

Lower Thames Crossing

7.9 Transport Assessment (Clean version)

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8 Construction assessment

8.1 Introduction

- 8.1.1 The construction of the Project would have an impact on some of the following four groups of users of the transport network in the Lower Thames area:
- a. users of the highway network due to construction works and the presence of construction traffic on the network.
 - b. passengers on parts of the public transport network.
 - c. walkers, cyclists and horse riders.
 - d. users of the River Thames.
- 8.1.2 This chapter presents the impacts during construction of the Project on these groups.
- 8.1.3 Further detail about the assessments undertaken and the assumptions made is contained within Appendix E Construction traffic assessment supporting information.
- 8.1.4 The Project's construction programme is complex and involves works associated with both the construction of the new highways and the tunnel, and the provision of new, and diversion of, utility connections. This work would result in new, temporary vehicle movements associated with the construction works, as well as changes to existing traffic flows through the introduction of temporary traffic management across the road network.
- 8.1.5 Following the DCO Grant there would be preparatory works, referred to in the draft DCO as preliminary works taking place in 2024. The main construction period for the Lower Thames Crossing would start in early 2025, with the road being open for traffic in late 2030.
- 8.1.6 As with all large projects, assumptions about the construction programme have been made, which would be refined as contractors are appointed and as the detailed design is developed.
- 8.1.7 The Lower Thames Area Model (LTAM) has been used to provide an extensive quantitative assessment of the impact of construction works on the road network.
- a. The LTAM provides a tool for assessing the complex and extensive nature of the construction programme. It enables the consideration of how changes on the road network would change road user choices across the entire impacted region, as they avoid areas of network delay, and so enables the identification of areas that might be impacted by re-routing traffic and the impact of the traffic management measures.

- b. The actual construction works across the region would change on a daily basis, with short term activities of less than a week, and different combinations of works taking place at the same time. For example, two pieces of work each of a month duration may only overlap for a few days. At this stage of planning it is not possible to produce a day to day construction plan for the works, as it would require further input from Contractors, and the detailed planning would take place on a rolling basis as construction proceeds. As a consequence, it is necessary to rationalise the construction programme to allow for it to be represented in a model, while ensuring that it provides assessments of both the transport and environmental impacts associated with the works.
- c. For the purposes of modelling the impacts of these measures on the transport system, and for the environmental assessment, the schedule from early 2025 to late 2030 has been divided into 11 phases. For each phase a representative set of traffic management measures for that phase were coded into the representation of the highway network in the LTAM. In developing these 11 phases a number of assumptions have been made as to the works being undertaken, with the intention of developing a representation of a reasonably worst case construction scenario for each modelled time period.
- d. Traffic management measures have been included when they are in place for half or more of a single phase and on a road that is included in the LTAM. Inclusion of all activities that would occur within the time covered by a single phase would not create a representative assessment of the likely impacts. Throughout a single phase, traffic management measures would be continuously introduced and removed from the highway network. Including all of the traffic management measures at the same time would create a disproportionately worst case representation of the traffic flows across the region. To create a representative model of each phase, the works that are likely to be in place at the same time, based on their comparative length, have been included. This is a proportionate approach to modelling a representative construction programme.
- e. A review of the excluded traffic management measures was undertaken to check that this process had not excluded any traffic management measures that would create significant changes in the traffic flows across the region. While the excluded works do include some closures of local roads would be in place for less than one month and so providing a detailed model focussed solely on this period would be disproportionate. Road closures would be planned with the appropriate local authorities, the framework for working with the local authorities on these works is set out in the oTMPfC (Application Document 7.14).

- f. The LTAM covers an average weekday in the Lower Thames area. Traffic management works that take place over nights and weekends cannot be included in the modelling. Works of this nature would have short term impacts on traffic flows and would be subject to careful planning and engagement with highways authorities.
- g. The LTAM is a strategic model and some local roads or 'C' roads are not included in the model. This is set out in more detail in Appendix B of the Combined Modelling and Appraisal Report (Application Document 7.7). For completeness, the framework for working with the local authorities is set out in the oTMPfC (Application Document 7.14).
- h. Notwithstanding the above exclusions, the construction models developed using the LTAM are a robust representation of a reasonable worst case. In developing the model, a further series of assumptions have been made to ensure that the construction programme is not under-represented. These include:
 - i. A 20% uplift has been made to the earthworks movement volumes to account for uncertainty associated with this stage of design development.
 - ii. Selected shift times have been aligned to sit on the morning and evening traffic peak, whereas the proposed shift times, as set out in the Code of Construction Practice (Application Document 6.3) do not align with peak traffic flows
- i. If a worksite would only be active for part of a phase, the modelling assumes it would be in place for the whole phase; e.g. if a worksite would in place for 50% of a phase, and generating 100 staff trips per month, the value used as the phase average is 100 staff trips, rather than 50.
- j. The application of contraflows as described within this chapter as a traffic management measure have been modelled with fixed signal timings. In reality, the signal timings would be set responsively to travel conditions and so are likely to operate with less delay than has been assumed in the modelling.
- k. No allowance has been made for the effectiveness of the Framework Construction Travel Plan (Application Document 7.13) in reducing staff journeys on the highway network
- l. In addition, a review of the excluded traffic management measures was undertaken to check that this process had not excluded any traffic management measures that would create significant changes in the traffic flows across the region. While the excluded works do include some closures of local roads, and a lane closure on the A13, these would be in place for less than one month.

- 8.1.8 The construction traffic and traffic management measures included in the LTAM incorporate the following elements:
- a. HGV movements associated with the construction of the Project.
 - b. Vehicle movements associated with staff attending the construction worksites.
 - c. Temporary traffic management measures associated with:
 - i. the construction of the new junctions with the A2, A13 and M25
 - ii. the construction of new structures over existing highways
 - iii. the modification of existing roads
 - iv. construction and use of access routes to the construction worksites
 - v. utilities diversions and new utility connections required for the Project
- 8.1.9 The Outline Traffic Management Plan for Construction (oTMPfC) (Application Document 7.14) has been produced which sets the principles which would be applied during the construction of the Project. The Traffic Management Plan for Construction (TMP) will be drafted substantially in accordance with the oTMPfC (Application Document 7.14). The TMP will be submitted and approved by the Secretary of State, following consultation on the plan by National Highways with local authorities and other specified bodies (see Schedule 2, Requirement 10 of the draft DCO (Application Document 3.1)).
- 8.1.10 The following sections of this chapter describe:
- a. the phases used in the traffic modelling
 - b. the changes made to the transport network to represent each phase
 - c. the number of Project-related vehicles in each phase
- 8.1.11 An assessment is then provided of the impact of the construction of the Project, in each phase, on the users of the transport system.
- 8.1.12 Chapter 10 of this TA provides details of how the Project would mitigate the forecast impacts of the construction programme.

8.2 Construction Phasing

- 8.2.1 Following the DCO Grant there would be preparatory works, referred to in the draft DCO as preliminary works taking place in 2024. The main construction period for the Lower Thames Crossing would start in early 2025, with the road being open for traffic in late 2030. These preliminary works are not considered to be significant in traffic terms and so do not form part of the assessment within this TA. These works would however be controlled by the measures set out in the oTMPfC (Application Document 7.14).

- 8.2.2 The construction of the Project would require the use of traffic management measures, such as narrow lanes and traffic lights to control traffic through contraflows. As these would be required for a variety of different works, they would be in place for differing lengths of time; some relatively short term, while others would last for longer periods.
- 8.2.3 The impacts on the performance of the highway network as a result of the construction of the Project were forecast by using the LTAM. As the traffic management measures occur at different times, and the number of additional construction vehicles on the network vary over time, a series of representative phases were modelled using the LTAM.
- 8.2.4 For the purposes of assessing the impacts of the proposed construction programme on the transport network a phasing plan was developed, primarily based on the scheduled traffic management measures. This led to the identification of 11 phases for the construction period where, as far as possible, the traffic management within each phase is constant. Some approximations have been made which means that, in some instances, the duration of the traffic management measures has been slightly increased or decreased in order to fit in with the phases modelled.
- 8.2.5 The number of construction related vehicle movements have been averaged over each phase, so that the LTAM forecasts the average conditions within each phase.
- 8.2.6 The indicative start and end dates of each of the 11 phases are shown in Table 8.1.

Table 8.1 Construction modelling phases

Phase	Start	End	Duration (months)
1	01/01/2025	31/08/2025	8
2	01/09/2025	28/02/2026	6
3	01/03/2026	31/05/2026	3
4	01/06/2026	31/10/2026	5
5	01/11/2026	31/03/2027	5
6	01/04/2027	31/08/2027	5
7	01/09/2027	31/03/2028	7
8	01/04/2028	30/11/2028	8
9	01/12/2028	31/03/2029	4
10	01/04/2029	31/07/2029	4
11	01/08/2029	31/12/2030	17

Terminology

- 8.2.7 Within this chapter, reference is made to the following terms. An explanation of their meaning is provided here for clarity:
- 8.2.8 Haul roads: Some compound accesses would require the addition of temporary new link roads between compounds and the existing highway infrastructure.

These are known as haul roads and they would generally follow the alignment of the Project road. Some of these haul roads would require new temporary priority or signalised junctions to be created to enable construction traffic to access and egress the compounds.

- a. Background traffic: In this chapter the term ‘background traffic’ is used to describe the existing or forecast general traffic on the road network and the term ‘construction traffic’ is used to describe the forecast construction and staff/worker vehicles travelling to and from the construction worksites.
- b. Scenarios: In this chapter, for the purposes of describing the construction modelling the term ‘without construction scenario’ (Do Minimum) is used to describe the road network if the Project construction was not happening. The ‘with construction scenario’ (Do Something) represents the network with the Project construction activities.

Networks by phase

- 8.2.9 The starting point for the development of the networks was the coding of the 2030 Do Minimum network in the LTAM. This is described more fully in the Combined Modelling and Appraisal Report, Appendix C: Transport Forecasting Package (Application Document 7.7).
- 8.2.10 The Thurrock Flexible Generation Plant (TFGP) is planned to be constructed at the same time as the Project and as such, consideration of its forecast impact on the road network during its construction has been made within the construction assessment of the Project on the road network. This is set out below.
- 8.2.11 There are currently a range of different options for the construction of the TFGP as outlined in their Environmental Statement and Transport Assessment (The Planning Inspectorate, 2022). For the purposes of the Project’s construction modelling the most impactful scenario was assumed to be construction beginning in Q3 2022 and running in three 18 month phases with a nine month gap in between each phase. This leads to the following dates for the TFGP construction phases:
 - a. Phase 1: July 2022 to December 2023 (before Project Construction)
 - b. Phase 2: October 2024 to March 2026 (Project phases 1, 2, and the first month of phase 3)
 - c. Phase 3: January 2027 to June 2028 (the last two months of phase 5, through to the first three months of phase 8)
- 8.2.12 If the TFGP construction phase occurs within a Project construction modelling phase, the TFGP construction has been assumed for the whole of that phase and included in the LTAM. These additional vehicles on the network due to the construction of the TFGP lead to a requirement to develop two separate Do Minimum scenarios, which affect the Do Minimum matrices used. These are defined as follows:
 - a. Do Minimum A (DMA): Excluding TFGP construction traffic
 - b. Do Minimum B (DMB): Including TFGP construction traffic

8.2.13 Table 8.2 describes how the different Do Minimum (DM) and Do Something (DS) scenarios are related to the different phases, and Plate 8.1 presents this graphically.

Table 8.2 Correspondence Between Phases and Scenarios

Phase	Without construction (DM) scenario	With construction (DS) scenario
1	2030 DM including TFGP (DMB)	2030 DM including TFGP plus Phase 1 construction arrangements
2	2030 DM including TFGP (DMB)	2030 DM including TFGP plus Phase 2 construction arrangements
3	2030 DM including TFGP (DMB)	2030 DM including TFGP plus Phase 3 construction arrangements
4	2030 DM excluding TFGP (DMA)	2030 DM excluding TFGP plus Phase 4 construction arrangements
5	2030 DM including TFGP (DMB)	2030 DM including TFGP plus Phase 5 construction arrangements
6	2030 DM including TFGP (DMB)	2030 DM excluding TFGP plus Phase 6 construction arrangements
7	2030 DM including TFGP (DMB)	2030 DM including TFGP plus Phase 7 construction arrangements
8	2030 DM including TFGP (DMB)	2030 DM including TFGP plus Phase 8 construction arrangements
9	2030 DM excluding TFGP (DMA)	2030 DM excluding TFGP plus Phase 9 construction arrangements
10	2030 DM excluding TFGP (DMA)	2030 DM excluding TFGP plus Phase 10 construction arrangements
11	2030 DM excluding TFGP (DMA)	2030 DM excluding TFGP plus Phase 11 construction arrangements

Plate 8.1 Construction traffic modelling scenarios

	2025		2026		2027		2028		2029		2030
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
Without Construction	<i>DMB</i>	<i>DMB</i>	<i>DMB</i>	<i>DMA</i>	<i>DMB</i>	<i>DMB</i>	<i>DMB</i>	<i>DMB</i>	<i>DMA</i>	<i>DMA</i>	<i>DMA</i>
2030 DM											
TFGP Construction Traffic											
With Construction											
2030 DM											
TFGP Construction Traffic											
Construction traffic management (phase specific)											

8.3 Networks

Introduction

- 8.3.1 This section provides more details on how the different aspects of construction activity have been represented in the LTAM networks. It presents the proposed location of the construction compounds and the Utility Logistics Hubs (ULH), and the proposed access and egress arrangements for each compound.

Construction compounds and Utility Logistics Hubs

- 8.3.2 The works associated with the construction of the Project were defined in terms of a series of compounds that have been grouped into Sections. Plate 8.2 to Plate 8.4 show the compounds and ULHs in relation to the existing network and the Project alignment.

Plate 8.2 Construction compounds and Utility Logistics Hubs (1 of 3)

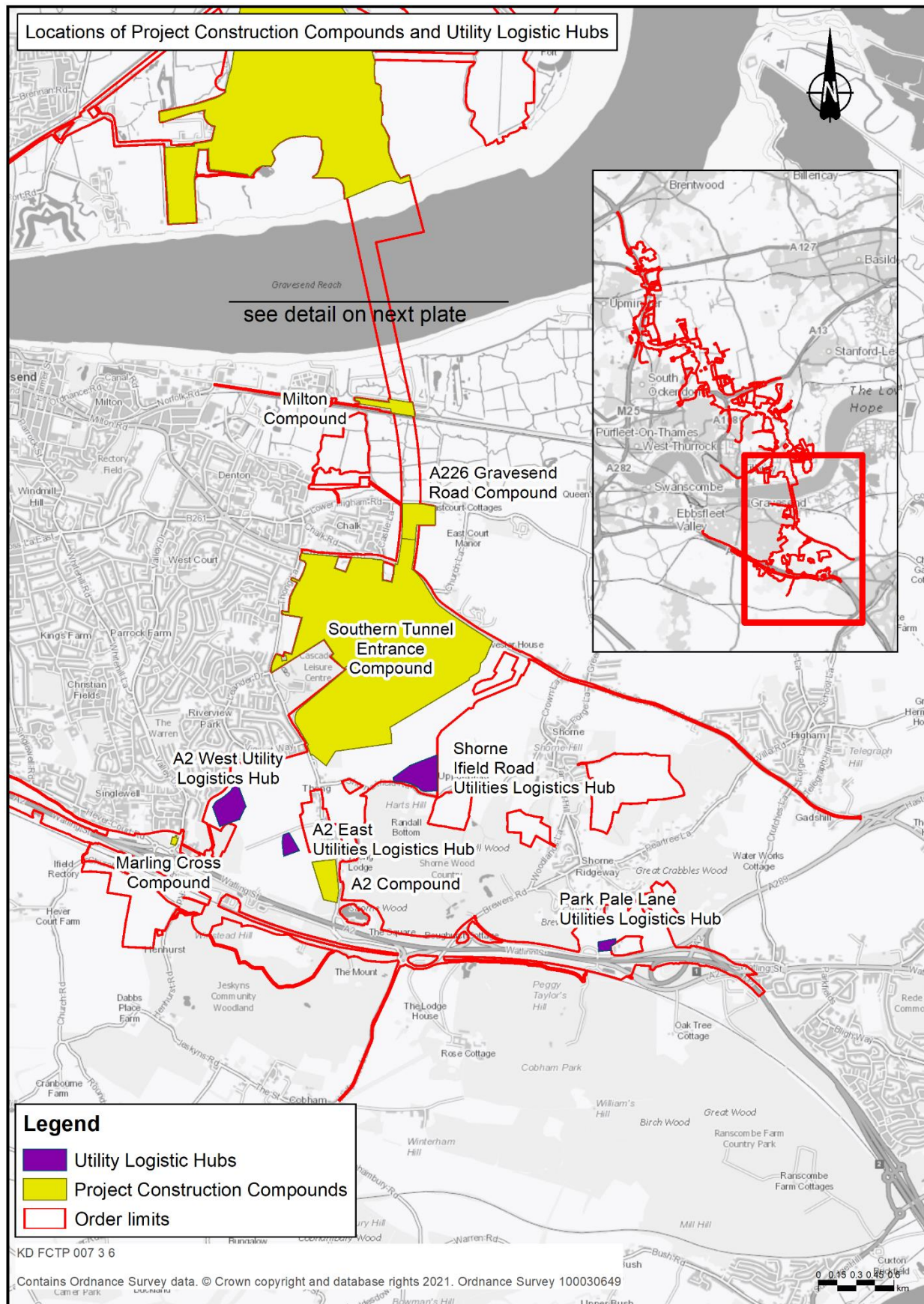


Plate 8.3 Construction compounds and Utility Logistics Hubs (2 of 3)

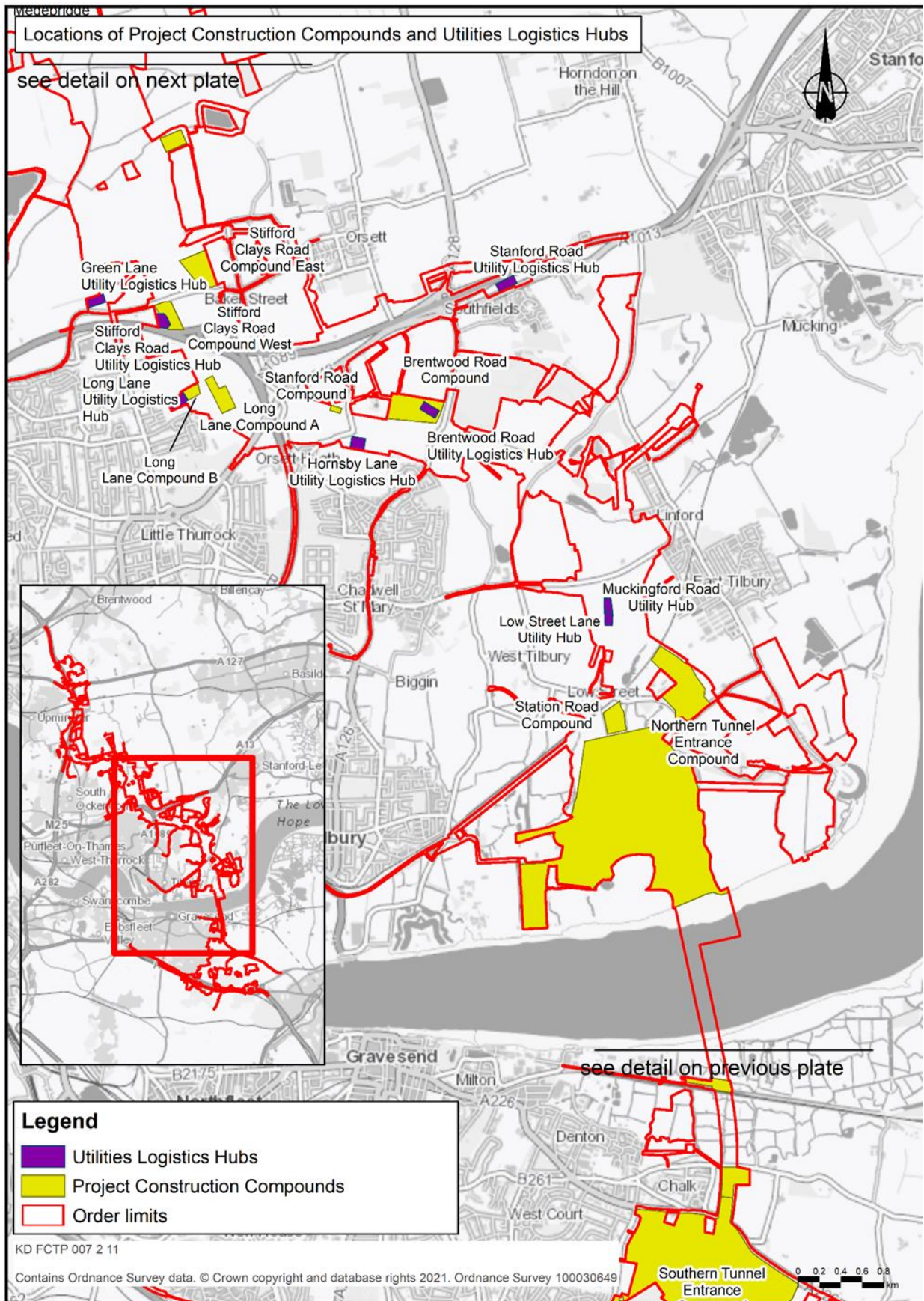
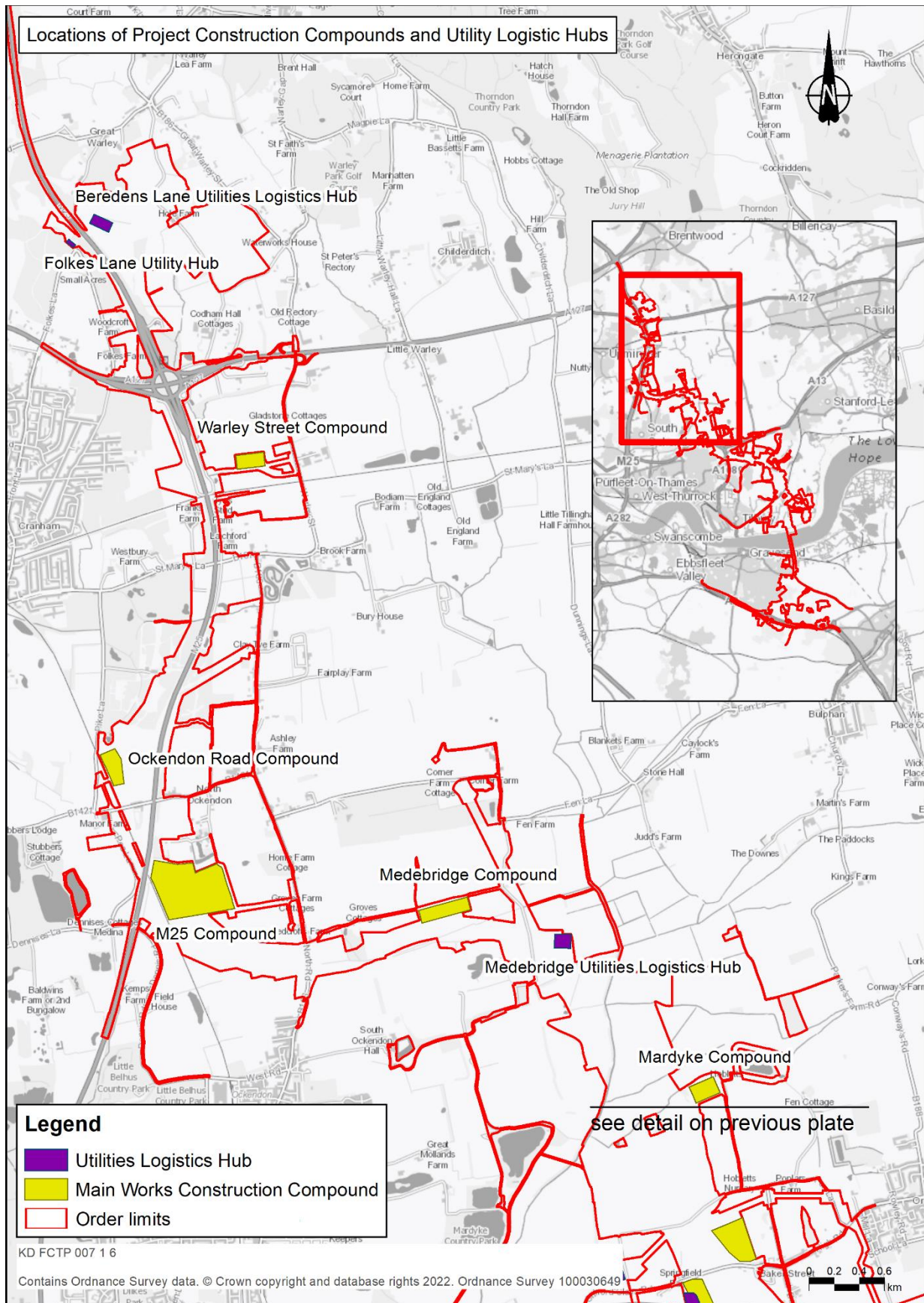


Plate 8.4 Construction compounds and Utility Logistics Hubs (3 of 3)



Haul roads

- 8.3.3 During the construction of the Project a series of haul roads would be built for use by construction vehicles. These would generally follow the alignment of the Project road and would allow access without the need to use the local road network.
- 8.3.4 Some of the haul roads would be for use by internal construction activity only and are therefore excluded from assessment within this TA as they would not have an impact on the public road network (construction activity on these roads is considered within “Plant Activity” within the Environmental Statement (Application Document 6.1)). Some of the haul roads would be used to transfer materials between compounds or to deliver supplies from external suppliers and therefore are included within this assessment.
- 8.3.5 Table 8.3 provides the programme for when each haul road is opened and able to be used by Project related construction traffic. Plate 8.5 to Plate 8.12 show the location of each haul road.

Table 8.3 Programme of haul road availability in the LTAM

No.	ID	Haul road description	Phase availability
1	H18	Haul road between the A2 and Southern tunnel entrance compounds	Phase 2 – Phase 11
2	H16	Haul road between the Southern tunnel entrance and A226 Gravesend Road compounds	Phase 2 – Phase 11
3	H19	Haul road within the Northern tunnel entrance and the Station Road compounds	Phase 1 – Phase 11
3a	H25	Haul road between the Station Road and Brentwood Road compounds	Phase 2 – Phase 11
4	H20	Haul road between Brentwood Road and the Stanford Road compounds	Phase 2 – Phase 11
4a	H24	Haul road underneath the A13	Phase 5 – Phase 11
5	H21	Haul road between Green Lane and Stifford Clays Road - serving the Stifford Clays Road East and Stifford Clays Road West compounds	Phase 2 – Phase 11
6	H17	Haul road between the Stifford Clays Road compound West and M25 temporary slip road	Phase 2 – Phase 11
7	H22	M25 temporary on-off slips, south of Ockendon Road (between M25 junction 29 and junction 30)	Phase 4 – Phase 11

Plate 8.5 Haul road 1 (between the A2 and Southern tunnel entrance compounds)

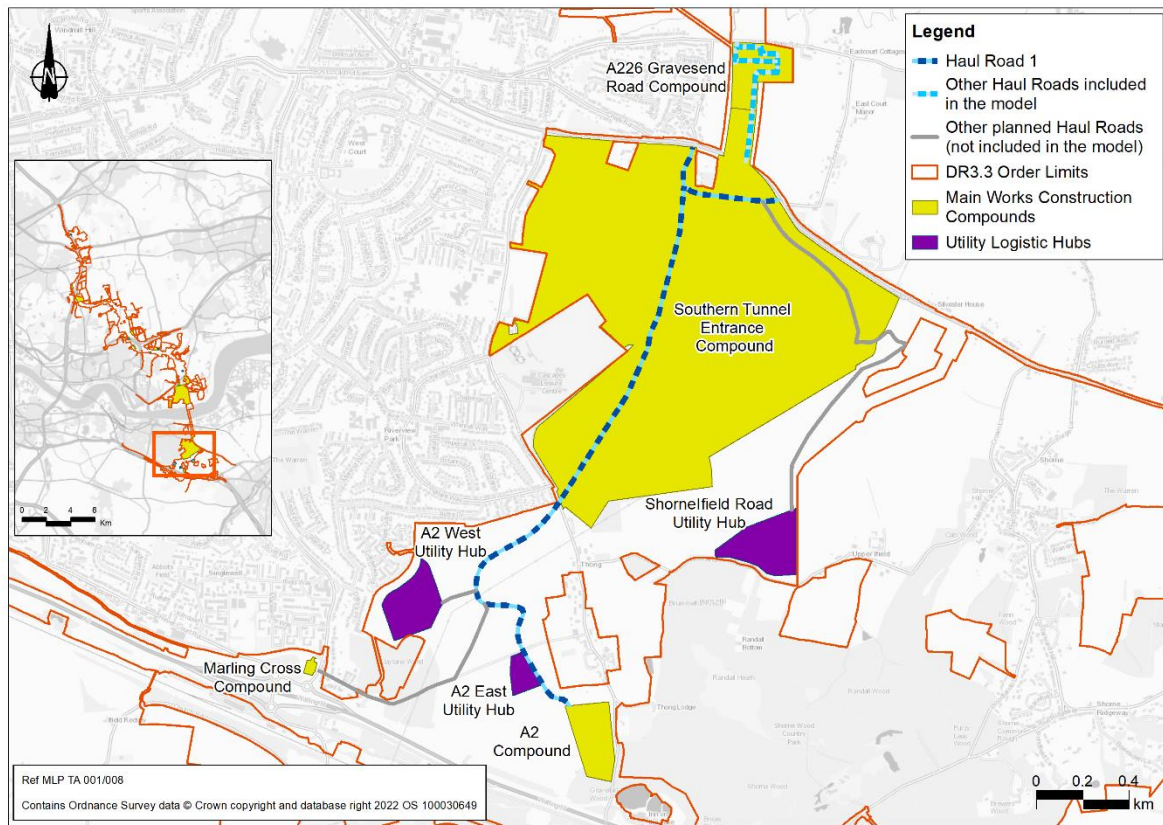


Plate 8.6 Haul road 2 (between the Southern tunnel entrance and A226 Gravesend Road compounds)

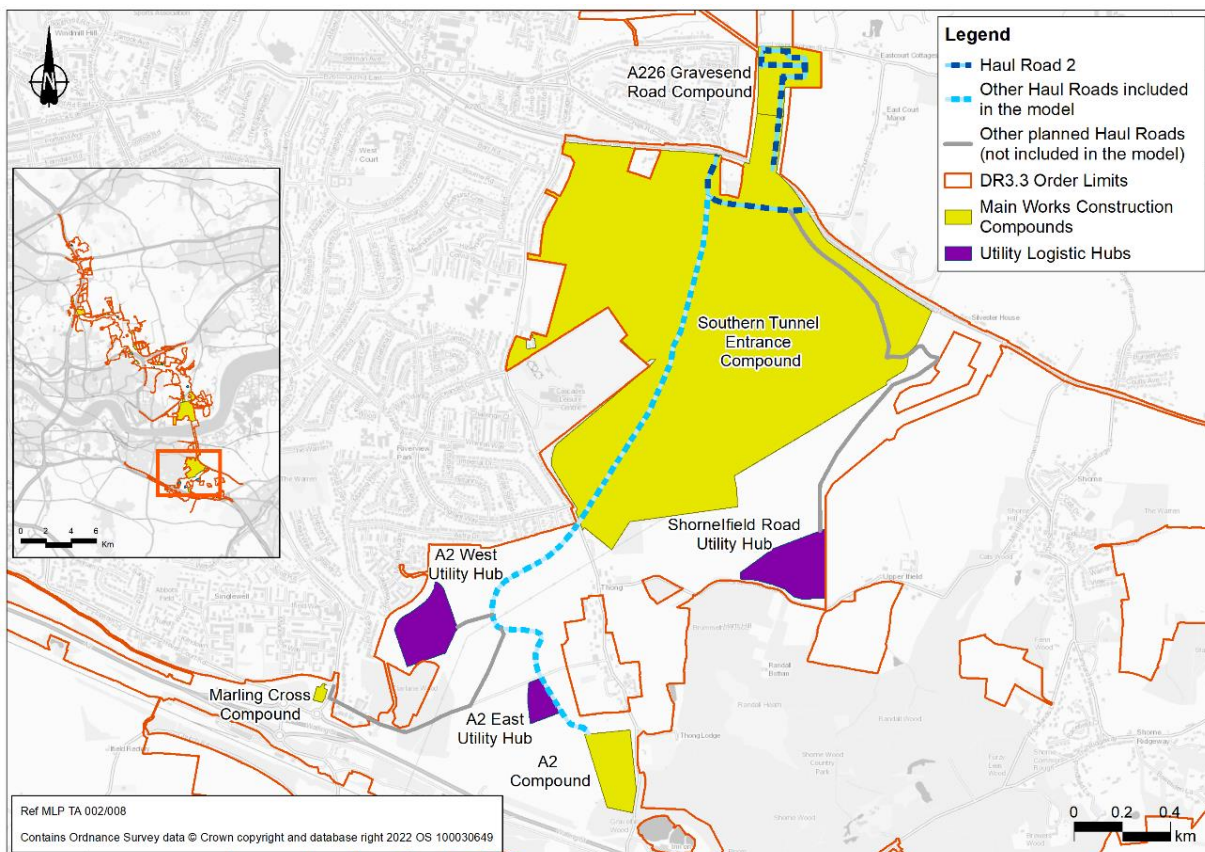


Plate 8.7 Haul road 3 (within the Northern tunnel entrance and Station Road compounds)

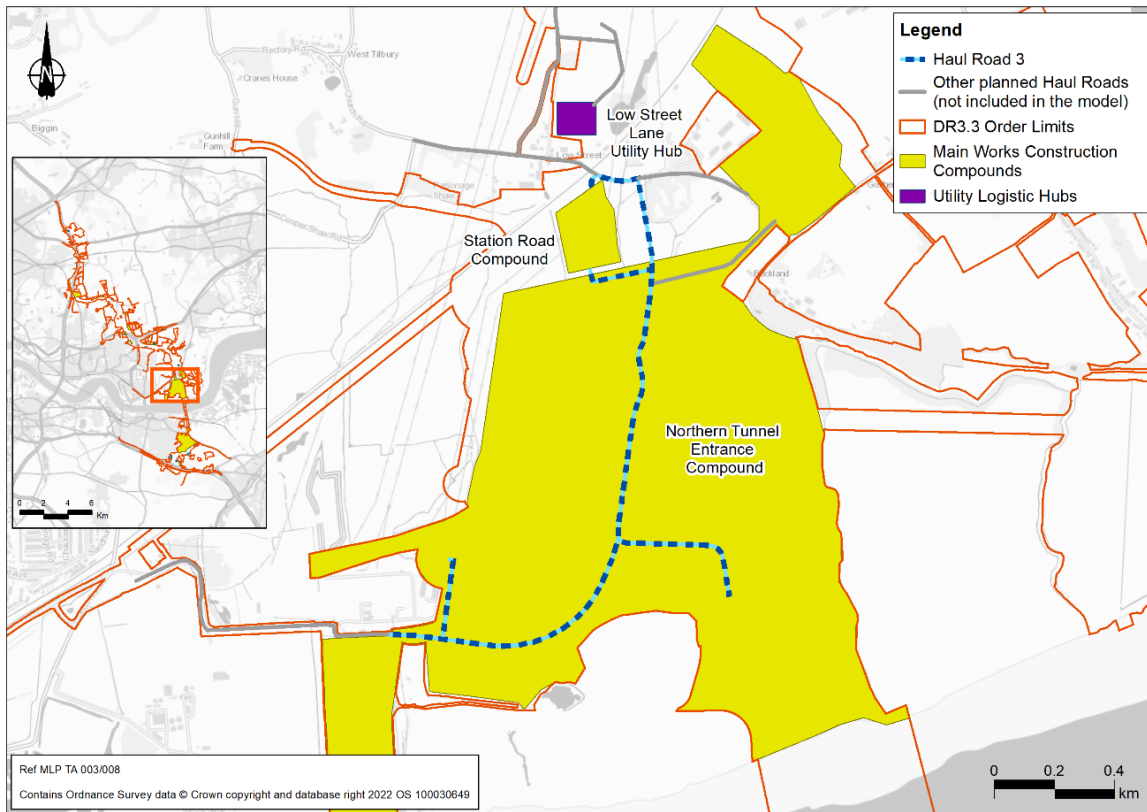


Plate 8.8 Haul road 3a (between the Station Road and Brentwood Road compounds) haul road 4 (between Brentwood Road and the Stanford Road compounds)

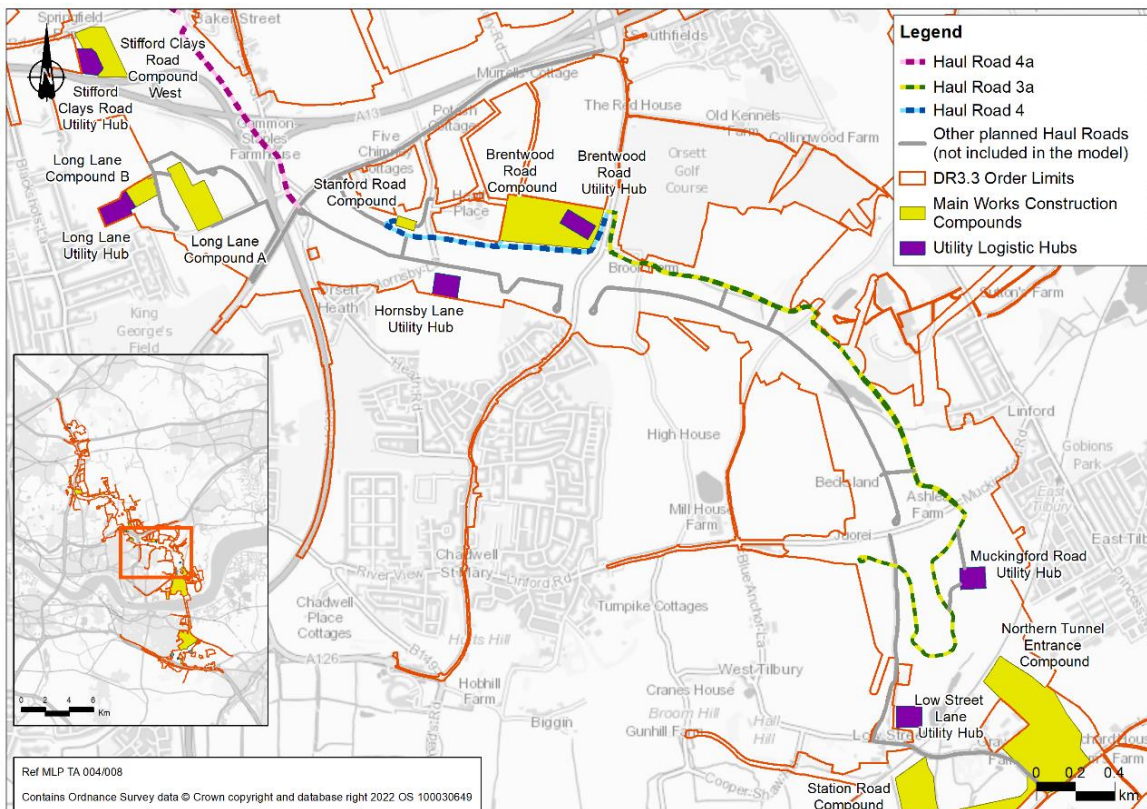


Plate 8.9 Haul road 4a (underneath the A13) and haul road 5 (between Green Lane and Stifford Clays Road - serving the Stifford Clays Road West and Stifford Clays Road East compounds)

