

HIGHWAYS AGENCY

## **M20 MAIDSTONE NEW GROWTH POINT**

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| I        | Acceptability Criteria.  |
| II       | Letter from the Department for Communities and the Local Government regarding New Growth Points. |

### 1 INTRODUCTION

#### 1.1 General

1.1.1 Parsons Brinckerhoff (PB) has been commissioned by the Highways Agency (HA) to investigate the operation of the M20 from Junction 5 to Junction 8.

1.1.2 The HA has been asked to respond to the proposals for Maidstone to achieve New Growth Point status. In the DCLG's response to Maidstone's proposals, there were two areas of concern in which Maidstone were recommended to consult with the Highways Agency, these were:

- Sustainability of locating employment development near to the M20
- Appraisal of current and future constraints on the M20 around Maidstone

1.1.3 The HA has been asked to respond to the proposals for Maidstone to achieve New Growth Point status. To enable the HA and Kent County Council (KCC) to understand the impact of the proposed development on the highway network, and to inform the evidence based assessments regarding transport, it is necessary to undertake a strategic transport model of the area. This will enable the transport implications of the proposals to be determined and will provide evidence to enable both highway authorities to address the following questions:

- How would the growth proposals impact on existing transport networks?
- What interventions are necessary to deal with these impacts?
- To what extent have alternatives to investment in new infrastructure been explored by authorities as a means of providing the necessary capacity to cater for the proposed additional growth (i.e. reducing the need to travel, smarter choices, demand management etc)?
- What would be impact on the growth proposals if these interventions were not delivered?
- Is there room for changes in the proposal that would lessen the transport impact
- What are the ballpark costs of each of the transport interventions necessary to support the growth?
- Are there sufficient resources to deliver the growth?

#### 1.2 Project Background

1.2.1 The report has transpired as a result of the Government initiative 'New Growth Points' which are;

*'designed to provide support to local communities who wish to pursue large scale and sustainable growth, including new housing, through a partnership with Government.'*<sup>1</sup>

1.2.2 As a result, the town of Maidstone applied for such funding and was granted with £1.5 million for the first year, to support the regeneration of the town and to introduce affordable housing, new employment and small business units which will in turn require improved transport links and an upgrade to public spaces. Future funding is dependant upon the outcome of the comprehensive spending review in 2007.

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<sup>1</sup> <http://www.communities.gov.uk>

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1.2.3 The HA has been working in partnership with Maidstone Borough Council (MBC) and KCC on this report as required by the Henry Clary letter dated July 2006 which states there will be specific transport issues that need resolved (see appendix 1). "The HA have commented that it will be necessary to assess the effects of the proposals on traffic distribution to ensure that they are deliverable without adverse consequences for the strategic road network".

1.2.4 The funding however has many stipulations, one being the need to achieve an overall growth of 500 houses per year. In order to achieve New Growth Point status, MBC has proposed that 10,080 new homes will be built by 2026 of which 5,040 will be built by 2016. In addition to this 12,000 jobs are predicted to be supplied by 2026. This compares to the housing allocation stated within the South East Plan of 8,200 houses to be built by 2026. In addition it should be noted that these figures are subject to change and it is predicted that there will be potential for an uplift in housing beyond the housing levels used within this report.

1.2.5 Therefore it should be noted that this study only considers the proposed development allocated for the New Growth Point status. As a result, any increase in housing levels will only contribute to the levels of congestion predicted for future years. Also this report assumes there to be no further growth following 2026.

### 1.3 Local issues

1.3.1 The local highway network within Maidstone is frequently congested especially during weekday AM peak periods. Due to existing levels of congestion it is apparent that the transport network will require a number of measures to ensure that Maidstone can adequately accommodate the proposed development.

### 1.4 Wider Impacts

1.4.1 The introduction of any development of this volume will result in an increase in traffic flow and congestion levels both within Maidstone and the surrounding area. It is important to note that this report only identifies the problems between M20 Junction 5 – 8 and neighboring junctions and therefore does not consider additional network problems beyond this realm. A few locations already experiencing problems have been provided below.

- The M20 from Junctions 3 to 5 currently operates over capacity. An increase in traffic volumes will only add to the existing congestion levels.
- The growth generated by Medway towns has not been directly included within this assessment and therefore will only add further to congestion levels.
- The current growth proposals occurring at Kent Thameside and Ashford has also not been directly included within this assessment and will also contribute to an increase in congestion levels in the future.

### 1.5 Purpose and Objectives

1.5.1 The purpose of this study is to inform the Highway Agency on the current operation and future operation of the M20 Junctions 5 to 8, focusing on the development issues. The study also remains in line with the transport analysis objectives set out in

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the Guidance for the Methodology for the Multi-Modal Studies (GOMMMS) and any supplementary revisions, namely:

- 1 Safety;
- 2 Economy;
- 3 Environment;
- 4 Accessibility; and
- 5 Integration

1.5.2 Understanding the operation and development issues today will allow the HA to make informed decisions in the future regarding changes to the network in accordance with the policies at the time.

1.5.3 The aim of this study is to provide the HA with sufficient information to develop a strategy for improvements along the section of the M20 from Junction 5 to Junction 8 to accommodate future planned developments within Maidstone. This strategy will be in line with policies such as DfT Circular 02/2007 'Planning and the Strategic Road Network'.

1.5.4 This will enable the HA to respond to the Core Strategy and assist in identifying sustainable locations for developments. In addition the intent is to establish a good working relationship with the relevant authorities in order to derive a Core Strategy, which can be supported by the transport evidence in this study to ensure that the Core Strategy is sound.

### 1.6 Study Area

1.6.1 The M20 forms the main link through the county of Kent and is part of the Trans European Road Network (TERN). It represents a significant link between London and the South West to Dover, Calais, Maidstone and Ashford.

1.6.2 At a regional level the road network supports, commerce, supply and distribution. It serves as a commuting route across the region, and is the main link for Freight offering access to the major ports in the UK.

1.6.3 Locally, the M20 supports economic activity and provides a route linking local communities giving access to local services including; healthcare, shops, education and public transport.

1.6.4 This study covers an 11.1km section of the M20 between Junction 5 to Junction 8.

1.6.5 The trunk road is mainly a three lane motorway with an additional two lane connector road running between Junction 5 and Junction 6 and four lanes between Junction 6 to 7. The national speed limit is in force along the trunk road.

1.6.6 The location the study area is shown in Figure 1.1.

### 1.7 Report Layout

1.7.1 This report is separated into nine sections, see below, summarising the work undertaken and the results attained:

- Existing Conditions
- Model Validation
- Transport Policy Context
- Qualitative Assessment of Options
- Development Areas
- Future Traffic Growth
- Trip Reduction
- Options
- Transport Strategy
- Conclusion

## 2 EXISTING CONDITIONS

### 2.1 General

2.1.1 The existing conditions have been assessed for the current operation of the M20 between Junction 5 and 8. The data collected to carry out this assessment includes the following;

- Automatic Traffic Counters.
- Manual Classified Counts.
- Queue Length Surveys.
- Collision Analysis.
- Special Workplace Statistics Data.
- Roadside Interview Data.
- Existing Public Transport routes/facilities.

2.1.2 In addition, this data has also been used to develop base line transport models for the major junctions concerned in this study.

2.1.3 Please note a more detailed analysis of existing conditions can be found in the technical note 'M20 Junction 5 to 8 - Existing Conditions HTT91272/2020/1/0'.

### 2.2 Automatic Traffic Counters (ATC)

2.2.1 ATC data was obtained from the HA Traffic Information Database in relation to a number of locations along the M20 corridor, on both eastbound and westbound carriageways. The average 12 hour AWT flow along this stretch of the M20 Motorway is approximately 82,000. Higher flow rates can be observed immediately west of Maidstone, with a general downwards trend as the carriageway continues further east.

2.2.2 Junctions 5 to 7 represent major access points into parts of Maidstone and the surrounding areas. As such the flows are generally above the route average, this is due to a large amount of local trips using the motorway to travel within Maidstone. The RSI data analysed also confirms that there are a significant number of local movements between Junction 5 to 8.

2.2.3 During the AM peak period the major traffic movements travel westbound from Junctions 7 to 5 and eastbound from Junctions 7 to 8 towards Dover. The PM peak movements are mirrored to those in the AM peak.

2.2.4 A review of existing ATC data has been undertaken to understand how existing levels of traffic have grown over the last 3 years (between 2004 and 2006). This has demonstrated that the mainline average annual weekday flows are increasing on average by 1% per year.

## EXISTING CONDITIONS

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- 2.2.5 The M20 carries a high proportion of HGV's. Within the study area HGV's make up around 20% of the traffic flows travelling the mainline of the M20 in each direction. The proportion of HGV's on the slip roads vary between 8 – 13% in either direction.

### 2.3 Manual Turning Counts

- 2.3.1 PB commissioned Sky High Traffic Data to carry out a 12-hour manual classified traffic counts between the hours of 7:00 and 19:00 on Tuesday, Wednesday and Thursday, the 14th-16th November 2006 to determine turning movements at each of the 5 junctions along the M20 corridor and 8 junctions adjacent to the network. Figure 2.3.1 shows the location of the manual turning counts.

- 2.3.2 The level of activity at each of the thirteen junctions has been assessed and highlights that the M20 junction 7 has a significantly higher traffic volume than the other junctions with a total volume of 56,900 vehicles. The A20 London Road Roundabout, the two M20 Junction 6 Roundabouts and Bearsted Road Roundabout also experiences high levels of vehicle movement (approximately 44,000 a day) in comparison to the other junctions surveyed. Figures 2.3.2 to 2.3.14 shows the turning counts for each junction.

### 2.4 Queue Surveys

- 2.4.1 PB carried out queue length surveys between the hours of 07:00-18:00 on Thursday 8th March 2007 to determine levels of congestion at Coldharbour Roundabout, Junction 7 and Bearsted Road Roundabout.

- 2.4.2 Coldharbour Roundabout is a signalised roundabout situated south of Junction 5. The approach with the largest congestion is the London Road (A20) West approach during the AM Peak with a 500 metre queue and London Road East with a 400 metre queue in the PM peak. However the queues at this junction were not reported to queue back to Junction 7 at any point throughout the day.

- 2.4.3 Junction 7 is a non-signalised roundabout along the M20. Sittingbourne Road to the north of the junction was the most congested during the AM peak with a queue of over 1900 metres long. During the PM Peak the M20 West had the longest queue of 750 metres. None of the queues on the M20 slip roads extend back onto the M20 mainline.

- 2.4.4 Bearsted Road Roundabout is a non-signalised junction, south of Junction 7. Queuing was only recorded on the Bearsted Road east arm. The queues are 800 metres in the AM peak and 300 metres in the PM peak. The survey did not demonstrate that the operation of this junction causes a problem with the operation of Junction 7.

