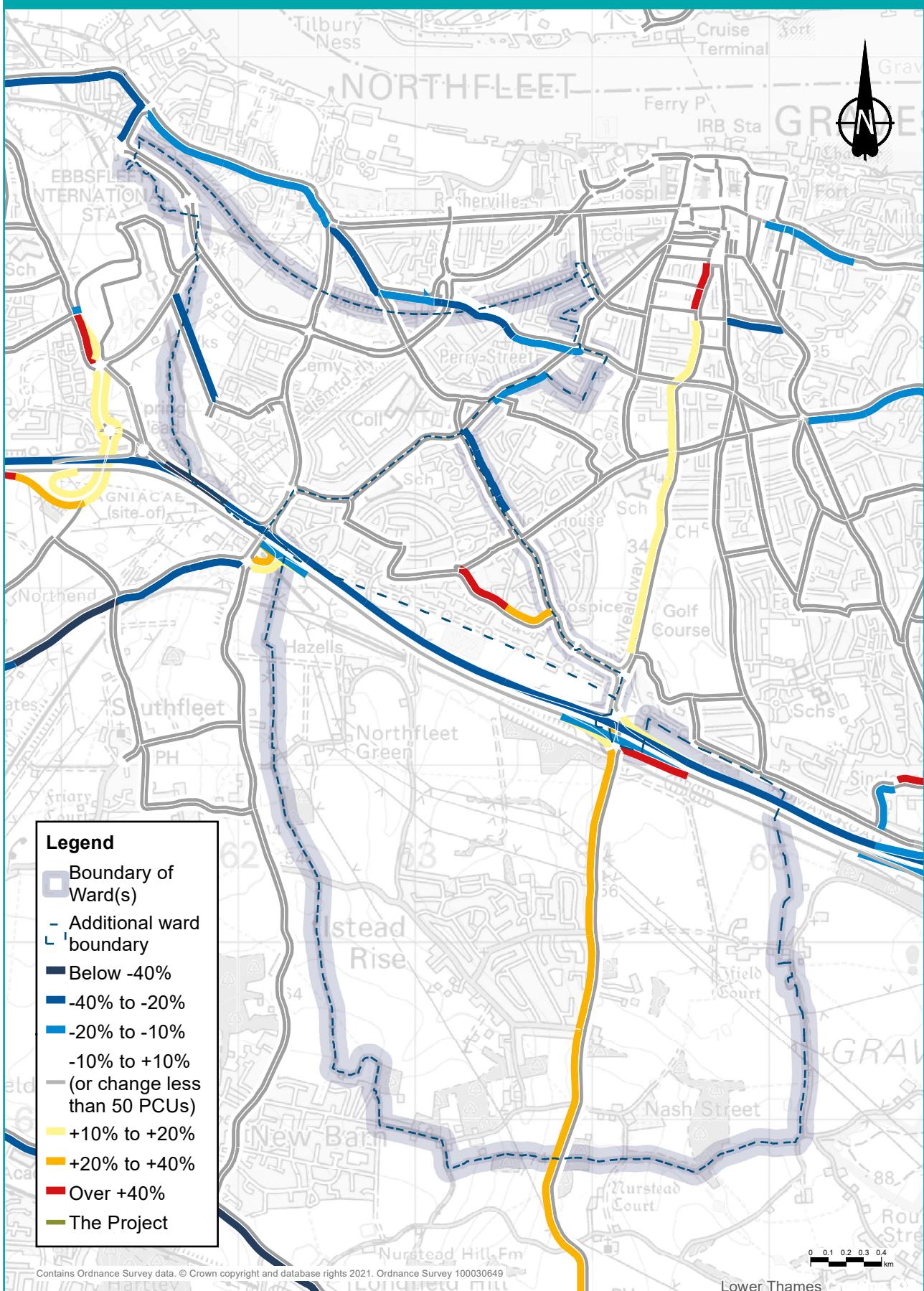
On Hall Road, just north of the Pepper Hill junction on the A2, there would be an increase in traffic in both directions. Northbound, there would be an increase of between 50 and 250 PCUs in each modelled time period, which is a 0% to 10% increase in the morning peak hour and an average interpeak hour and a 10% to 20% reduction in the evening peak hour. Southbound, there would be an increase in traffic of between 50 and 250 PCUs in the average peak hour (an increase of between 0% and 10%) and in the evening peak hour (an increase of between 10% and 20%). Further north along Springhead Road, there would be an increase in flows northbound of between 50 and 250 PCUs (an increase of between 0% and 10%) and a decrease in traffic flows southbound in the evening peak hour of between 50 and 250 PCUs (a decrease of between 0% and 10%). On Hall Road, just east of the junction with Springhead Road, there would be an increase in traffic flows in the evening peak hour of between 50 and 250 PCUs, an increase of between 10% and 20%.

Elsewhere in the ward, there would be a decrease of traffic in the evening peak hour westbound, outside Springhead Park primary school on Springfield Parkway, of between 50 and 250 PCUs, a decrease of between 20% and 40%. There would also be a decrease eastbound in the evening peak period as well, of between 50 and 250 PCUS, which is a decrease of between 10% and 20%. On Vale Road between Thames Way and Colyer Road, there would be a decrease in traffic northbound in an average interpeak hour of between 50 and 250 PCUs, a decrease of between 10% and 20%, and an increase in traffic flows of between 50 and 250 PCUs southbound in the evening peak hour, an increase of between 10% and 20% southbound.

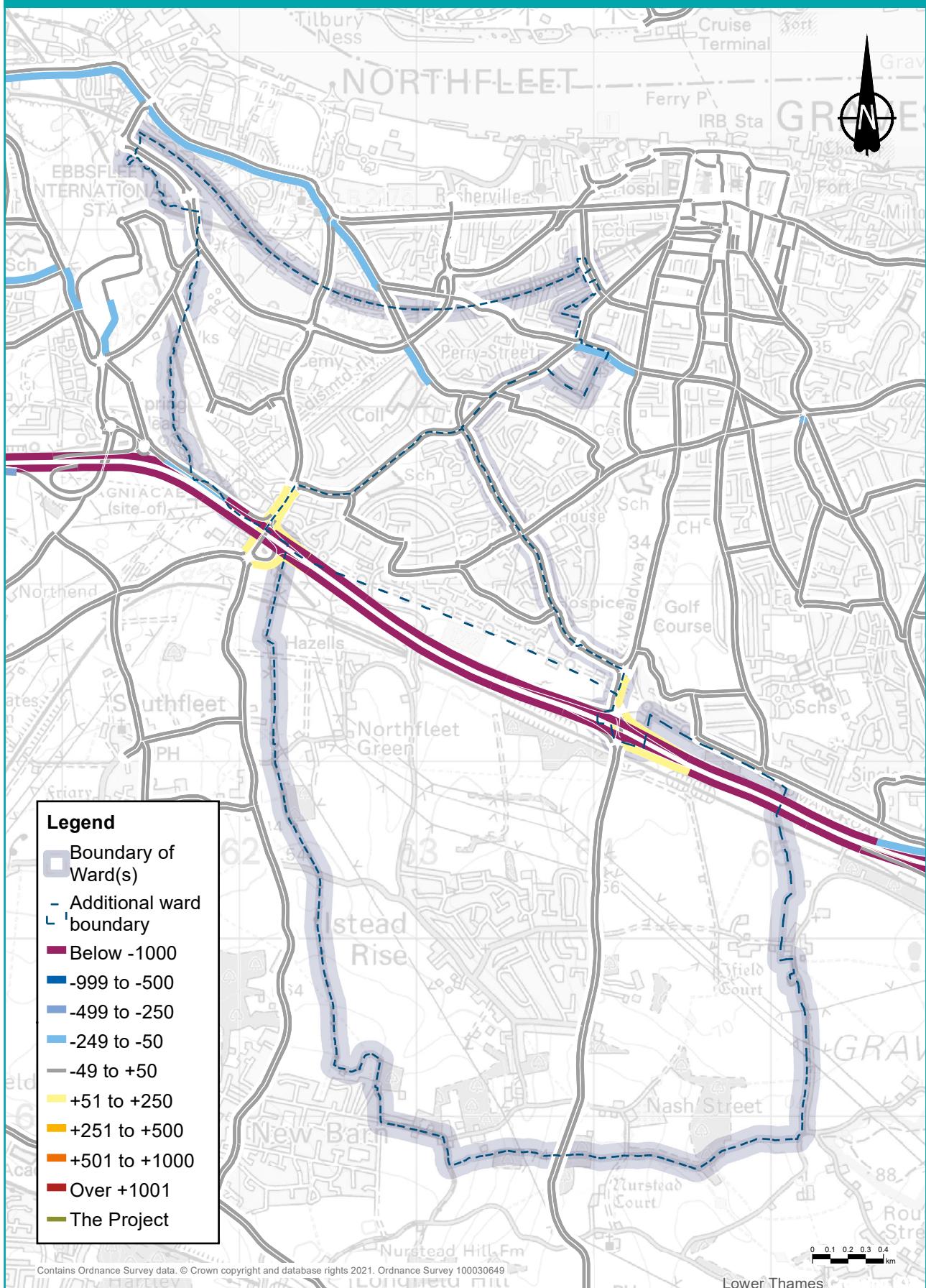
**Figure 10.4: Predicted change in traffic flows (PCUs) with the project during the morning peak in 2029**



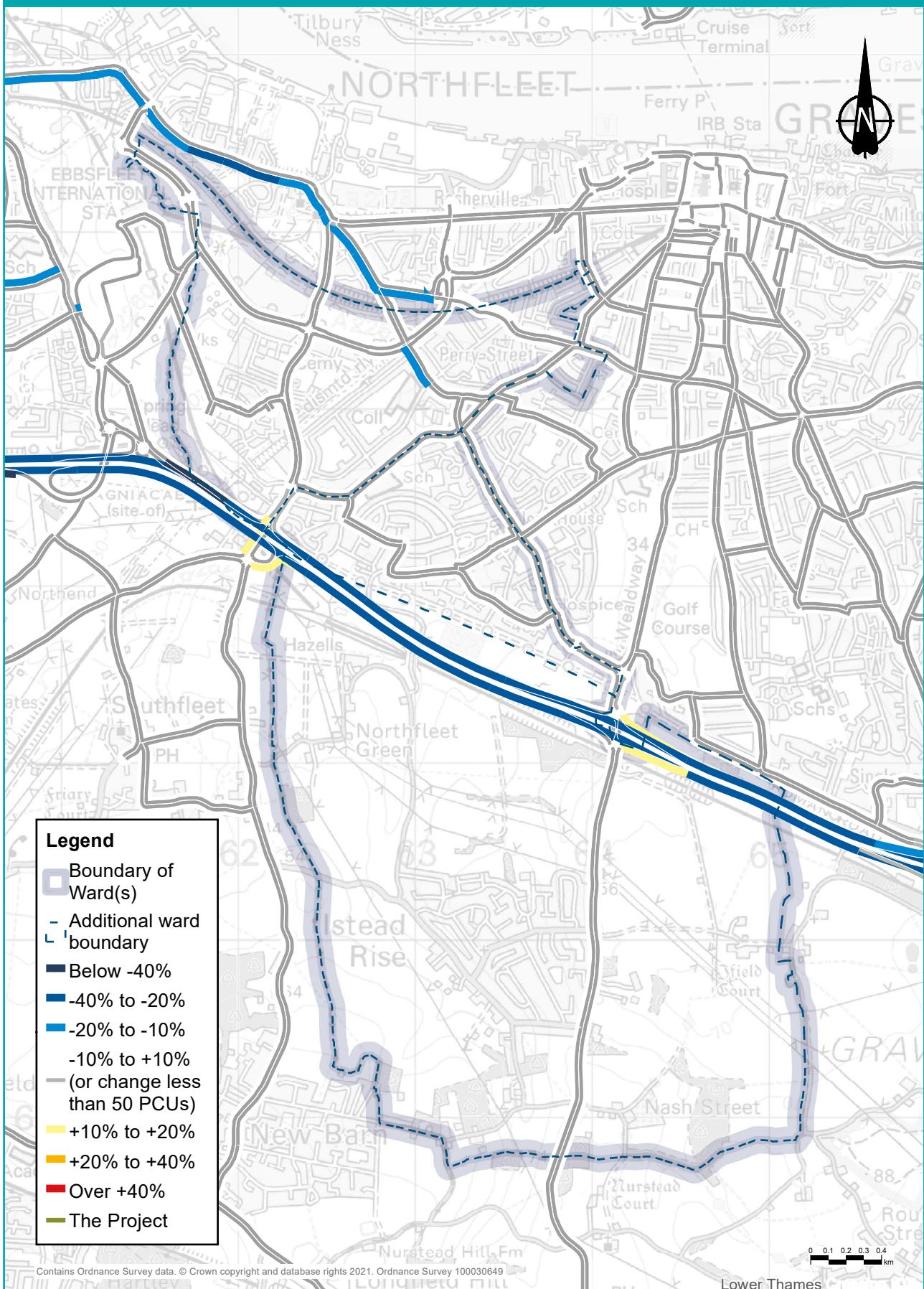
**Figure 10.5: Predicted percentage change in traffic flows with the project during the morning peak in 2029**



