A non-technical overview of the key outcomes from studies and modelling informing Dartford's spatial strategy and transport policy update.

Transport Background Paper

Dartford Local Plan, September 2021

Planning Policy Team

DARTFORD BOROUGH COUNCIL

Contents

INTRODUCTION

I. This paper sets out the Council's approach to ensuring that appropriate planning policy and mitigations are identified and planned, to respond to the current and new development in Dartford's proposed Local Plan to 2037, in accordance with national planning policy.

II. It provides an overview of the key information contained in various technical documents and studies that have assisted the Council in defining the approach to transport management and mitigation proposed in the Plan. The report includes;

- outline of national policy and guidance and overview of draft Local Plan growth proposals –quantum, development types and broad locations
- current circumstances with regard to the highways network in Dartford and sustainable travel provision
- explanation of key existing transport impact assessments of future development
- Local Plan strategic transport assessment: an account of modelling and liaison/ collaboration with partners- account of activity so far.

III. A Local Plan transport assessment is an important piece of evidence to assess the transport implications of the strategic spatial strategy, and provide guidance to the proposed policy framework. Details of the strategic transport modelling for the Local Plan are set out in section 3 below. However, it should be noted that there are a number of other recent transport assessments that have been undertaken in Dartford, including for very large and detailed specific development proposals (i.e. planning applications), which provide additional information and an understanding of the future capacity and issues arising on both the strategic (SRN) and local road (LRN) network in Dartford Borough. In some cases these assessments have led to identification of longer term mitigations. This evidence has all informed the Dartford Local Plan 2021.

IV. Reference is made throughout the report to National Highways (NH) (formerly Highways England), as the strategic highway authority, and Kent Highways (KH) as the local transport authority. Together these bodies have responsibility for the road network within Dartford Borough

V. The paper firstly outlines the applicable policy and transport network context (Part 1). Part 2 sets out existing highway assessment evidence, followed by full explanation of the current strategic modelling/ assessment project (Part 3). The final part of the paper presents an outline of findings and next steps.

VI. The Paper is supported by several reports covering stages of the Local Plan Strategic Modelling assessment produced by the consultants (Stantec) which must be read alongside this background paper.

PART 1: APPLICABLE CONTEXT

1.0 This part of the study outlines key policy and local transport issues, including how Dartford proposes to address these issues in the new Local Plan.

National Policy

1.1 The primary aim of National Planning Policy Framework's (NPPF, July 2021) is to achieve future sustainable development. National transport policies contribute to the achievement of all of the three overarching objectives of NPPF – a strong and responsive economy, vibrant and healthy communities, protecting and enhancing natural, built and historic environment.

1.2 Section 9 of NPPF is wholly focused on Promoting Sustainable Transport. Paragraph 104 says that the 'Transport issues should be considered from the earliest stages of plan-making and development proposals', so that; the potential impacts of development on transport networks can be addressed and opportunities to promote walking, cycling and public transport use are identified and pursued amongst other outcomes.

1.3 Paragraph 105 states that significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes.

1.4 Paragraph 106 advises that planning policies should;

a) support an appropriate mix of uses across an area, and within larger sites, to minimise the number and length of journeys;
b) be prepared with the active involvement of highways authorities, other transport providers and neighbouring councils, so that strategies and investment for supporting sustainable transport and development patterns are aligned;
c) identify and protect sites and routes which could be critical in developing infrastructure to widen transport choice;
d) provide for attractive and well-designed high quality walking and cycling networks with supporting facilities; and
e) provide for any large scale transport facilities that need to be located in the area, and the infrastructure and wider development required to support their operation, expansion and contribution to the wider economy; and

1.5 Paragraphs 107 and 108 set out the considerations to be taken into account when setting local parking standards and advises that maximum parking standards should be set only where justified with regard to the situation of the local road network or with regard to the type of development/locations, e.g. Town centres.

1.6 Paragraphs 110 to 113 set out the types of considerations required in allocating development or assessing specific development proposals including the take up of opportunities to promote sustainable transport, and that any significant impacts on the transport network (capacity, congestion or highway safety) can be cost effectively mitigated to an acceptable degree.

1.7 Paragraph 111 states that development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe. Developments that will generate significant amounts of movements should provide a travel plan, and applications supported by an appropriate review of transport impacts.

1.8 The advice in Planning Practice Guidance (PPG) supporting the NPPF is also relevant. In particular it highlights the importance of an assessment of transport implications to enable a robust evidence base to support the preparation of the Plan. Assessments should take into account the existing situation, forecast future trips by mode and cumulative impact. Transport evidence should identify the opportunities for encouraging a shift to more sustainable transport usage, reduce demand for travel and highlight infrastructure requirements to be incorporated in spending plans. Guidance is provided on technical aspects of transport assessment for Local Plans, including consideration of scenarios where there are options which would impact travel patterns in the future.

Guidance refers to 'The Strategic Road Network and the Delivery of Sustainable Development – DfT Circular 2013'.

1.9 The Circular explains how National Highways (NH) will engage with the planning system and how it will continue to act as a management and delivery partner for the strategic road network (SRN). NH seeks to make the most efficient use of the limited available capacity on the SRN and will engage with the Local Plan process to reduce the potential for congestion on the SRN and achieve a pattern of development that will not compromise its operation. In developing the evidence base, NH will work with the planning authority to understand the transport implications of development options, including the ability of junctions to accommodate forecast flows. Assessments should be carried out in line with guidance or on a basis otherwise agreed with NH.

Dartford Local Plan Publication document

1.10 The new Local Plan will replace Dartford's existing Core Strategy 2011 and Development Policies Plan 2017. Notably, the new plan will look towards the 2030s but maintain several principal features of the overall growth strategy and priorities established through these existing Plans. This includes a focus on plan-led urban development, with land identified at locations close to good public transport services, and clear criteria to resist unplanned additional "windfall" housing (in order to avoid adverse infrastructure impacts).

1.11 Proposals in the Local Plan that are likely to result/influence transport impact on the highways network and local area are;

- An average of 790 new homes per annum to be built (a substantial proportion, already having planning consent).
- A target for 80% of new homes to be built on brownfield land.
- Dartford Town Centre (renewal of existing uses) and Ebbsfleet Garden City are identified as being the main areas of focus for future new development. This is accompanied by four specific land allocations within these areas some of which have historic permission.
- Other broad site locations within these areas are also identified in case land that is currently unavailable comes forward in a suitable form, with policy provided to guide future development. One of these is in Central Dartford surrounding the railway station. A limited part of Swanscombe Peninsula is identified as a potential broad area for relatively low intensity development. (The Plan does not propose the delivery of the London Resort as part of the growth strategy, however, it notes that if the proposal was to be approved through the Nationally Significant Infrastructure Projects (NSIP) process and delivery of the first phase was to take place, this would trigger a review of the need for an update of the Local Plan).
- No residential or commercial development is planned to take place in Dartford's Green Belt.
- Approximately 22,000sqm per annum of new commercial, business and services uses, and community and learning uses (including offices, health facilities and schools); and

approximately 25,000sqm per annum of new industrial/distribution premises. By 2032, approximately 8-16,000 additional jobs generated from planned new development primarily at existing identified employment areas with some strategic commercial development at Dartford town centre and Ebbsfleet Central.