### 2.5 Collision Data

- 2.5.1 The collision data was obtained for a 6-year period from January 2000 to September 2006 for the M20 between junctions 5 and 8. The area covered by the study comprises the M20 corridor from Junction 5 to Junction 8, a length of approximately 10.5km. This section of the M20 was opened to traffic in 1971.

- 2.5.2 Of the 215 PIA reported along this stretch of the M20, there were 5 fatal (2.3%), 26 serious (12.2%) and 184 slight (85.6%) collisions. This compares to the Road

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Causalities of Great Britain 2005 documented value of 88% for slight collisions. 2004 represents the highest number of collisions with a total of 40 collisions in each year. As a general trend, the above results indicate that the collision rate along the study route is steadily around 30 collisions a year with 2004 being an exception to this.

- 2.5.3 In addition, there appears to be an unusually high proportion of serious collisions in 2001 (11), but on an assessment of the location of these collisions, there does not appear to be a specific reason why this has occurred.
- 2.5.4 The data has been assessed in respect of collisions by day of the week. This showed a consistent pattern over the survey period. The data demonstrated that Friday has the highest collision totals, while Saturday displays the lowest number. The collision data has been further analysed to discover at which times of the day collisions are occurring. The greatest number of collisions occurred in the time periods prior to 09:30 and 16:00-18:30. These time periods include both the AM and PM peak, which are when the total vehicle flows are at their highest levels.
- 2.5.5 This stretch of the M20 experiences slightly more collisions in the dark in comparison to the national averages. This is especially apparent at junctions 5, 6 and 8 and between junctions 5 and 6 and 7 and 8. M20 collision data is broadly in line with the national average for road surface. Although there are a couple of skewed results due to low total numbers, which make the proportion of collisions in icy conditions at Junction 7 and 8 look considerably higher than average.
- 2.5.6 The majority of collisions along this stretch of the M20 occur under fine weather conditions, which is broadly in line with the national averages. However, on the M20 between Junctions 5 and 6 and at Junction 8, a higher proportion of collisions in wet weather conditions are reported in comparison to national averages, but the same pattern is not recorded in the wet surface collisions.
- 2.5.7 The data has been assessed for the type of accident occurring on the network. It is evident that there is a high proportion of loss of control collisions and some common themes to these collisions include excess water on the carriageway and tyre blow outs. In addition, rear shunts are also fairly high on the mainline as well as at junctions. This could be due to the collisions largely occurring in congested conditions on the mainline. The majority of side impact collisions relate to overtaking incidents both on the mainline and at the junction approaches.
- 2.5.8 The level of Heavy Goods Vehicles (HGV's) involvement in the observed collisions has also been considered. This shows that 30% of all observed collisions had HGV involvement. When this was broken down further by M20 location, all sections appear to have varying levels of HGV involvement, with the majority being recorded on the mainline M20.

## 2.6 Special Workplace Statistics

- 2.6.1 The special workplace statistics (SWS) data was collected in 2001. This data was used to distinguish the actual origin and destination trips of car drivers travelling to and from the workplace. This provides relevant trip distribution information for the Maidstone area.
- 2.6.2 Approximately 1/3 of all who live in Maidstone also work within Maidstone Borough, with the High Street being the main work attractor. However the most significant commuter destination from Maidstone is to the remainder of Kent indicating that approximately 20% of commuting traffic has a destination to the east, west or south of

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Maidstone. In addition, 10% of commuters living in Maidstone travel for work in London and 7% work to the South West of Maidstone.

- 2.6.3 Maidstone generates over 22,000 internal trips that start and end within the urban area, and of these around 43% are made by car. The internal trips represent 56% of total daily trips generated within the town.
- 2.6.4 There are about 3,100 daily commuters who have an origin in the Maidstone urban area and a destination in other wards within Maidstone district, with Boxley as the top destination which has a daily trip number of 875, car drivers represent the bulk (76%) of these commuters.
- 2.6.5 The top destination for out-of-district trips is Tonbridge and Malling with over 4,400 trips per day. The percentage of car commuters making these journeys is fairly high at 82%. This is followed by Medway which attracts around 2,000 daily trips, of which 90% travel by car.
- 2.6.6 Trips to the Maidstone urban area, on the other hand, originate mostly from the districts of Medway and Tonbridge and Malling, which generate 5,700 and 4,100 trips per day. Medway has a slightly higher percentage of car drivers making this movement at 81%, while Tonbridge and Malling has 75%.
- 2.6.7 The wards of Coxheath and Hunton, and Boxley generate the highest level of trips to the Maidstone urban area from within Maidstone District, with 950 and 820 trips per day. The corresponding car driver percentage is 73%.
- 2.6.8 In summary, Maidstone town attracts over 6,500 more trips than it generates. The strongest links occur with Tonbridge and Malling and Medway districts. Future forecast to the year 2026, the M20 between Junction 5 and Junction 7 is likely to experience a 25% increase in stress. This will also result in a level of stress that is not deliverable in practice.

## 2.7 Road Side Interview Data

- 2.7.1 Data from the London and South East Travel Survey (LATS) was made available for a number of roadside interview sites in the study area carried out in 2001.
- 2.7.2 The origins of trips are quite localised within Maidstone and accesses the M20 through the use of Junctions 4 to 8. The trip destinations are more widely spread with the M20 being used to access London, Ashford, Canterbury and East Kent.
- 2.7.3 It is notable that the M20 is also used for localised movements using mainly Junctions 4, 5 and 6 to access areas of Maidstone. The Roadside Interview data was used to determine the destination of trips in the network.
- 2.7.4 In the AM peak, around a quarter of the traffic accessing the M20 at Junction 5 and 45% of the traffic joining the M20 at Junction 4 heading eastbound, all comes off at Junction 6 and goes into Maidstone. Approximately 50% of all traffic getting on the M20 westbound at Junctions 7 and 8, in the AM peak comes off and goes into Maidstone at Junction 6. It is also notable that over 50% of traffic that enters the motorway at Junction 3 from the M26 go to Maidstone.
- 2.7.5 All three time periods universally show that over 70% of trips are single occupancy trips and between 13% and 22% is dual occupancy. Vehicles with 3 or more

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passengers account for around 5% of all trips within the network across the three time periods (AM, PM and Interpeak).

- 2.7.6 The Roadside Interview data shows that in the AM peak the majority of trips are to an employer's usual place of work with the reverse journey in the PM peak.

### 2.8 Junction Models

- 2.8.1 An assessment of the operation of M20 junctions 5, 6, 7 and 8 and the Bearsted Road junction have been carried out using the ARCADY 6 roundabout capacity assessment program. The ARCADY software assesses the capacity of the roundabout based on the existing traffic flows and queue surveys and calculates if there is any queuing.

- 2.8.2 The capacity is measured in a Ratio of Flow to Capacity (RFC). Within the Design Manual for Roads and Bridges (TD16/91) there is an accepted standard error prediction of plus or minus 15%. This therefore means any roundabout which has an RFC of close to or over 85% is considered to be near to capacity.

- 2.8.3 M20 Junction 5 shows that none of the entry arms is over capacity and therefore does not exceed the recommended government standard of 85% RFC. The results show that there is no queuing issue at the roundabout.

- 2.8.4 During the AM peak at M20 Junction 6 Cobtree roundabout the junction is shown to operate at capacity. However the PM peak model indicates that the M20 west approach is operating overcapacity causing a queue of over 400 vehicles in the peak hour.

- 2.8.5 M20 Junction 6 Running Horse roundabout shows that in the AM peak the M20, the A229 and Sandling Lane are all operating above 85% RFC, the A229 is the arm which operates the most over capacity and has an RFC of 99% and a queue of 30 vehicles. In the PM peak the roundabout performs better than the AM peak with all arms operating under 85%. However, A229 and Forstal Road are operating close to capacity. There is no issue with queuing in the PM peak.

- 2.8.6 The assessment of M20 Junction 7 demonstrates that the roundabout is currently operating over capacity on the A249 North in the AM peak with a 136 vehicle queue. The PM peak on the A249 North and the AM peak on the M20 East are both currently operating close to capacity in 2006, however it does not queue back onto the mainline.

- 2.8.7 Bearsted Road roundabout is shown to operate over capacity in the AM peak hour in 2006 on all approaches. In the PM peak it can be seen that the Bearsted Road East arm is operating over capacity.

- 2.8.8 M20 Junction 8 shows that the roundabout operates under capacity in both the AM and PM peak. However, the M20 west offslip is close to the 85% recommended guidelines in the PM peak. There is also no issue with queuing at the junction.

### 2.9 Alternative Transport Modes

#### Pedestrians

- 2.9.1 Most areas of the Maidstone town centre have not been pedestrianised, though there are several streets which are now off limit to motor vehicles. Gabriel's Hill, and Week Street – busy shopping areas, are inaccessible by vehicles. Figure 2.9.1 indicates the location and routes of Maidstone's public footpaths.

#### Cycling

- 2.9.2 There are very few designated cycle routes in and around the immediate vicinity of Maidstone's town centre, though a network of bridleways provides some coverage of the outskirts of the town and beyond. Maidstone's latest Integrated Transport Strategy indicates the council's intention to improve and build upon existing cycle routes as part of an initiative to cut down on widespread congestion. A new cycle-way links areas to the north of Maidstone (including Aylesford and Walderslade) to Maidstone centre, and land to the South-East of the town. Figure 2.9.1 indicates the location of cycle routes and bridleways in the Maidstone area.

#### Bus

- 2.9.3 Bus services within Maidstone are provided largely by the company 'Arriva', with 'Nu-Venture' and 'Stagecoach in East Kent' run less frequent services. Buses are run from the centre of Maidstone with greatest frequency from Monday - Friday daytime, with multiple services leaving every 10-15 minutes. Services to locations outside of Maidstone vary from hourly to bi-daily. The town's Park and Ride scheme operates from four locations positioned around the outskirts of the town centre. "These sites provide a total of over 1600 car parking spaces. In July 2004 an average of over 1,500 cars and almost 2,000 fare paying passengers used these sites each day. In the busy pre-Christmas period in December 2004 these figures were just under 2,000 cars and just under 3,000 passengers."<sup>2</sup> An award winning service, buses run from every 12 – 15 minutes, between the hours of 07:00-18:30, Monday to Saturday.
- 2.9.4 Due to the popularity of the scheme, discussions are underway regarding the possibility of the expansion of two of the four parking locations, with a view to introducing further facilities and expanding corresponding bus services. New locations for two "potential sites on A229 and A26" are currently being evaluated.
- 2.9.5 Buses are run from the centre of Maidstone with greatest frequency from Monday - Friday during daylight hours, with many local services leaving every 10-15 minutes. The frequency of services with destinations outside of Maidstone vary widely from hourly, to twice-daily. Maidstone and its immediate area generally have good coverage from bus transport, but some villages are underserved in the evening time, leading to areas being cut off after normal working hours. Appendix 1 shows buses running in the Maidstone area, and the approximate frequency at which they depart, and figure 2.9.2 shows the route of all buses in the Maidstone area, along with key public service locations (rail and bus).

