

Maidstone Borough Council

Maidstone Borough Local Plan Transport Topic Paper 2016





Affordable housing,
Armstrong Road, Maidstone



Scania Depot, Brooklyn Yard



Lenham Village Square



Langley Park, Maidstone



Kent Institute of Medicine
and Surgery, Maidstone



Sandling Lane, Penenden
Heath, Maidstone



Captain Nolan Sculpture,
Old Ophthalmic Hospital



Mote Park, Maidstone



Marden



Fremlin Walk

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Executive Summary

The Transport Topic Paper highlights the current transport issues within Maidstone Borough and summarises the results of strategic transport modelling, which has been supplemented by detailed localised modelling and proposed mitigation.

Strategic VISUM modelling shows that the balanced package of transport interventions tested in scenario 2031 DS4b, comprising highway capacity, public transport and walking and cycling improvements as set out in the draft Integrated Transport Strategy, result in a level of impact on the highway network that cannot be regarded as severe in the context of the National Planning Policy Framework.

Substantive localised junction modelling has also been undertaken to support the delivery of housing development in the Regulation 19 draft Local Plan. The results of the detailed junction modelling support the dispersed spatial strategy of directing growth to strategic development areas at the north-west and south-east of the Maidstone urban area, and at four rural service centre villages and six larger villages. Transport Assessments that have been submitted with approved planning applications for key sites allocated in the Regulation 19 draft Local Plan have further supplemented the Council's evidence base.

The policies of the Regulation 19 draft Local Plan Infrastructure include the infrastructure and mitigation measures required for each allocated development site. The Infrastructure Delivery Plan 2016 (DEL 003) itemises the costs for each scheme, including highway schemes, and explains in detail how proposals will be delivered. Funding has already been secured for a number of schemes through external funding and the granting of planning permissions, whilst future funding will be sought through the delivery of allocated sites.

The Housing Topic Paper (SUB 004) updates the Council's housing land supply position at a base date of 1 April 2016, and demonstrates how the borough's objectively assessed housing need of 18,560 dwellings over the plan period 2011 to 2031 will be met. The Council has a robust supply of deliverable and developable housing sites, of which over 8,300 dwellings are already built or are on sites with planning permission (including 3,000 dwellings from sites allocated in the Regulation 19 draft Local Plan). Of the 5,600 dwellings on the balance of allocated sites, over 3,000 units have been granted subject to the signing of Section 106 agreements or are awaiting the determination of a submitted application.

Thus, the development strategy of the Regulation 19 draft Local Plan is already being successfully delivered.

In conclusion, appropriate mitigation and infrastructure measures can be provided to deliver planned development to 2031; and the spatial strategy and related policies and proposals set out in the Regulation 19 draft Local Plan to 2031 will not have an unacceptably adverse impact on the local highway network.

1.0 Introduction

1.1 This Topic Paper (SUB 005) has been prepared by officers from Maidstone Borough Council (MBC) and is informed by technical studies produced by third parties including Amey and Mott MacDonald. It explains the background and summarises the main evidence supporting the policies in the Submission Local Plan which relate to transport, specifically:

- Policy H1 – Housing site allocations: the 71 sites allocated under policies H1(1) to H1(68) and policies RMX1(2) to RMX(4) will deliver a total of approximately 8,707 dwellings towards the Borough’s Objectively Assessed Need (OAN) of 18,560 dwellings during the Plan period to 2031. It can be seen from the housing land supply tabulated in **Appendix A** that, as of 1 April 2016, a total of 8,335 dwellings (45%) have either been completed or have extant planning permission.
- Policy H2 – Broad locations for housing growth: a total of 3,500 dwellings have been identified at three locations (700 in Maidstone town centre, 1,300 at Invicta Park Barracks and 1,500 in Lenham).
- Policy DM24 – Sustainable Transport
- Policy DM25 – Public Transport
- Policy DM26 – Park and ride sites
- Policy DM27 – Parking standards
- Policy ID1 – Infrastructure delivery

1.2 It should be read in conjunction with the draft Integrated Transport Strategy (ITS) and Local Plan evidence, in particular the documents listed in **Appendix B** and available at <http://www.maidstone.gov.uk/residents/planning/local-plan/evidence>.

1.3 The Topic Paper is structured as follows:

- Section 2 summarises the current transport issues in the Borough as identified in the draft ITS;
- Section 3 provides a commentary on the transport impacts of Local Plan development and the measures proposed to mitigate these impacts;
- Section 4 demonstrates how the necessary mitigation measures have been incorporated into the Maidstone Borough Local Plan, as well as the Infrastructure Delivery Plan and Kent Local Transport Plan; and
- Section 5 summarises the above sections to demonstrate how the Local Plan meets the need for housing and employment growth whilst mitigating the transport impacts to a level which is less than severe.

2.0 Current Transport Issues within the Borough

The Issues

- 2.1 Maidstone is a dynamic borough, set within both an urban and a rural context, which has a vital role to play in the significant growth expected in the South East over the next two decades. The borough currently has a population of 155,143 which is evenly split between the County Town and its rural hinterland, including the six Rural Service Centres (RSCs) of Coxheath, Harrietsham, Headcorn, Lenham, Marden and Staplehurst. Whilst the town's main function is as a centre for business, retail and administration; the rural economy is characterised by pockets of manufacturing, horticulture and farming. The Maidstone Borough Local Plan seeks to meet in full the identified objectively assessed need of 18,560 dwellings and the creation of almost 14,500 jobs in the plan period from 2011 to 2031. 2,860 dwellings (15%) have already been completed between 1 April 2011 and 31 March 2016.
- 2.2 Maidstone's transport network has come under increasing strain in recent years, principally on account of the configuration of its road and rail networks and the growing demand for travel generally. In order for the borough to have an emphasis on sustainable transport access in line with national priorities and to accommodate the level of housing and employment growth envisaged by the Local Plan, a comprehensive and deliverable transport strategy must be in place to address these challenges.
- 2.3 The geography of the borough means that sustainable modes are a more feasible option in some locations and for some journeys than for others. The benefits of shifting trips from single occupancy car use to sustainable modes are manifold and recognised and promoted by Central Government. Examples of these include improved air quality; a healthier population and attractive, safe and secure public spaces.
- 2.4 The specific issues for action have been drawn from the draft ITS and are summarised in **Table 1** below.

Table 1: Key Transport Issues in Maidstone Borough

Topic	Issue
Highways	Parts of the road network operate at or near capacity during peak periods, resulting in congestion. Especially to the south of the Borough, people find it difficult to access the services they need due to the lack of transport options available to them.
	Congestion is caused by road traffic outgrowing capacity. The amount of road traffic is a consequence of the reliance placed on the private car and population and job growth (and their relative locations). Journey to work data from the 2011 Census indicates that more than 50,000 Borough residents drive to work (44.3%) whilst less than 4,000 residents travel as a car passenger (3.4%), less than 5,300 by train (4.6%), less than 3,000 by bus/coach (2.6%), 9,000 on foot (8.0%) and less than 1,000 by bicycle (0.8%).
	Maidstone has very high levels of car ownership and usage. The 2011 Census shows that 84% of households in the borough have at least 1 car, compared with 80% across Kent and 74% in England.
	Heavy reliance is placed on a small number of key junctions, in particular the singular river crossing point in Maidstone's town centre where the A20, A26 and A229 all meet.
	There are hotspots on the highway network where there are safety issues and a poor collision history.
	Particular areas suffer from poor air quality, with the whole of the Maidstone urban area being designated an Air Quality Management Area (AQMA).
	Schools with very large catchment areas result in high car use for the 'school-run'.
Walking	The level of walking to work and to school is low. The dominance of motorised traffic leads to a severance effect. This effect is especially pronounced in the town centre, which is segregated from the surrounding residential areas.
Cycling	Cycle routes linking schools, colleges, employment and retail areas are limited and disjointed, with few off-road options and a lack of secure cycle parking at key destinations.
Public Transport	Maidstone's three town centre rail stations and bus station are poorly connected to one another, and form unattractive gateways to the town.
	There are very few bus priority measures within the Borough, which results in unreliable journey times for bus services and no advantage relative to the private car
Car Parking	Car parking is relatively cheap and plentiful compared with similar sized towns elsewhere.

The Accommodation of Growth

- 2.5 The impacts of housing and employment growth on the Borough's transport network needs careful and considered management, to ensure that the transport systems in place are appropriate and that additional mitigation measures are implemented where required.

2.6 Congestion presents a cost to the Borough's economy in terms of lost time and environmental degradation and associated health costs resulting from poor air quality and inactivity. However it is widely acknowledged across the industry that this problem cannot be solved by simply providing more road capacity as in the absence of alternative choices and demand restricting measures, traffic is expected to outgrow capacity. Hence the draft ITS has sought to identify a balanced package of highway infrastructure enhancements and sustainable transport improvements to cater for housing and employment growth. This package has been tested for locations within the urban area using the Maidstone VISUM transport model. This has been supplemented by more detailed modelling of individual road junctions, including within the Rural Service Centres and larger villages located outside the VISUM model outer cordon, which have been identified as potentially sensitive to future traffic flow changes.

3.0 Understanding the Impacts of Development on the Transport Network and Mitigation Measures

Overview

- 3.1 Maidstone Borough Council and Kent County Council have worked for a number of years to consider the impact of new development on the transport network. The Local Transport Plan for Kent 2011-2016 specifically references the Maidstone Integrated Transport Strategy (ITS), with the initial draft ITS being prepared to complement the Local Plan Core Strategy which was subject to consultation in summer 2011. Since then, a number of studies have been undertaken to assess the transport issues raised by the quantum and distribution of development proposed as the Local Plan has progressed from Core Strategy to submission.
- 3.2 These studies have included both **strategic transport modelling**, assessing the assignment of traffic onto a highway network covering the Maidstone urban area and its immediate environs, and **localised transport modelling**, assessing the cumulative impacts of Local Plan growth proposals on specific road junctions in more detail.
- 3.3 Consideration of the mitigation of transport impacts arising from Local Plan housing and employment growth has taken into account evidence from the following information sources:
- The **Maidstone VISUM transport model** has been used to test the strategic implications of Local Plan growth and the package of transport interventions identified in the draft ITS with respect to the urban area. Various development and transport infrastructure scenarios have been assessed in terms of their impacts on travel time, distance travelled, link traffic flows and modal choice (i.e. between car and public transport, car trips are manually adjusted to reflect an assumed level of walking and cycling trips) for journeys within or via the Maidstone urban area.
 - **Localised junction modelling** undertaken by Mott MacDonald on behalf of MBC to test the impacts of Local Plan growth to 2031. This has covered the Rural Service Centres (RSCs) and Larger Villages of Lenham, Headcorn, Staplehurst and Coxheath which VISUM has not modelled in detail, as well as the A229 Royal Engineers Way/Invicta Barracks roundabout and A229/Boughton Lane/Cripple Street signalised junction. Modelling has been undertaken using the industry standard ARCADY, PICADY and LinSig software packages to assess in detail the capacity of individual junctions and the impacts of proposed infrastructure improvements at these junctions.
 - **Developers' Transport Assessments (TAs)** submitted in support of planning applications where these have assessed cumulative impacts, in particular at the south east strategic

development location (Policy SP3), the north west strategic development location (Policy SP2) and at M20 Junction 7 (Policy RMX1(1)). The TAs have used the same localised junction modelling tools as those in the Mott MacDonald assessments to assess in detail the capacity of individual junctions and the impacts of proposed infrastructure improvements at these junctions.

- 3.4 This section provides commentary on the testing of strategic transport options and how this work has fed into the choice of housing and employment locations in the draft Local Plan. It then sets out the chronology of the strategic transport modelling and the key findings from the Maidstone VISUM model outputs. A summary of the main findings from the localised junction modelling studies and developer TAs for the areas potentially most sensitive to changes in traffic flows is provided in **Appendix D**.

Strategic Transport Modelling

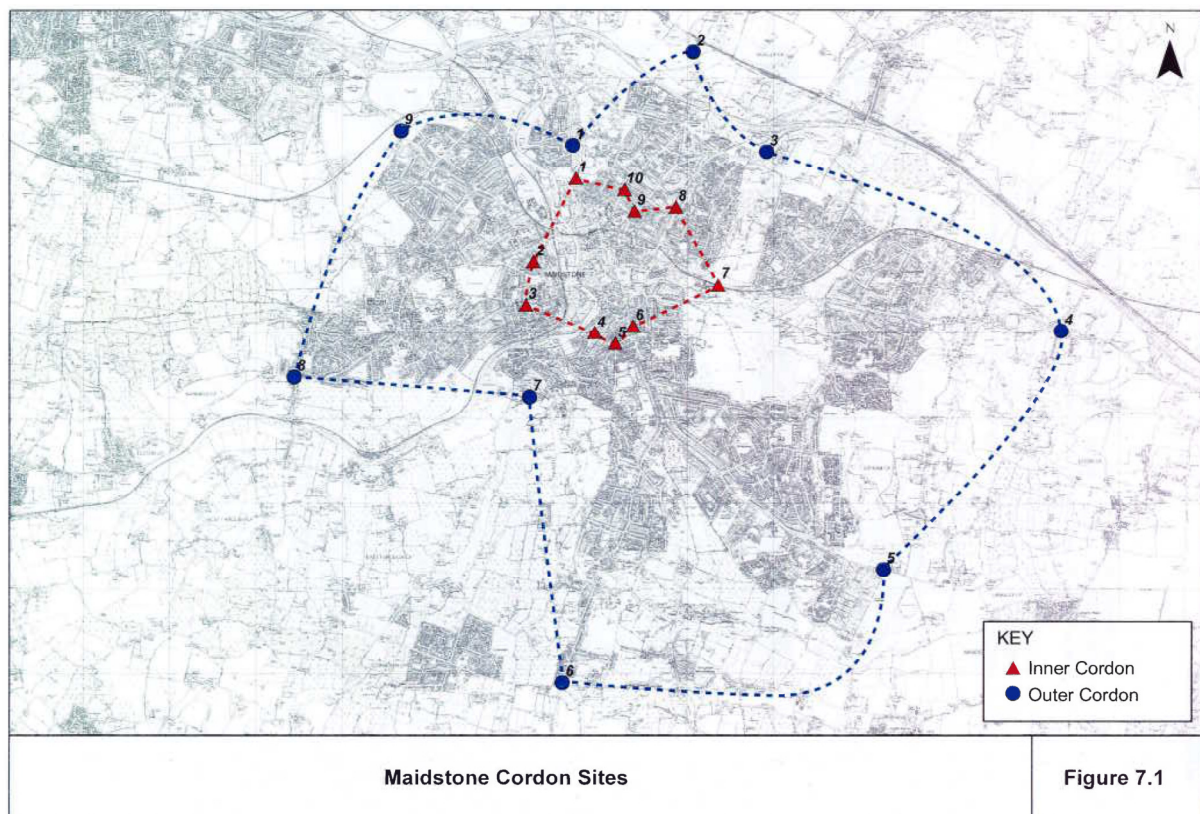
Overview of the Maidstone VISUM Model

- 3.5 The Maidstone VISUM transport model was developed on behalf of KCC and MBC to assist in assessing the transport impacts of alternative Local Plan land use allocations and transport strategies/schemes. VISUM is an industry standard tool for assessing the assignment of vehicular traffic onto a transport network.
- 3.6 In testing various scenarios with respect to forecast years, development allocations and transport intervention packages, the Maidstone VISUM model can identify how person trips can transfer between car, bus or rail; how vehicle trips may be reassigned across the network; and it can highlight locations where travel time delay may be experienced as a result of constrained highway capacity. As a strategic highways model with a mode choice option, the Maidstone VISUM model is best suited to modelling highways improvements. It can model bus service changes, but in assessing the attractiveness of these services it is unable to take into account bus capacity issues; furthermore it is unable to model bus priority measures. Increases in walking and cycling can only be reflected in an estimation of the number of car trips which may be removed from the road network due to changes in mode share. Overall, the Maidstone VISUM model is a reasonable tool for representing the impact of Maidstone Integrated Transport Strategy measures, albeit only those measures within the model cordon, and with the caveat that bus priority and walking and cycling infrastructure cannot be modelled specifically.
- 3.7 Subsequent sections summarise the analysis of the various model runs. They confirm that the outputs from the VISUM modelling do not demonstrate that the Local Plan development allocations will have a severe impact on the highway network, including the A229 and A274 to the south and east of Maidstone. Increased traffic volumes as a result of housing growth

can be mitigated to a level where the residual impact is less than severe. However, given the limitations of the Maidstone VISUM model (summarised in paragraphs 3.61 to 3.69) it is necessary to provide supplementary evidence to confirm that the identified mitigation measures will be effective, also to confirm that Local Plan growth can be accommodated without a severe impact on the M20 motorway and its junctions, following mitigation. This supplementary evidence is provided through the results of localised junction modelling, which is reported in **Appendix D**.

3.8 The Maidstone VISUM model encompasses the urban area of Maidstone Borough and the B2163 which skirts the south and east of the town. The major road approaches are also modelled, but in less detail. It is understood that VISUM does not fully model the M20 junctions and main carriageway. **Figure 1** below shows the inner and outer model cordons. The Rural Service Centres and Larger Villages fall outside of the outer model cordon, but trips between these areas and the Maidstone urban area will have been accounted for in the VISUM model.

Figure 1: Maidstone VISUM Model Cordons¹



¹ Source: Maidstone Multi Modal Transport Model – Local Model Validation Report. Jacobs, February 2011.

3.9 The original Maidstone model was developed in 2007/08 by Jacobs as a multi-modal², variable demand model validated against weekday morning and evening peak conditions for a 2007 base year. Data used to develop the 2007 base model included 2001 London Area Transport Study (LATS) survey data, 2001 Census Journey to Work data and other roadside interview (RSI) data. The model was further developed to produce 2017 and 2026 forecast year models for a range of different scenarios. These were based on future land use assumptions set out in the Core Strategy, which envisaged the delivery of 10,080 homes and approximately 10,000 additional jobs in the period to 2026.

VISUM Forecast Model Scenarios for Core Strategy

3.10 The *Maidstone Integrated Parking Strategy Research – Option Appraisal Report* (TRA 012) was produced by JMP in April 2012. It presented the results of VISUM modelling for a 2026 forecast year which supported the appraisal of a series of potential scheme options for inclusion within the emerging Integrated Transport Strategy. The options were designed to mitigate the impacts of delivering 10,080 homes and around 10,000 additional jobs within the Borough during the period to 2026, as set out within the Core Strategy. Four strategic transport packages were appraised as follows:

- **Option 1 (Reference Case)** – the minimum required provision of transport services by 2026. This assumed all transport provision as it was provided in 2012, but with the addition of committed schemes and other proposed schemes which offered high value for money against transport strategy objectives. These schemes were:
 - Thameslink rail services to London;
 - M20 traffic signals;
 - 10 minute bus frequencies on all main radial routes into the town centre;
 - Romney Place bus lane;
 - Upgraded Park & Ride site facilities;
 - Walking and cycling infrastructure; and
 - Travel plans for new development sites.