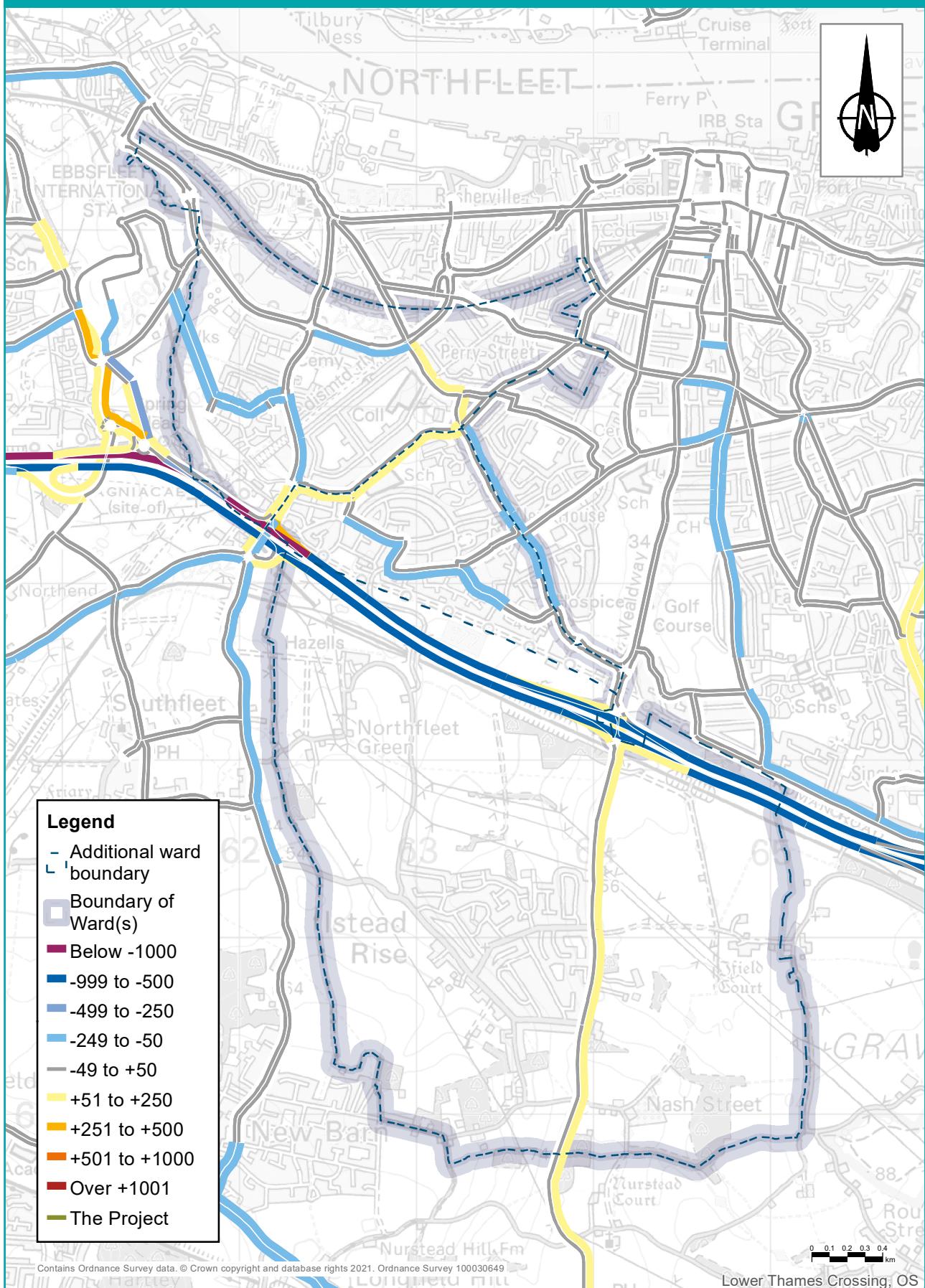
**Figure 10.6: Predicted change in traffic flows (PCUs) with the project during the interpeak period in 2029**



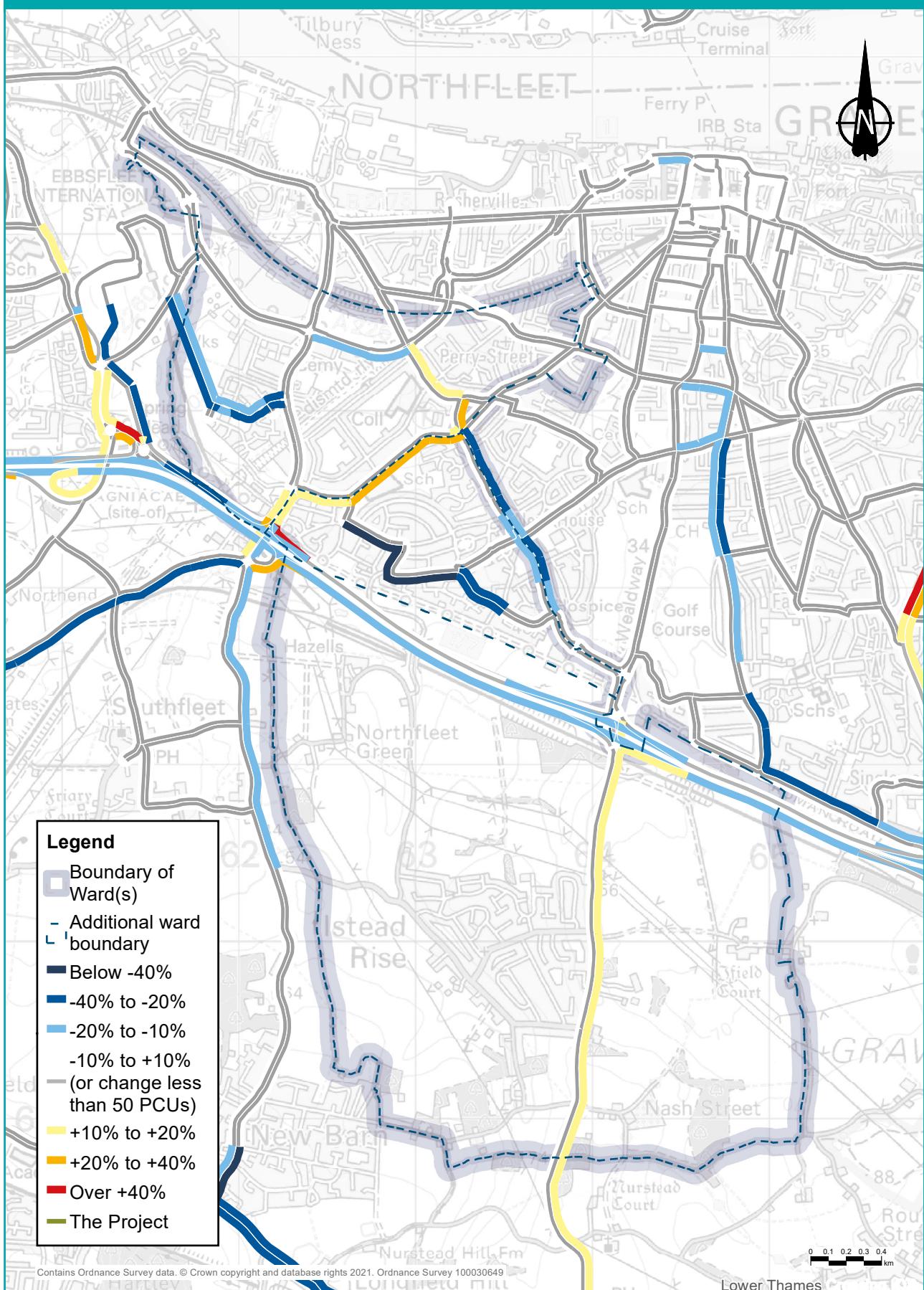
**Figure 10.7: Predicted percentage change in traffic flows with the project during the interpeak period in 2029**