- By 2027, approximately 20,000sqm of retail floor space. This can be achieved through existing planning permissions. Primarily focused at Dartford Town Centre (renewal), new centres in Ebbsfleet Garden City, and some at Bluewater regional shopping centre (with planning consent)

1.12 Transport focused policy includes:

- Substantial support within strategic and development policies for continued priority for Fastrack (bus rapid transit) and future development of the network, potential enhancement of rail services and potential for new stations, new and improved cycling and walking infrastructure including a focus on interchanges.
- Applicable development transport policies are not proposed to change substantially from those adopted in the Development Management Policies Plan 2017. A variety of policy requirements are identified to ensure appropriate management of highway impact and opportunities for sustainable travel be provided through new development. The policies include;
    - the design of sites to ensure the provision of a good quality cycling/walking environment;
    - access to public transport services;
    - a requirement for trip generating development to be supported by a travel plan incorporating longer term monitoring of measures;
    - a requirement for any forecast off-site transport impacts to be addressed; and
    - a requirement to consider the feasibility of river transportation at applicable sites.

1.13 Sections 2 to 4 of the Local Plan form the heart of the development strategy, with Borough-wide strategic objectives (policies S1-S4) and provisions for the growth of Central Dartford (policies D1-D7) and Ebbsfleet & Swanscombe (policies E1-E6). Development management policies M16 and M17 focus on transport sustainable travel related issues.

Kent County, and north Kent policy and partnerships

1.14 With Kent County Council (KH) as the local highway authority for Dartford, this outlines the Kent/ sub-regional level context. Dartford also works with a range of other transport bodies, particularly on specific projects for north Kent.

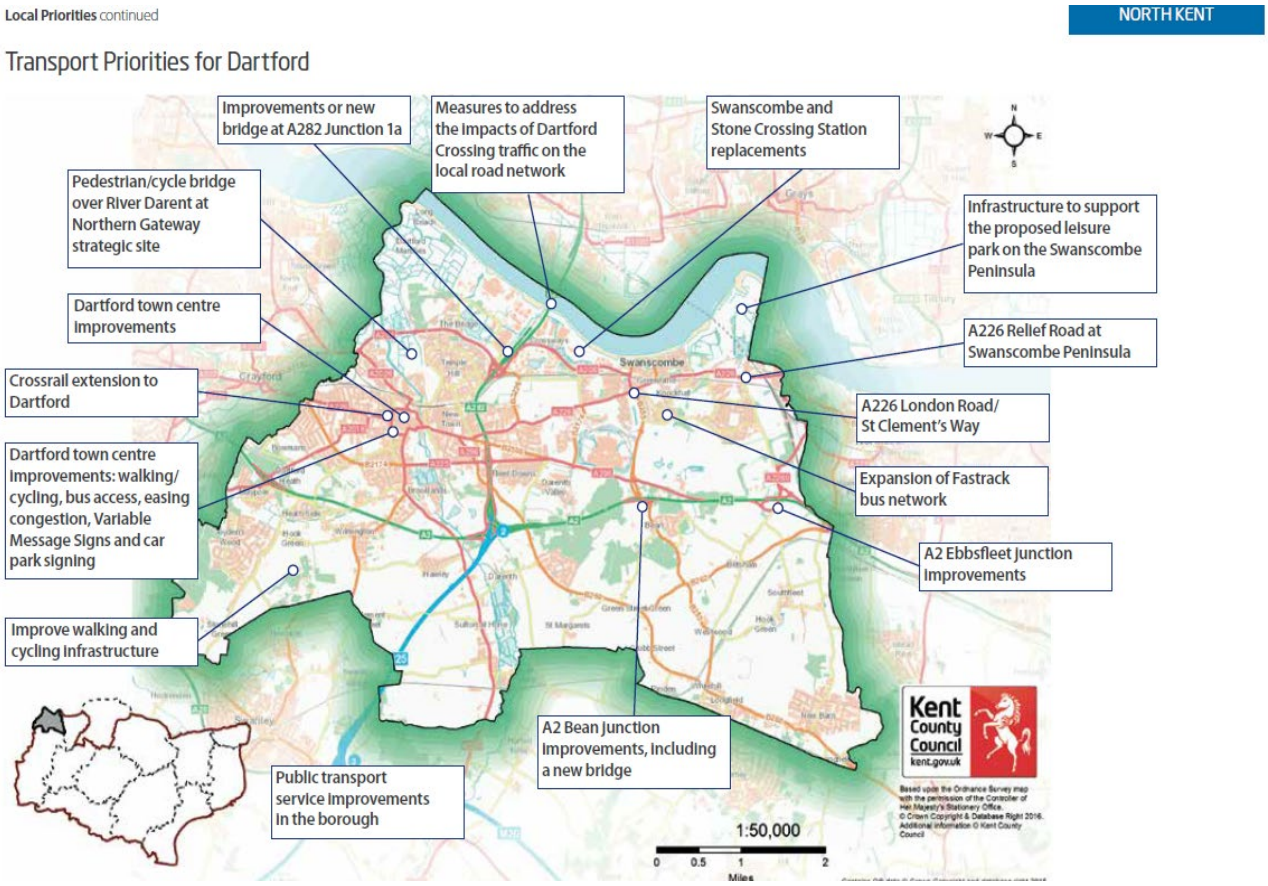
Local Transport Plan 4: Delivering Growth without Gridlock 2016 to 2031 (Kent County Council)

1.15 The Local Transport Plan (LTP) identifies the transport priorities for Kent over a fifteen year period. It sets policies to deliver strategic outcomes, the level of investment required in the County to support growth, and contains implementation plans and the approach to prioritising funding.

1.16 Five overarching policies are identified to achieve;

- Economic growth and minimise congestion
- Affordable and accessible door to door journeys
- Safer Travel
- Reduced impact and enhance environment
- Promote active travel choices to encourage good health

1.17 Focusing on aspects of the plan that are particularly pertinent to Dartford, the LTP considers the transport actions required to enable growth in the Thames Estuary, these include various strategic highways schemes, improved rail services and an expanded Fastrack network. Focusing on Dartford the LTP sets out the following priorities;[1]



1.18 These priorities are reflected in the draft Local Plan and other applicable documents such as the Infrastructure Delivery Plan and the Dartford Sustainable Transport Strategy. A number of the schemes/projects are already in progress.

Long term transport strategy and partnership working in North Kent

1.19 There has been long term collaboration between strategic stakeholders in the North Kent area to address highways issues associated with increased level of trips through development growth. Collaboration continues, albeit, through new and evolving groupings and strategic documents.

1.20 A Kent Thameside transport model undertaken by local partners prior to 2008, formed the basis for the thrust of policies in the Core Strategy 2011. The Plan notes that 'the Council working with its partners, Gravesham Borough Council, Highways England (now National Highways) and Kent County Council has identified a programme of transport schemes, over and above sustainable land use and transport policies, to address the transport impacts of proposed growth'. The programme is referred to as the Strategic Transport Infrastructure Programme (STIP).

1.21 Some STIP projects have been completed, with others in construction, design or in early scoping stages. The programme and partnership continues with in addition, the Ebbsfleet Development Corporation (EDC), as the development forecast on which the programme was

[1] Kent County Council Local Transport Plan 2016 -31 pp. 35

based, remains relevant at this point; mitigating large scale development still underway such as Ebbsfleet Garden City.

1.22 The Council works closely with the Ebbsfleet Development Corporation (EDC), which was formed in 2015 with development management and regeneration responsibilities for the Ebbsfleet Garden City. However, Local Plans by Dartford and Gravesham councils set planning strategy and, together with Kent County Council Minerals & Waste Plan, make up the statutory development plan under which the EDC operates.