- **Option 2 (Bus and Radial Park & Ride)** – in addition to the reference case schemes, this option assumed the enhancement of all bus provision across the network alongside upgraded Park & Ride facilities and services on all approaches to Maidstone. The schemes/measures included:

² Paragraph 9.2.17 of the Maidstone VISUM Transport Model Forecasting Report (March 2016) notes that the model is “essentially a highway model with a mode choice option to estimate the potential transfer of trips between car, bus or rail. The model does not include walking and cycling modes of travel”. Assumptions about the expected level of walking and cycling trips are reflected by an adjustment of the car trips which are modelled.

- Inbound bus/high occupancy vehicle lanes on the A229 (Gibraltar Lane to Southfield Roundabout) and A274 (Willington Street to Wheatsheaf Junction);
 - Bus priority measures (Huntsman Lane/Ashford Road junction and Willington Street/Ashford Road junction);
 - St Andrew's Bus Gate;
 - Park & Ride sites at Bluebell Hill, Sutton Road and Linton Corner, with a 10 minute service frequency;
 - Replacement of Sittingbourne Road Park & Ride site with Newnham Court Park & Ride;
 - Reduction in town centre car parking supply;
 - 150% increase in long stay (>4+ hours) car parking tariff; and
 - 20% increase in short stay (<4+ hours) car parking tariff.
- **Option 3 (Bus and North/South Spine Park & Ride)** – in addition to the reference case schemes, this option assumed the enhancement of all bus provision across the network alongside improvements to Park & Ride facilities along the north/south spine corridor (A229/A274). The schemes/measures included:
 - Inbound bus/high occupancy vehicle lanes on the A229 (Gibraltar Lane to Southfield Roundabout) and A274 (Willington Street to Wheatsheaf Junction);
 - Outbound bus/high occupancy vehicle lane on the A229 (White Rabbit Roundabout to Southfield Roundabout and Gibraltar Lane to Running Horse Roundabout);
 - A229 Gyratory bus/high occupancy vehicle lane;
 - Bus priority measures (Coldharbour Roundabout, Romney Place bus lane, St Andrew's Bus Gate);
 - Park & Ride sites at Cobtree and Sutton Road, with a 10 minute service frequency between them;
 - Closure of London Road, Sittingbourne Road and Willington Street Park & Ride sites;
 - Upgraded link between Bircholt Road and Heath Road (B2163) and upgrade of the latter road;
 - North east express loop bus service (10 minute frequency);
 - Circular route from Cobtree to town centre (5 minute frequency peak, 10 minute frequency inter-peak);
 - Reduction in town centre car parking supply;
 - 150% increase in long stay (>4+ hours) car parking tariff; and
 - 20% increase in short stay (<4+ hours) car parking tariff.
- **Option 4 (South East Maidstone Strategic Link (SEMSL))** – this assumed the provision of a single carriageway link (60 mph speed limit) from the A274 northwards to M20 Junction 8. Scheme capital costs were not fully costed as part of the commission;

however the report cited previous quantification work which estimated a cost of approximately £76 million.

- 3.11 Option 4 (SEMSL) was not directly modelled in VISUM, but it had previously been modelled in December 2009 as part of preliminary work to assess the impact of the then proposed South East Urban Extension (SEUE). This was a proposed free-standing settlement of 4,000 residential units, located near Parkwood off the A274. Although commenting that it was difficult to draw strong conclusions from the December 2009 modelling work, JMP did note that the results demonstrated that traffic flows in Maidstone town centre would continue to increase, with some key routes remaining over capacity. SEMSL would not resolve all of the predicted transport issues and would require supplementary traffic management strategies alongside it. It would, nevertheless, provide significant capacity relief to the overall impact of the growth in trips from SEUE – which is no longer planned.
- 3.12 The JMP report used the Option 1 reference case model to assess the potential demand for SEMSL through the assessment of forecast 2026 trip patterns. The analysis work extracted the overall matrix of forecast 2026 vehicle trips in order to assess where individuals are expected to be travelling to and from based on the future Core Strategy land use assumptions pertaining at the time, which have since been superseded. It was forecast that the two-way traffic flow along SEMSL would be 4,500 vehicles during the AM peak, and that a further 17,500 vehicle trips could potentially benefit from reduced congestion as a result of other vehicles diverting to use SEMSL. For the purpose of cost benefit analysis, it was assumed that there would be an average journey time saving for SEMSL users of five minutes and for non-SEMSL users of two minutes.
- 3.13 Based on these values a Benefit to Cost Ratio (BCR) of 1.3 to 1 was calculated. Para. 9.109 of the JMP report remarked that *“the results are inconclusive as to whether the SEMSL scheme has the potential to generate sufficient journey time benefits with which to off-set the costs of construction and maintenance of the scheme”*.
- 3.14 From the JMP report it can be concluded that if any free-standing settlement to the south east of Maidstone was proposed (i.e. SEUE), a variant of SEMSL would clearly need to be an integral part of the transport strategy for that settlement. However, such a spatial strategy was discounted via the work undertaken for the Sustainability Appraisal of the Maidstone Local Plan (SUB 001) which was in turn informed by the appraisal of strategic transport options in the JMP report. This identified Option 3 as the best performing strategic transport package. Draft Local Plan Policy SS1 sets out the choice of housing and employment allocations. The Maidstone urban area is the principal focus for development in the Borough with the regeneration of the town centre, residential development at strategic locations to the southeast and northwest of Maidstone and employment uses

around M20 Junction 7 making the best use of existing transport infrastructure whilst delivering mitigation measures where necessary.

- 3.15 In particular, the south east strategic development location (Policy SP3) benefits from its proximity to Maidstone town centre and good public transport, walking and cycling linkages. A key objective of Policy SP3 is to limit as much as possible the extension of development further into the countryside, and to provide infrastructure so that new residents can access Maidstone town centre and local employment opportunities by a choice of modes and not just by private car – as well as benefiting from community facilities within the development. The analysis in the JMP report suggests that the high scheme costs of SEMSL are unlikely to be offset by the journey time benefits delivered. Other transport mitigation measures within the Maidstone urban area would be required regardless of whether the proposed road is constructed.
- 3.16 Consequently, although SEMSL is referred to in the Local Plan Publication version (as the Leeds Langley Relief Road), it is not required to mitigate the impact of development during the Local Plan period. The Borough Council is nevertheless willing to work with KCC to progress this scheme once sufficient evidence has been assembled to prove that it is viable.
- 3.17 The Core Strategy land use assumptions have been superseded as the Local Plan growth proposals and transport strategies/schemes have developed over time. Revised models have since been developed by Amey to represent 2022 and 2031 forecast years. The most comprehensive available documentation of the methodology used to construct forecast year models is set out in the *Maidstone VISUM Model Interim Forecasting Report for 2017 and 2026* (Jacobs, May 2009).

2014 VISUM Model

- 3.18 Due to the age of the original Jacobs 2007 base model, this was updated by Amey to a 2014 baseline to assess its validity as a forecasting tool. The 2014 model incorporated land use changes between the base year 2007 and 2014, namely an additional 4,166 residential units, 14,693m² of employment and 19,693m² of retail uses. It was considered that the new development was reasonably well distributed across the district and was unlikely to have a significant impact on traffic distribution patterns.
- 3.19 The trips generated by the new development were estimated using the same TRICS data as that used in the earlier 2017 and 2026 forecast models. External traffic movements with no trip end in Maidstone were updated to 2014 based on average growth from TEMPRO for the South East region.

- 3.20 All known changes to transport infrastructure and other modelled elements from 2007 were included in the 2014 model. These were:
- New signals at the junction of Cripple Street with the A229 Loose Road;
 - Access to Sittingbourne Road Park & Ride site including traffic signals;
 - Access to new hospital site adjacent to Newnham Court on Bearsted Road;
 - Updated bus services; and
 - 2007 bus fares and car parking charges adjusted to 2014 costs.
- 3.21 The 2014 model was reviewed using third party data including traffic flow data from relevant Transport Assessments and Automatic Number Plate Recognition (ANPR) camera data, to calculate journey times. Where anomalies were identified between the ANPR journey time data and modelled journey times, in-vehicle journey time survey data collected during July 2014 was used.
- 3.22 Of the 58 locations where observed data were compared with modelled traffic flows, 78% and 72% of the AM and PM peak modelled flows met the standard Design Manual for Roads and Bridges (DMRB) criteria. Inbound and outbound journey times on the radial routes met the normal acceptable criteria in all but two cases in the AM peak. All the PM journey times met the criteria.
- 3.23 Amey therefore considered the 2014 AM and PM models to provide a reasonable representation of the current travel conditions within the Maidstone urban area, and therefore that the Maidstone VISUM model is still a valid tool for forecasting the traffic impacts of future development and transport infrastructure changes.

VISUM Forecast Model Scenarios for Local Plan

- 3.24 Forecast models were built from the 2014 base model for 2031 (the end of the Local Plan period) and subsequently for an interim forecast year of 2022, at which time the first review of the Local Plan is scheduled to take place. Although the detailed model covers the county road network leading north to M20 Junctions 5 to 8, it is understood that it does not cover in detail the motorway itself.
- 3.25 For these reasons, Highways England (HE) has indicated that the VISUM model is unsuitable for use as a tool for assessing the impacts of the Local Plan on the motorway network. HE's Regulation 19 representation therefore objected to the Local Plan. In order to remove this objection, following a meeting on 18 May 2016 MBC is working towards the agreement of an alternative methodology with HE and KCC involving localised junction modelling at M20 Junctions 5 to 8. This work will be completed prior to September 2016.

3.26 Since 2014 various scenarios have been tested using VISUM for the 2022 and 2031 forecast years, these are:

- **2031 Do Minimum (DM)** – this includes the same infrastructure changes identified for the 2014 model, plus the Bridges Gyrotory Scheme. The 2031 DM model run was undertaken prior to March 2015;
- **2031 Do Something 1 (DS1)** – this scenario is based exclusively on highway infrastructure improvements, with the inclusion of the South East Maidstone Strategic Link (SEMSL³), then referred to as the Leeds Langley bypass, as an indicative route. The 2031 DS1 model run was undertaken alongside DM and DS2;
- **2031 Do Something 2 (DS2)** – this scenario was based around a balanced package of highway infrastructure and sustainable transport measures as set out in the draft Maidstone Integrated Transport Strategy. As the Maidstone VISUM model is essentially a highway model, it was not possible to model all the strategy measures, particularly those related to walking, cycling and car sharing. Car travel demand was therefore adjusted to a lower level than that modelled for the 2031 DM and 2031 DS1 scenarios;
- **2031 Do Something 3 (DS3)** – this scenario was essentially a hybrid of DS1 and DS2. It featured most of the highway infrastructure measures (including SEMSL) plus a less comprehensive package of sustainable transport measures than that tested in DS2. The 2031 DS3 model run was undertaken in July 2015;
- **2031 Do Something 4a (DS4a)** – this scenario represented a modification of DS3 in which the Park & Ride sites at Linton Crossroads and at M20 Junction 7 were removed and short car trips within the urban area (defined as up to 5km) were discounted to simulate an increase in walking and cycling. The 2031 DS4a model run was undertaken in October 2015;
- **2031 Do Something 4b (DS4b)** – this scenario is identical to DS4a except that SEMSL was excluded from the highway infrastructure package;
- **2022 Do Minimum (DM)** – this includes the same infrastructure changes identified for the 2014 model, plus the Bridges Gyrotory Scheme; and
- **2022 Do Something (DS)** – the modelled package of measures is identical to 2031 DS4b. The 2022 DM and DS model runs were undertaken in February 2016.

³ SEMSL is not an option under consideration during the Local Plan period. It is not required to mitigate traffic generated by Local Plan housing and employment allocations. See paragraph 3.16.

3.27 The quantum of housing, employment and retail development tested for each of the scenarios is presented in the table below.

Table 2: Summary of Development Projections – VISUM Forecast Model Scenarios

Development Projections	2031 DM	2031 DS1	2031 DS2	2031 DS3	2031 DS4a	2031 DS4b	2022 DM	2022 DS
Residential (units)	17,381	17,381	17,381	16,247	18,560	18,560	14,034	14,034
Employment (m ²)	151,000	151,000	151,000	151,000	200,100	200,100	200,100	200,100
Retail (m ²)	12,100	12,100	12,100	12,100	12,100	12,100	12,100	12,100

3.28 It can be seen from the table that only the 2031 DS4a & DS4b scenarios have tested the objectively assessed need (OAN) for housing numbers of 18,560 units. The 2031 DM scenario tested a lower housing number of 17,381. A further 2031 DM model run with the objectively assessed housing numbers had not been undertaken at the time of writing, but this work will be completed prior to September 2016. At this time, therefore, a true reflection of the DM impacts relative to DS4a and DS4b is not possible. Details of the housing and commercial development allocations for each 2031 forecast model scenario are provided in **Tables 2** and **3** below⁴. It should be noted that the allocations in these tables include housing already completed between the beginning of the Plan period in 2011 and the date on which the models were run.

⁴ Source: Appendix B of the Maidstone VISUM Transport Model Forecasting Report (Amey, March 2016)

Table 3: DM, DS1 and DS2 Development Summary for VISUM

Source	Housing Allocation (DM, DS1 & DS2 models)
completions 11 12	873
completions 12 13	630
completions 13 14	423
MBWLP 2000 Allocations	49
approved subject to S106 to 280214	219
Extant Permissions to April 2014	1758
LP allocations SHLAA sites (LP policy H1) - NW strategic	1155
LP allocations SHLAA sites (LP policy H1) - SE strategic	2781
LP allocations SHLAA sites (LP policy H1) - other	2052
LP allocations SHLAA sites (LP policy RMX1) - retail & mixed use	520
H1 rural service centre - Harrietsham	315
H1 rural service centre - Lenham	245
H1 rural service centre - Marden	398
H1 rural service centre - Staplehurst	905
H1 rural service centre - Headcorn	350
H1 Larger villages - Coxheath	410
H1 Larger villages - Yalding	65
H1 Larger villages - Boughton Monchelsea	45
H1 Larger villages - Eyhorne Street (Hollingbourne)	45
Sites Likely to come forward	243
Future locations for housing (locate across town centre)	600
Future locations-Lenham	1300
TOTAL	17,381

Table 4: DS4a and DS4b Development Summary for VISUM

Source of Supply	Housing Allocation
completions 2011 to 2015	2341
Extant Planning consents (net)	4172
Local Plan allocations with resolution to grant consent subject to S106	2076
Local Plan allocations approved for inclusion in the R19 Local Plan	3660
Local Plan allocations subject to R18 consultation	1337
Local Plan Broad Allocations	3500
Windfall allowance	1026
Shortfall	448
TOTAL	18,560

3.29 A technical note providing information on the 2022 forecast model scenarios will be produced prior to September 2016. For the purposes of this topic paper information has been derived from the presentation of the 2022 VISUM modelling given to the Maidstone

Joint Transportation Board (JTB) on 22 February 2016. The 2022 scenarios use housing numbers which have been reduced from the allocations used in 2031 DS4a and DS4b. The 2022 numbers omit the strategic sites at Lenham, Invicta Barracks and the town centre as these are scheduled for development post 2026. The windfall sites between 2022 and 2031 were also omitted.

- 3.30 A summary of the transport interventions incorporated into each of the forecast model scenarios is provided in **Appendix C (Table C1)**. Infrastructure-related interventions are cross-referenced with the *Maidstone Borough Local Plan Publication Infrastructure Delivery Plan* (DEL 003). Details of how the interventions have been modelled within VISUM are provided in Appendices C and D of Amey's March 2016 report.
- 3.31 The table shows that the only significant change to the highway network in the 2022 and 2031 Do Minimum scenarios is the Bridges Gyratory Scheme, which is expected to be in place by the end of 2016. It is therefore included in all of the forecast models as a committed scheme.

VISUM Outputs – 2031 Forecast Model Scenarios

- 3.32 Commentary on the VISUM model outputs and the forecast impacts for the Maidstone urban area is provided below. It focuses on the 2031 DS4a and DS4b scenarios as these most recent 2031 model runs have tested the objectively assessed housing need of 18,560 units. The outputs have been compared with those from the 2014 base and from the 2031 DM (do minimum) scenario, although a true reflection of the DM impacts will be forthcoming before September 2016 once the DM scenario is re-run with the Objectively Assessed Need (OAN) housing numbers.
- 3.33 As the busier of the two weekday peak periods, a summary of the travel demand and network performance for the AM peak in each of the above scenarios is provided in **Table 5** below.