**Figure 10.8: Predicted change in traffic flows (PCUs) with the project during the evening peak in 2029**



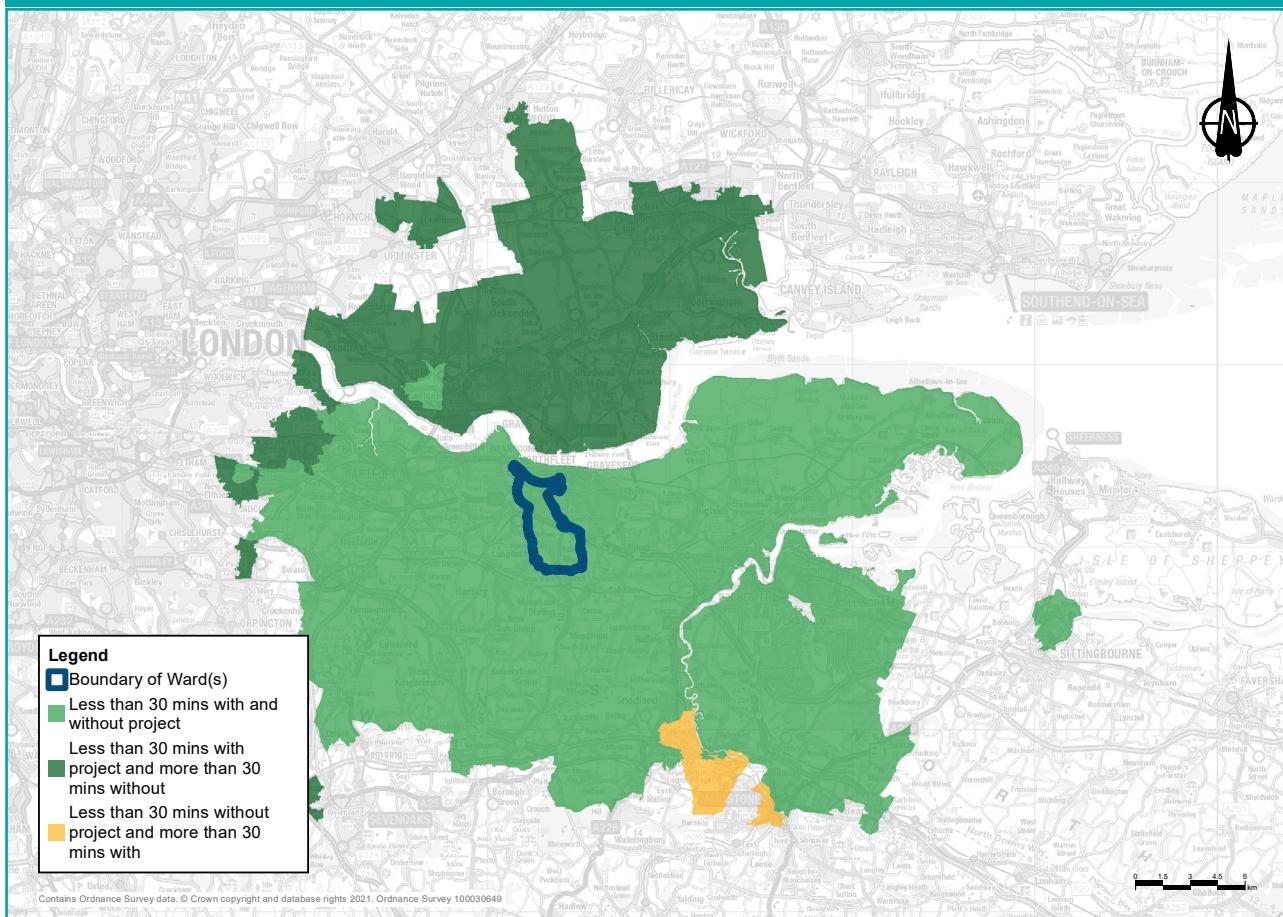
**Figure 10.9: Predicted percentage change in traffic flows with the project during the evening peak in 2029**



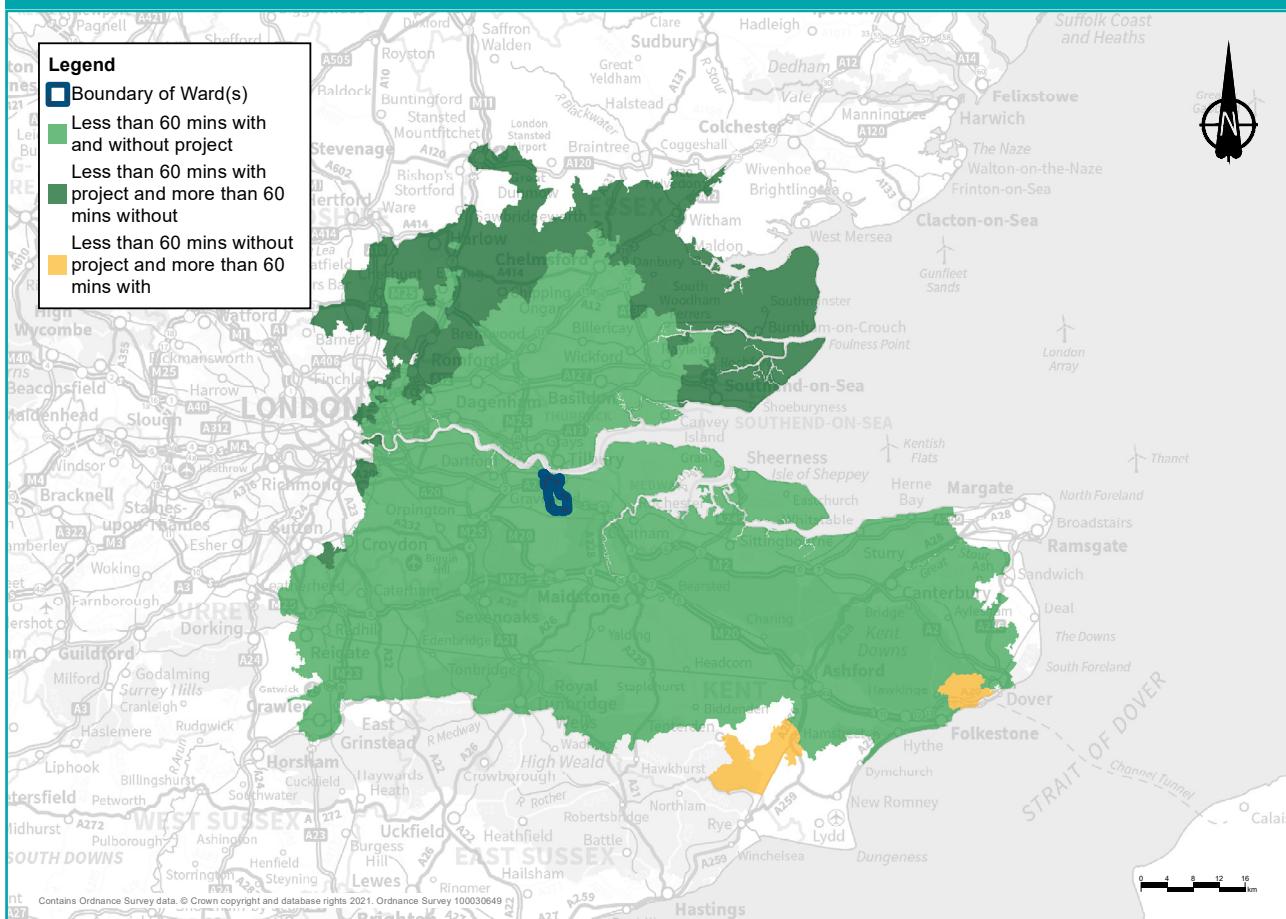
## Changes to journey times

Figure 10.10 shows the change in the area that could be reached within a 30-minute drive from the centre of the wards without and with the project. Figure 10.11 shows the change in areas within a 60-minute drive. The areas have been calculated for the morning peak hour (7am to 8am). The number of jobs within a 30-minute drive would increase by 42% with the project. The number within a 60-minute drive would increase by 22%, providing access to 570,000 additional jobs. Despite the project providing a substantial net gain in access for motorists within the wards, there are areas (shown in orange in the following maps) that would no longer be accessible by car within 30 or 60 minutes because of changes to traffic flows on the wider road network.

**Figure 10.10: Change in area that motorists could drive to within 30 minutes from Northfleet South, Istead Rise and Painters Ash wards**



**Figure 10.11: Change in area that motorists could drive to within 60 minutes from Northfleet South, Istead Rise and Painters Ash wards**



## Operational traffic flows

Once the road is open, 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.

## 10.4 Public transport

### Existing situation

There are no railway stations in Northfleet South, Istead Rise or Painters Ash wards. There are, however, stations within neighbouring wards including Ebbsfleet International station, which provides Southeastern services to London and a wide variety of destinations in Kent and south London.

There are a number of buses within the wards, including the 1, 3, 34, 223, 305, 306, 308, 408, 416, 418, 481, 483, 489, 695, 735, 736, 770, G1, S1, B fastrack, and the school buses NAG1, NAG2, Meopham1 and VIGO. Regional coach services use the A2 through these wards.

### 10.4.1 Construction

#### Buses

There would be no changes to bus journey times during construction as a result of activities within these wards. There may, however, be some increases to journey times for buses and coaches using the A2 due to activities in adjacent wards.

#### Rail

There would be no noticeable change in local journey times to Ebbsfleet or Meopham stations, and no changes to the rail services at these stations.

### 10.4.2 Operations

#### Buses

There would be no changes to bus routes through these wards once the road opens, and no noticeable change to bus journey times. The only bus route that would experience a slight increase in journey time, of around two minutes, is the 695 school bus westbound from Rochester Grammar School via Cobham and Sole Street to Meopham School and on to Istead Rise.

#### Rail

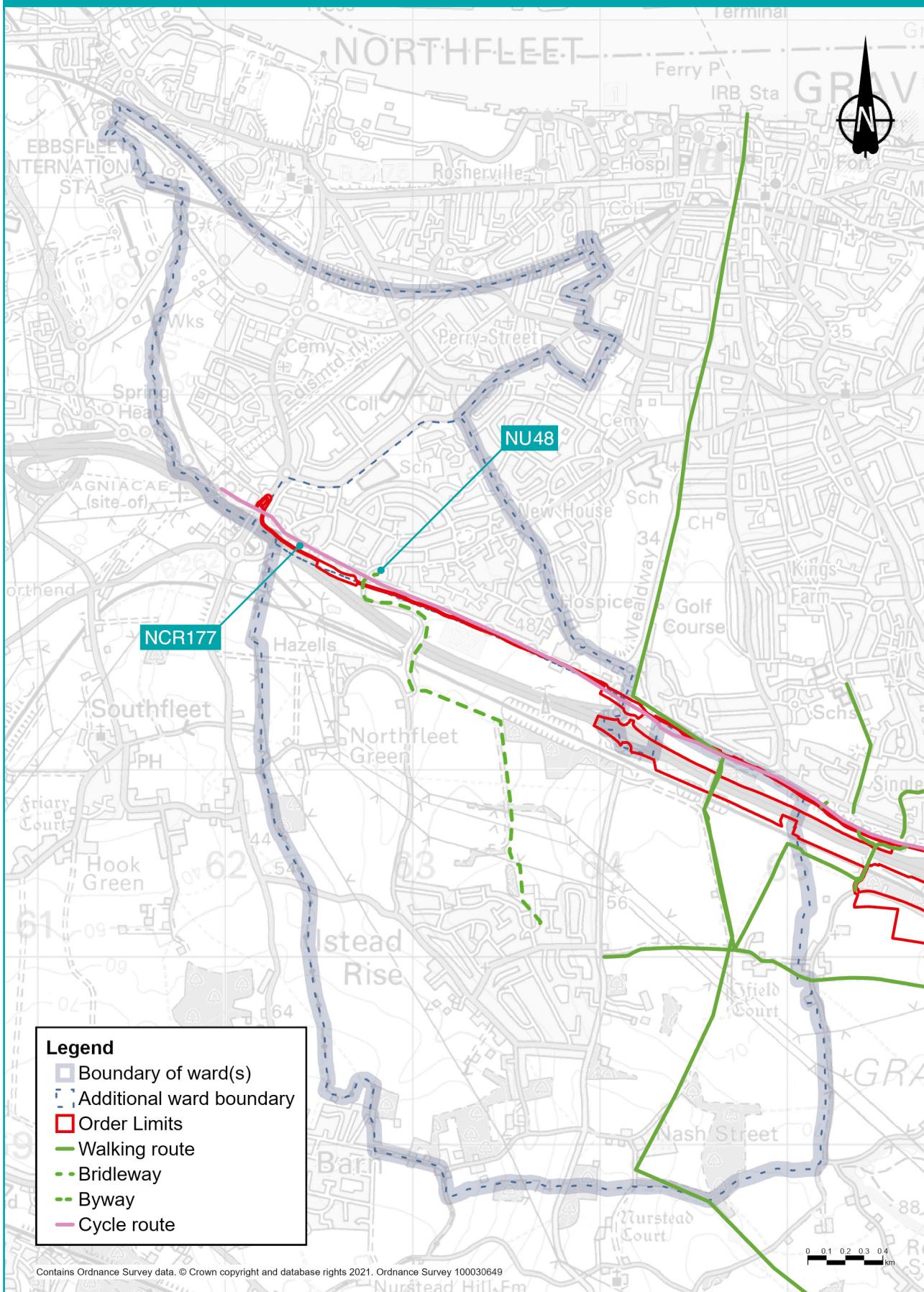
There would be no noticeable change in local journey times to Ebbsfleet or Meopham stations, and no changes to the rail services at these stations.

