Lower Thames Crossing

7.8 Traffic Forecasts Non-Technical Summary

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Lower Thames Crossing

7.8 Traffic Forecasts Non-Technical Summary

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1 Executive summary

1.1.1 This Traffic Forecasts Non-Technical Summary provides an overview of the work carried out by National Highways to assess the need for, and impact of, the A122 Lower Thames Crossing (the Project) on the road network.

1.1.2 It presents the key findings of the performance of the road network in the future:

a. with the Project (the 'Do Something' scenario)

b. without the Project (the 'Do Minimum' scenario)

c. during the construction of the Project

1.1.3 This document summarises the modelling work done to support the application for a Development Consent Order for the Project.

1.1.4 National Highways has assessed the need for additional road capacity across the River Thames east of London, and the impact that the Project would have, by developing a simulation of the transport system in the Lower Thames area, called the Lower Thames Area Model (LTAM).

1.1.5 The transport model contains a detailed representation of the road network in the area and information on where people travelled to and from in an average month (March 2016). It uses an industry-recognised method of predicting future traffic flows and conditions, both with and without the Project.

1.1.6 The transport model shows the number of people choosing to travel by road and rail and the route they use now, and the route they are forecast to use. This allows predictions to be made as to how many vehicles would be using each part of the road network in the future and how long it would take to complete a journey.

1.1.7 More information can be found in the following documents which have also been submitted as part of the Development Consent Order application:

a. The Combined Modelling and Appraisal Report (Application Document 7.7), including its appendices:

i. Appendix A – Transport Data Package – sets out the data used to help build the transport model.

ii. Appendix B – Transport Model Package – sets out how the transport model was built and how it performs against industry standard guidance.

iii. Appendix C – Transport Forecasting Package – details what the model predicts, both with and without the Project.

iv. Appendix D – Economic Appraisal Package – provides details of the economic effects of the Project.

b. The Transport Assessment (Application Document 7.9) – sets out the forecast transport impacts that result from the Project during both construction and operation.

c. The Community Impact Report (Application Document 7.16) – sets out the forecast transport impacts that result from the Project during both construction and operation at a local ward level.

d. The Wider Network Impacts Management and Monitoring Plan (Application Document 7.12) – sets out a suitable framework for traffic monitoring and the role of National Highways and other organisations in the future management of the road network.

1.1.8 Documents containing similar information to that contained within this document were produced in support of Statutory Consultation (Traffic Forecasts Non-Technical Summary, 2018), Supplementary Consultation (Traffic Modelling Update, 2020) and the Community Impacts Consultation (Operations Update, 2021).

1.1.9 The construction programme for the Project is expected to last from 2025 to 2030. This assumes development consent is granted in 2024. The anticipated opening date for the Project is in 2030.

2 The Project

2.1.1 The A122 Lower Thames Crossing (the Project) would provide a connection between the A2 and M2 in Kent and the M25 south of junction 29, crossing under the River Thames through a tunnel. The Project route is presented in Plate 2.1.

2.1.2 The A122 would be approximately 23km long, 4.25km of which would be in tunnel. On the south side of the River Thames, the Project route would link the tunnel to the A2 and M2. On the north side, it would link to the A13, M25 junction 29 and the M25 south of junction 29. The tunnel entrances would be located to the east of the village of Chalk on the south of the River Thames and to the west of East Tilbury on the north side.

2.1.3 Junctions are proposed at the following locations:

e. New junction with the A2 to the south-east of Gravesend

f. Modified junction with the A13/A1089 in Thurrock

g. New junction with the M25 between junctions 29 and 30

2.1.4 To align with National Policy Statement for National Networks (Department for Transport, 2014) policy and to help the Project meet the Scheme Objectives, it is proposed that road user charges would be levied in line with the Dartford Crossing. Vehicles would be charged for using the new tunnel.

2.1.5 The Project route would be three lanes in both directions, except for:

a. link roads

b. stretches of the carriageway through junctions

c. the southbound carriageway from the M25 to the junction with the A13/A1089, which would be two lanes

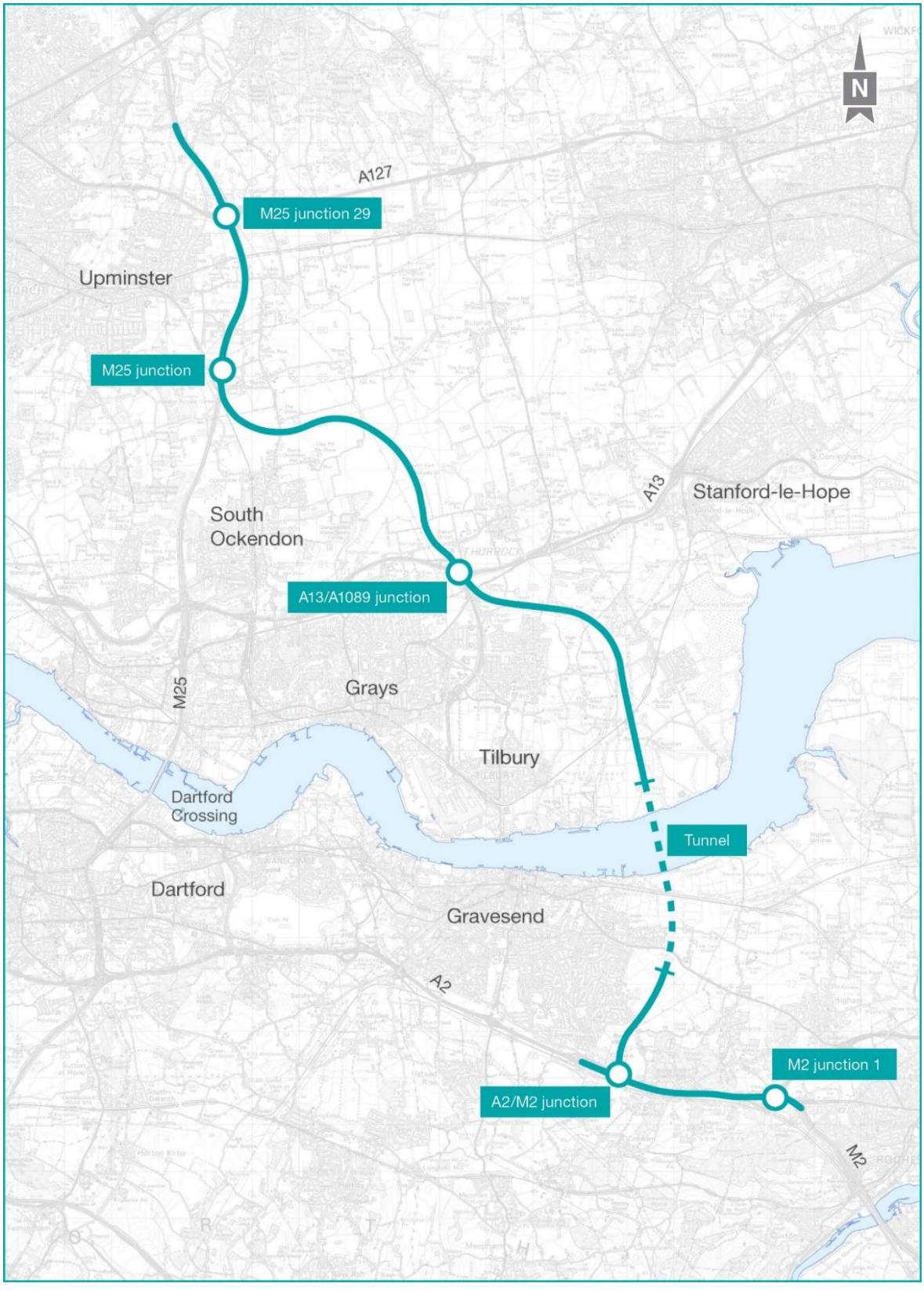
2.1.6 In common with most A-roads, the A122 would operate with no hard shoulder but would feature a 1m hard strip on either side of the carriageway. It would also feature technology including stopped vehicle and incident detection, lane control, variable speed limits and electronic signage and signalling. The A122 design outside the tunnel would include emergency areas. The tunnel would include a range of enhanced systems and response measures instead of emergency areas.

2.1.7 The A122 would be classified as an ‘all-purpose trunk road’ with green signs. For safety reasons, walkers, cyclists, horse riders and slow-moving vehicles would be prohibited from using it.

2.1.8 The Project would include adjustment to a number of local roads. There would also be changes to a number of Public Rights of Way, used by walkers, cyclists and horse riders. Construction of the Project would also require the installation and diversion of a number of utilities, including gas mains, overhead electricity powerlines and underground electricity cables, as well as water supplies and telecommunications assets and associated infrastructure.

2.1.9 The Project has been developed to avoid or minimise significant effects on the environment. The measures adopted include landscaping, noise mitigation, green bridges, floodplain compensation, new areas of ecological habitat and two new parks.

Plate 2.1 Lower Thames Crossing route



3 Modelling current conditions

3.1 Introduction

3.1.1 This chapter explains how the transport model was developed to reflect current conditions. More details are set out in Appendix A: Transport Data Package and Appendix B: Transport Model Package of the Combined Modelling and Appraisal Report (Application Document 7.7).

3.2 The transport model

3.2.1 This section sets out how the transport model has been built, detailing key aspects.

Transport model guidance

3.2.2 The Department for Transport (DfT) has issued guidance on how transport models such as this should be built, and the extent to which the predictions of traffic flows and journey times made by the model compare with real life. This guidance is called TAG (Transport Analysis Guidance).

3.2.3 TAG has been used as the basis for collecting data and building the model and then assessing its performance. Full details of the processes and checks carried out are in Appendix A: Transport Data Package and Appendix B: Transport Model Package of the Combined Modelling and Appraisal Report (Application Document 7.7).

3.2.4 An independent specialist assessor within National Highways has assessed the LTAM throughout its development. The independent specialist assessor has concluded that the LTAM is suitable to assess the Project.

Modelled year and month

3.2.5 The transport model was created to represent the transport system in the Lower Thames area in March 2016, to reflect an average month.

3.2.6 The selected base year is in line with the guidance set out in TAG.

Modelled hours

3.2.7 The hours modelled in the transport model are from 07:00–08:00 (the morning peak) and 17:00–18:00 (the evening peak). These were selected following assessment as they were the busiest times of day on the main roads in the area. A typical hour in the middle of the day was also modelled (the inter-peak), reflecting the period between 09:00–15:00.

Modelled highway network

3.2.8 Details of the current transport network were taken from other recent transport models of the area and digital mapping. The transport model covers the whole of England, Scotland and Wales in order to capture the start and end of every trip, but more comprehensively so in Dartford, Medway, Kent, Thurrock, Essex and east London. In these areas, the road network is represented in great detail. For example, it includes the amount of red and green time at traffic signals, restrictions for Heavy Goods Vehicles (HGVs) and the number of lanes along each stretch of road and at junctions.

Traffic demand

3.2.9 Information on where people are travelling to and from has been taken from analysis of anonymised movements and travel patterns of millions of mobile phones in the UK. This information has then been scaled to match observed traffic volumes using counts in the area and merged with other data sources to provide the travel patterns of cars, vans and HGVs.

3.2.10 The data used within the transport model has been put through a series of quality checks to make sure it is suitable. The data is considered acceptable to use within the transport model to assess the Project.

Model calibration and validation

3.2.11 Model calibration and validation is the process by which the LTAM has been tested, to see if it can be used to assess the changes to the transport network as a result of the Project.

3.2.12 The transport model was tested by getting the model to predict which routes vehicles would travel on, taking into account:

a. where people want to travel to

b. people's preference between journey time and journey distance

c. the actual speeds of vehicles on the road network

3.2.13 The amount of traffic predicted by the transport model as using the road network in 2016 has been compared to actual counts (where available) of the number of vehicles on the road network. Actual counts were collected from traffic counters laid out on the road and video surveys or using data obtained from other recently assessed road schemes in the area.

3.2.14 The time that journeys are predicted to take has been compared with observations from a large number of in-vehicle Global Positioning System (GPS) devices, which provide actual travel times recorded during the modelled hours in March 2016.

4 Forecasts without the Lower Thames Crossing

4.1 Introduction

4.1.1 This chapter sets out how the transport model is used to forecast traffic movements without the Project. More details are set out in Appendix C: Transport Forecasting Package of the Combined Modelling and Appraisal Report (Application Document 7.7).

4.1.2 The scenario in which the Project is not built is called the Do Minimum scenario. This includes changes to the road network and planned development that is forecast to go ahead whether the Project is built or not.

4.2 Modelled years

4.2.1 The transport model has been used to predict the conditions on the road network in:

a. 2030, the proposed opening year of the Project

b. 2037, an interim year used in the economic appraisal

c. 2045, the design year of the Project (15 years from opening)

d. 2051, the final year of DfT published forecasts of traffic growth from its National Trip End Model

4.3 Forecast traffic growth

4.3.1 The growth in the number of trips made by vans and HGVs has been taken from the most recent DfT Road Traffic Forecasts, published in 2018, and adjusted to allow for trips made to and from new developments in the area.