Table 5: Travel Demand and Network Performance Summary (AM Peak)

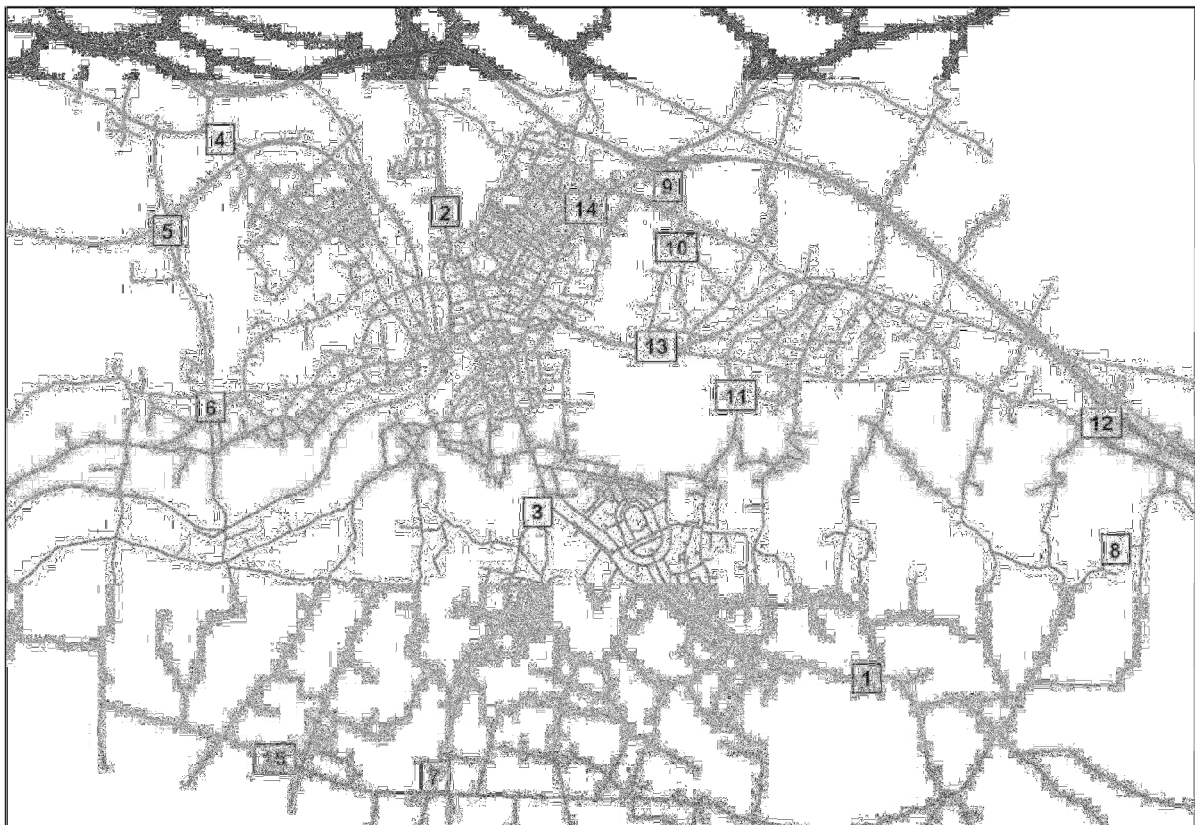
	2014 Base	2031 DM⁵	2031 DS4a	2031 DS4b
Person Trips	50,300	58,600	59,200	59,200
<i>% difference vs 2014</i>		<i>17%</i>	<i>18%</i>	<i>18%</i>
Vehicle Trips	35,500	41,500	39,300	39,300
<i>% difference vs 2014</i>		<i>17%</i>	<i>11%</i>	<i>11%</i>
Travel Distance (veh km)	122,000	144,500	140,100	135,600
<i>% difference vs 2014</i>		<i>18%</i>	<i>15%</i>	<i>11%</i>
Travel Time (veh hours)	8,300	11,400	9,300	9,700
<i>% difference vs 2014</i>		<i>37%</i>	<i>12%</i>	<i>17%</i>

- 3.34 The increase in person trips for DS4a and DS4b reflects the increase in housing numbers from the 17,381 modelled in the DM to 18,560. Both scenarios result in an increase in vehicle trips relative to the 2014 base, but a reduction relative to the DM. This reflects the impact of the transport interventions, namely improved bus frequencies, increased long stay parking charges and a modal shift from car to walking and cycling, the latter simulated by reducing the number of forecast short car trips (i.e. less than 5km) within the urban area in the year 2031 by 6%. This is considered a realistic achievement given the modal shift which has been achieved in other areas where a package of sustainable transport measures has been successfully delivered. For example in Lincoln (population 119,541) the 2011 Census records travel to work mode shares for walking and cycling of 19.6% and 6.0% respectively. In Cheltenham the equivalent mode shares are 18.4% and 6.6% respectively. This compares with an 8.0% walking and 0.8% cycling mode share in Maidstone.

⁵ Based on 17,381 housing units and 151,000m² of employment floorspace, not the 18,560 Objectively Assessed Need (OAN) housing units and 201,000m² employment floorspace tested in DS4a and DS4b.

- 3.35 The reduction in vehicle trips in DS4a and DS4b relative to the DM also leads to reduced travel distance. However, the reduction is less pronounced for DS4a as the reassignment of some trips via SEMSL leads to longer journey distances compared with DS4b which excludes the proposed road. Both scenarios DS4a and DS4b result in reduced network travel time relative to the DM. Total travel time is slightly lower for DS4a (which includes SEMSL) than for DS4b (which does not). This equates to a saving of 4%.
- 3.36 It must be reiterated that the travel distance and travel time presented in **Table 5** are indicators of overall network performance. Further model outputs will be supplied prior to September 2016 which it is anticipated will assist in considering the trip origin/destination combinations which have been reassigned on the network and so contributed to the increased travel distance indicated for DS4a relative to DS4b. This will also aid consideration of the specific links on the network which contribute to the travel time savings achieved for DS4a relative to DS4b.
- 3.37 Analysis of model outputs has been confined to the link flows and travel time routes presented in Appendix E of Amey's March 2016 report. **Figure 2** below shows the model network and the approximate location of the links for which directional traffic flows have been published.

Figure 2: Maidstone VISUM Model Network – Available Traffic Flow Outputs



Source: Maidstone VISUM Transport Model Forecasting Report (Amey, March 2016)

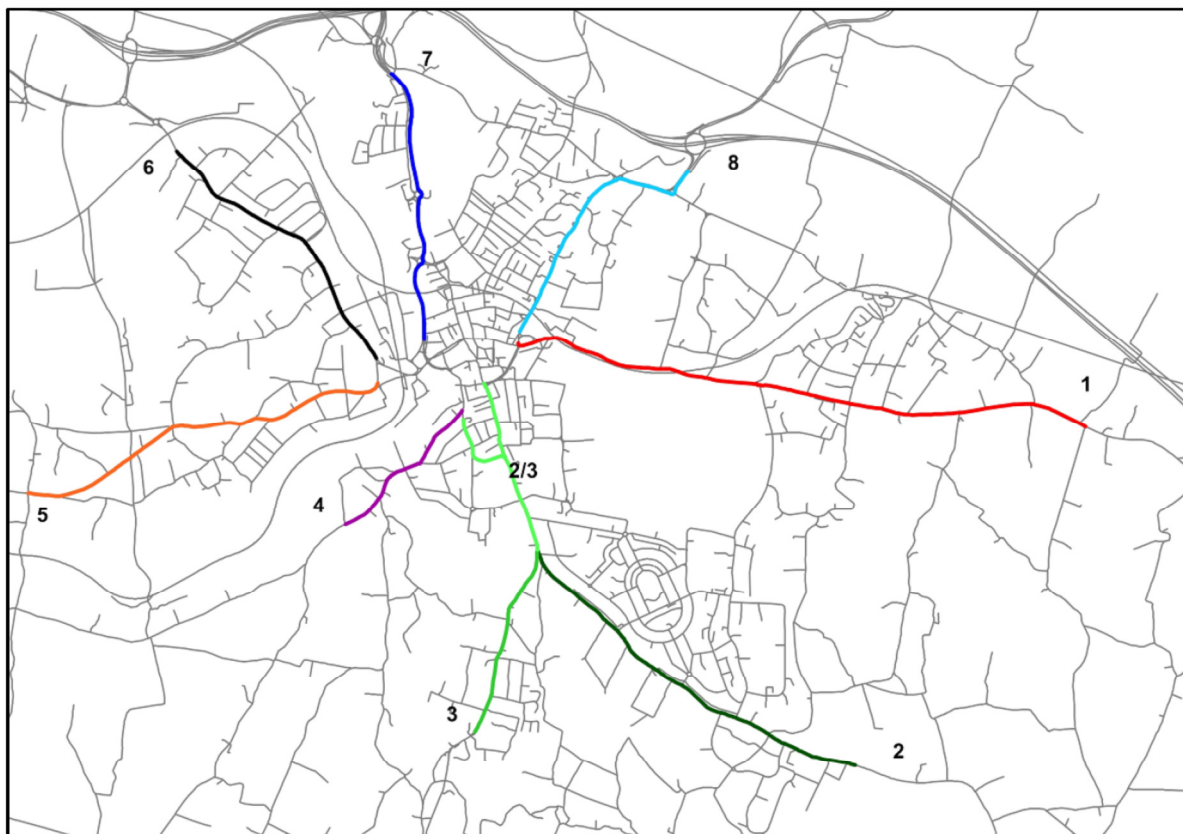
- 3.38 **Table C2** in **Appendix C** presents the output link flows (directional and two-way) from Amey's March 2016 report. Given the lower housing number of 17,381 tested for the 2031 DM, it could reasonably be expected that traffic flows on many of these links would be slightly higher if this scenario had tested the OAN of 18,560.
- 3.39 **Table C3** in **Appendix C** shows the percentage change in link flows relative to the 2014 base for the three 2031 scenarios. As could be anticipated, the VISUM outputs for the 2031 scenarios show increased traffic flows relative to the 2014 base on the majority of the links for which flows have been published.
- 3.40 With regard to the A274(W), eastbound flows increase in both scenarios, by 88% (350 vehicles) for DS4a and 100% (400 vehicles) for DS4b relative to the 2014 base. However, it could reasonably be anticipated that the A274(W) eastbound flow would be higher for DS4a (which includes SEMSL) than for DS4b if some journeys are reassigned via the Five Wents junction and SEMSL rather than routing via the town centre/Willington Street. Westbound flows increase by 50 vehicles (8%) for DS4a but are unchanged from the 2014 base for DS4b. This results in an identical increase in two-way flows of 400 vehicles (38%) for both scenarios.
- 3.41 Traffic flows on Willington Street (N) increase in all 2031 scenarios compared with 2014, but the increase is greater for DS4a and DS4b than for the DM. Northbound flows increase by 10% (100 vehicles) for both DS4a and DS4b. Southbound flows increase by 60% (450 vehicles) in DS4a and by 73% (550 vehicles) in DS4b. This suggests a reassignment of some journeys away from Willington Street (N) with SEMSL in place, but the difference in two-way flows between DS4a and DS4b is just 100 vehicles (2300 versus 2400 respectively).
- 3.42 With regard to the B2163, as could be expected scenario DS4a (including SEMSL) removes most of the traffic flow from Lower Street in Leeds village. However, no information is provided on the relative impacts of scenarios DS4a and DS4b on the B2163 between Linton Crossroads and Five Wents. It is possible that SEMSL could attract trips from the A229 Loose Road via the B2163 but the reported model outputs do not confirm or discount this assertion.
- 3.43 Amey presented the results of the most recent VISUM transport modelling to the Maidstone Joint Transportation Board (JTB) on 22nd February 2016. The presentation considered the forecast reduction in two-way traffic flows on selected links with SEMSL in place. **Table 6** below presents two-way flows equivalent to those presented for site 3 in **Table C2**, **Appendix C** (A229 Loose Road (N)). The latter figures appear to have been rounded from those presented in **Table 6**, hence the percentage changes relative to 2014 differ slightly between the tables.

Table 6: AM Traffic Flows (A229 North of Wheatsheaf Junction)

AM Peak	2014	2031 DM	2031 DS4a	2031 DS4b
2-way traffic flow	2,600	3,390	3,000	3,180
% change relative to 2014		+30%	+15%	+22%

- 3.44 **Table 6** indicates that the difference in two-way flows between DS4a and DS4b is 180 vehicles. This represents a reduction in flows of 6% in both the northbound and southbound directions with SEMSL in place (**Table C2**).
- 3.45 Amey's presentation to the JTB also indicated a 16% reduction in two-way flows on the A274 Sutton Road in DS4a compared with DS4b. This appears to relate to a model link for which data was not published in Amey's March 2016 report, as the data presented for site 1 (A274 (W)) in **Table C2** indicate no change in flows between the scenarios.
- 3.46 Amey also claimed a reduction in flows on Willington Street (S) of 15% with SEMSL in place (DS4a). However, data for Willington Street (S) was not presented in their March 2016 report. The closest link for which model outputs have been published, Willington Street (N), indicates a significantly smaller reduction in flows of 4% (100 vehicles) with SEMSL in place.
- 3.47 In summary, the published VISUM traffic flow outputs for DS4a and DS4b suggest that the reassignment of traffic from the urban area with SEMSL in place is limited and that the beneficial impacts of the proposed road upon congestion have not been conclusively demonstrated.
- 3.48 Amey's March 2016 report also presented forecast travel times from VISUM for eight key radial road corridors as shown in **Figure 3**.

Figure 3: Travel Time Route Locations Plan



- 3.49 The forecast AM peak travel times for these corridors are presented in **Appendix C (Tables C4 and C5)** for the inbound (i.e. to the town centre) and outbound (i.e. from the town centre) directions respectively. The percentage change in travel times relative to the 2014 base is illustrated in **Tables C6 and C7** for the inbound and outbound directions respectively.
- 3.50 A commentary on the travel time savings forecast by VISUM is provided in paragraphs C1 to C6 in **Appendix C**. In summary, when considered in the context of the variations in traffic conditions that can typically be expected to occur on a day-to-day basis, the magnitude of the travel time savings forecast by VISUM with SEMSL in place (typically one minute or less) cannot be regarded as significant.
- 3.51 In conclusion, the published traffic flow and travel time outputs from VISUM demonstrate a level of impact on the highway network with scenario 2031 DS4b, testing a balanced package of transport interventions, comprising highway capacity, public transport and walking and cycling improvements as set out in the draft Integrated Transport Strategy, that cannot be regarded as severe in the context of the National Planning Policy Framework.

VISUM Outputs – 2022 Forecast Model Scenarios

- 3.52 At the Maidstone JTB meeting on 7 December 2015, it was agreed that further VISUM modelling be undertaken to assess the transport impacts of the Local Plan development allocations to the year 2022, at which time the first review of the Local Plan is scheduled to take place. The modelling would test the components of the draft Integrated Transport Strategy which had previously been agreed by the JTB. **Table C1 (Appendix C)** indicates that the package of measures tested for the 2022 Do Something (DS) scenario was identical to that tested for 2031 DS4b. SEMSL was not included within the modelling, as given the need for a detailed route assessment, environmental impact assessment, sustainability appraisal and a more detailed analysis of costs and benefits in general, this scheme would require delivery over a longer timescale. Furthermore, the scheme does not appear in the current Local Transport Plan for Kent. The 2022 DS scenario was compared with a Do Minimum (DM) scenario which included only the Bridges Gyrotory.
- 3.53 For the 2022 DM and DS scenarios, the Local Plan OAN of 18,560 housing units to 2031 was adjusted to deduct the three broad locations for housing growth towards the end of the Local Plan period, namely the 700 dwellings in Maidstone town centre, 1,300 dwellings at Invicta Park Barracks and 1,500 dwellings in Lenham together with the windfall sites which are expected to come forward over the period 2022 to 2031 (1,026 dwellings). A revised housing target of 14,034 units was taken forward, alongside all employment and retail sites as per 2031 DS4a and DS4b (**Table 2**). The 2022 target includes all development identified for the South East Strategic Development Location (draft Local Plan Policy SP3).
- 3.54 Publication of a technical note providing the model outputs from the 2022 DM and DS scenarios is scheduled prior to September 2016, but in the meantime commentary is provided below on the results which were presented to the Maidstone JTB meeting on 22 February 2016.
- 3.55 The AM peak travel demand and network performance for the 2022 scenarios is presented in **Table 7** below. These are compared with the 2014 base and 2031 DS4b (i.e. excluding SEMSL).

Table 7: Travel Demand and Network Performance Summary (AM Peak)

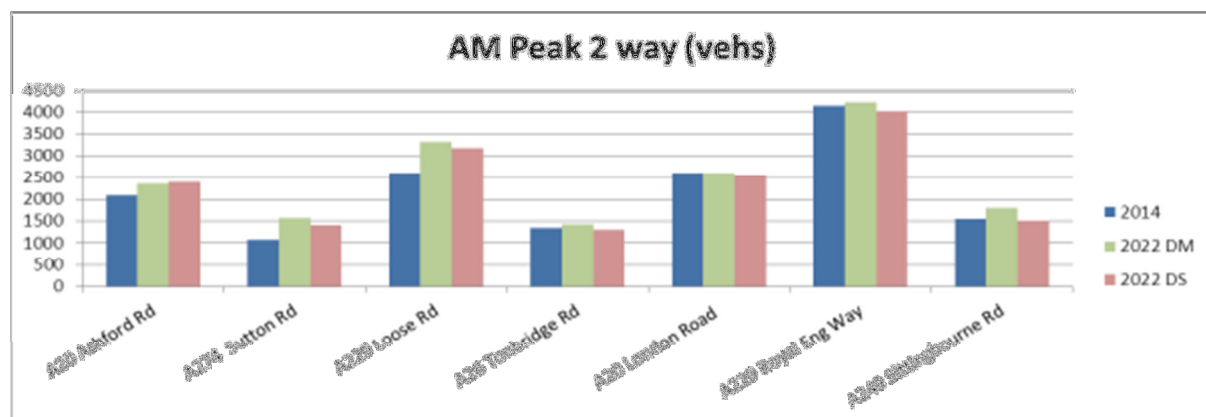
	2014 Base	2022 DM	2022 DS	2031 DS4b
Person Trips	50,300	56,800	56,800	59,200
% difference vs 2014		13%	13%	18%
Vehicle Trips	35,500	40,000	37,800	39,300
% difference vs 2014		13%	6%	11%
Travel Distance (veh km)	122,000	141,400	132,000	135,600
% difference vs 2014		16%	8%	11%
Travel Time (veh hours)	8,300	10,700	9,100	9,700
% difference vs 2014		29%	10%	17%

3.56 The increase in person trips for the 2022 DM and DS scenarios compared with the 2014 base reflects the housing target of 14,034 units, with the person trips for 2031 DS4b increasing further due to the OAN of 18,560 units. Both the DM and DS scenarios result in an increase in vehicle trips relative to the 2014 base, but the package of transport interventions in the DS achieves a 6% reduction relative to the DM.

3.57 The reduction in vehicle trips in the DS scenario relative to the DM also leads to reduced travel distance, but still an increase over the 2014 base of 8% as **Table 7** shows. Both the 2022 DS and 2031 DS4b scenarios result in reduced travel distance, and reduced travel time, relative to the 2022 DM.

3.58 It must be reiterated that the travel distance and travel time presented in **Table 7** are indicators of overall network performance. The only published route-specific 2022 model output data is presented in **Figure 4** below. This is the chart of two-way traffic flows on selected arterial routes which was included in Amey’s presentation to the Maidstone JTB on 22 February 2016.