#### Train

- 2.9.6 There are three railway stations in the town; Maidstone East, Maidstone West and Maidstone Barracks. Trains run from Maidstone to London, and more Eastern locations on average every 60 minutes, becoming more frequent at peak hours.

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<sup>2</sup> [Integrated Transport Strategy](#)

## EXISTING CONDITIONS

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Maidstone's integrated transport strategy however, describes a rail system within which "overcrowding at peak times is unacceptable...there is also very poor connectivity to other parts of the rail network". This is a contributing factor to the current situation - in which many commuters are driven away from the train system and back to their cars. KCC views this as a key issue which needs to be addressed; they aim to make public transport as a whole a more viable, attractive option to commuters and consumers in the Maidstone area.

- 2.9.7 The current 'South Eastern Trains' body (responsible for the interim operation of Maidstone's train network) is set to be superseded by the 'Integrated Kent Franchise' in 2007. Along with new links to Channel Tunnel services, the franchise will feature revised rail services taking advantage of the new high-speed line. Appendix 2 indicates approximate frequency of trains currently running through stations in Maidstone, and Appendix 3 gives examples of typical fares for common journeys.

### Coach

- 2.9.8 Two main coach companies offer inter-city travel in Maidstone. [GreenLine](#), in conjunction with Arriva, operate services tailored for commuters. There run between residential areas in Maidstone, and Central London. Services are limited to Monday to Friday, only during traditional commuting time periods (5:34am-06:44am,4:00pm-6:15pm). [National Express](#) operates no services which originate in Maidstone, but several do stop off en-route to London. Other coach services similarly to the case of Greenline, share the destination only of London, and [operate only during peak hours](#).

### Park and Ride

- 2.9.9 Maidstone operates a successful park and ride scheme. This operation is based out of four locations positioned around the outskirts of the town centre, these locations of these sites is shown in figure 2.9.3. They "provide a total of over 1600 car parking spaces. In July 2004 an average of over 1500 cars and almost 2,000 fare paying passengers used these sites each day. In the busy pre-Christmas period in December 2004 these figures were just under 2,000 cars and just under 3,000 passengers." Due to the popularity of the scheme, discussions are underway regarding the possibility of the expansion of two of the four parking locations, with a view to introducing further facilities and expanding corresponding bus services. New locations for two sites on A229 and A26 are currently being evaluated.

### Maidstone Modal Split

- 2.9.10 The current Modal Split in Kent has been compared to a national average from the National Travel Survey 2004. The results show that the figures are broadly similar to Maidstone. The results show in the region of 70% of people who travel to work in Kent travel by car (with 8% as car passengers) and 13% travel by foot. Bus travel makes up 4% with rail and cycle around 2.5%.

### 3 MODEL VALIDATION

#### 3.1 General

- 3.1.1 Development of a transport model was considered essential in order to determine the impact of the proposed development areas on the trunk road network. A SATURN model was the tool used for this study.
- 3.1.2 The SATURN model NAOMI has been validated for the year 2001 for the purpose of this report. This model covers the whole of the South East of England and includes the main road network within the area. For this study the whole of Kent was extracted from the NAOMI model providing a basic road network and matrix.
- 3.1.3 The road network within the Maidstone area was developed and updated to reflect the existing road conditions and junction arrangements. The original NAOMI matrix was then updated with the use of current count information and roadside interview data. This provided a model which was accurate in layout and demonstrated appropriate trip distributions.
- 3.1.4 The model validation utilises the data from the turning counts, automatic traffic counts, journey time surveys and queue surveys conducted in November 2006. The following section illustrates how, using the information, the model of the AM peak hour accurately reflects the conditions observed.
- 3.1.5 To measure the accuracy of the traffic model there are "Acceptability Criteria" prescribed in the Design Manual for Road and Bridges (DMRB) Vol. 12a. The acceptability of the traffic model constructed is governed by the criteria. Please refer to Appendix 1 for details.
- 3.1.6 Due to the strategic nature of the analysis, the calibration was never envisaged to meet all the DMRB calibration criteria along all screenlines. In addition the calibration was concentrated in the M20 corridor. The model was built to inform the current strategic decision process, therefore should any scheme progress further along the design process, a more refined and robust modelling exercise will need to be undertaken.

#### 3.2 Convergence and Stability

- 3.2.1 Stability – Table 3.2.1 summarises the stability of the model during the AM peak period. The table shows that convergence is reached within 8 assignment/simulation loops with a percentage flow change of less than 5% and is more than 90% for 5 successive iterations. This demonstrates that the model is stable and the flows are not significantly changing between iterations.

## MODEL VALIDATION

| Assignment/Simulation Loop Number | Number of Assignment Iterations in Loop | Number of Simulation Iterations in Loop | Percentage Flow changing by less that 5% |
|-----------------------------------|---|---|--|
| 1                                 | 0.161/59                                | 0.037/25                                |  |
| 2                                 | 0.202/29                                | 0.042/17                                | 56.4                                     |
| 3                                 | 0.233/9                                 | 0.032/10                                | 89.7                                     |
| 4                                 | 0.203/16                                | 0.030/6                                 | 96.2                                     |
| 5                                 | 0.162/6                                 | 0.023/5                                 | 98.9                                     |
| 6                                 | 0.162/2                                 | 0.022/5                                 | 99.9                                     |
| 7                                 | 0.141/2                                 | 0.021/4                                 | 99.9                                     |
| 8                                 | 0.141/2                                 | 0.019/4                                 | 99.9                                     |

Table 3.2.1: AM Peak Hour Convergence Stability

### 3.2.2 Proximity

3.2.3 As stated in DMRB Vol12a the delta value should be below 1%. The delta value extracted from our model is 0.235%. This shows that the model reaches an acceptable level of convergence.

## 3.3 Screenline Validation

3.3.1 The Screenlines within this model have been focused along the M20 Junctions. The approaches to Junction 5, 6, 7 and 8 have also been included within the validation process. These screenlines were selected in order to monitor the flows within the model especially that accessing and exiting Maidstone via the M20. The screenlines can be found in figure 3.2.1.

3.3.2 In addition, an outer cordon was used to monitor the actual volumes of traffic entering and leaving the study area and therefore all main movements within the area were used in the assessment.

3.3.3 Table 3.2.2 shows to what accuracy the screenline totals reflects the total observed flows onto the key sections of the model, with 88% of links and GEH statistics meeting the DMRB criteria. The largest GEH is 7 which is located at site 6610.

| Location   | Count | Modelled Flow | Difference | % Difference | GEH  | HA pass/fail GEH<5 |
|------------|-------|---------------|------------|--------------|------|--------------------|
| <b>M20</b> |       |               |            |              |      |                    |
| M20 J4-J3  | 4777  | 4659          | -117       | -2           | 1.72 | PASS               |
| M20 J5-J4  | 4807  | 4991          | 184        | 4            | 2.63 | PASS               |
| M20 J6-J5  | 3106  | 3254          | 148        | 5            | 2.63 | PASS               |
| M20 J7-J6  | 4752  | 4584          | -167       | -4           | 2.46 | PASS               |
| M20 J8-J7  | 3525  | 3393          | -131       | -4           | 2.24 | PASS               |
| M20 J9-J8  | 2493  | 2494          | 1          | 0            | 0.02 | PASS               |
| M20 J3-J4  | 3553  | 3367          | -185       | -5           | 3.17 | PASS               |
| M20 J4-J5  | 4216  | 4391          | 175        | 4            | 2.67 | PASS               |
| M20 J5-J6  | 2393  | 2566          | 173        | 7            | 3.47 | PASS               |
| M20 J6-J7  | 4126  | 3943          | -182       | -4           | 2.87 | PASS               |

## MODEL VALIDATION

|                     |      |      |      |     |      |      |
|---------------------|------|------|------|-----|------|------|
| M20 J7-J8           | 2690 | 2600 | -89  | -3  | 1.75 | PASS |
| M20 J8-J9           | 2066 | 1998 | -67  | -3  | 1.51 | PASS |
| <b>Outer Cordon</b> |      |      |      |     |      |      |
| 2008                | 122  | 136  | 14   | 12  | 1.24 | PASS |
| 2011                | 300  | 315  | 15   | 5   | 0.86 | PASS |
| 2013                | 442  | 442  | 0    | 0   | 0.01 | PASS |
| 207                 | 1117 | 876  | -240 | -22 | 7.63 | FAIL |
| 6610                | 685  | 881  | 196  | 29  | 7.00 | FAIL |
| 104                 | 1031 | 972  | -58  | -6  | 1.87 | PASS |
| 2008                | 138  | 180  | 42   | 30  | 3.30 | PASS |
| 2011                | 471  | 435  | -35  | -8  | 1.69 | PASS |
| 2013                | 504  | 511  | 7    | 1   | 0.30 | PASS |
| 207                 | 1451 | 1216 | -234 | -16 | 6.45 | FAIL |
| 6610                | 1113 | 1104 | -8   | -1  | 0.27 | PASS |
| 104                 | 550  | 558  | 8    | 2   | 0.36 | PASS |

Table 3.2.2 – AM Peak link calibration

3.3.4 Since the M20 links and the majority of the outer cordon passes the GEH criteria, this model is considered robust and suitable for this report.

### 3.4 Link Validation

3.4.1 Link flows were derived from the manual classified link and junction counts undertaken. Throughout the study area there are 24 individual link counts used during the model validation. Table 3.2.3 summarises the results from the link calibration. 88% of links had a GEH statistic of less than 5.

| Link Description                                     |    | GEH Statistic |          |
|--|----|---------------|----------|
|  |    | Passed        | % Passed |
| Individual links with flow less than 700 veh/h       | 7  | 7             | 100%     |
| Individual links with flow between 700 – 2,700 veh/h | 9  | 6             | 66%      |
| Individual links with flow greater than 2,700 veh/h  | 8  | 8             | 100%     |
| <b>ALL LINKS</b>                                     | 24 | 21            | 88%      |

Table 3.2.3 – GEH calibration results

3.4.2 This indicates that the model is in compliance with GEH statistics.

### 3.5 Conclusion

- 3.5.1 Although the SATURN model has not been calibrated and validated fully in accordance with DMRB standards, it is considered suitably robust for the strategic nature of this study, and reasonably reflects the existing conditions along the M20 corridor.

### 4 TRANSPORT POLICY CONTEXT

#### 4.1 General Background

4.1.1 Along with 28 other towns across the breadth of England, Maidstone was elevated to New Growth Point status in October 2006. With a target of delivering around 5040 new homes by 2016, planning for the introduction of new, and the improvement of existing transport infrastructure is forefront in ensuring that the region is able to cope with the demands that greatly increased habitation will impose on its road and rail networks.

4.1.2 In support of this time of ambitious growth for the region, Maidstone was allocated £1.55 m from the primary budget for the national scheme, in its opening year. Further financial support as the scheme progresses will be allocated in accordance with the 2007 Comprehensive Spending Review.