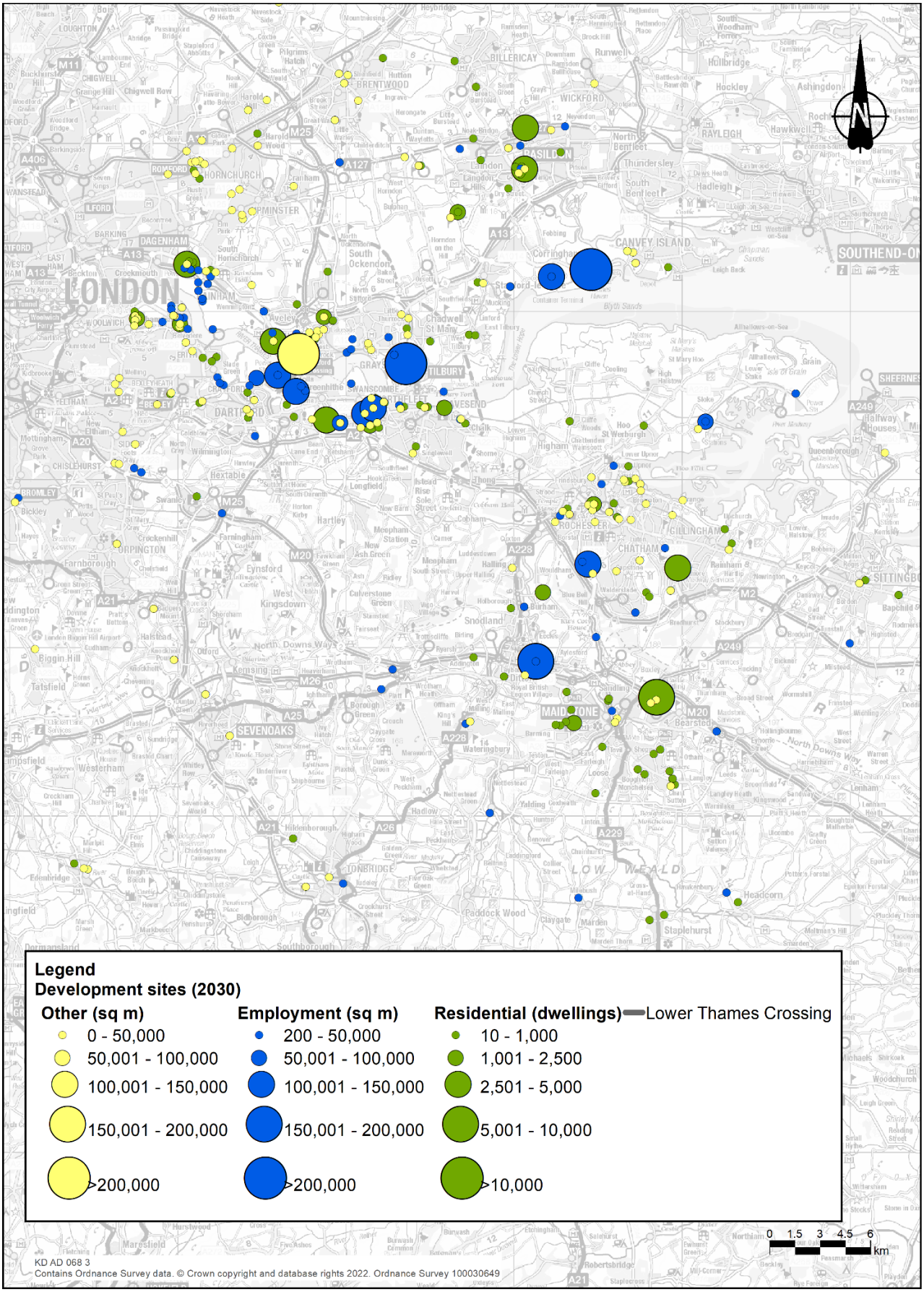
4.3.2 The overall level of growth in car trips is taken from the DfT National Trip End Model forecasts, published in February 2017 (version 7.2), which provide annual forecasts to 2051. These are based on estimates of population growth from the Office for National Statistics, which show the number of people forecast to live in each area.

4.3.3 The number of car trips made per person varies based on factors such as age, employment status, car ownership and household size. This is then applied to the number of people forecast in the future for these categories. This produces a forecast of the future number of car trips.

Proposed developments

4.3.4 Local adjustments were made to the transport model to include more detailed geographic information on the proposed location and associated trips of new housing and other developments (such as employment, retail and leisure sites). These developments, either under construction, with planning permission or a submitted planning application, are included in the transport model and are shown in Plate 4.1. This information is based on information provided by local authorities and from local authority online planning databases at the end of September 2021.

Plate 4.1 Main future development areas included in the transport model



Proposed road schemes

4.3.5 The road network in the transport model was updated for the future years to include road schemes that have been completed since 2016, or are likely to be built regardless of whether the Project is built or not. This information (see Table 4.1) has been provided by the highway authorities in the area and reflects the status of schemes as at the end of September 2021.

Table 4.1 Road schemes included in the transport model

Scheme Name	Scheme Type
A1014 Sorrells roundabout	Junction improvement
A1089 - Tilbury2 link road	New link road
A12 Chelmsford to A120 widening scheme	Carriageway widening
A127/ A1015 Kent Elms Corner	Junction Improvement
A127/A130 Fairglen Interchange	Junction improvement
A127/A130 Fairglen Interchange new link road	New link road
A127/A132 Nevendon Interchange improvement scheme	Junction improvement
A128 - Dunton Hills new roundabouts (x2)	New junction
A128/Old Tilbury Road junction	New roundabout
A128/Station Road junction improvements	Junction improvement
A129/Mountnessing Road junction	New signalised junction
A13 North Stifford improvement	Junction improvement
A13 Stanford-le-Hope bypass widening	Carriageway widening
A13 Stanford-le-Hope junction	Junction improvement

Scheme Name	Scheme Type
A1306/ Purfleet Road	Junction improvement
A131 Chelmsford to Braintree route improvements	Junction and carriageway improvements
A2 Fox Hill junction	New signalised junction
A2/Bean and A2/Ebbsfleet junctions	Junction improvements
A20 access to Dover	Junction improvement
A20 Ashford Road, Bearsted	New junction
A20 Ashford Road/A274 Sutton Road/Willington Street	Junction improvement
A20 London Road/Ashton Way/Castle Way junction	Junction improvement
A21 Tonbridge to Pembury	Carriageway widening
A226 London Road / B255 St Clements Way	Junction improvement
A228/ Castle Way junction	Junction improvement
A229 Bridgewood roundabout	Junction improvement
A229 Loose Road corridor and A20 London Road/Hall Road/Mills Road junction	Junction improvement
A249 Bearsted Road, Maidstone	Junction improvement and carriageway widening
A274 Sutton Road, Boughton Monchelsea	New junction
A28 Chart Road improvement scheme	Carriageway widening and junction improvement

Scheme Name	Scheme Type
A28 Sturry Link Road	New road
A289 Four Elms roundabout to Medway Tunnel (Medway)	New road
A289 Upnor roundabout, Frindsbury	Junction improvement
A414 Pinch Point Package	Junction improvements and A414 widening
Air Quality in Basildon	Carriageway improvements
B2097 Rochester Road, Medway	New junction
Beam Parkway A1306 transformational scheme	New railway station and A1306 carriageway reconfiguration
Chelmsford North East Bypass	Local bypass scheme
Chelmsford Urban Expansion (Boreham Interchange upgrade/Capacity Improvements)	Junction improvement
Dunton Road/Wash Road	Junction improvements
Ebbsfleet Garden City	New Infrastructure Serving Development
Hempstead Valley, Medway	Various improvements
Hewitts roundabout, Sevenoaks	Junction improvement
Hoath Way roundabout	Junction improvements

Scheme Name	Scheme Type
Lakeside Shopping Centre	New link road
M11 junction 7a	New junction on the M11 north of junction 7
M11 junction 8	Junction improvements
M2 junction 4	Junction improvements
M2 junction 5 improvements	Junction improvement
M20 junction 10a	New junction
M20 junction 4 eastern overbridge widening	Carriageway widening
M20 junction 5, Coldharbour roundabout	Junction improvement
M20 junctions 3-5 smart motorway	Smart motorway
M23 junctions 8-10 smart motorway	Smart motorway
M25 junction 10/A3 Wisley interchange improvement	Junction improvement
M25 junction 13 improvements	Junction improvement
M25 junction 2 improvement	Junction improvement
M25 junction 23	Junction improvement
M25 junction 25 improvements	Junction improvement
M25 junction 28 improvements	Junction improvement
M25 junction 30/A13 corridor relieving congestion scheme*	Junction improvement
M25 junctions 31-30	Junction improvements at junction 31 and mainline northbound
M25 junctions 10-16 smart motorway	Smart motorway
M3 junctions 2-4a smart motorway	Smart motorway

Scheme Name	Scheme Type
M4 junctions 3-12 smart motorway	Smart motorway
Maidstone bridges improvement scheme	Carriageway widening and junction improvement
Noak Hill Road/ Wash Road	New roundabout
Northlake, Lakeside basin	New junction
Parkway Corridor, Chelmsford	Junction improvements
Peters Village Medway River Crossing	New bridge across the River Medway
Rathmore Road Link, Gravesend	Carriageway and junction widening
Silvertown Tunnel scheme	New twin bore tunnel east of the Blackwall Tunnel
St Clements Way, Greenhithe improvement scheme	Carriageway and junction widening
Station Quarter North	New link roads
Thurrock Local Area Speed Limit Improvements	Speed Limit traffic management

4.4 What the model shows

4.4.1 The transport model shows where people are travelling to and how long their journeys take. In the future, for many people these journeys would take longer (because there are predicted to be more cars on the roads), but the real cost of making these journeys would decrease. This is because, although fuel prices would rise, vehicles are forecast to become more fuel efficient, and as people's incomes rise, journeys by car would feel more affordable.

4.4.2 The transport model predicts how people would react to changes in the time and cost of their journeys. The possible changes include:

a. how often they make the same trip

b. the time of day they travel

c. whether they switch to or from public transport

d. where they travel to/from

e. what route they choose to take

4.4.3 Government forecasts and evidence from schemes of a similar nature to the Project suggest that, in the main, people would continue to travel by car but may change where they travel to. As traffic speeds fall, or trips become more expensive, people tend to respond by making shorter journeys. Where journeys become quicker or cheaper, some people choose to travel to places further away; for example, they choose employment further away from home.

4.4.4 The transport model shows how many vehicles are expected to use each part of the road network. This information is then used to predict the environmental impacts of traffic (for example on noise and air quality), more detail of which is contained in the Environmental Statement (Application Documents 6.1 to 6.3). The approach, showing the consistency between the traffic modelling and the environmental assessment, is set out in Appendix 4.4 Traffic and Transport.

4.4.5 The speed on each section of the network is calculated in the transport model. This is used to measure the performance of the road network and to provide details on the location and level of congestion.

4.4.6 The transport model's predictions without the Project (the Do Minimum scenario) are shown in the following section and compared against the predictions with the Project (the Do Something scenario).

5 Forecasts with the Lower Thames Crossing

5.1 Introduction

5.1.1 This chapter sets out how the transport model is used to predict the use of both the Project and other parts of the road network once the Project is operational, known as the Do Something scenario. More details are set out in Appendix C: Transport Forecasting Package of the Combined Modelling and Appraisal Report (Application Document 7.7).

5.1.2 The transport model is used to predict:

a. how people would react to the changes in the time and cost of their journeys

b. the routes they would use as a result of the Project

5.1.3 The economic impact of the Project is determined from changes in journey times and costs for all traffic in the area. This includes people who do not use the Project but have their journey times affected by changes in traffic patterns.

5.1.4 The transport model provides data on traffic flows and speeds. This data is used to look at the environmental impacts of traffic, accident levels and changes in journey time reliability and to show the economic benefits of the Project (more detail of which is set out in Appendix D: Economic Appraisal Package of the Combined Modelling and Appraisal Report (Application Document 7.7)).

5.2 What the model predicts

5.2.1 The transport model predicts that the biggest change as a result of the Project would be the number of people who choose to travel to the other side of the River Thames.

5.2.2 Across the following pages, information from the transport model is presented to show these changes in the AM peak hour, Inter-peak hour and PM peak hour. This information includes:

a. change in flow

b. percentage change in flow

c. percentage of HGVs

d. journey times

e. change in volume/capacity

5.2.3 It is recommended that these changes are viewed both individually and together as a series to help understand what the transport model predicts. For example, a change in flow on a particular road does not necessarily result in an increase in congestion (which is shown by the change in volume/capacity) if the road has enough spare capacity to cater for the additional traffic.

Changes in flow

5.2.4 The transport model uses an industry standard approach, in which the capacity of each part of the road network is given as the number of Passenger Car Units (PCUs) that can use each road link in the transport model each hour:

a. Cars and vans are defined as 1 PCU.

b. HGVs are considered to be equivalent to 2.5 PCUs, because they take up more road space.

5.2.5 The capacity of a road depends on its type, the speed limit, the number of lanes and its layout. For example, the capacity is often reduced on a motorway where traffic changes lane to leave or join the road at the next junction.

5.2.6 Table 5.1 shows the forecast traffic flows in both directions on the Dartford Crossing and at the Lower Thames Crossing during the morning and evening peak hours and an average inter-peak hour.

5.2.7 The table shows the benefits that the Project would bring to users of the Dartford Crossing. Traffic flows would be lower than in 2016 in the evening peak hour in both the proposed opening (2030) and design (2045) years, and lower than in 2016 in the morning and inter-peak hours in 2030, and only slightly higher in 2045.

Table 5.1 Forecast peak and inter-peak two-way hourly traffic flows at the Dartford Crossing and the Lower Thames Crossing (PCUs)

Period	Year	Without the Project	With the Project	
		Dartford Crossing*	Dartford Crossing*	Lower Thames Crossing
AM peak hour	2016	14,430		
	2030	16,020	13,280	8,040
	2045	16,260	14,870	8,940
Inter-peak hour	2016	11,790		
	2030	14,410	10,780	6,510
	2045	15,660	12,770	7,590
PM peak hour	2016	12,830		
	2030	15,310	12,020	7,990
	2045	16,280	13,540	8,830

**Flows at the Dartford Crossing (northbound only) are approaching the Traffic Management Cell. Note: Flows rounded to nearest 10. Source: Lower Thames Area Model (LR_N108 (Run 1), LR_CM49, LR_CS72)*

5.2.8 Table 5.2 shows the forecast daily traffic flows on the Dartford Crossing and at the Lower Thames Crossing.

Table 5.2 Forecast daily traffic flows at the Dartford Crossing and the Lower Thames Crossing

Year	Measure	Without the Project	With the Project	
		Dartford Crossing	Dartford Crossing	Lower Thames Crossing
2016	Vehicles	141,500	-	
	PCUs	182,400		
2030	Vehicles	171,700	139,800	87,400
	PCUs	217,200	169,700	105,000
2045	Vehicles	184,700	162,800	102,600
	PCUs	231,500	196,100	120,000

Note: Flows rounded to nearest 100. Source: Lower Thames Area Model (LR_N108 (Run 1), LR_CM49, LR_CS72

5.2.9 Much of the forecast increase in traffic would come from additional trips travelling in the middle of the day and overnight as the Dartford Crossing is already heavily used in the morning and evening, leaving little space for extra vehicles to use it. However, the overall growth in traffic would be restricted by the lack of sufficient capacity and resulting delays at the Dartford Crossing, which would deter some people and businesses from making a trip across the River Thames.