1.23 The EDC's function is to facilitate delivery of Ebbsfleet Garden City which lies largely within Dartford Borough. Provision of opportunities to encourage an uplift in sustainable travel is a key focus for the EDC, and is featured in ongoing master planning for the Garden City.

1.24 Partnership working also continues to achieve and plan for an increased proportion of trips to be made by sustainable modes in the North Kent area. Schemes include the Fastrack (Bus Rapid Transit) services, new cycling/walking infrastructure and more recent partnerships include:

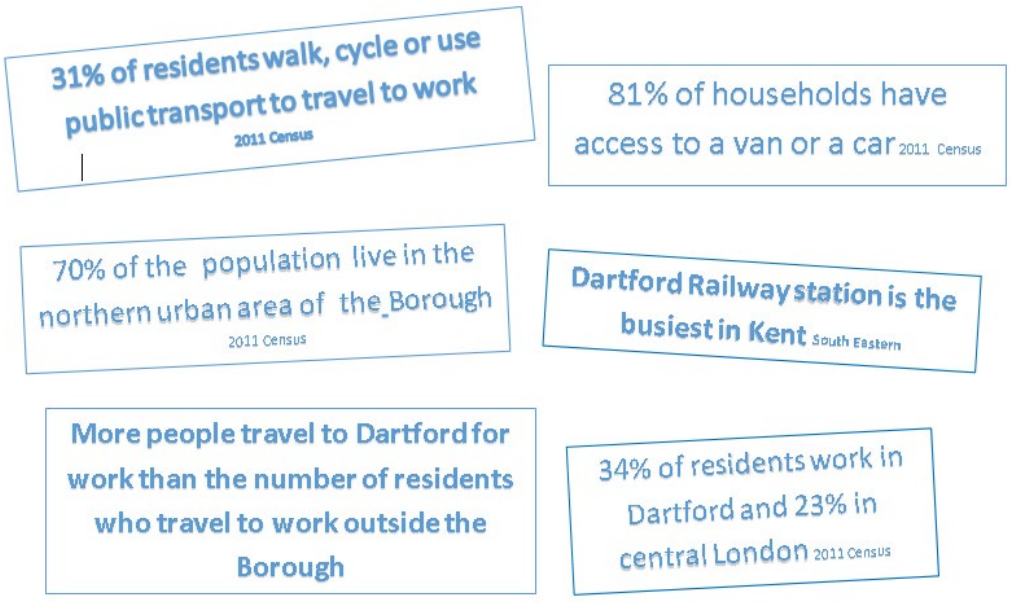
- a joint project since 2015 on enhanced connectivity from Abbey Wood to Ebbsfleet through the extension of Elizabeth Line (Crossrail) services (https://www.abbeywood2ebbsfleet.com/)
- Transport for the South East, established in 2017 (https://transportforthesoutheast.org.uk), and
- A North Kent Sustainable Transport officers group.

Current Transport Situation in Dartford

1.25 Taking into account the 2011 Census and the location of new development since that time, over 70% of the population live to the north of the A2 within the principal urban areas in the Borough.

1.26 In 2011, around a third of the population used sustainable transport to travel to work and a similar proportion worked within the Borough. In addition 23% of the population worked in central/inner London which is a key reason for Dartford railway station being the busiest in Kent. However, the number of residents who travel to work locations outside the Borough is outweighed by the number of people travelling into Dartford for employment purposes (net in-commuting).

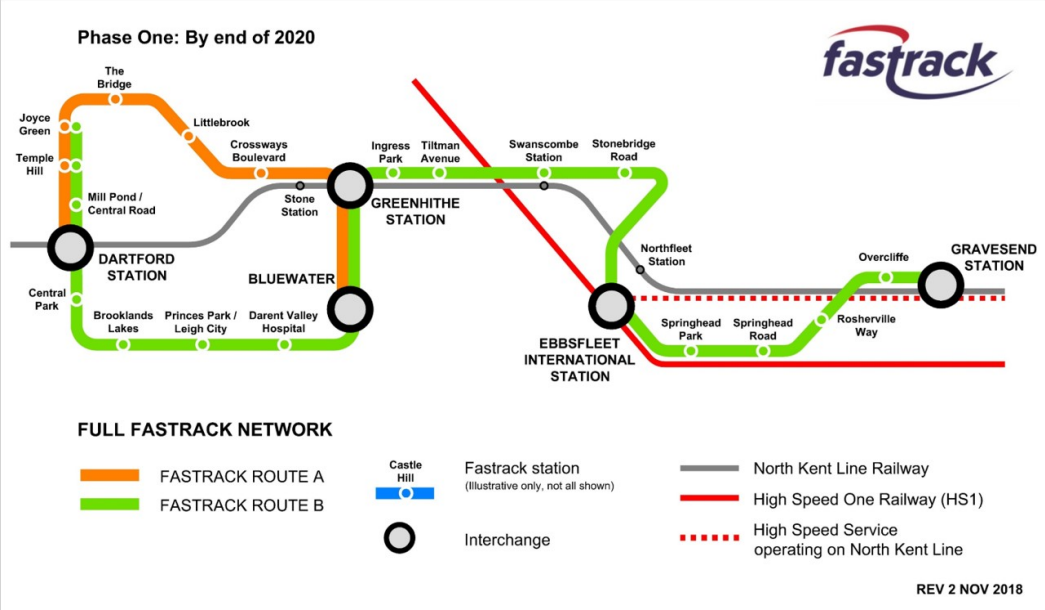
1.27 Some of these key determinants are illustrated below:



1.28 The Borough is traversed by two strategic highway routes. The A2(T) London to Dover and M25/Dartford Crossing approach (London Outer Orbital). A number of key east-west/north-east local roads add to the highway network across the Borough.

1.29 Two railway lines that are part of the network of railway lines radiating from London into the South-East region, serve the Borough with a number of stations available, with in addition the HS1 line at Ebbsfleet, providing access to international and domestic hi-speed train services.

1.30 Fastrack (Bus Rapid Transit) services were introduced in Dartford and Gravesham in 2006 and presently provides two routes linking new developments with employment areas, town centres and stations, as shown below:



1.31 Fastrack complements a network of other privately operated bus services to settlements across Dartford also serving outer London and parts of North Kent.

1.32 National Cycle Route 1 and 125 run through the Borough on a mix of segregated and on-street cycle tracks. New and enhanced segregated pedestrian and cycle routes have been provided in some areas by Kent Highways (KH) and through new development provision, with more in the pipeline, including provision by National Highways (NH) at the A2 Bean & Ebbsfleet Junction Improvements currently under construction.

Congestion and resilience

1.33 The current Dartford Crossing provides the only road link to the east of London, between Kent/continental Europe, and the Midlands and North of England.

1.34 In recent times, the capacity of the crossing is often exceeded for large periods of the day. Due to the large amount of international, national and local traffic using the crossing this often causes queuing on the approach to the tunnels that impacts on Junction 1A(A282). The congestion can then extend to impact on Junction 1b and Junction 2 (A2 interchange) particularly when accidents or incidents occur. On these occasions (which take place on multiple occasions in any given year), it is not unusual for the local road network in the area to become congested especially around the junctions to the approach roads.

1.35 Significant incidents can result in congestion taking a considerable time to return to normal levels. Whilst congestion also often occurs on the A2 (as one of London's principal radial routes), particularly due to incidents or peak hour use, the impacts on the local road network are less pronounced. However, major delays on either strategic route, can lead to significantly increased local traffic due to drivers seeking alternative routes.