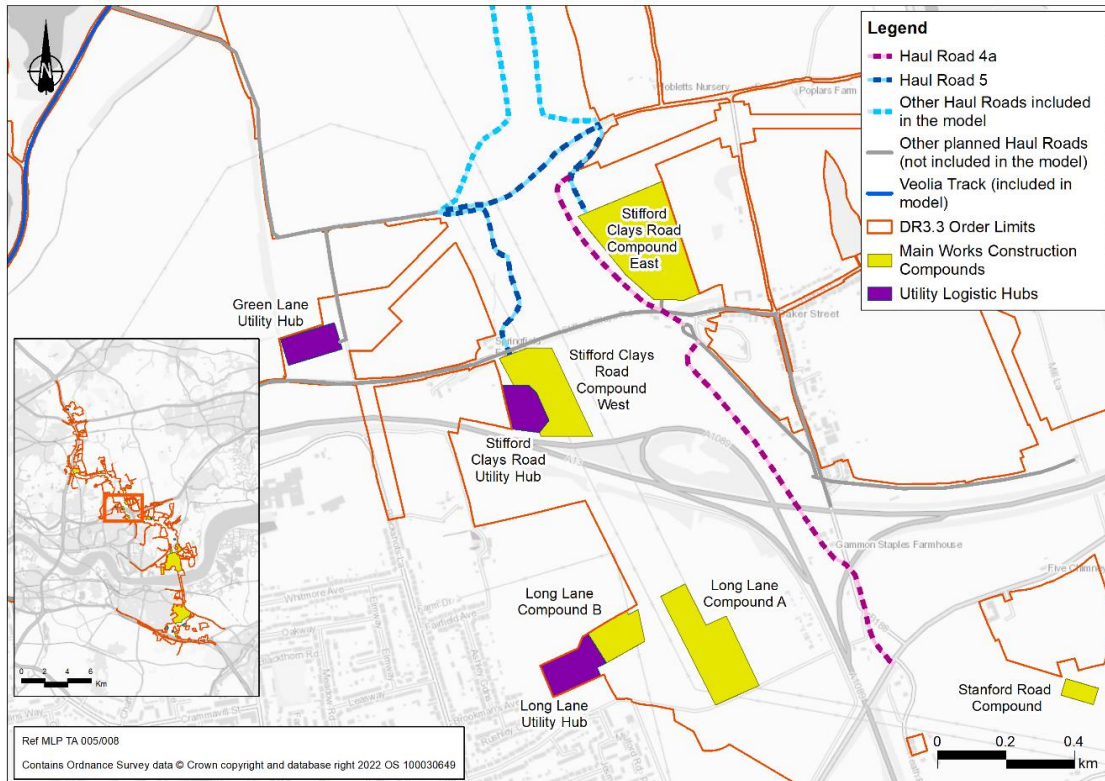


Plate 8.10 Haul road 6 (haul road between the Stifford Clays Road compound West and M25 temporary slip road) – phase 2 to 4

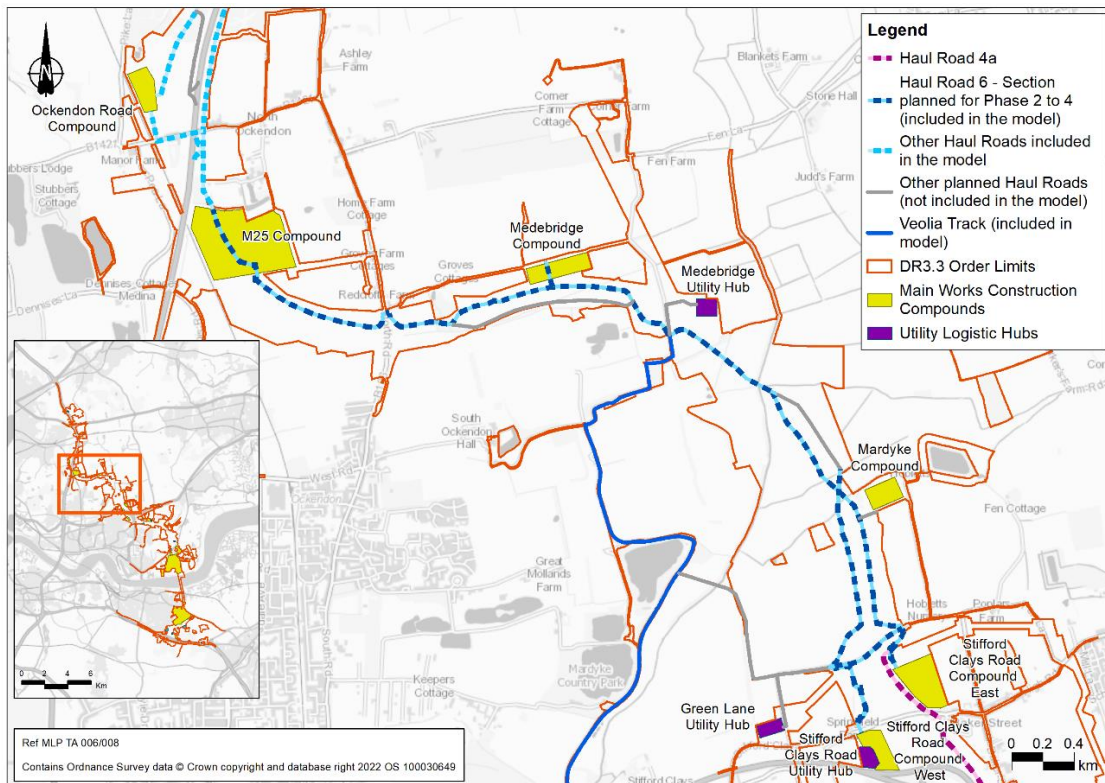


Plate 8.11 Haul road 6 (haul road between the Stifford Clays Road compound West and M25 temporary slip road) – phase 5 to 11

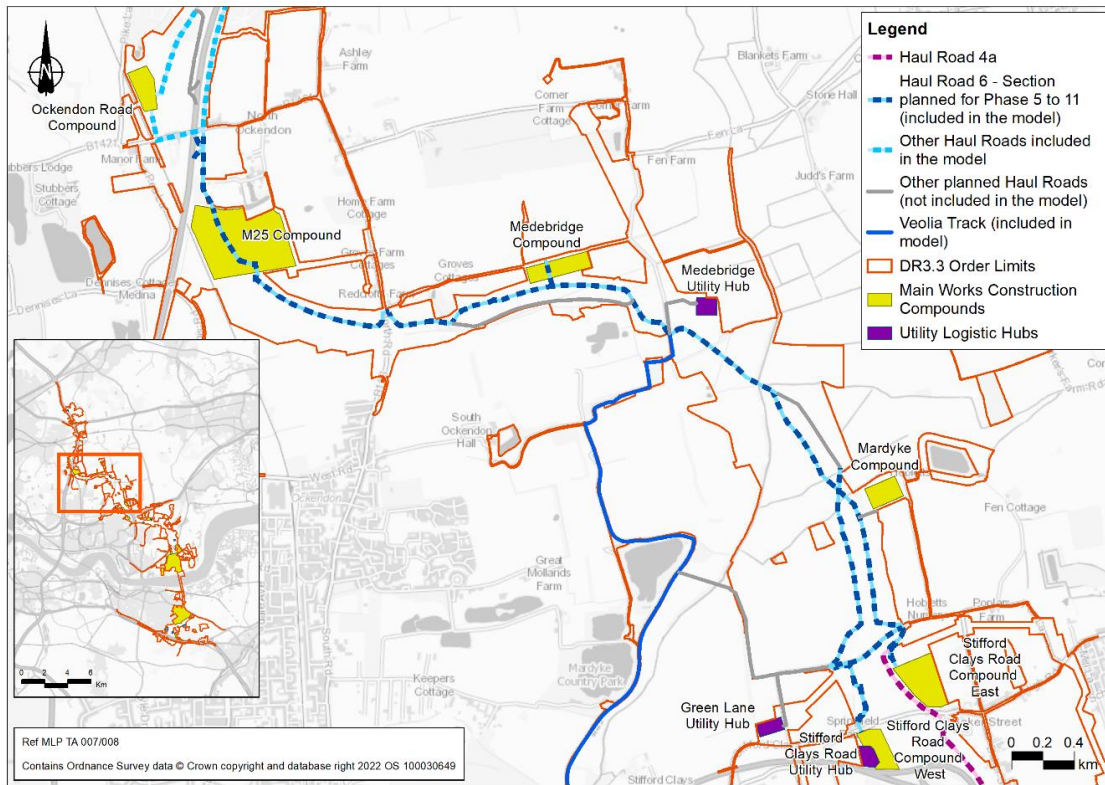
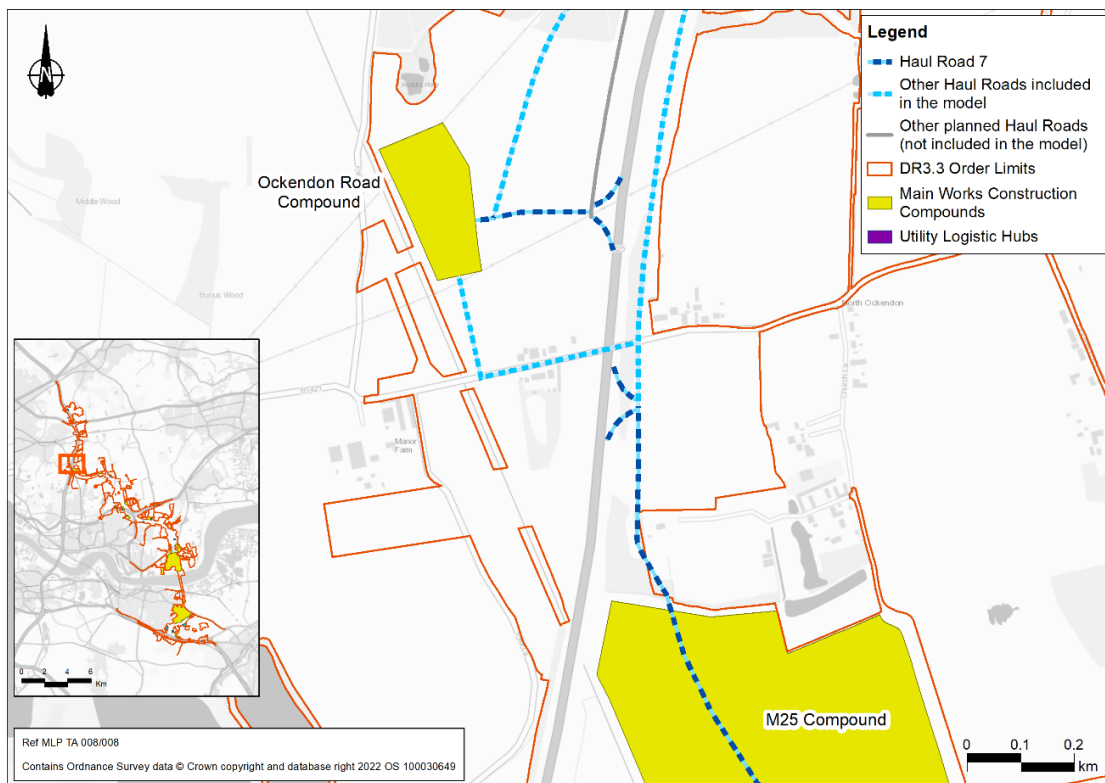


Plate 8.12 Haul road 7 (M25 temporary on-off slip roads between junction 29 and junction 30 (from Phase 4))



8.4 Compounds and Utility Logistics Hubs access arrangements

- 8.4.1 Each construction compound would be provided with a preliminary access and egress arrangement.
- 8.4.2 Where traffic signals or similar would be required to facilitate construction movements, such as access to compounds and construction vehicle crossing points, they would be locally controlled to ensure that traffic on the local road network (LRN) has priority in terms of traffic movements. In addition, when the traffic signals are not required they would be turned off. For the purposes of the traffic model, most compound access points are coded with a signalised junction and the remainder are coded as priority-controlled junctions. All ULH access points have been coded as priority-controlled junctions.

Traffic management measures

- 8.4.3 This section provides a detailed description of each of the individual traffic management measures associated with the construction of the Project. Table 8.4 summarises the number of traffic management measures and network changes by type, and the number included in the LTAM.

Table 8.4 Number of traffic management measures and network changes by type

Types	Included in the LTAM
Narrow lanes	9
Hard shoulder closure	0
Permanent closures	1
Temporary closures	7
Lane restrictions / closures	4
Contraflow	15
3-way signals	0
Crossing points	13
HGV bans	8
Lifting of HGV bans	2
Total traffic measures	59
Switchovers*	18
Total traffic measures and network changes	77

* A 'switchover' is an event in which an existing road link is closed and a new road opened in its place on a new permanent realignment (as opposed to a temporary realignment, which would only be in place for a limited period during the construction).

- 8.4.4 Some traffic management measures have not been included in the LTAM if they meet one of the following criteria:
- a relatively minor alignment change (such as a switchover to a temporary or permanent alignment)
 - of a short duration compared to the length of the construction model phase in which they occur, or they would occur at nights/weekends.
 - the road on which they would occur is not included within the LTAM (not all roads are included within the LTAM, especially where these are minor (see the Transport Model Package, as Appendix B of the ComMA (Application Document 7.7) for more information))
- 8.4.5 Further detail on the considerations made regarding the above exclusions is contained in Section 8.1 of this TA.
- 8.4.6 Table 8.5 summarises these. While not included in the construction assessment within this TA, these works would be subject to the controls as set out in the oTMPfC (Application Document 7.14).

Table 8.5 Traffic management measures excluded from the analysis

ID	Traffic measure	Purpose	Duration (approximately) / time of day	Reason for exclusion
Thurrock				
RNTM04	Muckingford Road Closure	Bridge works & modifications to local utility networks	Nights / Weekends	Short duration
RNTM07	Hoford Road Closure	Bridge works & modifications to local utility networks	Nights / Weekends	Road not in the LTAM
RNTM09	Brentwood Road Closure	Bridge works & modifications to local utility networks & installation of temporary connections to the Brentwood Road compound	Nights / Weekends	Short duration
RNTM16	A13 eastbound off-slip closure	Carry out nearby works	Nights / Weekends	Short duration
RNTM17	A13 westbound on-slip closure	Carry out nearby works	Nights / Weekends	Short duration
RNTM18	Rectory Road closure	Installation of new high-pressure gas pipeline	2 weeks	Short duration
RNTM21	A13 closure	Bridge works	Nights / Weekends	Short duration
RNTM22	A13 closure	Bridge demolition works & modifications to local utility networks	Nights / Weekends	Short duration

ID	Traffic measure	Purpose	Duration (approximately) / time of day	Reason for exclusion
RNTM26	A1013 closure	Carry out nearby works & modifications to local utility networks & installation of temporary connections to the Stanford Road compound	Nights / Weekends	Short duration
RNTM28	A1013 closure	Carry out nearby works	Nights / Weekends	Short duration
RNTM32	A1089 closure	Bridge demolition works & removal of overhead line (OHL) equipment	Nights / Weekends	Short duration
RNTM33	A1089 closure	Bridge works & removal of OHL equipment	Nights / Weekends	Short duration
RNTM34	A13 westbound to A1089 southbound closure	Carry out nearby works	Nights / Weekends	Short duration
RNTM35	Long Lane closure	Carry out nearby works & modifications to local utility networks & installation of temporary connections to the Long Lane compounds	Nights / Weekends	Short duration
RNTM36	A1089 northbound off-slip to A13 westbound closure	Bridge works	Nights / Weekends	Short duration
RNTM37	A1089 closure	Bridge works	Nights / Weekends	Short duration
RNTM42	Stifford Clays Road closure	Carry out nearby works and modifications to local utility networks & installation of temporary compound connections to the Stifford Clays Road compounds	Nights / Weekends	Short duration
RNTM45	Stifford Clays Road closure	Carry out nearby works & modifications to local utility networks	Nights / Weekends	Short duration
RNTM46	A13 eastbound off-slip to A1089 southbound closure	Carry out nearby works & modifications to local utility networks	Nights / Weekends	Short duration
RNTM50	Green Lane closure	Bridge works & modifications to local utility networks & installation of temporary connections to the Stifford Clays Road West compound	Nights / Weekends	Short duration

ID	Traffic measure	Purpose	Duration (approximately) / time of day	Reason for exclusion
RNTM53	B186 closure	Bridge works & modifications to local utility networks & installation of temporary connections to the Medebridge and M25 compounds	Nights / Weekends	Short duration
RNTM77	A13 closure	Modifications to local utility networks	Nights / Weekends	Short duration
RNTM78	Mill Lane closure	Modifications to local utility networks	Two weeks	Road not in the LTAM
RNTM30	Heath Road lane restrictions	Carry out nearby works & modifications to local utility networks	One month	Short duration
RNTM29	A1089 southbound lane closure	Carry out nearby works	Nights / Weekends	Short duration
RNTM31	A1089 northbound lane closure	Carry out nearby works	Nights / Weekends	Short duration
RNTM03	Muckingford Road contraflow	Construction access works & modifications to local utility networks	One week	Short duration
RNTM10	Brentwood Road contraflow	Construction access works & installation of temporary connections to the Brentwood Road compound	One month	Short duration
RNTM14	A1013 contraflow	Construction of a new permanent access & modifications to local utility networks	One month	Short duration
RNTM44	Stifford Clays Road contraflow	Construction access works & modifications to local utility networks & installation of temporary connections to the Stifford Clays Road compounds	Two weeks	Short duration, and impacts covered by RNTM43
RNTM47	Stifford Clays Road contraflow	Construction access works & modifications to local utility networks	One week	Short duration, and impacts covered by RNTM43
RNTM55	B186 contraflow	Construction access works & modifications to local utility networks & installation of temporary connections to the Medebridge and M25 compounds	One month	Short duration
TUTM07	Coopers Shaw Road contraflow	Modifications to local utility networks	One month	Short duration

ID	Traffic measure	Purpose	Duration (approximately) / time of day	Reason for exclusion
TUTM08	Rectory Road/ Church Road/ Station Road contraflow	Modifications to local utility networks & installation of temporary connections to the northern tunnel entrance compound	One month	Short duration
TUTM09	Station Road contraflow	Construction access works & modifications to local utility networks & installation of temporary connections to the Northern tunnel entrance compound	One month	Short duration
TUTM10	Station Road contraflow	Carry out nearby works & removal of OHL equipment	Nights / Weekends	Short duration
RNTM49	Stifford Clays Road contraflow (300m sections)	Modifications to local utility networks & installation of temporary connections to the Stifford Clays Road West compound	Nights / Weekends	Short duration
RNTM79	Hornsby Lane contraflow (300m sections)	Modifications to local utility networks	Two months	Short duration
RNTM06	Hoford Road crossing point	Allow construction vehicles to cross	Until access under overbridge	Road not in the LTAM
RNTM08	Hoford Road crossing point	Allow construction vehicles to cross	Until access under overbridge	Road not in the LTAM
RNTM25	Mill Lane crossing point	Allow construction vehicles to cross	Until A13 eastbound tie in works	Road not in the LTAM
RNTM82	Hoford Road switchover	Switch to permanent alignment	Weekend	Road not in the LTAM
RNTM89	Stifford Clays Road switchover	Switch to permanent alignment	Weekend	Actual location of crossing point means that switchover would not impact crossing point.
RNTM93	Brentwood Road temporary switchover	Switch to temporary alignment	Weekend	Minor temporary realignment
RNTM94	Stifford Clays Road temporary switchover	Switch to temporary alignment	Weekend	Minor temporary realignment
RNTM95	Green Lane temporary switchover	Switch to temporary alignment	Weekend	Minor temporary realignment
RNTM96	B186 North Road temporary switchover	Switch to temporary alignment	Weekend	Minor temporary realignment

ID	Traffic measure	Purpose	Duration (approximately) / time of day	Reason for exclusion
RNTM98	Baker Street closure	Bridge works	Nights/Weekends	Short duration
RNTM99	Gun Hill Closure	Modification to local utility networks	Two weeks	Short duration
RNTM100	Coopers Shaw Road closure	Modifications to local utility networks	Weekend	Short duration
RNTM102	A13 eastbound lane closure	Modifications to local utility networks	Nights/weekends	Short duration
RNTM104	A128 layby access closure	Modification to existing field access	Two months	Layby not in the LTAM
HB7	School Lane HGV ban	HGV ban for earthworks and deliveries from Mill Lane to Rectory Road	Full construction period	Not in the LTAM
Brentwood				
RNTM76	A127 closure	Bridge works & modifications to local utility networks	Nights / Weekends	Short duration
RNTM70	B186 contraflow	Construction access works & modifications to local utility networks	Four weeks	Short duration
RNTM103	B186 contraflow	Modifications to existing field access	Two weeks	Short duration
Gravesham				
RSTM41	Pepper Hill & Roman Road closure	Modifications to local utility networks	One month	Short duration
RSTM14	A2 eastbound hard shoulder closure	Construction access works & modifications to local utility networks	Two Weeks	Short duration
RSTM06	A2 westbound off-slip closure	Permanent closure to new alignment	Nights / Weekends	Short duration
RSTM07	A2 closure	Bridge widening works	Nights / Weekends	Short duration
RSTM08	Hever Court Road closure	Carry out nearby works & modifications to local utility networks	Nights / Weekends	Short duration
RSTM11	A2 eastbound on-slip closure	Permanent closure to new alignment & modifications to local utility networks	Nights / Weekends	Short duration
RSTM12	Singlewell substation access road closure	Carry out nearby works & modifications to local utility networks	Nights / Weekends	Short duration
RSTM13	A2 closure	New bridge works & modifications to local utility networks	Nights / Weekends	Short duration
RSTM18	A2 closure	New bridge works & modifications to local utility networks	Nights / Weekends	Short duration

ID	Traffic measure	Purpose	Duration (approximately) / time of day	Reason for exclusion
RSTM19	A2 closure	Bridge demolition works & modifications to local utility networks	Nights / Weekends	Short duration
RSTM20	Thong Lane closure	Carry out nearby works & modifications to local utility networks	Nights / Weekends	Short duration
RSTM21	Thong Lane closure	Carry out nearby works & modifications to local utility networks	Nights / Weekends	Short duration
RSTM26	A2 closure	Bridge demolition works	Nights / Weekends	Short duration
RSTM27	A2 eastbound off-slip closure	Carry out nearby works	Nights / Weekends	Short duration
RSTM29	A2 eastbound on-slip closure	Carry out nearby works	Nights / Weekends	Short duration
RSTM30	Park Pale closure	Carry out nearby works & modifications to local utility networks	Nights / Weekends	Road not in the LTAM
RSTM32	Thong Lane closure	Bridge works & modifications to local utility networks	Nights / Weekends	Short duration
RSTM38	Brewers Road switchover	Switch to permanent alignment	Weekend	Minor realignment
RSTM01	Hever Court Road closures and lane restrictions	Carry out nearby works & modifications to local utility networks	Two weeks	Short duration
RSTM05	Henhurst Road closures and lane restrictions	Carry out nearby works & modifications to local utility networks	Nights / Weekends	Short duration
RSTM04	Gravesend East junction (Bridge) lane restrictions	Carry out bridge widening & modifications to local utility networks	Four months	Assume no narrowing or reduction in speed limit (the road is wide enough; it would be reduced but unlikely to be below substandard i.e. 3.65m)
RSTM10	Valley Drive lane closure	Carry out nearby works & modifications to local utility networks	Nights / Weekends	Short duration
RSTM16	Thong Lane contraflow	Construction access works & modifications to local utility networks & installation of temporary connections to the A2 compound	One week	Short duration

ID	Traffic measure	Purpose	Duration (approximately) / time of day	Reason for exclusion
RSTM17	Thong Lane contraflow	Modifications to local utility networks	Two months	Short duration
RSTM31	Park Pale contraflow	Carry out nearby works & modifications to local utility networks	Nights / Weekends	Road not in the LTAM
TUTM01	A226 contraflow	Construction access works & modifications to local utility networks & installation of temporary connections to the Southern tunnel entrance and A226 Gravesend Road compounds	Four weeks	Short duration
TUTM03	Lower Higham Road contraflow	Construction access works & modifications to local utility networks	Two weeks	Short duration
TUTM04	Lower Higham Road contraflow	Modifications to local utility networks	Two weeks	Short duration
Havering				
RNTM63	M25 closure	Bridge works & removal of OHL equipment	Nights	Short duration
RNTM69	St Marys Lane closure	Bridge works & modifications to local utility networks	Nights / Weekends	Short duration
RNTM71	M25 southbound on-slip closure	Carry out nearby works	Nights / Weekends	Short duration
RNTM72	M25 northbound off-slip closure	Carry out nearby works	Nights / Weekends	Short duration
RNTM73	A127 westbound off-slip closure	Carry out nearby works	Nights / Weekends	Short duration
RNTM75	A127 closure	Bridge works & modifications to local utility networks	Nights / Weekends	Short duration
RNTM59	Ockendon Road contraflow	Construction access works & modifications to local utility networks & installation of temporary connections to the Ockendon Road compound	Two weeks	Short duration
RNTM106	A127 & slips closure	Bridge works	Nights / Weekends	Short duration
Essex / Havering				
J28-B	A12 eastbound off-slip entry to junction 28 inside lane closure	Narrow Lanes	Six + Four months, Completed before Jan 2024	Traffic measures completed before 2024

Principles of network coding

8.4.7 Principles of the network coding changes made within the LTAM that have been applied to the different types of traffic management measures, are set out below.

Narrow lanes

8.4.8 Narrow lanes are normally implemented to facilitate main carriageway working on the strategic road network (SRN). The narrowing of lanes leads to a reduction in mainline capacity and is usually accompanied by a reduced speed limit through the narrow lanes section.

8.4.9 In order to represent the narrow lanes sections in the LTAM, the reduced capacity needs to be identified and a new speed limit allocated.

8.4.10 Traditionally, narrow lanes on the SRN have been accompanied by a reduced maximum speed of 50mph. Recently, National Highways has released new guidance suggesting that 60mph would be appropriate in certain locations (where it is considered safe to do so). As a result of discussions, it has been agreed that the only narrow lanes section that could operate at 60mph safely would be the narrow lanes on the M25 and the narrow lanes on the A13. A 60mph speed limit has therefore been imposed in the narrow lane sections on the M25 and the narrow lane sections on the A13. A 50mph speed limit has been imposed in all other narrow lane locations.

Road closures

8.4.11 There are a number of road closures, for differing lengths of time, during the Project's construction programme. Short-term closures (those which occur for less than half the duration of a phase) have not been included in the LTAM analysis. The longer-term road closures are represented in the LTAM as a series of bans to stop vehicles using the closed road.

8.4.12 If existing bus routes use the closed roads, these have been diverted around the road closure.

Contraflows

8.4.13 Contraflows are represented in the LTAM through the use of traffic signals and a reduced capacity along the road.

Traffic Management

8.4.14 Figures showing all the proposed traffic management measures included in the traffic modelling are presented in Appendix E. These are schematic in nature and show the general principle of the proposed traffic management. They are not intended to show the precise locations of specific elements.

8.5 Network changes

8.5.1 This section details the modelled traffic management measures and network coding changes in each of the construction modelling phases.

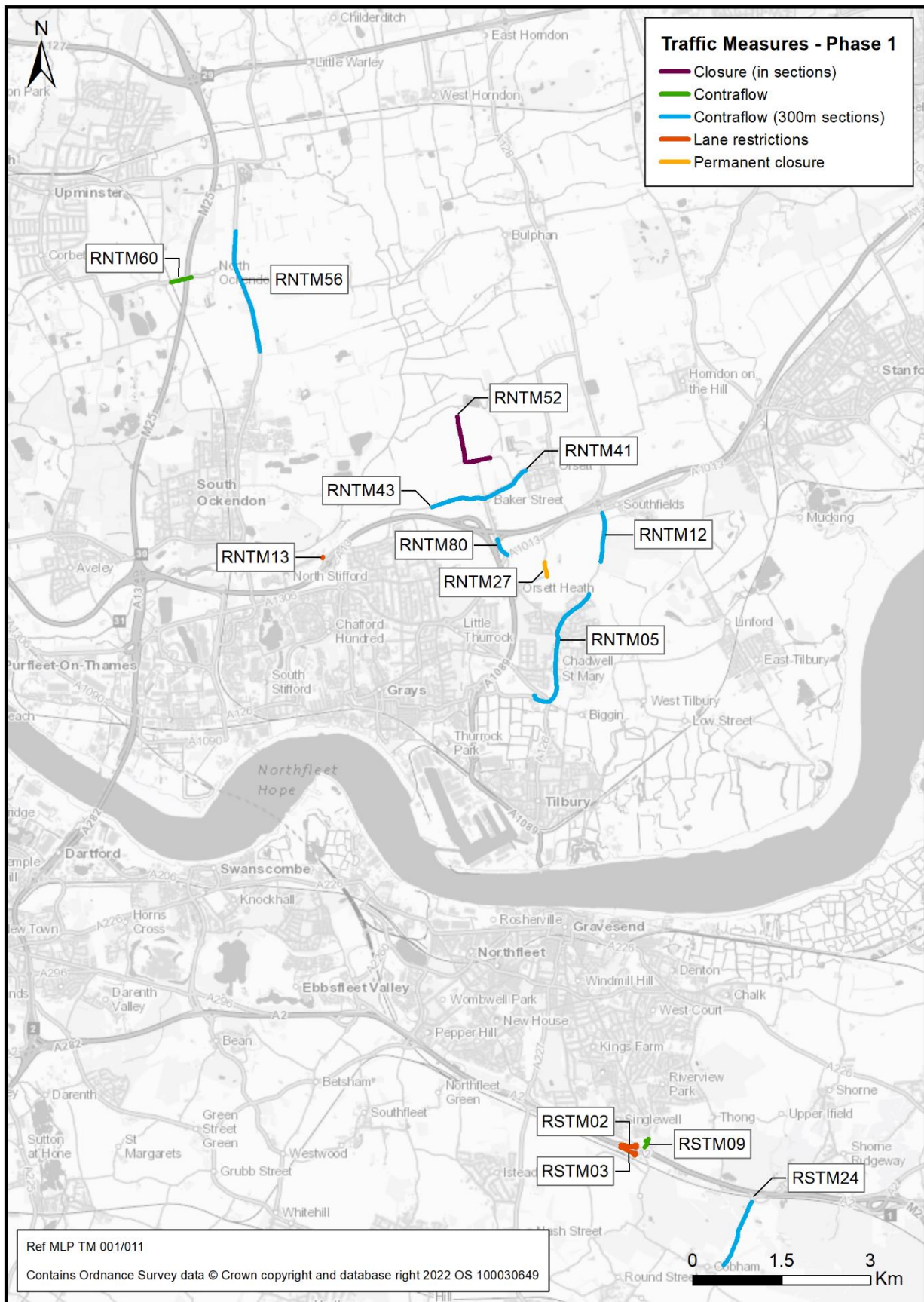
Phase 1

8.5.2 Table 8.6 lists the 24 traffic management measures that are included in this phase and Plate 8.13 shows these geographically.

Table 8.6 Traffic measures and network changes modelled in Phase 1

ID	Road	Traffic Management Measure
Traffic management		
New to this phase		
RSTM02	Gravesend East junction (north)	Lane restrictions
RSTM03	Gravesend East junction (south)	Lane restrictions
RNTM12	Brentwood Road	Contraflow (300m sections)
RSTM24	Halfpence Lane	Contraflow (300m sections)
RNTM60	Ockendon Road	Contraflow
RNTM43	Stifford Clays Road	Contraflow (300m sections)
RNTM13	Medebridge Road	Lane restrictions
RSTM09	Valley Drive	Contraflow
RNTM05	Marshfoot Road/Chadwell Hill/Brentwood Road	Contraflow (300m sections)
RNTM27	Hornsby Lane	Permanent closure
RNTM41	High Road	Contraflow (300m sections)
RNTM52	Fen Lane/Green Lane	Closure (in sections)
RNTM56	B186	Contraflow (300m sections)
RNTM80	Baker Street	Contraflow (300m sections)
HB1	Thong Lane (urban section to Astra Drive)	HGV ban
HB2	Brewers Road, The Ridgeway, Peartree Lane	HGV ban
HB3	The Street	HGV ban
HB4	Lower Higham Road	HGV ban
HB5	Castle Lane	HGV ban
HB6	Rectory Road	HGV ban
HB8	B188 High Road	HGV ban
HB9	Prince Charles Avenue	HGV ban
HB10	Stifford Clays Road	HGV ban lifted
HB11	North end of Brentwood Road	HGV ban lifted
Network changes		
No network changes		

Plate 8.13 Map of traffic measures and network changes modelled in Phase 1



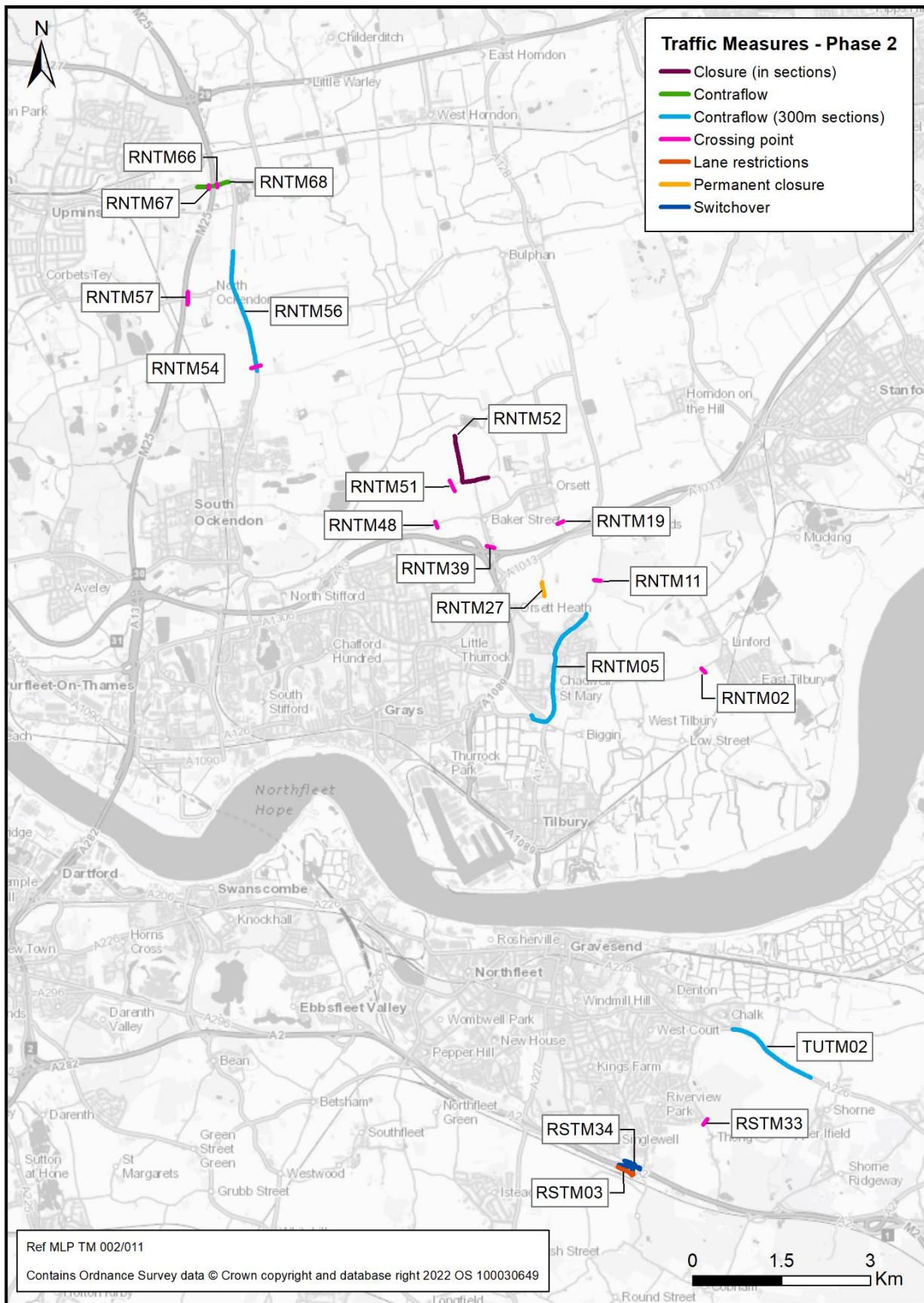
Phase 2

8.5.3 Table 8.7 lists the 28 traffic management measures that are included in Phase 2 and Plate 8.14 shows these geographically.

Table 8.7 Traffic measures and network changes modelled in Phase 2

ID	Road	Traffic Management Measure
Traffic management		
New to this phase		
RNTM54	B186 North Road	Crossing point
RNTM66	St Marys Lane	Crossing point
RNTM02	Muckingford Road	Crossing point
RNTM11	Brentwood Road	Crossing point
RNTM19	Rectory Road	Crossing point
RNTM39	Baker Street	Crossing point
RNTM48	Stifford Clays Road	Crossing point
RNTM51	Green Lane	Crossing point
RNTM57	Ockendon Road	Crossing point
RNTM67	St Marys Lane	Crossing point
RNTM68	St Marys Lane	Contraflow
RSTM33	Thong Lane	Crossing point
TUTM02	A226	Contraflow (300m sections)
Carried over from previous phase		
RSTM03	Gravesend East junction (south)	Lane restrictions
RNTM05	Marshfoot Road/Chadwell Hill/Brentwood Road	Contraflow (300m sections)
RNTM27	Hornsby Lane	Permanent closure
RNTM52	Fen Lane/Green Lane	Closure (in sections)
RNTM56	B186	Contraflow (300m sections)
HB1	Thong Lane (urban section to Astra Drive)	HGV ban
HB2	Brewers Road, The Ridgeway, Peartree Lane	HGV ban
HB3	The Street	HGV ban
HB4	Lower Higham Road	HGV ban
HB5	Castle Lane	HGV ban
HB6	Rectory Road	HGV ban
HB8	B188 High Road	HGV ban
HB9	Prince Charles Avenue	HGV ban
HB11	North end of Brentwood Road	HGV ban lifted
Network changes		
New to this phase		
RSTM34	Gravesend East junction (north)	Switchover

Plate 8.14 Map of traffic measures and network changes modelled in Phase 2



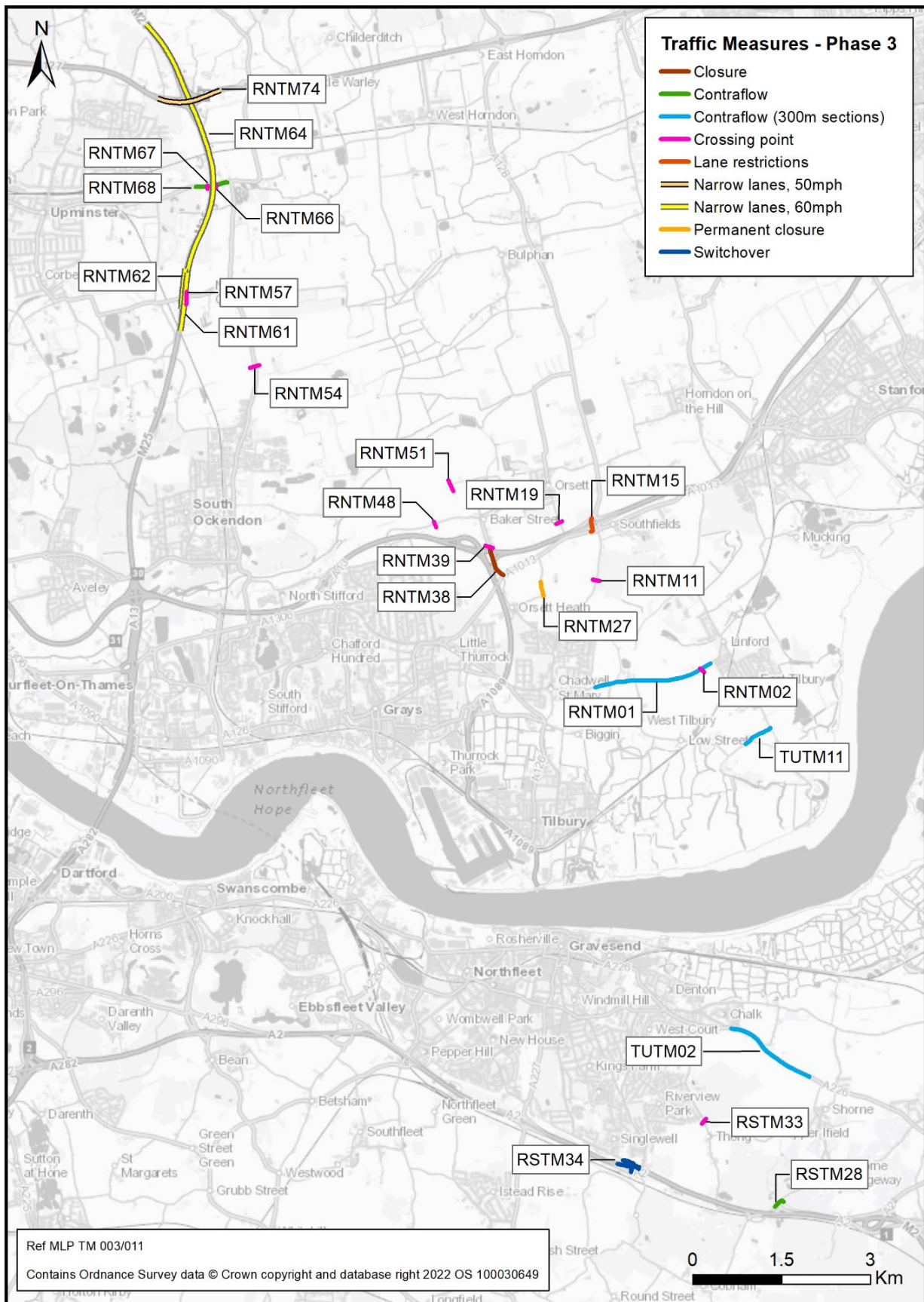
Phase 3

8.5.4 Table 8.8 lists the 33 traffic management measures that are included in this phase and Plate 8.15 shows these geographically.