5.2.10 Although the transport model forecasts more trips across the River Thames as a result of the Project, the majority of these are not new trips. Instead, they are a result of drivers making longer journeys as destinations either side of the River Thames become easier to reach due to the additional capacity that the Project would provide.

5.2.11 When the Project opens, a significant proportion of the traffic that currently crosses the River Thames using the Dartford Crossing is forecast to divert to the Lower Thames Crossing as it would be a shorter route. Some of the space this creates at the Dartford Crossing would be taken up by people who were not using it because they were deterred from doing so by the high traffic levels and unpredictable journey times. The transport model predicts that, even with these additional journeys:

a. The overall level of traffic using the Dartford Crossing would fall on average by 19% in 2030 and 12% in 2045 (but up to a maximum of 25% in 2030 and up to a maximum of 25% in 2045 in the modelled hours) when compared to the Do Minimum scenario.

b. Average speeds on that part of the network would rise and journey times would become more reliable.

5.2.12 The transport model estimates future conditions on the road network. Plate 5.1 to Plate 5.6 show the change in the predicted amount of traffic in 2030, between the Do Minimum and the Do Something scenarios.

5.2.13 Roads contained within the transport model are shown in varying shades of blue if traffic levels are forecast to decrease and in yellow to red if they are forecast to increase; the darker the colour, the greater the change. The Project is shown in green.

5.2.14 Overall, the impact on traffic flows as a result of the Project is similar during the morning, evening and inter-peak periods, with the changes more pronounced, and covering a wider area, during the morning and evening peaks.

5.2.15 On many roads to the west of the Project, such as the A2, the A13, the Dartford Crossing and the M25 in Thurrock, the number of vehicles would fall when the Lower Thames Crossing opens. However, roads on the approach to the Project, including the M2, A228, A229, and some roads to the east of the Project, such as the A13, and on some sections of the M25, would experience an increase in traffic levels as travel across the River Thames becomes easier and more reliable.

Plate 5.1 Change in flows with the Project: AM peak (07:00–08:00), 2030

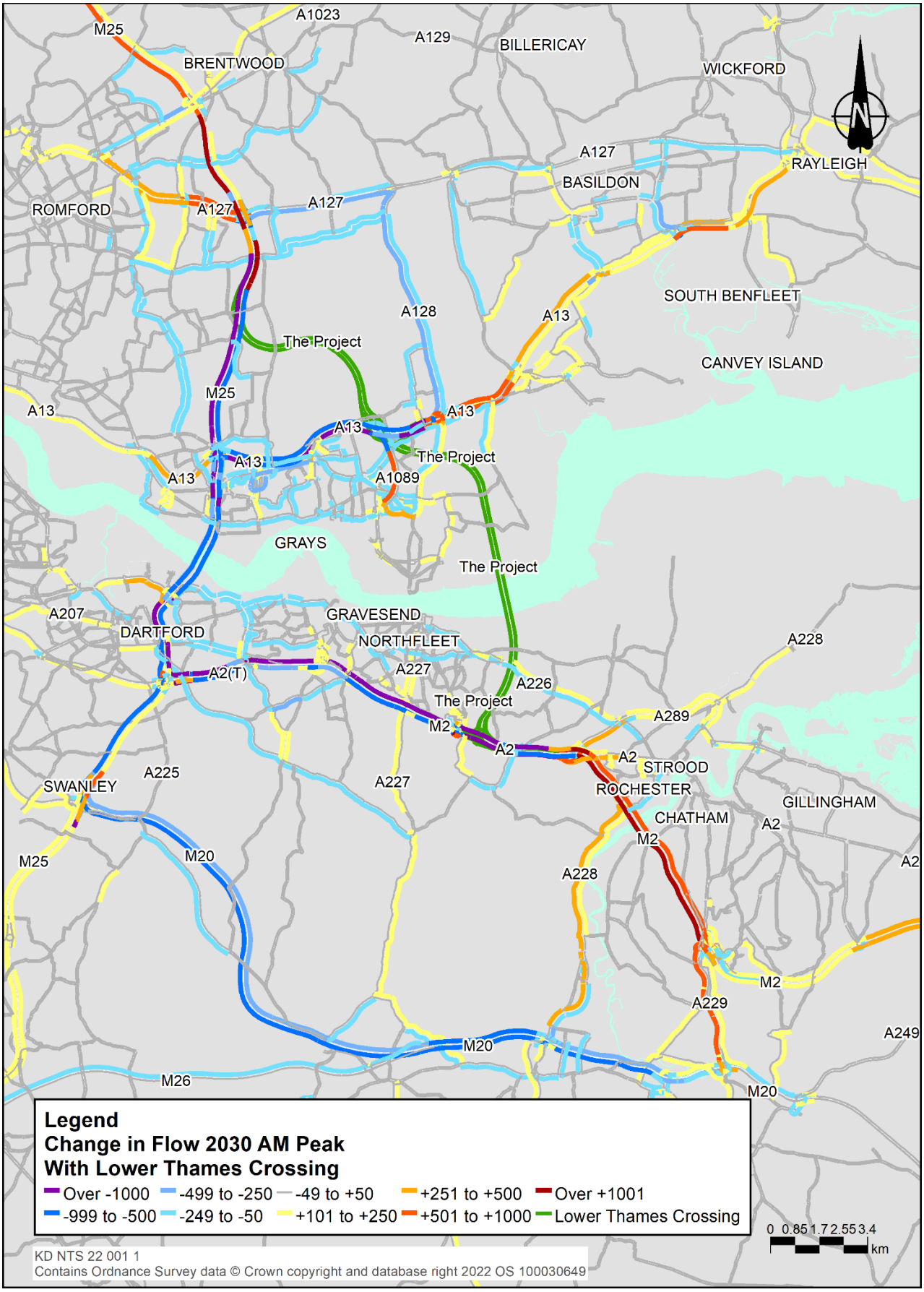


Plate 5.2 Change in flows with the Project: AM peak (07:00–08:00), 2030 at the junctions with the A2, A13 and M25

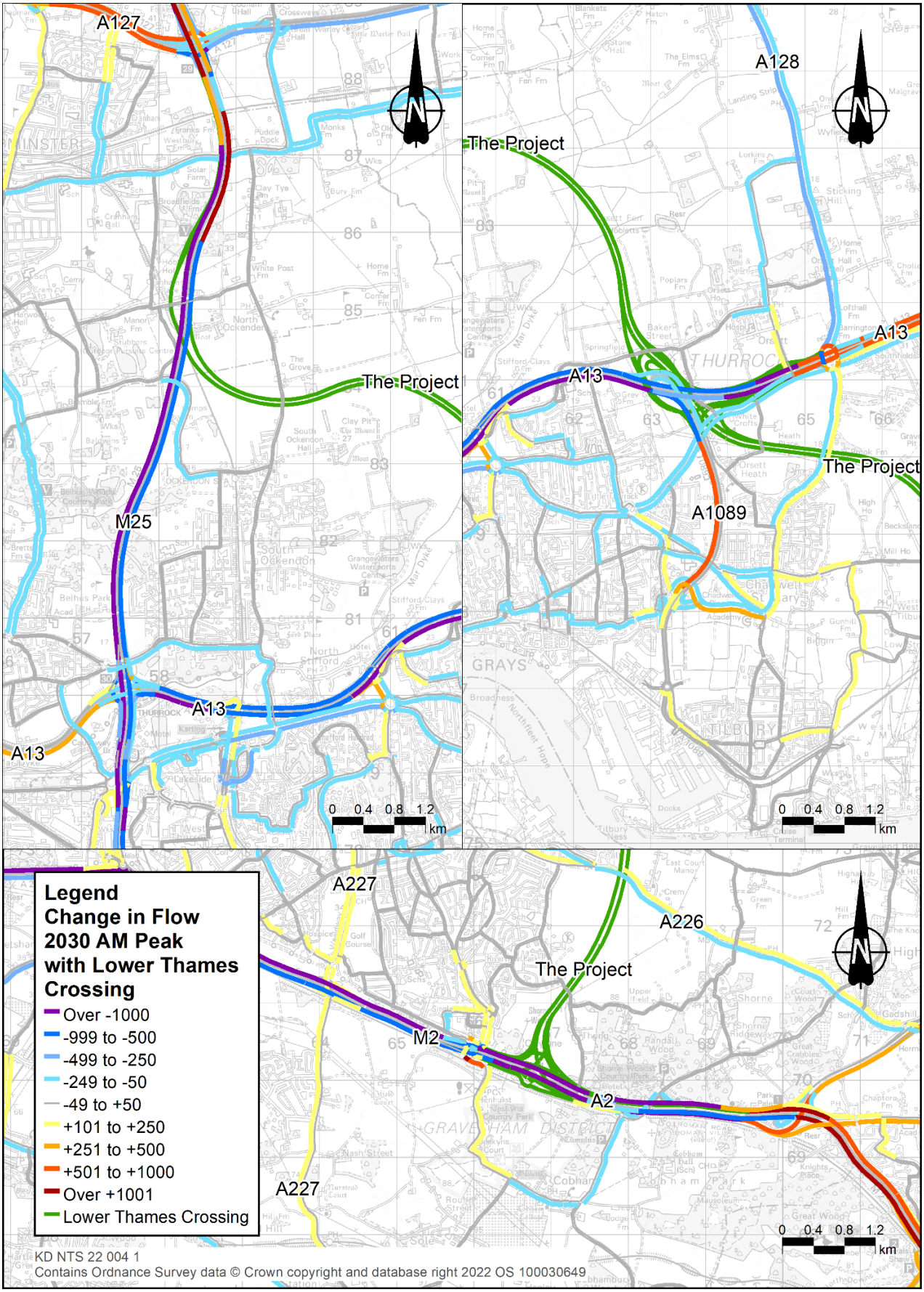


Plate 5.3 Change in flows with the Project: Inter-peak, 2030

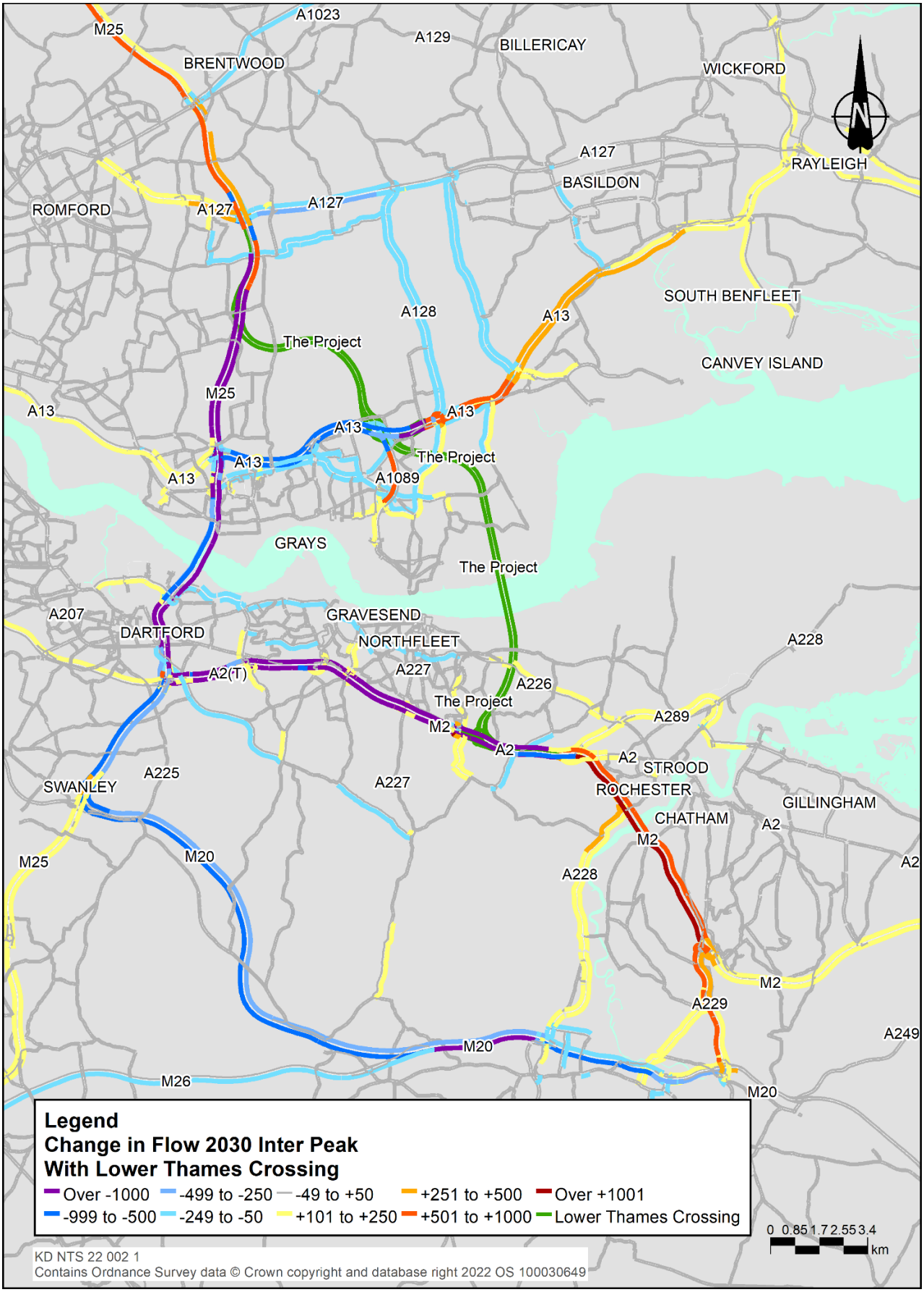


Plate 5.4 Change in flows with the Project: Inter-peak, 2030 at the junctions with the A2, A13 and M25