Figure 4: AM Peak 2-way Traffic Flows, 2022 Scenarios vs 2014 Base



- 3.59 The VISUM model outputs presented in **Figure 4** indicate that the two-way traffic flows on most arterial routes will increase in the 2022 DM scenario relative to the 2014 base, with the largest increases on the A274 Sutton Road and A229 Loose Road which can be expected given the focus of development in the south east of the urban area. With the exception of the A20 Ashford Road, the package of transport interventions tested in the 2022 DS scenario would reduce in a decrease in two-way traffic flows relative to the DM.
- 3.60 In summarising the results of the 2022 model runs, paragraph 5.1 of KCC's original report to the 22 February 2016 JTB noted that the results *"demonstrate a level of impact on the highway network that cannot be regarded as severe in the context of the National Planning Policy Framework"*. Furthermore, KCC's report to the 20 April 2016 JTB noted that the modelling *"demonstrates an overall level of impact on the highway network that is not regarded as severe, when viewed in the context of the variations in traffic conditions that can typically be expected to occur on a day-to-day basis"*.
- 3.61 KCC's conclusions are especially significant in the context of impacts on the A274 Sutton Road and A229 Loose Road. The results of the 2022 DS scenario, which included all development identified for the South East Strategic Development Location to the end of the Local Plan period, indicate that with a balanced package of transport interventions, comprising highway capacity, public transport and walking and cycling improvements as set out in the draft Integrated Transport Strategy, the transport impacts of the proposed development in the south east area (as well as across the whole Maidstone urban area) can be mitigated to a level where the residual impact is less than severe. The justification for SEMSL – a significantly higher cost intervention with a longer delivery timescale – would therefore depend on enabling development in the vicinity of its route. No evidence is available at the time of writing to indicate the extent of enabling development which would be required to support the proposed road, or the feasibility and desirability of this development.

VISUM Modelling - Conclusions

- 3.62 The above commentary has sought to outline the chronology of the strategic transport modelling undertaken using the Maidstone VISUM model, and summarise the assumptions, schemes and outputs for the various model scenarios tested for the 2022 and 2031 forecast years. However, caution has been taken in drawing conclusions from the VISUM outputs, in advance of further information being received regarding how the model works and the robustness of its underlying data. Furthermore, fair comparison between the 2031 DM and DS4a/DS4b scenarios will not be possible until the 2031 DM model is re-run with the OAN of 18,560 housing units, which is scheduled prior to September 2016. The VISUM outputs nevertheless demonstrate that the balanced package of transport interventions tested in scenario 2031 DS4b, comprising highway capacity, public transport and walking and cycling

improvements as set out in the draft Integrated Transport Strategy, result in a level of impact on the highway network that cannot be regarded as severe in the context of the National Planning Policy Framework.

3.63 Amey themselves acknowledge in their March 2016 report that the model results should be regarded as indicative only as all of the modelled scenarios “have some level of uncertainty regarding their achievability” (para. 13.6.8). In respect of scenarios 2031 DS4a and DS4b, they comment that the assumptions made for walking and cycling present more reasonable scenarios than those tested in the earlier DS1, DS2 and DS3 model runs. However, in respect of DS4a, they note the uncertainty regarding the deliverability of SEMSL and the need for a more detailed appraisal of the costs and benefits that may be attributed to it. To date, the most detailed assessment of costs and benefits for SEMSL which has been published is contained within TRA 015.

3.64 Uncertainty currently exists regarding the forecasting process and only a partial analysis of the model outputs is possible from Amey’s March 2016 report. To address these issues, the following information is being supplied to MBC:

- Confirmation of trip rates assumed for future development and background growth rates
- Sectorised forecast Do-Minimum and Do-Something matrices (to compare with base year)
- Time v distance graphs along journey time routes
- Plots of flow differences across network
- Plots of delays at junctions across network

3.65 At the time of writing, on the basis of the information which has been made available via meetings and liaison with Amey, KCC and Highways England, a series of observations are made in the following paragraphs.

3.66 The Maidstone VISUM model does not comply with the DfT’s WebTAG guidance for the appraisal of transport schemes not least because its underlying data is of varying ages. It is known that much of the roadside interview survey (RSIs) data used to build the trip matrices used within VISUM are from the 2001 London Area Transport Study surveys (which covered the entire South East) and in particular this data was used for capturing movements using the M20 slip roads. Other data is from more recent surveys (though pre-2007). Trip patterns may have changed in the past 15 years and new origin/destination data could produce more accurate forecasts. WebTAG advises that any origin/destination data over six years old should be replaced.

3.67 Because of the age of the underlying data and as it is understood that VISUM does not fully model the M20 junctions and main carriageway, HE has recommended that an alternative

approach to assessing the impact of the Local Plan on the strategic road network without use of VISUM is pursued. HE has confirmed that static junction modelling using existing count surveys and a modified TEMPRO forecasting approach to reflect objectively assessed need and non-committed development would be acceptable. MBC met with HE and KCC on 18 May 2016 and is working towards an agreed scope and methodology for undertaking individual junction capacity assessments at M20 J5 to 8. The Maidstone VISUM model nevertheless remains a reasonable tool for modelling the impact of transport strategy measures on the non-strategic road network within the urban area, and as a proxy for calculating forecast traffic flows on the strategic road network.

- 3.68 It can be inferred from the VISUM model outputs that there is a limited reassignment of trips from the Maidstone urban area with SEMSL in place, although the extent of the benefits from the reduction in trips within the town centre is not clear from the information published. The model appears unsuitable to accurately model the impacts of SEMSL as it focuses on the Maidstone urban area and does not model the surrounding Rural Service Centres and Larger Villages in detail. SEMSL appears to be outside the outer model cordon shown in **Figure 1**. Assuming this is the case, VISUM will have picked up the reassignment of demand from within Maidstone as a result of adding SEMSL to the network, but it will not have picked up demand from outside the model cordon to the south east, e.g. via the A274 from the Headcorn direction. It is possible that VISUM is underestimating the traffic impact of SEMSL on M20 Junction 8, and in turn overestimating the time saving via SEMSL for journeys from within the Maidstone urban area compared to routeing via the town centre. It is therefore possible that the reassignment of traffic from within Maidstone to SEMSL may be lower than that predicted by VISUM.
- 3.69 Regardless of the above, it is unlikely that developer contributions from the allocations in south east Maidstone and the surrounding area would be sufficient to deliver SEMSL in full given the capital costs of the scheme, therefore necessitating an application for Government funding. It is unlikely that the DfT would accept the use of the Maidstone VISUM model in its present guise as a tool for making decisions to invest in infrastructure schemes such as SEMSL given the age of the underlying model data, but it could be accepted if the data were updated.
- 3.70 It is standard practice for strategic transport modelling to be supplemented by localised transport modelling to consider the capacity of individual junctions in greater detail, and to confirm that identified transport mitigation measures will be effective. The above observations regarding the Maidstone VISUM model accentuate the importance of providing this supplementary transport evidence, to further justify that the policies and allocations within the Local Plan are deliverable.

Localised transport modelling

3.71 **Appendix D** provides a summary of the main findings from the localised junction modelling studies and developer TAs for the areas within Maidstone Borough which have been identified as particularly sensitive to changes in traffic flows. These are:

- Maidstone Bridges Gyratory (TRA 016);
- South East Strategic Development Location (TRA 028 and **Appendix B**);
- A229 Loose Road (TRA 030);
- A229 Royal Engineers Way (TRA 032);
- M20 Junction 7 (see **Appendix B**);
- North West Strategic Development Location (see **Appendix B**);
- Lenham Rural Service Centre (TRA 023, 024 and 033);
- Headcorn Rural Service Centre (TRA 022);
- Staplehurst Rural Service Centre (TRA 021 and 027); and
- Coxheath Larger Village (TRA 020 and 031).

3.72 In addition, capacity assessments will also be undertaken at M20 Junctions 5 to 8 prior to September 2016, with MBC working towards an agreed methodology for this work with HE and KCC following a meeting on 18 May 2016.

3.73 In conclusion, the results of the various junction modelling studies confirm that the impact of the increased demand for travel as a result of Local Plan housing and employment growth can be successfully mitigated. In many cases the mitigation delivers a net positive impact compared to the situation without the proposed development, given background traffic growth. The mitigation measures comprise not only highway capacity improvements but also bus prioritisation measures, increased bus service frequencies and high quality walking and cycling facilities, for which a significant proportion of funding has already been secured from committed developments.

4.0 Integrating the Planning and Transport Approach

- 4.1 This section summarises how local planning and transport policy documents have incorporated the mitigation measures which have been developed through the strategic and localised transport modelling documented in section 3, and will be delivered during the Local Plan period to 2031.

Regulation 19 Local Plan, February 2016

- 4.2 Policy H1 (Housing site allocations) stipulates the criteria which all housing sites should meet, in addition to site specific requirements. Item 1(v) states that *“an individual transport assessment for development proposals that reach the required threshold will be required to demonstrate how proposed mitigation measures address the cumulative impacts of all sites taken together. The transport assessment will be submitted to and be approved by the Borough Council in consultation with Kent County Council as the highway authority and Highways England”*.

- 4.3 The transport mitigation measures incorporated within **Table C1** in **Appendix C** have been developed through Transport Assessments (TAs) submitted in support of planning applications where these have assessed cumulative impacts, as well as through localised junction modelling commissioned by MBC. In some cases the modelling work postdates the Regulation 19 Local Plan, but the principles of the transport mitigation measures discussed in **Appendix D** have been included as specific items under “Highways and transportation” within the detailed site allocation policies for housing (Policies H1(1) to H1(68)), retail/mixed use (Policies RMX1(1) to RMX1(4)) and employment uses (Policies EMP1(1) to EMP1(5)).

Local Transport Plan (LTP) for Kent 2011-2016 (2011)

- 4.4 Under the Local Transport Act 2008 it is a statutory duty for KCC to have an LTP in place, although the Act allows Local Transport Authorities (LTAs) the freedom to replace LTPs as and when they see fit rather than having a five year planning horizon as stipulated in the previous legislation (Transport Act 2000). The purpose of an LTP is to set out KCC’s plans for local transport investment and is a critical tool by which to attract Government funding for these schemes.

- 4.5 KCC’s strategic approach for the third Local Transport Plan (LTP3), covering the period January 2011 to December 2016, was to develop five LTP3 themes aligned to the previous government’s national transport goals. The key theme with respect to mitigating the transport impacts of the Local Plan is “Growth Without Gridlock” and in LTP3 Chapter 8 (The

Implementation Plan for Growth without Gridlock) numerous references are made to Maidstone. It noted the work being undertaken by MBC and KCC to develop a draft integrated transport strategy for the Borough to complement the LDF Core Strategy being prepared at the time, which consulted on an option for 10,080 homes in summer 2011. Paragraph 8.48 states that:

“The Maidstone Transport Strategy, and hence the County Council’s Integrated Transport Programme for 2011 – 2016, will be driven by the desire to preserve and enhance the accessibility of Maidstone town centre by sustainable means. The proposed level of development will be underlined by a package containing a number of traffic management measures including the enhanced provision and priority of bus services through the Maidstone Quality Bus Partnership involving the County and Borough Councils along with the town’s principal bus operator.”

- 4.6 LTP3 also noted that the SEMSL proposal was unlikely to be pursued further, given the more widely distributed development strategy being pursued compared with that within preliminary versions of the LDF Core Strategy.

Kent County Council Local Transport Plan 4 (LTP4)

- 4.7 KCC is currently in the process of replacing LTP3. The refresh provides an opportunity to produce a longer-term strategic transport plan along similar timescales to the county’s growth ambitions as set out in the various Local Plans. As LTP3 will remain effective until December 2016, only limited weight can be accorded to the emerging LTP4 at this time.
- 4.8 LTP4 will be integrated with a refresh of KCC’s transport delivery plan, Growth without Gridlock. Although produced at the same time as LTP3, this was a separate document setting out the strategic aims for transport to support economic growth in Kent. LTP4 will also feed into a refresh of the Kent and Medway Growth and Infrastructure Framework (GIF). The GIF identifies Kent’s infrastructure needs to support planned growth to 2031. As the LTP4 identifies changes to or new transport infrastructure priorities, these priorities will input into the refresh of the GIF.
- 4.9 LTP4 is currently at the pre-consultation stage and MBC is engaging with KCC to communicate its priority transport schemes. These schemes are as set out in the Maidstone Borough Local Plan Publication (Regulation 19) February 2016 and the draft Integrated Transport Strategy, and have been identified and assessed as part of the strategic and local modelling undertaken to assess and mitigate the impacts of Local Plan growth.

Maidstone Borough-Wide Local Plan 2000

- 4.10 The Maidstone Borough-Wide Local Plan 2000⁵ was examined in May and June 1999. At that examination, the overarching issue with respect to transport was whether the location of many of the proposed housing sites and the traffic they would generate meet the principles of sustainable development. It is notable that, in respect of south east Maidstone, the Inspector's Report concluded that the allocated housing sites "*broadly meet objectives for a sustainable location given the availability of local services including shops and schools, the possibility of jobs at Parkwood Industrial Estate and bus services on the A274*" (para 4.85).
- 4.11 A series of strategies/interventions were identified to mitigate the transport impacts of new development and these became policy. Many of these policies have been saved and are not linked to the Local Plan period.
- 4.12 The intention of saved Policy T1 is to ensure that an integrated land use and transport strategy is pursued, with developments well connected to existing transport networks and appropriate facilities provided in order to reduce the need to travel. The spatial policies set out in the draft Local Plan and the transport policies set out in the draft ITS have been developed to support saved Policy T1.
- 4.13 Saved Policy T2 affirms the intention of MBC and KCC to develop bus prioritisation measures for the key corridors in Maidstone. The proposals recommended in the A274 Sutton Road Corridor Study are consistent with saved Policy T2. These proposals will contribute to the mitigation of transport impacts generated by developments in the south east Maidstone strategic development location by encouraging a modal shift from the private car to buses, which will benefit road users in general.
- 4.14 Saved Policy T3 sets out the Council's requirement that land be allocated, buildings to be designed/located and fixed passenger facilities to be provided to ensure that private developments are highly accessible by public transport. This policy is supported, for example, by the access strategies for sites H1(10) and H1(3), which enable bus service access through the development areas and high quality passenger waiting facilities.

Infrastructure Delivery Plan (IDP), February 2016 (DEL 003)

- 4.15 The overall approach to infrastructure delivery is detailed in section 20 of the Regulation 19 Local Plan and Policy ID1 – Infrastructure Delivery. The IDP itself is a document which identifies the infrastructure schemes necessary to support the development proposed in the Local Plan and outlines how and when these will be delivered.

- 4.16 Schedule A: Highways and transportation covers schemes relating to walking, cycling and public transport as well as those relating to the local or strategic road network. The schemes include new and enhanced bus services as well as infrastructure measures, and have been cross-referenced where appropriate in **Appendices C** and **D** of this topic paper.
- 4.17 The IDP is a live document and further schemes for rural areas in particular are likely to be developed through the progression of Neighbourhood Plans.

5. Conclusion

- 5.1 Maidstone's transport network has come under increasing strain in recent years, principally on account of the configuration of its road and rail networks and the growing demand for travel generally. It is recognised that the level of housing and employment growth envisaged by the Local Plan will increase the transport challenges in Maidstone Borough and a comprehensive and deliverable transport strategy must be in place to address these.
- 5.2 Robust analysis of the location of growth and allocated sites has been undertaken through the Sustainability Appraisal process at each relevant stage of the Local Plan preparation, informed by the appraisal of strategic transport packages using the Maidstone VISUM model and supplementary local transport modelling. These transport packages comprise practical mitigation measures, many of which are already being delivered, and funding for the other schemes is being put into place as identified in the IDP. The proposed allocations are well related to existing development and transport infrastructure, and will therefore maximise the opportunities for use of sustainable transport modes. This is consistent with the NPPF and is considered a sound approach to integrating transport and land use planning.
- 5.3 The Submission Local Plan is aligned with local planning and transport policies including the current Local Transport Plan and saved policies from the Maidstone Borough-Wide Local Plan 2000.
- 5.4 The evidence base presented in this Topic Paper summarises the results of cumulative impact assessments which demonstrate the Local Plan can meet the objectively assessed need for housing and employment growth without severe residual transport impacts. The Local Plan is therefore in accordance with the NPPF.

Appendix A: Housing land supply 1 April 2011 to 31 March 2031

		Dwellings (net)	Dwellings (net)
1	Objectively assessed housing need/ Local Plan housing target		18,560
2	Completed dwellings 1 April 2011 to 31 March 2016	2,860	
3	Extant planning permissions as at 1 April 2016 (including a non-implementation discount)	5,475	
4	Local Plan allocated sites (balance of Regulation 19 Local Plan allocations not included in line 3 above)	5,600	
5	Local Plan broad locations for future housing development	3,790	
6	Windfall sites contribution	1,600	
7	Total housing land supply		19,325
8	Housing land surplus 2011/2031		765

Appendix B: List of Reference Documents

South East Strategic Development Location

Land South of Sutton Road, Langley: Transport Assessment. DHA Transport, October 2015.

Land South of Sutton Road, Langley: Transport Assessment Addendum. DHA Transport, April 2016.

<http://pa.midkent.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=NX6XEPTY00S00>

A229 Loose Road

Maidstone Joint Transportation Board, Wednesday 15 April 2015

Item 63 – Report of the KCC Head of Transportation and Development: A229 Corridor Study
<https://services.maidstone.gov.uk/meetings/ieListDocuments.aspx?CId=137&MId=2247>

Maidstone Joint Transportation Board, Monday 22 February 2016

Item 148 – Report of the KCC Head of Transportation: A229 Loose Road Corridor Study, Maidstone
<https://services.maidstone.gov.uk/meetings/ieListDocuments.aspx?CId=137&MId=2574>

M20 Junction 7

Proposed Medical Campus, Newnham Park: Transport Assessment: DHA Transport, June 2013.

<http://pa.midkent.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=ZZZVV7KJTA630>

Redevelopment at Newnham Court Shopping Village: Transport Assessment: DHA Transport, November 2013.

<http://pa.midkent.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=ZZZVU5KJTA449>

North West Strategic Development Location

Land at Fant Farm, Maidstone: Transport Assessment. I-Transport, November 2015.