Table 8.8 Traffic measures and network changes modelled in Phase 3

ID	Road	Traffic Management Measure
Traffic management		
New to this phase		
RNTM38	Baker Street	Closure
RNTM64	M25 southbound	Narrow lanes, 60mph
RNTM74	A127	Narrow lanes, 50mph
RNTM61	M25 southbound	Narrow lanes, 60mph
RNTM62	M25 northbound	Narrow lanes, 60mph
RNTM01	Muckingford Road	Contraflow (300m sections)
RNTM15	Orsett Cock junction	Lane restrictions
RSTM28	Brewers Road & Park Pale	Contraflow
TUTM11	Love Lane/Princess Margaret Road/Station Road	Contraflow (300m sections)
Carried over from previous phase		
RNTM54	B186 North Road	Crossing point
RNTM66	St Marys Lane	Crossing point
RNTM02	Muckingford Road	Crossing point
RNTM11	Brentwood Road	Crossing point
RNTM19	Rectory Road	Crossing point
RNTM27	Hornsby Lane	Permanent closure
RNTM39	Baker Street	Crossing point
RNTM48	Stifford Clays Road	Crossing point
RNTM51	Green Lane	Crossing point
RNTM57	Ockendon Road	Crossing point
RNTM67	St Marys Lane	Crossing point
RNTM68	St Marys Lane	Contraflow
RSTM33	Thong Lane	Crossing point
TUTM02	A226	Contraflow (300m sections)
HB1	Thong Lane (urban section to Astra Drive)	HGV ban
HB2	Brewers Road, The Ridgeway, Peartree Lane	HGV ban
HB3	The Street	HGV ban
HB4	Lower Higham Road	HGV ban
HB5	Castle Lane	HGV ban
HB6	Rectory Road	HGV ban
HB8	B188 High Road	HGV ban
HB9	Prince Charles Avenue	HGV ban
HB11	North end of Brentwood Road (7.5 tonne ban)	HGV ban lifted
Network changes		
Carried over from previous phase		
RSTM34	Gravesend East Junction (northern section)	Switchover

Plate 8.15 Map of traffic measures and network changes modelled in Phase 3



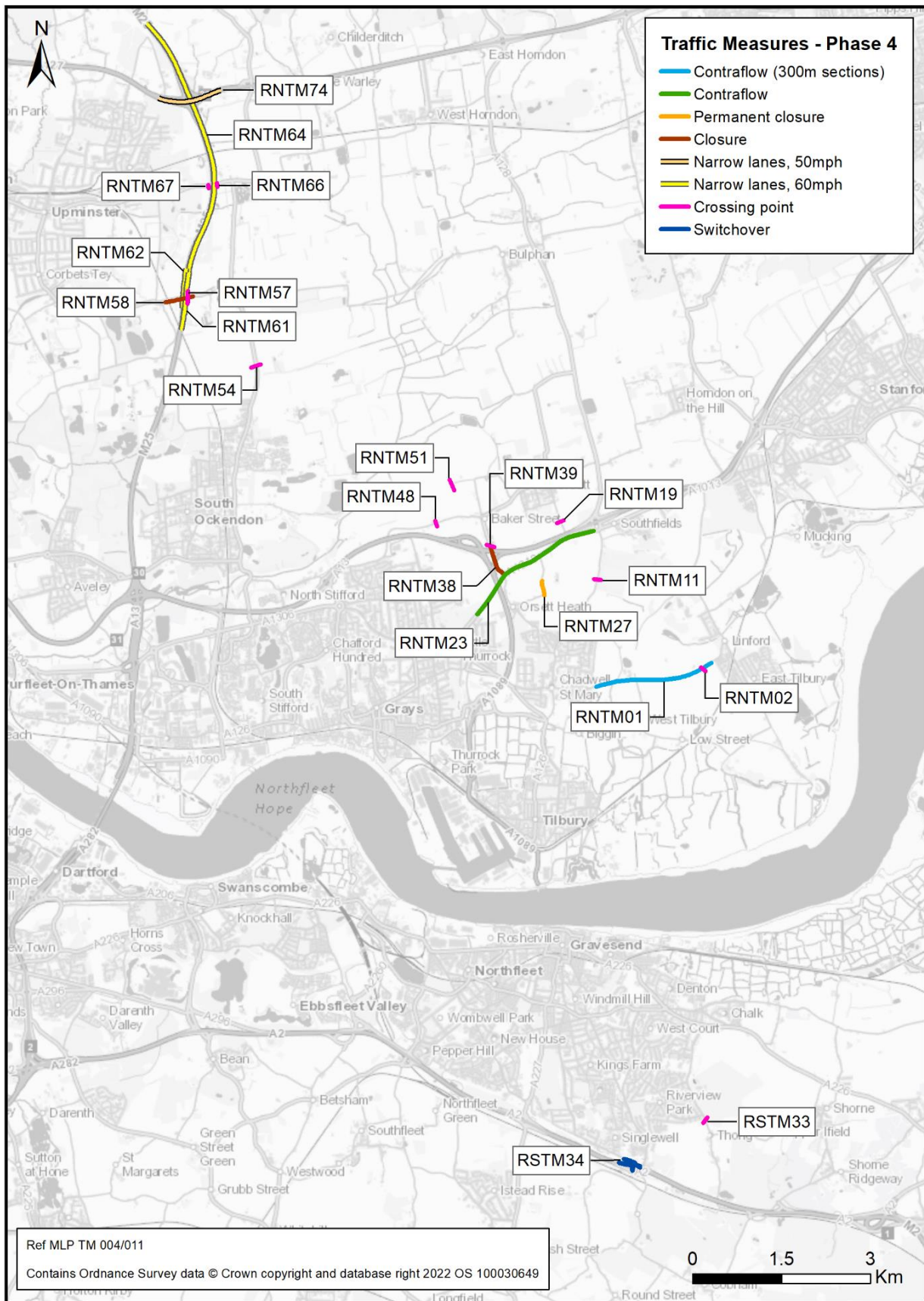
Phase 4

8.5.5 Table 8.9 lists the 30 traffic management measures that are included in this phase and Plate 8.16 shows these geographically.

Table 8.9 Traffic measures and network changes modelled in Phase 4

ID	Road	Traffic Management Measure
Traffic management		
New to this phase		
RNTM58	Ockendon Road	Closure
RNTM23	A1013	Contraflow
Carried over from previous phase		
RNTM38	Baker Street	Closure
RNTM64	M25 southbound	Narrow lanes, 60mph
RNTM74	A127	Narrow lanes, 50mph
RNTM54	B186 North Road	Crossing point
RNTM61	M25 southbound	Narrow lanes, 60mph
RNTM62	M25 northbound	Narrow lanes, 60mph
RNTM01	Muckingford Road	Contraflow (300m sections)
RNTM66	St Marys Lane	Crossing point
RNTM02	Muckingford Road	Crossing point
RNTM11	Brentwood Road	Crossing point
RNTM19	Rectory Road	Crossing point
RNTM27	Hornsby Lane	Permanent closure
RNTM39	Baker Street	Crossing point
RNTM48	Stifford Clays Road	Crossing point
RNTM51	Green Lane	Crossing point
RNTM57	Ockendon Road	Crossing point
RNTM67	St Marys Lane	Crossing point
RSTM33	Thong Lane	Crossing point
HB1	Thong Lane (urban section to Astra Drive)	HGV ban
HB2	Brewers Road, The Ridgeway, Peartree Lane	HGV ban
HB3	The Street	HGV ban
HB4	Lower Higham Road	HGV ban
HB5	Castle Lane	HGV ban
HB6	Rectory Road	HGV ban
HB8	B188 High Road	HGV ban
HB9	Prince Charles Avenue	HGV ban
HB11	North end of Brentwood Road	HGV ban lifted
Network changes		
Carried over from previous phase		
RSTM34	Gravesend East junction (north)	Switchover

Plate 8.16 Map of traffic measures and network changes modelled in Phase 4



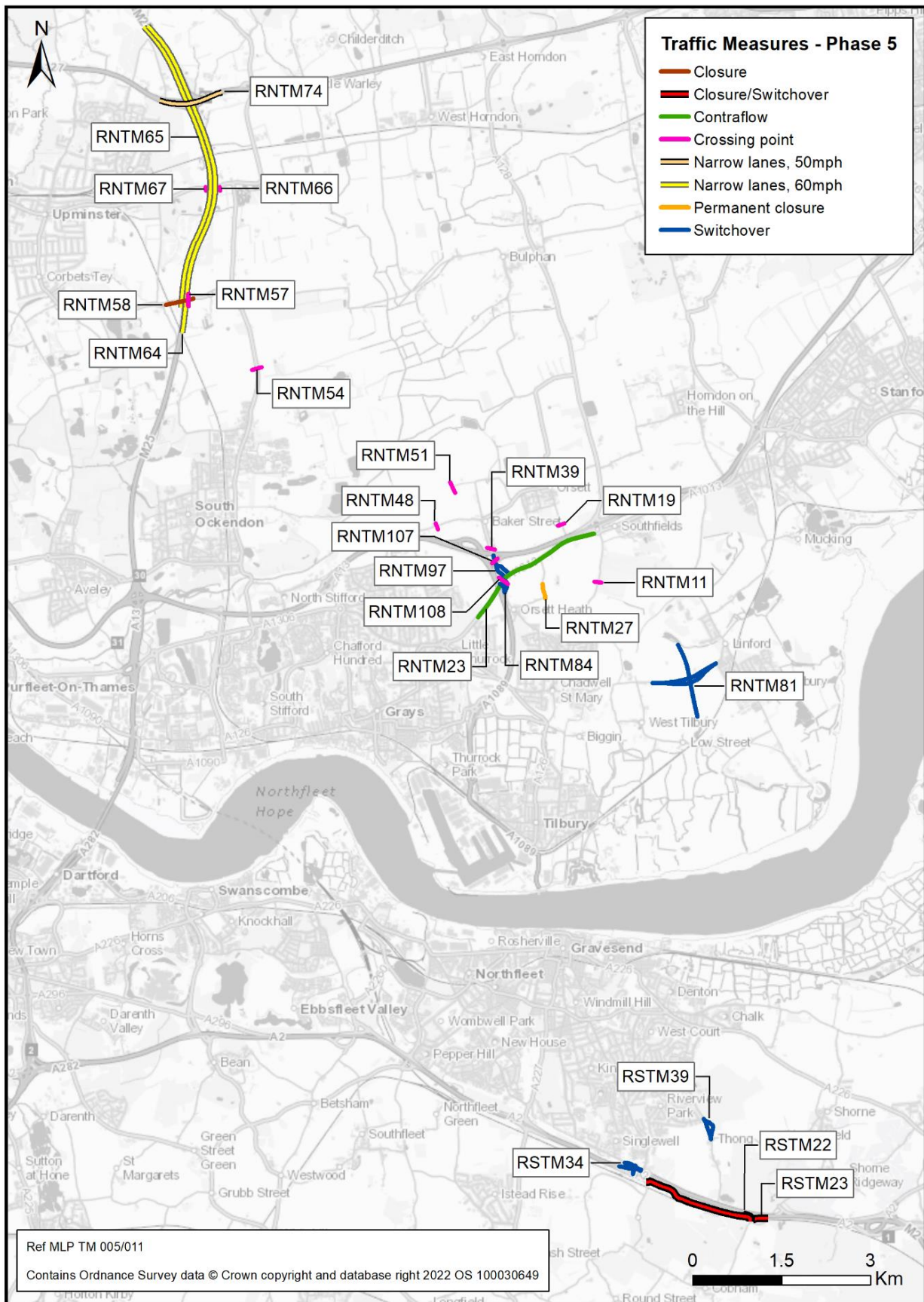
Phase 5

8.5.6 Table 8.10 lists the 33 traffic management measures that are included in this phase and Plate 8.17 shows these geographically.

Table 8.10 Traffic measures and network changes modelled in Phase 5

ID	Road	Traffic Management Measure
Traffic management		
New to this phase		
RNTM65	M25 northbound	Narrow lanes, 60mph
RNTM107	Baker Street	Crossing point
RNTM108	A1013	Crossing point
Carried over from previous phase		
RNTM58	Ockendon Road	Closure
RNTM64	M25 southbound	Narrow lanes, 60mph
RNTM74	A127	Narrow lanes, 50mph
RNTM23	A1013	Contraflow
RNTM54	B186 North Road	Crossing point
RNTM66	St Marys Lane	Crossing point
RNTM11	Brentwood Road	Crossing point
RNTM19	Rectory Road	Crossing point
RNTM27	Hornsby Lane	Permanent closure
RNTM39	Baker Street	Crossing point
RNTM48	Stifford Clays Road	Crossing point
RNTM51	Green Lane	Crossing point
RNTM57	Ockendon Road	Crossing point
RNTM67	St Marys Lane	Crossing point
HB1	Thong Lane (urban section to Astra Drive)	HGV ban
HB2	Brewers Road, The Ridgeway, Peartree Lane	HGV ban
HB3	The Street	HGV ban
HB4	Lower Higham Road	HGV ban
HB5	Castle Lane	HGV ban
HB6	Rectory Road	HGV ban
HB8	B188 High Road	HGV ban
HB9	Prince Charles Avenue	HGV ban
HB11	North end of Brentwood Road (7.5 tonne ban)	HGV ban lifted
Network changes		
New to this phase		
RNTM81	Muckingford Road	Switchover
RNTM84	Heath Road & A1013	Switchover
RSTM22	A2 westbound on-slip	Closure/Switchover
RSTM23	A2 westbound off-slip	Closure/Switchover
RSTM39	Thong Lane (over the Project)	Switchover
RNTM97	Baker Street	Switchover
Carried over from previous phase		
RSTM34	Gravesend East junction (northern section)	Switchover

Plate 8.17 Map of traffic measures and network changes modelled in Phase 5



Phase 6

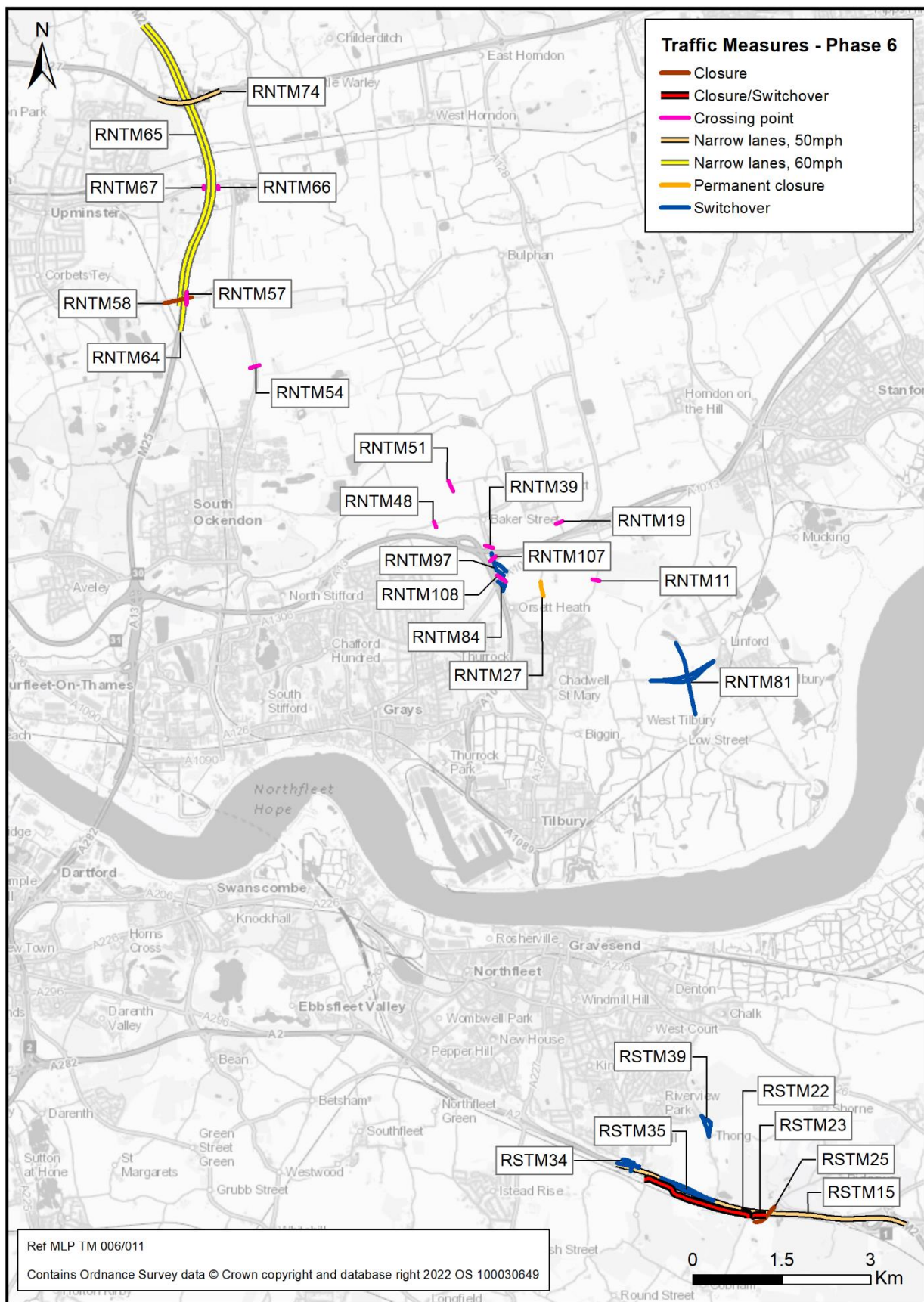
8.5.7 Table 8.11 lists the 35 traffic management measures that are included in this phase and Plate 8.18 shows these geographically.

Table 8.11 Traffic measures and network changes modelled in Phase 6

ID	Road	Traffic Management Measure
Traffic management		
New to this phase		
RSTM15	A2	Narrow lanes, 50mph
RSTM25	Brewers Road	Closure
Carried over from previous phase		
RNTM58	Ockendon Road	Closure
RNTM65	M25 northbound	Narrow lanes, 60mph
RNTM64	M25 southbound	Narrow lanes, 60mph
RNTM74	A127	Narrow lanes, 50mph
RNTM54	B186 North Road	Crossing point
RNTM66	St Marys Lane	Crossing point
RNTM11	Brentwood Road	Crossing point
RNTM19	Rectory Road	Crossing point
RNTM27	Hornsby Lane	Permanent closure
RNTM39	Baker Street	Crossing point
RNTM48	Stifford Clays Road	Crossing point
RNTM51	Green Lane	Crossing point
RNTM57	Ockendon Road	Crossing point
RNTM67	St Marys Lane	Crossing point
HB1	Thong Lane (urban section to Astra Drive)	HGV ban
HB2	Brewers Road, The Ridgeway, Peartree Lane	HGV ban
HB3	The Street	HGV ban
HB4	Lower Higham Road	HGV ban
HB5	Castle Lane	HGV ban
HB6	Rectory Road	HGV ban
HB8	B188 High Road	HGV ban
HB9	Prince Charles Avenue	HGV ban
HB11	North end of Brentwood Road (7.5 tonne ban)	HGV ban lifted
RNTM107	Baker Street	Crossing point
RNTM108	A1013	Crossing point
Network changes		
Carried over from previous phase		
RNTM81	Muckingford Road	Switchover
RNTM84	Heath Road & A1013	Switchover
RSTM22	A2 westbound on-slip	Closure/Switchover

ID	Road	Traffic Management Measure
RSTM23	A2 westbound off-slip	Closure/Switchover
RSTM34	Gravesend East junction (northern section)	Switchover
RSTM39	Thong Lane (over the Project)	Switchover
RNTM97	Baker Street	Switchover
New to this phase		
RSTM35	A2 eastbound	Switchover

Plate 8.18 Map of traffic measures and network changes modelled in Phase 6



Phase 7

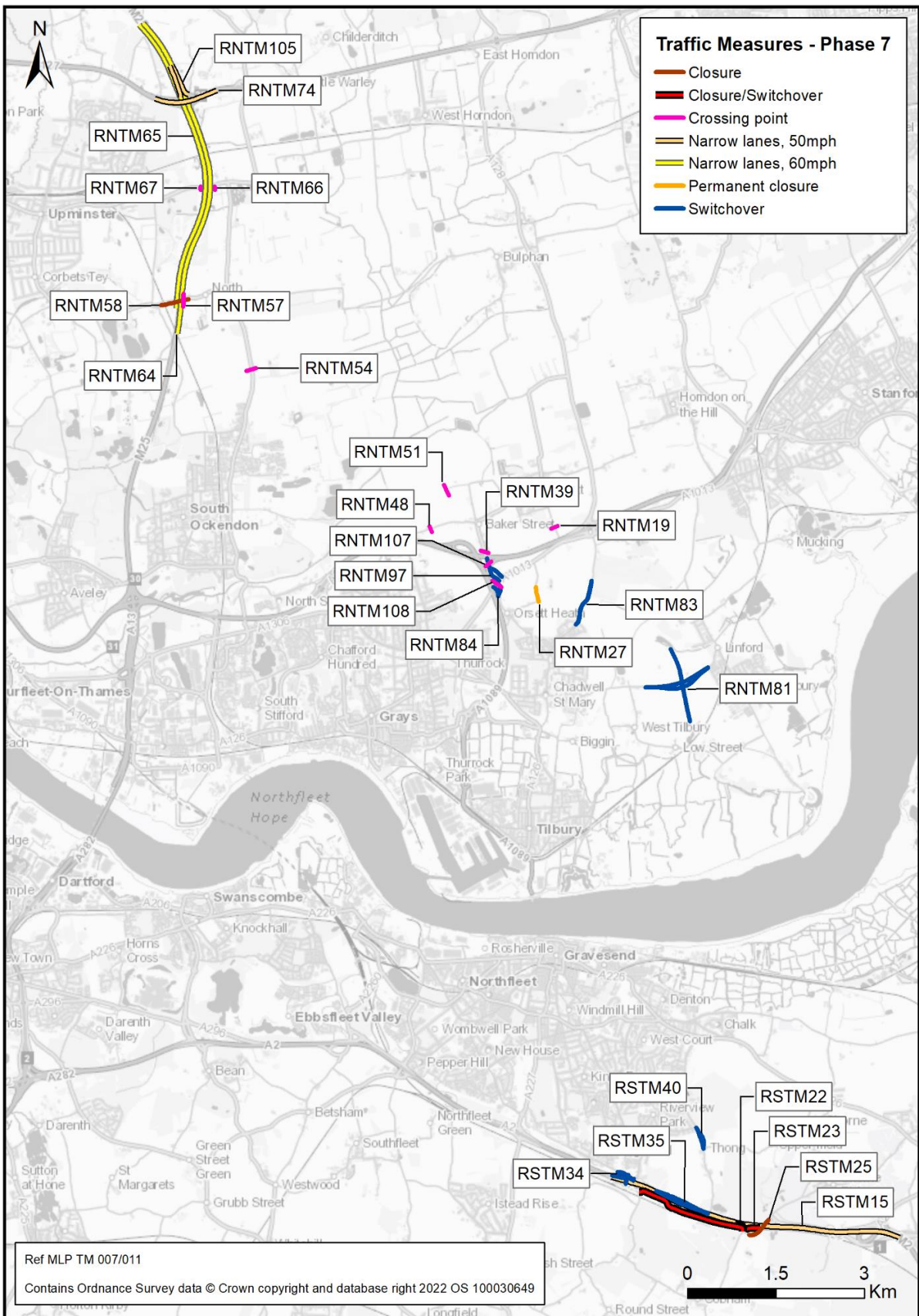
8.5.8 Table 8.12 lists the 36 traffic management measures that are included in this phase and Plate 8.19 shows these geographically.

Table 8.12 Traffic measures and network changes modelled in Phase 7

ID	Road	Traffic Management Measure
Traffic management		
New to this phase		
RNTM105	M25 slips	Narrow Lanes, 50mph
Carried over from previous phase		
RSTM15	A2	Narrow lanes, 50mph
RSTM25	Brewers Road	Closure
RNTM58	Ockendon Road	Closure
RNTM65	M25 northbound	Narrow lanes, 60mph
RNTM64	M25 southbound	Narrow lanes, 60mph
RNTM74	A127	Narrow lanes, 50mph
RNTM54	B186 North Road	Crossing Point
RNTM66	St Marys Lane	Crossing Point
RNTM19	Rectory Road	Crossing Point
RNTM27	Hornsby Lane	Perm closure
RNTM39	Baker Street	Crossing Point
RNTM48	Stifford Clays Road	Crossing Point
RNTM51	Green Lane	Crossing Point
RNTM57	Ockendon Road	Crossing Point
RNTM67	St Marys Lane	Crossing Point
HB1	Thong Lane (urban section to Astra Drive)	HGV Ban
HB2	Brewers Road, The Ridgeway, Peartree Lane	HGV Ban
HB3	The Street	HGV Ban
HB4	Lower Higham Road	HGV Ban
HB5	Castle Lane	HGV Ban
HB6	Rectory Road	HGV Ban
HB8	B188 High Road	HGV Ban
HB9	Prince Charles Avenue	HGV Ban
HB11	North end of Brentwood Road (7.5 tonne ban)	HGV Ban lifted
RNTM107	Baker Street	Crossing Point
RNTM108	A1013	Crossing Point
Network changes		
Carried over from previous phase		
RNTM81	Muckingford Road	Switchover
RNTM84	Heath Road & A1013	Switchover
RSTM22	A2 westbound on-slip	Closure/Switchover

ID	Road	Traffic Management Measure
RSTM23	A2 westbound off-slip	Closure/Switchover
RSTM34	Gravesend East junction (north)	Switchover
RSTM35	A2 eastbound	Switchover
RNTM97	Baker Street	Switchover
New to this phase		
RNTM83	Brentwood Road	Switchover
RSTM40	Thong Lane (over the Project)	Switchover

Plate 8.19 Map of traffic measures and network changes modelled in Phase 7



Phase 8

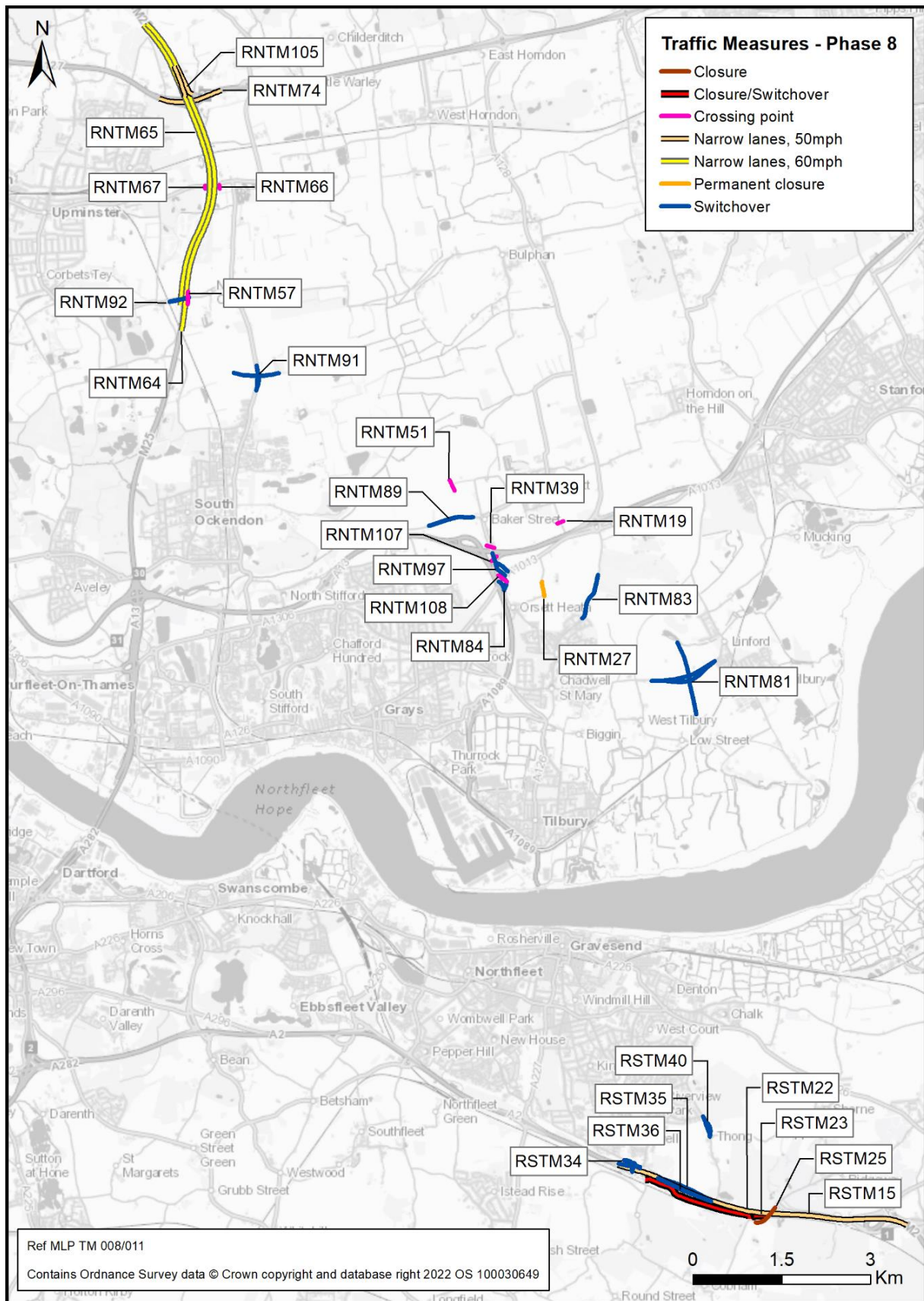
8.5.9 Table 8.13 lists the 37 traffic management measures that are included in this phase and Plate 8.20 shows these geographically.

Table 8.13 Traffic measures and network changes modelled in Phase 8

ID	Road	Traffic Management Measure
Traffic management		
New this phase		
None		
Carried over from previous phase		
RSTM15	A2	Narrow lanes, 50mph
RSTM25	Brewers Road	Closure
RNTM65	M25 northbound	Narrow lanes, 60mph
RNTM64	M25 southbound	Narrow lanes, 60mph
RNTM74	A127	Narrow lanes, 50mph
RNTM66	St Marys Lane	Crossing point
RNTM19	Rectory Road	Crossing point
RNTM27	Hornsby Lane	Permanent closure
RNTM39	Baker Street	Crossing point
RNTM51	Green Lane	Crossing point
RNTM57	Ockendon Road	Crossing point
RNTM67	St Marys Lane	Crossing point
HB1	Thong Lane (urban section to Astra Drive)	HGV ban
HB2	Brewers Road, The Ridgeway, Peartree Lane	HGV ban
HB3	The Street	HGV ban
HB4	Lower Higham Road	HGV ban
HB5	Castle Lane	HGV ban
HB6	Rectory Road	HGV ban
HB8	B188 High Road	HGV ban
HB9	Prince Charles Avenue	HGV ban
HB11	North end of Brentwood Road (7.5 tonne ban)	HGV ban lifted
RNTM105	M25 Slips	Narrow Lanes, 50mph
RNTM107	Baker Street	Crossing point
RNTM108	A1013	Crossing point

ID	Road	Traffic Management Measure
Network changes		
New to this phase		
RNTM89	Stifford Clays Road	Switchover
RNTM91	B186 North Road	Switchover
RNTM92	Ockendon Road	Switchover
RSTM36	A2 westbound	Switchover
Carried over from previous phase		
RNTM81	Muckingford Road	Switchover
RNTM83	Brentwood Road	Switchover
RNTM84	Heath Road & A1013	Switchover
RSTM22	A2 westbound on-slip	Closure/Switchover
RSTM23	A2 westbound off-slip	Closure/Switchover
RSTM34	Gravesend East junction (northern section)	Switchover
RSTM35	A2 eastbound	Switchover
RSTM40	Thong Lane (over the Project)	Switchover
RNTM97	Baker Street	Switchover

Plate 8.20 Map of traffic measures and network changes modelled in Phase 8



Phase 9

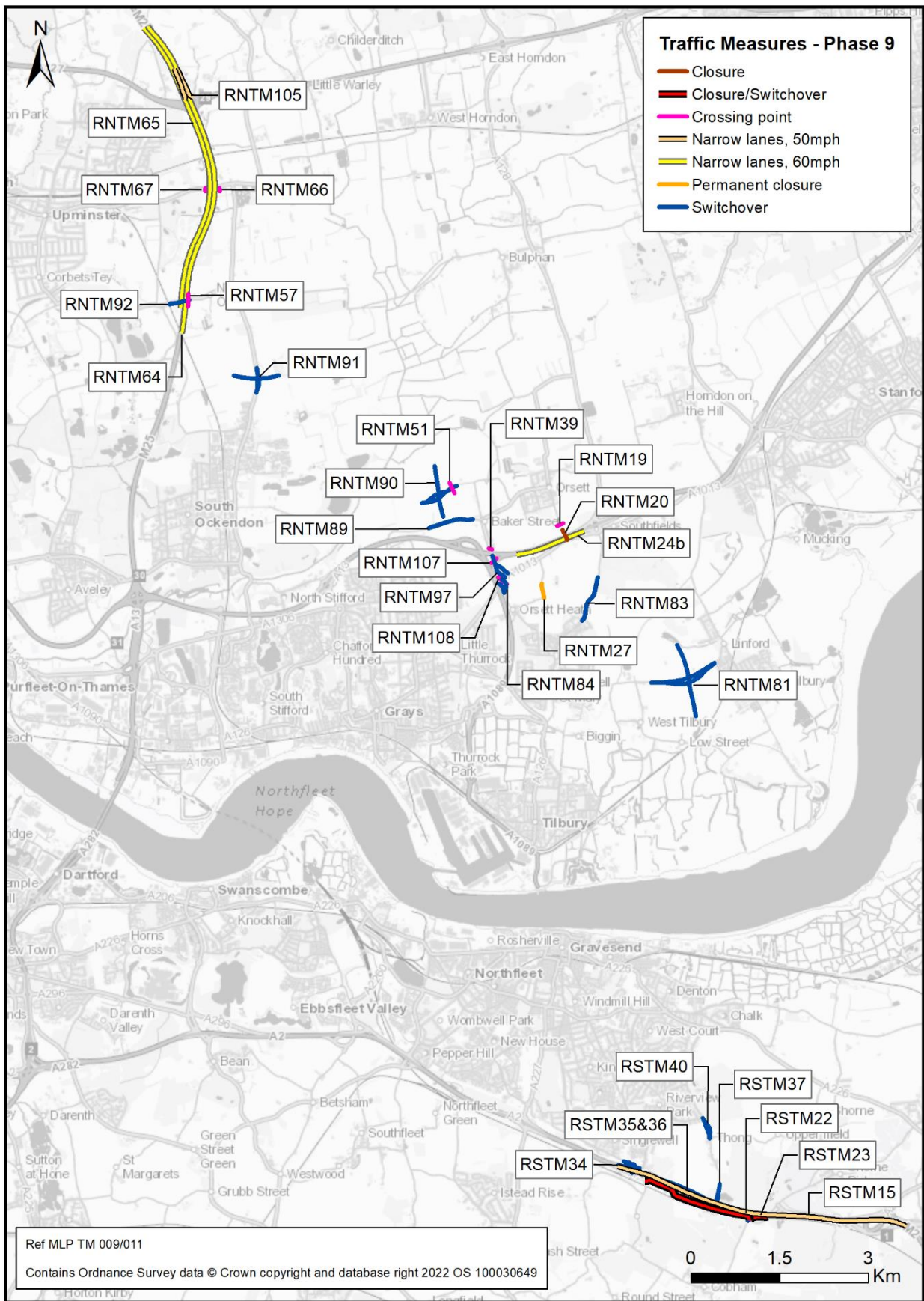
8.5.10 Table 8.14 lists the 39 traffic management measures that are included in this phase and Plate 8.21 shows these geographically.