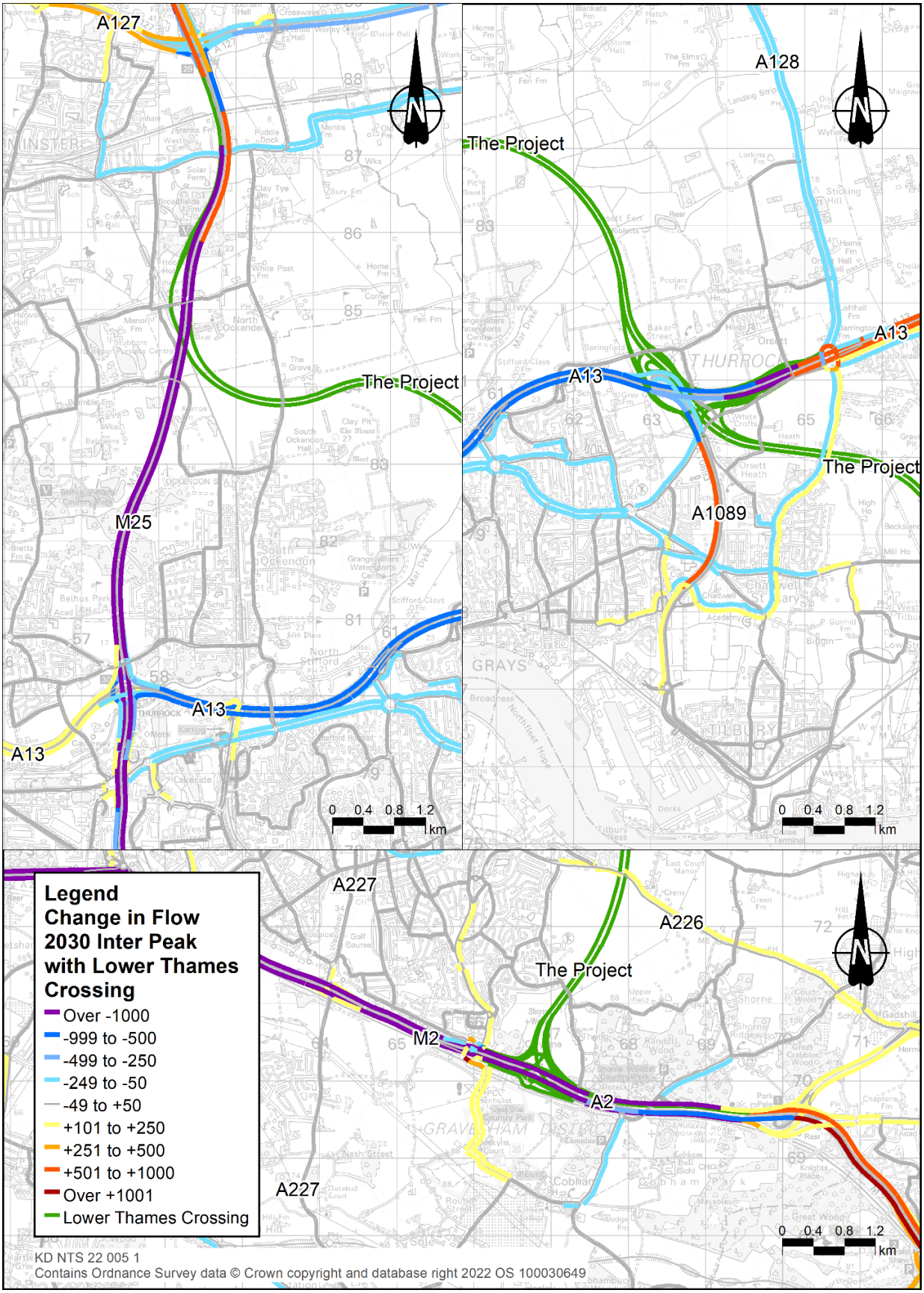


Plate 5.5 Change in flows with the Project: PM peak (17:00–18:00), 2030

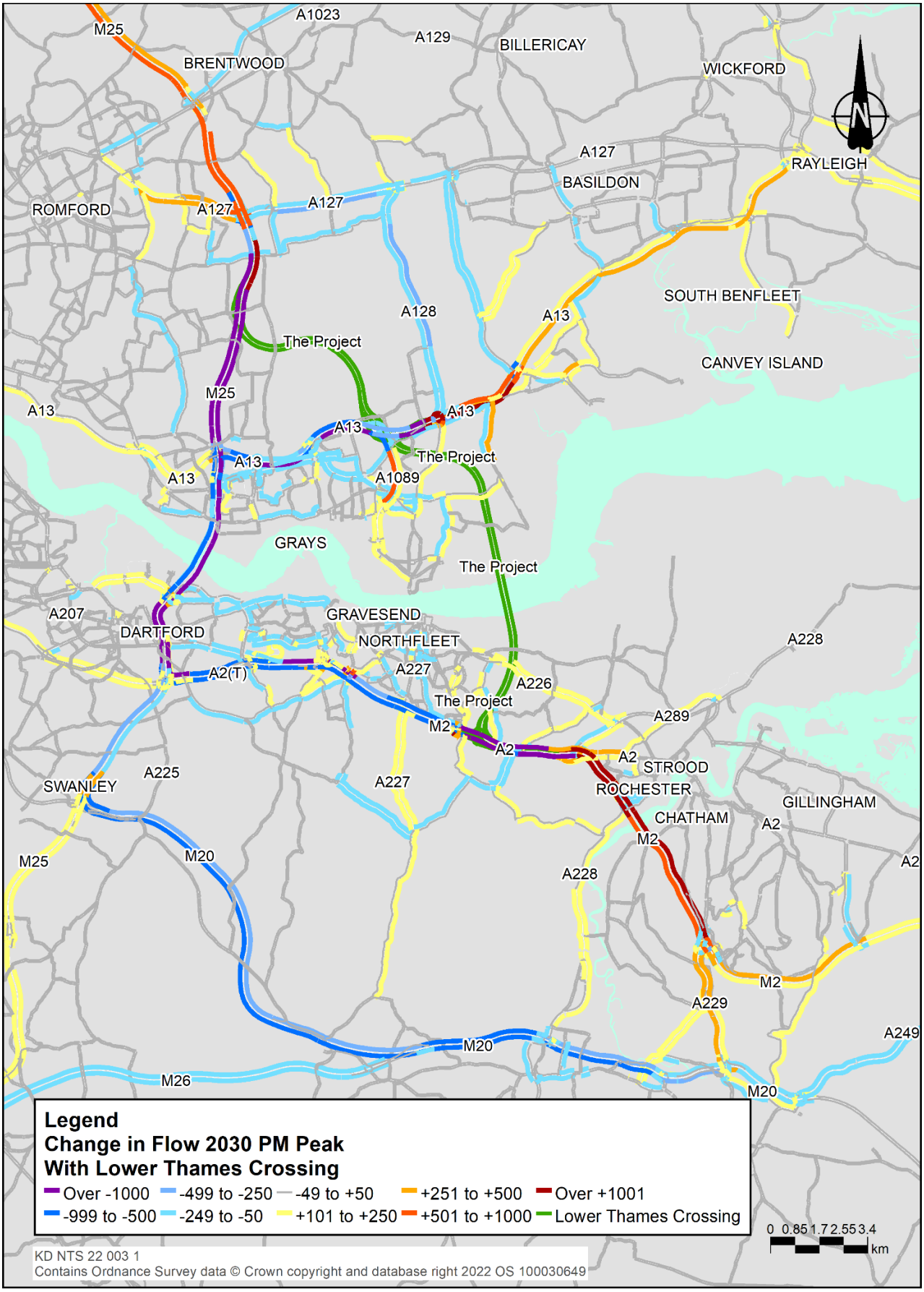
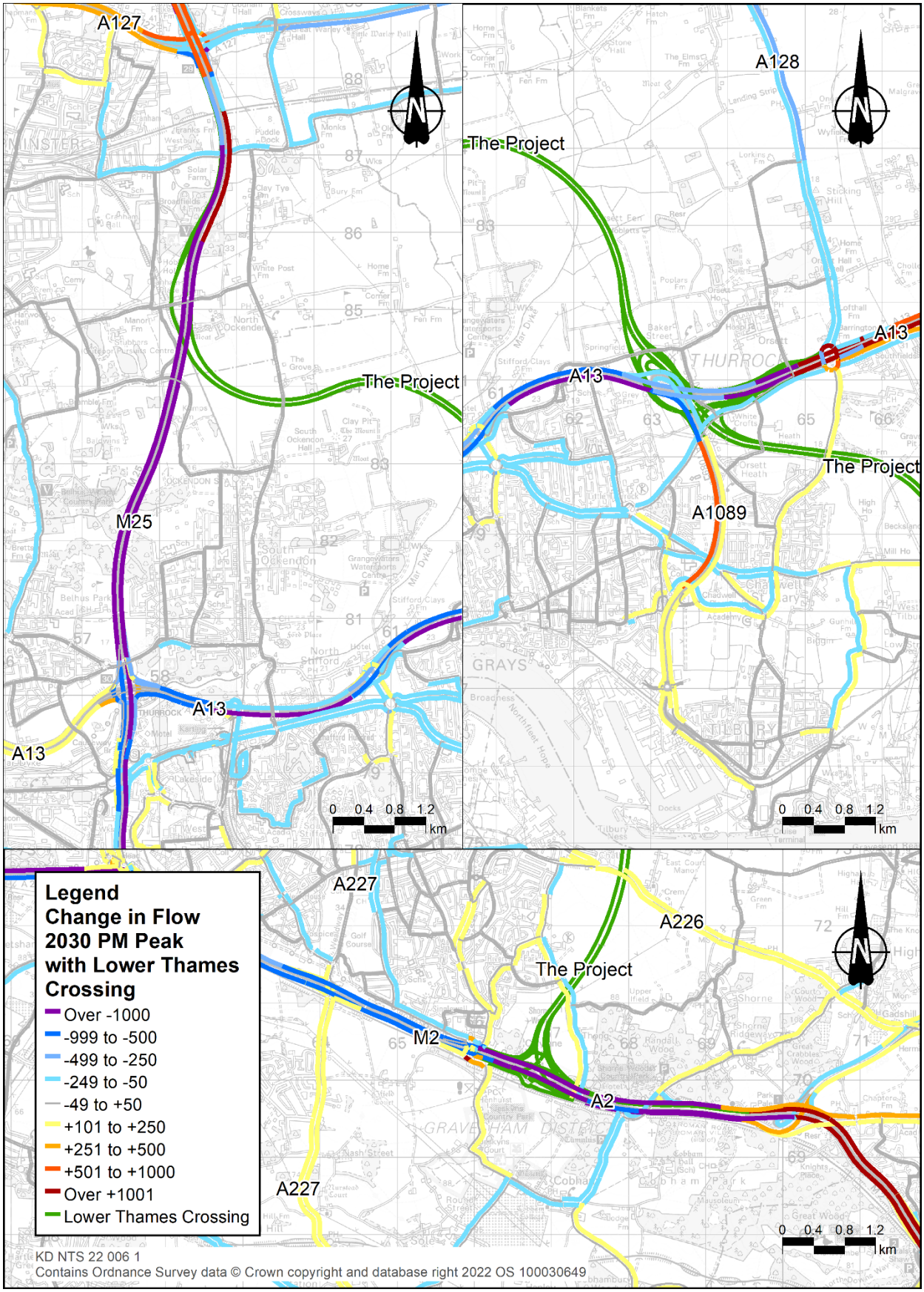


Plate 5.6 Change in flows with the Project: PM peak (17:00–18:00), 2030 at the junctions with the A2, A13 and M25



Percentage change in flow

5.2.16 This section presents the change in flow forecast by the transport model as a percentage of the flow without the Project (Do Minimum). This shows the relative effect of the change in flow, in relation to the flow that would be present without the Project.

5.2.17 In Plate 5.7, Plate 5.8 and Plate 5.9, the predicted percentage change in traffic in 2030 is shown, between the Do Minimum and the Do Something scenarios.

5.2.18 Roads contained within the transport model are shown in varying shades of blue if a forecast decrease is predicted and in yellow to red if a forecast increase is predicted; the darker the colour, the greater the change. The Lower Thames Crossing and other new links that would be built as part of the Project are shown in green.

5.2.19 For example, if the flow on a section of road was forecast to be 1,000 PCUs in the 2030 AM peak hour without the Project, and 900 PCUs with the Project, that section would be highlighted in light blue, as the forecast change would be between -10% and -20%.

5.2.20 Some roads are shown with different colours on different sections, because of the addition/removal of traffic flow to account for the origins and destinations of trips within the transport model.

5.2.21 Overall, the pattern of impacts is similar during the morning, evening and inter-peak periods, although they are more pronounced and extensive during the morning and evening peaks.

5.2.22 Generally, local roads with lower traffic flow without the Project see higher percentage changes. Meanwhile, roads on the strategic road network which have a higher level of flow without the Project, see a lower percentage change.

5.2.23 There are some exceptions, such as parts of the A2 to the west of its junction with the Project, parts of the M25, and the Dartford Crossing, where high percentage reductions are forecast and flows are already high.