<http://pa.midkent.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=NYN2P8TYJ4T00>

Appendix C: Maidstone VISUM Model – Supplementary Information

Table C1: Summary of Transport Interventions – VISUM Forecast Model Scenarios

Transport Intervention	Description/ Objectives	IDP Reference	Funding Source(s)	2031 DM	2031 DS1	2031 DS2	2031 DS3	2031 DS4A	2031 DS4B	2022 DM	2022 DS
Highway Schemes											
Bridges Gyratory	New northbound link to bypass the gyratory	HTTC1	Local Enterprise Partnership / MBC (New Homes Bonus)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
A20 / Coldharbour Lane Junction	Junction Capacity and signals – no change to M20 J5	HTNW3	Existing S106 Contributions / CIL		Yes	Yes	Yes	Yes	Yes		Yes
A249 / Bearsted Rd roundabout	Junction improvements	HTJ71	S106		Yes	Yes	Yes	Yes	Yes		Yes
Bearsted Rd / New Cut junction	Junction improvements	HTJ71	S106		Yes	Yes	Yes	Yes	Yes		Yes
Dual carriageway between A249 and New Cut junctions	Increased capacity and junction arrangement	HTJ74	S106		Yes	Yes	Yes	Yes	Yes		Yes
A20 Ashford Road / Willington Street	Junction capacity and signals arrangement	HTUA2	S106		Yes	Yes	Yes	Yes	Yes		Yes
A229 / A274 Wheatsheaf Junction	Close exit to Cranbourne Avenue	HTSE6	S106		Yes	Yes	Yes	Yes	Yes		Yes
A274 / Willington Street Junctions	Junction capacity improvements	HTSE2	Local Enterprise Partnership		Yes	Yes	Yes	Yes	Yes		Yes
A274 / Wallis Avenue Junction	Junction capacity improvements	HTSE2	Local Enterprise Partnership		Yes	Yes	Yes	Yes	Yes		Yes
A26 Fountain Lane Junction	Changes to accommodate right turn vehicles within the junction	HTNW4	Existing S106 contributions CIL		Yes	Yes	Yes	Yes	Yes		Yes

Transport Intervention	Description/ Objectives	IDP Reference	Funding Source(s)	2031 DM	2031 DS1	2031 DS2	2031 DS3	2031 DS4A	2031 DS4B	2022 DM	2022 DS
Highway Schemes											
M20 Junction 7 improvement	Signals on M20 eastbound approach and A249 approaches to the roundabout	HTJ72	S106			Yes	Yes	Yes	Yes		Yes
New Cut / A20 left turn slip	Junction expansion to include left hand turn slip with give way at A20 (to allow for bus priority right hand turn lane). NB Bus priority not modelled.	HTJ71	S106			Yes	Yes	Yes	Yes		Yes
Hermitage Lane pedestrian signals	New pedestrian signals near vehicle access to Barming Station	HTNW9	Existing S106 contributions CIL			Yes	Yes	Yes	Yes		Yes
New link between Gore Court Rd and Bicknor Wood	New link with priority junctions assumed at each end	HTSE3	Developer funded			Yes					
Widening of Gore Court Road	Increased capacity on Gore Court Rd	HTSE4	S106			Yes					
Leeds Langley (west route)	New route linking the A274 and the A20 and including improvements to the A274. Single carriageway with roundabouts at each end and replacing the 5 Wents junction. Existing B2163 closed south of Horseshoes Lane	N/A	N/A		Yes						
Leeds / Langley (west / east route)	New route linking the A274 at the 5 Wents junction to the A20. Single carriageway route passing west of Leeds and east of Langley, terminating with roundabouts at each end.	N/A	N/A				Yes	Yes			
Park & Ride											
P&R Fare	£3.00 Park and Ride parking cost	N/A	N/A			Yes					
New P&R service from Linton Corner	New service with 15 minute frequency assumed	N/A	N/A			Yes					

Transport Intervention	Description/ Objectives	IDP Reference	Funding Source(s)	2031 DM	2031 DS1	2031 DS2	2031 DS3	2031 DS4A	2031 DS4B	2022 DM	2022 DS
Park & Ride											
Existing P&R bus services	15 minute frequency assumed for existing PR	N/A	N/A			Yes	Yes	Yes	Yes		Yes
Existing P&R service to Sittingbourne Road	Service removed	N/A	N/A					Yes	Yes	Yes	Yes
Other Measures											
Car parking charges	50% increase in parking charges (long & short stay)	N/A	N/A			Yes	Yes				
Car parking charges	50% increase in parking charges (weighted for long stay)	N/A	N/A					Yes	Yes		Yes
Notcutts shuttle bus	New shuttle bus route from Notcutts to the bus station with 20 minute frequency	HTJ75	Existing S106 contributions CIL			Yes		Yes	Yes		Yes
Bus services	Bus services on main radial routes increased to 7 minute frequencies	N/A	N/A			Yes					
Bus services	Bus services on main radial routes increased to 10 minute frequencies	N/A	N/A				Yes	Yes	Yes		Yes
Car sharing	Increase in car sharing by 5%.	N/A	N/A			Yes					
Romney Place bus lane	Bus only lane from Lower Stone Street to Romney Place	HTTC2	Local Transport Plan			Yes					
Walking mode share	Mode share target - 8.5% increase in walking mode share over 2014 base	N/A	N/A			Yes					
Cycling Mode Share	Mode share target - 8.5% increase in walking mode share over 2014 base	N/A	N/A			Yes					
Walking & cycling mode share	Reduction in home-based work (HBW) & home-based other (HBO) trips <5km in urban area to reflect increased walking and cycling	N/A	N/A					Yes	Yes		Yes

Transport Intervention	Description/ Objectives	IDP Reference	Funding Source(s)	2031 DM	2031 DS1	2031 DS2	2031 DS3	2031 DS4A	2031 DS4B	2022 DM	2022 DS
Other Measures											
Circular bus route to hospital	Linking town centre, Hermitage Lane, hospital, Howard Drive and London Rd	HTNW7	Existing S106 contributions CIL			Yes					

Table C2: AM Link Traffic Flows

Site	Link	Direction	2014	2031 DM ²	2031 DS4A	2031 DS4B
1	A274 (W)	EB	400	900	750	800
		WB	650	700	700	650
		<i>2-way</i>	<i>1050</i>	<i>1600</i>	<i>1450</i>	<i>1450</i>
2	A229 (N)	SB	2350	2400	2100	2150
		NB	1800	1700	1800	1850
		<i>2-way</i>	<i>4150</i>	<i>4100</i>	<i>3900</i>	<i>4000</i>
3	A229 Loose Road (N)	SB	1150	1500	1550	1650
		NB	1450	1900	1450	1550
		<i>2-way</i>	<i>2600</i>	<i>3400</i>	<i>3000</i>	<i>3200</i>
4	A20 London Road	EB	1350	1350	1400	1350
		WB	1250	1300	1250	1250
		<i>2-way</i>	<i>2600</i>	<i>2650</i>	<i>2650</i>	<i>2600</i>
5	Hermitage Lane	NB	950	1150	1200	1200
		SB	800	950	850	850
		<i>2-way</i>	<i>1750</i>	<i>2100</i>	<i>2050</i>	<i>2050</i>
6	A26 Tonbridge Road	EB	700	800	550	550
		WB	650	750	800	800
		<i>2-way</i>	<i>1350</i>	<i>1550</i>	<i>1350</i>	<i>1350</i>
7	A229 Linton Road	SB	500	750	750	750
		NB	400	700	550	550
		<i>2-way</i>	<i>900</i>	<i>1450</i>	<i>1300</i>	<i>1300</i>
8	B2163 Lower Street, Leeds	NB	650	600	0	550
		SB	500	500	50	550
		<i>2-way</i>	<i>1150</i>	<i>1100</i>	<i>50</i>	<i>1100</i>
9	A249	NB	1950	1850	2100	2200
		SB	2100	2400	2800	2850
		<i>2-way</i>	<i>4050</i>	<i>4250</i>	<i>4900</i>	<i>5050</i>
10	New Cut Road	NB	800	850	1050	1100
		SB	950	900	1250	1300
		<i>2-way</i>	<i>1750</i>	<i>1750</i>	<i>2300</i>	<i>2400</i>
11	Willington Street (N)	NB	1000	1150	1100	1100
		SB	750	900	1200	1300
		<i>2-way</i>	<i>1750</i>	<i>2050</i>	<i>2300</i>	<i>2400</i>
12	M20 Spur Road	NB	1750	1950	2250	2050
		SB	1650	1850	2400	2200
		<i>2-way</i>	<i>3400</i>	<i>3800</i>	<i>4650</i>	<i>4250</i>
13	A20 Ashford Road	EB	850	850	1350	1350
		WB	1250	1450	1150	1150
		<i>2-way</i>	<i>2100</i>	<i>2300</i>	<i>2500</i>	<i>2500</i>
14	A249 Sittingbourne Road	NB	950	1150	1000	1000
		SB	600	800	500	550
		<i>2-way</i>	<i>1550</i>	<i>1950</i>	<i>1500</i>	<i>1550</i>
15	B2163 (W)	EB	200	350	350	350
		WB	300	450	400	400
		<i>2-way</i>	<i>500</i>	<i>800</i>	<i>750</i>	<i>750</i>

Table C3: Percentage change in AM Link Traffic Flows Relative to 2014 Base

Site	Link	Direction	2031 DM ²	2031 DS4A	2031 DS4B
1	A274 (W)	EB	125%	88%	100%
		WB	8%	8%	0%
		2-way	52%	38%	38%
2	A229 (N)	SB	2%	-11%	-9%
		NB	-6%	0%	3%
		2-way	-1%	-6%	-4%
3	A229 Loose Road (N)	SB	30%	35%	43%
		NB	31%	0%	7%
		2-way	31%	15%	23%
4	A20 London Road	EB	0%	4%	0%
		WB	4%	0%	0%
		2-way	2%	2%	0%
5	Hermitage Lane	NB	21%	26%	26%
		SB	19%	6%	6%
		2-way	20%	17%	17%
6	A26 Tonbridge Road	EB	14%	-21%	-21%
		WB	15%	23%	23%
		2-way	15%	0%	0%
7	A229 Linton Road	SB	50%	50%	50%
		NB	75%	38%	38%
		2-way	61%	44%	44%
8	B2163 Lower Street, Leeds	NB	-8%	-100%	-15%
		SB	0%	-90%	10%
		2-way	-4%	-96%	-4%
9	A249	NB	-5%	8%	13%
		SB	14%	33%	36%
		2-way	5%	21%	25%
10	New Cut Road	NB	6%	31%	38%
		SB	-5%	32%	37%
		2-way	0%	31%	37%
11	Willington Street (N)	NB	15%	10%	10%
		SB	20%	60%	73%
		2-way	17%	31%	37%
12	M20 Spur Road	NB	11%	29%	17%
		SB	12%	45%	33%
		2-way	12%	37%	25%
13	A20 Ashford Road	EB	0%	59%	59%
		WB	16%	-8%	-8%
		2-way	10%	19%	19%
14	A249 Sittingbourne Road	NB	21%	5%	5%
		SB	33%	-17%	-8%
		2-way	26%	-3%	0%
15	B2163 (W)	EB	75%	75%	75%
		WB	50%	33%	33%
		2-way	60%	50%	50%

Table C4: AM Inbound Travel Times (seconds)

No.	Route	2014	2031 DM	2031 DS4A	2031 DS4B
1	A20 Ashford Road	616	823	557	577
2	A274 Sutton Road	738	935	746	818
3	A229 Loose Road	558	782	572	638
4	B2010 Farleigh Hill	166	170	168	168
5	A26 Tonbridge Road	432	461	436	441
6	A20 London Road	393	423	360	366
7	A229 Royal Engineers Way	326	381	269	282
8	A249 Sittingbourne Road	312	368	325	333

Table C5: AM Outbound Travel Times (seconds)

No.	Route	2014	2031 DM	2031 DS4A	2031 DS4B
1	A20 Ashford Road	472	475	523	571
2	A274 Sutton Road	602	690	667	713
3	A29 Loose Road	456	568	545	592
4	B2010 Farleigh Hill	208	248	225	239
5	A26 Tonbridge Road	389	404	393	395
6	A20 London Road	380	420	394	413
7	A229 Royal Engineers Way	261	338	348	367
8	A249 Sittingbourne Road	354	403	360	364

Table C6: Percentage Change in AM Inbound Travel Times Relative to 2014 Base

No.	Route	2031 DM ²	2031 DS4A	2031 DS4B
1	A20 Ashford Road	34%	-10%	-6%
2	A274 Sutton Road	27%	1%	11%
3	A229 Loose Road	40%	3%	14%
4	B2010 Farleigh Hill	2%	1%	1%
5	A26 Tonbridge Road	7%	1%	2%
6	A20 London Road	8%	-8%	-7%
7	A229 Royal Engineers Way	17%	-17%	-13%
8	A249 Sittingbourne Road	18%	4%	7%

- C1. It can be seen from **Table C6** that the DM scenario results in an increase in AM inbound travel times relative to the 2014 base on all routes. Despite the higher number of housing units tested, with the package of transport interventions scenarios DS4a and DS4b indicate a reduction in AM inbound travel times relative to the 2014 base on three of the eight routes

- C2. The greatest inbound travel time reductions in percentage terms are achieved on the A229 Royal Engineers Way. DS4a and DS4b travel times of 4 minutes 29 seconds and 4 minutes 42 seconds respectively compare with the 2014 base travel time of 5 minutes 26 seconds (**Table C4**). DM travel times increase to 6 minutes 8 seconds, which is a 17% increase relative to the 2014 base, yet southbound traffic flows increase by just 2% in this scenario (site 2, **Table C3**). With a reduction in the northbound traffic flow, two-way DM traffic flows on the A229 Royal Engineers Way are forecast to reduce by 1% (50 vehicles) relative to the 2014 base. For comparison, two-way DS4a and DS4b traffic flows are forecast to reduce by 6% and 4% (250 and 150 vehicles) respectively relative to the 2014 base.
- C3. The traffic flows quoted for site 2 in **Table C3** are for a single model link so there is not a direct relationship between traffic flows at this site and the overall travel time from the beginning to the end of the route, which is the aggregate of travel times on numerous model links, data for which has not been made available for review. Nevertheless, given the relatively small changes in traffic flows with the three 2031 scenarios compared with the 2014 base, the significant increase in DM travel times in contrast to the reduction in DS4a and DS4b travel times is notable. As VISUM has forecast a 17% increase in vehicle trips on the Maidstone model network as a whole in the DM scenario, the model appears to have reassigned a significant number of trips away from the A229 Royal Engineers Way but it is not possible from the available information to verify the specific trip origin/destination combinations which have been diverted and to which routes.
- C4. **Table C6** shows inbound travel time increases on the A274 Sutton Road and A229 Loose Road in all future year scenarios. On the A274 Sutton Road, the DS4a travel time of 12 minutes 26 seconds compares with the DS4b travel time of 13 minutes 38 seconds. The model therefore predicts an inbound travel time saving of just over one minute (9%) with SEMSL in place, all other transport interventions being equal. On the A229 Loose Road, the DS4a travel time of 9 minutes 32 seconds compares with the DS4b travel time of 10 minutes 38 seconds, again a travel time saving of just over one minute (10%) with SEMSL in place.

Table C7: Percentage Change in AM Outbound Travel Times Relative to 2014 Base

No.	Route	2031 DM ²	2031 DS4A	2031 DS4B
1	A20 Ashford Road	1%	11%	21%
2	A274 Sutton Road	15%	11%	18%
3	A229 Loose Road	25%	20%	30%
4	B2010 Farleigh Hill	19%	8%	15%
5	A26 Tonbridge Road	4%	1%	2%
6	A20 London Road	11%	4%	9%
7	A229 Royal Engineers Way	30%	33%	41%
8	A249 Sittingbourne Road	14%	2%	3%

C5. **Table C7** shows that all future year scenarios result in an increase in outbound travel time relative to the 2014 base. On four of the eight routes DS4a and DS4b result in significantly reduced outbound travel times in percentage terms compared with the DM. However, it must be reiterated that the Do Something scenarios are not directly comparable with the Do Minimum due to the higher number of housing units tested in the former. With regard to the other four routes where travel times increase compared with the DM, key observations are as follows:

- **A20 Ashford Road** – the DS4a travel time of 8 minutes 43 seconds compares with the DS4b travel time of 9 minutes 31 seconds (**Table C5**). This represents a saving of 48 seconds (8%) with SEMSL in place but is still higher than the DM travel time of 7 minutes 55 seconds.
- **A274 Sutton Road** – the DS4a travel time of 11 minutes 7 seconds compares with the DS4b travel time of 11 minutes 53 seconds, a saving of 46 seconds (6%) with SEMSL in place. Both DS4a and DS4b are close to the DM travel time of 11 minutes 30 seconds.
- **A229 Loose Road** – the DS4a travel time of 9 minutes 5 seconds compares with the DS4b travel time of 9 minutes 52 seconds and the DM travel time of 9 minutes 28 seconds. The results indicate a saving of 47 seconds (8%) is achieved with SEMSL in place.
- **A229 Royal Engineers Way** – in contrast to inbound travel times, outbound travel times for DS4a and DS4b increase from the DM travel time of 5 minutes 38 seconds to 5 minutes 48 seconds and 6 minutes 7 seconds respectively. This represents a saving of 19 seconds (5%) with SEMSL in place.

C6. When considered in the context of the variations in traffic conditions that can typically be expected to occur on a day-to-day basis, the magnitude of the travel time savings forecast by VISUM with SEMSL in place cannot be regarded as significant.

Appendix D: Summary of Key Localised Transport Modelling Studies

Maidstone Bridges Gyratory (TRA 016)

- D1. In July 2014 KCC H&T secured a £4.6m capital funding allocation from Government as part of the Single Local Growth Fund (SLGF) initiative which, alongside a £1.1m contribution from MBC's New Homes Bonus, will deliver capacity improvements to the Bridges Gyratory intersection in Maidstone Town Centre. The scheme (TRA 016) involves the construction of two additional northbound lanes on the eastern side of the River Medway, enabling northbound traffic on the A229 to avoid the existing Gyratory system. It is understood that LinSig modelling has demonstrated:
- an increase in overall junction capacity of approximately 15%;
 - an overall reduction in delay of approximately 25% in both the AM and PM peak hour periods; and
 - a reduction in average maximum queue lengths of approximately 15% in the AM and 20% in the PM peak periods.
- D2. It is also understood that KCC's submission to the SLGF stated that the scheme would unlock sufficient highway capacity to accommodate in excess of 5,000 additional dwellings in and around the town during the new Local Plan period (to 2031), in addition to background traffic growth.
- D3. Construction works will commence in June 2016 and are scheduled to be completed by March 2017.