1.36 Whilst there are some localised congestion' hotspots', it is issues arising from Dartford Crossing described above, that are of particular significance to the smooth flowing of the road network in the north area of Dartford. These issues have resulted in ongoing liaison and on-going partnership working between the Council, NH and KH to seek mitigations and resolve causes of congestion on both the strategic and local road network.

PART 2: EXISTING TRANSPORT ASSESSMENT EVIDENCE

2.0 This part of the topic paper features recent area and specific transport assessments of proposals with potential to impact known areas of sensitivity on the Dartford Network. Together these provide an up to date detailed existing base of evidence on the functioning of the Borough's highway network and impact of new development.

About Transport Assessments in Dartford

2.1 Relevant transport assessments undertaken in the Borough include;

- National Highways (NH) strategic transport modelling to support the proposal for a new Lower Thames Crossing east of Gravesend;
- A focused transport assessment of Dartford Town Centre to assess options for a strategic improvement scheme and additionally to provide a forecasting tool for future development proposals;
- NH modelling to support the application for a road order for the A2 Bean & Ebbsfleet Junction Improvement scheme (under construction);
- Detailed modelling to support option assessment for improvements to Junction 1A;
- Transport assessments at Ebbsfleet Garden City; and
- Recent site specific transport assessments to support the determination of large scale development proposals in areas of known highway sensitivity. Some of these are located in the vicinity of Junction 1a of the Dartford Tunnel Approach, and have considered impacts on the SRN as well as localised network impacts.

2.2 Further detail is provided below on some of the transport assessments and outcomes that are most applicable to understanding Local Plan impacts.

2.3 In addition to the assessments above, KH has started developing a Kent-wide strategic transport model, which includes consideration of the contribution of public transport. Unfortunately, the programme for the development of the Kent model had not begun when the Council were embarking on the Local Plan transport assessment.

2.4 The need for Dartford to undertake local plan transport assessment based on an alternative modelling approach in advance of the development of the County strategic model, was considered and acknowledged by KH officers at an early stage of the Dartford local plan timetable.

Proposed Lower Thames Crossing (LTC)

2.5 Consideration of a proposal for a new Lower Thames Crossing began with public consultation on potential locations in 2013. Further more detailed consultations focused on refining location options, and variants, design and construction matters have followed, with a supplementary consultation taking place in the summer of 2020. The most recent consultation on the community impacts of the proposed schemed closed on 8 September 2021.

2.6 Dartford Borough Council has consistently supported a crossing scheme in a different location to the current crossing, particularly as it is likely to ease congestion and provide resilience at Dartford and reduce traffic flows on the A2 to the east of the existing crossing and within the vicinity of Ebbsfleet. It is for this reason that the transport assessment impact findings of the scheme are of particular interest to Dartford.

Artists Impression of the northbound route of the proposed Lower Thames Crossing Route (*NH website)*

2.7 Extensive assessments including transport, have supported various stages of refinement of the scheme. Ongoing evaluation and public consultation feedback resulted in NH recommending a bored tunnel east of Gravesend. It is this scheme that is now being taken forward for determination through the Nationally Significant Infrastructure Project (NSIP) process. National Highways submitted an application for a Development Consent Order in October 2020 but this was subsequently withdrawn. NH is currently refining the proposal in advance and working on further evidence before re-submitting its DCO application. A date for this re-submission has yet to be finalised.

2.8 Public consultation on detailed proposals of the scheme was undertaken at the end of 2018. This was supported by an updated transport assessment, based on a strategic area wide model which included eastern areas of Greater London. This is called the Lower Thames Area Transport Model (LTAM), formulated by Highways England's Lower Thames Crossing team.

2.9 Overall, the transport modelling predicted that in the future there would be a reduction in passenger car units at peak hours at the Dartford Crossing compared to the continuation of the existing situation without a new lower river crossing.

2.10 Following statutory consultation the Lower Thames Area Model (LTAM), was updated to a supplementary consultation version in early 2020, to support further revision to proposed design in response to the 2018 consultation. Whilst the changes that occurred were primarily to reflect changes to junctions and approaches to the new crossing (outside of the Dartford area), other updates included updating local development details and heavy goods vehicle numbers.

2.11 The developments included within LTAM are shown in its 'Uncertainty Log', these include large scale sites with planning consent, submitted planning applications or those identified within an adopted plan. The information was supplied by local authorities and included forecasts in Dartford's Core Strategy.

2.12 Updated assumptions resulted in some change to the 2018 predicted impacts on parts of Dartford's network to that shown in the consultation version, however, overall the traffic impact of the LTC scheme over the whole area was similar.

2.13 LTAM is a SATURN[2] strategic transport model and has been based on various traffic data and journey patterns derived from mobile phone analysis. The model uses a peak hour assessment that is consistent with peak hours on the Strategic Road Network (SRN) but not the Local Road Network (LRN).

2.14 Forecasts have taken into account Department for Transport forecasts for traffic growth in the South East up to the opening and design year (2042) with adjustments made for local new development identified through the planning system. The model has been used to predict future traffic journeys, taking into account how people will react to changes in the time and cost of journeys and subsequent route choices, with and without the new crossing in operation.

2.15 Whilst confirming that it would continue to work with HE after the post-consultation stage, Kent County Council noted in a previous consultation response that the model does not contain sufficient validation points on the LRN which results in the model being unsuitable to reasonably assess impacts on local roads and further validation with traffic counts on the LRN should be undertaken. These issues were considered and addressed in Dartford's Local Plan Transport Assessment and are set out below.

2.16 During the statutory consultation phase of the project, the LTC team presented details of the assumptions underlying LTAM to local authority officers and subsequently offered local authorities a 'cookie cutter' extract of their model for each local authority area. It was suggested that this may provide some useful modelling evidence for local planning authorities. For Dartford, the cookie cutter section also included Gravesham local authority area. *Additional information is provided in Dartford's Local Plan Transport Assessment Stage 1 report.*

2.17 Taking into account the considerable technical work undertaken and that the model had incorporated most of the development forecast by the Core Strategy, which has continued into the forecasts of the new Local Plan; DBC entered a legal agreement in early 2019 with NH to procure and use the Dartford cordon of LTAM. This followed discussion with KH, and high level input from experienced consultants regarding the use of the model to support the Dartford Local Plan.

2.18 The model provides some understanding of LRN forecast trips but was primarily focused on local links to the SRN. This had been taken into account in the methodology of the Local Plan transport assessment set out in section 3 below, *with further detail provided in the Dartford Transport Assessment Stage 1 Report.*