## **10.5 Footpaths, bridleways and cycle routes**

### **Existing situation**

Northfleet South, Istead Rise and Painters Ash wards are largely suburban wards with Green Belt surrounding Istead Rise to the south of the A2. The wards are connected by a network of footpaths. For other potential impacts, see the other sections in this chapter, such as Visual and Noise and vibration.

**Figure 10.12: Footpaths, bridleways and cycle routes in the vicinity of the project in Northfleet South, Istead Rise and Painters Ash wards**



## **10.5.1 Construction**

### **Construction impacts**

Due to the construction activities around the A2, there would be minor disruption during the construction period:

- Bridleway NU48 would be affected by utility works, and would need to be closed for six months.
- Cycle route NCR177 within these wards would be affected by utility works in this area, potentially requiring temporary diversion of the existing route. For information about impacts on NCR177 east of these wards, see chapters 3 and 8.

## **10.5.2 Operations**

### **Operational impacts**

Overall, the proposals for walking, cycling and horse riding include more than 46km of new, diverted, extended or upgraded footpaths, bridleways and cycle routes. These would provide greatly improved connections across the project. We developed our proposals after consultation and engagement with local communities and stakeholders. For an overview of the proposed improvements to footpaths and bridleways across the Lower Thames Crossing, see chapter 7 of the Operations update.

- Cycle route NCR177 would be unaffected within Northfleet South, Istead Rise and Painters Ash wards. For information about impacts on NCR177 east of these wards, see chapters 3 and 8.

## **10.6 Visual**

### **Existing situation**

Northfleet South is surrounded by an urban area and there would be no views of the land on which the project would be built from this ward.

The land on which the project would be built in Istead Rise ward is visible from local footpaths south of the A2, including Wealdway long-distance footpath and from the Cyclopark recreational facility. Otherwise, views of the land on which the project would be built from this ward are limited by a combination of the landscape and existing vegetation. Current views towards the land on which the project would be built from the Wealdway long-distance path include flat arable land with hedges and trees along the HS1/A2 corridor. However, A2 gantries and HS1 infrastructure are visible through breaks in the vegetation. There are similar views from other nearby footpaths. There are views from the Cyclopark towards Roman Road, where utility works would take place.

Views from Painters Ash ward towards the project area are mostly limited to properties on the southern edge of Gravesend, and those using cycle route NCR177. Current views towards the project from these homes are screened or densely filtered by a combination of roadside hedgerows and garden vegetation. From NCR177, there are views along the Roman Road green corridor, flanked by Cyclopark and glimpses of the A2 beyond.

### **10.6.1 Construction**

#### **Construction impacts**

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

From Istead Rise, the main construction activities likely to be seen are the widening of the A2 corridor and utility diversions. Views of construction activities from the Wealdway and nearby footpaths would be likely to include works to widen the A2 and the erection of new tunnel entrance gantries.

From the Cyclopark, views of the utility works along the Roman Road would be expected, including from NCR177.

From Painters Ash, the main construction activities likely to be seen are utility diversions, including from NCR177. Views of these activities from homes along the southern edge of Gravesend would be screened by vegetation.

### **Measures to reduce visual impacts during construction**

Given the relatively limited views of the project from these wards and the existing A2's effect on views, no specific mitigation measures are considered necessary.

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

## **10.6.2 Operations**

### **Operational impacts**

There would be minimal visual impact from the project along the Wealdway and nearby footpaths, and from the Cyclopark in Istead Rise. There would be no visual impacts in Northfleet South and Painters Ash.

### **Measures to reduce visual impacts during operation**

Landscape restoration and screen planting would be the primary mitigation in Istead Rise. No measures would be required in Northfleet South or Painters Ash.

## 10.7 Noise and vibration

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

### Existing situation

The existing noise environment in these three wards is mainly traffic noise from the A2, A227, A226, A2260 and the B262. There is also noise from the railway.

As part of our environmental assessment process, we carried out surveys of existing background noise at one location in Istead Rise. The levels monitored at these locations recorded average existing noise level of 63dB (A)<sup>4</sup>.

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 road was not built. We model this because we cannot assume that noise levels when the road opens would be the same as they are now. For example, our assessment of the opening year noise levels takes into account predicted changes in traffic levels.

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

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4 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 project are predicted to range, on average:

- from 40 to 73dB(A) during the day and from 29 to 59dB(A) during the night, at the locations within Northfleet South
- from 59 to 66dB(A) during the day and from 45 to 53dB(A) during the night, at the locations within Istead Rise
- from 51 to 79dB(A) during the day and from 35 to 64dB(A) during the night, at the locations within Painters Ash

As such, our noise assessments predict that by opening year, noise levels would increase compared with the existing situation even if the road is not built. Information on how they would change with the project is below.

## **10.7.1 Construction**

### **Construction activities**

The main construction activities expected to make noise and vibration in these wards are those associated with the A2 upgrade works and utilities works.

There are no main works compounds or Utility Logistics Hubs currently proposed to be located within the Northfleet South, Istead Rise and Painters Ash wards, nor are there any haul roads proposed within these wards.

There are no percussive or vibratory works proposed within these wards.

### **Daytime construction noise impacts**

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

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

**Figure 10.13: Construction noise assessment locations in Northfleet South, Istead Rise and Painters Ash wards**

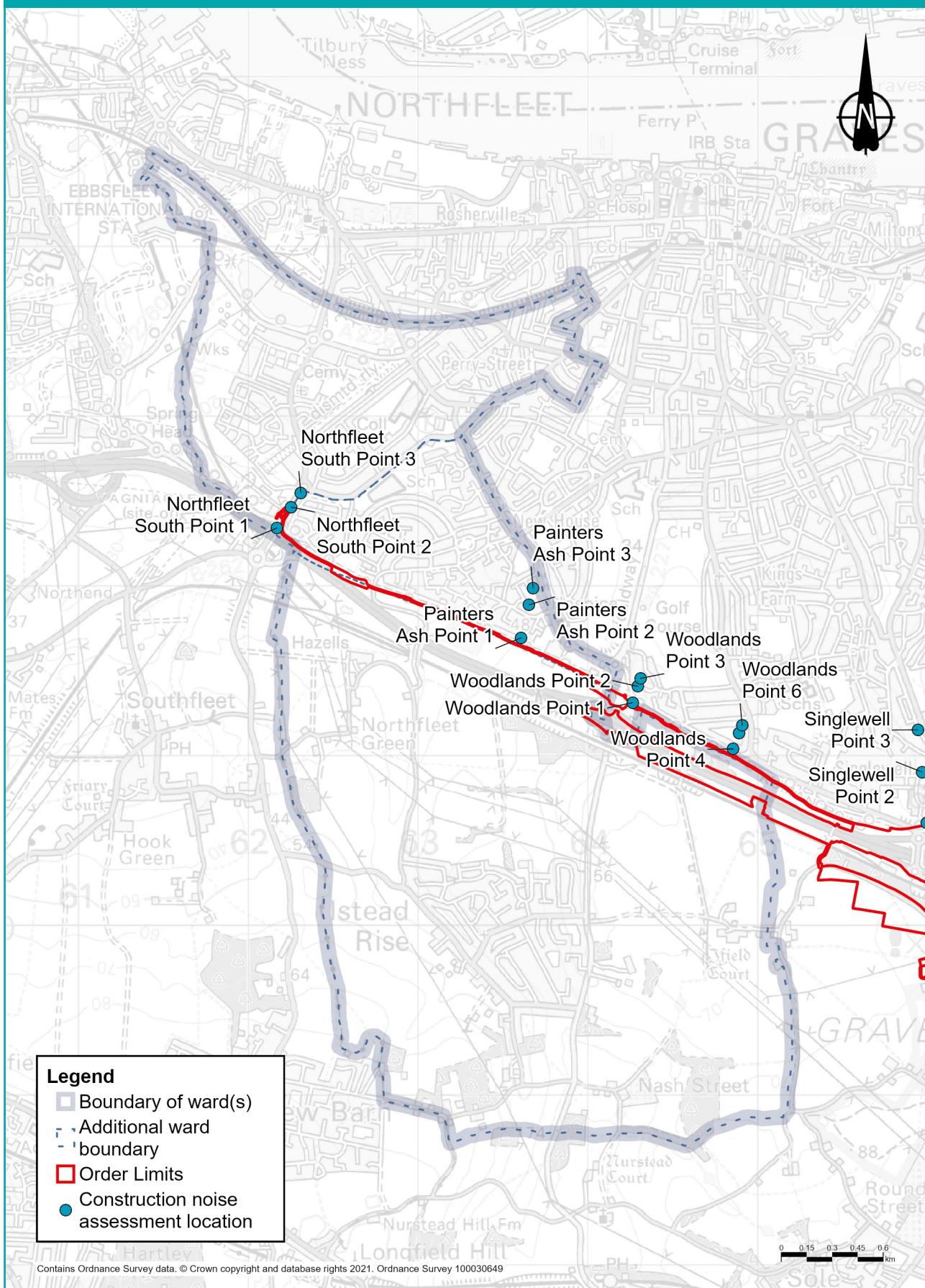


Figure 10.13 shows the locations at which we have predicted the daytime construction noise during construction.