Plate 5.7 Percentage change in flows with the Project: AM peak (07:00–08:00), 2030

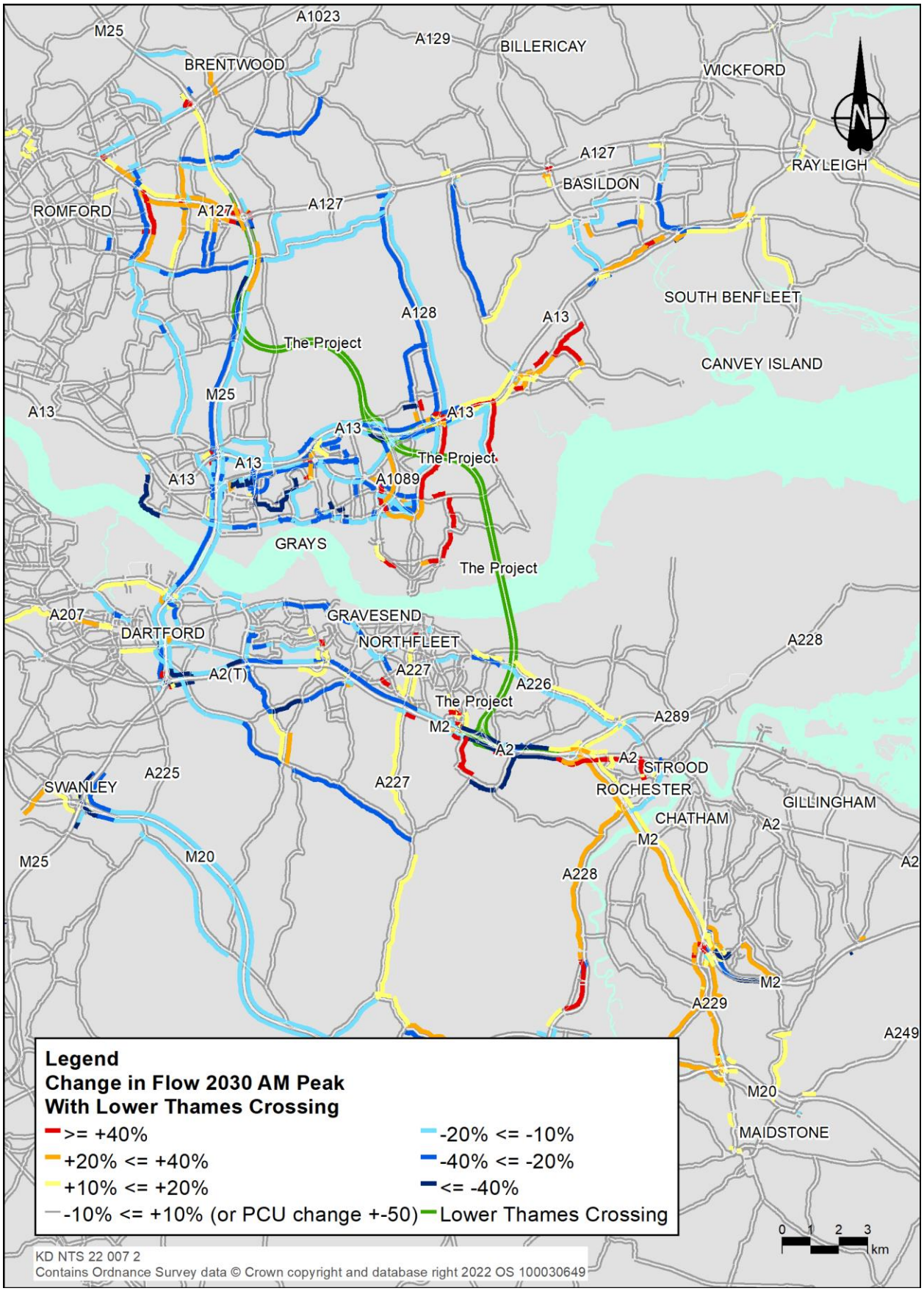


Plate 5.8 Percentage change in flows with the Project: Inter-peak, 2030

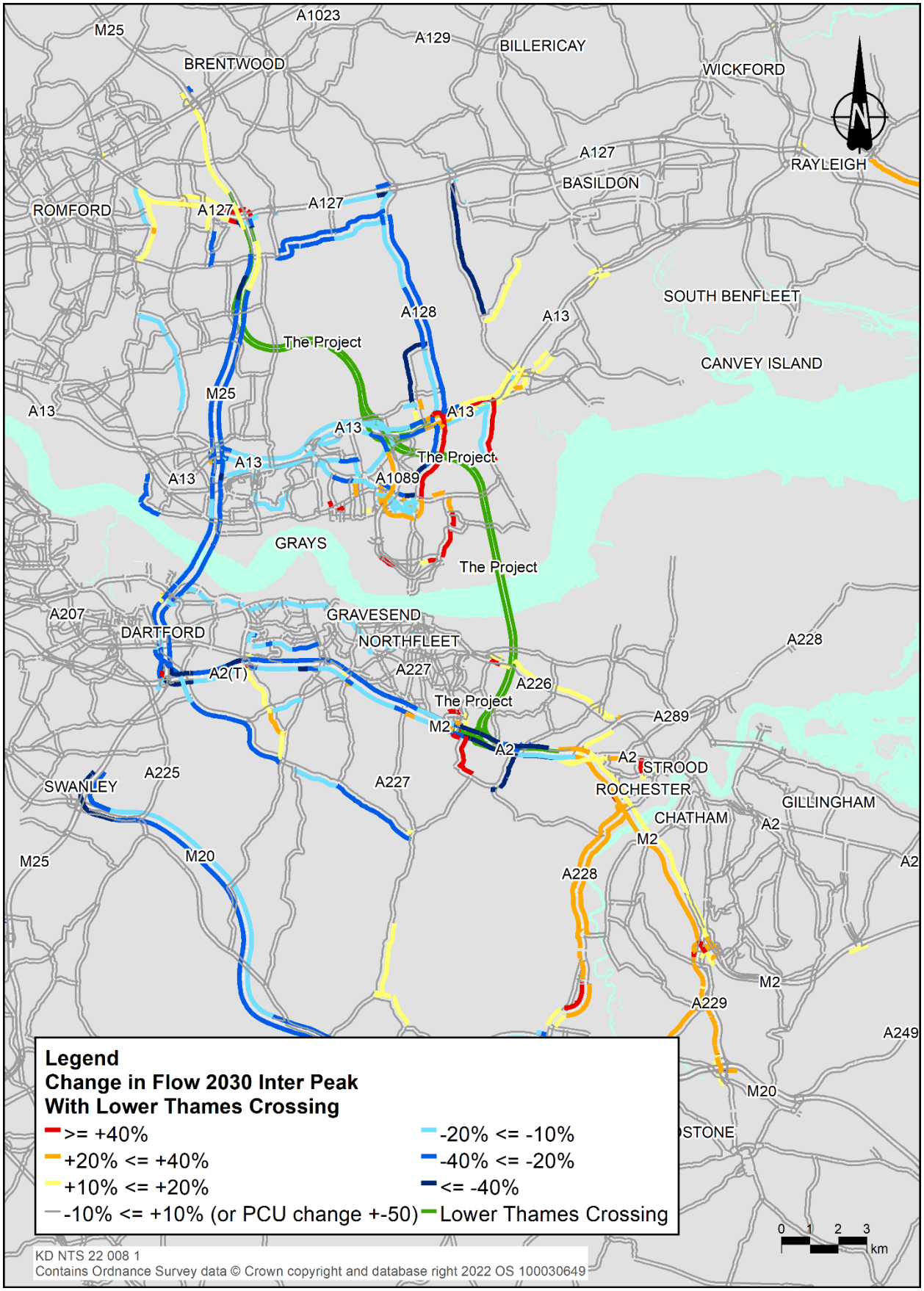
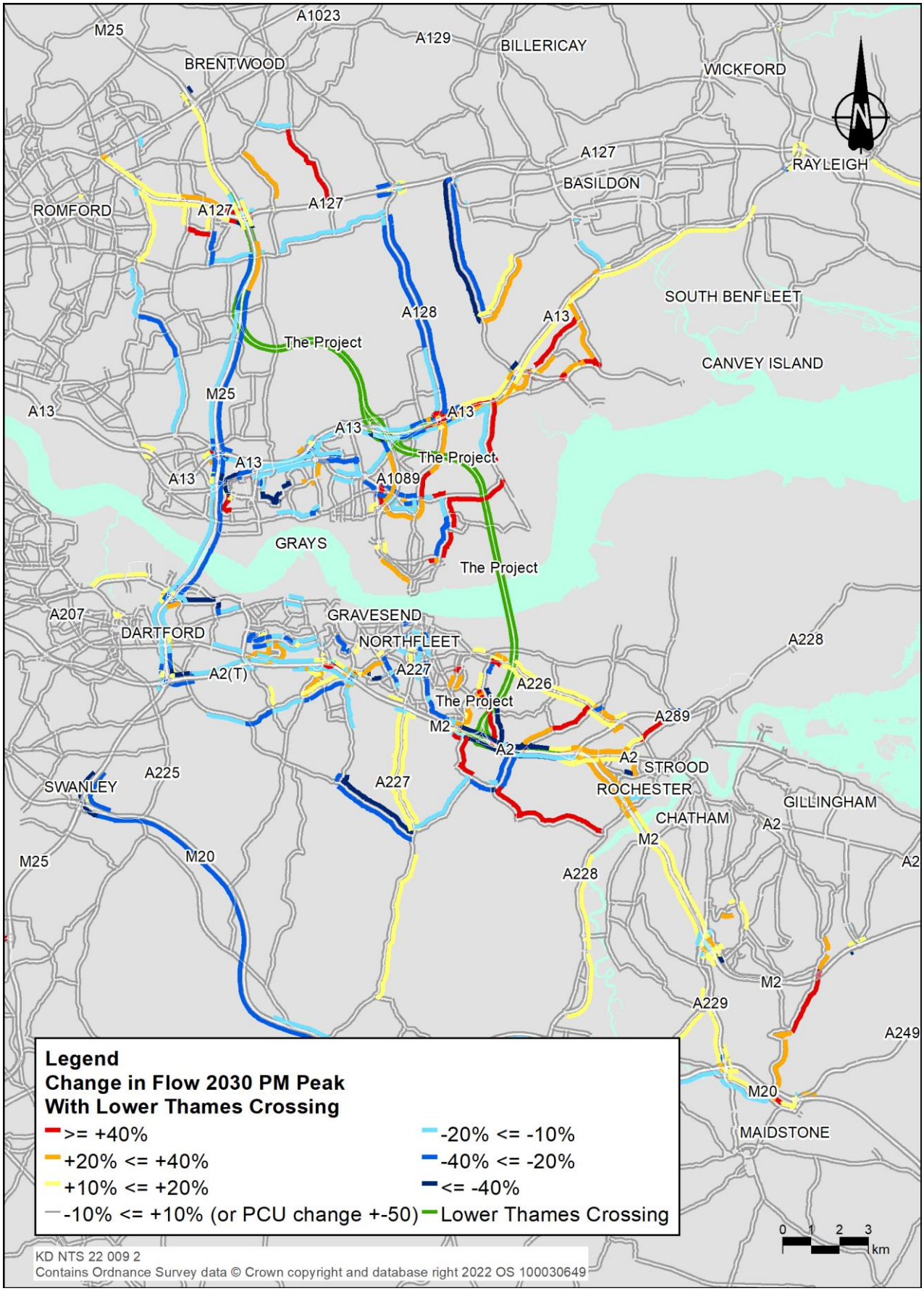


Plate 5.9 Percentage change in flows with the Project: PM peak (17:00–18:00), 2030



Percentage of HGVs

5.2.24 The transport model uses the most recent DfT data (as detailed in Chapter 4) which forecasts the number of HGVs on the road network. Table 5.3 compares the percentage of vehicles that are HGVs using both the Dartford Crossing and the Lower Thames Crossing.

5.2.25 The percentage of vehicles using the Dartford Crossing which are HGVs is forecast to fall once the Project is built, across the morning, evening and inter-peak hours. In addition, the percentage of vehicles using the Project which are HGVs is forecast to be slightly lower than on the Dartford Crossing.

5.2.26 The Project is forecast to reduce the number of HGVs at the Dartford Crossing as it would be an attractive route for those vehicles travelling to and from the ports and other industrial areas. It would be built to the latest design standards so that it would be able to accommodate all HGVs wishing to use the route, without having to use convoys, which is currently the case for some HGVs (such as fuel tankers and abnormal loads) at the Dartford Crossing.

Table 5.3 Percentage of vehicles which are HGVs at the Dartford Crossing and the Lower Thames Crossing

Period	Year	Without the Project	With the Project	
		Dartford Crossing	Dartford Crossing	Lower Thames Crossing
AM peak hour	2016	18		
	2030	18	15	13
	2045	17	14	11
Inter-peak hour	2016	26		
	2030	24	19	20
	2045	23	18	16
PM peak hour	2016	14		
	2030	13	10	9
	2045	12	10	8

Source: Lower Thames Area Model (N108 (Run 1), CM49, CS72)

Journey times

5.2.27 In the transport model, predicted average journey times in the morning peak in 2030 between M25 junction 2 (with the A2) south of the River Thames and M25 junction 31 (for Lakeside) north of the River Thames, are forecast to fall from just under 12 minutes if the Project is not built to seven minutes if it is. In 2045, the journey time would almost halve from 14 minutes without the Project to just over seven and a half minutes with the Project.

5.2.28 If the Project is not built, it is expected that the high levels of traffic using the Dartford Crossing would lead to a higher number of incidents, increased journey times and more days where traffic conditions are worse than typically experienced.

Change in volume/capacity

5.2.29 When the number of vehicles using a road (volume) becomes closer to the number of vehicles that the road can carry (capacity), then the average speed falls and journey times become more unreliable When the volume of traffic (in PCUs) is over 85% of the capacity of the road, queuing or slow-moving traffic is often seen.

5.2.30 Plate 5.10 to Plate 5.15 show the volume of traffic as a percentage of capacity for the road network in the transport model without (Do Minimum) and with (Do Something) the Project, for the AM peak, inter-peak and PM peak hours.

5.2.31 The roads are coloured as follows:

a. Grey if below 75% capacity

b. Yellow if between 75% and 85% capacity

c. Orange if between 85% and 95% capacity

d. Red if over 95% capacity

5.2.32 The plates show there are forecast to be improvements around the Dartford Crossing and on other roads in Gravesham and Thurrock because of the Project. On the wider road network, conditions mostly stay the same. In a number of areas, the ratio of volume to capacity on some roads increases, particularly those close to the Project.

5.2.33 In the AM peak without the Project (i.e. in the Do Minimum scenario), as shown in Plate 5.10, the road network is forecast to have a number of roads where the percentage of volume to road capacity is above 95%, including the Dartford Crossing; sections of the M25, A2, A12 and A13; and areas around Basildon and Rochester.

5.2.34 The Project (see Plate 5.11) is forecast (i.e. in the Do Something scenario) to improve the operation of the road network in the AM peak around the Dartford Crossing, as well as on the M20 and on parts of the M25, A13 and A2. However, some increases are shown in the percentage of volume to capacity on sections of the M25 north of the Project, on the A13 to the east of the Project, and on the M2 as traffic switches away from the M20 to use the Project.

5.2.35 In the inter-peak (see Plate 5.12 and Plate 5.13) there are comparatively fewer places, particularly on the strategic road network, where the percentage of volume to capacity is forecast to be above 75% without the Project. The major exception to this is at the Dartford Crossing, which is forecast to be over 95% without the Project, as shown in red in Plate 5.12. However, the introduction of the Project reduces this forecast to below 75%, as shown in Plate 5.13.