Dartford Town Centre Transport Modelling

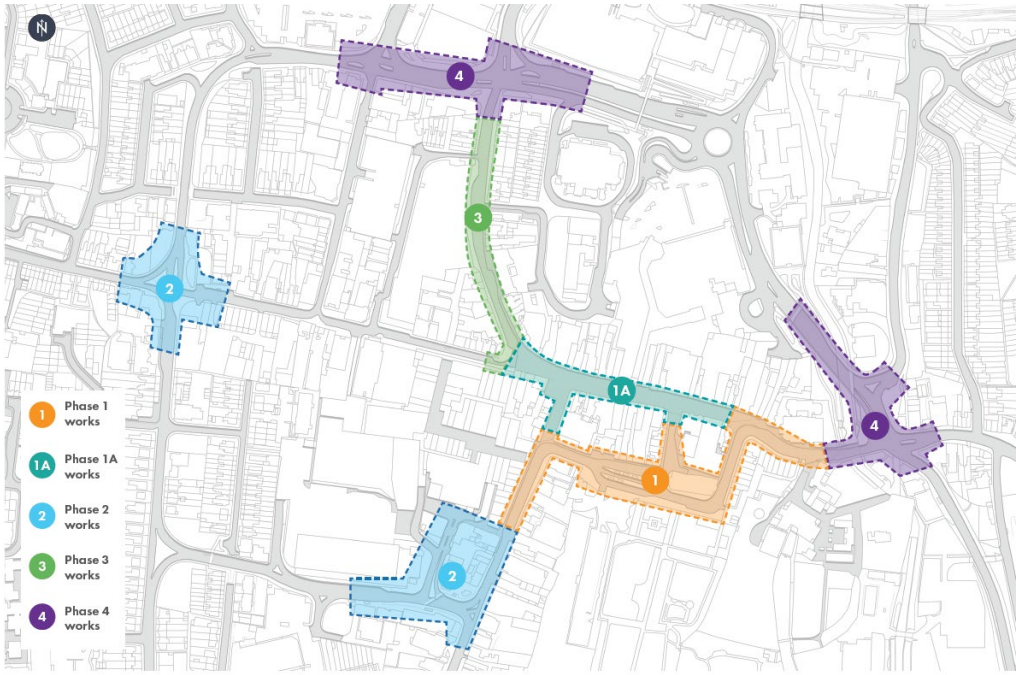
2.19 A comprehensive project of highway improvements at Dartford Town Centre was identified at an early stage of the North Kent transport strategy, and a project identified in the STIP programme.

2.20 Early work commenced in October 2016 with the scope of the project and phasing clarified before formal commencement of the project in August 2018. It incorporates highways, junction and additional improvements in areas that are primarily pedestrian, but may result in transport impacts. A primary focus of the Town Centre project is to enable an integrated pattern of travel and transport to support recent development built and future planned

[2] Saturn simulation and assignment software used for analysis of larger networks and major infrastructure highway proposals plus other functions

development in and around the town centre in its design. A phased approach has been adopted as shown below:

Dartford Town Centre – phased improvement project plan:



2.21 At this point, Phase 1 of the project has been completed incorporating realignment of the ring road, re-routing of some bus services and significant new public realm.

- Phase 1a commenced in May 2021 comprising of further public realm improvements along the High Street;
- A contract has been awarded for Phase 2 and this is due to commence later this year comprising junction improvements at two key gateways to the town centre, with the introduction of the latest traffic signal technology, and further public realm improvements.
- Phases 3 and 4 are being designed with construction scheduled for 2022/23 and 2023/24.

2.22 To assist in the identification of improvement schemes and testing of early design proposals for each phase, a Vissim[3] transport model of Dartford Town Centre and environs was commissioned and produced. The model provides a 2027 forecast and was updated in early 2019 (pre-Covid lockdown) to recalibrate the base to observed flows.

2.23 The forecast assumptions and formulation of the Vissim model and ongoing approach to its use for the town centre scheme included regular input from KH. Additionally, the model has also recently been used to inform an assessment of transport impacts of a large mixed use development application in the heart of the town centre, which has subsequently been given outline consent. The use of the model for the transport assessment also informed the highway authority's comments on the planning application.

2.24 This transport assessment and ongoing testing of schemes using the model, have provided an iterative basis of reviewing the ongoing scope and design of highways improvements in the town centre. For example, early proposals for Phase 2 of the town centre

[3] Vissim is a multi-modal traffic flow simulation software package

scheme for the ring road to become two way, were revised after the model indicated that this would result in a worsening of traffic congestion in the morning peak, and the transport assessment of the development proposal indicated that Phase 4 of the town centre scheme should be slightly expanded to incorporate some further changes to adjoining local roads, to assist vehicles leaving a new car park.

2.25 It is envisaged that the town centre Vissim model will be used to support the testing of impacts of the designs for the further phases of the town centre scheme and available to be used for assessing the transport impacts of future development in the town centre.

2.26 This is particularly useful taking account that the Local Plan focuses future development on this area.

Ebbsfleet Development Corporation Transport Modelling

2.27 In the east of the Borough, Ebbsfleet Garden City is the other main area of focus for future growth identified in the Local Plan.

2.28 The sites within the Garden City were identified in the early stages of Thames/North Kent growth strategies as having potential for significant residential and commercial development accompanied by new infrastructure, and this featured in the adopted Dartford Core Strategy.

2.29 Outline planning consents were granted a number of years ago, some of which have been taken forward to master planning and onward phased detailed consents. A substantial amount of new homes and supporting infrastructure has been delivered over the last few years particularly in the Whitecliffe area.

2.30 The outline consents were supported by transport impact assessments and all consents contain strong measures to reduce car use, identification of specific junction improvements (included within the STIP programme), s106 contributions and additionally an ongoing monitoring and mitigation framework. Both NH and KH were and are key agencies involved in this framework approach.

2.31 The EDC in tandem with its development management function has developed strategies for place making and sustainable communities at Ebbsfleet which are set out in the draft Local Plan. This has included a focus on sustainable and active travel. Whilst there has not been a need to undertake further transport assessment to support development in the area, as ongoing development already has planning consent, focused public transport modelling has been taken forward by KH in conjunction with the EDC.

2.32 Vissim modelling was undertaken during 2018 to particularly consider highways hotspots with particular focus on Fastrack. The model included the highways network current and planned within Ebbsfleet and a small area in the vicinity. The later stages of the project focused on some of the highway congestion' hotspots' identified through earlier modelling.

2.33 Further Vissim microsimulation, was commissioned in 2019 by KH, for a large area of the Fastrack network and has been used in conjunction with testing potential journey times of proposals for specific Fastrack enhancement projects at Ebbsfleet and beyond.

2.34 The model was based on 2018 observed flows and compared with and without future Fastrack improvement scenario, taking into account highways changes expected in the future. The work included modelling at Junction 1b of the Dartford Tunnel Approach together with other pinch-points affecting Fastrack service resilience on the highway network.

2.35 The findings were used to identify schemes worthy of more detailed analysis and design some of which are being taken forward in partnership with EDC.

2.36 Modelling indicated that at Junction 1b, Fastrack timing improvement only occurs if an additional bridge structure was provided. However, the cost of such a scheme did not warrant this improvement being taken forward.

2.37 The EDC has indicated that a new outline application is likely to be submitted for substantial development at its Ebbsfleet Central site, the site surrounding Ebbsfleet International Station, which is supported in principle in the Local Plan.

2.38 This will result in a new transport assessment of impacts being undertaken, which will take into account Local Plan forecast development to identify cumulative transport implications.

London Resort

2.39 Within the EDC area, at Swanscombe Peninsula, proposals for an entertainment resort were submitted as an NSIP application on 31 December 2020. This follows several years of uncertainty as to if/when it would be submitted.

2.40 Extremely limited information on the transport implications of the scheme were made available to the Council. The developer has not sought a site allocation in the Dartford Local Plan, instead choosing to put forward proposals as an NSIP. It, therefore, has not been a feature of Dartford strategic transport modelling outputs.

2.41 The NSIP process has been delayed with London Resort being required to provide further information on a range of topics including its transport assessment. London Resort has also had to consider its response to the declaration of a Site of Special Scientific Interest by Natural England that affects most of its site as well as covering the Ebbsfleet Valley.