Table 8.14 Traffic measures and network changes modelled in Phase 9

ID	Road	Traffic Management Measure
Traffic management		
New to this phase		
RNTM20	Rectory Road	Closure
RNTM24b	A13 westbound	Narrow lanes, 60mph
Carried over from previous phase		
RSTM15	A2	Narrow lanes, 50mph
RNTM65	M25 northbound	Narrow lanes, 60mph
RNTM64	M25 southbound	Narrow lanes, 60mph
RNTM66	St Marys Lane	Crossing point
RNTM19	Rectory Road	Crossing point
RNTM27	Hornsby Lane	Permanent closure
RNTM39	Baker Street	Crossing point
RNTM51	Green Lane	Crossing point
RNTM57	Ockendon Road	Crossing point
RNTM67	St Marys Lane	Crossing point
HB1	Thong Lane (urban section to Astra Drive)	HGV ban
HB2	Brewers Road, The Ridgeway, Peartree Lane	HGV ban
HB3	The Street	HGV ban
HB4	Lower Higham Road	HGV ban
HB5	Castle Lane	HGV ban
HB6	Rectory Road	HGV ban
HB8	B188 High Road	HGV ban
HB9	Prince Charles Avenue	HGV ban
HB11	North end of Brentwood Road	HGV ban lifted
RNTM105	M25 slips	Narrow Lanes, 50mph
RNTM107	Baker Street	Crossing point
RNTM108	A1013	Crossing point

ID	Road	Traffic Management Measure
Network changes		
New to this phase		
RNTM90	Green Lane	Switchover
RSTM37	Thong Lane (over the A2)	Switchover
Carried over from previous phase		
RNTM81	Muckingford Road	Switchover
RNTM83	Brentwood Road	Switchover
RNTM84	Heath Road & A1013	Switchover
RNTM89	Stifford Clays Road	Switchover
RNTM91	B186 North Road	Switchover
RNTM92	Ockendon Road	Switchover
RSTM22	A2 westbound on-slip	Closure/Switchover
RSTM23	A2 westbound off-slip	Closure/Switchover
RSTM34	Gravesend East junction (northern section)	Switchover
RSTM35	A2 eastbound	Switchover
RSTM36	A2 westbound	Switchover
RSTM40	Thong Lane (over the Project)	Switchover
RNTM97	Baker Street	Switchover

Plate 8.21 Map of traffic measures and network changes modelled in Phase 9



Phase 10

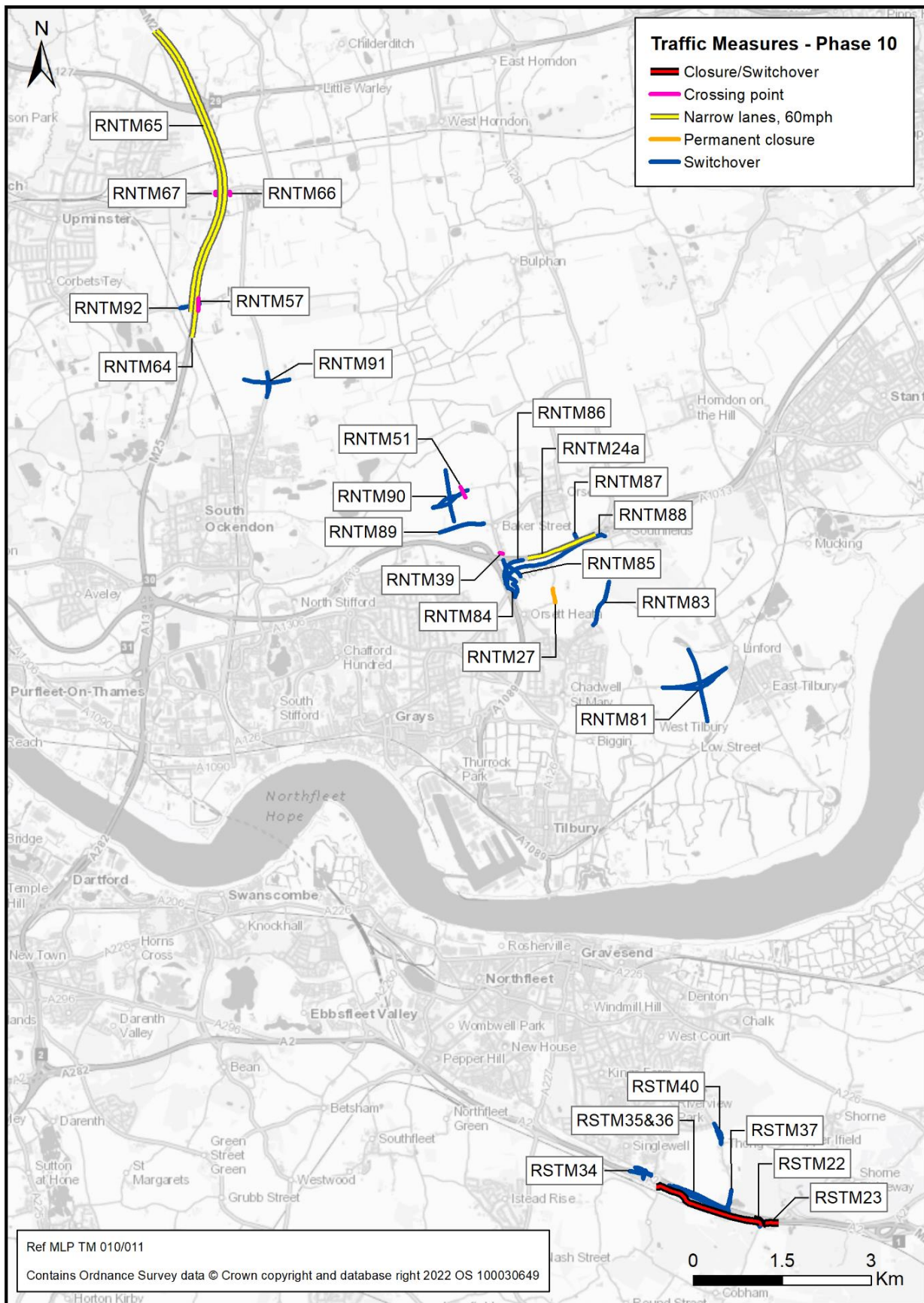
8.5.11 Table 8.15 lists the 36 traffic management measures that are included in this phase and Plate 8.22 shows these geographically.

Table 8.15 Traffic measures and network changes modelled in Phase 10

ID	Road	Traffic Management Measure
Traffic management		
New to this phase		
RNTM24a	A13 eastbound	Narrow lanes, 60mph
Carried over from previous phase		
RNTM65	M25 northbound	Narrow lanes, 60mph
RNTM64	M25 southbound	Narrow lanes, 60mph
RNTM66	St Marys Lane	Crossing point
RNTM27	Hornsby Lane	Permanent closure
RNTM39	Baker Street	Crossing point
RNTM51	Green Lane	Crossing point
RNTM57	Ockendon Road	Crossing point
RNTM67	St Marys Lane	Crossing point
HB1	Thong Lane (urban section to Astra Drive)	HGV ban
HB2	Brewers Road, The Ridgeway, Peartree Lane	HGV ban
HB3	The Street	HGV ban
HB4	Lower Higham Road	HGV ban
HB5	Castle Lane	HGV ban
HB6	Rectory Road	HGV ban
HB8	B188 High Road	HGV ban
HB9	Prince Charles Avenue	HGV ban
HB11	North end of Brentwood Road (7.5 tonne ban)	HGV ban lifted
Network changes		
Carried over from previous phase		
RNTM81	Muckingford Road	Switchover
RNTM83	Brentwood Road	Switchover
RNTM84	Heath Road & A1013	Switchover
RNTM89	Stifford Clays Road	Switchover
RNTM90	Green Lane	Switchover
RNTM91	B186 North Road	Switchover
RNTM92	Ockendon Road	Switchover
RSTM22	A2 westbound on-slip	Closure/Switchover
RSTM23	A2 westbound off-slip	Closure/Switchover
RSTM34	Gravesend East junction (northern section)	Switchover

ID	Road	Traffic Management Measure
RSTM35	A2 eastbound	Switchover
RSTM36	A2 westbound	Switchover
RSTM37	Thong Lane (over the A2)	Switchover
RSTM40	Thong Lane (over the Project)	Switchover
New to this phase		
RNTM85	Baker Street	Switchover
RNTM86	A13 westbound to A1089 southbound	Switchover
RNTM87	Rectory Road	Switchover
RNTM88	A13 westbound on-slip	Switchover

Plate 8.22 Map of traffic measures and network changes modelled in Phase 10



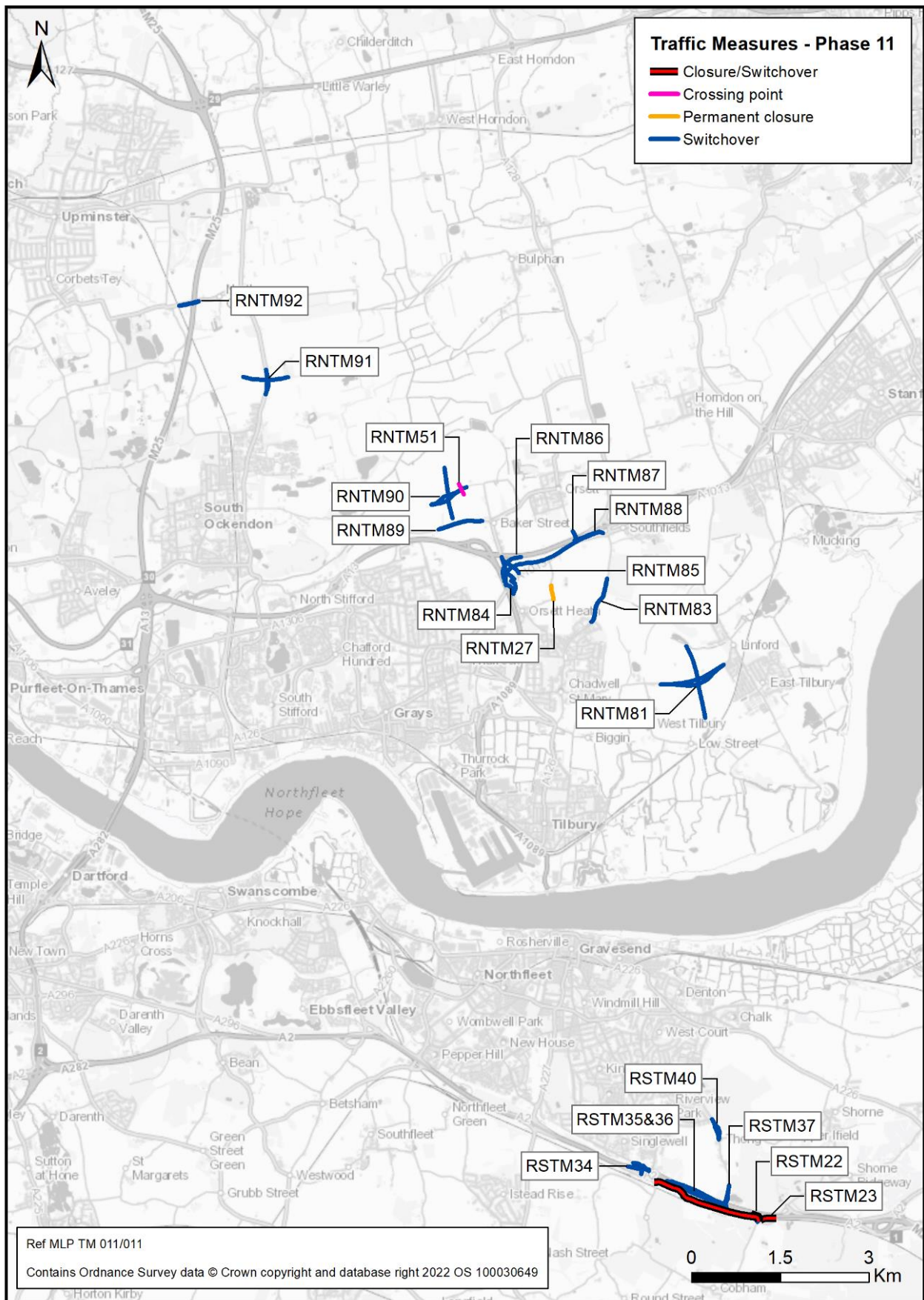
Phase 11

8.5.12 Table 8.16 lists the 29 traffic management measures that are included in this phase and Plate 8.23 shows these geographically.

Table 8.16 Traffic measures and network changes modelled in Phase 11

ID	Road	Traffic Management Measure
Traffic management		
New to this phase		
None		
Carried over from previous phase		
RNTM27	Hornsby Lane	Permanent closure
RNTM51	Green Lane	Crossing point
HB1	Thong Lane (urban section to Astra Drive)	HGV ban
HB2	Brewers Road, The Ridgeway, Peartree Lane	HGV ban
HB3	The Street	HGV ban
HB4	Lower Higham Road	HGV ban
HB5	Castle Lane	HGV ban
HB6	Rectory Road	HGV ban
HB8	B188 High Road	HGV ban
HB9	Prince Charles Avenue	HGV ban
HB11	North end of Brentwood Road (7.5 tonne ban)	HGV ban lifted
Network changes		
Carried over from previous phase		
RNTM81	Muckingford Road	Switchover
RNTM83	Brentwood Road	Switchover
RNTM84	Heath Road & A1013	Switchover
RNTM85	Baker Street	Switchover
RNTM86	A13 westbound to A1089 southbound	Switchover
RNTM87	Rectory Road	Switchover
RNTM88	A13 westbound on-slip	Switchover
RNTM89	Stifford Clays Road	Switchover
RNTM90	Green Lane	Switchover
RNTM91	B186 North Road	Switchover
RNTM92	Ockendon Road	Switchover
RSTM22	A2 westbound on-slip	Closure/Switchover
RSTM23	A2 westbound off-slip	Closure/Switchover
RSTM34	Gravesend East junction (northern section)	Switchover
RSTM35	A2 eastbound	Switchover
RSTM36	A2 westbound	Switchover
RSTM37	Thong Lane (over the A2)	Switchover
RSTM40	Thong Lane (over the Project)	Switchover
New to this phase		
None		

Plate 8.23 Map of traffic Measures and network changes modelled in Phase 11



8.6 Construction vehicles

8.6.1 The vehicular demand associated with construction is represented in the following five ways:

- a. Compound to compound earthwork movements
- b. Compound to external earthwork movements
- c. Deliveries to/from external suppliers
- d. Light Goods Vehicle (LGV) movements
- e. Staff movements

Compound to compound earthwork movements

8.6.2 These are movements of earthworks between different construction compounds. This includes earthwork movements associated with both the main works and enabling works. An allowance has also been made for site mobilisation and demobilisation, by adding movements to the first six and last six months of the construction programme. The capacities of different vehicles were then applied in order to convert the earthwork volumes into vehicular values.

8.6.3 Some of the earthworks would be kept within the same compound and are therefore not included in the traffic calculations. Some of the earthworks would need to be moved to other compounds, either using haul roads, or the public road network. These types of movements were included within the traffic calculations.

8.6.4 The demand was calculated for each individual phase using the schedule of movements by month for each phase. Initially these are represented as daily movements, which are then converted into the number of vehicles per hour, assuming that the vehicle movements are spread evenly across the day from 07:00 to 19:00. This means that 8.3% of the daily HGVs are attributed to each of the model hours.

8.6.5 These movements are represented in the LTAM as a series of fixed routes where each compound to compound movement has been allocated a route which would be used to transfer the earth.

8.6.6 In order to reflect current levels of uncertainty regarding the total amount of traffic generated from each compound, and to ensure a robust assessment, an additional 20% was added to the forecast number of construction related HGVs.

8.6.7 In the LTAM, 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 model each hour, which is an industry standard approach. Cars and vans are defined as 1 PCU and HGVs are considered to be equivalent to 2.5 PCUs, because they take up more road space.

8.6.8 The number of HGVs were converted into PCU values for use in the LTAM, using a factor of 2.5. Both directions of movement (outward and return) were included in the LTAM. For the return trip it was assumed that the vehicle would return to the compound from which it originated.

Compound to external earthwork movements

8.6.9 Some of the spoil/excavated material described above would need to be transported to external locations. At the time of undertaking this work, the precise location of these external destinations is not known and therefore these have been allocated to a set of notional destinations which are representative of travel away from the construction compounds to the north, south, east or west.

8.6.10 These external locations were defined differently for compounds which are south and north of the River Thames. Spoil/excavated material from north of the River Thames are proposed to go to locations north of the River Thames and likewise for earthworks from south of the River Thames. Plate 8.24 shows these destinations.

Plate 8.24 External destinations for spoil/excavated material



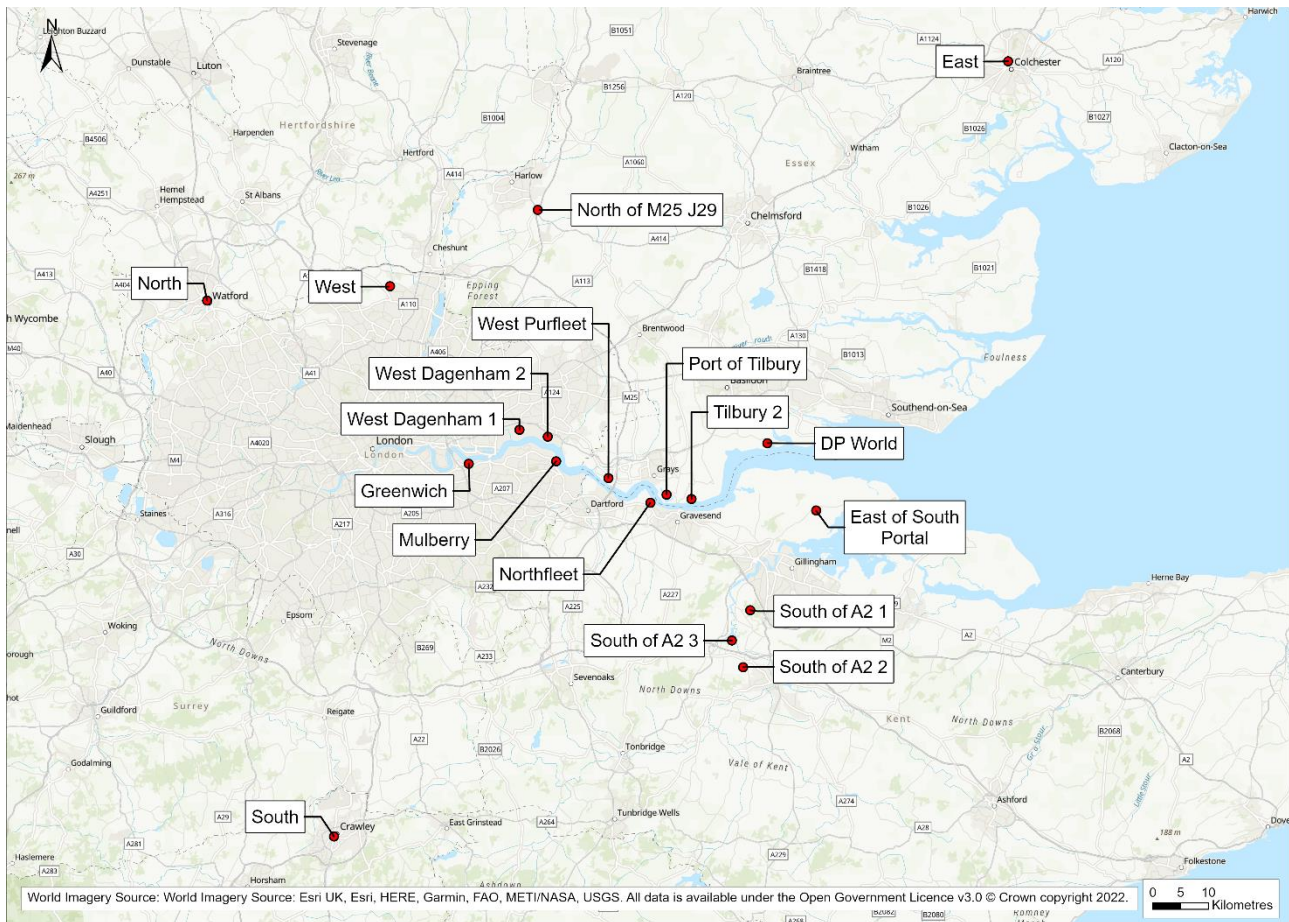
8.6.11 It has been assumed that these HGV movements occur evenly between 07:00 and 19:00.

- 8.6.12 In order to reflect the current levels of uncertainty regarding the total amount of traffic generated from each compound, and to ensure a robust assessment, an additional 20% was added to the HGV traffic volume. The number of HGVs were also converted into PCU values for use in the LTAM using a factor of 2.5. Both directions of movement (outward and return) are shown in the LTAM. For the return trip it has been assumed that the vehicle would return to the compound from which it originated.

Deliveries from external suppliers

- 8.6.13 The final element of HGV demand associated with the construction of the Project relates to deliveries from external suppliers. The type and quantities of goods required across a range of different commodities has been allocated to each of the compounds. This includes deliveries associated with both the main works and enabling works. The deliveries have been estimated based on the developing bill of quantities for the works, and assumptions about the timing of the activities and the capacity of the HGVs. While there are uncertainties over the exact programme and design requirements, these assumptions are considered to be proportionate and reasonable for this stage of the planning, to create a reasonable worst case.
- 8.6.14 The actual sourcing of the products is unknown, as the final supply chain will be defined through the procurement process following appointment of the Contractor. Therefore, it is necessary to make assumptions regarding the sourcing of deliveries. The approach taken has been to select a series of representative supplier locations, based on a combination of known distribution centres and a wider network of sources defined by geographical direction. This is a reasonable approach to handle the current uncertainty as it is likely to be representative of the diverse supply chains that would be needed for the construction of the Project.
- 8.6.15 A profile showing the total amount of goods that would be delivered throughout the construction programme was used to determine the volume of commodities required in each of the 11 construction traffic modelling phases.
- 8.6.16 All of these movements would use the external road network and were included in the LTAM. A series of external locations were identified which represent typical places from which these commodities would be sourced. Plate 8.25 shows these locations.
- 8.6.17 It should be noted that the “north”, “east”, “south” and “west” locations are representative; at this stage the exact locations of material sources for these are unknown, as they could come from a wide variety of locations, for example deliveries from “north” could come from anywhere in the north of England. The locations assumed in the Plate 8.25 were selected in order to ensure that the HGV delivery trips coming from those cardinal points would enter the modelled network at a representative position.
- 8.6.18 The assumptions made accord with the “baseline commitment” as set out in the outline Materials Handling Plan (Application Document 6.3), which states that the Project shall utilise port facilities for at least 80% by weight of bulk aggregates imported to the north portal construction area.

Plate 8.25 External supplier locations



- 8.6.19 The peak period for deliveries to compounds is forecast to be between 08:00 and 09:00, whereas the LTAM AM peak hour is 07:00 to 08:00. This would result in the peak delivery movements not being accounted for in the LTAM, underestimating their impact on traffic conditions. Therefore, for the purposes of traffic modelling, the AM peak delivery vehicles to compounds were assigned to the 07:00 to 08:00 peak hour in the LTAM and are therefore accounted for in the traffic modelling. This is considered to be a robust approach.
- 8.6.20 For deliveries from external suppliers arriving at compound sites, 25% are assumed to occur in the LTAM AM peak hour, 7.5% in the LTAM inter-peak hour and 7.5% in the LTAM PM peak hour.
- 8.6.21 For return trips leaving compound sites to external suppliers, 9.1% of these trips are assumed to occur in each of the LTAM AM peak hour, inter-peak hour and PM peak hour.
- 8.6.22 The LTAM calculates the routes that each of these HGVs would take, making use of both the Project’s haul roads and the public road network.
- 8.6.23 In order to reflect the current levels of uncertainty regarding the total amount of HGV traffic generated from each compound, and to ensure a robust assessment, an additional 20% was added to the HGV traffic volumes. The number of HGV vehicles was also converted into PCU values for use in the LTAM using a factor of 2.5. Both directions of movement (outward and return) are reflected in the LTAM. For the return trip it is assumed that the vehicle would return to its origin.

LGV

- 8.6.24 There are two groups of LGVs considered within the project assessment:
- a. specialist contractors; and
 - b. LGV deliveries
- 8.6.25 Specialist contractors would come to site in LGVs carrying their equipment. These LGVs are included within the forecast staff travel numbers, with both cars and LGVs having a PCU value of 1 within the LTAM.
- 8.6.26 In addition some LGVs would deliver materials. The number of forecast LGV delivery trips per compound is forecast at 15-25 trips per day depending on the size of the compound. These volumes, converted to hourly flows are insignificant in the context of a strategic model so have not been modelled.

Staff

- 8.6.27 Estimates of the number of staff in each compound throughout the construction programme have been derived, both for the enabling works and main works but for assessment purposes these were added together.
- 8.6.28 The total number of workers, at the peak phase of construction, are shown in Table 8.17. Some workers would be accommodated onsite in the north. The remaining workers are expected to live within 90 minutes travel time from the construction site.
- 8.6.29 For the origin of the staff trips a series of journey time assumptions were adopted. It was assumed that 28% of staff would travel from within 30 minutes of their work compound. This assumption ensured that the effective number of staff requiring accommodation within 30 minutes of a northern site (which effectively serves as a proxy for the Thurrock local authority area) was capped in line with the accommodation strategy. The remaining staff would travel in, from between 30-90 minutes away, with 75% of those travelling 30-60 minutes and 25% travelling 60-90 minutes. Effectively this is an overall percentage split of 28, 54 and 18, for the three respective bands.
- 8.6.30 For more information on the Project's construction workforce and the assumptions made above, see the Worker Accommodation Report (Application Document 7.18).

Table 8.17 Workforce numbers

	North (at peak)	South (at peak)
Total workers	3,802	885
Home-based	1,331	310
Onsite	480	0
Requiring accommodation	1,991	575

- 8.6.31 Assumptions were made regarding the modal share of workers accessing compounds, based upon an assumed number of available parking spaces and the likely vehicle occupancy. These assumptions are:
- at compounds with fewer than 50 workers, all workers would arrive by car.
 - at compounds with 50 – 100 workers, the number of cars would be 80% of the number of workers
 - at compounds with over 100 workers this figure would fall to 70%.
- 8.6.32 Table 8.18 provides the modal share assumptions applied in the assessment for each compound.

Table 8.18 Modal share assumptions by compound/ ULH

Destination	Car driver (%)
Marling Cross compound	80
A2 compound, A2 West Utility Hub, and A2 East Utility Hub	70
Southern tunnel entrance compound and Shorne Ifield Road Utility Hub	70
A226 Gravesend Road compound	100
Milton compound	100
Northern tunnel entrance compound	70
Station Road compound	100
Brentwood Road compound, and Brentwood Road Utility Hub	70
Stanford Road compound, and Hornsby Lane Utility Hub	80
Long Lane compounds A and B, and Long Lane Utility Hub	80
Stifford Clays Road compound West, Green Lane Utility Hub, and Stifford Clays Road Utility Hub	80
Stifford Clays Road compound East	70
Mardyke compound	80
Medebridge compound, and Medebridge Utility Hub	70
M25 compound	70
Ockendon Road compound	80
Warley Street compound	70
Beredens Lane Utility Hub	100
Folkes Lane Utility Hub	100
Stanford Road Utility Hub	100
Muckingford Road Utility Hub	100
Low Street Lane Utility Hub	100
Park Pale Lane Utility Hub	100

- 8.6.33 However, the Project is committed to reducing the impact of its workforce on the road network, more details of which are set out in the Framework Construction Travel Plan (Application Document 7.13).
- 8.6.34 The level of demand in each individual phase was calculated by averaging over level of demand for each of the months within that phase. If, in a given month, there were no workers allocated to a site, then that month was excluded from the average for the phase. In effect, this means that the average for a phase is representative only of the months within a phase where the site was active, rather than as a true average across all months of the phase. For example, if a site is open for one month of a four month phase, with 100 workers in that month, then the average calculated for the phase would be 100, not 25.
- 8.6.35 A temporal profile (representing the start and end times of each working shift) was used to convert the daily values into the LTAM peak hours. Most compounds use the same temporal profile, with these compounds operating to the same shift pattern, which is a daytime shift.
- 8.6.36 For the compounds associated with tunnelling (southern tunnel entrance and northern tunnel entrance compounds) three different shift patterns are proposed. These are:
- Daytime: This is the 'standard' daytime working pattern, common to tunnelling and non-tunnelling sites.
 - Extended daytime: This is a second shift in addition to the daytime shift. This only occurs during the six months of the year when extra daylight hours allow.
 - 24hr shift: This is itself comprised of three separate shifts, allowing for a continuous presence on site throughout each 24hr period. There is also a further shift 'in reserve' representing those people on the 24hr shift who are on leave, but these are away from site on any given day and so are not included in the traffic modelling.
- 8.6.37 The proposed shift patterns do not fully align with the LTAM time periods. For example, the tunnel and non-tunnel workforce daily shift is proposed to end at 18:00 which would mean that all staff departures would occur between 18:00 and 19:00, whereas the LTAM PM peak time period is from 17:00 to 18:00. This means that no staff would be modelled as leaving site in the LTAM PM peak and their impact on traffic conditions would be ignored. Therefore, for modelling purposes, the shift has been modelled with the departure time as between 17:00 and 18:00 so that the impact of staff leaving site is included within the analysis. Similar changes to the arrival/departure times were made for the other shift types to ensure that these are included in the traffic modelling.
- 8.6.38 Table 8.19 to Table 8.21 show the assumed staff temporal distribution for each of the different shift types. Applying these profiles leads to a frequency of each movement in each time period in each phase. All profiles are defined in terms of number of workers per shift, thus the profiles sum to 1 for daytime and extended daytime, and 3 for the 24hr shift.

Table 8.19 Staff temporal profile – staff non tunnel, and tunnel daytime shift

Time of day	Modelled period	Departures		Arrivals	
		Actual	Modelled	Actual	Modelled
07:00 – 08:00	Yes (AM peak)	0.0	0.0	1.0	1.0
08:00 – 09:00	No	0.0	0.0	0.0	0.0
09:00 – 10:00	Yes (Average Inter peak)	0.0	0.0	0.0	0.0
10:00 – 11:00		0.0		0.0	
11:00 – 12:00		0.0		0.0	
12:00 – 13:00		0.0		0.0	
13:00 – 14:00		0.0		0.0	
14:00 – 15:00		0.0		0.0	
15:00 – 16:00		No		0.0	
16:00 – 17:00	No	0.0	0.0	0.0	0.0
17:00 – 18:00	Yes (PM peak)	0.0	1.0	0.0	0.0
18:00 – 19:00	No	1.0	0.0	0.0	0.0
Total		1.0	1.0	1.0	1.0

Table 8.20 Staff temporal profile – staff tunnel extended daytime shift

Time of day	Modelled period	Departures		Arrivals	
		Actual	Modelled	Actual	Modelled
07:00 – 08:00	Yes (AM peak)	0.0	0.0	0.0	0.0
08:00 – 09:00	No	0.0	0.0	0.0	0.0
09:00 – 10:00	Yes (Average Inter Peak)	0.0	0.0	0.0	1.0 (all assumed to occur in 1 hour)
10:00 – 11:00		0.0		0.0	
11:00 – 12:00		0.0		0.0	
12:00 – 13:00		0.0		0.0	
13:00 – 14:00		0.0		1.0	
14:00 – 15:00		0.0		0.0	
15:00 – 16:00		No		0.0	
16:00 – 17:00	No	0.0	0.0	0.0	0.0
17:00 – 18:00	Yes (PM Peak)	0.0	0.0	0.0	0.0
18:00 – 19:00	No	0.0	0.0	0.0	0.0
19:00 – 20:00	No	0.0	0.0	0.0	0.0
20:00 – 21:00	No	0.0	0.0	0.0	0.0
21:00 – 22:00	No	0.0	0.0	0.0	0.0
22:00 – 23:00	No	1.0	1.0	0.0	0.0
23:00 – 00:00	No	0.0	0.0	0.0	0.0
Total		1.0	1.0	1.0	1.0

Table 8.21 Staff temporal profile – staff tunnel 24hr shift

Time of day	Modelled period	Departures		Arrivals	
		Actual	Modelled	Actual	Modelled
06:00 – 07:00	No	0.0	0.0	1.0	0.0
07:00 – 08:00	Yes (AM peak)	1.0	1.0	0.0	1.0
08:00 – 09:00	No	0.0	0.0	0.0	0.0
09:00 – 10:00	Yes (Average Inter peak)	0.0	1.0 (all assumed to occur in 1 hour)	0.0	1.0 (all assumed to occur in 1 hour)
10:00 – 11:00		0.0		0.0	
11:00 – 12:00		0.0		0.0	
12:00 – 13:00		0.0		0.0	
13:00 – 14:00		0.0		0.0	
14:00 – 15:00		0.0		1.0	
15:00 – 16:00	No	1.0	0.0	0.0	0.0
16:00 – 17:00	No	0.0	0.0	0.0	0.0
17:00 – 18:00	Yes (PM peak)	0.0	0.0	0.0	0.0
18:00 – 19:00	No	0.0	0.0	0.0	0.0
19:00 – 20:00	No	0.0	0.0	0.0	0.0
20:00 – 21:00	No	0.0	0.0	0.0	0.0
21:00 – 22:00	No	0.0	0.0	0.0	0.0
22:00 – 23:00	No	0.0	0.0	1.0	1.0
23:00 – 00:00	No	1.0	1.0	0.0	0.0
Total		3.0	3.0	3.0	3.0

- 8.6.39 For the purposes of assessment, it has been assumed that there would be up to 480 onsite accommodation spaces available for staff to use. However, for most phases and to ensure robustness in the assessment, an accommodation capacity of 400 spaces has been assumed. If an employee is staying in onsite accommodation it has been assumed that they would not make a commute trip. As such, the approach taken means that the assessment allows for the travel of an additional 80 workers, whereas in reality they would be resident on site, thus not making a commute trip.
- 8.6.40 An assumption has been made that throughout the life of the Project’s construction, 35% of the workers would be travelling in to work from their own home. These workers would therefore not require onsite accommodation; only the remaining 65% would be eligible to be offered onsite accommodation.
- 8.6.41 The onsite accommodation would be located at the northern tunnel entrance compound. It is assumed that workers at this compound who are working on the 24hr shift pattern would be given first priority for the accommodation (note that there are four ‘gangs’ of workers who could take up accommodation, one for each of the three shifts, plus a fourth ‘gang’ of workers who are on leave but would still require accommodation). Workers at the northern tunnel entrance compound working on the extended and normal daytime shift pattern would be given second and third priority. Any remaining accommodation spaces would then be allocated across all other compounds situated north of the River Thames. Workers south of the River Thames have been assumed to not have access to this accommodation.
- 8.6.42 Table 8.22 shows the number of workers and the assumptions made regarding access to accommodation.

Table 8.22 Onsite accommodation assumptions for the workforce north of the River Thames

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
Onsite accommodation spaces	400	480	480	480	400	400	400	400	400	400	400
24 hr Shift – total workers (four ‘gangs’)	461	1,089	1,892	1,770	2,000	2,177	1,812	1,386	1,636	1,360	349
24 hr Shift – not travelling in from home (65% of above)	300	708	1,230	1,151	1,300	1,415	1,178	901	1,063	884	227
24 hr shift staying in onsite accommodation	300	480	480	480	400	400	400	400	400	400	227
% 24 hr shift travelling every day	35%	56%	75%	73%	80%	82%	78%	71%	76%	71%	35%
Remaining onsite accommodation spaces	100	0	0	0	0	0	0	0	0	0	173
Extended daytime shift workers	123	133	52	52	0	52	0	28	0	31	23
Extended daytime shift not travelling in from home (65% of above)	80	86	34	34	0	34	0	18	0	20	15
Extended daytime shift staying in onsite accommodation	80	0	0	0	0	0	0	0	0	0	15
% Extended daytime shift travelling every day	35%	100%	100%	100%	0%	100%	0%	100%	0%	100%	35%
Remaining onsite accommodation spaces	21	0	0	0	0	0	0	0	0	0	158
Daytime shift	368	442	350	333	325	284	237	216	195	195	122
Daytime shift not travelling in from home (65% of above)	239	287	228	217	211	184	154	140	127	127	79
Daytime shift staying in onsite accommodation	21	0	0	0	0	0	0	0	0	0	79
% daytime shift travelling every day	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	35%
Remaining onsite accommodation spaces	0	0	0	0	0	0	0	0	0	0	79
Remaining workers north of the River Thames	649	986	1083	1182	1257	1225	1192	982	606	332	189
Remaining workers north of the River Thames not travelling in from home (65% of above)	422	641	704	769	817	796	775	638	394	216	123
Remaining workers north of the River Thames staying in onsite accommodation	0	0	0	0	0	0	0	0	0	0	79
Remaining workers north of River Thames travelling every day	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	58%

- 8.6.43 As can be seen in Table 8.22, in all but phases 1 and 11, the onsite accommodation is filled up by 24hr shift workers. In phase 1, the accommodation is full after being offered to the extended daytime and daytime shift. In phase 11, there is spare accommodation remaining after being offered to all workers at the northern tunnel entrance compound, which would enable some of the workers at other sites to use this onsite accommodation.
- 8.6.44 The total number of car trips by staff originating and terminating in each construction compound was calculated for each of the LTAM modelled time periods. These trips were then distributed across the rest of the zones in the LTAM to form an origin and destination for each trip. The output from this process was a set of staff trip matrices that was added to the construction traffic and the existing trips to form the Do Something (DS), with construction, trip matrices.

Construction vehicles by phase

- 8.6.45 Table 8.23 to Table 8.33 provide a summary of the total demand levels for different elements of construction traffic in each phase.

Table 8.23 Construction traffic demand in phase 1 (PCU/hr)

Movement type	Phase 1		
	AM	IP	PM
Compound to compound earthworks	6	6	6
Compound to external earthworks	43	43	43
Supplies	168	82	82
Staff	1,113	110	1,056
Total PCUs	1,329	240	1,187

Table 8.24 Construction traffic demand in phase 2 (PCU/hr)

Movement type	Phase 2		
	AM	IP	PM
Compound to compound earthworks	31	31	31
Compound to external earthworks	53	53	53
Supplies	267	130	130
Staff	1,805	360	1,591
Total PCUs	2,156	574	1,806

Table 8.25 Construction traffic demand in phase 3 (PCU/hr)

Movement type	Phase 3		
	AM	IP	PM
Compound to compound earthworks	49	49	49
Compound to external earthworks	80	80	80
Supplies	314	153	153
Staff	2,043	584	1,548
Total PCUs	2,486	866	1,830

Table 8.26 Construction traffic demand in phase 4 (PCU/hr)

Movement type	Phase 4		
	AM	IP	PM
Compound to compound earthworks	131	131	131
Compound to external earthworks	94	94	94
Supplies	332	162	162
Staff	2,099	553	1,647
Total PCUs	2,656	940	2,034

Table 8.27 Construction traffic demand in phase 5 (PCU/hr)

Movement Type	Phase 5		
	AM	IP	PM
Compound to compound earthworks	94	94	94
Compound to external earthworks	64	64	64
Supplies	344	168	168
Staff	2,241	560	1,681
Total PCUs	2,743	886	2,006

Table 8.28 Construction traffic demand in phase 6 (PCU/hr)

Movement type	Phase 6		
	AM	IP	PM
Compound to compound earthworks	253	253	253
Compound to external earthworks	119	119	119
Supplies	373	182	182
Staff	2,215	731	1,593
Total PCUs	2,961	1,285	2,148

Table 8.29 Construction traffic demand in phase 7 (PCU/hr)

Movement type	Phase 7		
	AM	IP	PM
Compound to compound earthworks	154	154	154
Compound to external earthworks	75	75	75
Supplies	382	186	186
Staff	2,053	633	1,497
Total PCUs	2,664	1,048	1,912

Table 8.30 Construction traffic demand in phase 7 (PCU/hr)

Movement type	Phase 8		
	AM	IP	PM
Compound to compound earthworks	85	85	85
Compound to external earthworks	63	63	63
Supplies	329	160	160
Staff	1,589	466	1,219
Total PCUs	2,066	775	1,528

Table 8.31 Construction traffic demand in phase 9 (PCU/hr)

Movement Type	Phase 9		
	AM	IP	PM
Compound to compound earthworks	26	26	26
Compound to external earthworks	18	18	18
Supplies	245	119	119
Staff	1,270	504	767
Total PCUs	1,560	667	931

Table 8.32 Construction traffic demand in phase 10 (PCU/hr)

Movement type	Phase 10		
	AM	IP	PM
Compound to compound earthworks	43	43	43
Compound to external earthworks	12	12	12
Supplies	186	91	91
Staff	916	455	509
Total PCUs	1,158	601	655

Table 8.33 Construction traffic demand in phase 11 (PCU/hr)

Movement type	Phase 11		
	AM	IP	PM
Compound to compound earthworks	1	1	1
Compound to external earthworks	0	0	0
Supplies	42	21	21
Staff	301	109	213
Total PCUs	345	131	236

8.7 Thurrock Flexible Generation Plant demand

- 8.7.1 As noted in Section 8.2, the TFGP is proposed to be constructed in the same timeframe as the Project. There are currently a range of different options for the construction of TFGP as outlined in their Transport Assessment and Environmental Statement (The Planning Inspectorate, 2022).
- 8.7.2 For the purposes of the Project’s construction modelling the most impactful scenario was assumed to be the scenario which has construction beginning in Q3 2022 and running in three 18 month phases, with a nine month gap in between each phase. The information detailed below is based on the TFGP Transport Assessment (TFGP TA) for the site, and specifically Section 6 of the TFGP TA (The Planning Inspectorate, 2022).
- 8.7.3 The total HGV traffic generation for a single phase of construction is expected to be on average 40 HGV movements per day, with a peak of up to 80 HGV movements per day. The construction workforce is expected to average 250 full time equivalent (FTE) workers, with a peak of up to 350 people.
- 8.7.4 For the purposes of a robust assessment the following peak worker flows are assumed as shown in Table 8.34.