4.1.3 By means of response to Maidstone's elevation to the New Growth Point status, a wide reaching set of attainment targets have been realised. A summary of raised points are presented below, relevant to the development and improvement of transport systems in the area:

- Ease congestion and reduce air pollution in Maidstone Town Centre through a package of traffic management measures and improvements to public transport.
- Construction of the 'South Maidstone Strategic Link Road'.
- Provide an additional 10,080 new homes by 2026, 5040 of which will be provided by 2016. Address local housing needs by providing much needed low cost family homes, and the transport infrastructure necessary to support this new growth.
- Reduce the need for car travel across peak hours, providing viable alternatives for commuter use.

4.1.4 Planned expansion of the Maidstone Park and Ride scheme aims to alleviate strain currently imposed on the road network at peak hours, serving both commuters on weekdays, and shoppers on weekends. Two new sites are being considered for addition to the scheme, positioned on the A229 (running from the North to South of Maidstone) and A26 (positioned to the West). Development and expansion of two of the current sites; Sittingbourne Road and Coombe Quarry has also been proposed due to the scheme's popularity, and allowing for future growth. The Park and Ride Scheme currently operates close to capacity at peak months (1500 vehicles / 1600 spaces per day), and so expansion is viewed as a prerequisite to Maidstone's transport system succeeding in the face of its new growth.

4.1.5 Due to concerns regarding the widespread and heavy use of minor highways to the east of Maidstone as a means of access to southern areas of the town, and the future development of a large number of new homes in the area, the South Maidstone Strategic Link Road is seen as a necessary addition to the highway network. Its aim will be to provide a partial orbital route positioned to the south of the town, serving areas which would otherwise be reliant on minor roads for access to Maidstone. Vehicles accessing Maidstone from M20 Junctions positioned to the east of the town, will be able to join the South Maidstone Strategic Link Road, diverted from the heavily

used minor roads. Whilst funds have been allocated by KCC for the advancement of the Strategic Link Road project, Maidstone Council have identified three other schemes it views as necessary to alleviating the onset of gridlock in the town. They include:

- The development of the All Saints Relief Road
- The Dualling of Upper Stone Street
- Improvements to motorway junctions in the Maidstone area

4.1.6 Maidstone's rail network is also a target for improvement. 'Overcrowding at peak times is unacceptable...there is also very poor connectivity to other parts of the rail network' (Maidstone Integrated Transport Strategy). New rail links to Gatwick, and more frequent services to other non-London destinations are envisaged. The Integrated Kent Franchise will be central to delivering these and many other targets. Significant changes to the nature of rail travel in Kent will be seen in 2009, when the IKF phase II is adopted by South-Eastern Trains. Improvements to rail services will be an integral part in reducing strain on the road network in and around Maidstone.

4.1.7 Concern however has been raised regarding how effective these new changes will be to facilitate improvement of services. Whilst in the current system, a maximum theoretical capacity of 26,000 passengers is observed across the network; under the new system, capacity will be significantly lower - at 18,800. This will be due to the lower passenger capacity of new train varieties. More frequent services taking advantage of the high speed channel tunnel rail link (for domestic as well as international journeys) it is hoped will redress this imbalance, and attract more commuters to the rail network.

## 4.2 DfT Circular 02/02: Planning and the Strategic Road Network

4.2.1 The HA's approach to participating in the planning process is set out in DfT Circular 02/07. The HA is responsible for managing and operating a safe and efficient strategic road network along the M20 corridor and one particular activity that the HA undertake is to review the impact on the network of proposals for new developments and to work proactively with local planning and highway authorities, to identify the demand management tools and infrastructure required to deliver this growth.

4.2.2 Paragraph 21 of Circular 02/07 sets out the HA's role in the preparation of LDF documents. It states that the HA will 'offer advice and technical support that will guide the scale and location of proposal in relation to the strategic road network'. In addition, the HA will 'provide guidance {...} on the scale and nature of improvements to the strategic road network and demand management measures that will be considered in order to facilitate development. However, it remains important for the 'LPA to ensure that its proposals are evidence based and deliverable'.

4.2.3 The HA have been proactive in commissioning this report to undertake a review of the LDF preferred option for Maidstone and also review the Growth Point proposals. The purpose of this report is to provide information and an evidence base for the required transport strategy to ensure that the preferred option can be delivered, in accordance with paragraph 21 of the circular, as identified above.

### 4.3 South East Regional Spatial Strategy

- 4.3.1 The Regional Spatial Strategy (RSS) identifies key areas within which the transport network can be improved over the coming years, and outlines causal links which are responsible for the propagation of current issues with the system. Using the Regional Transport Strategy as a basis for its suggestions, the RSS sets forth guidelines for the production of policy surrounding these improvements.
- 4.3.2 An overview is given of the picture of the South East's transport system as it stands today, and highlights areas of emerging and existing concern.
- "The South-East's gateway function means that it plays a pivotal role in the wider transport system of both North-Western Europe and the UK, with access to/from the region's airports and ports a key issue not only for South East England, but also for the rest of the UK".*
- 4.3.3 The smooth running of key strategic links in the South East (this would include Maidstone, positioned as it is – adjacent to the M20), plays an important role in the wider view of transport across the whole of Northern Europe.
- 4.3.4 The recently updated Regional Transport Strategy for the South East sets forward several points which are relevant to the Maidstone area. The town is referred to widely as a 'hub' for the Kent area; it acts as a major thoroughfare from the ports of Dover and Folkestone on toward the South-East (and by extension to the whole country). Maidstone plays host to several strategic movement corridors which are linked to the efficient working of the South East's international gateways.
- 4.3.5 The European Commission's 'Spatial Vision for North-Western Europe' draws attention to the transport network subsequent to the Dover Strait, up to and including the M25 Orbital. The spatial vision raises concerns with this corridor's ability to cope with demand created by the constant throughput of freight to and from Northern Europe. The area is identified as one of the major transport congestion bottlenecks in North-Western Europe, with ever present issues conspiring to prevent the smooth running of both road and rail networks.
- 4.3.6 Maidstone's elevation to the status of New Growth Point and the resulting spike in population over the coming decade means that now more than ever, improvements to local and wider networks are vital to maintaining a functional transport infrastructure.
- 4.3.7 Besides from planned expansions of the transport networks, the importance of diverting more commuters away from their cars in favour of public transport, walking or cycling is recognised. This will contribute to NGP targets to reduce carbon emissions, improve air quality, and ease the strain on the road network.
- 4.3.8 Maidstone has been identified as regional hubs in the South East Plan. Work completed by PB in preparation for the RSS examination in public (November 2006) has assisted the HA in understanding the likely impact of the RSS on the trunk road network.

4.3.9 The strongest car-commuter links are as follows:

| <b>ORIGIN</b>       | <b>DESTINATION</b>    | <b>TRIPS (per day)</b> |
|---------------------|-----------------------|------------------------|
| Medway              | Maidstone             | 6707                   |
| Maidstone           | Tonbridge and Malling | 5784                   |
| Tonbridge & Malling | Maidstone             | 4185                   |
| Maidstone           | Medway                | 3333                   |
| Maidstone           | Tunbridge Wells       | 1972                   |
| Tunbridge Wells     | Maidstone             | 1380                   |
| Maidstone           | Ashford               | 1078                   |

Table 4.3.1 – Car Commuter Links

\*Source: Special Workplace Statistics based on 2001 census \*\*Trips less than 1000 are not included in the table

4.3.10 This shows there to be a large amount of trips from Medway to Maidstone as a destination for work. In addition a high proportion of Maidstone residents go to work in Tunbridge and Malling.

4.3.11 Maidstone is not particularly self-contained (i.e. residents living and working in the same district). From the above trends, it is clear that many commuters drive to neighbouring districts. The dispersed pattern of movement will make it difficult to provide sustainable transport choices to cater for the range of movements that are likely to be demanded by additional development in these districts.

#### **4.4 Maidstone Local Development Framework**

4.4.1 The local development scheme sets out both conditions and a timetable for delivery of the constituent parts of the LDF for Kent. It provides a definition of the purpose of each document comprising the piece, offering guidance as to the levels of public consultation appropriate for each item. As well as submitting a short term timetable for the production of the LDF, a long term timetable sets down a vision of how the document as a whole will evolve up until 2010.

4.4.2 Maidstone local development framework is currently in the preferred options stage of the core strategy. In this document, the Councils preferred options for their allocated development is to provide an urban extension to the east of the town consisting of 5,040 dwellings with the remaining 5,040 in the town centre. The core strategy also states that a corresponding level of employment will also be required by 2026. For the purpose of this report it has been assumed that 12,000 jobs are spread equally between the town centre and the urban extension.

4.4.3 The HA's response to the Council's preferred options (dated 26/02/07) identified that there was no supporting transport evidence to justify the preferred options and therefore this study has completed a qualitative assessment of the options and has also developed the transport strategy to support the core strategy.

4.4.4 Little of the LDF deals directly with the nature of the existing or future transport infrastructure in and around Maidstone, but instead tackles the viability of various locations as potential sites for the upcoming housing growth promoted by the New Growth Point initiative.

4.4.5 Since the consultation on the preferred options report a planning application for Kent International Gateway (KIG) has been received. KIG is 400,000sqm of freight

interchange located south of the M20 Junction 8. It is not within the current local plan.

### 5 QUALITATIVE ASSESSMENT OF OPTIONS

#### 5.1 Introduction

- 5.1.1 The Government has named Maidstone as a 'New Growth Point'. This will result in a total number of 10,080 homes proposed in the Borough over the next 20 years. This level of growth will ultimately need to be confirmed in the regional South East Plan. In order to balance housing growth with employment opportunities and to increase economic prosperity, it is likely that provision will also need to be made for at least a further 10,000 jobs in a range of sectors and locations.
- 5.1.2 Maidstone's Preferred Option stage of the LDF identifies a preferred option for the location (Policy CS2) of the above development as a new mixed use sustainable settlement at eastern/ south eastern edge of Maidstone (50% of housing), with remainder within existing urban area.
- 5.1.3 In addition, two broad alternative options for the spatial distribution of development were considered: An urban-led approach shown on Alternative Option Key Diagram 1 with over 70% new housing development focused in the existing built-up areas; Maidstone town, the 5 Rural Service Centres (RSCs) and 21 villages with detailed boundaries.
- 5.1.4 A significantly expanded Rural Service Centre approach shown on Alternative Option Key Diagram 2 with some 50 – 70% of new housing development (some 5000 dwellings) located at the edge of one or more of the 5 Rural Service Centres or alternatively as a completely new settlement. Only two of the Rural Service Centres (Harrietsham and Lenham) are located on a direct rail link to Maidstone. The other 3 centres would rely on the less frequent rural bus service to travel on public transport to Maidstone. Consequently the most likely location for significantly expanded /new rural settlement would be in the vicinity of Harrietsham and Lenham.
- 5.1.5 This section reviews the two alternative options and the preferred option qualitatively to give an indication of whether the preferred option is reasonable in terms of transport.
- 5.1.6 In principle, it would appear that the preferred option, that being a combination of continuing brownfield/regeneration development in the town centre and a concentration of greenfield sites on the edge of the town, is reasonably sound in transport terms. However, as with any option accommodating significant growth, it does present some major challenges to both the County Council and the HA as the highway authorities involved.
- 5.1.7 The level of future development, unless modified through the Regional Spatial Strategy examination process, has identified a figure of 10,080 additional dwellings over the next 20 years. This represents the Growth Point target adopted by MBC, supported by KCC, and endorsed by DCLG.
- 5.1.8 This level of housing development would appear to be extremely difficult to accommodate within the urban area of Maidstone without resulting in unacceptably high densities. Although this approach would have some advantages in transport terms, assuming that car trips were heavily suppressed by much reduced car parking provision, it is unlikely that this would result in a welcoming environment for residents. It would also tend to use all available land in the centre for housing, forcing all employment land away from the centre, rather than look for development to be a mix

## QUALITATIVE ASSESSMENT OF OPTIONS

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of housing and employment within easy reach of each other. This latter form of development would be better in encouraging the use of all modes of sustainable transport.