2.42 The Dartford Local Plan Publication 2021 proposes a review of the need to amend the Local Plan should the London Resort proposals gain development consent and progresses to a start in construction.

PART 3: DARTFORD LOCAL PLAN STRATEGIC TRANSPORT MODELLING PROGRESS

3.0 This central part of the report outlines the rationale, structure, and outline of engagement with stakeholders (notably highway authorities) undertaken for Local Plan transport modelling; plus highlighting key outputs so far.

Local Plan Strategic Modelling Background

3.1 Whilst much of the forecast development identified by the new Local Plan has planning consent with the transport implications set out in various transport assessments and incorporated into long term partnership working, it is essential, in accordance with national policy, that a review of transport implications of the Local Plan is undertaken.

3.2 In spring 2019, the Council commenced initial engagement with potential transport consultants, with experience in strategic transport modelling regarding a project to provide evidence on the transport implications of a new Local Plan. Key points identified for testing and evidence support by the Council at this stage were;

- A likely urban focussed strategy, e.g. central area regeneration and better/more intensive use of land (rather than alternative spatial location options such as greenfield 'urban extensions')
- Implications of strong demand for business floor space in the Borough
- Evidence to support a District transport strategy to minimise the impact of forecast development on the transport network

3.3 Overall, these points are still the key focus for the Dartford Local Plan Publication 2021.

3.4 A Dartford strategic transport model was required to support Local Plan transport impact evidence along with other sources. However, as set out in section 2 there are other robust information sources in existence that provide an understanding of the transport implications of Local Plan strategy and the Dartford context.

3.5 After a competitive procurement process, Stantec (formerly Peter Brett Associates) was appointed to undertake the commission. The team had considerable experience of transport assessments, modelling and had been involved in a number of projects in the local area.

3.6 The key stages of the project at its commencement were;

Stage 1 – Review and produce a 2019 base model

Stage 2 – Develop a 'without Local Plan' forecast model

Stage 3 – Testing of a Local Plan Preferred Option and initial variants for mode shift

Stage 4 – Identification of mitigations

3.7 A Dartford Cordon of the Lower Thames Area Model (DCLTAM) was provided to the consultants by the Lower Thames Crossing team under a legal agreement.

Option Testing

3.8 It was envisaged at this early stage that there may be a need for some testing of growth options to inform the Plan.

3.9 During the formulation of the preferred Local Plan growth strategy, it was clear that a substantial proportion of future development in the Borough already had planning consent.

3.10 Consideration of development options was achieved through considering the Sustainability Appraisal, Strategic Housing Land Availability Assessment and Economic Land Report, and responses to the Regulation 18 Preferred Options Consultation stage of the Plan in January 2020.

3.11 Testing of mode shift scenarios remains an important part of the project.

Activities completed

3.12 Substantial progress has been made, working with partners resulting in the completion of Stages 1 to 3 as set out below. The key areas of work for each phase, liaison with highways partners, issues arising and a summary of outputs is set out below. The following commentary also sets out the changes to the project and issues arising during the project that have impacted on the timescale for outputs.

3.13 *The following reports have been produced by the transport assessment and are provided as part of the Local Plan Publication evidence base. These provide full details of the work carried out.*

Stage 1 – Base Year Model

Stage 2a – Forecast Year Baseline Model

Stage 2b – Reference Case Methodology

Stage 3a – Local Plan Option Testing Methodology

Stage 3b – Local Plan Option Testing Outputs

The Duty to Cooperate Statement, also published as evidence base for the Local Plan, provides a summary of the liaison meetings held with highways partners during the course of the Transport assessment.

Dartford highway network analysis in the Stantec Stage 1 Report

Stage 1 - Base Year Model

3.14 This stage included

- Agreement with partners on the scope and methodology of the assessment
- Enhancing some of the DCLTAM modelled network and zoning to provide a greater local refined network for the base
- Collection of existing traffic data and calibration of the base year model with observed flows

3.15 Stantec completed much of the initial review and adjustment to DCLTAM during the summer of 2019 followed by liaison with KH, NH and EDC during the autumn.

3.16 A meeting was held with the LTC team to ensure that the methodology being applied to update DCLTAM to a 2019 base was technically appropriate. Overall, there was general agreement on the base model and matrix estimation approach. The LTC team continued to provide technical assistance, where requested by Stantec.

3.17 Based on feedback from these bodies a draft report was produced in early 2020, however for reasons outlined under Stage 2 below *an updated report was produced in February 2021 to accompany Regulation 19 consultation of the Local Plan*. The report sets out more background on engagement, and technical detail provided on the changes and enhancements made by Stantec to DCLTAM to produce a 2019 base model.

3.18 At this initial stage, liaison with highways partners highlighted that Dartford contained a critical part of the SRN and that Local Plan testing should clearly identify the impact of the Local Plan differentiating between those sites with and without consent. Ongoing liaison with KH had identified that based on current understanding, there would be a need to alleviate traffic congestion, and mode shift would be essential to achieving this.

3.19 Key changes made;

- Reduced DCLTAM to cover only Dartford Borough
- Change to modelled peak hours to local road network peak times
- Links added to incorporate local important routes
- St Clements Way junction scheme added to highways schemes
- Local coding changes to reflect – local speed limits, junction design
- Additional zones added to town centre to enable more detailed distribution

3.20 Updating included testing against observed flows and recent traffic assessment data from planning applications.

3.21 The resulting 2019 base year network model will be used in conjunction with forecast models to indicate an uplift of traffic flows for the reference year (2036), and Local Plan scenarios to enable a comparative understanding of the impacts on the highways network.

Stage 2 - Forecast Baseline Report

3.22 The objective of this stage of the project was to produce 2036 trip matrices based on the DCLTAM model with no Local Plan development (but including developments with planning consent) both with and without the Lower Thames Crossing.

3.23 This enables an understanding of impacts if the LTC project was not to go ahead.

3.24 In developing a 2036 without Local Plan model Stantec undertook the following actions;

- Interpolation from DCLTAM essentially producing a 2036 forecast from 2032 and 2042 data
- Some zone connector changes – the point where a zone loads onto the network to be commensurate with local circumstances
- Growth comparisons with TEMPRO
- Review of future highways schemes and relevant adjustments to the DCLTAM base
- Matrices assignment

3.25 DCLTAM forecast data was assumed at the start of this stage to be a reasonable basis for representing the forecast year scenarios. However, it became clear in reviewing the uncertainty log (list of development incorporated into LTAM) that additional developments had gained planning consent up to 2019 that had not been included, and that consents were not

in place at 2019, for development areas anticipated in the Core Strategy, but which had been included in the uncertainty log. Therefore there was a need for update.

3.26 Overall these changes did not result in any significant difference to development quanta anticipated by DCLTAM although changes occurred at specific locations. These have been required to be applied to the Local Plan updated network, *described in the Stage 1 and 2 consultant reports.*

3.27 Additionally, in liaison with NH traffic generation rates of specific development types forecast in the Local Plan, were reviewed and updated in the Dartford model.

3.28 These factors resulted in a two stage process, being taken by Stantec, to produce a Dartford Local Plan 2036 Reference Case model that continues to be based on DCLTAM.

3.29 The 2036 forecast baseline scenario modelling approach based on LTAM is provided in the *Stage 2a Report*. However, details of the additional development of a more refined local reference case incorporating changes to land use and quanta to that of DCLTAM, as outlined, is set out in the *Stage 2b Report*.