Table 8.34 TFGP staff volumes

Vehicle type	People	Vehicles
Car	35	35
Minibus	196	13
Coach	115	2
Total	346	50

- 8.7.5 TFGP assumes construction staff typically arrive between 06:00 and 08:00 and leave between 18:00 and 20:00. Given only a single hour is assessed within the LTAM for each peak, it has been assumed that the vehicular flow would be half of the numbers in the ‘vehicles’ column in Table 8.34. For robustness, the staff departure period was shifted for the purposes of assessment to 17:00 to 19:00 so that TFGP trips would be included in the modelled PM peak. It is assumed that when arriving, cars will stay onsite for the duration of the day, but coaches and minibuses will immediately return after dropping off. Thus, coaches and minibuses would generate trips in each direction, within the arrival or departure periods, but cars would not.

- 8.7.6 HGV material movements are assumed at their peak levels, this is eight HGVs per hour throughout the day; after delivering materials, HGVs depart the site, thus there would be 16 two-way HGV trips per hour.
- 8.7.7 The residential locations of staff working at TFGP, and the source of HGV material deliveries are not specified in the TFGP TA. For the modelling, the distribution of staff is assumed to be the same as for the modelled zone which TFGP sits within. HGV deliveries are assumed to be sourced from the locations shown in Table 8.35 which are the locations that would be used by the Project construction deliveries.

Table 8.35 TFGP HGV delivery sources

Location	Percentage
Port of Tilbury	40
DP World London Gateway	30
West Purfleet	10
West Dagenham	10
North of M25 junction 29	5
Northfleet	5

- 8.7.8 The trip matrices for TFGP were added to the Project’s forecast trip matrices for the phases when TFGP construction is assumed to be taking place.

8.8 Impacts on the highway network

Introduction

- 8.8.1 This section of the report summarises the forecast impact of the Project’s construction programme in each phase.
- 8.8.2 For each phase a map shows the forecast change in traffic flows, north and south of the River Thames for the AM, inter-peak and PM peaks. The maps show traffic on the haul roads, but these are not part of the public road network.
- 8.8.3 The changes in flow for each phase are also shown on maps as a percentage change in flow. These are presented in Appendix G.
- 8.8.4 A series of journey time routes have been identified in order to monitor the impacts of the Project’s construction programme on journey times throughout the Lower Thames area. Plate 8.26 shows these journey time routes spatially and Table 8.36 provides a description of the routes. The journey times for each phase are also tabulated within this section, where the changes are colour coded as green if there is forecast to be a reduction in journey time, orange if the forecast change is between 0.0 and 20.0% and if over 20%, they are coloured red.
- 8.8.5 The impacts on journey times are shown on maps for each modelled time period. These are presented in Appendix H.

Plate 8.26 Journey time routes

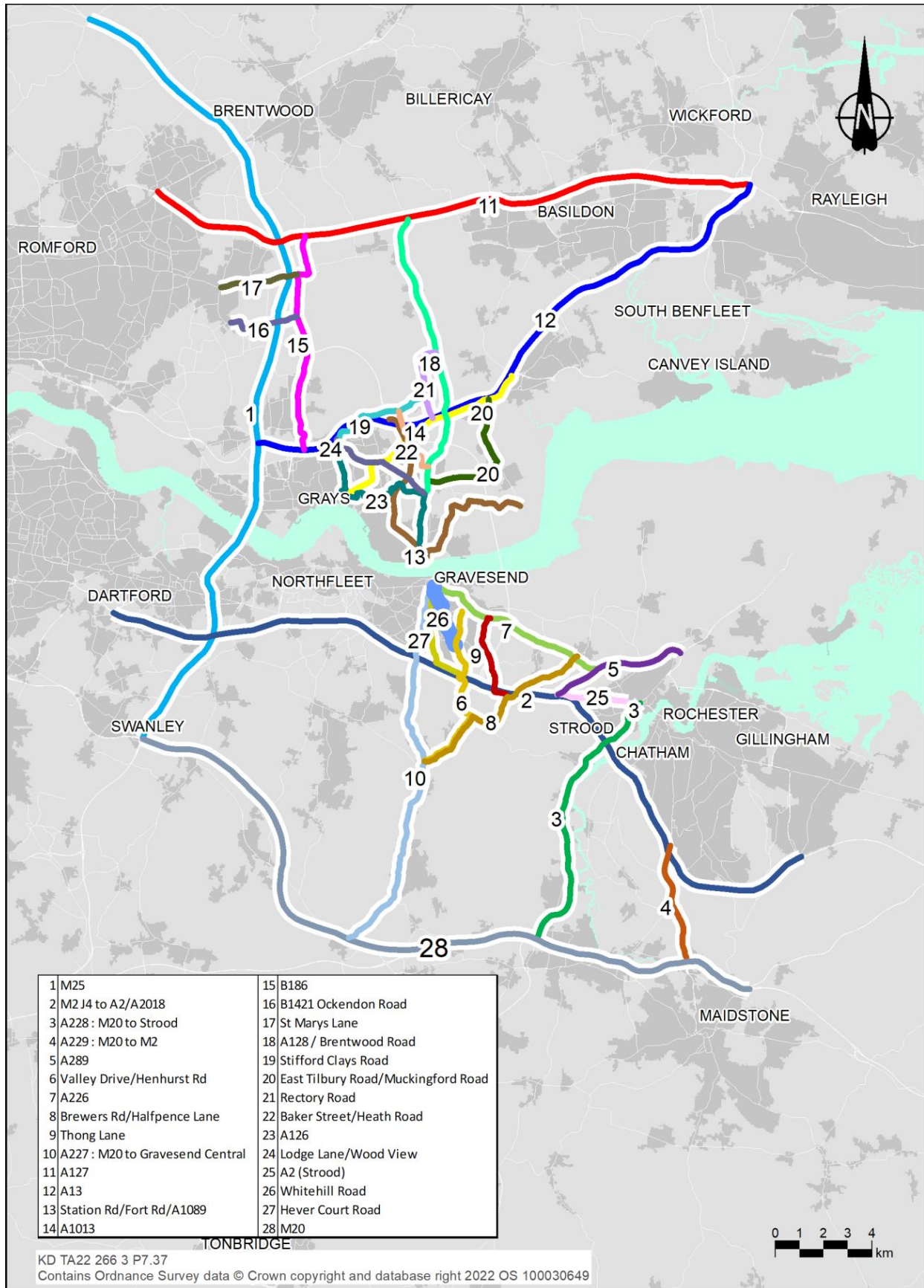


Table 8.36 Construction programme modelled journey time routes

Route	Road	Dir	Distance (km)	Route	Road	Dir	Distance (km)
1	M25	ACW	38.5	15	B186	NB	10.4
		CW	38.6			SB	10.4
2	M2 junction 4 to A2/ A2018	EB	34.4	16	B1421 Ockendon Road	EB	3.3
		WB	34.2			WB	3.3
3	A228: M20 to Strood	NB	11.8	17	St Marys Lane	EB	3.3
		SB	11.9			WB	3.3
4	A229: M20 to M2	NB	6.4	18	A128/ Brentwood Road	NB	12.4
		SB	6.8			SB	12.3
5	A289	EB	5.7	19	Stifford Clays Road	EB	4.5
		WB	7.0			WB	4.5
6	Valley Drive/ Henhurst Road	NB	8.1	20	East Tilbury Road/ Muckingford Road	EB	6.0
		SB	8.1			WB	6.0
7	A226	EB	7.7	21	Rectory Road	NB	3.4
		WB	7.7			SB	3.4
8	Brewers Road/ Halfpence Lane	NB	8.4	22	Baker Street/Heath Road	NB	3.0
		SB	8.4			SB	3.0
9	Thong Lane	NB	3.9	23	A126	NB	8.5
		SB	3.9			SB	8.5
10	A227: M20 to Gravesend Central junction	NB	15.8	24	Lodge Lane/Wood View	NB	4.3
		SB	15.8			SB	4.2
11	A127	EB	25.7	25	A2 (Strood)	EB	3.6
		WB	25.7			WB	4.9
12	A13	EB	25.0	26	Whitehill Road	NB	2.6
		WB	24.9			SB	2.6
13	Station Road/Fort Road /A1089	EB	12.8	27	Hever Court Road	NB	4.1
		WB	12.4			SB	4.1
14	A1013	EB	9.1	28	M20	WB	32.5
		WB	8.8			EB	32.0

Phase 1

- 8.8.6 The forecast change in traffic flows on the network, as a result of the additional construction related vehicles and the impact of the traffic management measures on the routes chosen by drivers are shown in Plate 8.27 to Plate 8.32. The maps present the change in flows, north and south of the river, for each of the modelled time periods.
- 8.8.7 For all journey time routes where the time changes by more than a minute or more than 10%, in either direction, the with and without construction journey times are shown in Table 8.37 to Table 8.39.

Plate 8.27 Change in flow (PCUs), north of the River Thames, phase 1 AM peak

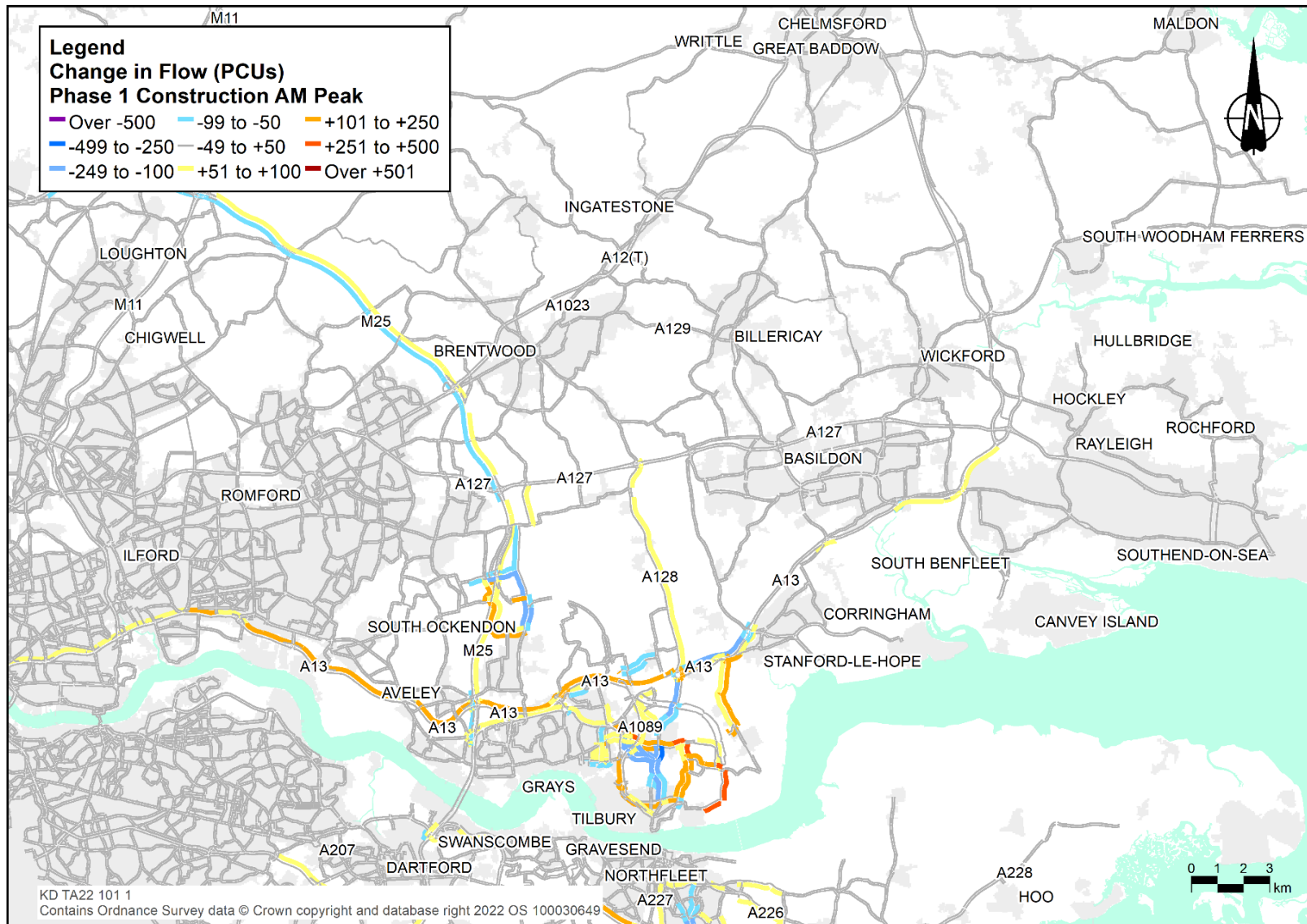


Plate 8.28 Change in flow (PCUs), north of the River Thames, phase 1 inter-peak

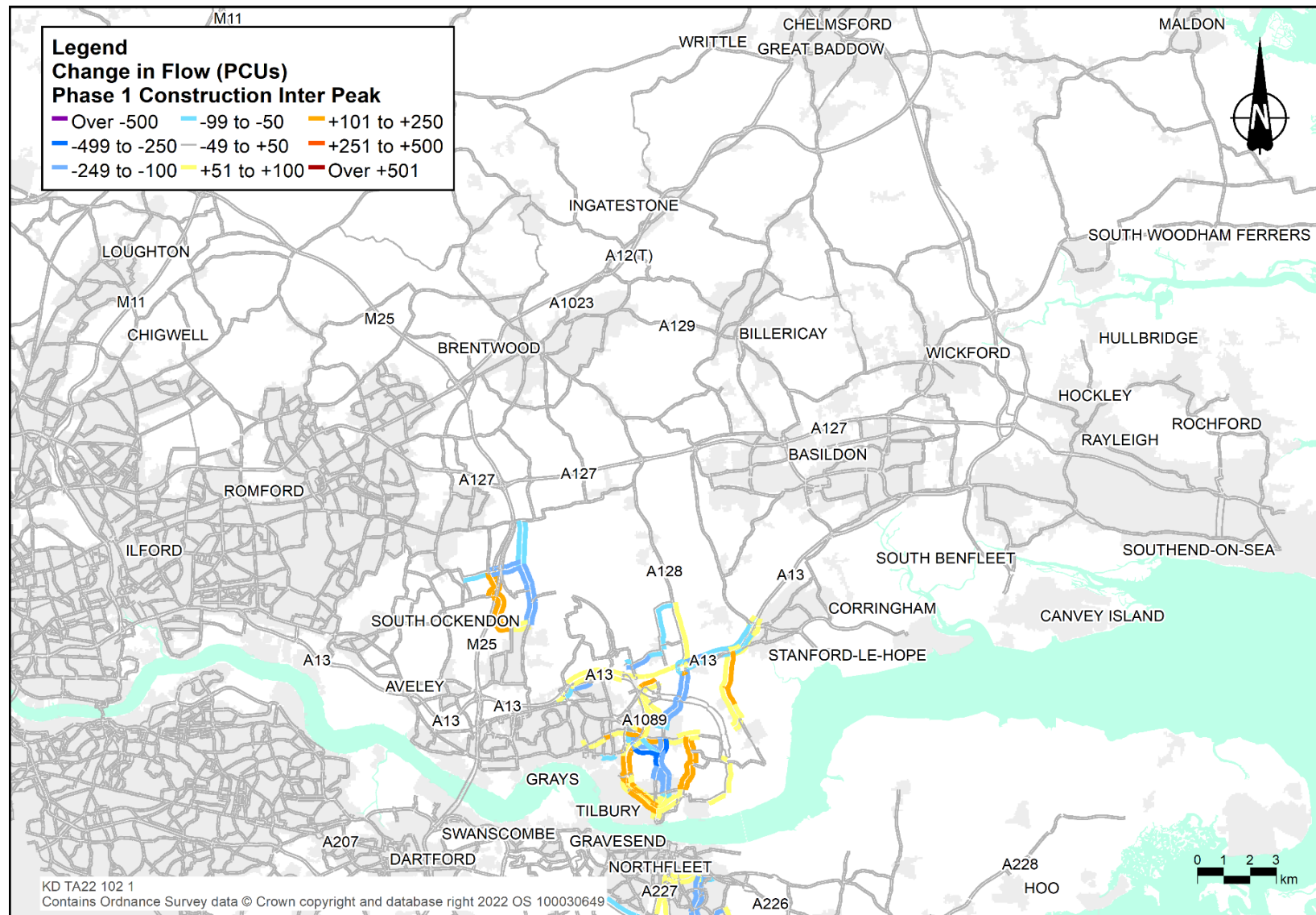


Plate 8.29 Change in actual flow (PCUs), north of the River Thames, phase 1 PM peak

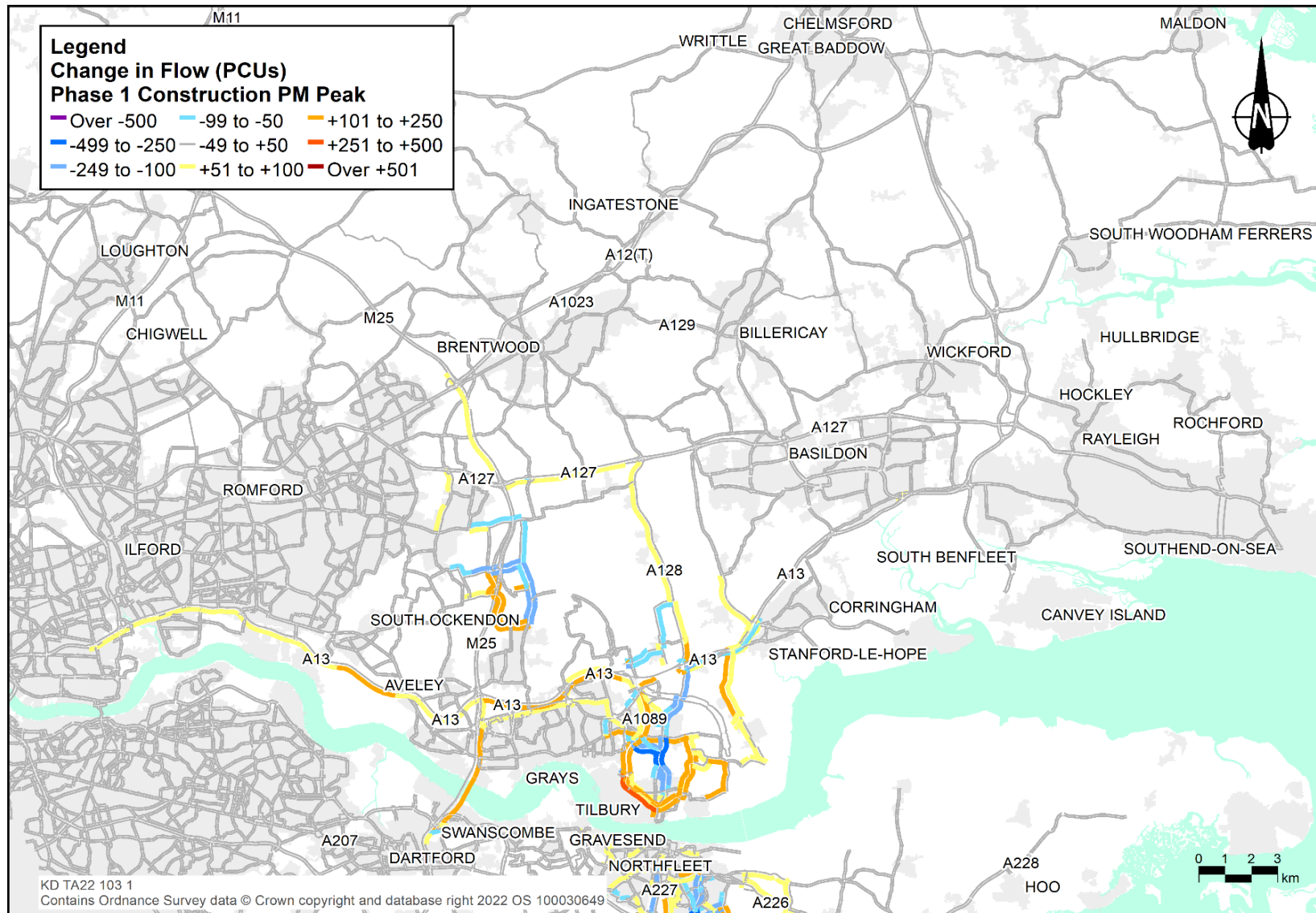


Plate 8.30 Change in flow (PCUs), south of the River Thames, phase 1 AM peak

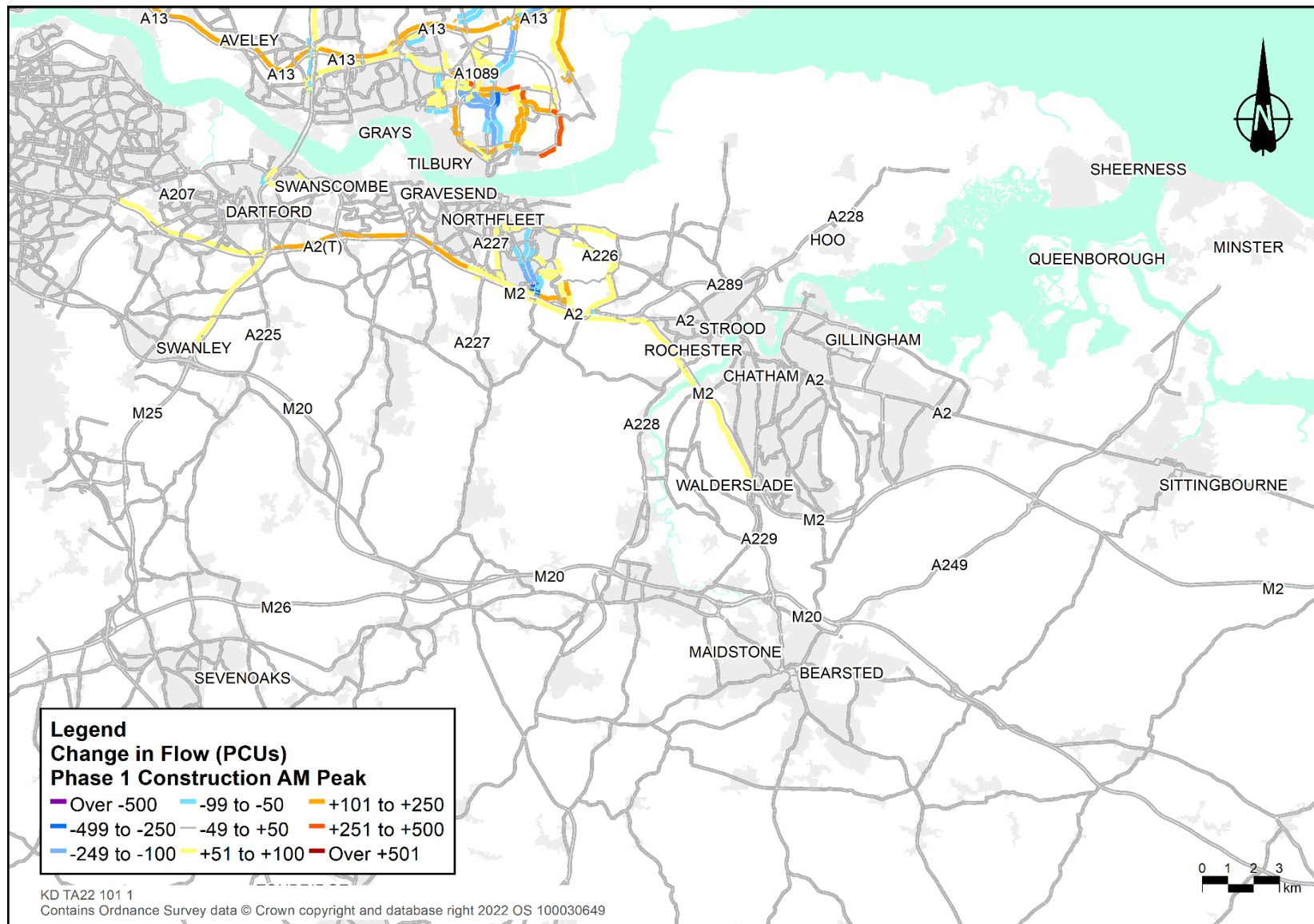


Plate 8.31 Change in flow (PCUs), south of the River Thames, phase 1 inter-peak

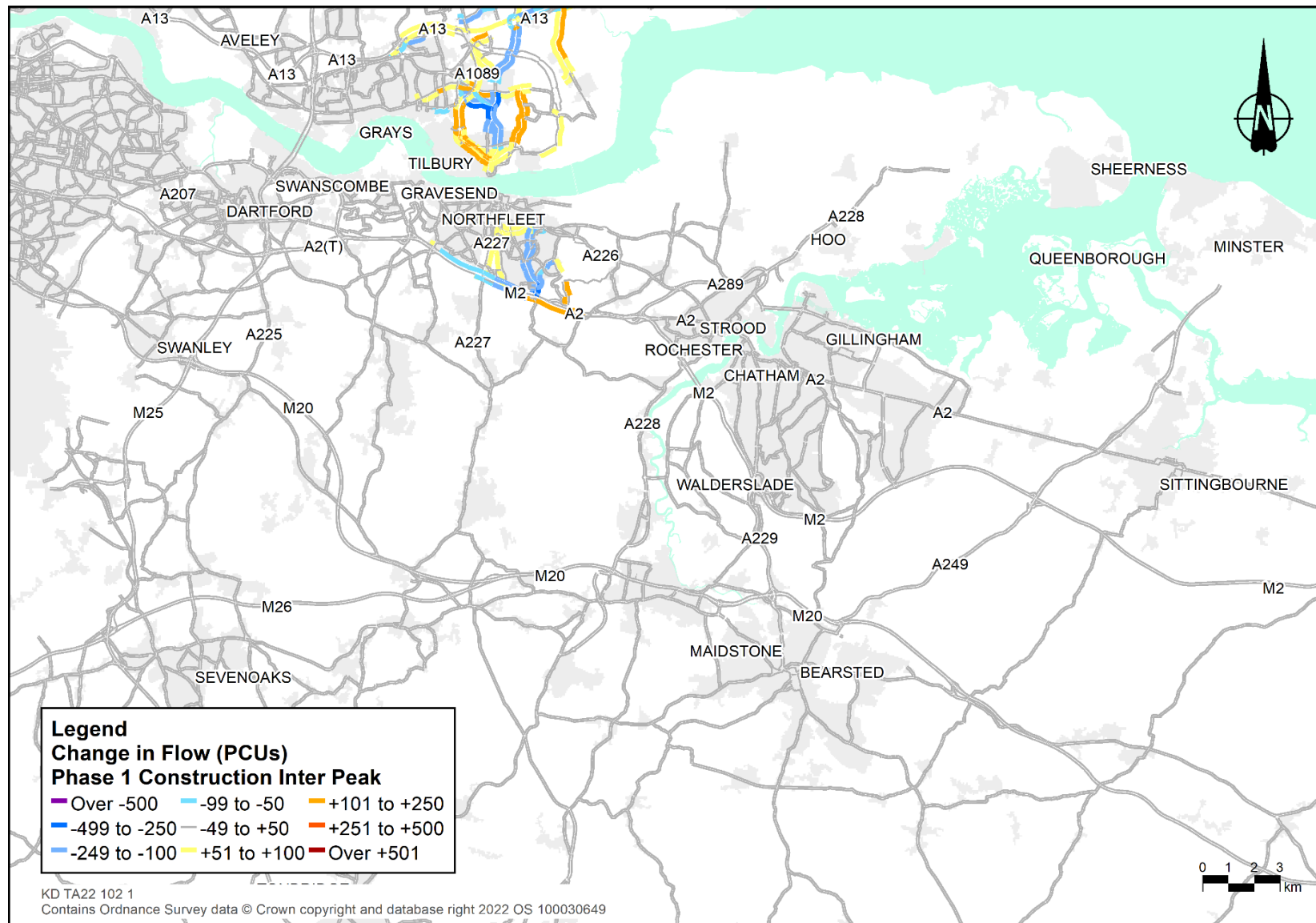


Plate 8.32 Change in flow (PCUs), south of the River Thames, phase 1 PM peak

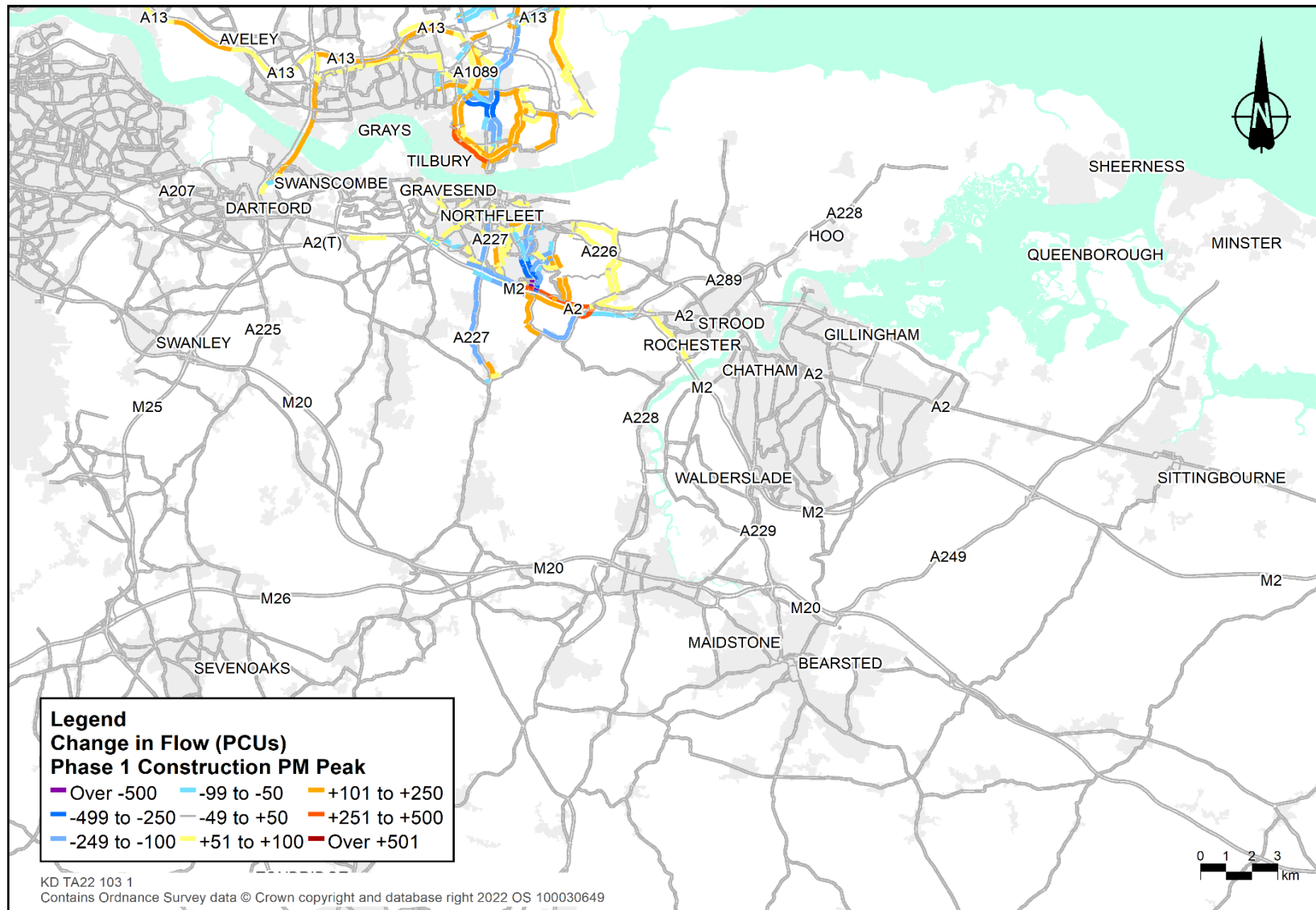


Table 8.37 Construction impact on journey times (phase 1 AM peak)

Route	Road	Dir	Without Construction		With Construction		Difference		Difference (%)	
			Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time	Av Speed
JT06	Valley Drive/Henhurst Road	NB	10.7	45.4	12.2	39.7	+1.5	-5.7	+14%	-13%
		SB	11.3	42.7	12.1	39.9	+0.8	-2.9	+7%	-7%
JT13	Station Road/Fort Road/A1089	EB	11.9	64.2	12.5	61.0	+0.6	-3.2	+5%	-5%
		WB	11.1	67.1	12.8	58.1	+1.7	-9.0	+15%	-13%
JT16	B1421 Ockendon Road	EB	3.8	51.4	4.7	42.1	+0.8	-9.3	+22%	-18%
		WB	3.8	51.5	4.6	42.7	+0.8	-8.7	+21%	-17%
JT18	A128 / Brentwood Road	NB	16.2	45.7	16.8	44.1	+0.6	-1.6	+4%	-3%
		SB	13.6	54.0	15.1	48.6	+1.5	-5.4	+11%	-10%
JT19	Stifford Clays Road	EB	4.8	55.8	6.4	41.9	+1.6	-13.9	+33%	-25%
		WB	5.3	51.0	6.4	41.6	+1.2	-9.4	+23%	-18%
JT22	Baker Street/Heath Road	NB	3.7	47.7	4.8	37.2	+1.1	-10.5	+28%	-22%
		SB	3.5	51.0	4.1	43.0	+0.7	-8.0	+19%	-16%
JT23	A126	NB	16.3	31.1	18.0	28.3	+1.6	-2.8	+10%	-9%
		SB	16.7	30.6	18.6	27.5	+1.9	-3.1	+11%	-10%

Table 8.38 Construction impact on journey times (phase 1 inter-peak)

Route	Road	Dir	Without Construction		With Construction		Difference		Difference (%)	
			Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time	Av Speed
JT06	Valley Drive/Henhurst Road	NB	10.9	44.2	12.0	40.3	+1.1	-3.9	+10%	-9%
		SB	10.8	44.9	11.8	41.0	+1.1	-4.0	+10%	-9%
JT16	B1421 Ockendon Road	EB	3.8	51.6	4.6	43.1	+0.8	-8.6	+20%	-17%
		WB	3.8	51.5	4.6	42.6	+0.8	-9.0	+21%	-17%
JT19	Stifford Clays Road	EB	4.8	55.7	6.3	42.3	+1.5	-13.4	+32%	-24%
		WB	5.0	53.6	6.0	44.7	+1.0	-8.9	+20%	-17%
JT22	Baker Street/Heath Road	NB	3.4	52.5	4.2	42.7	+0.8	-9.8	+23%	-19%
		SB	3.3	53.3	4.0	44.7	+0.6	-8.6	+19%	-16%
JT23	A126	NB	16.5	30.8	17.6	28.9	+1.1	-1.9	+7%	-6%
		SB	16.1	31.7	17.3	29.7	+1.1	-2.1	+7%	-6%

Table 8.39 Construction impact on journey times (phase 1 PM peak)

Route	Road	Dir	Without Construction		With Construction		Difference		Difference (%)	
			Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time	Av Speed
JT06	Valley Drive/Henhurst Road	NB	12.9	37.4	13.8	35.1	+0.8	-2.3	+6%	-6%
		SB	11.3	42.8	12.8	37.9	+1.5	-4.9	+13%	-11%
JT10	A227: M20 to Gravesend East	NB	21.8	40.4	23.1	38.0	+1.3	-2.3	+6%	-6%
		SB	19.2	45.4	19.7	44.3	+0.5	-1.2	+3%	-3%
JT15	B186	NB	12.7	48.8	13.7	45.3	+1.0	-3.6	+8%	-7%
		SB	13.9	44.6	14.8	42.0	+0.9	-2.6	+6%	-6%
JT16	B1421 Ockendon Road	EB	3.8	51.3	4.6	42.9	+0.8	-8.4	+20%	-16%
		WB	3.8	51.2	4.7	41.7	+0.9	-9.4	+22%	-18%
JT18	A128 / Brentwood Road	NB	13.7	54.1	15.0	49.2	+1.4	-4.9	+10%	-9%
		SB	15.3	48.1	16.1	45.7	+0.8	-2.4	+5%	-5%
JT19	Stifford Clays Road	EB	5.1	53.0	6.9	39.0	+1.8	-14.0	+36%	-26%
		WB	5.2	51.1	6.6	40.8	+1.3	-10.3	+25%	-20%
JT22	Baker Street/Heath Road	NB	3.6	49.0	4.8	37.4	+1.1	-11.6	+31%	-24%
		SB	4.4	40.4	5.4	32.8	+1.0	-7.6	+23%	-19%
JT23	A126	NB	17.8	28.6	19.3	26.4	+1.5	-2.2	+8%	-8%
		SB	17.5	29.2	18.6	27.5	+1.1	-1.7	+6%	-6%

- 8.8.8 The flow difference plots show small changes in total flow in the areas that would be directly impacted by the traffic management and Project related construction traffic. In this phase the predicted differences would generally be small.
- 8.8.9 The contraflow on B186 (RMTM56) would shift traffic from B186 to West Road / Dennis Road. The contraflow on Brentwood Road (RMTM12) would shift traffic to the A1089 and Muckingford Road / Buckingham Road. The contraflow on High Road (RNTM41) and on Stifford Clays Road (RNTM43) would shift traffic to Brentwood Road (North of Orsett Cock) southbound and the A13. The contraflow at Marshfoot Road/Chadwell Hill/Brentwood Road (RNTM05) would cause traffic to divert on to Linford Road and Turnpike Lane. The Valley Drive contraflow (RSTM09) would shift some traffic to Thong Lane.
- 8.8.10 The journey time analysis shows that there would be additional delays forecast on Valley Drive / Henhurst Road (JT06) in both directions in all time periods. These delays would be the result of the introduction of the traffic management measures at the A2 Gravesend East junction (RSTM02 and RSTM03) and the contraflow system on Valley Drive (RSTM09).
- 8.8.11 There would be additional delay along the A227 (JT10) in the northbound direction in the PM peak period. This occurs because of delays at the junction of the A227 and Chalky Bank north of the A2 as a result of the Valley Drive contraflow (RSTM09) causing traffic diverted on to the A227.
- 8.8.12 There would be additional predicted delays along Station Road / Fort Road / A1089 (JT13) in the AM peak hour in the westbound direction. These delays would be the result of a combination of the proposed contraflow systems on Marshfoot Road / Chadwell Hill / Brentwood Road (RNTM05) and an increase in traffic on the A1089 which would cause additional delays, in particular at the Asda Roundabout and at the A1089 Westbound on-slip to the A13. The ASDA roundabout and the A1089 Westbound on-slip are significantly congested in the Do Minimum scenario. Both of these locations would be used by Project construction vehicles and staff to access compounds and to make deliveries. Because the locations are already congested, a relatively small increase in overall traffic leads to a material increase in additional delay.
- 8.8.13 There would be additional delays in all periods along Ockendon Road (JT16), Stifford Clays Road (JT19) and Baker Street / Heath Road (JT22) due to contraflow systems in place on each respective road; the Ockendon Road contraflow (RNTM60), the Stifford Clays Road contraflow (RNTM43) and the Baker Street contraflow (RNTM80).
- 8.8.14 There would be additional delays in all periods along the A126 (JT23) in both directions due to the proposed contraflow system on Marshfoot Road / Chadwell Hill / Brentwood Road (RNTM05).
- 8.8.15 There would be additional delays along the B186 (JT15) in both directions in the PM peak only due to the proposed contraflow system on the B186 (RNTM56).
- 8.8.16 Additional delays would occur along the A128 / Brentwood Road route in the AM and PM peaks (JT18) due to the contraflow at Brentwood Road (RNTM12) and the contraflow at Marshfoot Road / Chadwell Hill / Brentwood Road (RNTM05).