5.2.36 The PM peak (see Plate 5.14 and Plate 5.15) shows a similar pattern to that of the AM peak, in that with the introduction of the Project, the volume over capacity ratio is forecast to reduce on sections of the network close to the Dartford Crossing.

Plate 5.10 Traffic volumes as percentage of road capacity, Do Minimum: AM peak, 2030

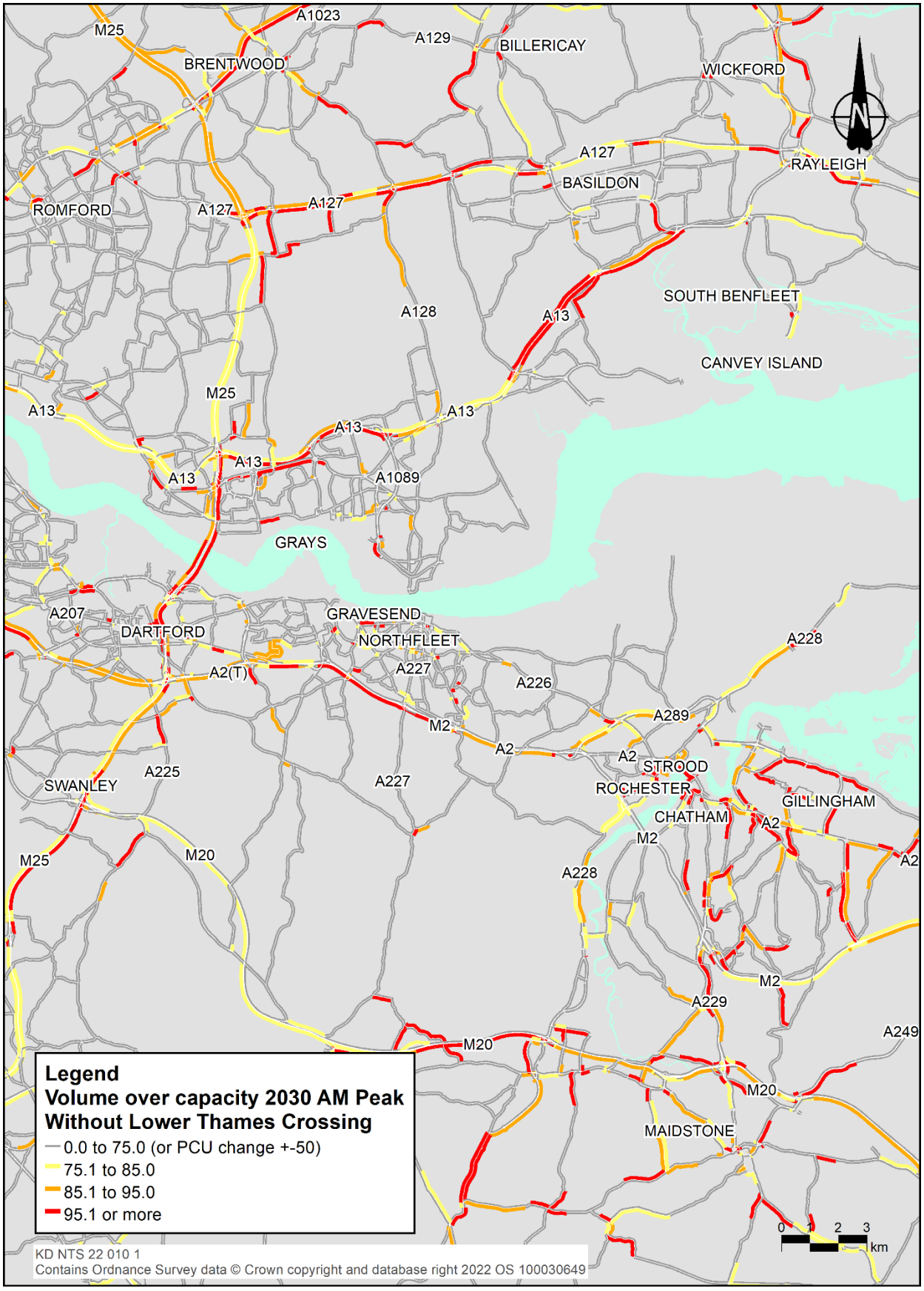


Plate 5.11 Traffic volumes as percentage of road capacity, Do Something: AM peak, 2030

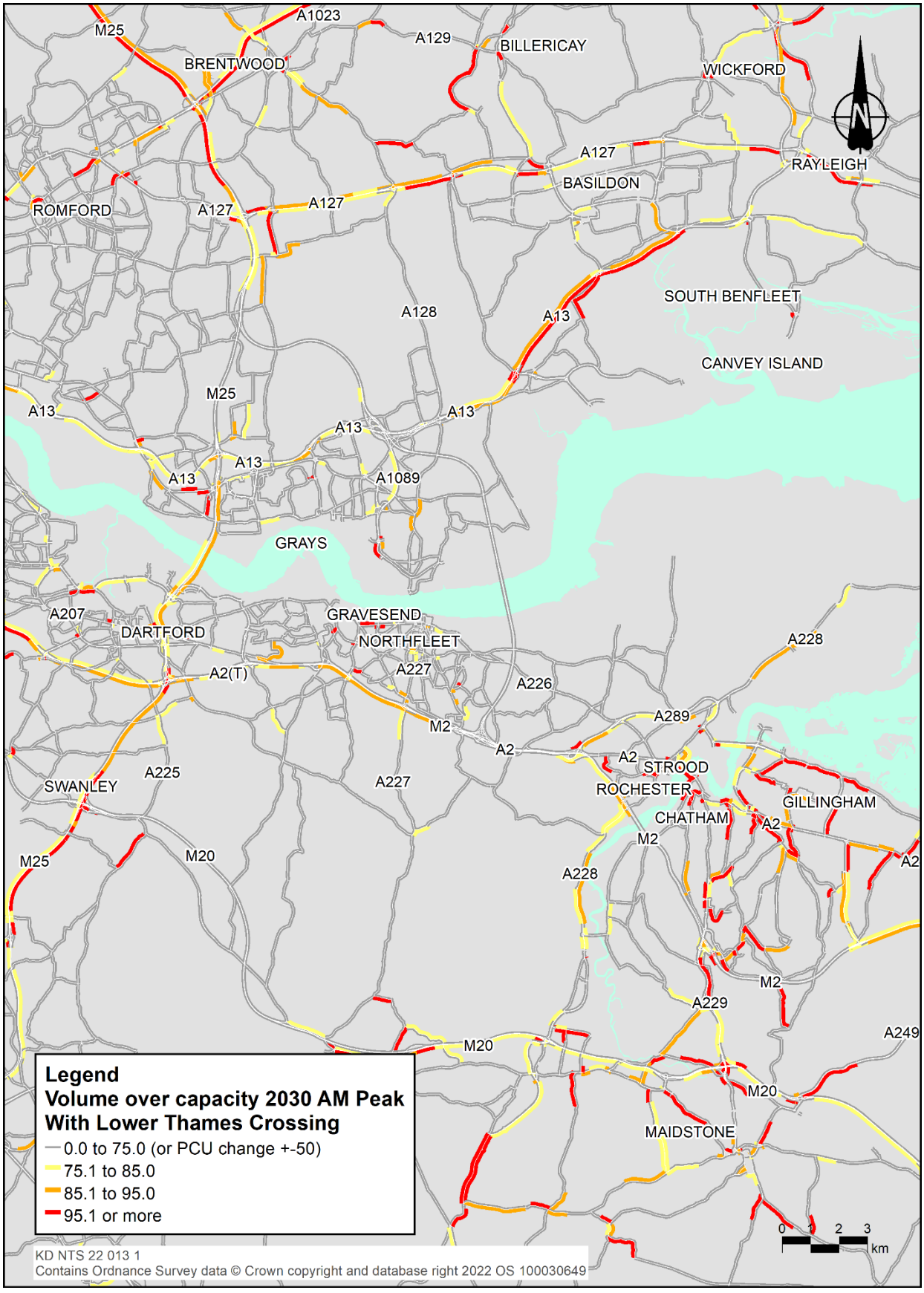


Plate 5.12 Traffic volumes as percentage of road capacity, Do Minimum: Inter-peak, 2030

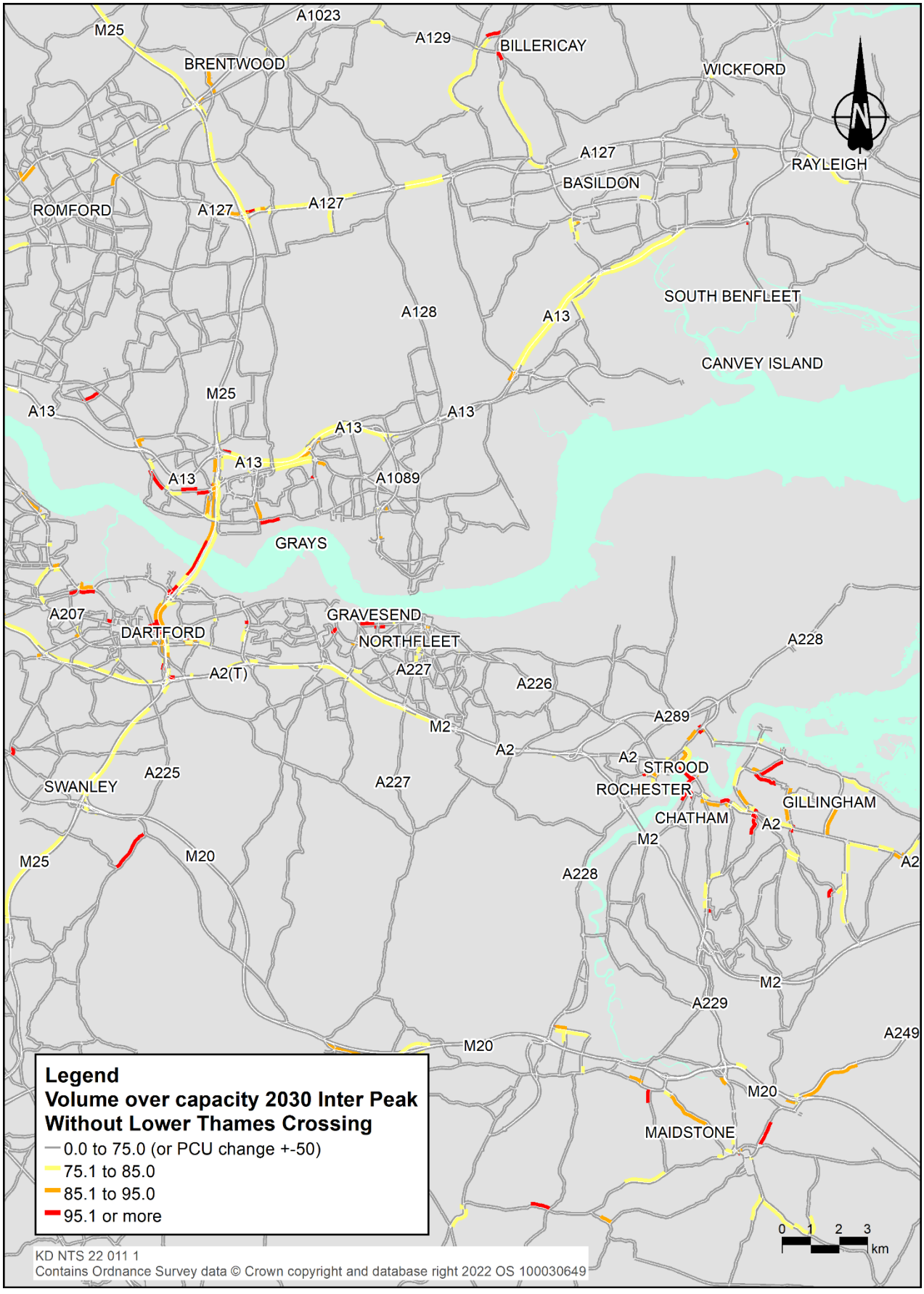


Plate 5.13 Traffic volumes as percentage of road capacity, Do Something: Inter-peak, 2030

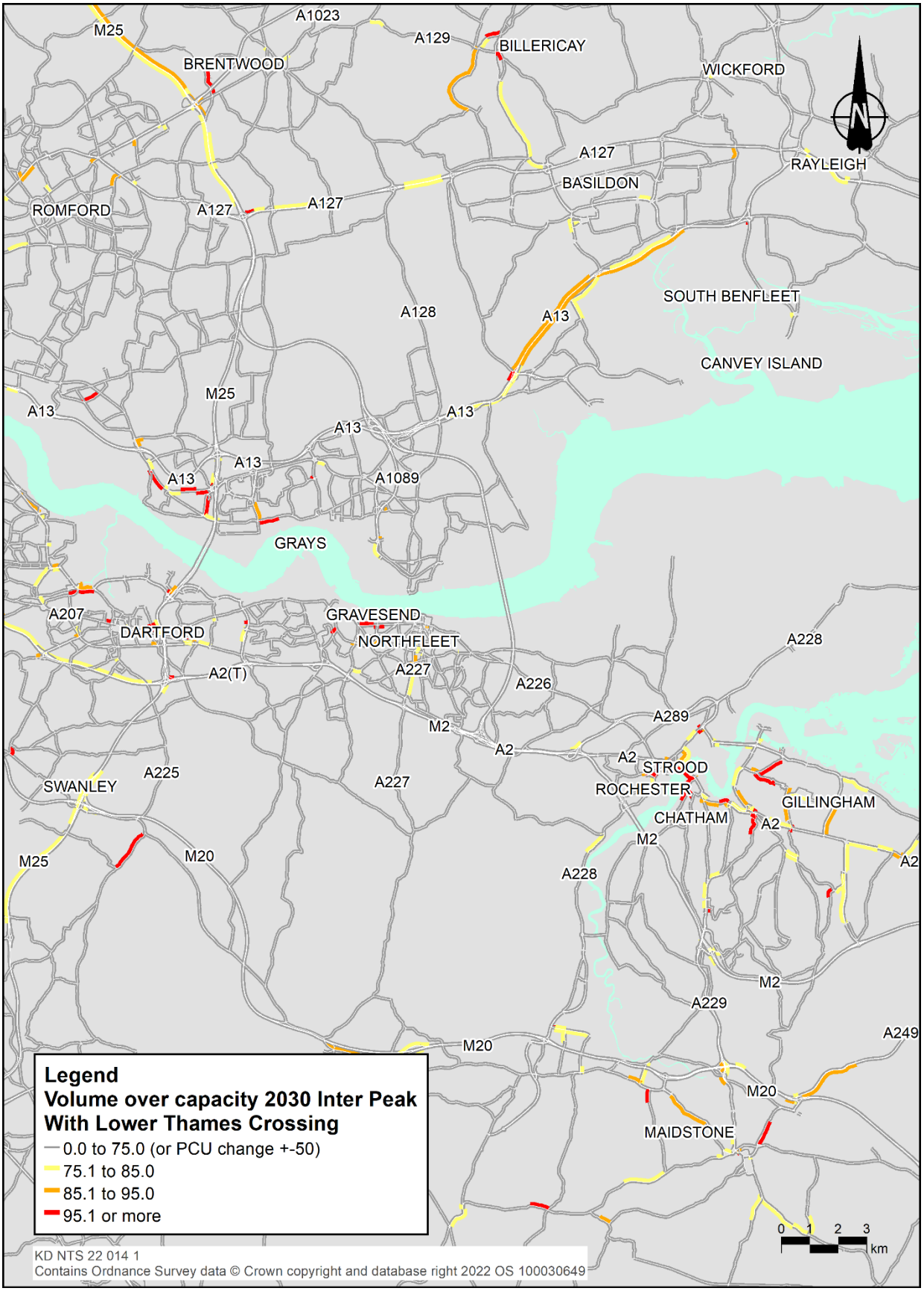


Plate 5.14 Traffic volumes as percentage of road capacity, Do Minimum: PM peak, 2030