3.30 Stage 2b also considers these two similar but different reference models and sets out the framework for the derivation of a 2036 Dartford Reference Case. Taking into account the input of highways authorities, outlined above, *the Stage 2b Report;*

- *Considers the traffic generation parameters applied to the two reference scenarios – with full detail of the approach to rates applied incorporated into the Stage 3 Report*
- *Compares the DCLTAM and refined local reference case predicted traffic generation based on these parameters*
- *Taking into account these factors considers the distribution assumptions to be applied in deriving a Dartford 2036 Reference Case*

3.31 The engagement with highways authorities during autumn 2019, outlined in Stage 1 above, included discussion of the project methodology to be applied.

3.32 Further liaison and discussion followed in 2020 and a revision to early phase 1 and 2 stages has influenced the development of the reference case as indicated above. Details of the reasoning for the revision to early work is set out in the LTC – supplementary consultation section below.

3.33 Notwithstanding, changes to methodology, assumptions and development of a 2036 reference case outlined above, the objective of comparing Local Plan scenario testing to the 2036 Dartford Reference Case remains.

Lower Thames Crossing – supplementary consultation

3.34 As explained in section 2 above, NH updated the design of the Lower Thames Crossing in early 2020, and this was supported by an update to LTAM - supplementary consultation version.

3.35 New data for the DCLTAM was provided to the Council in April 2020 and it was agreed that Stantec should conduct a high level assessment of the impact of changes to forecast traffic levels in Dartford, with further detailed assessment undertaken, if the initial assessment indicated this was required.

3.36 The findings of this comparison exercise indicated that the update had resulted in significant increases to traffic numbers in Dartford for both the 2016 base and forecast year 2042. These were in critical areas of the network such as J1a, J1b, Ebbsfleet and the A2, and north bound routing from A2 Bean Junction, only minor changes had occurred in and around Dartford Town Centre.

3.37 The LTC team confirmed to the Council, when providing the updated data, that there would be no further update in advance of a DCO application and it was deemed appropriate for the Dartford study to be based on the most up to date base.

3.38 Therefore it was decided that stage 1 and 2 of the transport assessment should be refreshed and work on the remaining stages should continue.

3.39 Underlying data in the base and forecast base models was updated, and the Stage 1 and 2 reports re-issued to highways partners in October 2020. This resulted in a number of more detailed issues being raised by NH regarding a number of technical concerns regarding the original assumptions and methodology which NH felt may undermine the robustness of modelling findings.

3.40 Over autumn 2020, Stantec provided responses and updates to ensure changes were within or near to parameters acceptable to NH for Local Plan assessment purposes.

3.41 In February 2021, NH confirmed, that after reviewing further information provided for clarification, use of the model for Local Plan forecasting and assignment was considered acceptable.

3.42 Kent Highways, indicated continued acceptance of the proposed approach after a presentation of the changes in autumn 2020.

3.43 The additional clarification information provided to NH has been incorporated into the *updated Stage 1, 2a and 2b Reports*. Resulting changes to forecasting methodology has also indicated a need to provide a be-spoke Dartford Reference Case based on DCLTAM. The *Stage 2b Report* indicates the approach to applying matrices of vehicle movements to the two reference models to derive a Dartford 2036 Reference Case matrix (to be used for comparison purposes against Local Plan scenarios).

3.44 The need to update stage 1 and 2 underlying model data due to the supplementary LTC update, the further technical clarifications for highways authorities and the emergence of the need to create a more refined Dartford 2036 forecast Reference Case was unforeseen and has led to significant delays to maintain robust outputs. This has impacted progress on stage 3 of the transport assessment.

Stage 3 – Local Plan Option Testing

3.45 Stage 3 of the transport assessment derives the traffic generation arising from Local Plan forecasts and the potential change to traffic impacts under two alternative mode share scenarios.

3.46 These are to provide a comparison of differences in peak hour trips and distribution on the strategic and local highway network against the Dartford Reference Case (with and without the Lower Thames Crossing) of;

i. Local Plan forecast development – locations, quanta and land use (without planning consent)
ii. Based on the above, two different scenarios anticipating higher levels of sustainable trips than usually assumed in Local Plan modelling

3.47 These project activities and outputs provide the key tasks of Stage 3. However, due to the delays set out above during stage 2, the modelling of each scenario was still underway into February 2021 when the first (Regulation 19) Local Plan Publication was published. Whilst acknowledging the importance of strategic testing of transport impacts of growth proposals to support the Local Plan, the Council, taking into account potential findings and other local evidence, progressed to Regulation 19 Local Plan Publication based on rationale set out below.

3.48 During 2020, Stantec provided draft methodology and assumptions to be applied in deriving the Local Plan modelling scenarios, to the highways authorities and EDC. This was primarily based on local evidence. The proposed approach has evolved in response to stakeholder input, and the *Stage 3 Report* was provided as part of the evidences base for this first Regulation 19 Local Plan Publication.

3.49 NH and KH both indicated that the approaches proposed were acceptable for assessing the transport impact of the Local Plan.

3.50 The *Stage 3a Report* set out:

- The traffic generation parameters for various land uses – approach to identification of the TRICS[4] data to be applied and application of urban and suburban sites.
- Mode share of trip generation for various uses – review of relevant 2011 census mode, origin and destination findings, and TRICS mode share data
- Mode share shift variant scenarios to be assessed – details of local and national policy ambition, evidence, future trends and identification of two mode share variants. This includes the methodology to be applied to differentiate areas/trips that have most potential to achieve higher levels of sustainable trips
- Distribution assumptions to be applied – application of a blend of 2011 journey to work data with recent mobile phone data for the distribution of Local Plan traffic generation. Considers internal and internal/external – origin and destination trips

Local Plan Transport Assessment Results

3.51 During the course of the first Regulation 19 Local Plan Publication, Natural England declared a Site of Special Scientific Interest covering the Swanscombe Peninsula and a large part of the Ebbsfleet Valley. This was judged to have a material impact on the Local Plan particularly as it potentially affects the scale and disposition of planned development in the Ebbsfleet Central area one of the key areas for development within the Local Plan. The decision was, therefore, taken to review the Local Plan and prepare a second Regulation 19 Local Plan Publication. This preparation has led to the Dartford Local Plan Publication (September 2021).

3.52 This provided the opportunity to complete the transport assessment for the Local Plan Preferred Option (Stage 3) and carry out further engagement of the highways authorities regarding mitigation of the transport impacts.

3.53 In July 2021, NH raised as an issue that the level of development within the Dartford Reference Case was higher than the level of development in the Local Plan Preferred Option with the consequences that, across a large part of the highway network in Dartford, there was little or no impact a result of the Local Plan development. It was concluded that the primary issue was the level of development that had been included in the Dartford Reference Case.

3.54 In considering the potential transport impact of the Local Plan it is important to emphasise the context of growth identified. The Local Plan forecasts indicate:

1. The majority of future development identified has planning consent and most feature in the LTAM reference baseline;
2. A reduced scale of delivery of some consented land uses forecast and in some cases, particularly in the Ebbsfleet area, sites may continue to develop beyond 2036/7;
3. Large scale historic but live outline development consents at Ebbsfleet incorporate land use maxima parameters, to provide flexibility for future master planning. At

[4] TRICS is a database and data analysis system comprising a large number of transport survey records of individual developments. The traffic generation data is used as a proxy in transport assessments of development proposals.

the time of consent it was generally accepted that all land use parameters were highly unlikely to be implemented in full;

4. Presently sites within Ebbsfleet that are under construction, are primarily focused on delivering a significant number of homes with supporting uses such as schools and retail. It is unlikely that the previously envisaged mixed-use development throughout Ebbsfleet will materialise on the scale envisaged;
5. It is acknowledged that preliminary master planning at the Ebbsfleet Central site is underway, with an indication that a more mixed development distribution is anticipated. The EDC has indicated that a new outline application will be submitted which will provide clarification. Local Plan development quanta in the transport assessment has taken emerging proposals into account for this site.
6. In addition other historic non–residential outline consents elsewhere (at the Bridge and Crossways) are unlikely to be developed to the maxima floor space permitted, due to changes to commercial market requirements, with very limited development parcels still available for new development. Again, the maxima floor spaces were generally taken into account in LTAMs uncertainty log.