- 5.1.9 It would therefore seem inevitable that a considerable amount of development land would have to be found outside the built up area of the town. The options being either to concentrate on the edge of the existing town or create a new community based on one or more existing villages,
- 5.1.10 In transportation terms, it would be best to create a concentration of new development, as this gives a stronger market in which to extend public transport services, and create communities where residents have opportunities to walk or cycle to local facilities. The options then come down to whether an edge of town area is better than an outlying area based on existing villages.
- 5.1.11 The principle would seem to be that the new development will still depend on Maidstone town as its provider of major facilities, such as large shops, employment, hospital, cinema, theatre, restaurants etc. The best way of achieving this, without encouraging reliance on car trips, would be by developing in an area that could be linked to the town by extending and improving the existing bus, cycle and pedestrian networks. This would point to the edge of town area identified in the Core Strategy as being the best in local sustainable transport strategy terms.
- 5.1.12 There are wider implications, however, as the level of development being promoted will have a major impact on the M20 as well as the local highway network, particularly with new employment land being looked for along the motorway corridor.
- 5.1.13 Traffic modelling in the town centre was undertaken in 2003 by Jacobs on behalf of KCC, and identified serious peak hour capacity problems beyond 2011, assuming all current permissions and developments under discussion were taken up.
- 5.1.14 The model work on the M20 being done by PB on behalf of the HA is also likely to show that both the main line and junction capacities are under severe threat from development both in Maidstone and beyond (i.e. Ashford Growth Area and international traffic through Dover), and the HA's principle remit is to retain capacity on this strategic link in the national road network.
- 5.1.15 Initially we have carried out a NATA type of assessment of the development options that led Maidstone Borough to adopting their preferred option in the Core Strategy. The HA and the DfT Regional Directorate will wish to be convinced that every effort will be made to make future development as sustainable as possible, before they can regard the Core Strategy as sound. If this is not achieved, it would be unwise to submit the Core Strategy to DCLG and its subsequent EIP.

## 5.2 Methodology

- 5.2.1 The Evaluation of Options has been done on the basis that the two principle rejected options, the Urban Led approach and the New Rural Settlement, have been compared with the Borough Council's Preferred Option for the Core Strategy. The assessment relates to the proposed housing allocations.
- 5.2.2 A number of assumptions have been made in comparing the options:-
- The impact is related to the distribution of new housing. The identification of employment land is generally the same for all the options.

## QUALITATIVE ASSESSMENT OF OPTIONS

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- The effect of noise is that to which the new dwellings are subject (i.e. it would be noisier to live in the middle of the urban area rather than in a new rural settlement)
- The impact on air quality is that which the residents of the new dwellings would be exposed to, rather than that which new development imposes on existing residents.
- Any infrastructure would have to go through full safety audit and technical appraisal processes, irrespective of whether they were funded from public or private sources. The safety issues are therefore considered the same for each option.
- The impact on infrastructure costs are taken as an extra cost to KCC with the Urban Led option (as there would be a greater need for investment in traffic management measures to overcome urban congestion) and a slightly lower cost to KCC for the new settlement (as such a settlement would be designed to be as self contained as possible, and thus have less connectivity to the main urban area). It is assumed that major infrastructure such as the South East Strategic Route would be fully funded by development. These assumptions are open to varying interpretations, as the full extent of the cost to public funds is difficult to identify until a full transport strategy has been drawn up to support the Core Strategy.
- In terms of Integration with other policies, the Urban Led option would be beneficial in concentrating new development in the Regional Transport Policy's Maidstone Hub, but offers less flexibility to deal with potential changes in regional targets and places more strain on the UTMC system.

### 5.3 Option Assessments – Option 1 – Urban Led

#### Environment

- 5.3.1 Noise - Higher density urban development would expose more residents to urban noise levels, both from traffic and other sources.
- 5.3.2 Air Quality - More residents would be exposed to lower quality air. There is already an Air Quality Action Area in the Town Centre. Over development of the town centre could only be achieved by severe traffic management.
- 5.3.3 Greenhouse Gases - Potentially fewer new vehicle trips, as more residents located closer to services and facilities in urban area, but congestion problems could have an adverse effect.
- 5.3.4 Landscape - Less greenfield land take, therefore better for rural environment.
- 5.3.5 Townscape - Higher density would result in a challenge to protect instinctive townscapes and the quality of residential amenity.
- 5.3.6 Heritage – Higher density development may detract from the setting of historic buildings in the town centre.
- 5.3.7 Biodiversity - No impact on statutory nature conservation sites.
- 5.3.8 Water Environment - All options have an impact on water supply concerns. There is countywide concern over the ability of water resources to support development targets.

## QUALITATIVE ASSESSMENT OF OPTIONS

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5.3.9 Physical Fitness - Urban development would encourage walking and cycling. This would be beneficial as long as safety concerns over protection of vulnerable road users are addressed, and air quality problems can be resolved.

5.3.10 Journey Ambience - Traveller Care would be a combination of safety and air quality issues, and Traveller Stress could be caused by severe traffic congestion in the town centre. This can partly be resolved by active traffic management and demand restraint.

### Safety

5.3.11 Accidents - All access and highway improvements would be subject to safety audit. There would be a particular need to protect vulnerable road users.

5.3.12 Security - No specific security issues

### Economy

5.3.13 Infrastructure Costs - The County Council is committed to funding the Bridge Gyratory and Upper Stone Street improvements, and continuing to develop the Urban Traffic Management and Control system. Further infrastructure cost would be determined by the scale and nature of the development.

5.3.14 Beyond these, there is no current undertaking to progress the All Saints Link Road as a fully funded Local Transport Plan scheme. The revised alignment opens up more opportunities for developer funding, with supporting funds being sought by the Borough Council through Growth Point and any other available sources.

### Accessibility

5.3.15 Access to Transport Systems - Urban location would give residents easier access to bus and rail services, and would also encourage access to the town's shops and services on foot and by cycle.

5.3.16 Severance - As with the safety objective, there would be a need to protect vulnerable road users.

### Integration

5.3.17 Transport Interchange - Urban location gives better access to bus/rail interchanges

5.3.18 Land Use Policies - Better for reduction in number of trips (PPS 4, PPG 13), assuming severe restraint of parking provision.

### Other Government/Regional Policies

5.3.19 Regional Transport Strategy – Maidstone identified as a regional hub, well related to the strategic road and rail network.

5.3.20 Regional Spatial Strategy – EIP process continuing, development targets may change in due course.

5.3.21 Traffic Management Act – Requirement for highway authorities to manage existing network as efficiently as possible (hence UTMC system, Controlled Motorway project)

## QUALITATIVE ASSESSMENT OF OPTIONS

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### 5.4 Option 2 – Edge of Town

#### Environment

- 5.4.1 Noise - New residents would be exposed to less ambient noise, but existing residents of the Otham area would experience increased noise from both traffic and development.
- 5.4.2 Air Quality - Less development in town centre, so new housing would be away from Air Quality Action Area.
- 5.4.3 Greenhouse Gases - Less concentration of congestion would occur in the rural location of the development, but still general problem of major impact on main network, including the M20.
- 5.4.4 Landscape - Impact on landscape in Otham area, between A274 and A20/M20.
- 5.4.5 Townscape - No impact on urban area of Maidstone
- 5.4.6 Heritage - Less impact on urban area of Maidstone
- 5.4.7 Biodiversity - South East Strategic Route would have an impact on the Len Valley Site of Nature Conservation Interest (Local Wildlife Site)
- 5.4.8 Water Environment - All options have an impact on water supply concerns.
- 5.4.9 Physical Fitness - Developments will be designed to encourage walking and cycling to local facilities
- 5.4.10 Journey Ambience - Less congestion than intensive development in town centre, but still concern over wider road network

#### Safety

- 5.4.11 Accidents - All infrastructures, including the South East Strategic Route would be subject to safety audit.
- 5.4.12 Security - No specific security issues

#### Economy

- 5.4.13 Infrastructure Costs - The intention is that the South East Strategic Route would have to be funded by development, with little or no public funding. There is a long term maintenance cost involved.
- 5.4.14 There will still be a need for investment in the UTMC system in the town centre, bus priority and cycle route improvements.

#### Accessibility

- 5.4.15 Access to Transport Systems - No easy access to rail network. A step change in bus provision is envisaged through the introduction of a new quality bus service to the town centre.

## QUALITATIVE ASSESSMENT OF OPTIONS

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5.4.16 Severance - New housing developments will be designed to support sustainable transport and allow easy movement between housing and local facilities and therefore will avoid severance.

### Integration

5.4.17 Transport Interchange - More remote from transport interchange than town centre locations

5.4.18 Land Use Policies - More difficult to reduce car trips in rural locations

### Other Government/Regional Policies

5.4.19 Regional Transport Strategy – new development connected to the edge of Maidstone's transport hub.

5.4.20 Regional Spatial Strategy – Potentially more flexible to accommodate higher growth targets if these emerge from the RSS process.

## **5.5 New Rural Settlement**

### Environment

5.5.1 Noise - Lower noise levels for new residents than town centre. Need to mitigate M20 noise. Existing rural residents would experience noise intrusion from new development

5.5.2 Air Quality - Less impact than adding to concentration in urban area but longer trips would damage air quality.

5.5.3 Greenhouse Gases - Potential for more car trips, and hence more emissions

5.5.4 Landscape - Considerable effect on rural landscape in vicinity of Harrietsham and Lenham.

5.5.5 Townscape - Less impact on Maidstone town centre but significant impact would be felt on the villages and surrounding countryside.

5.5.6 Heritage - Less impact on historic buildings in Maidstone town but significant impact would be felt on the villages.