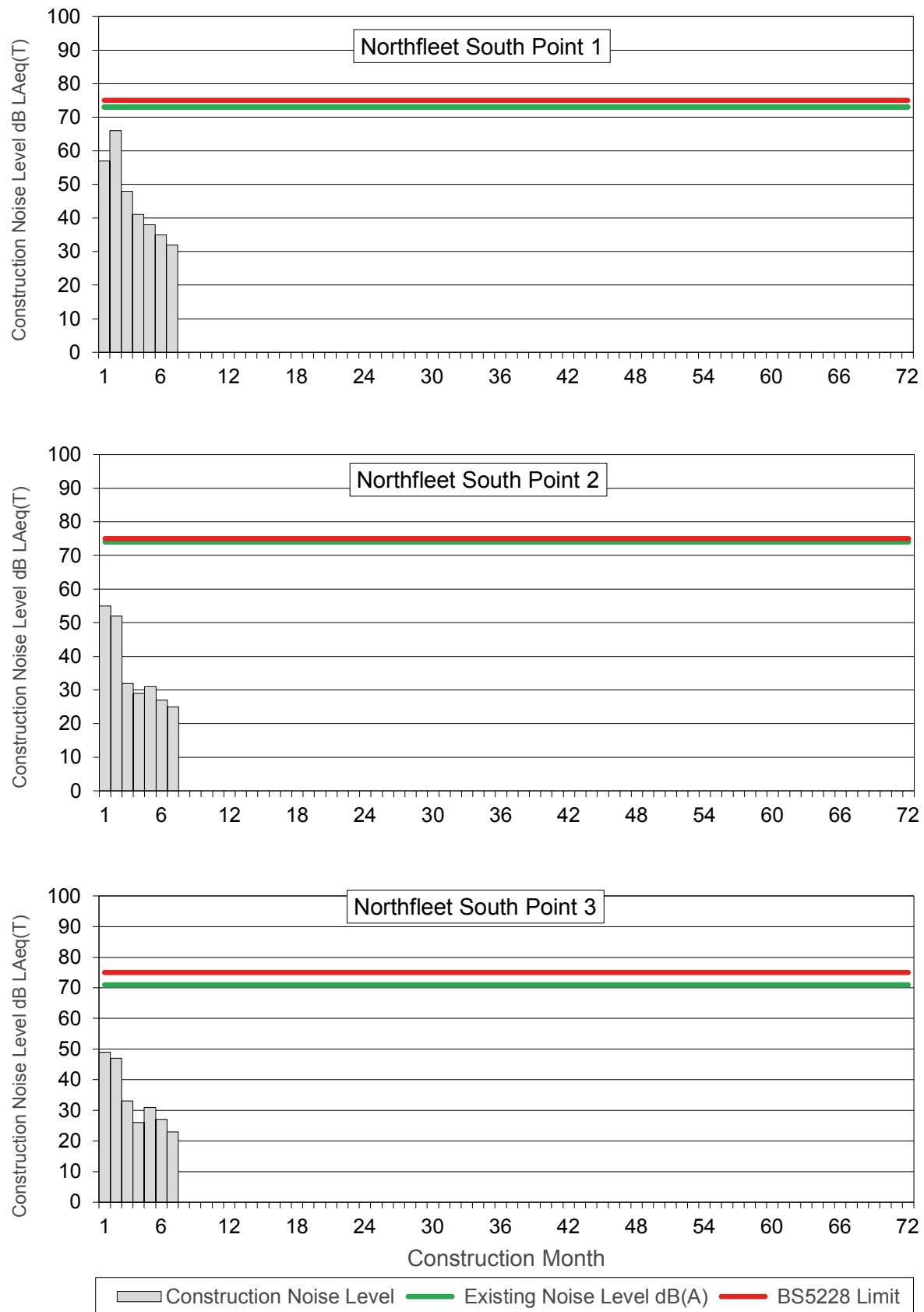
Each vertical bar in figures 10.14 and 10.15 show the predicted noise levels for that month of the construction period (months 1 to 72). The horizontal green line in each chart represents the existing background noise level at each assessment point without the project. The horizontal red line shows the level at which construction noise would exceed acceptable thresholds (see chapter 1 for more information about these thresholds). If noise is predicted to exceed acceptable levels, then specific measures would be implemented to reduce the noise.

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

With reference to figure 10.14, the following summarises the noise level changes over the construction period for points 1 to 3:

- At point 1, construction noise levels are predicted to range from 32 to 66dB LAeq (12-hour). Construction noise is not expected to exceed the existing background noise levels.
- At point 2, construction noise levels are predicted to range from 25 to 55dB LAeq (12-hour). Construction noise is not expected to exceed the existing background noise levels.
- At point 3, construction noise levels are predicted to range from 23 to 49dB LAeq (12-hour). Construction noise is not expected to exceed the existing background noise levels.

**Figure 10.14: Construction noise by month for assessment locations 1, 2 and 3 in Northfleet South ward**



With reference to figure 10.15, 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 21 to 63dB LAeq (12-hour). Construction noise would exceed the existing background daytime noise level for approximately one month. However, they would not breach the defined threshold.
- At point 2, construction noise levels are predicted to range from 14 to 34dB LAeq (12-hour). Construction noise is not expected to exceed the existing background noise levels.
- At point 3, construction noise levels are predicted to range from 21 to 32dB LAeq (12-hour). Construction noise is not expected to exceed the existing background noise levels.

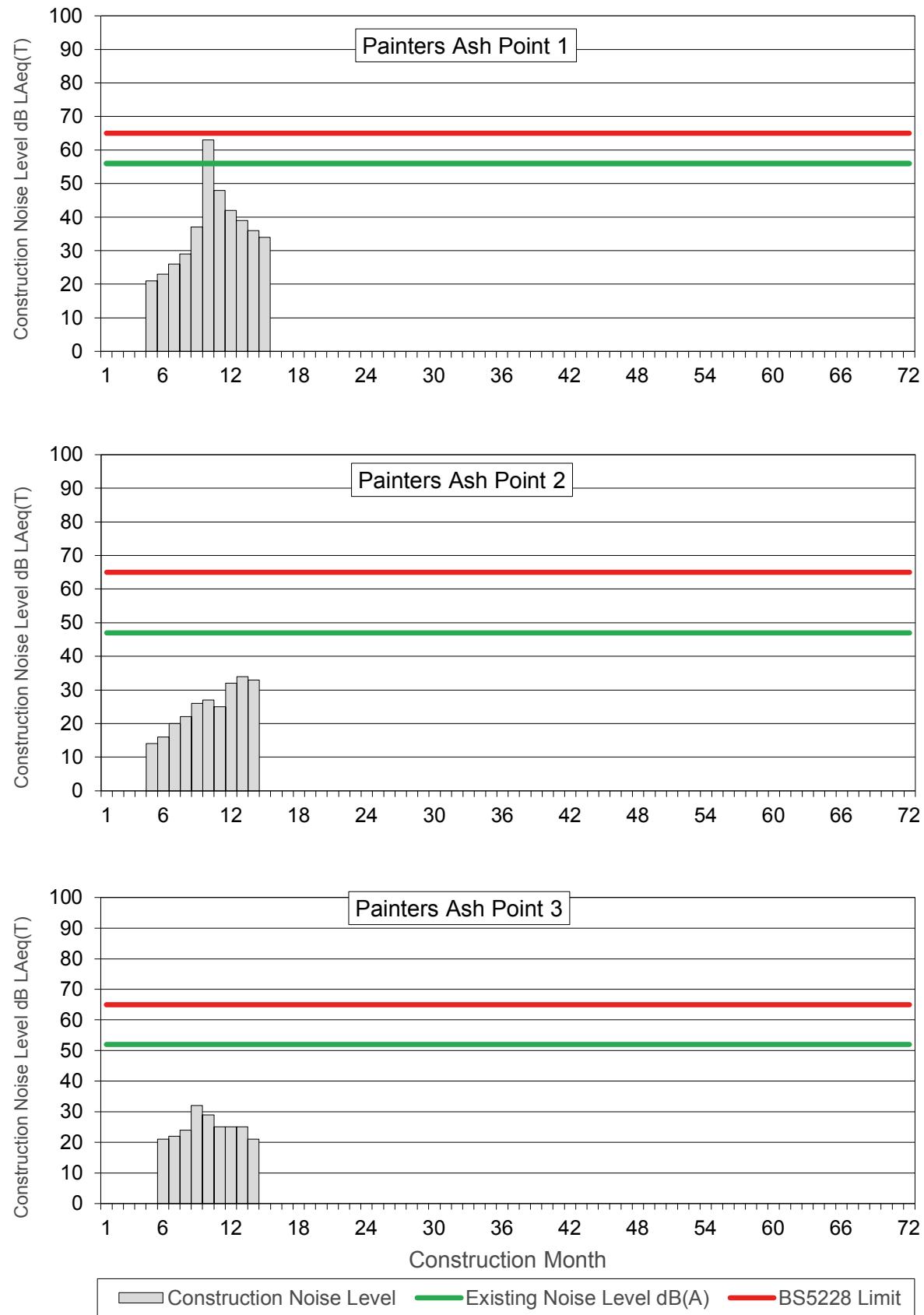
### **24/7 construction working**

As can be seen in figure 10.16, there is no proposed night-time working in Northfleet South, Istead Rise, and Painters Ash wards.

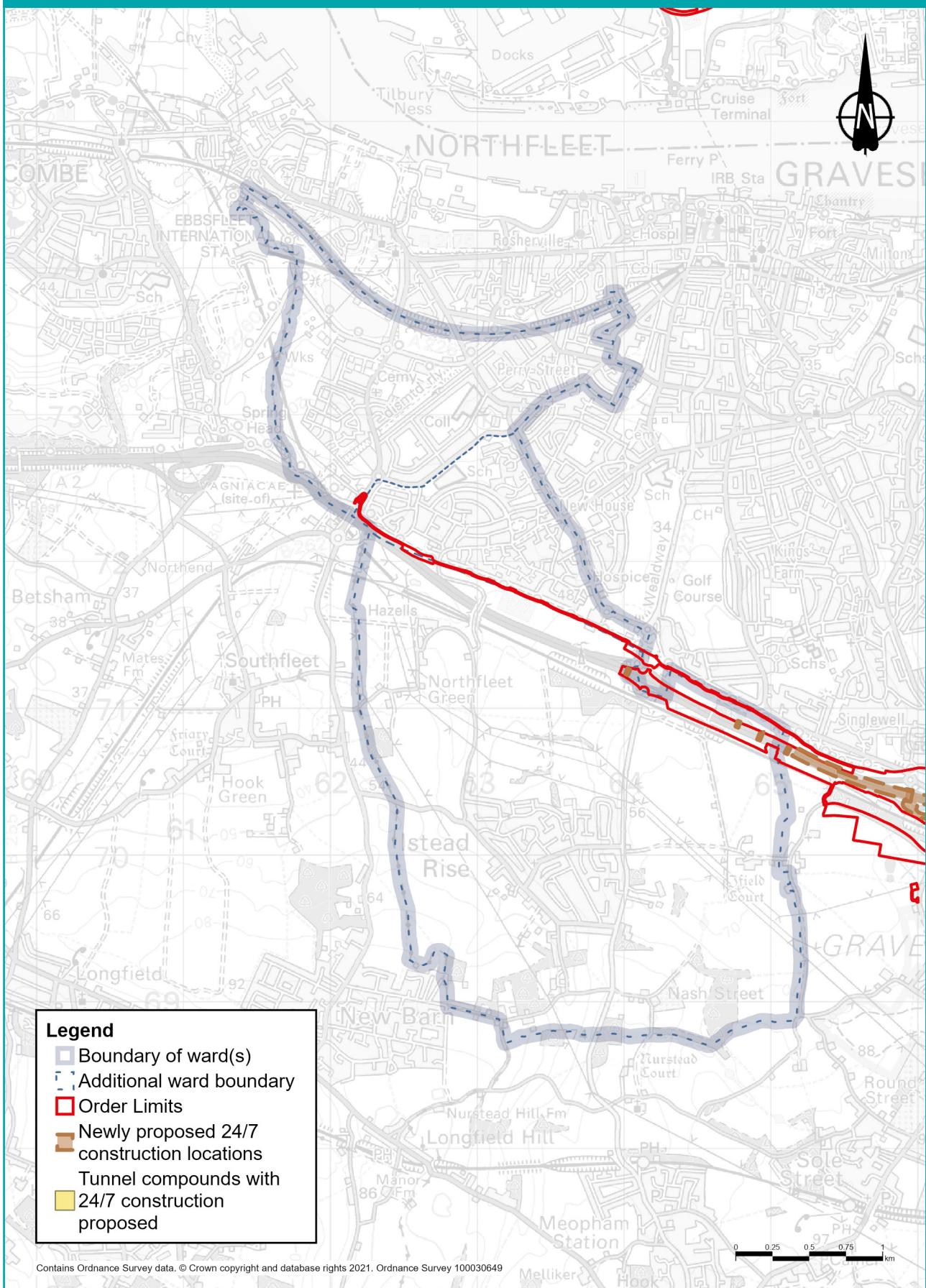
### **Construction traffic noise impacts**

Maps showing predicted changes in road traffic noise within these wards during each year of construction can be found in chapter 7 of the Construction update. Based on the currently available traffic data (which offers a representative picture of what receptors within these wards are likely to experience), during the construction period there would be negligible changes in road traffic noise (less than 1dB change in noise levels) during all construction years.