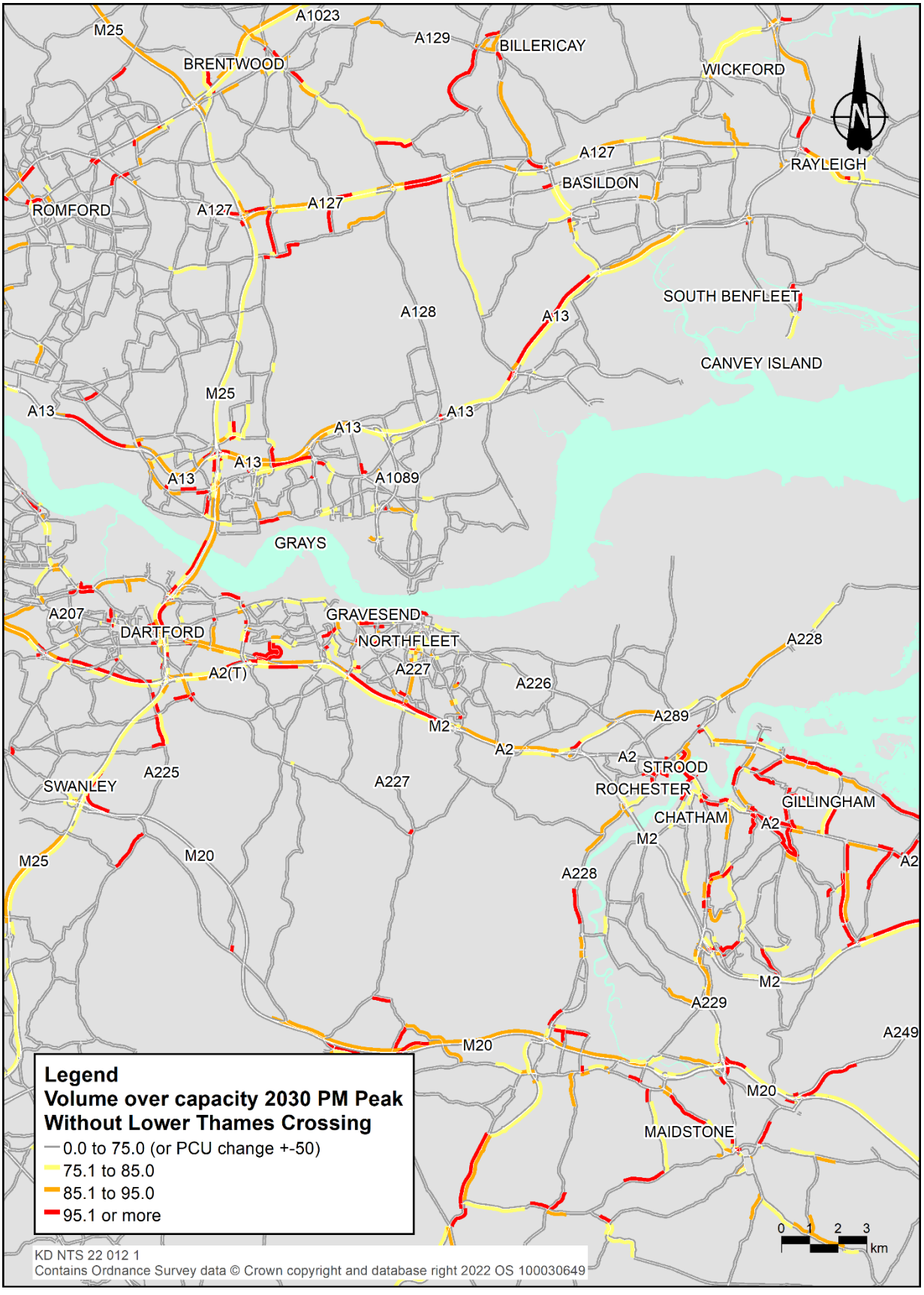
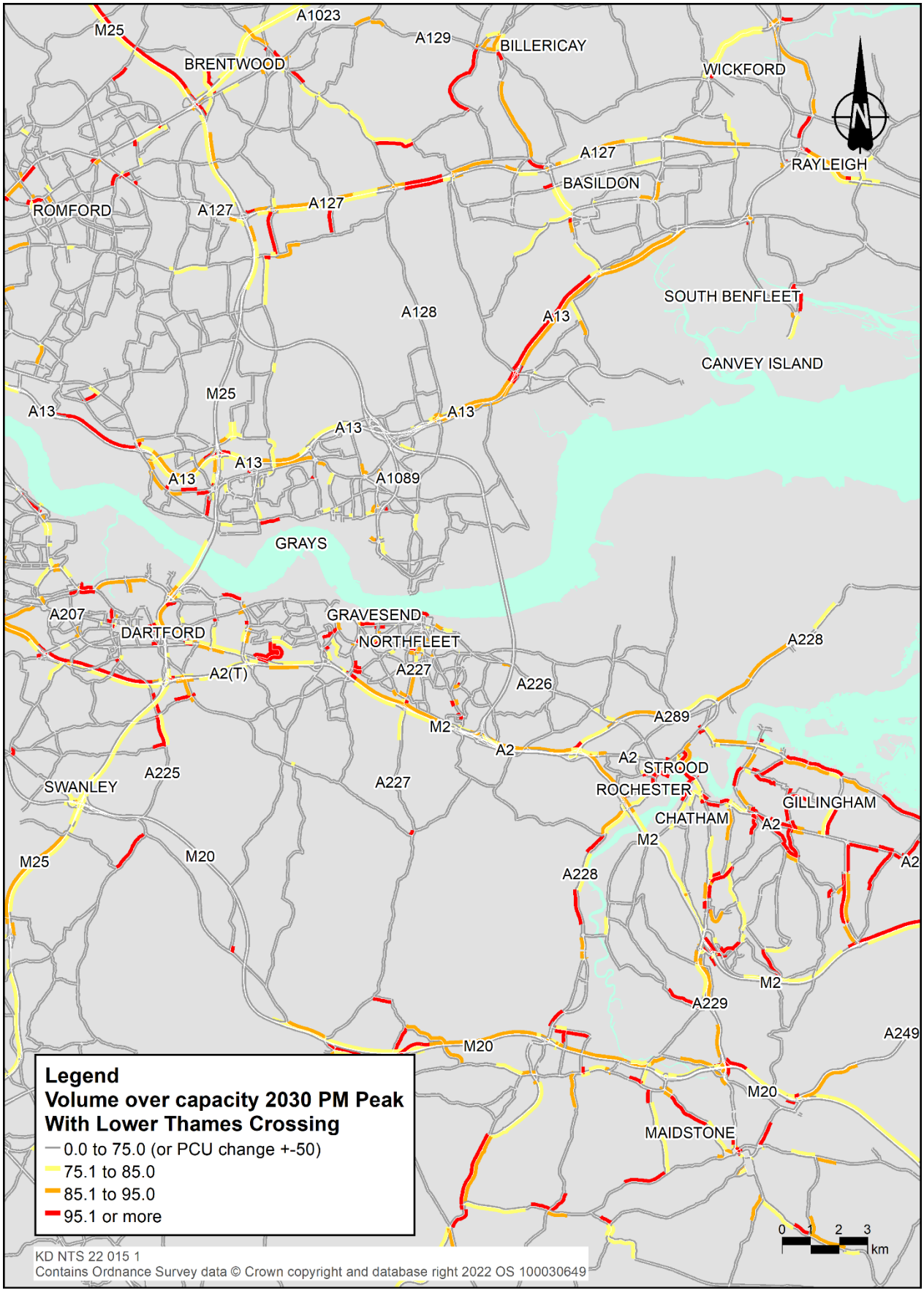


Plate 5.15 Traffic volumes as percentage of road capacity, Do Something: PM peak, 2030



6 Forecasts during the construction of the Lower Thames Crossing

6.1 Introduction

6.1.1 This chapter sets out how the transport model is used to predict the use of the road network during the construction of the Project. More details of the forecast impacts of the construction of the Project are set out in the Transport Assessment (Application Document 7.9).

6.2 Approach

6.2.1 The transport model uses information about the proposed construction programme of the Project as set out in the Outline Traffic Management Plan for Construction (Application Document 7.14) and the outline Materials Handling Plan (Appendix B of the Code of Construction Practice (Application Document 6.3)). This comprises:

a. proposed temporary traffic management measures

b. the forecast workforce traffic movements

c. the forecast HGV movements for Project related vehicles and deliveries.

6.2.2 The Project's construction programme is proposed to run from 2025 until the Project opens in 2030. The proposed construction programme is complex as the construction activities would vary significantly both temporally and spatially. It is therefore not possible to replicate this exactly within the transport model.

6.2.3 The construction programme was divided into 11 construction traffic modelling phases. The timing of the 11 phases is set out in Table 6.1.

Table 6.1 Construction traffic modelling phases

Phase	Start	Finish	Duration (months)
1	January 2025	August 2025	Eight
2	September 2025	February 2026	Six
3	March 2026	May 2026	Three
4	June 2026	October 2026	Five
5	November 2026	March 2027	Five
6	April 2027	August 2027	Five
7	September 2027	March 2028	Seven
8	April 2028	November 2028	Eight
9	December 2028	March 2029	Four
10	April 2029	July 2029	Four
11	August 2029	December 2030	17

6.2.4 For each construction traffic modelling phase, the main traffic management measures, such as narrow lanes and traffic lights at entrances to compounds and to control lane closures, in operation in each phase are included in the coding of the highway network. The model assumes approximations of traffic management measures which reflect a reasonable construction scenario.

6.2.5 The average number of construction vehicles are included in the model in addition to the expected level of background trips, provided by the 2030 Do Minimum traffic model. Full details of the traffic management measures coded into the model, and the forecast number of construction related vehicles, are set out in the Transport Assessment (Application Document 7.9).

6.2.6 The transport model is used to predict the following for each of the 11 construction modelling phases:

a. If the routes drivers would use change as a result of the traffic management measures and the additional construction related traffic on the network

b. impacts on the time journeys would take by car

c. impacts upon journey times for buses

6.3 What the model shows

6.3.1 The transport model is run for each of the construction traffic modelling phases and predicts the changes for road users as a result of the construction of the Project. These changes may include a variation in the route a driver chooses to take, a change from the usual journey time for a trip and an impact on bus journey times.

6.3.2 The Transport Assessment (Application Document 7.9) provides detailed information from the transport model for each construction traffic modelling phase for the AM peak hour, Inter-peak hour and PM peak hour. This information includes:

a. change in flows on the network

b. change in journey times

c. impacts on bus journey times

6.3.3 Given the transport model provides this information for each construction traffic modelling phase and for the three modelled time periods, it is not possible to display this information in a simplified format within this document.

6.3.4 However, some of the outputs for phase 6 are shown in Plate 6.1 to Plate 6.3. This shows the actual change in flows on the network for each of the three modelled time periods. The maps are focussed on the area around construction activities for the Project.