5.5.7 Biodiversity - No impact on statutory nature conservation sites

5.5.8 Water Environment - All options have an impact on water supply problems

5.5.9 Physical Fitness - New development would need to be designed to facilitate walking and cycling access to local facilities

5.5.10 Journey Ambience - Potentially less congestion than the urban-led option, but still general congestion concerns

### Safety

5.5.11 Accidents - All access and highway improvements would be subject to safety audit

## QUALITATIVE ASSESSMENT OF OPTIONS

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5.5.12 Security - No specific security issues

### Economy

5.5.13 Infrastructure Costs - There would be no need for the full South East Strategic Route, although a section south of Junction 8 might be needed for access to commercial development. There would still be a need for continuing investment in UTMC, bus priority and cycle route improvements in the town.

### Accessibility

5.5.14 Access to Transport Systems - Could link to rail network at Harrietsham and Lenham stations

5.5.15 Severance - Care needed to maintain existing local communities and facilities

### Integration

5.5.16 Transport Interchange - Not good interchange between bus and rail, as stations away from A20. Future links between the bus and rail services would depend on evolving decisions over the nature of rail services on the London-Maidstone East-Ashford line (i.e. fast/semi-fast versus stopping services)

5.5.17 Land Use Policies - More difficult to restrain car trips in a more rural area.

### Other Government/Regional Policies

5.5.18 Regional Transport Strategy – More remote from Maidstone's transport hub

5.5.19 Regional Spatial Strategy – As this option is a new community, there is the potential for more flexibility to cope with any higher development targets emerging from the RSS process.

## **5.6 Discussion of Results**

5.6.1 The outcome of this format of evaluation gives a clear indication that the option of a New Rural Settlement emerges much less favourably than the Preferred Option of extending development onto the south eastern edge of the existing built up area. This would be expected from a transport led assessment, as the national policy emphasis is on minimising the need to travel and enhancing opportunities for sustainable development.

5.6.2 The comparative closeness of the Urban Led Option to the Preferred Option would also be expected. In pure transport terms, the concentration of housing in an existing urban area brings new residents close to many facilities, increasing the opportunities for walking, cycling and the use of public transport. The difficulty comes in achieving the density of development required to meet housing targets (both Structure Plan and Growth Point) without creating unacceptable development within the town– a strategy that would have a major impact on the environment. This form of development would also reduce the opportunities for creating a mix of housing and employment land away from the congestion of the town centre, but still connected to the existing urban area.

5.6.3 Overall, it would therefore appear that the Preferred Option in the Core Strategy represents a reasonable balance in terms of the location of new development.



## DEVELOPMENT AREAS

### 6 DEVELOPMENT AREAS

#### 6.1 Proposed Development

6.1.1 There are currently a number of existing developments proposed within the Maidstone area. The developments and their status in the development control process are listed in table 6.2.1 below.

| Site                         | Proposal in Local Plan/ LDF | Houses (No. of Dwellings) | Employment (sqm. & Type) | Status   | First point of contact with Trunk Road |
|------------------------------|-----------------------------|---------------------------|--------------------------|--|--|
| Abbey Court                  | ✓                           | -                         | 3,146 B1                 | Granted  | Junction 6                             |
| Eclipse Business Park        | ✓                           | -                         | 13,000 B1                | Outline Consent  | Junction 7                             |
| Maidstone Studios            |                             | 142                       | -                        | Permission granted subject to condition                                    | Junction 7                             |
| Kent Clinic Private Hospital |                             | -                         | 16,386 C2                | Permission granted subject to Grampian condition on Junction 7 improvement | Junction 7                             |
| Dettling Downs               |                             | -                         | -                        | Pre - Application  | Junction7                              |
| Kent International Gateway   |                             |                           | 380,000 B2               | Application submitted  | Junction 8                             |
| Proposed LDF Urban Extension | ✓                           | 5000                      | 6000 jobs                | Preferred options stage  | Junction 8                             |

Table 6.2.1 - Committed Development

6.1.2 At Junction 7 the developments situated within Eclipse Business Park currently consist of Towergate Partnership Ltd and GP Acoustics. The Mercedes Benz application, whilst within Eclipse Business Park is being assessed separately to the outline consent. The Dettling Downs development is situated to the north of junction 7 on the A249 and is in the early scoping stages of assessment for an equine centre.

6.1.3 The developments proposed at Junction 8 consist of the Kent International Gateway which consists of 400,000 sqm of General Warehouse and Warehousing Accommodation with inter-modal rail/road containerised freight hub. In addition to this the urban extension consists of 5000 houses and 6000 jobs.

**7 FUTURE TRAFFIC GROWTH**

**7.1 Introduction**

7.1.1 The base year traffic models have been factored up to undertake a future year assessment in both 2016 and 2026. The following section sets out the process utilised to determine the growth factors applied to the base year model.

7.1.2 The horizon year for the traffic forecasts has been set to 2026. This provides for a 10 year design period from 2006 base year with an opening year of 2016 which is consistent with the horizon year used during the Local Development Framework (LDF) process.

7.1.3 Separate growth factors have been derived for:

- M20 Mainline
- Local road growth
- Development related growth

7.1.4 These factors have then been superimposed on the base matrix to result in a future year assessment.

**7.2 Mainline Growth**

7.2.1 A number of factors were considered in determining traffic growth from 2006 to 2016. Standard national traffic growth rates (NRTF 1997) incorporate all the factors causing traffic to increase including economic growth, car ownership and use increases, and population and employment increases. The NRTF central factor is then adjusted to take into account TEMPRO values for the Maidstone area with the predicted New Growth Point developments. Tables 7.2.1 and 7.2.2 shows the adjusted traffic growth which will be applied to the M20 mainline flows.

| Years |      | NRTF Central | NRTF Adjust |
|-------|------|--------------|-------------|
| 2006  | 2016 | 1.160        | 1.315       |
| 2006  | 2026 | 1.266        | 1.363       |

Table 7.2.1 - AM peak NRTF adjusted to TEMPRO

| Years |      | NRTF Central | NRTF Adjust |
|-------|------|--------------|-------------|
| 2006  | 2016 | 1.160        | 1.139       |
| 2006  | 2026 | 1.266        | 1.370       |

Table 7.2.2 - PM peak NRTF adjusted to TEMPRO

**7.3 Local Road Growth**

7.3.1 TEMPRO 5 growth rates take account of local land use and population trends and policies. For the development areas in addition to the urban extension the suggestion is to use TEMPRO factors for the central Maidstone zone. Table 7.3.1 shows the traffic growth rates.

## FUTURE YEAR TRAFFIC GROWTH

|         | 2006-2016 |             | 2006-2026 |             |
|---------|-----------|-------------|-----------|-------------|
|         | Origin    | Destination | Origin    | Destination |
| AM Peak | 1.054     | 1.095       | 1.095     | 1.151       |
| PM Peak | 1.089     | 1.065       | 1.144     | 1.110       |

Table 7.3.1 - TEMPRO Growth for Maidstone

7.3.2 Table 7.3.2 shows the adjustments made within TEMPRO to account for the increase in housing and jobs within the area

| 2006 Base HH | 2006 Base Jobs | 2026 Future HH | 2026 Future Jobs |
|--------------|----------------|----------------|------------------|
| 38886        | 47101          | 41147          | 50590            |

Table 7.3.2 - Current adjusted Assumptions used within TEMPRO

## 7.4 TRICS

7.4.1 Another approach to estimate local growth would be to use TEMPRO for the background growth and then use trip rates to superimpose the urban extension on top of the background growth. This approach will allow for a more detailed understanding of the impact of the urban extension.

7.4.2 In order to account for the new development proposed within the Core Strategy Preferred Options report TRICS can be used in the assessment. The Core Strategy states that by 2026 the aim is to introduce 10,080 houses and 13,000 jobs. Therefore it has been assumed that by 2016 the borough will achieve half of the predicted growth.

## 7.5 Housing Trip Rates

7.5.1 Since the actual housing types for the proposed developments have not yet been confirmed trip rates for typical housing types have been provided below.

|   | Arrivals | Departures | Total |
|---|----------|------------|-------|
| <b>Flats Privately Owned</b>            |          |            |       |
| AM                                      | 0.047    | 0.189      | 0.236 |
| PM                                      | 0.156    | 0.077      | 0.233 |
| Total                                   | 1.311    | 1.39       | 2.701 |
| <b>Flats Rented</b>                     |          |            |       |
| AM                                      | 0.054    | 0.099      | 0.153 |
| PM                                      | 0.114    | 0.083      | 0.197 |
| Total                                   | 1.12     | 1.37       | 2.49  |
| <b>Mixed Private/non Private Houses</b> |          |            |       |
| AM                                      | 0.161    | 0.442      | 0.603 |
| PM                                      | 0.413    | 0.244      | 0.657 |
| Total                                   | 3.929    | 3.966      | 7.895 |
| <b>Mixed Private Houses</b>             |          |            |       |
| AM                                      | 0.096    | 0.343      | 0.439 |
| PM                                      | 0.357    | 0.188      | 0.539 |
| Total                                   | 3.104    | 3.092      | 6.196 |

Table 7.5.1 - Typical trip rates for housing

## FUTURE YEAR TRAFFIC GROWTH

### 7.6 Employment Trip Rates

7.6.1 As with housing the trip rates for employment have also been estimated, in order to provide an example of the possible trip rates for the proposed development.

|               | Arrivals | Departures | Total |
|---------------|----------|------------|-------|
| Office        |          |            |       |
| AM            | 0.139    | 0.017      | 0.156 |
| PM            | 0.019    | 0.114      | 0.133 |
| Total         | 1.073    | 1.110      | 2.183 |
| Business park |          |            |       |
| AM            | 0.126    | 0.018      | 0.207 |
| PM            | 0.043    | 0.105      | 0.383 |
| Total         | 1.024    | 0.993      | 2.017 |

Table 7.6.1 - Typical trip rates for employment

7.6.2 For the analysis it has been assumed that all the residential development will be a mixture of private and non private houses. In addition the employment will be considered to be of equal split between office and Business Park. Given that the development consists of 10,080 dwellings and 13,000 jobs the following development trips have been derived for the AM and PM peak periods.

|                                  | Arrivals | Departures | Total |
|----------------------------------|----------|------------|-------|
| Mixed Private/non Private Houses |          |            |       |
| AM                               | 1623     | 4455       | 6078  |
| PM                               | 4163     | 2460       | 6623  |
| Total                            | 5786     | 6915       | 12701 |
| Office                           |          |            |       |
| AM                               | 1801     | 221        | 2022  |
| PM                               | 247      | 1482       | 1729  |
| Total                            | 2048     | 1703       | 3751  |
| Business park                    |          |            |       |
| AM                               | 1638     | 228        | 1866  |
| PM                               | 553      | 1365       | 1918  |
| Total                            | 2191     | 1593       | 3783  |

Table 7.6.2 - Estimate of trips from the Urban Extension

7.6.3 This indicates that the proposed development will generate approximately 6,000 car trips during the peak periods from the housing developments and approximately 2,000 trips will be generated from the proposed employment. Using the existing data from SWS, LATS surveys and the SATURN model, an appropriate distribution for the development traffic, has been developed. The impact of such a distribution on the M20 junctions have been documented below (table 7.6.3) showing the percentage of impact the urban extension will have during the AM peak period.

|                 | Junction 5 | Junction 6 | Junction 7 | Junction 8 |
|-----------------|------------|------------|------------|------------|
| Urban Extension | 74         | 520        | 344        | 1830       |
| Junction Total  | 4,589      | 11762      | 6163       | 4460       |
| %               | 2%         | 4%         | 6%         | 41%        |

Table 7.6.3 – 2026 Percentage of Urban Extension Trips using the M20 Junctions

## FUTURE YEAR TRAFFIC GROWTH

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### 7.7 Surrounding Developments

7.7.1 It was also considered important to take into account separately all major growth areas that may impact on the traffic growth along the M20 corridor and Maidstone. The key areas of importance are Medway towns and Ashford.