**Figure 10.15: Construction noise by month for points 1, 2 and 3 in Painters Ash ward**



**Figure 10.16: Newly proposed and tunnel 24/7 working locations in Northfleet South, Istead Rise and Painters Ash wards**



## **Measures to reduce construction noise**

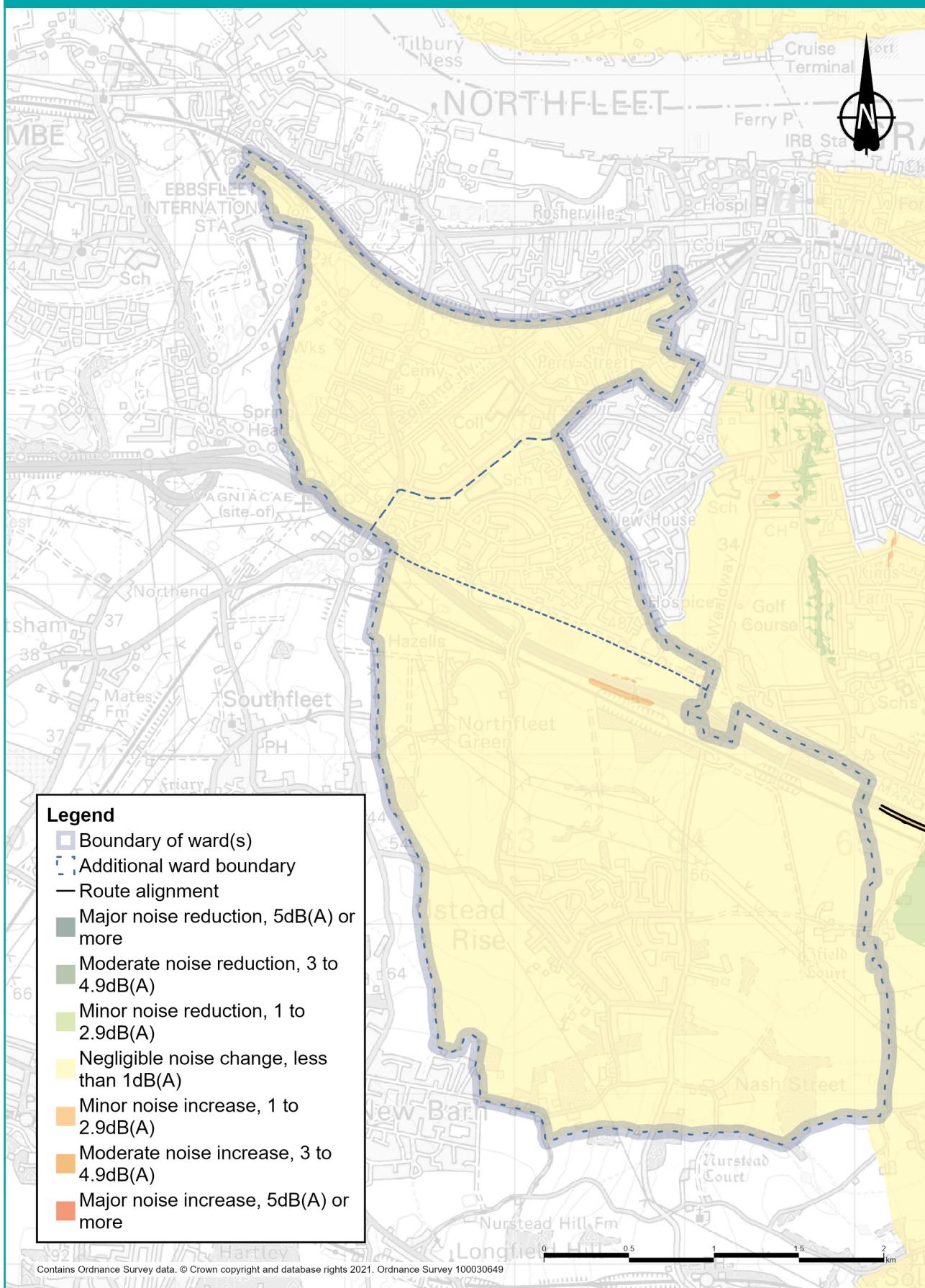
Construction noise levels would be controlled by using Best Available Techniques (BAT), with specific measures used at certain locations such as:

- installing and maintaining hoardings around the construction areas likely to generate noise
- keeping site access routes in good condition, with on-site condition assessments to inspect for defects such as potholes
- turning off plant and machinery when not in use
- maintaining all vehicles and mobile machinery so loose body fittings or exhausts do not rattle or vibrate
- using silenced equipment where available, in particular power generators and pumps
- not allowing music or radios (for entertainment purposes) outdoors on-site
- planning site layout to make sure reversing is kept to a practical minimum. Required reversing manoeuvres would be managed by a trained banksman/vehicle marshal so they are completed safely and quickly

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

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

**Figure 10.17: Noise impacts during operation in Northfleet South, Istead Rise and Painters Ash wards**



## **10.7.2 Operations**

### **Operational noise impacts**

Figure 10.17 shows the predicted changes in traffic noise in the opening year of the road. Within the Northfleet South, Istead Rise and Painters Ash wards, changes in road traffic noise at identified noise sensitive locations (such as nearby properties) are predicted to range from negligible change of less than 1.0dB to minor increases of between 1.0 and 2.9dB (within Istead Rise ward only). For more information about how we define noise impacts (negligible, minor, moderate and major), see chapter 1.

#### **Northfleet South**

As this ward is located around 3.5km to the west of the project, there would be no direct noise impacts from the project in the ward. There would be negligible noise impacts as a result of changes in traffic flow, the number of HGVs, and traffic speed on the existing roads in the ward.

#### **Istead Rise**

The ward is located around 1.7km to the west of the project and, as such, there would be no direct noise impacts from the project in the ward. However, there would be indirect noise as a result of changes in traffic flow, the number of HGVs, and traffic speed on the existing roads in the ward, and physical alterations/upgrade work along the A2 in the north of the ward.

#### **Painters Ash**

As Painters Ash is located around 2.8km to the west of the project, there would be no direct noise impacts from the project in the ward. There would be indirect noise as a result of changes in traffic flow, the number of HGVs, and traffic speed on the existing roads in the ward.

### **Measures to reduce traffic noise and vibration during operation**

The main methods of controlling noise across the project would be, where practical, to design the road within landscaped features such as cuttings and bunds (walls of earth). The use of low-noise surfacing would also reduce the traffic noise once the road is in use.

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

## **10.8 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 these wards, the A2 at the southern boundary of Northfleet South and Painters Ash, and either side of the A2 and M2 at the northern edge of Istead Rise have been declared an Air Quality Management Area (AQMA) due to annual levels of airborne pollution exceeding accepted standards.

AQMAs are areas that have been identified by local authorities as areas of poor air quality that require additional monitoring and controls. No other areas within the ward have been identified as AQMA.

## **10.8.1 Construction**

### **Construction impacts**

For information about construction in these wards, see the Project description section above. 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 these wards, are outside the area likely to be affected by construction dust or emissions from the worksite. In these wards, there are only a few properties within 200 metres of the worksite, including some east of the proposed A2/M2 junction and the new road. In Northfleet South ward, there are only a few properties within 200 metres of the worksite, including along the B262 near Pepper Hill. In Istead Rise and Painters Ash wards, there are only a few properties within 200 metres of the worksite, including the A2 corridor. Air quality impacts on these properties during construction would be temporary and we would put in place measures to minimise the dust impacts (see below). The proposed measures to reduce dust and emissions are ones that have been proven to be effective when used on similar construction projects in the past. The change in air quality during the construction phase would be negligible, and there would be no discernible effect on health.

Our analysis of construction traffic predicts that the impact on most roads in these wards would be negligible, although there would be a minor improvement in air quality in the area the A2 corridor as a result of the traffic management in place from 2026 to 2028. More information about construction traffic impacts on air quality can be found in chapter 7 of the Construction update.

## **Measures to reduce air quality impacts during construction**

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

## **10.8.2 Operations**

### **Operational impacts**

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

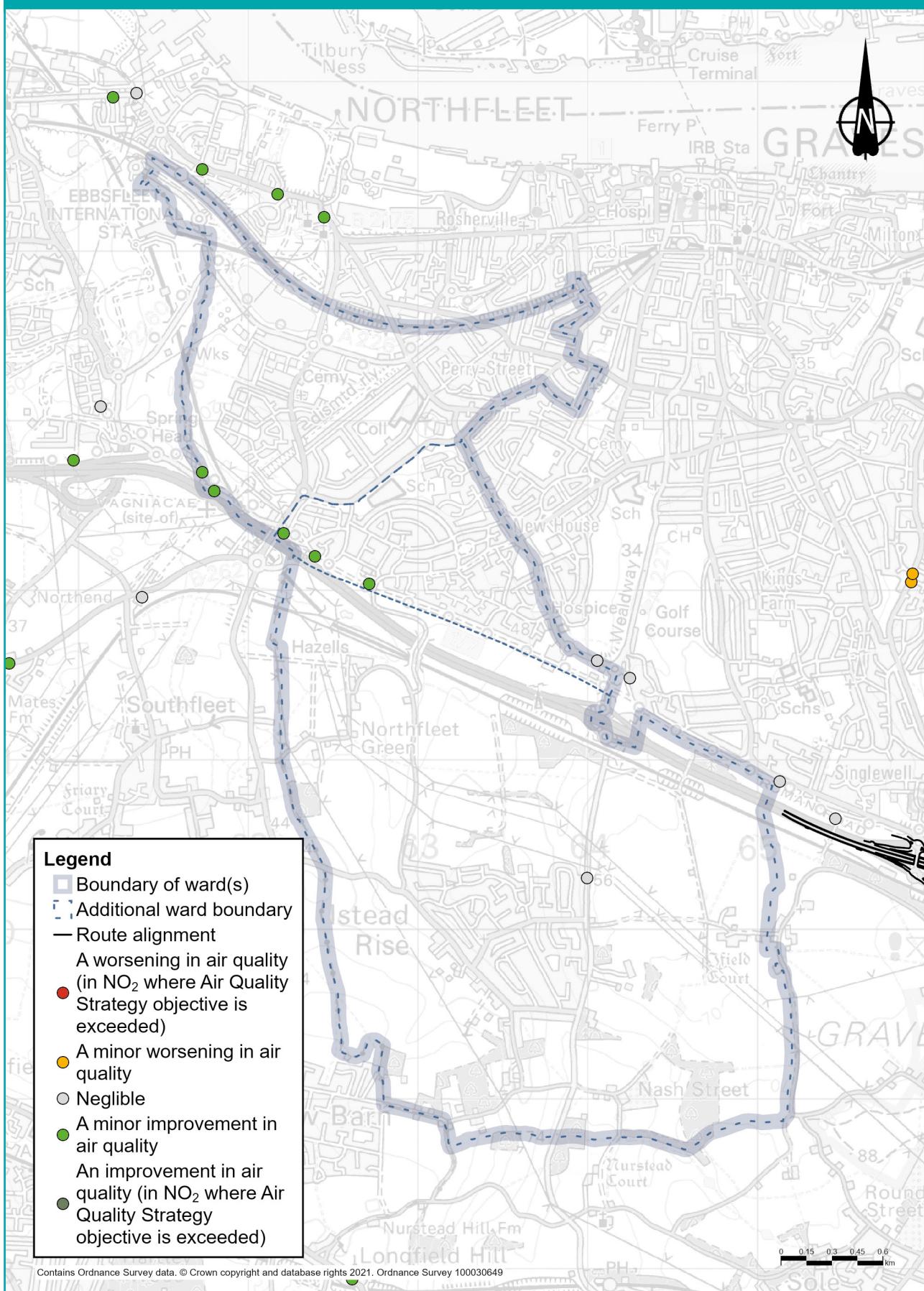
At all locations within the wards, there are no predicted exceedances of air quality thresholds. There are receptors (properties or habitats that are sensitive to changes in air quality) within Northfleet South and Painters Ash, close to the existing A2, that would experience a minor improvement in air quality for nitrogen dioxide ( $\text{NO}_2$ ). Likewise, in Istead Rise, identified locations would experience negligible changes in air quality for  $\text{NO}_2$ , the main traffic-related pollutant<sup>5</sup>. The highest modelled yearly average  $\text{NO}_2$  concentration:

- within Northfleet South ward is  $30.1 \mu\text{g}/\text{m}^3$ , which is below the yearly average threshold of  $40\mu\text{g}/\text{m}^3$
- within Istead Rise ward is  $18.2 \mu\text{g}/\text{m}^3$ , which is below the yearly average threshold of  $40\mu\text{g}/\text{m}^3$
- within Painters Ash ward is  $29.8 \mu\text{g}/\text{m}^3$ , which is below the yearly average threshold of  $40\mu\text{g}/\text{m}^3$

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<sup>5</sup>  $\text{NO}_2$  levels are measured in ‘micrograms per cubic metre’, or  $\mu\text{g}/\text{m}^3$ , where a microgram is one millionth of a gram.