Plate 6.1 Change in flows phase 6: AM peak (07:00-08:00)

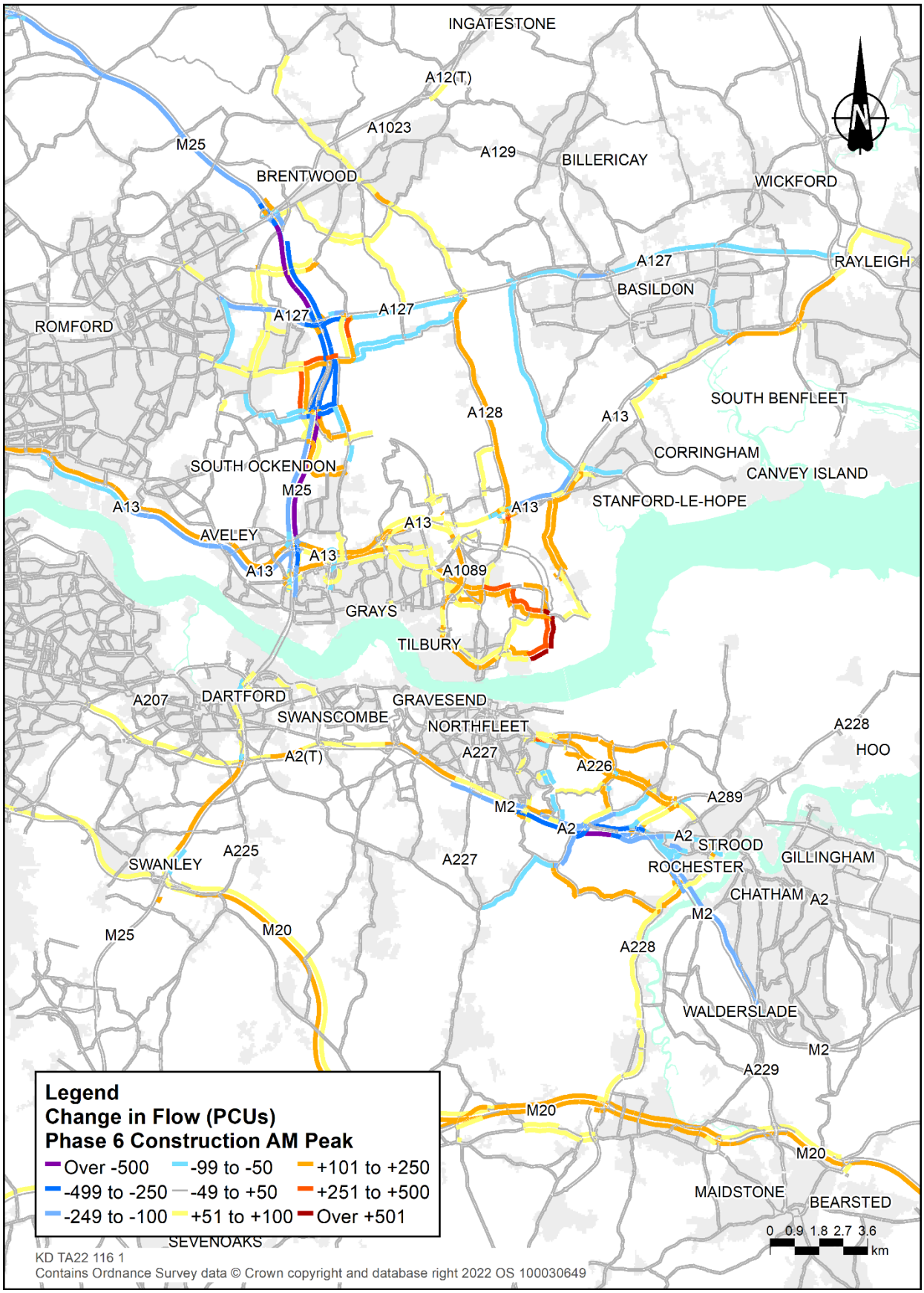


Plate 6.2 Change in flow phase 6: inter peak (07:00–08:00)

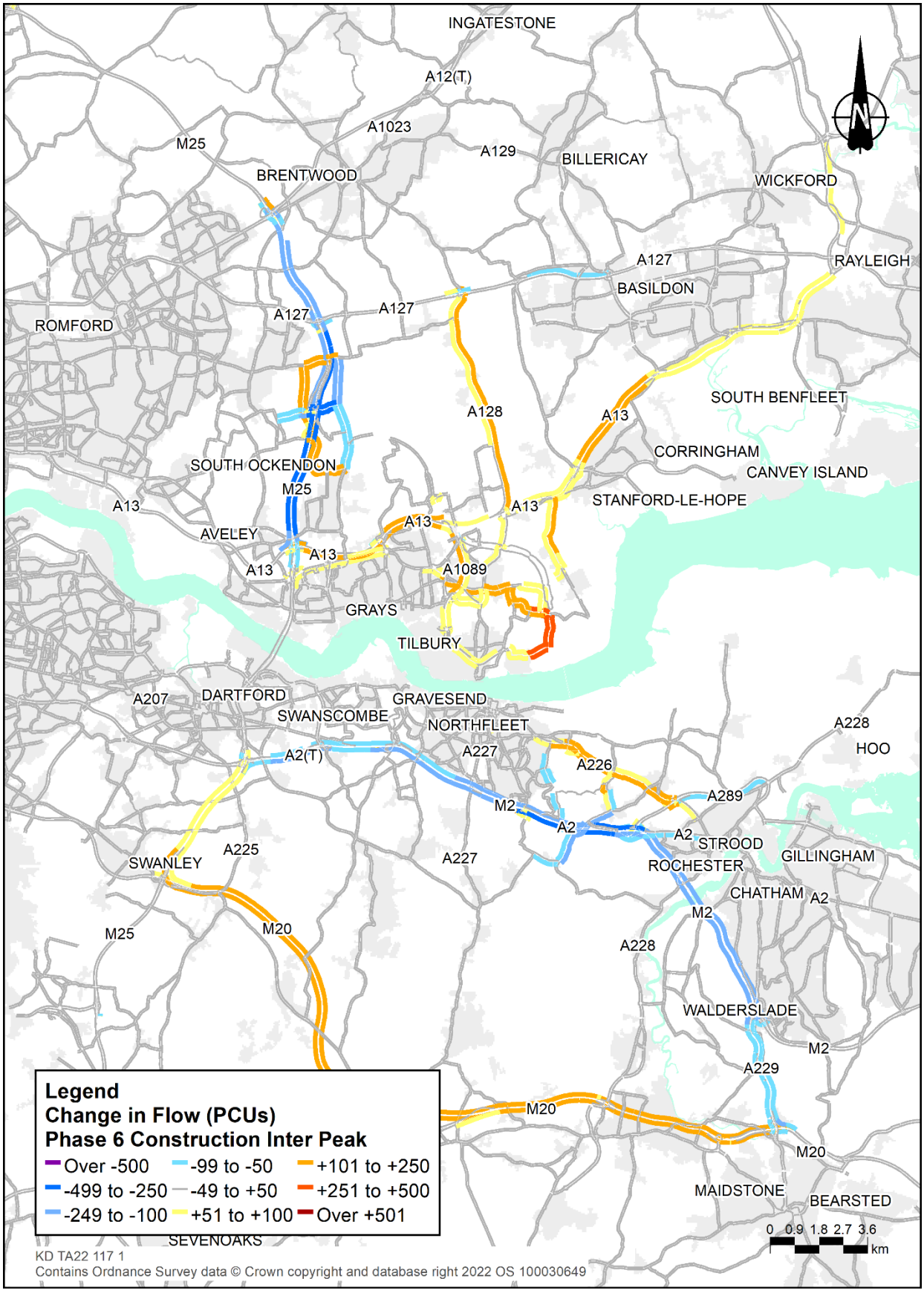
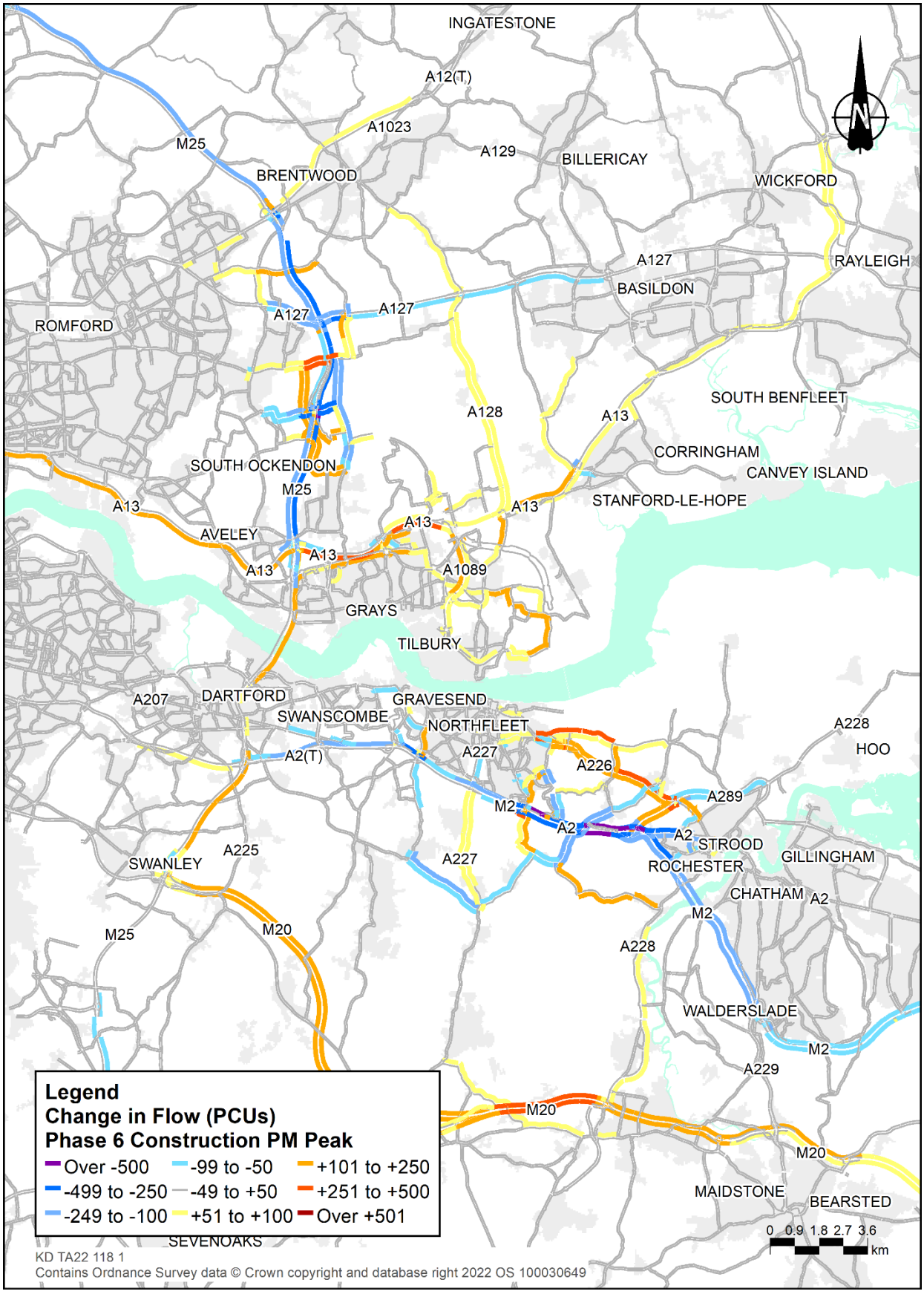


Plate 6.3 Change in flow phase 6: PM peak (07:00–08:00)



7 Summary

7.1.1 This Traffic Forecasts Non-Technical Summary has provided an overview of the forecast impacts on the transport network as a result of the Project.

7.1.2 The document has set out details of the transport model used to assess these impacts, providing details of the data used to inform the model, the processes it has undergone to ensure its suitability to provide a robust assessment of the Project, and a range of outputs showing the forecast impacts.

7.1.3 The transport model has been used to produce forecasts that have informed construction, operational, economic and environmental appraisals of the Project. In addition to the base model, which represents conditions on the transport network in March 2016, the following scenarios have been tested:

a. The 'Do Minimum' scenario, which represents conditions on the transport network in the future if the Project was not built

b. The 'Do Minimum' scenario, with the addition of the predicted traffic management, workforce and HGV movements to enable the Project to be built so that the impacts during construction can be presented.

c. The 'Do Something' scenario, which represents conditions on the transport network in the future if the Project is built

7.1.4 These forecast impacts have been set out in a variety of different ways within this document:

a. Changes in flow at the Dartford Crossing and at the Lower Thames Crossing

b. Changes in flow in the Lower Thames area

c. Percentage change in flow in the Lower Thames area

d. The percentage of HGVs at the Dartford Crossing and at the Lower Thames Crossing

e. Changes in journey times

f. Changes in volume/capacity

7.1.5 The transport model forecasts both congestion and delays on the transport network would get worse if the Project is not built (as shown in the Do Minimum scenario) particularly on the approaches to, and on the Dartford Crossing.

7.1.6 During the construction of the Project, there would be impacts on some road users as a result of traffic management measures and Project related construction traffic. There would also be impacts on some roads as a result of traffic changing its route as a result of Project related construction traffic and traffic management measures.

7.1.7 If the Project is built (as shown by the Do Something scenario), it would provide significant relief to the Dartford Crossing and its approach roads, as well as many roads to the west of the Project, including the A2 and A13. However, there are some roads which are forecast to see an increase in traffic as a result of journeys across the River Thames becoming more attractive.

7.1.8 Further details about the forecast impacts on the transport network can be found in the Combined Modelling and Appraisal Report (Application Document 7.7) and the Transport Assessment (Application Document 7.9).

References

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Local authority online databases checked June 2020

Glossary

Term	Abbreviation	Explanation
AM peak hour		The hour between 07:00–08:00 within the LTAM.
Do Minimum		A future year scenario in the LTAM which includes changes to the road network and planned development that is forecast to go ahead, but not the Lower Thames Crossing.
Do Something		A future year scenario in the LTAM which includes changes to the road network and planned development that is forecast to go ahead, and the Lower Thames Crossing.
Development Consent Order	**DCO**	Means of obtaining permission for developments categorised as Nationally Significant Infrastructure Projects (NSIP) under the Planning Act 2008.
Department for Transport	**DfT**	the government department responsible for the English transport network and a limited number of transport matters in Scotland, Wales and Northern Ireland that have not been devolved.
Global Positioning System	**GPS**	A global navigation satellite system that provides geolocation and time information to a GPS receiver anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites.
Inter-peak		An average hour within the LTAM to represent an hour within the period 09:00–15:00.
Heavy Goods Vehicle	**HGV**	A large, heavy motor vehicle used for transporting cargo.
Lower Thames Area Model	**LTAM**	Transport model designed to forecast impacts of providing additional road based capacity across the River Thames at locations at or east of the existing Dartford Crossing.
M25		Orbital motorway that encircles most of Greater London.
Nationally Significant Infrastructure Project	**NSIP**	Major infrastructure developments in England and Wales, such as proposals for power plants, large renewable energy projects, new airports and airport extensions, major road projects.
Passenger Car Units	**PCU**	A metric to allow different vehicle types within traffic flows in a transport model to be assessed in a consistent manner. Typical PCU factors are: 1 for a car or light goods vehicle; 2.5 for a bus or heavy goods vehicle; 0.4 for a motorcycle; and 0.2 for a pedal cycle.
PM peak hour		The hour between 17:00–18:00 within the LTAM.
Project		A122 Lower Thames Crossing: A proposed new crossing of the Thames Estuary linking the county of Kent with the county of Essex, at or east of the existing Dartford Crossing.
Project road		A122: The new A122 trunk road to be constructed as part of the Lower Thames Crossing project, including links, as defined in Part 2, Schedule 5 (Classification of Roads) in the draft DCO (Application Document 3.1).
Volume over capacity		The volume of traffic as a percentage of capacity of a road.

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