### 7.8 Medway

7.8.1 Medway is situated to the north of Maidstone and is also considered an area of high growth. The traffic growth rates extracted from TEMPRO for Medway are shown in Table 10.

| Medway | 2006-2016 |             | 2006-2026 |             |
|--------|-----------|-------------|-----------|-------------|
|        | Origin    | Destination | Origin    | Destination |
| AM     | 1.110     | 1.111       | 1.180     | 1.183       |
| PM     | 1.111     | 1.112       | 1.187     | 1.188       |

Table 7.8.1 - TEMPRO Growth for Medway

7.8.2 The area of Medway will be point loaded onto the network with the appropriate growth factor associated with the model year.

### 7.9 Ashford

7.9.1 In addition, Ashford is also considered an area of high growth. A previous study conducted for Ashford used NRTF Central growth for rural motorways for the main line and included the proposed developments at Ashford up to 2031, which also considered the influence of peak spreading on the traffic growth. These growth rates obtained from the Ashford Highways and Transport Study will be used in order to accurately represent Ashford in future years.

| Ashford | 2006-2016 |             | 2006-2026 |             |
|---------|-----------|-------------|-----------|-------------|
|         | Origin    | Destination | Origin    | Destination |
| AM      | 1.188     | 1.141       | 1.339     | 1.241       |
| PM      | 1.190     | 1.128       | 1.210     | 1.230       |

Table 7.9.1 - Calculated Growth for Ashford

7.9.2 As with Medway, Ashford will also be point loaded onto the network at Junction 9 and 10 and increased accordingly.

### 7.10 Future Year Model

7.10.1 In order to ensure all areas within the model are accurately factored, the following process was applied.

- The matrix was factored to account for Kent growth predictions using TEMPRO
- Through traffic along the M20 was factored separately used central growth factors derived from NRTF.

## FUTURE YEAR TRAFFIC GROWTH

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- Areas such as Medway, and Ashford were also factored separately to accurately account for the high development areas.
- The urban extension assumes mixed private/non private housing and a 50/50 split between office and Business Park for employment. TRICS trip rates were used to point load the Urban Extension onto the network.

7.10.2 The future year network was adjusted to include:

- The proposed strategic link road, connecting the M20 junction 8 to the A274 at Langley.
- The urban extension, which was loaded onto the new strategic link road via a single zone.

7.10.3 The following table shows the increase in flows, from the base year.

| Location        | Direction | 2006 | 2016 | 2026 |
|-----------------|-----------|------|------|------|
| M20 between 5-6 | WB        | 2853 | 3294 | 3937 |
|                 | EB        | 3445 | 4590 | 5109 |
| M20 between 6-7 | WB        | 4118 | 4717 | 5858 |
|                 | EB        | 4691 | 6065 | 7190 |
| M20 between 7-8 | WB        | 2693 | 3663 | 4060 |
|                 | EB        | 3583 | 4729 | 5425 |
| A249            | NB        | 1558 | 1426 | 2024 |
|                 | SB        | 1629 | 1661 | 1847 |
| Bearsted Road   | WB        | 916  | 1680 | 2179 |
|                 | EB        | 900  | 1237 | 1292 |

Table 7.10.1 - Summary Table of Growth in AM peak

**8 TRIP REDUCTION**

8.1.1 The previous section shows how the car traffic is predicted to grow in the future year assessments. However, this assumes a linear rate of growth and that traffic will not be impacted by other demand management tools available. This section now considers the use of peak spreading and other demand management tools that might reduce the likely future traffic flows, including:

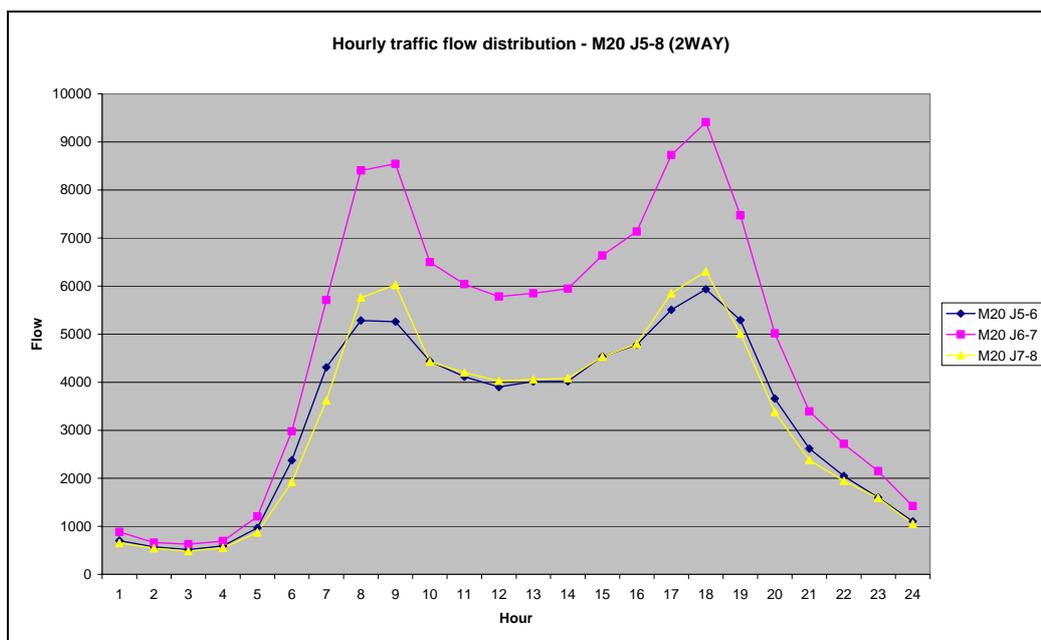
- Travel plans
- Public Transport
- Parking Control

**8.2 Peak Spreading**

8.2.1 The M20 at Maidstone currently has high levels of traffic and suffers from peak hour congestion. The 2016 traffic forecasts described above indicate a considerable increase in traffic mostly due to traffic generated from the development areas but also from continued traffic growth of existing traffic movements.

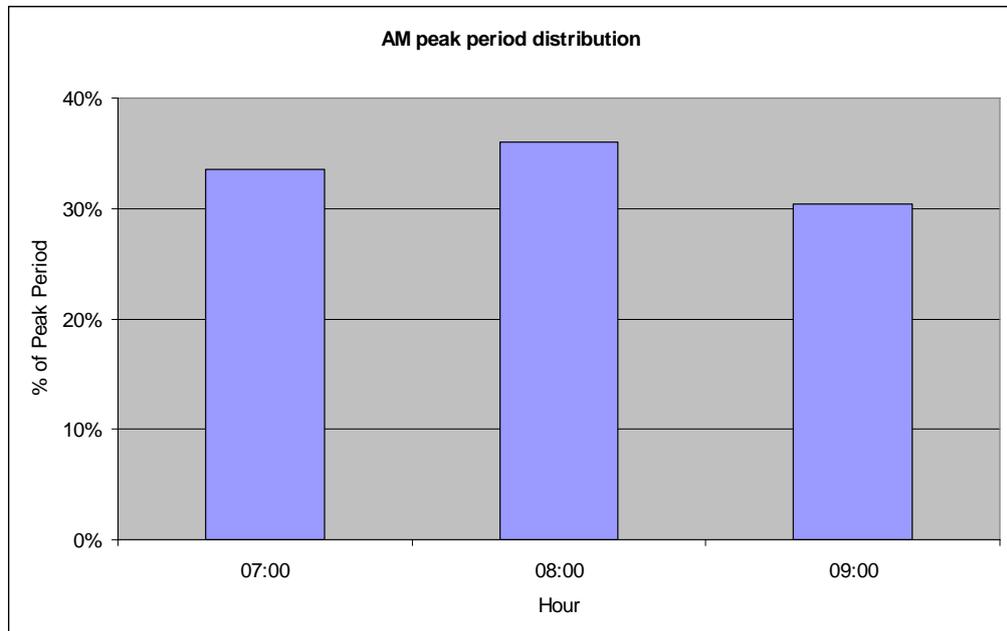
8.2.2 Due to the capacity constraints of the M20, the corresponding junctions and other congestion points that pass through the study area, the scope for peak spreading was considered. Peak spreading would have the effect of reducing the magnitude of the peak hour traffic flows with higher flows either side of the peak so that the total peak period flow remains the same.

8.2.3 Peak spreading would be caused by the deliberate retiming of trips, either earlier or later, to avoid the worst traffic conditions and by the extension of journeys past the peak due to increasing delays. Comparison of the average hour distribution of traffic on the M20 between Junction 5 to Junction 8 shows similar profiles.



## TRIP REDUCTION

- 8.2.4 The graph above shows that the M20 between Junctions 5 to 8 has pronounced peaks and therefore indicates that a degree of peak spreading may be possible.
- 8.2.5 However further investigation into the actual AM peak period shows that although the overall 24 hour profile shows peak period is peaky, the peak period is fairly flat. The graph below indicates this.