South East Strategic Development Location (Draft Local Plan Policy SP3)

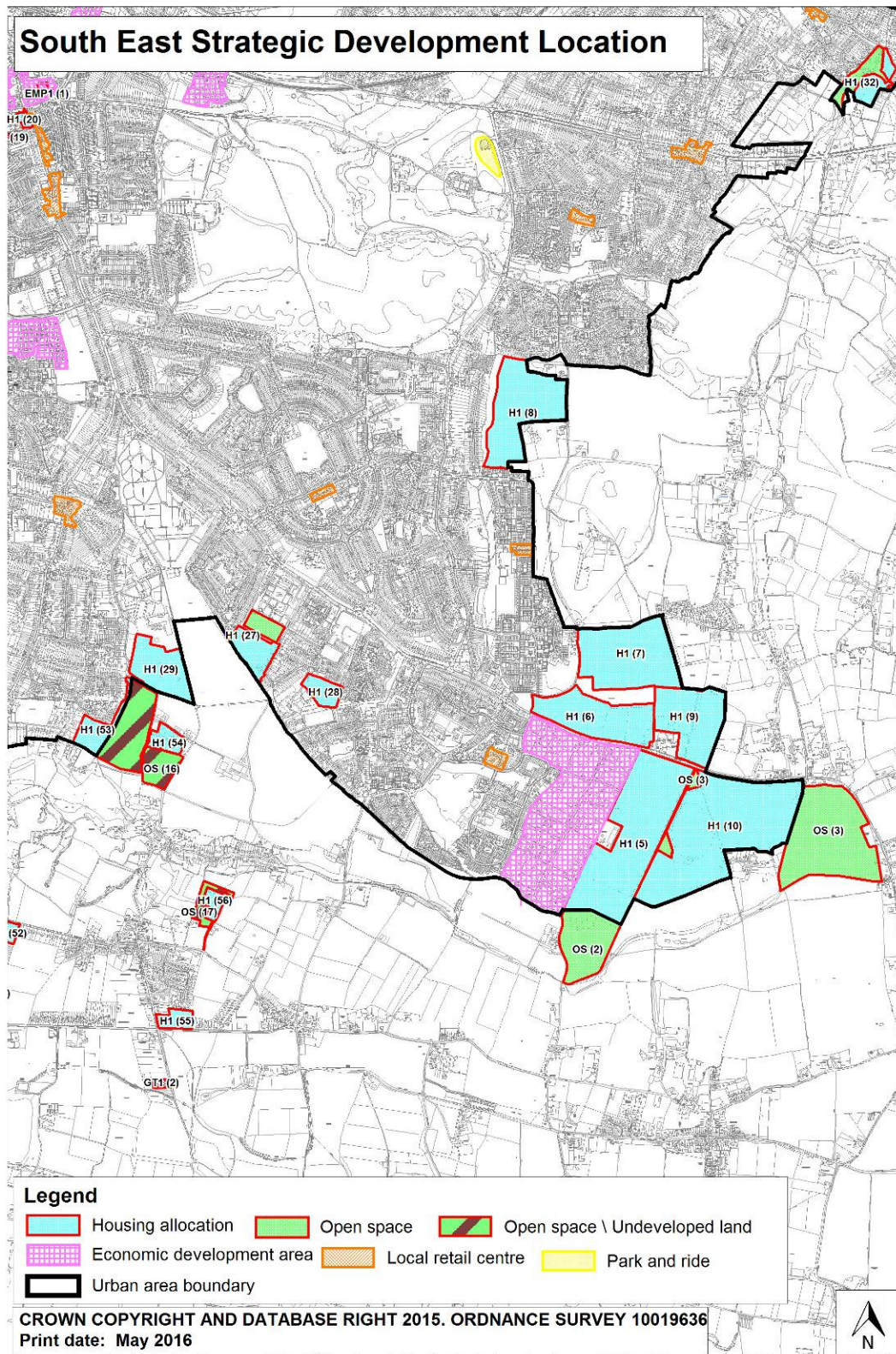
Cumulative transport assessment of development allocations

- D4. A transport assessment (TA) was submitted in October 2015 to accompany the planning application for residential development at Land South of Sutton Road (MA/15/509015/OUT) by Countryside Properties (hereafter referred to as the Countryside TA, listed in **Appendix B**). The trip generation assessment within the Countryside TA incorporated five committed and three proposed developments in the south east Maidstone area, including all housing allocations within the strategic development location and nearby allocations with an impact on the local highway network. These were:
- MA/12/0986 – Land Rear of Police Headquarters, Sutton Road (site H1(21)) – up to 112 dwellings.
 - MA/12/0987 – Land Rear of Kent Police Training School, St Saviours Road (site H1(22)) – up to 90 dwellings.

- MA/13/1149 – Land at Langley Park (site H1(5)) – up to 600 dwellings, with associated convenience store, retail/commercial units and public house, and two form entry primary school.
- MA/13/0951 – Land North of Sutton Road (site H1(6)) – 186 dwellings.
- MA/13/1523 – Land West of Bicknor Farm Cottages (site H1(6)) – 100 dwellings.
- Bicknor Farm, Sutton Road, Otham (site H1(9)) – up to 335 dwellings.
- North of Bicknor Wood, Otham (site H1(7)) – up to 190 dwellings.
- West of Church Road, Otham (site H1(8)) – up to 440 dwellings.

D5. The above Local Plan housing allocations are illustrated spatially in **Figure D1** below.

Figure D1: South East Strategic Development Housing Allocations



D6. It was agreed with KCC in a letter dated 16 October 2014 (included as Appendix A to the Countryside TA) that the Countryside TA should consider the impacts of committed and

proposed developments in south east Maidstone on capacity and delay at the following junctions:

- A229 Loose Road / Armstrong Road / Park Way;
- A229 Loose Road / A274 Sutton Road / Cranborne Avenue (Wheatsheaf);
- A274 Sutton Road / St Saviours Road;
- A274 Sutton Road / Wallis Avenue;
- A274 Sutton Road / Willington Street; and
- A20 Ashford Road / Willington Street.

D7. Localised transport modelling was undertaken at these traffic signal junctions utilising industry standard LinSig software, for a 2014 base year, 2019 opening year, 2024 assessment year and 2029 assessment year. The results of the assessment confirmed that mitigation would be required at these junctions in order to accommodate the traffic generated by the committed and proposed developments. The proposed mitigation was outlined in section 7.1 of the Countryside TA and feasibility drawings included as Appendices J to O of that report. In summary the mitigation measures comprise:

- **A229 Loose Road / Armstrong Road / Park Way (IDP Ref. HTSE7)** – the scheme for this signal junction proposes a) the relocation of the controlled pedestrian crossing from the A229 Loose Road (north) to the A229 Loose Road (south) arm of the junction, which would enable the removal of a full stage from the signal cycle, b) the provision of a new controlled pedestrian crossing to the north of the junction, in the approximate location of the existing pedestrian bridge, which would operate independently of the signal junction and enhance access to South Borough Primary School and Maidstone Grammar School, c) the installation of ‘Puffin’ technology on the relocated pedestrian crossing, and d) the provision of separate ‘left’ and ‘ahead’ lanes on the Park Way arm of the junction (returning it to its previous pre-2000’s configuration).
- **A229 Loose Road / A274 Sutton Road / Cranborne Avenue (IDP Ref. HTSE6)** – the installation of ‘Puffin’ technology on all controlled pedestrian crossings and the conversion of the lightly used Cranborne Avenue arm of the “Wheatsheaf” signal junction to one-way inbound operation is proposed. This scheme was progressed independently by KCC as part of their A229 Loose Road Corridor Study (see paragraphs D16 to D21).
- **A274 Sutton Road / St Saviours Road (IDP Ref. HTSE1)** – the proposed mitigation for this three-arm signal junction comprises a) remarking of the northbound A274 nearside flare to allow left and ahead traffic use (currently this is left only), b) the creation of a two-to-one merge lane on the northbound A274 exit, and c) modifications to the A274 right turn in to St Saviour’s Road.

- **A274 Sutton Road / Wallis Avenue / Willington Street (IDP Ref. HTSE2)** – a mitigation scheme was developed which revised that prepared on behalf of Taylor Wimpey with respect to the Langley Park development (site H1(5)). This comprised a) the widening of the A274 Sutton Road to provide two carriageway lanes in each direction between its junctions with Wallis Avenue and Willington Street, the inside lane being allocated to traffic travelling ‘ahead’ and ‘left’ and the outside lane being allocated to ‘ahead’ movements only, b) The provision of two-to-one lane merges on the Sutton Road (north) exit of the A274 / Wallis Avenue junction and Sutton Road (south) exit of the A274 / Willington Street junction, c) the extension of the right-turn lane on the Willington Street arm of the A274 / Willington Street junction, and d) The provision of a controlled pedestrian crossing on the Sutton Road (north) arm of the A274 / Wallis Avenue junction.
- **A20 Ashford Road / Willington Street (IDP Ref. HTUA2)** – the provision of a left turn flare on the A20 Ashford Road (East) approach to the junction was identified.

- D8. In addition to highway mitigation, the Countryside TA set out improvements to bus services. Arriva, the commercial operator of route 82 (Maidstone Town Centre – Park Wood Parade), has confirmed that it is willing in principle to extend the route to H1(10) at a 15-20 minute daytime frequency. In tandem with bus prioritisation measures on the A274 Sutton Road corridor, consistent with saved Policy T2 from the Maidstone Borough-Wide Local Plan 2000⁶, this will offer both existing and future residents a viable and attractive alternative to car travel for journeys to and from town centre destinations. High quality passenger waiting facilities will be provided within the development.
- D9. Improvements to walking and cycling facilities will also be delivered. A shared use route will be provided across the site, enabling residents of H1(10) and the adjacent residential developments to the north and west, to access the proposed primary school and village centre, Langley village and the surrounding Public Rights of Way (PRoW) network. A shared use route has already been provided across the frontage of site H1(5), which will link to a new toucan crossing on the A274 (IDP Ref. HTSE10) and onward footway/cycle way connections to Maidstone town centre and beyond.
- D10. The Countryside TA also considered how the SEMSL scheme could contribute towards the mitigation strategy for the development. Based on an analysis of 2011 Census travel to work data, together with the location of local schools, retail and leisure facilities, it was estimated that approximately 75% of trips generated by the H1(10) development during the AM and PM peak hours would route via the A274 Sutton Road to the north of the site, with

⁶ http://www.maidstone.gov.uk/_data/assets/pdf_file/0017/12068/Maidstone-Borough-Wide-Local-Plan-2000.pdf

a minority of trips assigning to Horseshoes Lane and the B2163 through Langley and Leeds villages. It was identified that the majority of trip attractors for residents of the Maidstone urban area and its environs during the weekday peak periods are likely to be located within the town itself. Consequently, a new road link connecting the A20 Ashford Road at Hollingbourne with the A274 Sutton Road at Langley is likely to be of limited utility for these trips. On this basis, the Countryside TA contended that the scope of highway and/or public transport mitigation measures should be confined to the A274 and A229 corridors.

- D11. It was concluded from the results of capacity modelling with the proposed improvement measures in place that the junctions would operate in a fashion which would successfully mitigate the increase in traffic from the proposed developments and partially that from the committed developments. Moreover, in most cases, a degree of planning gain would be provided by these mitigation schemes.
- D12. In response to technical issues raised by KCC Highways & Transportation and by MBC's transportation consultants Mott MacDonald following a review of the Countryside TA, in April 2016 a TA Addendum was submitted (listed in **Appendix B** of this topic paper) which provided a response to these issues.
- D13. The TA Addendum presented a revised trip generation assessment which took into account the revised H1(10) development yield of 750 housing units (not the 950 originally tested) and explicitly accounted for the non-residential uses on-site (specifically the convenience retail store, local shops and GP surgery), in addition to the 2FE primary school. The revised assessment also included the actual trip rates agreed with KCC for the Langley Park residential development, and revised housing numbers for the Bicknor Farm (272 units) and Land North of Bicknor Wood (250 units) sites included within the planning applications submitted for these sites since the original Countryside TA was prepared.
- D14. Further capacity modelling was undertaken for a 2029 assessment year for the junctions within the TA study area most affected by the modified traffic flows as per the revised trip generation assessment outlined above. Roundabouts and priority junctions were tested using the industry standard ARCADY and PICADY software respectively. The key conclusions were as follows:
- **A274 Sutton Road / Wallis Avenue / Willington Street** – LinSig outputs confirm that the provision of the mitigation measures continue to provide a significant improvement in the operation of the signal junctions relative to the 2029 scenarios either without traffic from the proposed development but including background traffic growth and committed development (Do Nothing), or with traffic from the proposed development on top of background traffic growth and proposed development (Do Minimum). Large reductions in average delay per vehicle provide a meaningful degree of planning gain. KCC is currently preparing a detailed design for a similar improvement scheme (based on the feasibility design submitted as part of the Langley Park development application) as part

of the Maidstone Integrated Transport Package for which it has recently secured Local Growth Funding with implementation scheduled for late 2016.

- **A274 Sutton Road / Langley Park / Bicknor Farm** – ARCADY outputs confirm that this roundabout is forecast to operate within capacity on all arms during the 2029 AM and PM peak hours, with scope for further capacity improvements as site H1(9) has a direct frontage to the roundabout.
- **A274 Sutton Road / Site Access** – ARCADY outputs confirm that the western site access roundabout is forecast to operate within capacity on all arms during the 2029 AM and PM peak hours. This assumes that all development traffic uses this access, with the eastern site access roundabout having been removed from the masterplan and replaced by a simple priority junction which will provide access to a bus gate for the development, to be served by Route 12 bus services (Maidstone to Tenterden via Headcorn). PICADY outputs for the priority junction confirm that it will operate well within capacity.
- **A274 Sutton Road/Horseshoes Lane** – a feasibility design of mitigation measures for this priority junction has been included in Appendix I of the TA Addendum. This was requested by KCC H&T and is fully achievable within land controlled by the local highway authority. The PICADY outputs confirm that the junction improvements would successfully mitigate the impact of the limited development travel demand generated to the south and east.

D15. With respect to the other junctions within the study area, the revised trip generation assessment would have no measurable or significant change to the modelling outputs and so the models for these junctions were not re-run. The conclusions of the original Countryside TA therefore remain valid in that the impacts of the traffic from proposed developments and in most cases the committed developments can be successfully mitigated.

A274 Sutton Road Corridor Study (TRA 028)

D16. The TAs already submitted in support of planning applications for sites within the south east Maidstone strategic development location note the requirement as set out in the draft Local Plan policies for sites H1(5) to H1(10) to contribute towards strategic highways and transportation schemes which support planned growth. In addition to the highway mitigation measures outlined in the previous section, the schemes include bus prioritisation measures on the A274 Sutton Road from the Willington Street junction to the Wheatsheaf junction, together with bus infrastructure improvements. The requirement for bus

prioritisation measures on the A274 corridor is consistent with saved Policy T2 from the Maidstone Borough-Wide Local Plan 2000¹⁰ which will remain applicable until the new Local Plan is adopted.

- D17. As part of the development of the Integrated Transport Strategy, and to support the housing growth planned for the south east Maidstone strategic development location, in August 2015 MBC commissioned Mott MacDonald to develop bus priority proposals for the A274. The study area comprised the corridor extending southeastwards from the A229 Loose Road / Sheal's Crescent junction to the Wheatsheaf junction and onwards along the A274 to Warmlake Corner.
- D18. The corridor study noted that, although the TAs supporting the proposed developments put forward mitigation measures for the key junctions, they also emphasise the need for public transport improvements to effect a transfer of trips from the private car to buses. It is unrealistic to expect a significant transfer of trips unless bus travel along the corridor is made more attractive, by achieving bus journey time savings compared with private car journeys, and by improving bus journey time reliability. The transfer of a relatively small proportion of people from car to bus will reduce the traffic on the road, which will benefit those people who remain in their cars. Well-designed bus priority measures have a minimal impact on the capacity of junctions, as the only negative effect on general traffic arises when the bus "overtakes" other traffic on road links, therefore pushing other vehicles very slightly back in the queue. The effect on general traffic is minimal and is far outweighed by the benefit to buses and the resulting transfer of some trips from private car to bus.
- D19. The study developed a package of bus priority interventions comprising a combination of bus lanes and bus "pre-signals" at junctions which allow buses easier access to the signal stop lines. These are illustrated in Appendix B of the study report. The recommendations are supported by junction capacity modelling using the industry standard LinSig software, taking into account the traffic generation and proposed highway mitigation measures associated with the draft Local Plan housing allocations along the A274 Sutton Road for a 2031 assessment year. Although caveats with the LinSig modelling are set out in section 4.3 of the study report, the results do demonstrate that junction capacity is not reduced by the recommended bus priority measures, and indicate the possible journey time savings for buses.
- D20. Based on the analysis in the study report, the recommended bus priority proposals are likely to be needed in the following order (subject to bus journey time monitoring in partnership with the bus companies operating in the area):
1. Inbound bus lane to Armstrong Road and junction improvement measures
 2. Improvements to the existing inbound bus lane on the approach to the Wheatsheaf junction
 3. Extension of the existing inbound bus lane to Mangraves Avenue
 4. Outbound bus lane from Sheal's Crescent to the Wheatsheaf Junction

5. Inbound bus lane from Wallis Avenue to St Saviours Road, and improvements at the St Saviours Road junction
6. Inbound bus lane to the Wallis Avenue/Willington Street junction in addition to the developer's proposed improvements at that junction OR improvements to the route through the Park Wood estate and associated improvements to the Wallis Avenue junction
7. Extension of the inbound bus lane from Grove Road to Mangravet Avenue, and subsequently from St Saviours Road to Grove Road

D21. With the exception of item 7, for which item 3 would also need to be implemented, all schemes stand alone and can be implemented separately to address problems as they arise, specifically to mitigate increased traffic flows generated by developments as they are occupied. The total cost estimate for the recommended package is £3,225,000, but this could increase to £3,840,000 depending on which design option is chosen for the Wallis Avenue/Willington Street junction and for the extension of the existing bus lane to Mangravet Avenue. Some developer contributions towards bus priority measures on the corridor have already been secured from committed developments, and it is possible for the remaining sum to be fully funded from proposed developments in south east Maidstone.

Conclusion

- D22. The proposed housing allocations at the south east strategic development location are well related to existing development and existing bus routes and walking and cycling facilities, providing an attractive choice of travel modes for work, education, business and leisure purposes.
- D23. The results of the localised junction modelling presented within the various TAs indicate that the impact of the increased demand for travel as a result of this housing growth can be successfully mitigated through a package of highway capacity improvements, bus prioritisation measures, increased bus service frequencies and high quality walking and cycling facilities for which funding can be obtained from the proposed developments, in addition to that already secured from committed developments.
- D24. The residual traffic impact would represent an improvement upon the operating conditions which would pertain if the mitigation measures were not implemented, given the increase in vehicle traffic which is already forecast to take place with background traffic growth and committed developments.