3.55 Unusually, this meant that Dartford's Local Plan is not forecasting significant uplift to development beyond the LTAM reference baseline. Non-residential development forecasts in the Local Plan are lower, taking account of the likely long-term build out of sites with outline consent and emerging proposals at Ebbsfleet Central, that indicate that non-residential floor space is likely to be lower than that already consented and contained in the LTAM uncertainty log.

3.56 After further discussions with NH it was agreed that the Dartford Reference Case should be altered to reflect the expected development for those consented sites identified above where the level of development is unlikely to be built or changed through a revised consent. This effectively means that a number of the consented sites now have the same levels of development in both the Dartford Reference Case and the Local Plan Preferred Option. Stage 3 of the transport assessment would, therefore, be testing the additional unconsented development within the Local Plan Preferred Option against a lower level of development in the Dartford Reference Case producing impacts on the transport network.

3.57 Having agreed a revised Dartford Reference Case with NH previous work carried out under Stages 2 & 3 had to be revised causing a further delay to the transport modelling. Revised *Stage 2b, 3a and 3b Reports* have now been completed and are provide as part of the evidence base for the further Regulation 19 Local Plan Publication (September 2021).

3.58 A useful overview of the land use quanta for the DCLTAM, Dartford Reference Case and Local Plan Preferred Option is set out below:

Development Forecasts 2019 to 2036 applied in the Transport Assessment

Land use	DCLTAM (Uncertainty Log)	Dartford Reference Case	Local Plan Preferred Option
Residential (dwellings)	11,882	11,741	13,996
Employment (sq. m)	738,713	467,748	559,954
Retail (sq. m)	53,333	37,633	39,133
Hospitality (sq. m)	35,532	12,807	24,868
Leisure (sq. m)	115,644	31,800	33,472

3.59 The Stage 3b Report sets out the following AM and PM peak hour vehicle generation resulting from the above land uses:

Peak Hour Vehicle Generation (2-way)

Land use	DCLTAM (Uncertainty Log)		Dartford Reference Case		Local Plan Preferred Option	
	AM	PM	AM	PM	AM	PM
Residential (dwellings)	5,708	5,711	4,246	4,461	4,862	5,150
Employment (sq. m)	10,238	9,526	4,963	5,142	6,067	6,391
Retail (sq. m)	2,260	3,480	1,343	2,214	1,439	2,343
Hospitality (sq. m)	73	383	11	259	68	333
Leisure (sq. m)	976	2,818	161	822	167	864
Total	**19,255**	**21,919**	**10,724**	**12,898**	**12,602**	**15,082**

3.60 In terms of the impact of the planned development in the Local Plan Preferred Option compared to the Dartford Reference Case the transport assessment has distinguished between:

a) the Strategic Road Network – M25(A282) Corridor and A2 Corridor;
b) the Local 'A' Roads – A206, A225, A226, A296, A2108, A2026 and A2260; and
c) the Local 'B' Roads – B255, B258, B259, B260, B262, B2174, B2175, B2228 and B2500.

3.61 A strong emphasis has been placed on the development of more sustainable forms of transport within Local Plan as a means of dealing with the demand for travel and increasing the mode share. Stage 3 of the transport assessment tested an increase in mode share of 15% and 30% related to local journeys (within Dartford and between Dartford and urban Gravesham) from new development. This showed a general, although limited, beneficial impact but indicates that this could form part of the mitigation of the transport impacts.

3.62 Stage 3 of the transport assessment has identified locations on the above road corridors where further detailed modelling is likely to be required to assess the junctions either for their Reference Case performance or Local Plan performance. Further details of these can be found in the *Stage 3b Report* and will form the basis of further discussions with highways authorities regarding mitigation. This will be the subject of Stage 4 of the transport assessment which was unable to be completed in time for the Regulation 19 Local Plan Publication (September 2021).

3.63 Stage 4 (Mitigation) of the transport assessment will be completed prior to Submission of the Dartford Local Plan and will involvement further engagement of the highways authorities and neighbouring councils particularly with regard to any strategic transport issues and their potential solutions. This stage of the transport assessment will give further consideration to a change in modal shift through improvements to more sustainable forms of transport as well as physical improvements to the highway network.

PART 4: FINDINGS & NEXT STEPS

4.1 This transport topic paper sets out the current Dartford context in terms of transport implications of the growth strategy contained in the proposed Dartford Local Plan to 2037, and forthcoming actions in support. Summary findings include:

a) A number of focused local transport assessments are available, in advance of the findings of the local plan transport modelling assessment, to provide a reasonable understanding of the future transport implications of development growth on the local and strategic network in Dartford Borough. These and other transport assessments, have been accepted by highways authorities and have focused on specific areas and developments in Dartford, and have highlighted the congestion hotspots (current and likely to occur in the future).

b) There is general agreement between stakeholders regarding which are the areas of sensitivity on the Dartford road network, particularly concentrated on the interface between the local and strategic network.

c) The majority of development identified in the Plan has consent in place.

d) Overall, this paper provides justification and reasoning as to why the current strategic transport modelling is unlikely to reveal new unknown adverse transport implications of future development in the Borough beyond that which already identified through existing transport models and assessments

e) Detailed outputs Stage 3 of the transport modelling will inform future transport investment and actions as set out below.

4.2 The Local Plan's strategy focuses heavily on directing growth to the parts of the urban area best served by facilities within walking distance, and in close proximity to railway stations and the Fastrack network. This is evident in Local Plan policies S1 and S2 in particular. Detailed plan policies are strengthened in topics such as travel planning, particularly after taking account of highways authority's views and recently accepted mitigation actions.

4.3 Additional to the Local Plan, improvements to sustainable and active travel will be key to alleviating the traffic implications of the Plan, with a number of projects already underway or in the pipeline, at Dartford town centre and in the Ebbsfleet Garden City. There is a commitment by the Council to continue to monitor outcomes and identify improvements, working with the Ebbsfleet Development Corporation and Kent County Council in particular.

4.4 A number of specific transport infrastructure schemes are identified in Dartford's Infrastructure Delivery Plan, which is reviewed annually. Further interventions on walking, cycling and public transport will be discussed with partners and specific schemes proposed. A framework within which existing and future interventions for such measures has been produced in the form of Dartford's Sustainable Transport Strategy. This supports the Local Plan's policies on sustainable transport.

4.5 Future strategy must complement the sustainable transport approach in the Local Plan, providing an overview of schemes and actions to;

1) Alleviate highway issues;
2) Ensure higher levels of sustainable travel over the Plan period; and
3) Detail joint working with partners to identify strategic level mitigations, including highway improvements and the introduction and expansion of sustainable travel initiatives.

4.6 This will take forward the outcomes of the strategic transport modelling to date and once concluded.