**Figure 10.18: Predicted changes in NO<sub>2</sub> levels in Northfleet South, Istead Rise and Painters Ash wards once the new road is open**



Our assessment is based on our opening year model, which represents a worst-case scenario, without accounting for the increase in less-polluting vehicles on our roads over time.

Furthermore, local air quality data shows an overall downward trend in NO<sub>2</sub> over recent years, which means that future air quality improvements at this location are likely (for example, through increased use of electric vehicles meaning a reduction in exhaust emissions).

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.

## **10.9 Health**

### **Existing situation**

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

### **Northfleet South**

Northfleet South is characterised by a younger population, with over 25% of residents under the age of 16. In addition, Northfleet South has a significantly lower proportion of residents who are aged 60+ when compared with Gravesham as a whole, 15.1% and 22.6% respectively. There are also fewer older people living alone than the average for Gravesham (10.0% compared with 12.2%). Economic activity is generally higher than for Gravesham wards. Home ownership is relatively low when compared with other wards found throughout Gravesham and for Gravesham as a whole.

Self-reported health status is generally good, with more than 80% of residents reporting very good or good health. Life expectancy at birth is 81.0 years for females and 80.5 years for males (slightly higher for males and slightly lower for females for the UK average life expectancy recorded for 2017-19 of 79.4 years for males and 83.1 years for females). Deaths from all causes (these are causes where all or most deaths could potentially be prevented by public health interventions in the broadest sense), respiratory diseases, coronary heart disease and all cancers are similar to that of Gravesham as a whole.

### **Istead Rise**

Istead Rise is characterised by an older population (with 38.5% of residents aged over 60 – a significantly higher proportion than for Gravesham as a whole and nationally). There are also more older people living alone than the average for Gravesham (13.3% compared with 12.2%). Economic activity rates are generally similar to other Gravesham wards. A very high proportion of residents own their own property when compared with other wards found throughout Gravesham and for Gravesham as a whole.

Self-reported health status is generally good, with more than 80% of residents reporting very good or good health. Life expectancy at birth is 87.8 years for females and 82.7 years for males (above the UK average life expectancy recorded for 2017-19 of 79.2 years for males and 83.1 for females). Deaths from all causes (these are causes where all or most deaths could potentially be prevented by public health interventions in the broadest sense) are lower for Istead Rise than is the case for Gravesham as a whole. Deaths from respiratory diseases, coronary heart disease and all cancers are similar to that of Gravesham.

### **Painters Ash**

Painters Ash is characterised by an older population (with 32.5% of residents aged over 60 – a significantly higher proportion than for Gravesham as a whole and nationally). There are also more older people living alone than the average for Gravesham (15.9% compared with 12.2%). Economic activity rates are generally similar to other Gravesham wards. A higher proportion of residents own their own property when compared with Gravesham as a whole.

Self-reported health status is generally poor, with less than 80% of residents reporting very good or good health, a lower proportion than for Gravesham as a whole. Similarly, Painters Ash has a relatively low proportion of residents who report that their day-to-day activities are not limited. Life expectancy at birth is 81.2 years for females and 77.8 years for males (lower than the UK average life expectancy recorded for 2017-19 of 79.2 for males and 83.1 years for females). Deaths from all causes (these are causes where all or most deaths could potentially be prevented by public health interventions in the broadest sense) and respiratory diseases are worse than is the case for Gravesham as a whole.

## **10.9.1 Construction**

### **Construction health impacts**

For information about the construction activities in these wards, see the Project description section above.

Elements of these activities could affect human health (including mental health and wellbeing), whether this is through noise associated with construction activities or construction traffic, air quality (as a result of dust emissions), severance caused by construction traffic, or road or footpath closures.

A range of personal, social, economic and environmental factors influence our health. These are known as health determinants and include the physical environment, income levels, employment, education, social support and housing. Different groups may be more sensitive to changes in these determinants – for example, children, older people or people with pre-existing health conditions.

### **Northfleet South ward**

- The main construction activities expected to cause noise impacts in this ward relate to the A2 works and utilities works during core daytime hours.
- The works on the project's main route are more than 3km from the ward boundary and therefore unlikely to present any impacts.
- There are few properties in the ward within 200 metres of the Order Limits, which reduces the impact on air quality of increased dust or emissions from construction. However, those properties within 200 metres could be affected. In Northfleet South, there are only a few properties within 200 metres of the worksite, including along the B262 near Pepper Hill.
- Negative health outcomes may be experienced by sensitive groups within the ward as a result of changes to:
  - accessibility (for example, people who are dependent on public transport and have less choice about how they travel and the route they take)
  - severance (where road and footpath closures may affect some people's ability to access services or facilities)
  - access to open space (people without access to private cars may have fewer alternatives within a reasonable travel time)
  - changes to the noise environment
  - mental health and wellbeing (for example, issues associated with stress and anxiety relating to the project)
- Positive health outcomes may also be experienced by residents as a result of access to work and training opportunities presented by construction activities.

## Istead Rise ward

- 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 Istead Rise wards, there are only a few properties within 200 metres of the worksite, including the A2 corridor.
- The main construction activities expected to cause noise and vibration impacts in the ward relate to A2 works and utilities works during core daytime hours.
- The main alignment works are more than 2.5km from the ward boundary and therefore unlikely to have any impacts.
- Construction traffic on the public highway close to Istead Rise could increase traffic noise.
- Views of A2 construction activities would be visible from the local footpath network to the south of the A2, including Wealdway long-distance footpath, and to the north of the A2 from the Cyclopark recreational area.
- Negative health outcomes may be experienced by sensitive groups within the ward as a result of changes to:
  - accessibility (for example, people who are dependent on public transport and have less choice about how they travel and the route they take)
  - severance (where road and footpath closures may affect some people's ability to access services or facilities)
  - access to open space (people without access to private cars may have fewer alternatives within a reasonable travel time)
  - changes to the noise environment
  - mental health and wellbeing (for example, issues associated with stress and anxiety relating to the project)
- Positive health outcomes may also be experienced by residents as a result of access to work and training opportunities presented by construction activities.

## **Painters Ash ward**

- 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 Painters Ash wards, there are only a few properties within 200 metres of the worksite, including the A2 corridor.
- The main construction activities expected to cause noise and vibration impacts in this ward relate to A2 works and utilities works during core daytime hours.
- The Marling Cross Compound would be unlikely to cause additional noise during core daytime hours, over and above the works on the A2 and the prevailing noise in an area dominated by the A2. The main alignment works are more than 2.5km from the ward boundary and therefore unlikely to present any impacts.
- Construction traffic on the public highway near Painters Ash could increase local traffic noise, but this would be controlled through the CoCP and traffic management measures.
- Negative health outcomes may be experienced by sensitive groups within the ward as a result of changes to:
  - accessibility (for example, people who are dependent on public transport and have less choice about how they travel and the route they take)
  - severance (where road and footpath closures may affect some people's ability to access services or facilities)
  - access to open space (people without access to private cars may have fewer alternatives within a reasonable travel time)
  - changes to the noise environment
  - mental health and wellbeing (for example, issues associated with stress and anxiety relating to the project)
- Positive health outcomes may also be experienced by residents as a result of increased access to work and training opportunities presented by construction activities.

## **Measures to reduce impacts on health during construction**

Within these wards, construction traffic would be limited to the A2. Where possible, we have reduced the volume of construction traffic that would use this road during the construction period.

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

The main methods of controlling noise across the project would be, where practical, to design the road within landscaped features such as cuttings and bunds (walls of earth). The use of low-noise surfacing would also reduce the traffic noise once the road is in use.

## **10.9.2 Operations**

### **Operational health impacts**

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

At all locations within these wards, there are no predicted exceedances of air quality thresholds. There are receptors (properties or habitats that are sensitive to changes in air quality) within Northfleet South and Painters Ash, close to the existing A2, that would experience a minor improvement in air quality for nitrogen dioxide ( $\text{NO}_2$ ). Likewise, in Istead Rise, identified locations would experience negligible changes in air quality for  $\text{NO}_2$ , the main traffic-related pollutant.

The conclusion of our air quality assessment is that the project would not result in significant air quality changes in these three wards.

Residents may also experience positive health outcomes in these wards as a result of improvements to accessibility, access to work and training, and access to open space.

### **Measures to reduce operational health impacts**

Over and above mitigation relating to noise and visual impacts already described elsewhere, no specific measures to address health outcomes have been identified in these wards.

## **10.10 Biodiversity**

### **Existing situation**

Only a small part of Northfleet South falls within the project's Order Limits, and this is restricted to an area around the B262 Hall Road. The habitat here consists of woodland and scrub. The ward contains no designated site within 1km of the Order Limits. A single non-designated site, Ebbsfleet Marshes Local Wildlife Site (LWS), is located within 500 metres of the Order Limits. Surveys to establish a baseline for assessment were carried out within the Order Limits and in the areas around them, and we identified no protected species.

Only a small part of Istead Rise and Painters Ash fall within the project's Order Limits, and this is restricted to an area around the bridleway north of the A2 along Roman Road. The habitat here consists of some landscape planting and grassland.

Painters Ash ward contains no designated or non-designated sites. Surveys to establish a baseline for assessment were undertaken within the Order Limits and in the areas around them. The only protected species identified in this ward were reptiles within the landscape planting and grassland along the bridleway.