A229 Loose Road

A229 Loose Road Corridor Study

- D25. Following a presentation to the 15 April 2015 Maidstone JTB (listed in **Appendix B**), KCC commenced a study of the A229 Loose Road from its junction with Upper Stone Street/Sheals Crescent to its junction with Boughton Lane/Cripple Street to examine potential capacity improvements on the corridor, in response to concerns expressed by County and Borough Members. Concerns were also expressed by the Maidstone Quality Bus Partnership and South Maidstone Action for Roads and Transport (SMART), as well as through the emerging North Loose Neighbourhood Plan.
- D26. The study scope was to look at minor improvements already identified by other parties and schemes which could be delivered using currently available funding, together with major improvements that would be needed to deal with longer term traffic growth as a result of Local Plan development allocations.
- D27. The following schemes were considered as part of the corridor review:
- **Loose Road / Upper Stone Street / Sheal's Crescent** – alteration of lane markings to create two continuous traffic streams into Sheal's Crescent and remove the give way arrangement for southbound traffic turning into Sheal's Crescent from Upper Stone Street. The scheme will improve southbound traffic flow and a preliminary design was presented to the 22 February 2016 JTB as shown in drawing KCC/ITS/2016/Drawing No.1.
 - **Loose Road / Armstrong Road / Park Way** – reallocation of road space to create three southbound lanes and one northbound lane, allowing a dedicated right turn to Armstrong Road. New pedestrian crossing facilities would be provided on the southern junction arm. A preliminary design is shown in the aforementioned Drawing No.1. This mitigation scheme has some differences from that identified in the Countryside TA.
 - **Loose Road / Sutton Road (Wheatsheaf)** – it was noted that this junction already operates above capacity during the AM and PM peak periods. KCC's April 2015 report outlined a two-step approach to mitigation:
 - **Step 1** – closure of the Cranbourne Avenue exit into the junction, requiring a Traffic Regulation Order (TRO). This would increase the green timing for the A229 and A274 by 17 seconds, equating to an additional 340 vehicles an hour being able to pass through the junction. A preliminary design is shown in drawing KCC/ITS/2016/Drawing No.2. This is consistent with the mitigation proposed by the Countryside TA.
 - **Step 2** – should Step 1 not gain sufficient capacity with respect to Local Plan growth, KCC stated its willingness to consider a widening of the A229 southern approach to provide two northbound lanes through the junction, which would require land outside the current highway boundary.

- **Loose Road / Boughton Lane / Cripple Street** – para. 3.4.2 of KCC’s April 2015 report stated that *“Investigations have been carried out by consultants, but the approaches to the junction are constrained and do not offer easy capacity improvements. Other forms of junction control have been considered, but would have difficulty coping with the combination of competing traffic flows and the need to allow pedestrians to cross both the main road and side roads safely. As planning applications have come in, we have therefore sought contributions to the wider transport strategy along the A229”*. Nevertheless, KCC did indicate that they would pursue SMART’s suggestion of a bus layby on the northbound Loose Road just south of the junction, as currently buses stop within the carriageway and can hold northbound traffic back when the signals turn green, reducing capacity. However, this proposal was not included in their presentation to the 22 February 2016 JTB.
- **Review of Bus Stop Locations** – it was identified that other bus stops could benefit from relocation or the provision of laybys to allow traffic to pass in both directions when a bus is stationary. The proposed relocation and removal of bus stops is illustrated in the aforementioned Drawings No.1 and 2.

D28. Members had received communications from members of the public objecting to the proposals in respect of Cranborne Avenue. The JTB therefore resolved that the recommendation for formal consultation on a TRO be dismissed, but approved the proposals with respect to the Loose Road / Upper Stone Street / Sheals Crescent and the Loose Road / Armstrong Road / Park Way junctions.

A229 / Boughton Lane / Cripple Street Junction Review (TRA 030)

D29. Application reference 13/2197 concerned the erection of 220 residential dwellings and the provision of new playing fields for the New Line Learning Academy at land at Boughton Lane (draft Local Plan site H1(29)). This was refused planning permission at Planning Committee on 24 July 2014, although no objection had been received from either the planning authority or highway authority on highways grounds. An appeal was heard on 7 – 10 July 2015. In a letter dated 3 March 2016, it was confirmed that the Secretary of State agreed with the Inspector’s recommendation to dismiss the appeal.

D30. The Inspector considered that the appellants’ forecasts would result in an increase in traffic on Boughton Lane, on the approach to its junction with the A229 Loose Road and Cripple Street, of 15-30% and that the likely impact on this junction would be severe (IR232). Without effective mitigation, the development’s impact on the highway network would be unacceptable (IR233). As KCC had identified no specific mitigation scheme for the junction (as per their A229 Loose Road Corridor Study), a financial contribution had been sought towards wider transport improvements. The Inspector considered that little reliance could

be placed on the proposed highways contribution as a means of mitigation (IR237) and so the development's severe traffic impact would not be effectively mitigated (IR239).

D31. Mott MacDonald was commissioned in March 2016 to consider the options to mitigate the impact of increased traffic flows from application 13/2197 on the operation of the A229 Loose Road / Boughton Lane / Cripple Street junction (IDP Ref. HTUA1). The following determined and pending planning applications (illustrated on the Local Plan Policies Map⁷) were reviewed and flows from each development affecting the junction were incorporated into the trip generation assessment:

- MA/12/1989 – Primary and Studio School, Boughton Lane
- MA/15/509015 – Land South of Sutton Road (site H1(10)) – 750 dwellings, with non-residential uses (including potentially A1 (retail), A3 (sale of food and drink on the premises e.g. restaurant), A4 (public house), D1(a) (medical use), D1(b) (creche/day centre/day nursery), or B1 (office), up to 0.4 ha of land reserved for C2 (residential care) and the reservation of 2.1 ha of land for primary education (use class D1)
- MA/14/503167 – Land at Cripple Street
- MA/15/509251 – Land North of Bicknor Wood, Otham (site H1(7)) – 250 dwellings
- MA/12/0986 – Land Rear of Police Headquarters, Sutton Road (site H1(21)) – up to 112 dwellings.
- MA/12/0987 – Land Rear of Kent Police Training School, St Saviours Road (site H1(22)) – up to 90 dwellings.
- MA/13/1149 – Land at Langley Park (site H1(5)) – up to 600 dwellings, with associated convenience store, retail/commercial units and public house, and two form entry primary school.
- MA/13/0951 – Land North of Sutton Road (site H1(6)) – 186 dwellings.
- MA/13/1523 – Land West of Bicknor Farm Cottages (site H1(6)) – 100 dwellings.
- MA/14/506264 – Bicknor Farm, Sutton Road, Otham (site H1(9)) – up to 272 dwellings.

D32. LinSig modelling was undertaken at the traffic signal junction for a 2031 assessment year. The 2031 base scenario assumed background traffic growth in line with TEMPro, adjusted to avoid double counting of the above developments. The results of the 2031 base assessment confirmed that, even without the traffic generated by the above developments, the existing junction would operate above capacity in both the AM and PM peak periods, with the longest queue on the A229 southbound approach although not blocking back to the Wheatsheaf junction.

Various options were therefore considered to mitigate the cumulative impacts of the committed and proposed developments. These comprised:

- flaring of the southbound A229 Loose Road through the junction to provide a dedicated left turn to Boughton Lane (scheme designed by DHA).

⁷ <http://maidstone.addresscafe.com/app/exploreit/default2016.aspx>

- a staggered pedestrian crossing in the middle of the junction (between Boughton Lane and Cripple Street), replacing the crossings on the A229 northern and southern arms, to reduce the length of the pedestrian green time (Signalised Option A).
- the introduction of secondary stop lines on the A229, to allow both side roads (Boughton Lane and Cripple Street) to run at the same time (Signalised Option B).
- a double mini-roundabout providing two southbound lanes between the two roundabouts (Mini-Roundabout Option 1).
- A double mini-roundabout also providing two southbound lanes at the southbound stop line of the northern roundabout (Mini-Roundabout Option 2).

D33. Mini-roundabout options 1 and 2 were tested using the ARCADY modelling software. The results indicated extensive queues on the A229, especially on the southbound approach which would mean blocking back through the Wheatsheaf junction to Maidstone town centre.

D34. Signalised Option B mitigates the impact of development in the AM peak, but not in the PM peak. The junction remains above capacity in both peak periods.

D35. However, signalised Option B fully mitigates the impact of development traffic in both periods. Furthermore, the junction is predicted to operate within its theoretical capacity in the AM peak, and only slightly over capacity in the PM peak – a significant improvement over the baseline situation (without development) with the existing junction layout.

D36. The results of the junction modelling therefore confirm that, with the implementation of mitigation measures, the Boughton Lane residential development and other proposed and committed developments in the area can be delivered with a net positive impact on the operation of the A229 Loose Road / Boughton Lane / Cripple Street junction.

A229 Royal Engineers Way (TRA 032)

D37. Mott MacDonald was commissioned in April 2016 to consider the capacity at the roundabout junction of the A229 Royal Engineers Road which serves the existing Barracks, in the context of draft Local Plan Policy H2(2) which identifies Invicta Park Barracks as a broad location for housing growth towards the end of the Local Plan period (post 2026) .

D38. A report was produced in May 2016 which tested two scenarios, for 1,300 and 1,500 dwellings at the Barracks. The ARCADY modelling showed that the roundabout is forecast to operate above capacity in both the 2031 base (without development); and 2031 design (with development) scenarios.

D39. Consideration was then given to widening the roundabout approaches, but this worsened the performance of the roundabout. The part-signalisation of the roundabout (north and south arm) and slight enlargement of the roundabout was then modelled using LinSig. This

would permit the roundabout to perform within its desirable capacity in 2031 with development traffic and background traffic growth. Compared to the existing layout, queuing would be reduced to below 2013 levels. The part-signalisation layout would therefore successfully mitigate the impacts of development traffic and provide a degree of planning gain. The mitigation scheme can be delivered within the existing highway boundary.

M20 Junction 7

Cumulative transport assessment of committed and proposed development

- D40. A TA was submitted in July 2013 to accompany the planning application for a proposed medical campus development at Land South of Kent Institute of Medicine and Surgery (KIMS), Newnham Park (MA/13/1163/OUT) by Maidstone Medical Campus Ltd (hereafter referred to as the MMC TA, listed in **Appendix B**). The application was permitted on 23 April 2014.
- D41. The trip generation assessment within the MMC TA assumed additional floorspace of 135,000m² associated with the medical campus, and not the (up to) 98,000m² included in the planning application. The assessment also included traffic generated by the following committed developments:
- Eclipse Park Phase 6, 7 and 8 - B1 offices (ED9 , 13/0389)
 - Eclipse Park Plot 4 – Offices (ED9, 08/1732, now a NEXT store)
 - Eclipse Park land west of P&R – c. 150 bed Hotel (ED9)
 - Maidstone TV Studios – mixed residential development (14/500290/FULL), 77 dwellings
 - Kent Clinic (KIMS) – tertiary private hospital (09/0973)
- D42. As per scoping responses included as Appendix A to the MMC TA, it was agreed with the then Highways Agency and KCC in March 2013 that the MMC TA should consider the impacts of committed and proposed developments in the vicinity of M20 Junction 7 on capacity and delay at the following junctions:
- M20 Junction 7
 - M20 link road / Bearsted Road roundabout
 - Sittingbourne Road / Penenden Heath Road / Bearsted Road/P&R/Eclipse Park roundabout (“Chiltern Hundreds”)
 - New Cut Road / Bearsted Road roundabout
 - Bearsted Road / Eclipse Park signal junction

- New Cut Road / A20 Ashford Road signal junction

D43. Localised transport modelling was undertaken at the above junctions utilising industry standard ARCADY software for roundabouts and LinSig for signal junctions, for a 2013 base year and 2015 (MMC Phase 1), 2017 (MMC 50% complete), 2020 (MMC 75% complete) and 2023 (MMC 100% complete) assessment years. The results of the assessment confirmed that mitigation would be required at three of the six junctions in order to accommodate the traffic generated by the committed and proposed developments. The proposed mitigation measures were outlined in section 10.2 of the MMC TA and comprise:

- **New Cut Road / Bearsted Road roundabout (IDP Ref. HTJ71)** – interventions would be required at the 75% development completion point, forecast to be in the year 2020. The improvements comprise a larger roundabout diameter, increased approach road widths (flares) and exit widening. A feasibility drawing is included as Appendix BB of the MMC TA.
- **M20 link road / Bearsted Road roundabout (IDP Ref. HTJ71)** – a feasibility drawing showing the signalisation of the junction is included as Appendix CC of the MMC TA. This would also be required at the 75% development completion point.
- **M20 Junction 7 (IDP Ref. HTJ72)** – Appendix DD of the MMC TA shows a feasibility design with the following interventions:
 - signalisation of three junction arms: M20 coast bound off slip, A249 north and south approaches;
 - London bound off slip remains as give way;
 - widening of the coast bound off slip from two lanes to four over a distance of approximately 200 metres;
 - removal of the two free flow left slip lanes;
 - re-marking of the west overbridge from two lanes to three (no physical works required); and
 - provision of a controlled pedestrian crossing route south to north and vice-versa.

D44. The results of junction modelling indicate that each scheme would successfully mitigate the impacts of the development, and provide a degree of planning gain.

D45. Section 8.11 of the MMC TA presents the results of sensitivity tests which assumed that the Newnham Court Shopping Village, immediately to the west of the MMC site, was developed. This comprised up to 45,297m² of internal and external floorspace, including a redeveloped Notcutts Garden Centre, a range of non-food retail including an anchor store and a Waitrose food store. Cumulative impacts were analysed for 2015 and 2023 assessment years which identified the need for additional mitigation due to the high volume of trips expected to be generated by the retail development.

D46. A detailed planning application (MA/13/1931) for the aforementioned Newnham Court Shopping Village was submitted in November 2013 by Land Securities plc but refused on

12th June 2014. The Land Securities TA (listed in **Appendix B**) contained a trip generation assessment which included the same committed developments as the MMC TA. It modelled a 2013 base year, 2016 opening year and 2023 assessment year. In addition to the schemes identified in the MMC TA, the Land Securities TA confirmed that the following mitigation measures would be required:

- **New Cut Road / Bearsted Road roundabout (IDP Ref. HTJ71)** – signalisation. A feasibility design is included as Appendix W of the Land Securities TA.
- **Bearsted Road dualling (IDP Ref. HTJ74)** - the approach road widening (flares) required on Bearsted Road to mitigate the impacts of the retail redevelopment, on the western approach to the New Cut Road roundabout and the eastern approach to the M20 link road roundabout, would effectively meet in the middle on a road link which is approximately 280m in length between roundabouts. Dualling would therefore be required, comprising two 7.3m wide carriageways, a 3.0m wide footway/cycleway on the north side and a 2.0m footway on the south side. A feasibility design is included as Appendix X of the Land Securities TA.

D47. In addition to highway mitigation, a package of walking and cycling improvements was identified in the MMC TA to encourage staff from the nearby residential areas of Vinters Park and Grove Green to travel by these modes. The improvements are shown in Appendix EE of the MMC TA and comprise:

- widening of the footway on the west side of New Cut Road southwards to the TV Studios roundabout to 1.8m where highway land allows;
- widening of the footway on the north side of Bearsted Road between the New Cut Road and M20 link road roundabouts to 2.0m;
- footway improvements on the south side of Bearsted Road between the M20 link road and Hampton Road;
- a signal controlled crossing on Bearsted Road immediately west of New Cut roundabout; and
- a combined foot/cycleway linking into the proposal site from Bearsted Road, in the vicinity of New Cut roundabout.

D48. With respect to public transport improvements, discussions took place prior to July 2013 between the developer and Arriva, the largest local bus operator, to consider the scope for providing a bus service between the medical campus and Maidstone town centre. The options considered were:

- (1) Extending the 506 Sittingbourne Road P&R to the site;

(2) Diverting the 333/334 Maidstone to Sittingbourne service to the site; and

(3) A standalone loop service between the site and town centre, via New Cut Road.

- D49. At the time (1) was identified by the developer as the preferred option, but the Park & Ride service was withdrawn in February 2016. However, Arriva has outlined its aspirations to upgrade the 333/334 service from the current half-hourly frequency to every 20 minutes. Proposals to further upgrade this service to a 15 minute frequency are identified through draft Local Plan Policy RMX1 (1), the draft ITS (Action PT2) and the IDP (Ref. HTJ75). A working group has been established to develop an overall masterplan for the M20 Junction 7 area, including KCC, HE, Arriva and developers, and detailed bus service proposals will be developed through the monthly group meetings.

Impacts of the full Local Plan development allocations to 2031

- D50. The TAs outlined above demonstrate that the transport impacts of committed and proposed developments in the vicinity of M20 Junction 7 can be successfully mitigated. However, the localised junction modelling within the TAs does not consider the impacts of the full Local Plan development allocations to 2031. The Maidstone VISUM model was originally identified as the tool for this purpose but, as it is understood to cover the county road network leading north to M20 Junction 7, but not the junction or the motorway itself in detail, MBC is working towards agreement of an alternative methodology with HE and KCC following a meeting on 18 May 2016. This will involve localised junction modelling for Junction 7 and the manual assignment of traffic generated by the Local Plan development allocations to 2031 which have not already been permitted. This exercise will confirm whether the already identified mitigation scheme for M20 Junction 7 can accommodate the full Local Plan development allocations, or whether additional mitigation is required and, if so, the year by which this mitigation will need to be delivered.
- D51. In its consultation response to application 15/509015/OUT (Land South of Sutton Road, Langley) dated 21 April 2016, HE considered that the proposed development may result in severe harm to M20 Junction 7, partly because the applicant's transport consultant has estimated that the development would generate 60 one-way trips via the junction in the AM peak, and 63 one-way trips in the PM peak. HE has requested a traffic impact assessment to establish the impact of the development on Junction 7 and the wider local network, and the plans to mitigate that impact. This exercise will take place in tandem with the wider motorway junction modelling exercise outlined above, and will also take into account traffic generated by applications MA/14/506264 (Bicknor Farm, Sutton Road, Otham) and MA/15/509251 (Land North of Bicknor Wood, Otham) as a means of establishing a suitable level of contribution from these developments towards mitigation works at Junction 7.