- 8.8.17 Finally, there would be additional delays along the B186 (JT15) in the PM peak only. This is due to the B186 contraflow (RNTM56).

Phase 2

- 8.8.18 The forecast change in traffic flows on the network, as a result of the additional construction related vehicles and the impact of the traffic management measures on the routes chosen by drivers are shown in Plate 8.33 to Plate 8.38. The maps present the change in flows, north and south of the river, for each of the modelled time periods.
- 8.8.19 For all journey time routes where the time changes by more than a minute or more than 10%, in either direction, the with and without construction journey times are shown in Table 8.40 to Table 8.45.

Plate 8.33 Change in flow (PCUs), north of the River Thames, phase 2 AM peak

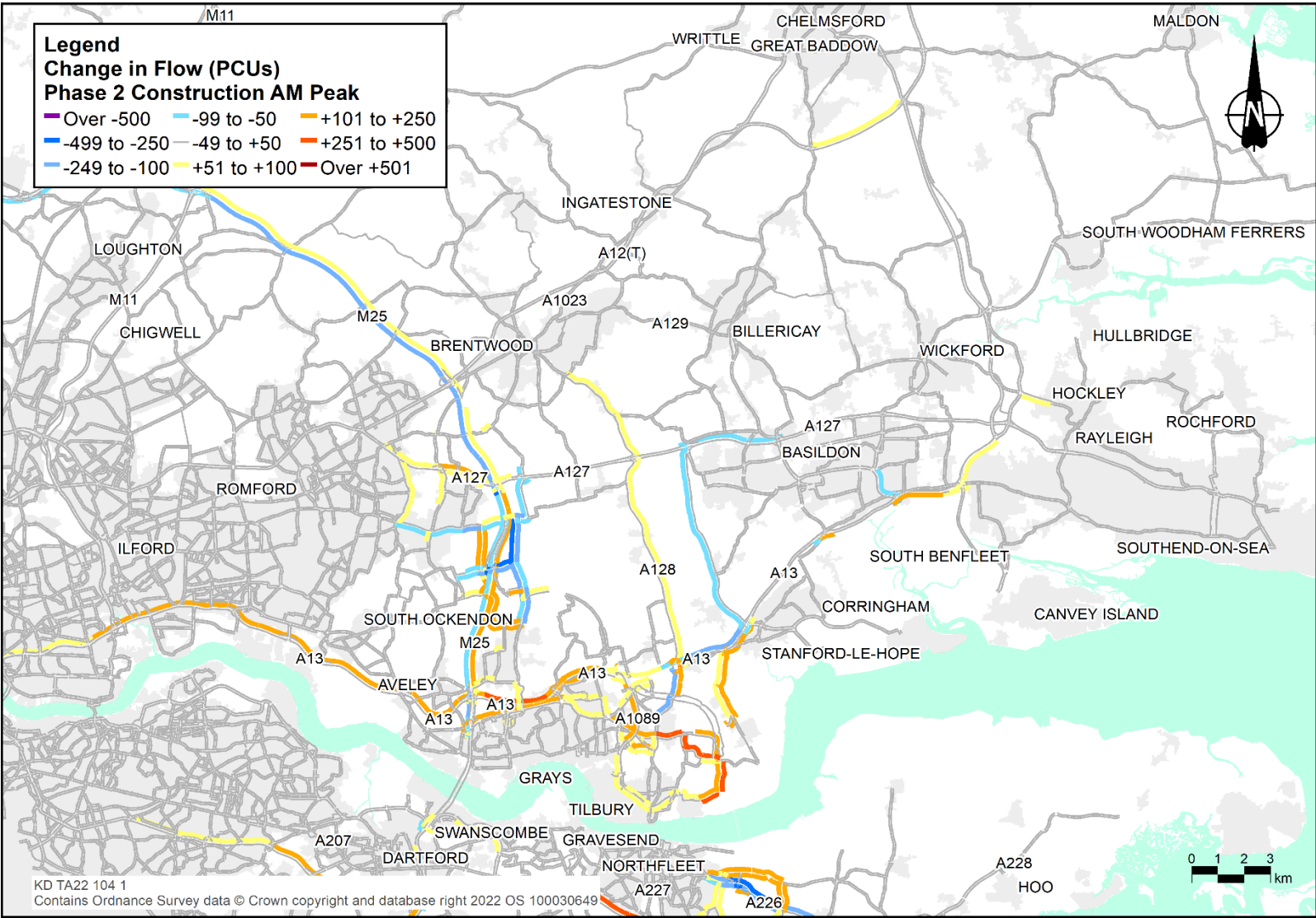


Plate 8.34 Change in flow (PCUs), north of the River Thames, phase 2 inter-peak

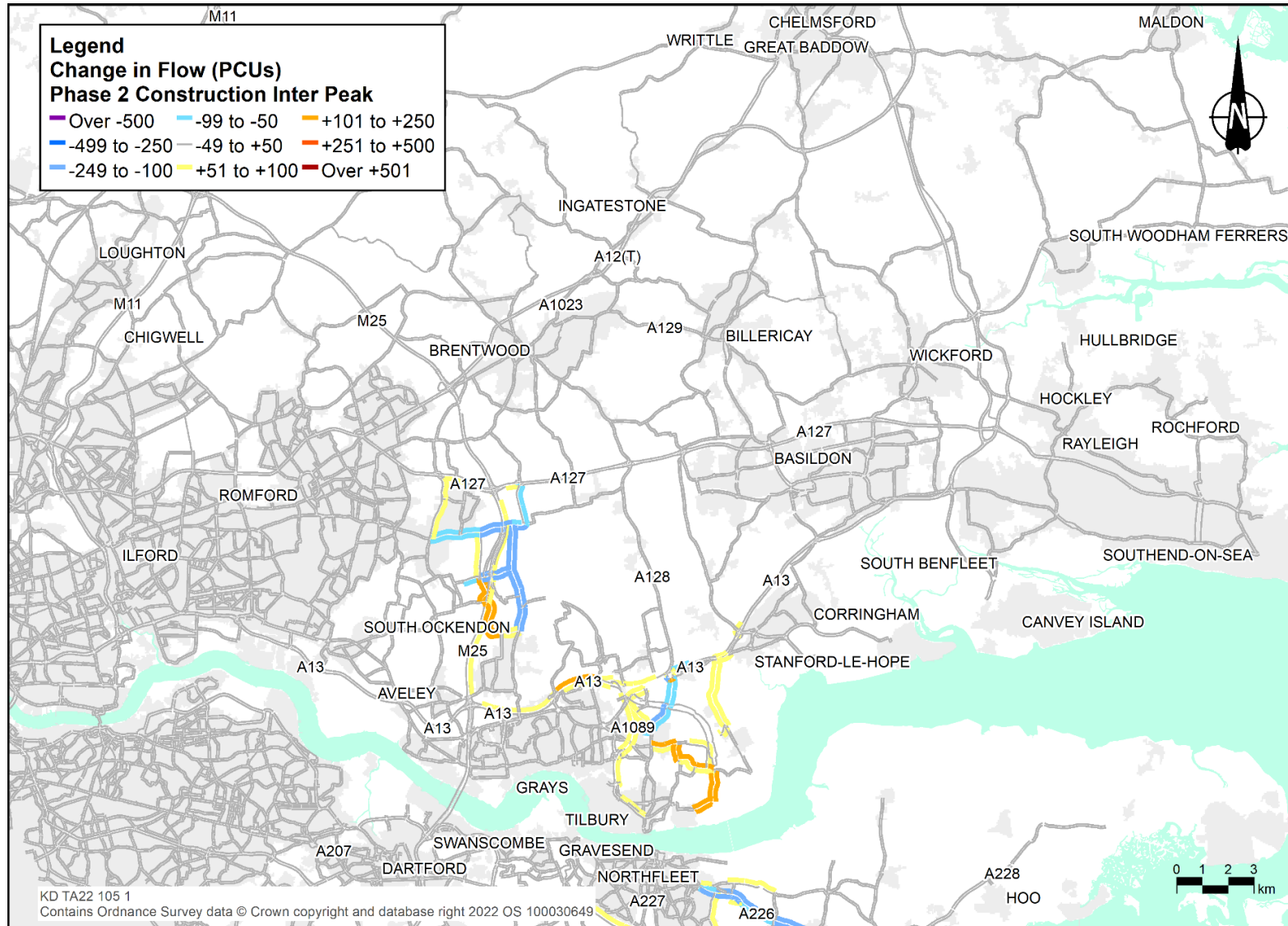


Plate 8.35 Change in flow (PCUs), north of the River Thames, phase 2 PM peak

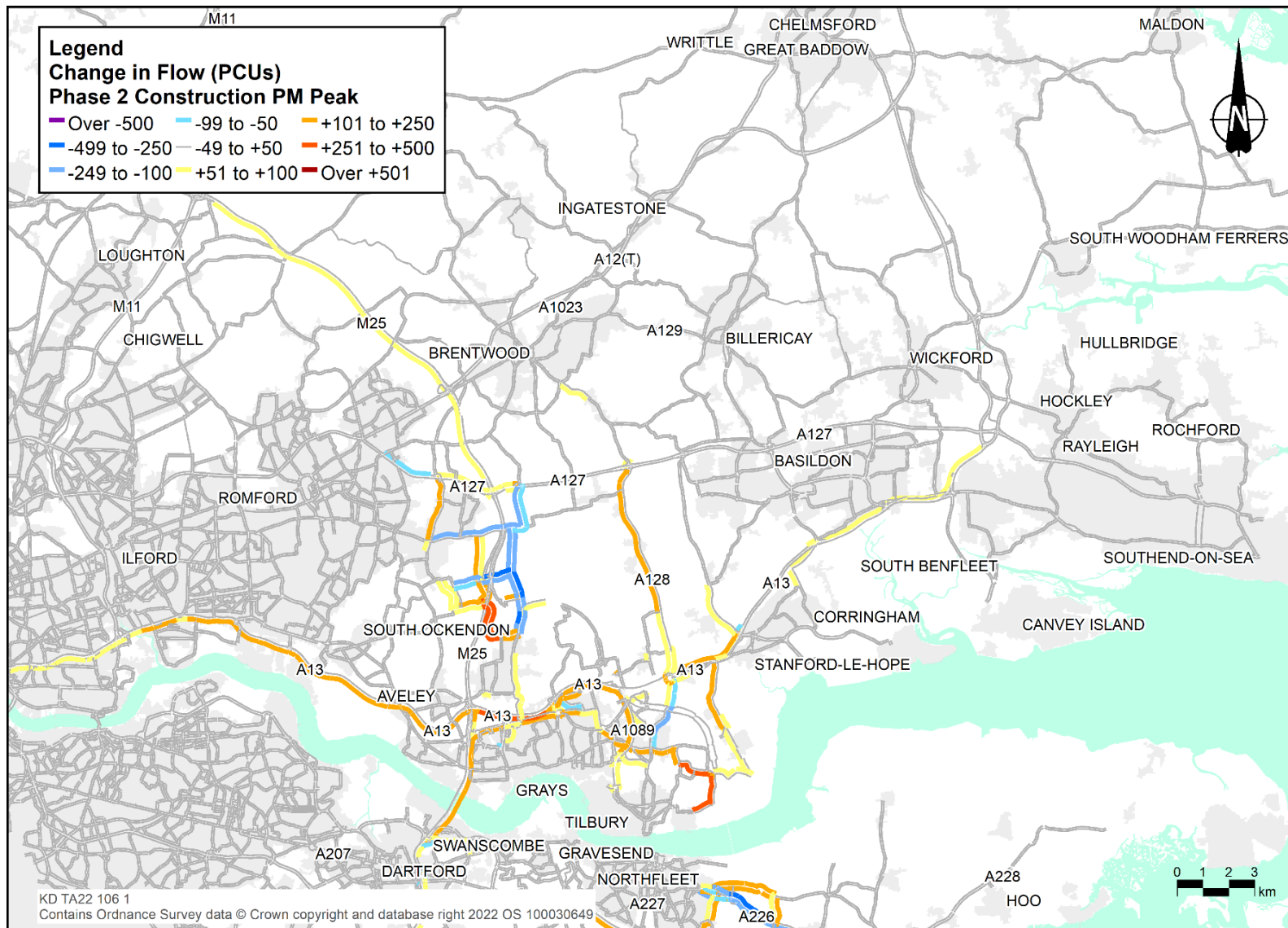


Plate 8.36 Change in flow (PCUs), south of the River Thames, phase 2 AM peak

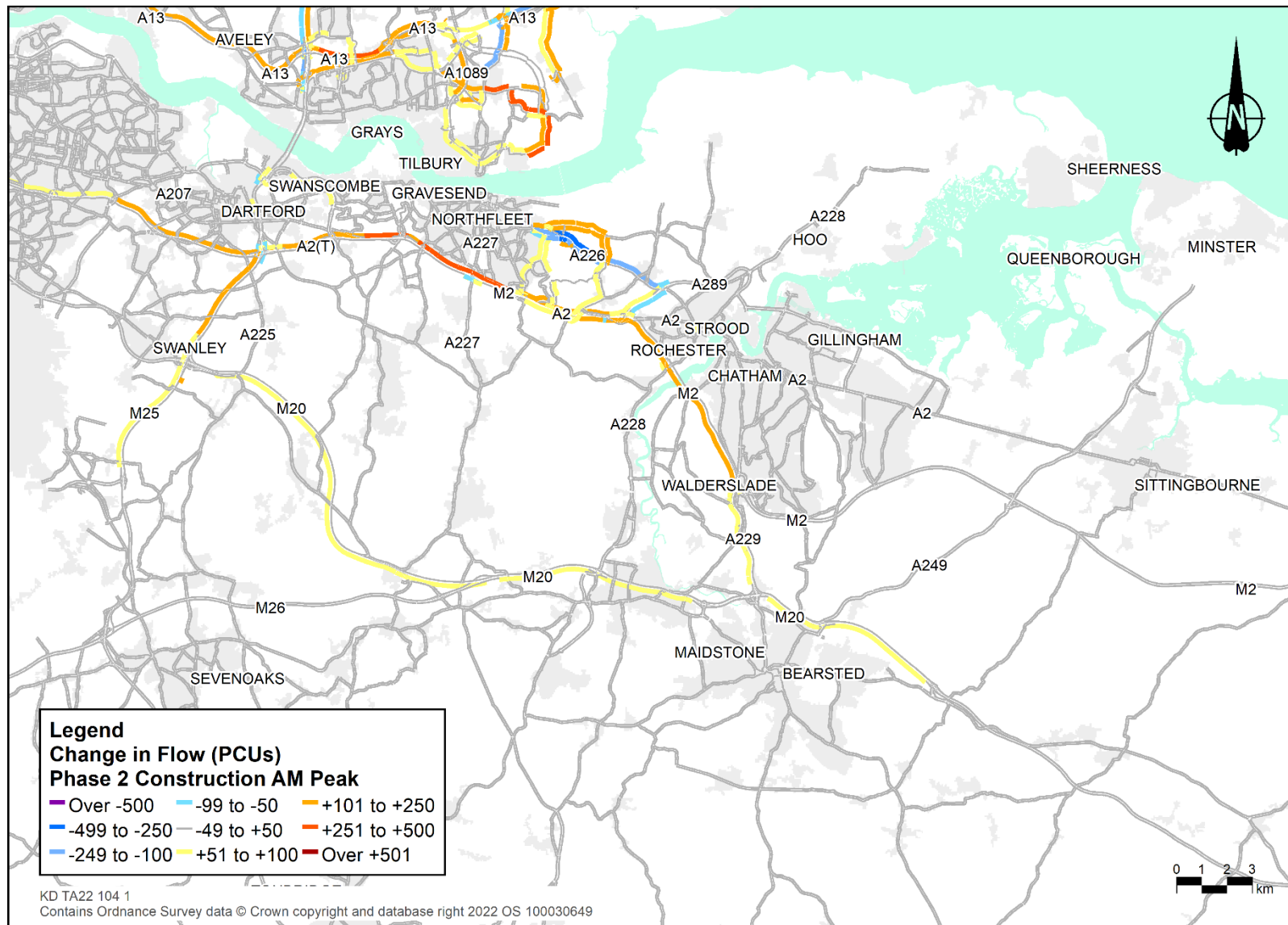


Plate 8.37 Change in flow (PCUs), south of the River Thames, phase 2 inter-peak

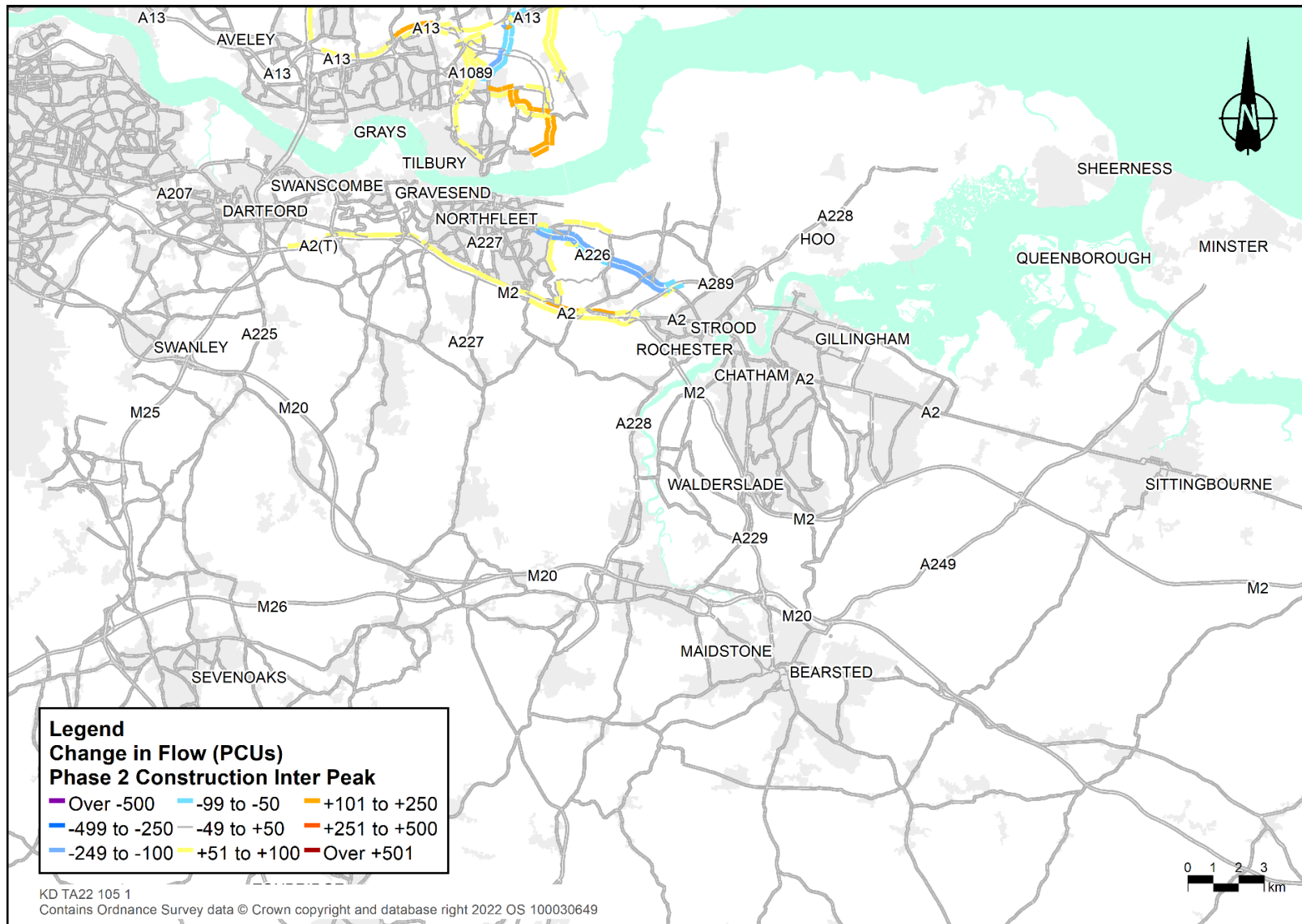


Plate 8.38 Change in flow (PCUs), south of the River Thames, phase 2 PM peak

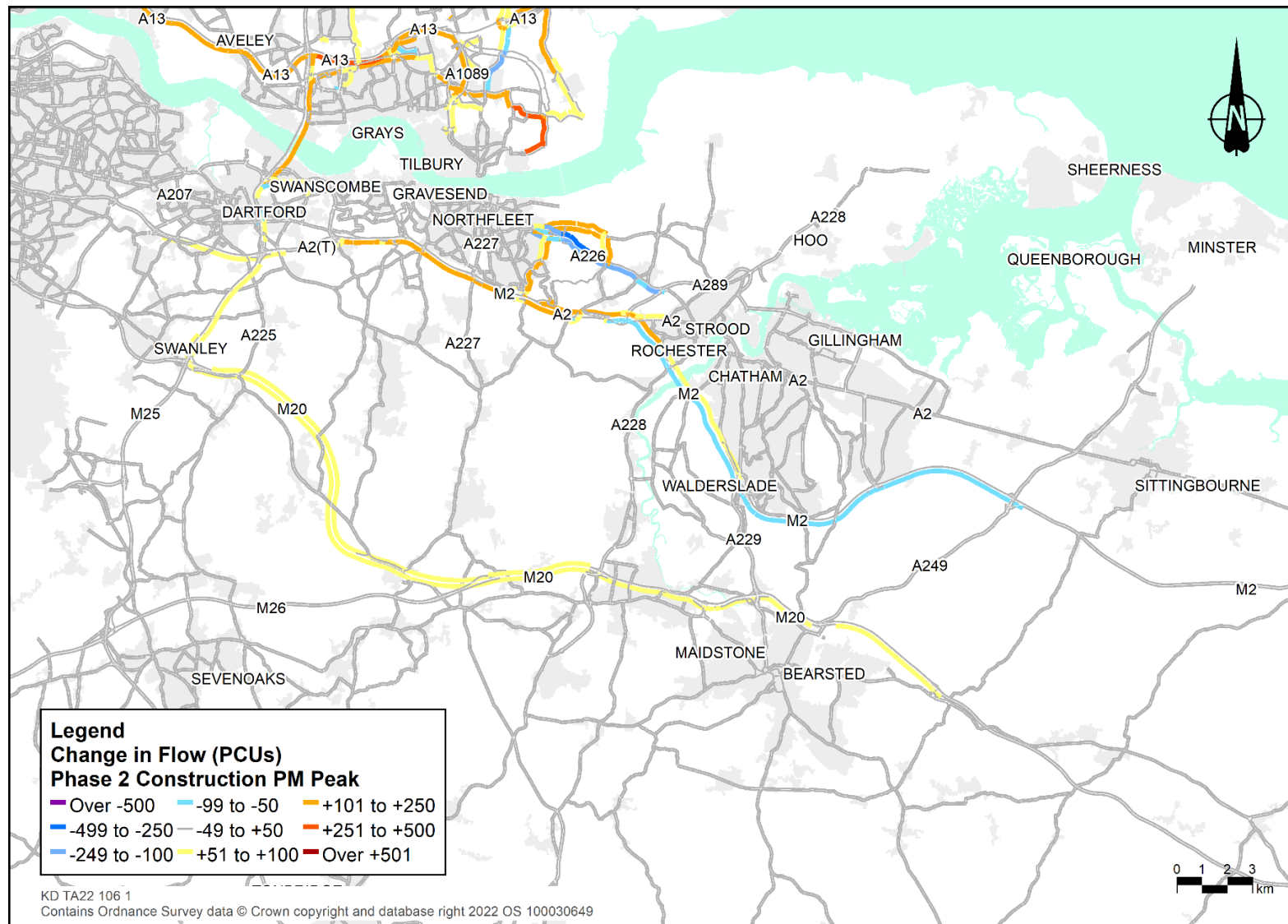


Table 8.40 Construction impact on journey times (phase 2 AM peak)

Route	Road	Dir	Without Construction		With Construction		Difference		Difference (%)	
			Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time	Av Speed
JT07	A226	EB	9.5	48.4	10.7	43.0	+1.2	-5.5	+13%	-11%
		WB	11.7	39.4	12.4	37.1	+0.7	-2.4	+6%	-6%
JT15	B186	NB	13.6	45.7	14.7	42.4	+1.1	-3.3	+8%	-7%
		SB	12.5	49.5	15.0	41.5	+2.4	-8.1	+19%	-16%
JT17	St Marys Lane	EB	4.5	44.0	5.5	35.7	+1.1	-8.3	+24%	-19%
		WB	4.4	44.4	5.5	35.9	+1.1	-8.5	+24%	-19%
JT22	Baker Street/Heath Road	NB	3.7	47.7	4.4	40.7	+0.6	-7.0	+17%	-15%
		SB	3.5	51.0	3.8	47.2	+0.3	-3.9	+8%	-8%

Table 8.41 Construction impact on journey times (phase 2 inter-peak)

Route	Road	Dir	Without Construction		With Construction		Difference		Difference (%)	
			Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time	Av Speed
JT15	B186	NB	12.3	50.7	13.4	46.4	+1.1	-4.3	+9%	-8%
		SB	12.5	49.9	13.7	45.2	+1.3	-4.7	+10%	-9%
JT17	St Marys Lane	EB	4.4	44.5	5.2	38.0	+0.8	-6.5	+17%	-15%
		WB	4.4	44.8	5.3	37.1	+0.9	-7.7	+21%	-17%

Table 8.42 Construction impact on journey times (phase 2 PM peak)

Route	Road	Dir	Without Construction		With Construction		Difference		Difference (%)	
			Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time	Av Speed
JT07	A226	EB	11.1	41.5	11.8	39.2	+0.7	-2.4	+6%	-6%
		WB	9.9	46.7	10.9	42.2	+1.1	-4.5	+11%	-10%
JT15	B186	NB	12.7	48.8	14.8	41.9	+2.1	-6.9	+16%	-14%
		SB	13.9	44.6	16.0	38.9	+2.0	-5.7	+15%	-13%
JT17	St Marys Lane	EB	4.5	44.0	5.2	37.4	+0.8	-6.5	+18%	-15%
		WB	4.4	44.6	5.5	35.5	+1.1	-9.0	+25%	-20%
JT18	A128 / Brentwood Road	NB	13.7	54.1	15.0	49.3	+1.3	-4.8	+10%	-9%
		SB	15.3	48.1	16.1	45.6	+0.9	-2.5	+6%	-5%
JT22	Baker Street/Heath Road	NB	3.6	49.0	4.2	42.6	+0.6	-6.4	+15%	-13%
		SB	4.4	40.4	5.3	33.8	+0.9	-6.6	+19%	-16%

- 8.8.20 The flow difference plots show small changes in total flow in the areas directly impacted by the traffic management and additional Project related construction traffic. In this phase the predicted differences are generally very minor. A contraflow on the B186 (RNTM54) would shift traffic from B186 northbound to West Road / Dennis Road. There would be higher flows on the A13 eastbound to the Orsett Cock junction, and westbound to the A1089, both due to construction traffic. A contraflow on A226 Gravesend Road (TUTM02) would shift traffic to the A2 and Lower Higham Road. The traffic increase on Lower Higham Road would be general traffic rerouting rather than Project related cars or HGVs. There would be higher flows on the A2 in both directions. There would also be increases due to Project related traffic on the A13 (M25 – A1012 section) and on Muckingford Road and Station Road. The journey time analysis shows that there would be additional delays on Thong Lane (JT09) in all time periods. These delays would be caused by the introduction of the contraflow system on Thong Lane (A10).
- 8.8.21 There would be additional delays on A226 (JT07) in the AM and PM time periods. These delays are caused by the introduction of the contraflow system on the A226 (TUTM02).
- 8.8.22 There would also be additional delays on the B186 (JT15) in both directions in all time periods. This is caused by the contraflow system proposed on the B186 (RNTM56). Similarly, there would be additional delays on St Mary's Lane (JT17) in both directions in all time periods. These delays are caused primarily by the contraflow system on St Mary's Lane (RMTM68).
- 8.8.23 There would also be delays on the A128/ Brentwood Road (JT18) in the PM peak due to contraflow at junction Heath Road/ Brentwood Road (RNTM05).
- 8.8.24 Also, there would be delays on the Baker Street/Heath Road journey time route (JT22) in the AM and PM peaks. These would be less than a minute, but would contribute more than 10% to the overall journey time on the route. These would be due to the crossing point at Baker Street (RNTM39) plus increased delay at the junction of Baker Street and the A1013.

Phase 3

- 8.8.25 The forecast change in traffic flows on the network, as a result of the additional construction related vehicles and the impact of the traffic management measures on the routes chosen by drivers are shown in Plate 8.39 to Plate 8.44. The maps present the change in flows, north and south of the river, for each of the modelled time periods.
- 8.8.26 For all journey time routes where the time changes by more than a minute or more than 10%, in either direction, the with and without construction journey times are shown in Table 8.43 to Plate 8.48