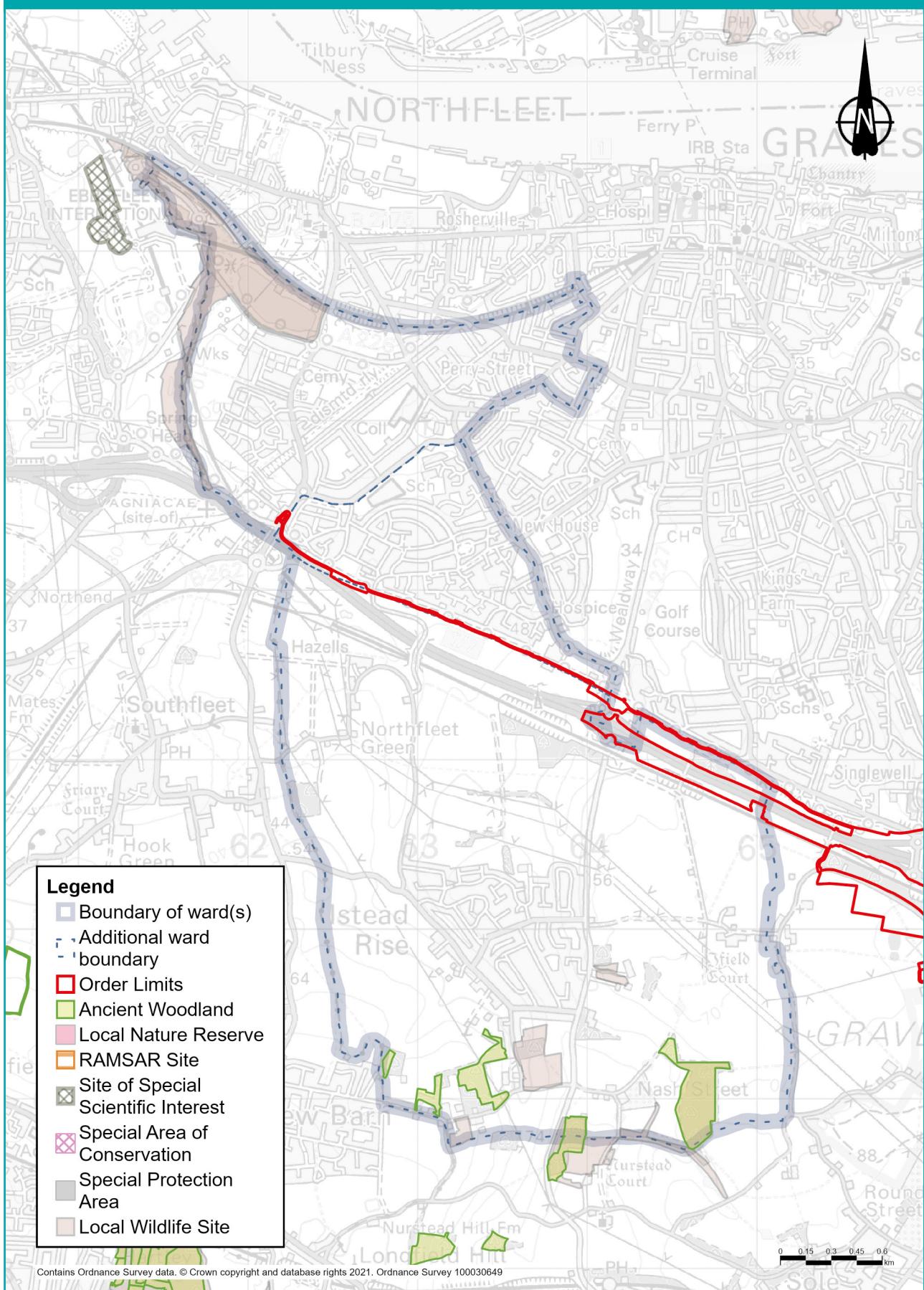
### **10.10.1 Construction**

#### **Construction impacts**

Ebbsfleet Marshes LWS would not be directly affected by construction activity in Northfleet South. Removal of woodland and scrub habitat would be necessary for the construction of the utility diversion. Disturbance from construction traffic using the B262 is possible, but it is a busy road, so this is considered unlikely.

In Istead Rise and Painters Ash wards, landscape planting and grassland habitat would need to be removed, both temporarily and permanently, from the route alignment. This habitat supports a range of protected and notable species that would be impacted by construction through direct habitat loss (reptile habitat), and disturbance to retained habitat.

**Figure 10.20: Designated and non-designated biodiversity sites in Northfleet South, Istead Rise and Painters Ash**



## **Measures to reduce biodiversity impacts during construction**

Vegetation clearance would take place during winter where possible, to avoid disturbing breeding birds. Where this is not practical, clearance would be supervised by an environmental clerk of works to ensure no nests are disturbed or destroyed. Where protected species are present, they would be moved away from the site before any construction activities take place, either through habitat manipulation (for example, strimming to reduce the height of vegetation and displace reptiles), or translocation. Any habitat lost for temporary construction would be reinstated after construction.

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

## **10.10.2 Operations**

### **Operational impacts**

Once the new road opens, it is unlikely to cause significant additional disturbance to species in Northfleet South, Istead Rise and Painters Ash beyond that from the existing A2.

## **Measures to reduce biodiversity impacts during operation**

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

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

## 10.11 Built heritage

### Existing situation

A scheduled monument has been identified in Northfleet South in relation to the project. No listed buildings are located in the ward that would be affected by the project.

### Scheduled monuments – Northfleet South ward

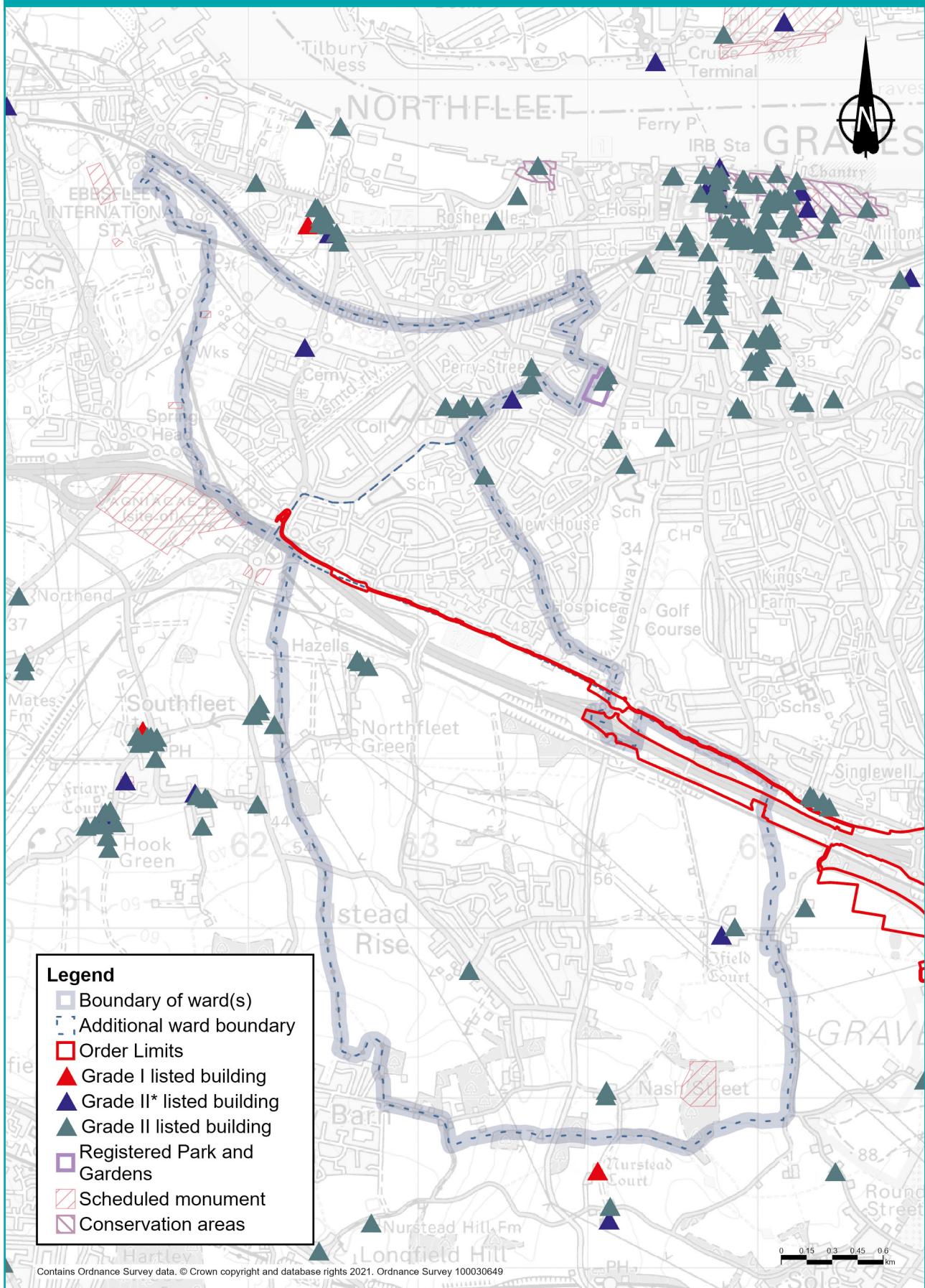
The Neolithic site near Ebbsfleet is a scheduled monument of high heritage value. The monument includes two prehistoric sites situated alongside the Ebbsfleet River, one in Northfleet South and the other in neighbouring Ebbsfleet ward to the west. Both sites are thought to have been riverside settlements and have produced finds of Neolithic pottery, stone tools and a buried land surface. The site in Northfleet South is around 1.2km to the northwest of the project, and would not be disturbed by it.

### Scheduled monuments – Istead Rise ward

A scheduled monument and six listed buildings have been identified in Istead Rise in relation to the project. One of the listed buildings is Grade II\* listed and the other five are Grade II listed.

The deserted medieval manorial settlement of Cossington is a scheduled monument of high heritage value. It is located west of Church Road, around 1.2km south of the project. The monument is the remains of a medieval settlement and survives only as earthworks. The remains include the platforms of at least six buildings enclosed by a bank and ditch, along with areas of former paddocks and fields. Documentary sources suggest the land was originally owned by the Ifield estate before being sold to the Cossington family in the late 13th or early 14th century. The settlement was well established by 1365, and is believed to be the site of Cossington Manor, bought in the 15th century by Edward IV.

**Figure 10.21 Built heritage in Northfleet South, Istead Rise and Painters Ash wards**



## **Grade II\* listed buildings**

- Ifield Court is a Grade II\* listed building of high value located around 900 metres south of the A2 and the project. The building is a late 18th century house built onto a 15th century manor. Parts of the earlier manor house remain within the building. The house sits in its own gardens and includes outbuildings, farm buildings, an orchard and paddock land forming part of the former estate.
- Court Cottage
- Garden Cottage
- Tudor Cottage
- Hazells
- Hazells Farm Barn and attached oast
- Calf house or stable with granary above

No buildings of historical relevance have been identified in Painters Ash in relation to the project.

## **10.11.1 Construction**

### **Construction impacts**

Construction activities affecting these wards relate to utilities works along Roman Road. More information can be found in the Project description section above. No scheduled monuments or listed buildings would be affected physically or indirectly by the project's construction activities.

### **Measures to reduce the impacts during construction**

Mitigation is not required as no built heritage would be affected by the project during construction.

## **10.11.2 Operations**

### **Operational impacts**

There are not anticipated to be any effects on built heritage in these wards once the road is open.

### **Measures to reduce the impacts during operation**

Mitigation is not required as no built heritage would be affected by the project once operational.

## 10.12 Contamination

### Existing situation

From a desk-based review of historical maps and environmental data, there are no known medium or high-risk sources of contamination that could be at risk of disturbance during construction or operation of the project within Northfleet South, Istead Rise and Painters Ash wards.

### Construction

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

### Operation

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