North West Strategic Development Location (Draft Local Plan Policy SP2)

Cumulative transport assessment of development allocations

- D52. A TA was submitted in December 2015 to accompany the planning application for residential development (225 dwellings) on Land at Fant Farm (15/509962/OUT) by Gleeson Developments Ltd (hereafter referred to as the Gleeson TA, listed in **Appendix B** of this topic paper).
- D53. In a scoping meeting between KCC and the developer's transport consultants on 15 October 2015 it was agreed that the trip generation assessment within the Gleeson TA would include the following committed developments:
- Bridge Nursery (site H1(1), 14/501209/FULL) – 140 dwellings;
 - Land West of Hermitage Lane (site H1(3), 13/1702) – 250 dwellings (see paragraph D59);
 - East of Hermitage Lane (site H1(2), 14/5037) – 500 dwellings;
 - Land at Oakapple Lane (site H1(4), 14/500412/FULL) – 69 dwellings;
 - South of Oakapple Lane (site H1(3), 13/2079) – 80 dwellings;
 - Preston Hall (within Tonbridge & Malling Borough, 12/1647) – 208 dwellings
 - Land off Marigold Way (12/1749) – 40 dwellings; and
 - Bell Farm (site H1(23), 14/506419) – 35 dwellings (refused).
- D54. It was further agreed with KCC at the scoping meeting that the Gleeson TA should consider the impacts of committed and proposed developments in north west Maidstone on capacity and delay at the following junctions:
- Gatland Lane / Site Access priority junction;
 - Farleigh Lane / Gatland Lane / Glebe Lane staggered priority junction;
 - A26 Tonbridge Road / B2246 Fountain Lane / Farleigh Lane signalised crossroads; and
 - M20 Junction 5.
- D55. Localised transport modelling was undertaken at these junctions using industry standard Junctions 9 (comprising PICADY for priority junctions and ARCADY for roundabouts) and LinSig software (for signalised junctions), for a 2018 opening year and 2025 assessment year.
- D56. The results of the assessment indicated that M20 Junction 5 will exceed capacity in the 2025 AM peak (but a mitigation scheme was identified in the TA for site H1(3) – see paragraph D59). With respect to the A26 Tonbridge Road / B2246 Fountain Lane / Farleigh Lane signalised crossroads, the Gleeson TA noted the committed mitigation scheme (IDP ref. HTNW4) associated with the development proposals for site H1(3), which is expected to be delivered by 2018. With this mitigation, the results show the junction as operating within capacity with the committed developments, but slightly over capacity with the inclusion of the proposed Fant Farm development. Further mitigation measures were identified,

comprising the lengthening of the A26 west approach to the junction, improving pedestrian facilities and alteration of the stop lines. The results of modelling with the additional mitigation in place indicate that the junction remains over capacity but that the impacts of the proposed development are largely mitigated. However, the Gleeson TA presented the results of a sensitivity test with reduced pedestrian crossing time within the LinSig model, consistent with conditions observed during a pedestrian survey on 3rd November 2015, which suggested that the junction would operate within capacity in the 2018 opening year.

D57. In response to technical issues raised by KCC following a review of the Gleeson TA, in February 2016 a TA Addendum was submitted (listed in **Appendix B** of this topic paper) which presented the results of further localised transport modelling as follows:

- **A26 Tonbridge Road / B2246 Fountain Lane / Farleigh Lane signalised crossroads** – further mitigation measures were identified within the existing highway boundary, illustrated on Addendum drawing ITB10344-GA-003. The LinSig model outputs indicate that the junction operates within capacity with the proposed and committed developments in the 2018 opening year.
- **A20 / B2246 Hermitage Lane / Preston Hall signal junction** – the Addendum tested the impacts of proposed and committed development on a mitigation scheme identified by KCC (IDP Ref. HTNW5). The proposals provide an additional ahead lane to the A20 westbound approach by widening the southern part of the junction towards Hermitage Lane. The LinSig model outputs indicate that the junction operates within capacity with the proposed and committed developments in the 2018 opening year.
- **A20 / Coldharbour Lane signalised roundabout** – the Addendum tested an interim mitigation scheme for the roundabout (not the more comprehensive scheme designed by WSP for the Land East of Hermitage Lane TA) which provides a third approach lane on the A20 London Road (West) arm. The LinSig model outputs indicate that the interim mitigation brings the A20 London Road (West) arm within capacity with the proposed and committed developments in the 2018 opening year.

Land East of Hermitage Lane (site H1(3))

D58. Application reference 13/1749 & TM/13/03147/OA, dated 11 October 2013, concerned the erection of 500 residential dwellings (including affordable homes, land safeguarded for an education facility and land safeguarded for a community centre, the provision of open space (including children's play areas) associated infrastructure and necessary demolition and earthworks and the formation of 2^{no} new vehicular accesses from Hermitage Lane and Howard Drive, the former to be the principal point of access and the latter an access for emergency vehicles and buses only. This was refused by notice dated 3 July 2014.

- D59. In the Highways Statement of Common Ground (signed on 17 April 2015) the Appellant (Croudace Strategic Ltd) agreed with KCC that the transport impacts of the development could be appropriately mitigated by s106 contributions towards the following schemes:
- Clearance, signing, lining and crossover works in support of KCC's scheme for a shared use footway on the east side of Hermitage Lane from the limit of the shared use at the Hospital northwards to Barming railway station (IDP Ref. HTNW10);
 - Provision of additional pedestrian crossing facilities on Hermitage Lane, north of the site access (IDP Ref. HTNW9);
 - Provision of support for a bus service linking the Hospital with Allington and the town centre via the development site (as per IDP Ref. HTNW7 and draft ITS Action PT7);
 - Funding of interim improvements to M20 Junction 5 as agreed with Highways England, i.e. a white lining scheme (IDP Ref. HTNW1). Appendix M of the TA (dated 7 February 2014) produced by WSP in support of application 13/1749 confirmed that the scheme (shown as Figure 4 in that appendix) successfully mitigated the impact of development traffic;
 - Contribution towards improvements at the A20 Coldharbour roundabout (IDP Ref. HTNW3). An outline design had been developed by WSP and included under paragraph 2.1.8 of the SoCG. This provides a third approach lane on the A20 London Road (West) arm as well as reducing the central island and regularising circulation areas. Although the proposals would be refined during the detailed design stage, it was accepted by both parties that a deliverable solution exists within the existing highway boundary; and
 - Contribution towards capacity improvements at the Fountain Lane/A26 Tonbridge Road signal junction (IDP Ref. HTNW4).
- D60. An appeal was heard on 2 – 5 and 9 June 2015 and only one of MBC's reasons for refusal remained an issue at that appeal, namely the need for a minor link road to be constructed through a section of designated Ancient Woodland to provide access to residential properties proposed on the "Hospital Field", *"where the need for and benefits of the development does not clearly outweigh the loss contrary to policy H12 of the Maidstone Borough-Wide Local Plan (2000), advice contained within paragraph 118 of the National Planning Policy framework 2012 and policies H1(2) and DM10 of the Maidstone Borough Local Plan Regulation 18 Consultation 2014."*
- D61. In a letter dated 19 October 2015, it was confirmed that the Secretary of State agreed with the Inspector's recommendation to dismiss the appeal. In respect of the Inspector's assessment regarding planning conditions (IR 281-300), condition 8 confirmed that *"No more than 250 dwellings within the development hereby permitted shall be occupied until*

the completion of the improvements to M20 Junction 5 shown on drawing number WSP Figure 5 (dated 1 May 2014)".

Conclusion

- D62. The proposed housing allocations at the north west strategic development location are well related to existing amenities, bus routes and walking and cycling facilities, providing an attractive choice of travel modes for work, education, business and leisure purposes.
- D63. The results of the localised junction modelling presented within the various TAs indicate that the increased demand for travel as a result of this housing growth can be successfully mitigated through a package of highway capacity improvements, new and improved bus services and high quality walking and cycling facilities. The majority of Local Plan housing allocations in the area have already been approved with funding secured towards these transport interventions. Additional funds will be obtained from developments currently proposed.

Lenham Rural Service Centre

- D64. Mott MacDonald was commissioned in June 2015 (TRA 023) to undertake localised transport modelling at six junctions in Lenham:
- Junction 1 – Pilgrims Way / Ashford Road (A20) / Ham Lane / Ashford Road (A20)
 - Junction 2 – Ashford Road (A20) / Maidstone Road / Ashford Road (A20)
 - Junction 3 – Ham Lane / Old Ham Lane / Ham Lane
 - Junction 4 – Faversham Road / Old Ashford Road / High Street / Maidstone Road
 - Junction 5 – Ashford Road (A20) / Old Ashford Road / Ashford Road (A20)
 - Junction 6 – Faversham Road / Ashford Road (A20) / Faversham Road / Ashford Road (A20)
- D65. Capacity assessments were undertaken at the above priority junctions using the industry standard PICADY software, for a 2015 existing year, a 2031 base year (i.e. forecast background traffic from TEMPro) and a 2031 design year (i.e. forecast background traffic plus development). The 2031 design year trip generation assessment incorporated the following development proposals:
- Tanyard Farm, Old Ashford Road (site H1(42)) – up to 155 dwellings;
 - Glebe Gardens (site H1(43), 14/0174/OUT) – 9 dwellings;
 - Ham Lane (14/502973/FULL) – 82 dwellings;
 - The Paddock, Grove House, Old Ashford Road (14/503411/FULL) – 23 dwellings;
 - Land At Northland and Groom Way, Old Ashford Road (12/1777) – 12 dwellings;

- Lenham United Reformed Church, Maidstone Road (14/502152/FULL) – 24 dwellings; and
 - The Old Goods Yard, Headcorn Road (14/500219/OUT) – 66 dwellings.
- D66. The junction capacity analysis shows all junctions would operate within the recommended maximum design capacity in both the 2031 base and design scenarios. However, the modelling omitted the up to 1,500 dwellings identified in draft Local Plan Policy H2(3), which identified Lenham as a broad location for housing growth towards the end of the Local Plan period (post 2026). A Technical Note Addendum was produced in August 2015 (TRA 024) which tested a scenario with the 1,500 dwellings equally split between the east and west of Lenham, in addition to the traffic movements modelled in the original Technical Note. With the inclusion of the larger 1,500 unit residential scheme, three of the six junctions – 1, 4 and 5 – are forecast to operate above capacity in the 2031 design year.
- D67. In April 2016 Mott MacDonald were commissioned to test further options for broad location housing growth in Lenham as follows:
- Option 1 – 30% located in the east, 70% in the west
 - Option 2 – 70% located in the east, 30% in the west
- D68. The existing priority junctions were subject to capacity assessment for both Options 1 and 2. The April 2016 Technical Note (TRA 033) indicated that for Option 1, only junction 5 was found to work within capacity (but above desirable capacity, i.e. a Ratio of Flow to Capacity (RFC) value of 0.85) in the 2031 design year, with junctions 4 and 5 both operating above capacity. For Option 2, all three junctions were found to operate above capacity.
- D69. A number of alternative junction layouts were then assessed for their potential to mitigate the impacts of traffic generated by the broad location housing growth. These layouts were:
- **Junction 1 (Pilgrims Way / Ashford Road (A20) / Ham Lane / Ashford Road (A20)):**
 - Improved priority layout with an extended ghost island
 - Roundabout layout
 - Signalised junction
 - Signalised junction with additional lanes (only this mitigation option brings the junction within capacity, for both Options 1 and 2)
 - **Junction 4 (Faversham Road / Old Ashford Road / High Street / Maidstone Road):**
 - Mini-roundabout layout (this mitigation option brings the junction within capacity, but for Option 1 only)
 - Signalised junction (this mitigation option brings the junction within capacity, but for Option 1 only. It is a higher cost option with greater visual impacts, so a mini-roundabout may be preferable).
 - **Junction 5 (Ashford Road (A20) / Old Ashford Road):**

- Mini-roundabout layout (this mitigation option operates within capacity for Option 1, but exceeds desirable capacity and is unsuited to a principal road with a 60mph speed limit)
- Roundabout layout (this mitigation option operates within capacity for both Options 1 and 2)
- Signalised junction (this mitigation option operates within capacity for both Options 1 and 2, and is the likely preferred option due to lower costs)

D.70 The April 2016 Technical Note recommended that the majority of broad location housing development is located to the west of Lenham, in line with Option 1.

D71. In conclusion, the localised junction modelling undertaken within Lenham indicates that the transport impacts of both allocated developments and the broad location housing growth can be fully mitigated, with junctions operating within capacity in the 2031 design year.

Headcorn Rural Service Centre (TRA 022)

D72. Mott MacDonald was commissioned in June 2015 to undertake localised transport modelling at five junctions in Headcorn:

- Junction 1 – Moat Road / North Street (A274) / Kings Road / Mill Bank (A274)
- Junction 2 – Kings Road / Ulcombe Road / Lenham Road / Forge Lane
- Junction 3 – Station Road (A274) / Station Approach / Station Road (A274)
- Junction 4 – Oak Lane / Grigg Lane / Oak Lane
- Junction 5 – Wheeler Street (A274) / Oak Lane / Wheeler Street (A274)

D73. Capacity assessments were undertaken at the above priority junctions using the industry standard PICADY software, for a 2015 existing year, a 2031 base year (i.e. forecast background traffic from TEMPro) and a 2031 design year (i.e. forecast background traffic plus development). The 2031 design year trip generation assessment incorporated the following development proposals:

- Old School Nursery, Station Road (site H1(36), 14/0721) – 9 dwellings;
- Ulcombe Road and Mill Bank (site H1(37), 14/505284/OUT) – 220 dwellings;
- Grigg Lane and Lenham Road (site H1(38), 12/1949, 13/1943, 14/503960/OUT, 15/501342/OUT) – 86 dwellings;
- South of Grigg Lane (site H1(39)) – up to 55 dwellings; and
- Knaves Lane (site H1(40)) – up to 5 dwellings.

D74. The junction capacity analysis shows all junctions would operate within the recommended maximum design capacity in both the 2031 base and design scenarios.

The study scope was to assess junction operation in existing and future scenarios, and not to analyse and review other aspects of junction operation such as safety. However, junction layout and safety could be considered interdependent of one another. The Technical Note commented that, although not unsafe, priority crossroads are considered less safe than other types of junctions because of the number of movements dependent on drivers waiting and giving way. The signalisation of Junction 1 was identified as a possible recommendation in terms of improving safety, as all arms would be controlled. IDP Ref. HTHE2 and draft ITS Action H1 identify the signalisation of the A274 North Street / Kings Road crossroads as a mitigation scheme.

Staplehurst Rural Service Centre

- D75. Mott MacDonald was commissioned in March 2015 to undertake localised transport modelling at two junctions in Staplehurst (TRA 021):
- A229 Station Road / Station Approach / Market Street priority crossroads; and
 - A229 Station Road / Headcorn Road / A229 High Street / Marden Road (“Cuckolds Corner”), a signalised junction.
- D73. Capacity assessments were undertaken at the priority crossroads and at the signalised junction using the industry standard PICADY and LinSig software respectively, for a 2014 existing year, a 2031 base year (i.e. forecast background traffic from TEMPro) and a 2031 design year (i.e. forecast background traffic plus development). The 2031 design year trip generation assessment incorporated the following development proposals:
- Hen and Duckhurst Farm, Marden Road (site H1(49), 14/502010/OUT) - up to 250 dwellings;
 - Fishers Farm, Fishers Road (site H1(50)) – 417 dwellings (of which 167 were the subject of application 14/505432/FULL);
 - Land at Lodge Road (HO3 – 283) – 60 dwellings;
 - Land south of Marden Road (HO3 – 240) – 100 dwellings; and
 - Land south of Oliver Road (known as Land north of Henhurst Farm) (site H1(51)) – 60 dwellings.
- D74. The junction capacity analysis showed that the A229 Station Road / Station Approach / Market Street priority crossroads would operate slightly above capacity in the 2031 design scenario, but with queuing and delay dissipating within the peak hour. The Cuckold’s Corner signal junction operates above design capacity in both the 2031 base and design scenarios.
- D75. A mitigation scheme was developed for Cuckolds Corner to bring the signal junction within design capacity. This covered third party land but KCC has advised that mitigation schemes requiring third party land are undeliverable, as the highway authority is not in a position to

use its powers to compulsorily purchase land. Mott MacDonald was therefore commissioned in November 2015 (TRA 021B) to develop a revised mitigation scheme within the existing highway boundary, with the addition of Land at Stanley Farm, Headcorn Road (HO-15, 15/507124/OUT) to the trip generation assessment. LinSig modelling of the revised scheme indicated that a 'nil detriment' situation was not quite achieved, but that additional queuing, the measure most easily perceived by road users, was relatively small and could not be considered severe.

- D76. In February 2016 Mott MacDonald were commissioned to undertake further modelling for a 2022 base and design year (TRA 027), at which time a review of the Local Plan is scheduled to take place. The LinSig models were re-run, with a further scenario tested with development flows reduced by 10% to take account of the impacts which could be achieved through travel planning measures. The improved layout would allow the junction to perform almost entirely within its theoretical capacity in 2022 if travel planning measures deliver the 10% reduction in development traffic. Queuing would be of a similar level to that in the base. Although the proposed scheme does not entirely mitigate the impact of proposed development, the residual impact cannot be considered severe in the context of the National Planning Policy Framework.

Coxheath Larger Village

- D77. Mott MacDonald was commissioned in May 2015 (TRA 020) to undertake localised transport modelling at two junctions in Coxheath:
- Stockett Lane/B2163 Heath Road/Westerhill Road priority crossroads
 - A229/B2163 signal junction (Linton Crossroads)
- D78. Capacity assessments were undertaken at the above priority junctions using the industry standard PICADY software for the former junction and LinSig for the latter junction, for a 2014 existing year, a 2031 base year (i.e. forecast background traffic from TEMPro) and a 2031 design year (i.e. forecast background traffic plus development). The 2031 design year trip generation assessment incorporated 1,087 housing units from Coxheath, Boughton Monchelsea and Marden as per Appendix A of the technical note (Mott MacDonald, June 2015), and 887 housing units from Staplehurst (Appendix A of the Staplehurst technical note (Mott MacDonald, June 2015)).
- D79. The junction capacity analysis showed that the Stockett Lane/B2163 Heath Road/Westerhill Road priority crossroads would operate within the recommended maximum design capacity in both the 2031 base and design scenarios during the AM and PM peak periods. However, Linton Crossroads would operate above capacity in the 2031 base and therefore the design scenario.

- D80. A mitigation scheme was developed for Linton Crossroads to bring the signal junction within design capacity. This covered third party land but KCC has advised that mitigation schemes requiring third party land are undeliverable, as the highway authority is not in a position to use its powers to compulsorily purchase land. Mott MacDonald was therefore commissioned in April 2016 (TRA 031) to develop a revised mitigation scheme within the existing highway boundary.
- D81. LinSig modelling of the revised scheme confirmed that the junction would operate within desirable capacity during both the AM and PM peak hours. A concept design (IDP Ref. HTC1) is included as Appendix A of the June 2015 technical note.
- D82. In conclusion, the localised junction modelling undertaken within Coxheath indicates that the transport impacts of allocated developments can be fully mitigated, with junctions operating within capacity in the 2031 design year.