Plate 8.39 Change in flow (PCUs), north of the River Thames, phase 3 AM peak

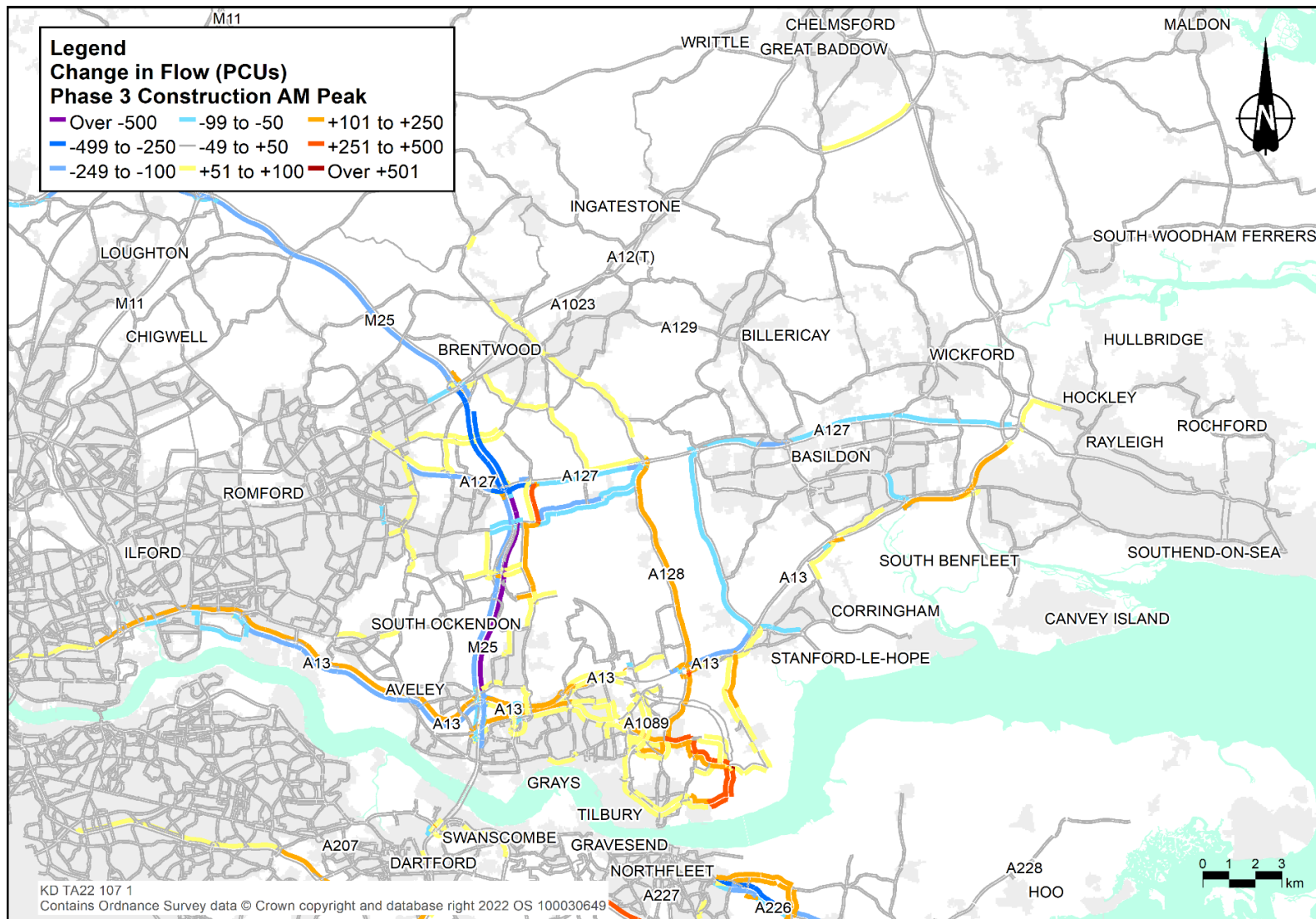


Plate 8.40 Change in flow (PCUs), north of the River Thames, phase 3 inter-peak

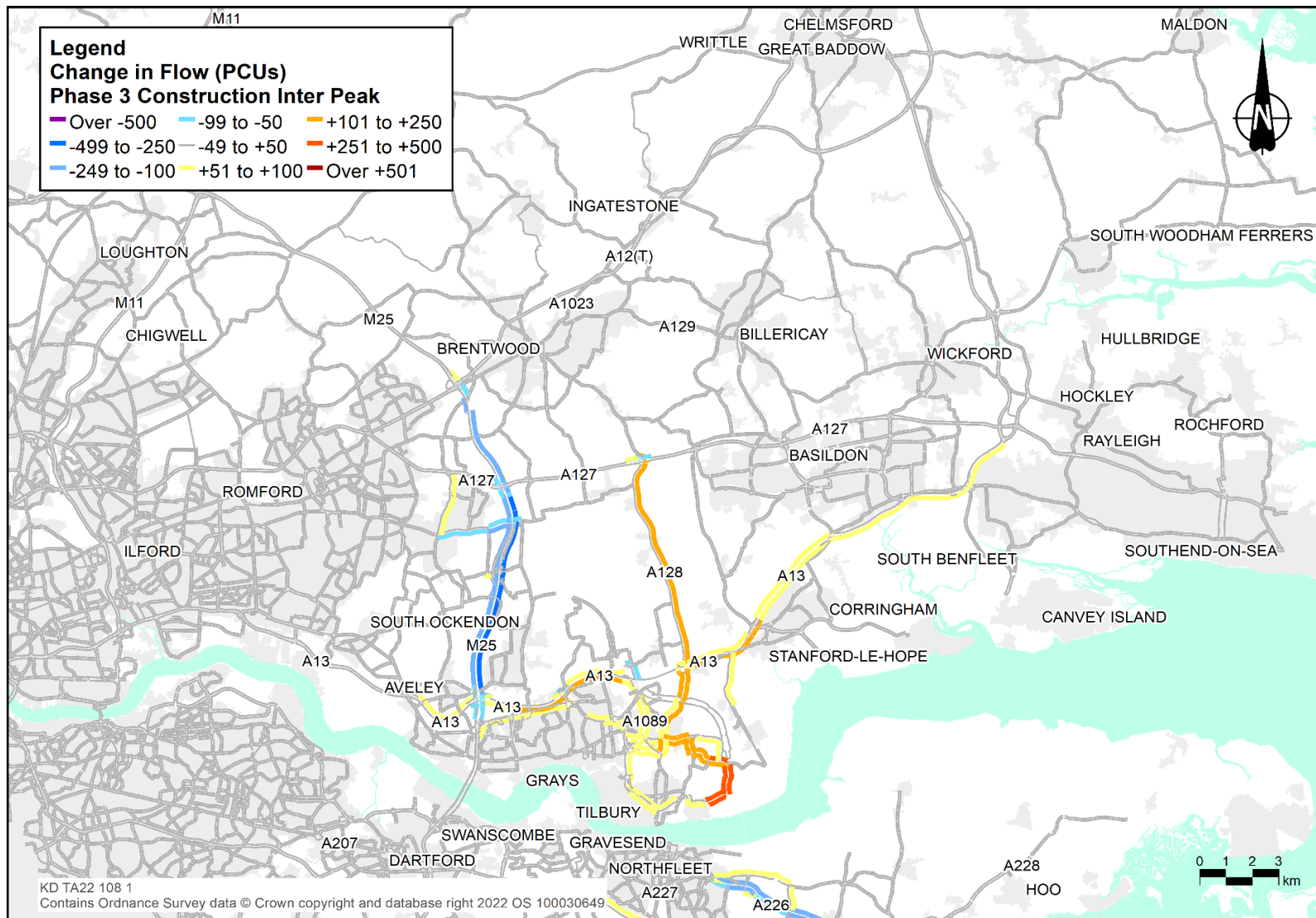


Plate 8.41 Change in flow (PCUs), north of the River Thames, phase 3 PM peak

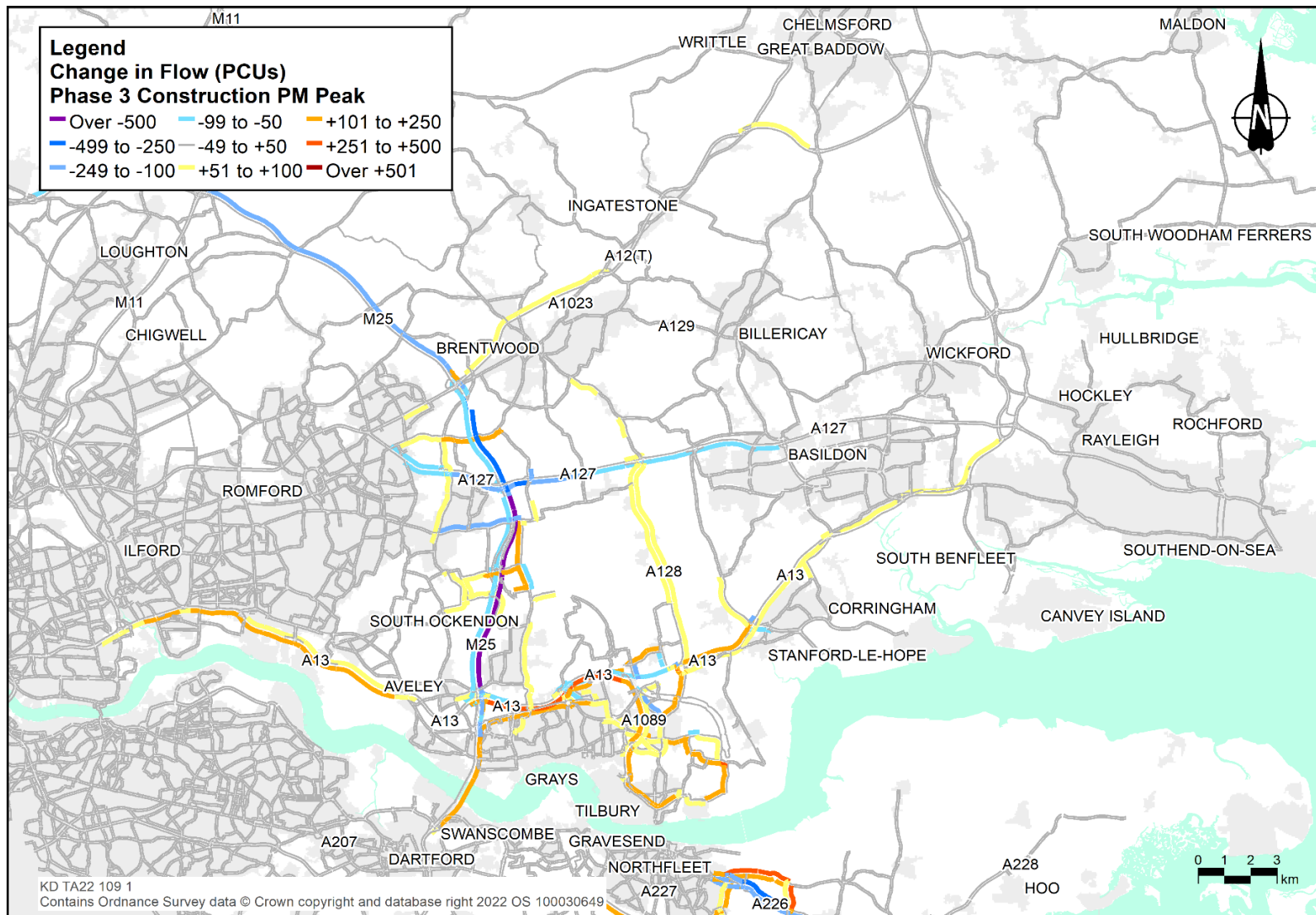


Plate 8.42 Change in flow (PCUs), south of the River Thames, phase 3 AM peak

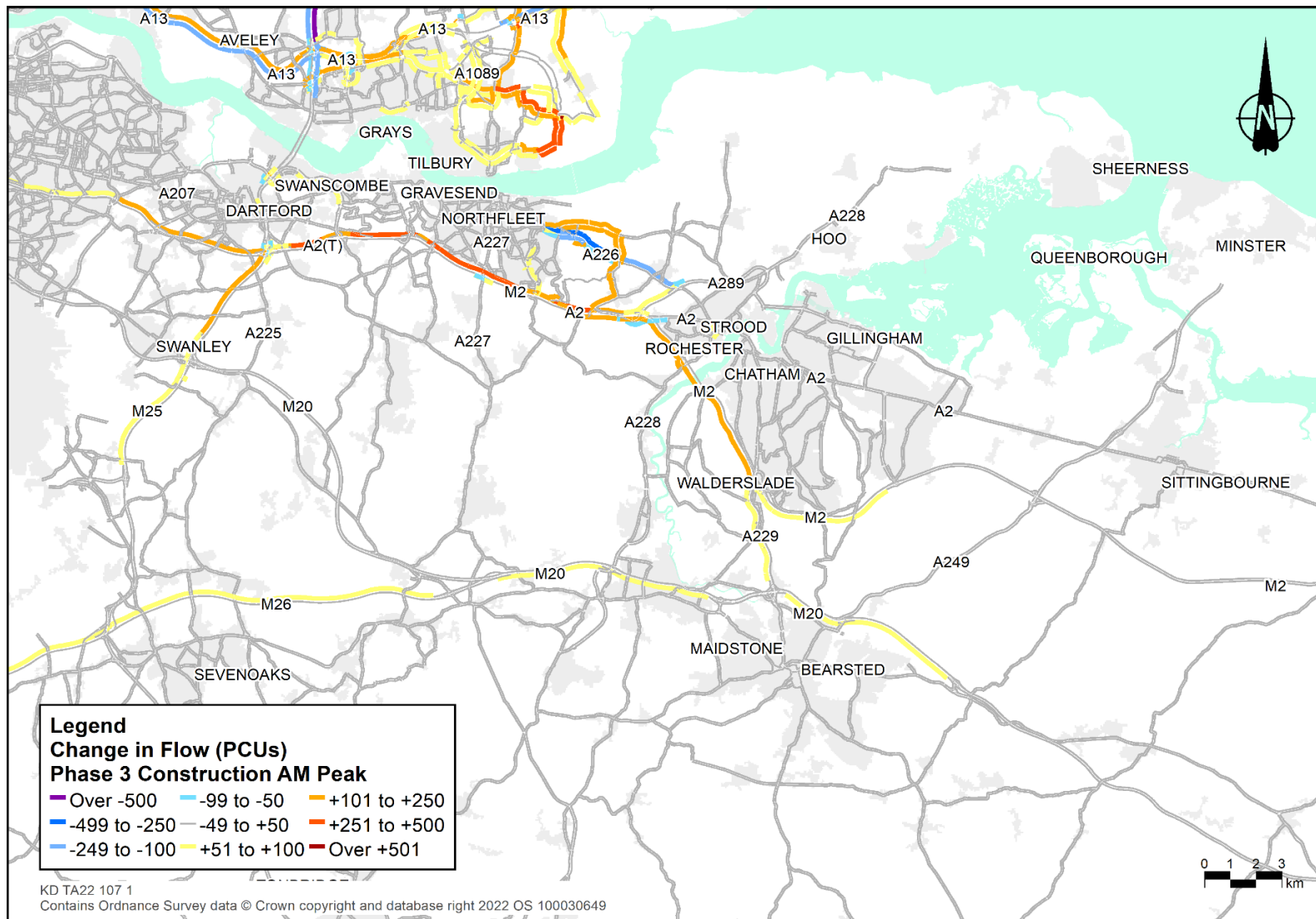


Plate 8.43 Change in flow (PCUs), south of the River Thames, phase 3 inter-peak

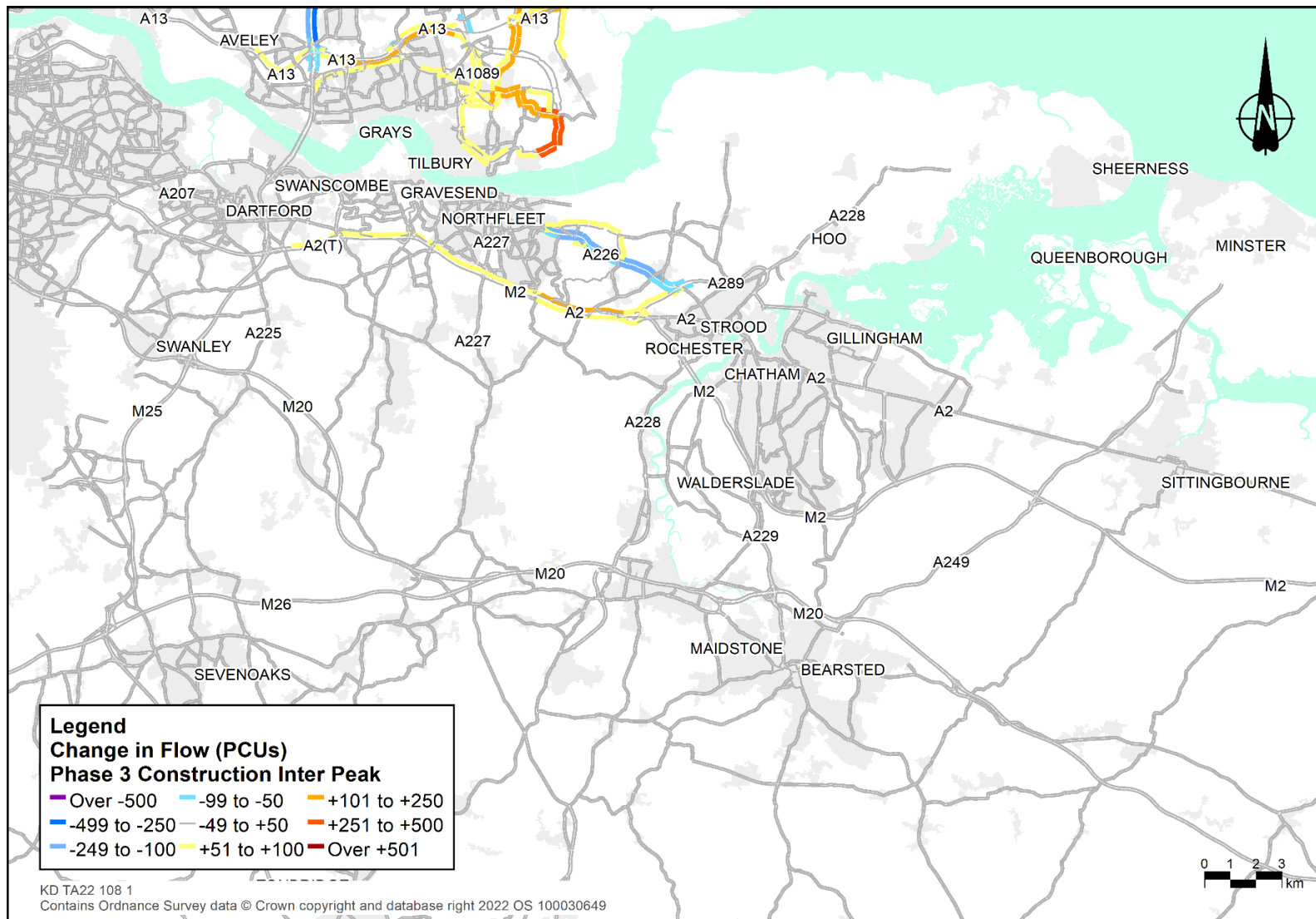


Plate 8.44 Change in flow (PCUs), south of the River Thames, phase 3 PM peak

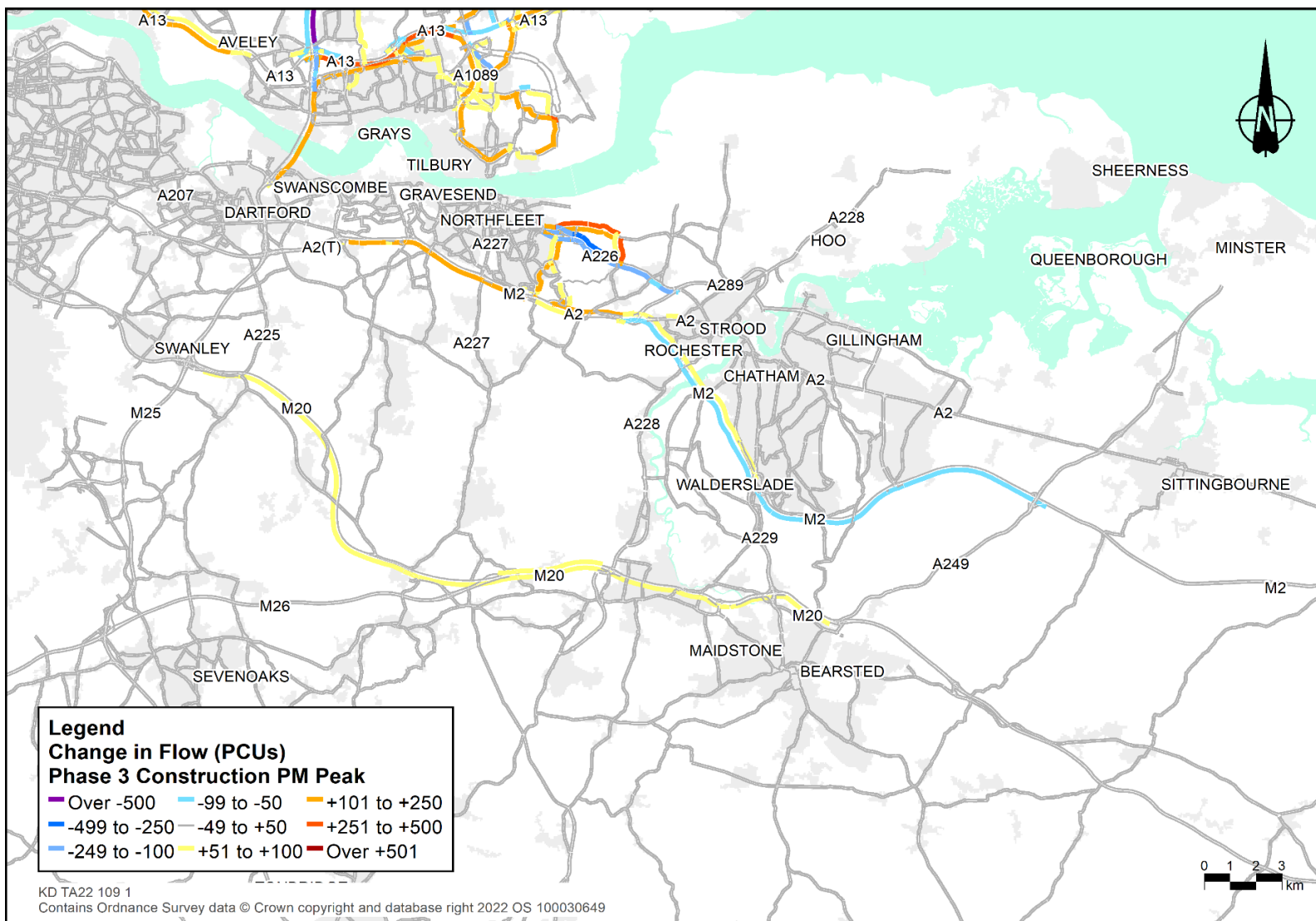


Table 8.43 Construction impact on journey times (phase 3 AM peak)

Route	Road	Dir	Without Construction		With Construction		Difference		Difference (%)	
			Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time	Av Speed
JT01	M25	NB	33.4	69.1	34.6	66.8	+1.2	-2.3	+4%	-3%
		SB	33.2	69.7	35.3	65.6	+2.1	-4.2	+6%	-6%
JT07	A226	EB	9.5	48.4	10.7	43.1	+1.2	-5.4	+12%	-11%
		WB	11.7	39.4	12.4	37.1	+0.8	-2.4	+6%	-6%
JT11	A127	EB	26.1	59.0	27.4	56.3	+1.2	-2.7	+5%	-4%
		WB	35.8	43.0	37.4	41.1	+1.6	-1.9	+5%	-4%
JT13	Station Road/Fort Road/A1089	EB	11.9	64.2	13.1	58.4	+1.2	-5.8	+10%	-9%
		WB	11.1	67.1	13.3	55.7	+2.3	-11.4	+21%	-17%
JT17	St Marys Lane	EB	4.5	44.0	5.3	36.9	+0.9	-7.1	+19%	-16%
		WB	4.4	44.4	5.5	35.8	+1.1	-8.6	+24%	-19%
JT20	East Tilbury Road/Muckingford Road	EB	6.8	53.4	8.2	44.2	+1.4	-9.2	+21%	-17%
		WB	6.9	52.5	8.2	44.5	+1.3	-8.0	+18%	-15%
JT22	Baker Street/Heath Road	NB	3.7	47.7	4.2	42.2	+0.5	-5.5	+13%	-12%
		SB	3.5	51.0	3.7	48.0	+0.2	-3.0	+6%	-6%

Table 8.44 Construction impact on journey times (phase 3 inter-peak)

Route	Road	Dir	Without Construction		With Construction		Difference		Difference (%)	
			Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time	Av Speed
JT01	M25	NB	29.8	77.5	30.2	76.4	+0.4	-1.1	+1%	-1%
		SB	26.5	87.4	28.0	82.7	+1.5	-4.7	+6%	-5%
JT08	Brewers Road/ Halfpence Lane	NB	9.8	51.5	10.4	48.8	+0.5	-2.7	+6%	-5%
		SB	9.8	51.8	11.0	46.0	+1.2	-5.7	+12%	-11%
JT17	St Marys Lane	EB	4.4	44.5	5.2	37.7	+0.8	-6.8	+18%	-15%
		WB	4.4	44.8	5.3	37.0	+0.9	-7.8	+21%	-17%
JT20	East Tilbury Road/Muckingford Road	EB	6.7	53.8	7.7	47.3	+0.9	-6.4	+14%	-12%
		WB	6.7	54.4	7.6	47.6	+1.0	-6.8	+15%	-13%

Table 8.45 Construction impact on journey times (phase 3 PM peak)

Route	Road	Dir	Without Construction		With Construction		Difference		Difference (%)	
			Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time	Av Speed
JT01	M25	NB	30.0	77.0	30.4	75.8	+0.4	-1.2	+2%	-2%
		SB	30.4	76.2	32.9	70.5	+2.5	-5.7	+8%	-8%
JT07	A226	EB	11.1	41.5	11.9	38.8	+0.8	-2.8	+7%	-7%
		WB	9.9	46.7	11.0	41.8	+1.2	-4.9	+12%	-10%
JT08	Brewers Road/Halfpence Lane	NB	10.9	46.4	11.5	44.0	+0.6	-2.4	+5%	-5%
		SB	9.9	51.0	11.4	44.6	+1.4	-6.4	+14%	-13%
JT11	A127	EB	29.7	51.9	30.5	50.5	+0.8	-1.4	+3%	-3%
		WB	26.9	57.2	28.2	54.6	+1.3	-2.6	+5%	-5%
JT12	A13	EB	23.9	62.7	24.0	62.5	+0.1	-0.2	+0%	-0%
		WB	20.3	73.5	21.5	69.5	+1.2	-4.0	+6%	-5%
JT15	B186	NB	12.7	48.8	13.0	47.8	+0.3	-1.0	+2%	-2%
		SB	13.9	44.6	15.2	40.9	+1.3	-3.7	+9%	-8%
JT17	St Marys Lane	EB	4.5	44.0	5.3	37.3	+0.8	-6.7	+18%	-15%
		WB	4.4	44.6	5.5	35.6	+1.1	-9.0	+25%	-20%
JT20	East Tilbury Road/Muckingford Road	EB	6.9	52.2	7.6	47.7	+0.7	-4.6	+10%	-9%
		WB	6.7	54.2	7.7	47.4	+1.0	-6.8	+14%	-13%

- 8.8.27 The flow difference plots presented in Plate 8.39 to Plate 8.44 show small changes in total flow in the areas directly impacted by the traffic management and Project related construction traffic. Narrow lanes on the M25 northbound and southbound (RNTM61 and RNTM62) would shift traffic away from the motorway with some dispersed to the B186 and A128. There would be higher flows on the A13 eastbound to the Orsett Cock junction, and westbound to A1089 due to Project related traffic and general traffic rerouting. A contraflow on the A226 Gravesend Road (TUTM02) would shift traffic to the A2 and Lower Higham Road. The traffic increase on Lower Higham Road would be a result of general traffic rerouting rather than Project related construction traffic. There would be high volumes of Project related construction traffic on Muckingford Road, Marshfoot Road and Station Road.
- 8.8.28 The journey time analysis presented shows that there would be additional delays on the M25 in all time periods (JT01); this phase includes the introduction of narrow lanes (RNTM61, and RNTM62)
- 8.8.29 There would be additional delays of greater than 10% on the A226 (JT07) in the AM peak hour in the eastbound direction and in the PM peak in the westbound direction. The additional delays are caused by the contraflow on the A226 (TUTM02).
- 8.8.30 There would be additional delays on Brewers Road / Halfpence Lane (JT08) in the inter-peak and PM peak. This is caused by the contraflows on Brewers Road and Park Pale (RSTM28).
- 8.8.31 There would be additional delay along the A127 (JT11) in the AM and PM time period. This occurs due to the introduction of narrow lanes (RNTM74).
- 8.8.32 There would be additional delay along the A13 (JT12) westbound in the PM peak. This is due to Project related construction traffic increasing the flow on the A13 westbound.
- 8.8.33 There would be additional delays predicted along journey time route JT13 Station Road / Fort Road / A1089 in all time periods and both directions. In this phase the contraflow measure on Marshfoot Road / Chadwell Hill / Brentwood Road (RNTM05) is no longer in place. Instead, the additional delay is caused by an increase in traffic on the A1089 (due to Project related construction traffic) which would cause additional delays, in particular at the Asda Roundabout and at the A1089 Westbound on-slip to the A13.
- 8.8.34 There would be additional delays along the B186 (JT15) southbound in the PM peak. This is due to increased traffic along the route diverted from the M25 narrow lanes (RNTM61).
- 8.8.35 There would be additional delays on St Mary's Lane (JT17) in all time periods in both directions. These delays are caused by the contraflow system on St Mary's Lane (RNTM68).
- 8.8.36 There would be additional delays on East Tilbury Road / Muckingford Road (JT20) in both directions in all time periods. These are caused by the introduction of the contraflow on Muckingford Road (RNTM01).
- 8.8.37 There would be additional delays Baker Street/Heat Road (JT22) in the AM peak caused by increased traffic on Heath Road.

Phase 4

- 8.8.38 The forecast change in traffic flows on the network, as a result of the additional construction related vehicles and the impact of the traffic management measures on the routes chosen by drivers are shown in Plate 8.45 to Plate 8.50. The maps present the change in flows, north and south of the river, for each of the modelled time periods.
- 8.8.39 For all journey time routes where the time changes by more than a minute or more than 10%, in either direction, the with and without construction journey times are shown in Plate 8.51 to Plate 8.58.

Plate 8.45 Change in flow (PCUs), north of the River Thames, phase 4 AM peak

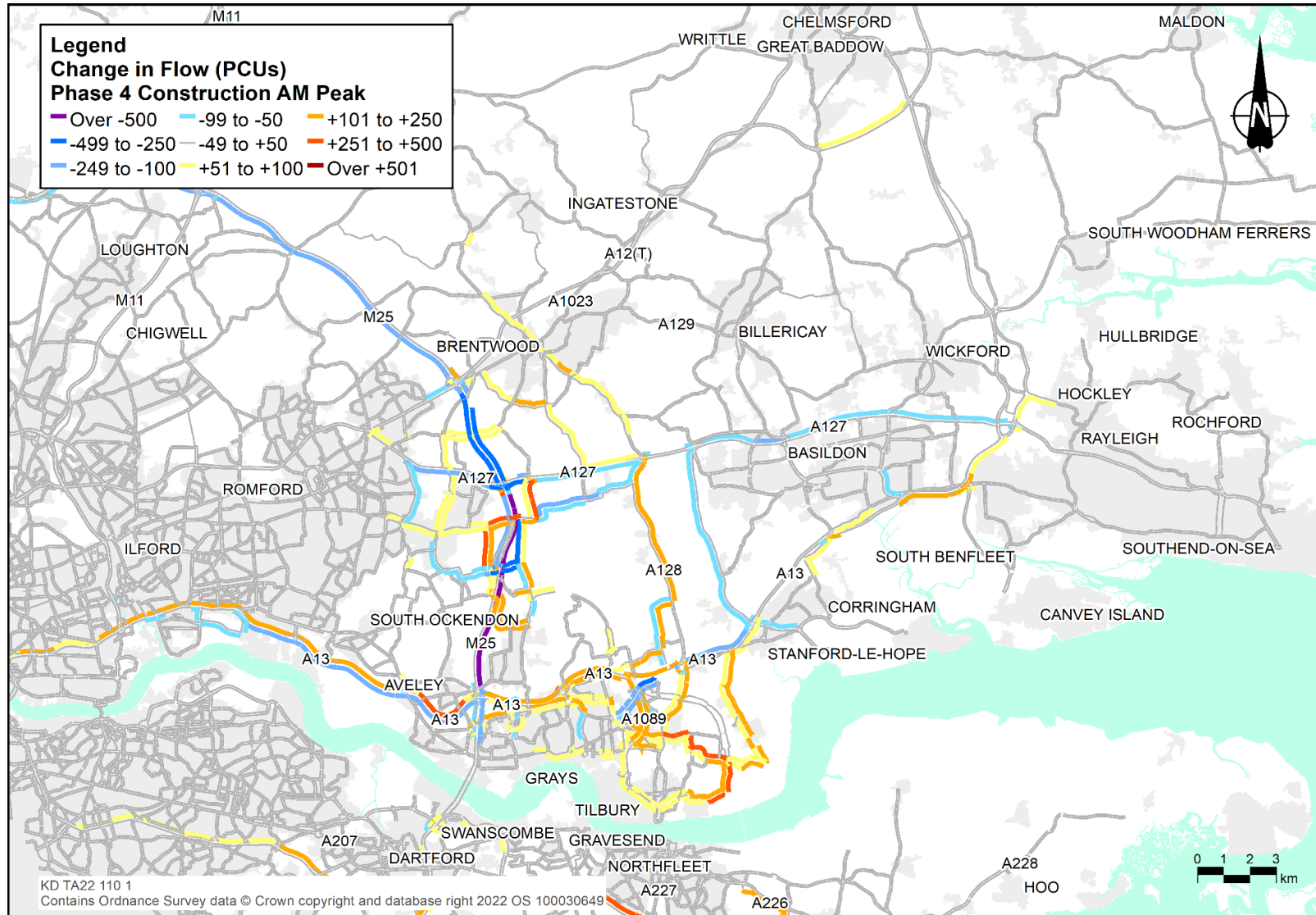


Plate 8.46 Change in flow (PCUs), north of the River Thames, phase 4 inter-peak

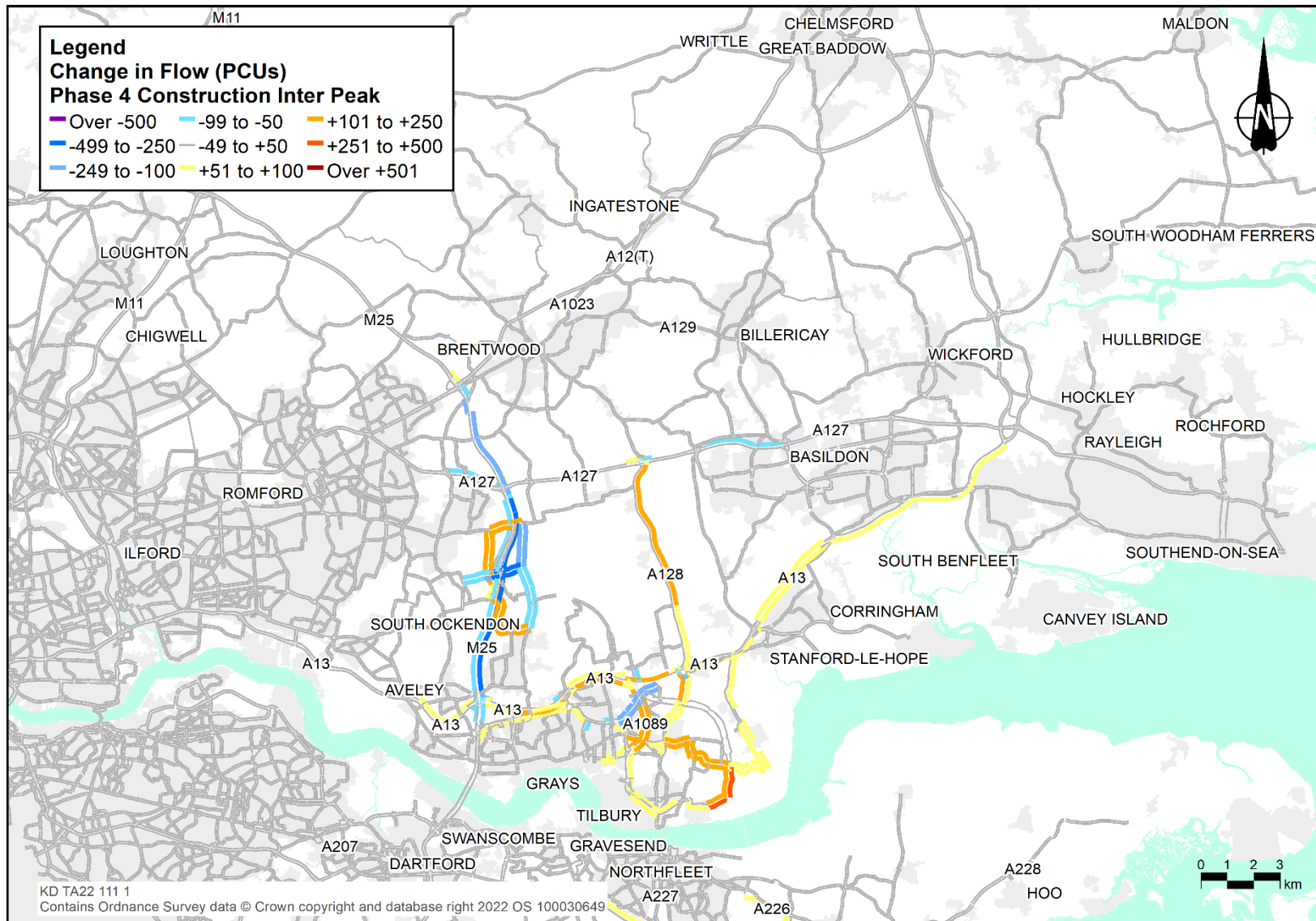


Plate 8.47 Change in flow (PCUs), north of the River Thames, phase 4 PM peak

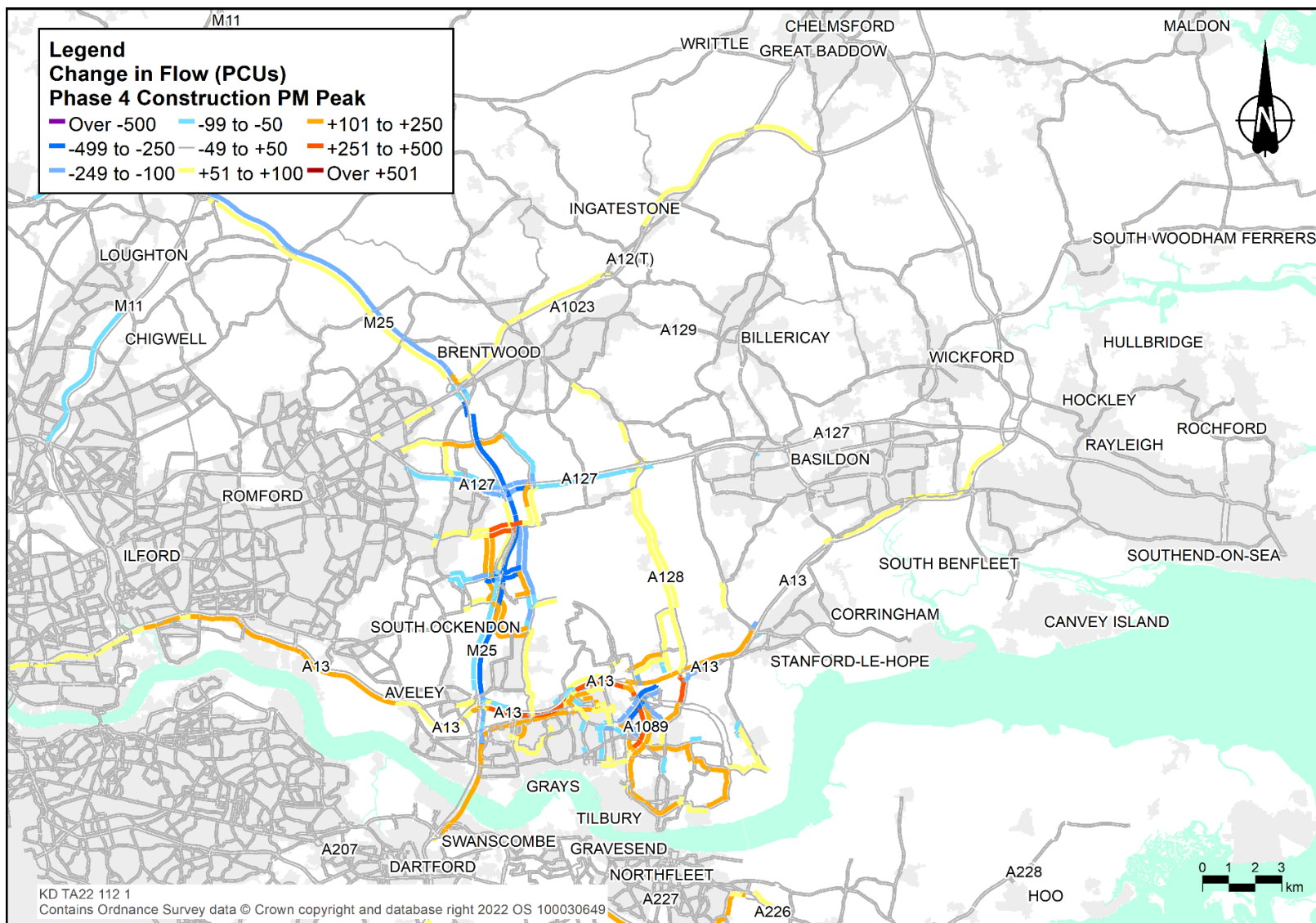


Plate 8.48 Change in flow (PCUs), south of the River Thames, phase 4 AM peak

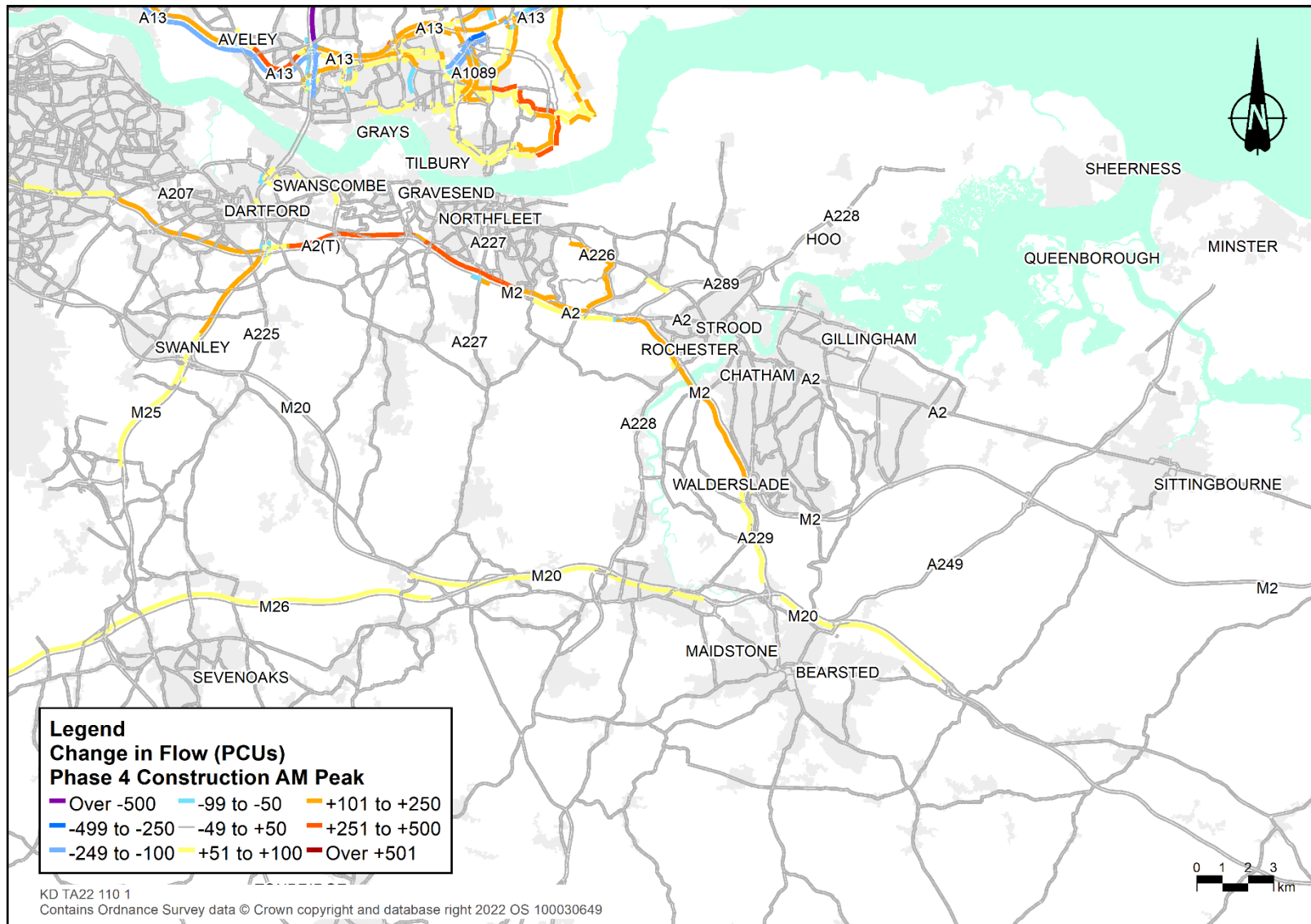


Plate 8.49 Change in flow (PCUs), south of the River Thames, phase 4 inter-peak

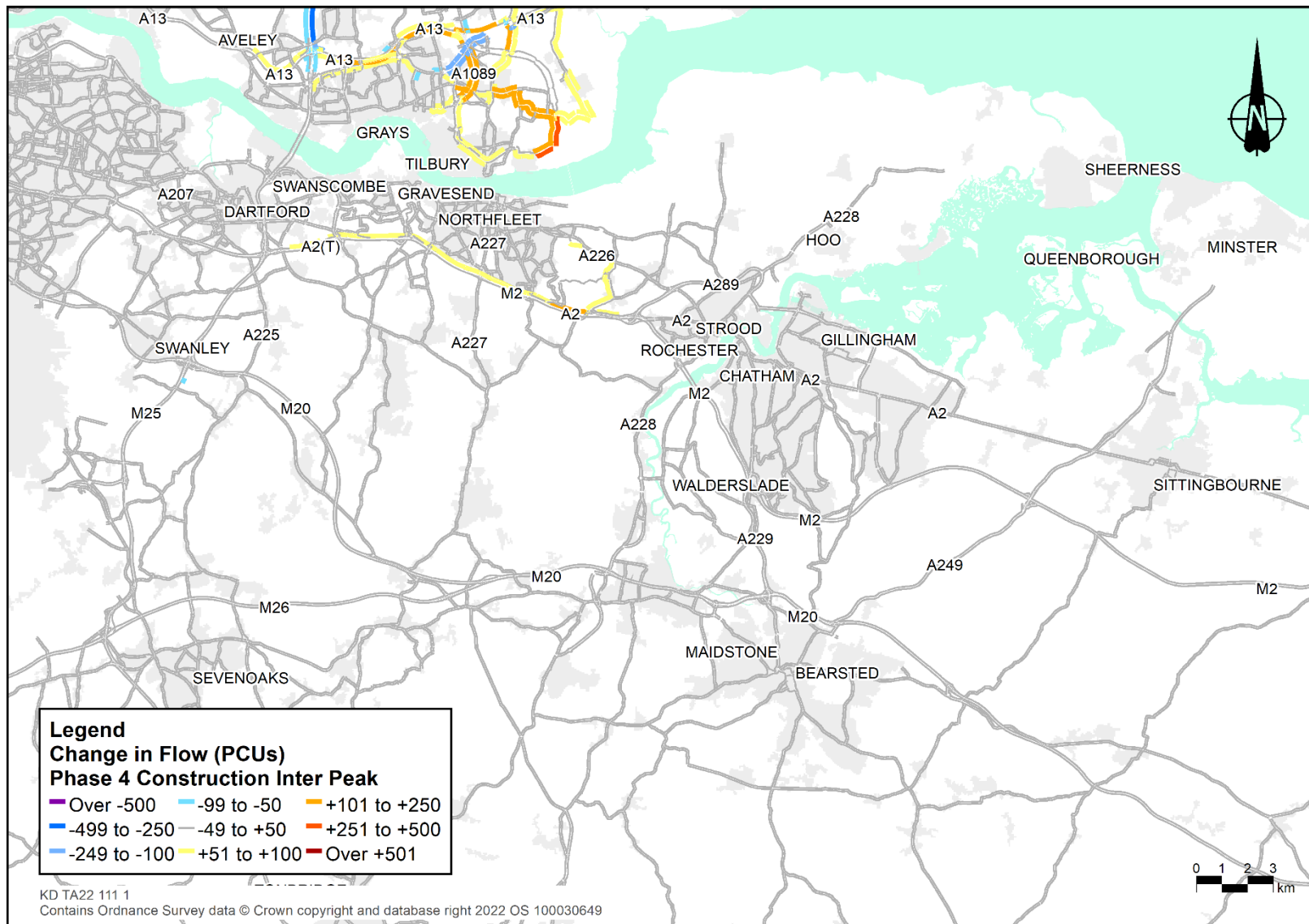


Plate 8.50 Change in flow (PCUs), south of the River Thames, phase 4 PM peak

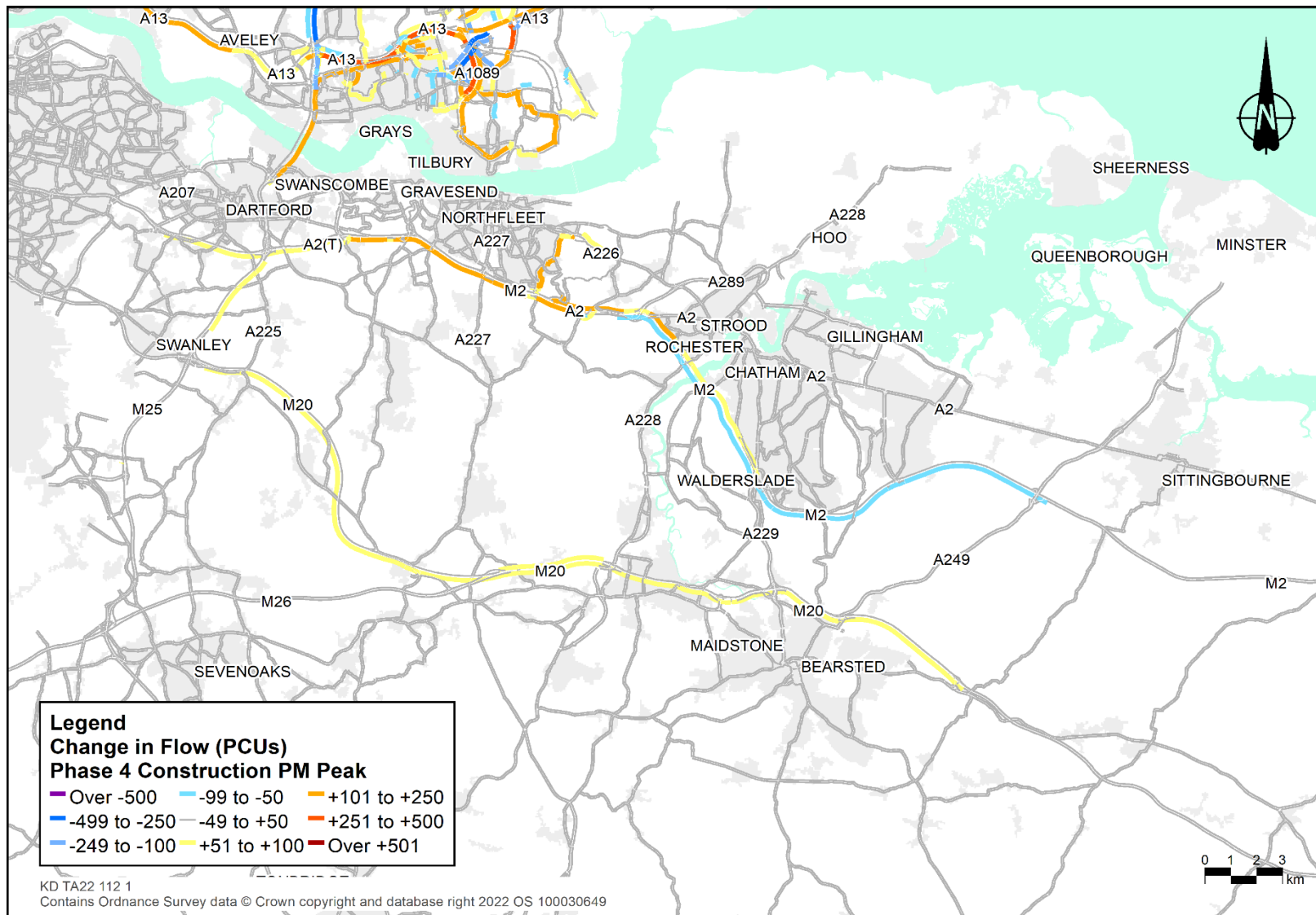


Table 8.46 Construction impact on journey times (phase 4 AM peak)

Route	Road	Dir	Without Construction		With Construction		Difference		Difference (%)	
			Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time	Av Speed
JT01	M25	NB	33.4	69.1	34.6	66.6	+1.3	-2.5	+4%	-4%
		SB	33.2	69.8	35.4	65.5	+2.2	-4.3	+6%	-6%
JT11	A127	EB	26.1	59.0	27.3	56.5	+1.2	-2.5	+4%	-4%
		WB	35.8	43.0	37.3	41.3	+1.5	-1.7	+4%	-4%
JT13	Station Road/Fort Road/A1089	EB	11.7	65.2	12.2	62.7	+0.5	-2.5	+4%	-4%
		WB	11.0	67.3	12.3	60.1	+1.3	-7.2	+12%	-11%
JT14	A1013	EB	13.9	39.4	15.5	35.4	+1.6	-4.0	+11%	-10%
		WB	14.0	37.9	16.0	33.1	+2.0	-4.8	+14%	-13%
JT20	East Tilbury Road/Muckingford Road	EB	6.8	53.4	8.0	45.4	+1.2	-8.1	+18%	-15%
		WB	6.9	52.6	7.8	46.6	+0.9	-6.0	+13%	-11%
JT22	Baker Street/Heath Road	NB	3.7	47.7	5.4	33.0	+1.7	-14.7	+45%	-31%
		SB	3.5	51.1	7.0	25.3	+3.5	-25.7	+101%	-50%

Table 8.47 Construction impact on journey times (phase 4 inter-peak)

Route	Road	Dir	Without Construction		With Construction		Difference		Difference (%)	
			Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time	Av Speed
JT01	M25	NB	29.9	77.3	30.3	76.2	+0.4	-1.0	+1%	-1%
		SB	26.5	87.4	28.1	82.6	+1.6	-4.8	+6%	-6%
JT14	A1013	EB	13.1	41.7	14.2	38.7	+1.1	-3.1	+8%	-7%
		WB	12.7	41.7	13.8	38.3	+1.1	-3.4	+9%	-8%
JT20	East Tilbury Road/Muckingford Road	EB	6.7	53.8	7.5	48.4	+0.8	-5.4	+11%	-10%
		WB	6.7	54.4	7.5	48.1	+0.9	-6.3	+13%	-12%
JT22	Baker Street/Heath Road	NB	3.4	52.5	4.9	36.5	+1.5	-16.1	+44%	-31%
		SB	3.3	53.3	5.6	31.5	+2.3	-21.8	+69%	-41%

Table 8.48 Construction impact on journey times (phase 4 PM peak)

Route	Road	Dir	Without Construction		With Construction		Difference		Difference (%)	
			Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)
JT01	M25	NB	30.0	77.1	30.6	75.5	+0.6	-1.6	+2%	-2%
		SB	30.4	76.3	32.9	70.3	+2.6	-5.9	+8%	-8%
JT11	A127	EB	29.7	51.9	30.3	51.0	+0.6	-0.9	+2%	-2%
		WB	26.9	57.2	28.2	54.6	+1.3	-2.7	+5%	-5%
JT12	A13	EB	23.9	62.8	24.2	62.0	+0.3	-0.8	+1%	-1%
		WB	20.3	73.6	21.7	68.9	+1.4	-4.7	+7%	-6%
JT14	A1013	EB	15.1	36.2	17.2	31.9	+2.0	-4.3	+13%	-12%
		WB	13.4	39.6	15.5	34.2	+2.1	-5.4	+16%	-14%
JT20	East Tilbury Road/Muckingford Road	EB	6.9	52.3	7.5	48.7	+0.5	-3.6	+7%	-7%
		WB	6.7	54.2	7.7	47.4	+1.0	-6.8	+14%	-13%
JT22	Baker Street/Heath Road	NB	3.6	49.2	6.6	26.9	+3.0	-22.2	+82%	-45%
		SB	4.4	40.5	6.9	26.0	+2.5	-14.5	+56%	-36%

- 8.8.40 The flow difference plots presented in Plate 8.45 to Plate 8.50 show small changes in total flow in the areas directly impacted by the traffic management and Project related construction traffic. In this phase narrow lanes on the M25 northbound and southbound (RNTM61 and RNTM62), combined with narrow lanes on the A127 (RNTM74) would shift traffic away from the motorway with some dispersed to the B186 and A128. The Ockendon Road closure (RNTM58) would cause traffic to divert Pike Lane and St. Marys Lane. The contraflow on the A1013 (RNTM23) would divert traffic to the A13 and Brentwood Road. There are higher flows on the A2 Eastbound direction due to Project related construction traffic. There would be increased Project related construction traffic on Muckingford Road, Marshfoot Road and Station Road. The A226 (A289-Thong Lane section) also has increased traffic due to the Project's construction.
- 8.8.41 The journey time analysis shows that there would be additional delays on the M25 (JT01) in all time periods particularly in the southbound direction as a result of the narrow lanes on the M25 southbound and the associated speed reduction to 60mph (RNTM64).
- 8.8.42 There would be additional delay along the A127 (JT11) in the westbound direction in the AM and PM time periods. This occurs due to the introduction of narrow lanes (RNTM74).
- 8.8.43 There would be additional delay on the A13 westbound (JT12) in the PM time periods as a result of additional traffic from Project construction along the A13 westbound.
- 8.8.44 There would be additional delay on Station Road/Fort Road/A1089 (JT13) in the AM period, due to an increase in traffic on the A1089 which would cause additional delays, in particular at the Asda Roundabout and at the A1089 westbound on-slip to the A13.
- 8.8.45 There would be additional delay on the A1013 (JT14) in all time periods in both directions as a result of the contraflow on the A1013 (RNTM23).
- 8.8.46 There would be additional delays on East Tilbury Road / Muckingford Road (JT20) in both directions in all time periods. This is caused by the contraflow on Muckingford Road (RNTM01).
- 8.8.47 There would be additional delays on Baker Street / Heath Road (JT22) in both directions in all time periods, due to increased flow on Heath Road.

Phase 5

- 8.8.48 The forecast change in traffic flows on the network, as a result of the additional construction related vehicles and the impact of the traffic management measures on the routes chosen by drivers are shown in Plate 8.51 to Plate 8.61. The maps present the change in flows, north and south of the River Thames, for each of the modelled time periods
- 8.8.49 For all journey time routes where the time changes by more than a minute or more than 10%, in either direction, the with and without construction journey times are shown in Table 8.49 to Table 8.51.

Plate 8.51 Change in flow (PCUs), north of the River Thames, phase 5 AM peak

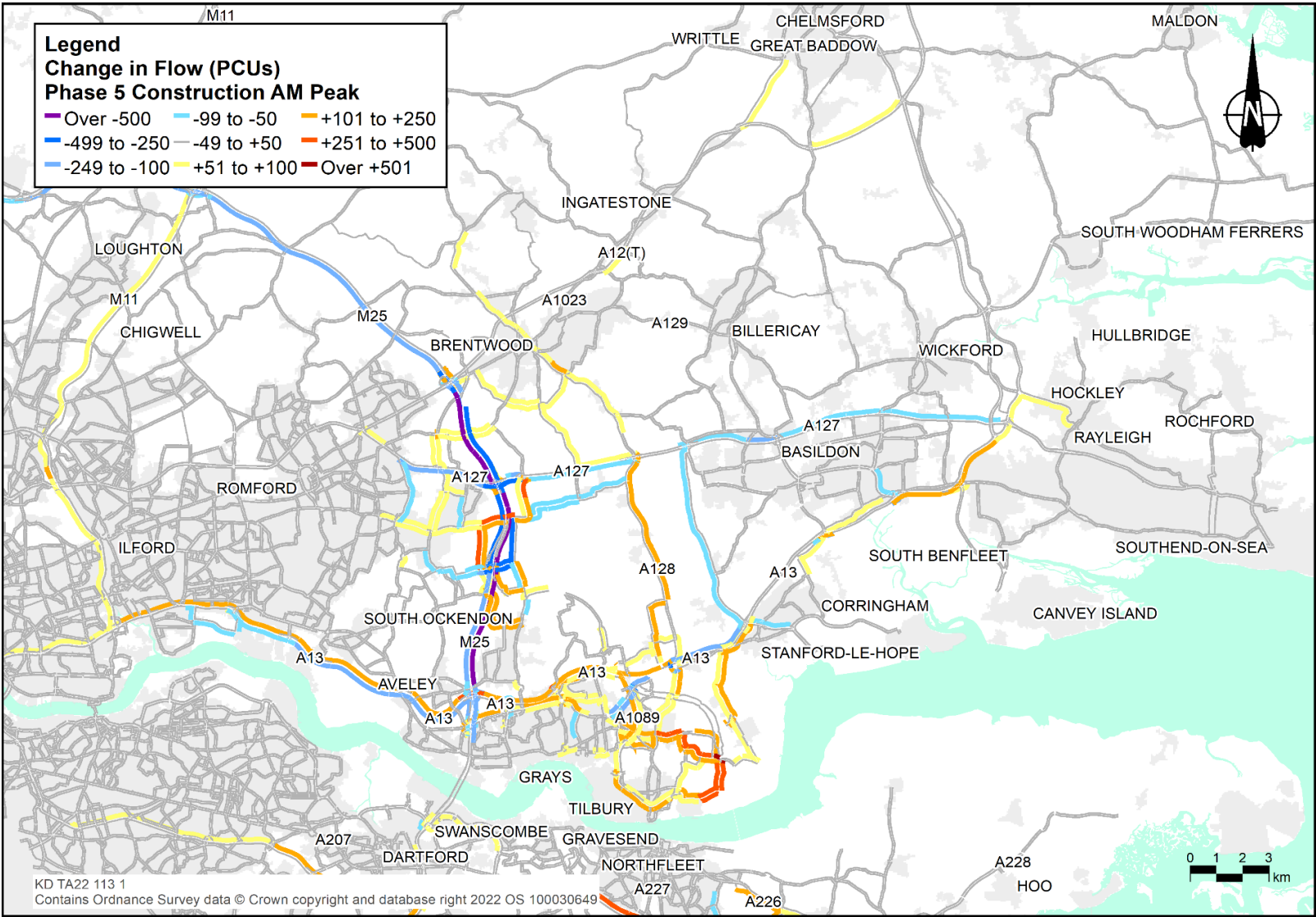


Plate 8.52 Change in flow (PCUs), north of the River Thames, phase 5 inter-peak

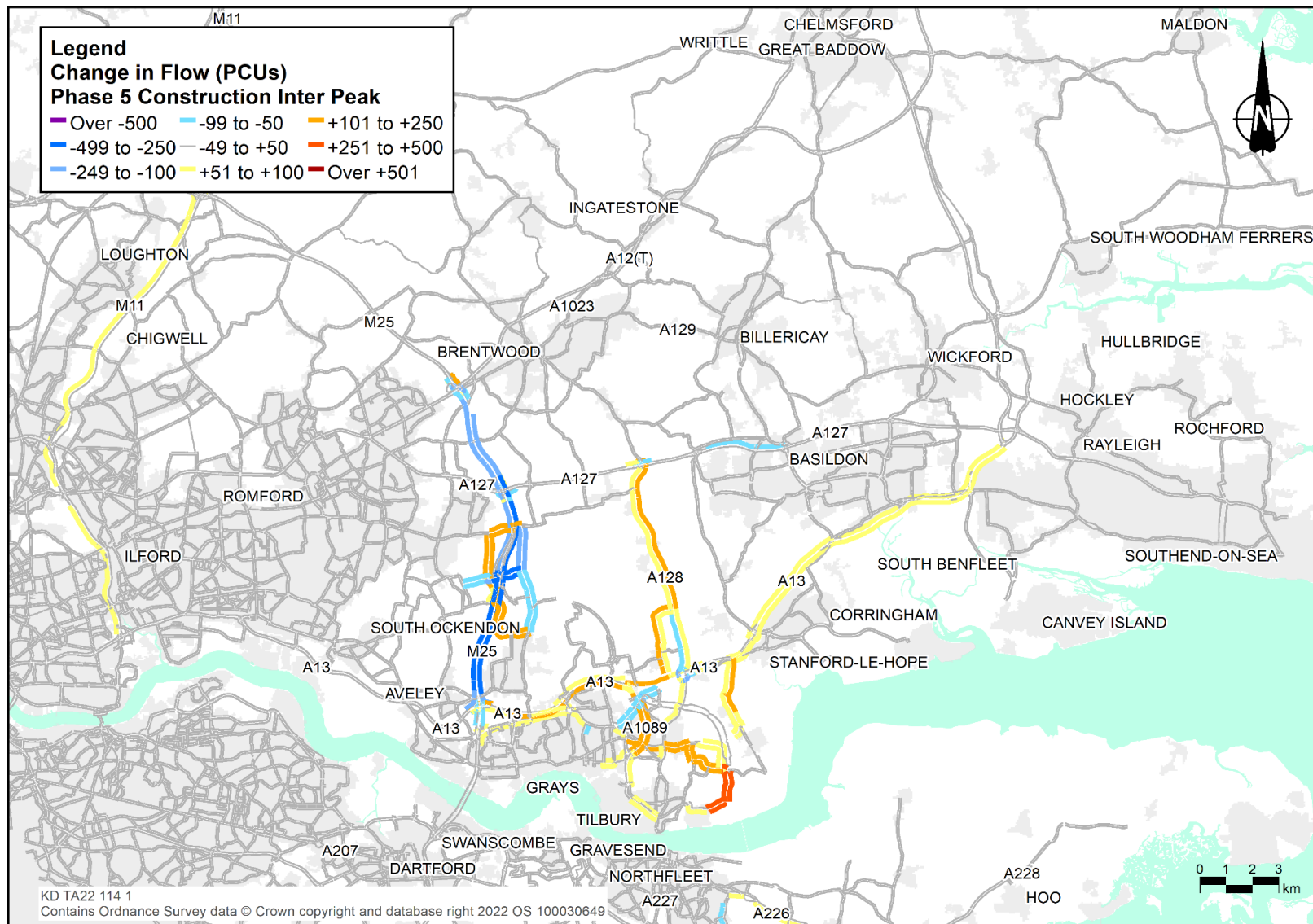


Plate 8.53 Change in flow (PCUs), north of the River Thames, phase 5 PM peak

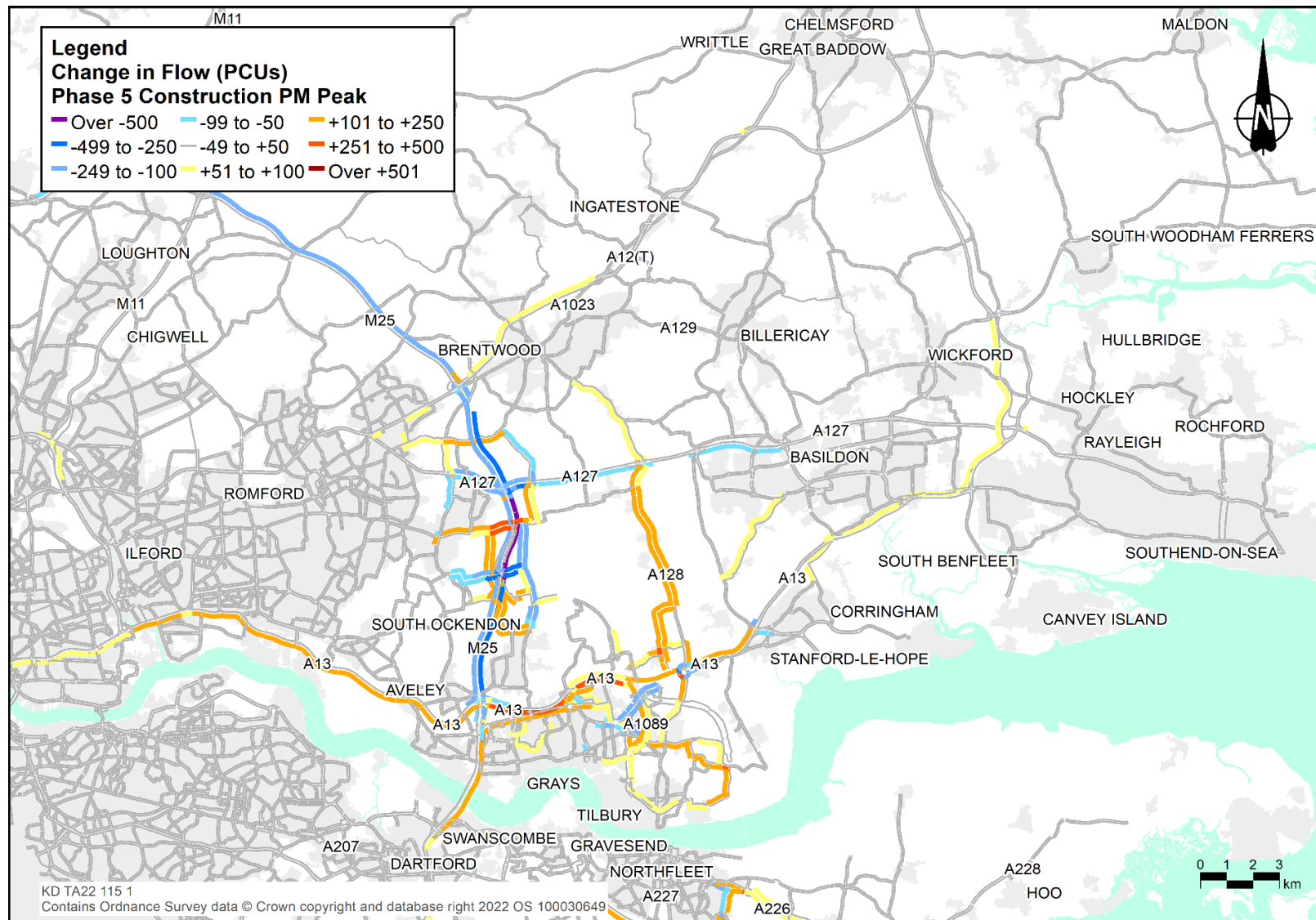


Plate 8.54 Change in flow (PCUs), south of the River Thames, phase 5 AM peak

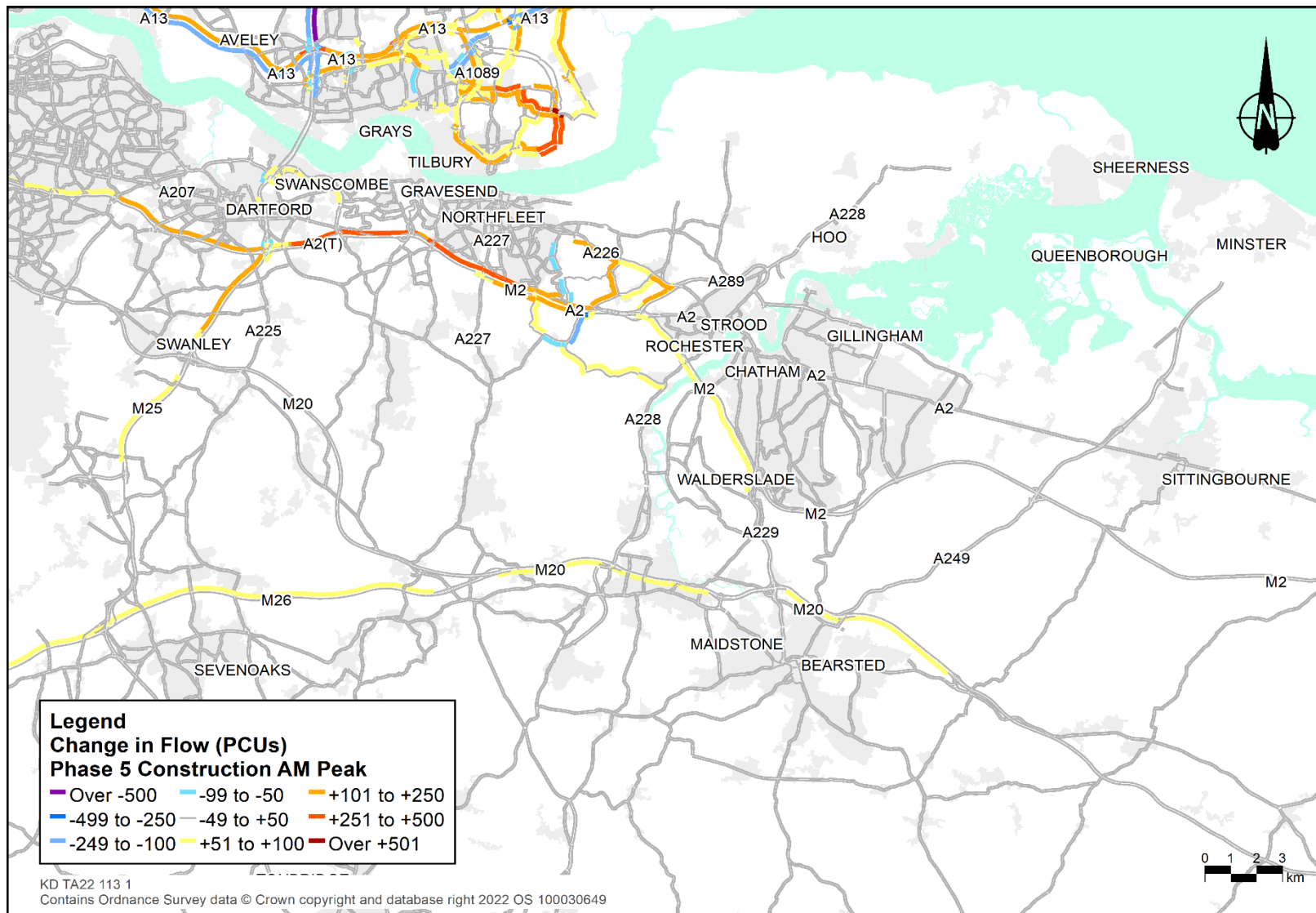


Plate 8.55 Change in flow (PCUs), south of the River Thames, phase 5 inter-peak

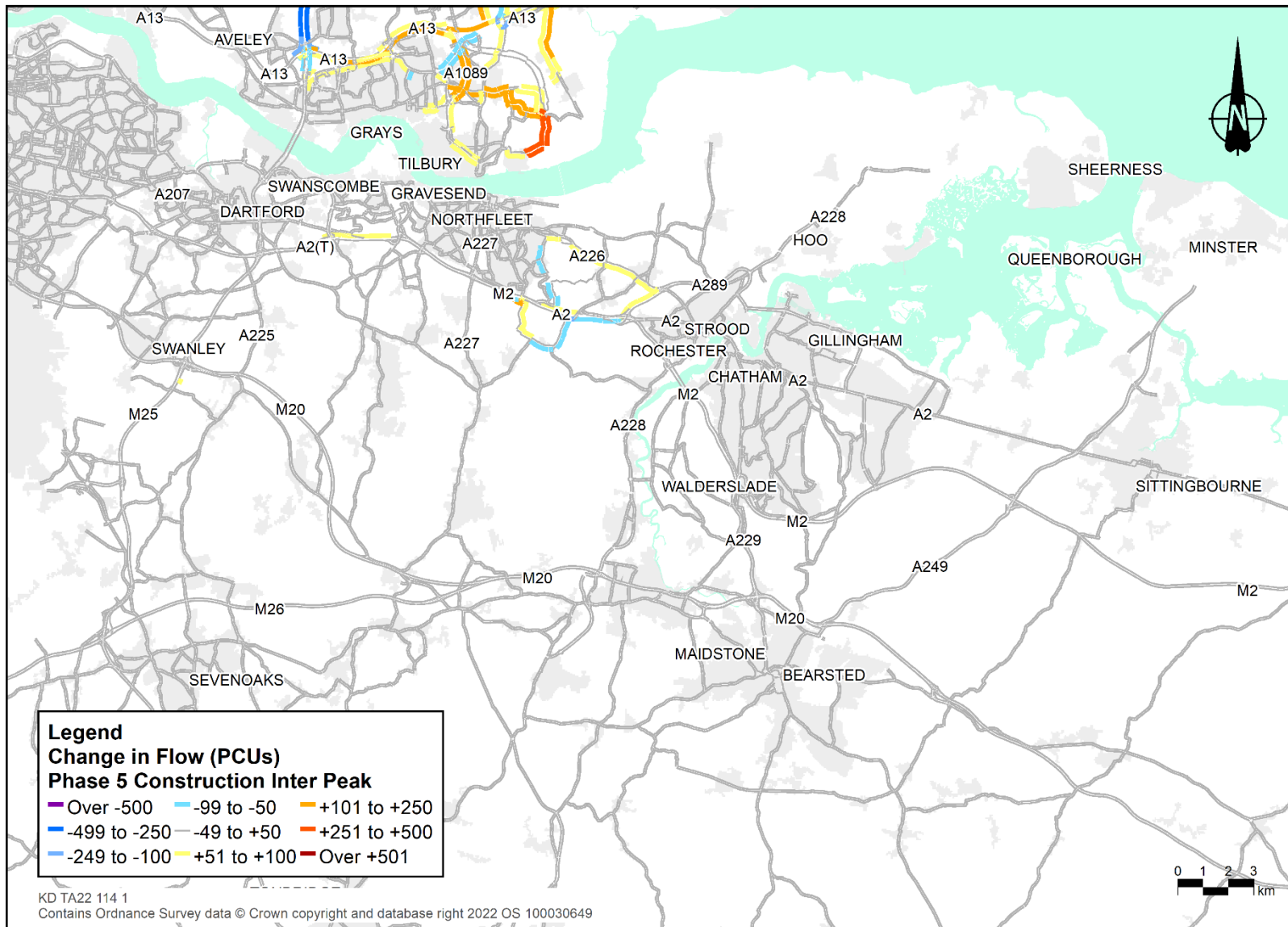


Plate 8.56 Change in flow (PCUs), south of the River Thames, phase 5 PM peak

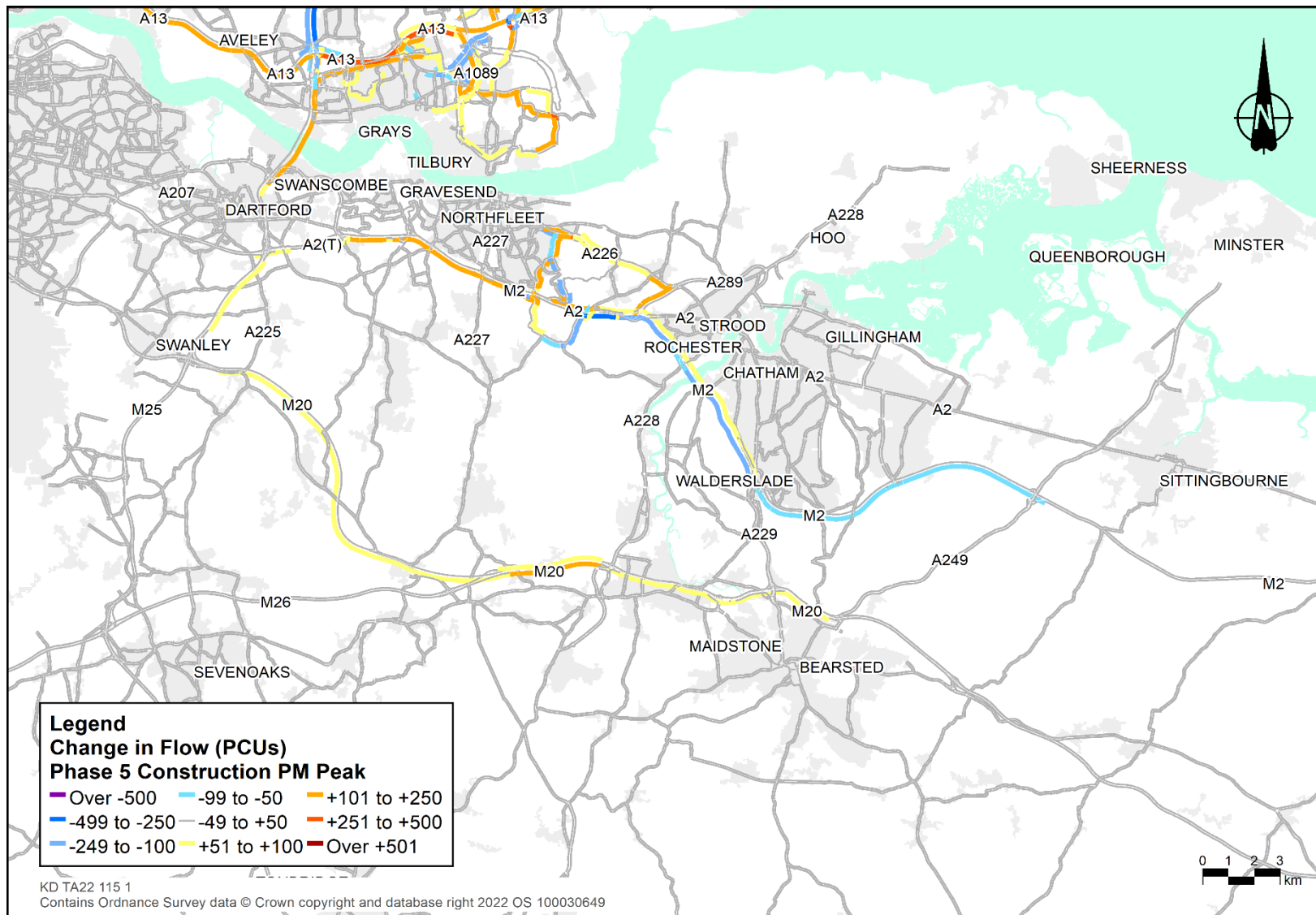


Table 8.49 Construction impact on journey times (phase 5 AM peak)

Route	Road	Dir	Without Construction		With Construction		Difference		Difference (%)	
			Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time	Av Speed
JT01	M25	NB	33.4	69.1	35.8	64.4	+2.4	-4.7	+7%	-7%
		SB	33.2	69.7	35.5	65.3	+2.3	-4.4	+7%	-6%
JT11	A127	EB	26.1	59.0	27.3	56.5	+1.1	-2.5	+4%	-4%
		WB	35.8	43.0	37.4	41.2	+1.6	-1.8	+4%	-4%
JT13	Station Road/Fort Road/A1089	EB	11.9	64.2	12.2	62.6	+0.3	-1.5	+3%	-2%
		WB	11.1	67.1	12.3	60.1	+1.3	-6.9	+11%	-10%
JT14	A1013	EB	13.9	39.4	15.8	34.6	+1.9	-4.8	+14%	-12%
		WB	14.0	37.8	16.1	32.9	+2.1	-4.9	+15%	-13%
JT22	Baker Street/Heath Road	NB	3.7	47.7	4.3	44.2	+0.6	-3.5	+16%	-7%
		SB	3.5	51.0	4.4	43.1	+0.9	-7.9	+27%	-16%

Table 8.50 Construction impact on journey times (phase 5 inter-peak)

Route	Road	Dir	Without Construction		With Construction		Difference		Difference (%)	
			Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time	Av Speed
JT01	M25	NB	29.8	77.5	31.2	74.0	+1.4	-3.5	+5%	-4%
		SB	26.5	87.4	28.1	82.6	+1.5	-4.8	+6%	-5%
JT14	A1013	EB	13.1	41.7	14.4	38.1	+1.3	-3.6	+10%	-9%
		WB	12.7	41.7	13.9	38.0	+1.3	-3.8	+10%	-9%
JT22	Baker Street/Heath Road	NB	3.4	52.5	4.1	47.1	+0.7	-5.5	+20%	-10%
		SB	3.3	53.3	4.2	45.5	+0.9	-7.8	+26%	-15%

Table 8.51 Construction impact on journey times (phase 5 PM peak)

Route	Road	Dir	Without Construction		With Construction		Difference		Difference (%)	
			Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time (mins)	Av Speed (km/h)	Time	Av Speed
JT01	M25	NB	30.0	77.0	31.6	72.9	+1.7	-4.0	+6%	-5%
		SB	30.4	76.2	33.0	70.3	+2.6	-6.0	+9%	-8%
JT11	A127	EB	29.7	51.9	30.2	51.0	+0.5	-0.9	+2%	-2%
		WB	26.9	57.2	28.2	54.5	+1.3	-2.7	+5%	-5%
JT12	A13	EB	23.9	62.7	24.3	61.7	+0.4	-1.1	+2%	-2%
		WB	20.3	73.5	21.6	69.0	+1.3	-4.5	+6%	-6%
JT14	A1013	EB	15.1	36.2	17.0	32.2	+1.9	-4.0	+12%	-11%
		WB	13.4	39.6	15.2	34.7	+1.9	-4.9	+14%	-12%
JT21	Rectory Road	NB	3.3	60.9	3.7	55.4	+0.3	-5.5	+10%	-9%
		SB	3.3	60.9	3.5	57.9	+0.2	-3.1	+6%	-5%
JT22	Baker Street/Heath Road	NB	3.6	49.0	4.3	44.6	+0.7	-4.4	+18%	-9%
		SB	4.4	40.4	4.9	38.9	+0.5	-1.5	+11%	-4%

- 8.8.50 The flow difference plots show the changes in total flow in the areas that would be directly impacted by the traffic management and Project related construction traffic. In this phase narrow lanes and a 60mph speed restriction would be introduced on the M25 over a 5-6km stretch in both directions (RNTM65 and RNTM64). This would lead to a reduction in flow on the M25 in this section. Narrow lanes on the A127 (RNTM74) and a 50mph speed restriction would also significantly reduce traffic on A127 around the M25/A127 junction. These would shift traffic away from the motorway with some dispersed to the B186 and A128.
- 8.8.51 The Ockendon Road closure (RNTM58) would cause traffic to divert to Pike Lane and St. Marys Lane. The contraflow on the A1013 (RNTM23) would divert traffic to the A13 and Brentwood Road. There would be higher flows on the A2 eastbound due to Project related construction traffic. There would also be some changes in flows at the A2 Brewers Road / Thong Lane westbound slip roads due to permanent closures and switchovers at this location. There would be Project related construction traffic on Muckingford Road, Marshfoot Road, Station Road and the A226 causing flow increases at those locations.
- 8.8.52 The journey time analysis shows that there would be additional delays on the M25 (JT01) in each time period and in both directions. This is a result of the narrow lanes and 60 mph speed limit on the M25 in both directions (RNTM64 and RNTM65).
- 8.8.53 There would be additional delay along the A127 (JT11) in the westbound direction in the AM and PM time periods. This occurs due to the introduction of narrow lanes (RNTM74).
- 8.8.54 There would be additional delay on the A13 westbound (JT12) in the PM peak as a result of additional traffic from the Project construction along the A13 westbound.
- 8.8.55 There would be additional delay on Station Road/Fort Road/A1089 (JT13) in the AM peak, due to an increase in traffic on the A1089 which would cause additional delays, in particular at the Asda Roundabout and at the A1089 Westbound on-slip to the A13.
- 8.8.56 There would also be additional delays on the A1013 (JT14) in both directions in all time periods. This is caused by the contraflow system proposed on the A1013 (RNTM23).
- 8.8.57 There would also be additional delays on Rectory Road (JT21) northbound in the PM peak, albeit this 10% increase in journey time is equivalent to only 20 seconds.
- 8.8.58 There would also be additional delays on Baker Street / Heath Road (JT22) in both directions in all time periods. These are caused by the contraflow on the A1013 (RNTM23).

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