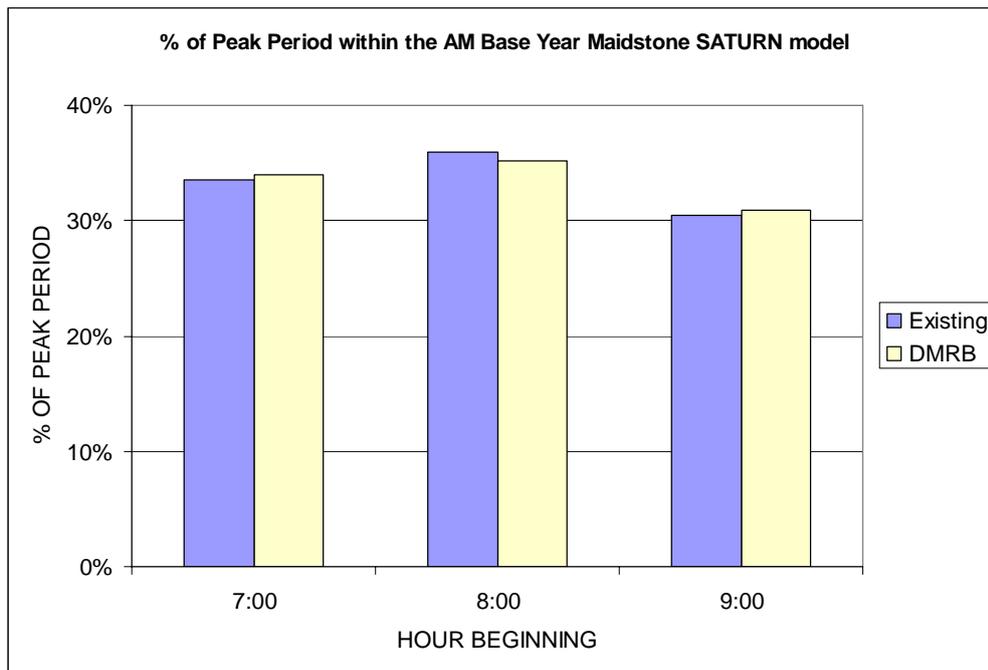


- 8.2.6 In order to forecast the level of potential peak spreading on the M20 the advice in DMRB Vol 12 Section 12 Appendix F – The Application of Peak Spreading was used. A count based model was calibrated to local traffic count data available for 2006.
- 8.2.7 Having assessed a three hour period a count based model analysis can be conducted, using the following format.

$$PH/PP = 0.333 + A \cdot \exp(-B \cdot V/C)$$

|             |   |                                    |
|-------------|---|------------------------------------|
| Where PH/PP | = | Peak hour to peak hour proportion  |
| V/C         | = | Peak hour volume to capacity ratio |
| B           | = | 3, average slope model             |
| A           | = | 0.432, calibrated coefficient      |

- 8.2.8 This results in the following graph which identifies a small amount of peak spreading will occur in the future.



8.2.9 The peak spreading model indicates a decrease in PH/PP index for increasing V/C. PH/PP shows a decrease of 0.01 as the V/C increases from 0.46 to 0.64. Peak hour traffic is indicated to reduce by about 1% due to peak spreading. This is due to the relatively flat peak period profile which therefore offers little scope for peak spreading. In addition, the V/C capacity is quite low therefore indicating that there is available capacity within the transport model.

8.2.10 A reduction in peak hour volumes with the equivalent transfer of trips to times before and after the peak hour will be used in the 2026 forecast. The peak spreading estimates can then be derived for 2016 and 2026 enabling a reduction in traffic volume within the forecast matrices.

**8.3 Smarter Choices**

8.3.1 In addition PB prepared three Library Papers (November 2006) for the RSS Examination in Public one of which looked at the impact of smarter choices on the impact of trip generation. There is a wide range of tools available to influence travel behaviour. The DfT report “Smarter Choices” (2004) identifies many of these and gives an indication of the expected trip reduction gained through the implementation of such measures. This has been summarised below:

Workplace Travel Plans

8.3.2 The typical reduction in car driving attributed to workplace travel plans has been between 10% and 30%, though the DfT Smarter Choices report (2004) acknowledges that the best plans achieve significantly more than that. Local authorities, prioritising workplace travel plans, have managed to engage with organisations representing about 30% of the workforce while county authorities have managed to engage with organisations representing about 10%.

## TRIP REDUCTION

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### Residential Travel Plans

- 8.3.3 Residential travel plans are relatively new and as such, there are only a limited number of case studies to draw results from and no conclusive results can be determined to demonstrate how these reduce trips.

### School Travel Plans

- 8.3.4 The application of school travel plans have been found generally to reduce school run traffic by between 8% and 15%, with high performing schools commonly achieving reductions of over 20%.

### Travel information systems (TIS)

- 8.3.5 These systems are increasingly being used on a local and nationwide basis, via internet, radio and in-car systems. However there is no information on the success of this is available to date.

### Car Clubs

- 8.3.6 Recent studies have indicated an increase in walking and cycling of 28% and a 35% increase in public transport through the implementation of car clubs. Such schemes also managed to reduce car mileage by approximately 72%.

### Car Sharing Schemes

- 8.3.7 A review of 20 organisations in 2002, reports that of the 14 companies with schemes that enable them to identify formally registered active sharers, on average 14% of staff have become active sharers. Schemes asking people to car share on an irregular basis have achieved the highest levels of take-up.

### Teleworking

- 8.3.8 Studies suggest that business travel can be reduced by between 10% and 30% as a result of teleconferencing. Home shopping or e-commerce for food retail is estimated to reach 10% to 15% of market spend over the next decade, leading to potential reductions of 7%-11% in all food shopping trips.

### Personalised Travel Planning

- 8.3.9 In the UK, all personalised travel planning initiatives have achieved reductions in car use. Particularly, individualised marketing initiatives have been the most effective in reducing car trips (between 5% and 16%).

### Public Transport Information and Marketing

- 8.3.10 In Cambridge, a simplification of the city's bus network, provision of better information materials and simpler ticketing delivered a patronage increase of 25% over a four-month period.

## TRIP REDUCTION

### Summary

8.3.11 In summary, the table below shows how each measure could be considered to reduce trip generation.

| SMART measure                              | Reduction in Car Trips   |
|--|--|
| Workplace travel plans                     | 10% - 30% reduction in car trips   |
| Residential travel plans                   | -  |
| School travel plans                        | 8% - 20% reduction in car trips  |
| Travel awareness                           | Approximately 30% reduction in car trips   |
| Travel information                         | -  |
| Car clubs                                  | 28% increase in cycling and walking and a 35% increase in the use of public transport. |
| Car share schemes                          | 14% of staff are active car shares   |
| Teleworking                                | 10% - 30% reduction in car trips   |
| Personalised travel planning               | 5% - 16% reduction in car trips  |
| Public transport information and marketing | Increase in patronage of approximately 25%   |

8.2.1 – SMART Measure Trip Reduction

## 8.4 Trip Reduction for Maidstone

8.4.1 For the purpose of this study the following trip reductions have been considered appropriate, to reflecting future year trips reductions.

- Peak spreading equates to a reduction of 1%
- Public transport improvements already accounted for within the mean trip rates used therefore no further reduction is necessary.
- Through the implementation of travel plans a 10% reduction for both employment and residential development is considered suitable.
- In order to encourage modal split a reduction in parking standards will be required. For example for office developments, this will reduce the current parking standard from 1:30 spaces/sqm to 1:32 spaces/sqm this should aim to reduce the total number of trips by 5%.

8.4.2 In order to realistically distribute the trip reductions for Maidstone across the trip matrix the percentage reduction has been applied as follows

- Peak Spreading (1%) – All trips within Maidstone and the urban extension was reduced by 1% to account for peak spreading.
- Travel Plans (10%) – It is anticipated that the inclusion of travel plans will result in the trips generated from the urban extension being reduced by 10%.
- Parking Standards (5%) – A reduction in parking standards is anticipated to reduce trips in the town centre only by 5%. Table 8.3.1 shows the trip reductions.

## TRIP REDUCTION

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| <b>Location</b> | <b>Direction</b> | <b>2006</b> | <b>2016</b> | <b>2026</b> | <b>2026 reduced demand</b> |
|-----------------|------------------|-------------|-------------|-------------|----------------------------|
| M20 between 5-6 | WB               | 2853        | 3294        | 3937        | 3878                       |
|                 | EB               | 3445        | 4590        | 5109        | 4993                       |
| M20 between 6-7 | WB               | 4118        | 4717        | 5858        | 5799                       |
|                 | EB               | 4691        | 6065        | 7190        | 7037                       |
| M20 between 7-8 | WB               | 2693        | 3663        | 4060        | 4014                       |
|                 | EB               | 3583        | 4729        | 5425        | 5280                       |
| A249            | NB               | 1558        | 1426        | 2024        | 2009                       |
|                 | SB               | 1629        | 1661        | 1847        | 1877                       |
| Bearsted Road   | WB               | 916         | 1680        | 2179        | 2130                       |
|                 | EB               | 900         | 1237        | 1292        | 1272                       |

Table 8.3.1 - Summary Table of Growth

**9 OPTIONS**

**9.1 General**

9.1.1 This study provided an understanding of the current operation of the M20 between Junctions 5 to 8. Subsequent discussions with the highways authorities provided a broader understanding of the issues and future requirements.

9.1.2 The following section summarises these issues and makes suggestions for possible improvements to each of the junctions.

9.1.3 Capacity assessments of the proposed improvements have been undertaken using future year turning count information from the assessment.

9.1.4 **Indicative layouts have been created for the majority of the proposed options giving a preliminary overview of the design. These layouts are provided for illustrative purposes only and so do not represent a working solution.**

9.1.5 Where necessary local models have been created to model forecasted flows and determine whether the proposed design is viable.

9.1.6 Comments are provided for each option, highlighting the main benefits and/or problems.

9.1.7 Options that bring an improvement to a junction (both in terms of Capacity and Safety) are highlighted in **GREEN**. Those with little or no improvement are highlighted in **RED**.

9.1.8 A 'CAPACITY INDEX' is provided for each option giving an indication of how the capacity of the junction will be improved. The index is based upon the capacity of the junction with 2016/2026 forecasted traffic flows (unless otherwise stated).

| <b>CAPACITY INDEX</b> | <b>JUNCTION CAPACITY</b> |
|-----------------------|--------------------------|
| ★ ★ ★                 | Below Capacity           |
| ★ ★                   | At Capacity              |
| ★                     | Over Capacity            |

9.1.9 A 'SAFETY INDEX' is a subjective indication provided for each option giving an indication of the relative improvement to safety at the junction.

| <b>SAFETY INDEX</b> | <b>IMPROVEMENT TO JUNCTION SAFETY</b> |
|---------------------|---------------------------------------|
| ★ ★ ★               | Improvement                           |
| ★ ★                 | No Change                             |
| ★                   | Worse                                 |

## OPTIONS

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9.1.10 A summary is given for each junction highlighting the main issues found with the options and modelling. Where necessary recommendations are made for further work.

### 9.2 Assumption/Limitations

9.2.1 **It should be noted that all of the options suggested are indicative designs based upon preliminary assessments of the junctions. They have been produced without detailed topographical studies and are intended purely to illustrate the different options suggested.**

9.2.2 Before any of these options is progressed further detailed site surveys would be necessary to fully understand the extent of the highway boundaries and level details.

9.2.3 The position of existing statutory undertaker's apparatus has not been considered, as this information was not readily available.

9.2.4 Vertical alignment of the junctions has not been considered, as level information was not readily available.

9.2.5 An initial cost estimate is provided for each option. It should be noted that costs are based upon the preliminary layouts and do not allow for stats, levels and land costs.

9.2.6 The cost estimates also do not allow for the following:

- Design and supervision
- Optimism Bias
- Inflation
- Land costs
- Accommodation works
- Boundary fencing
- Work to communication cables
- Work to existing services
- Road lighting

## OPTIONS

### 9.3 M20 Junction 5

9.3.1 M20 Junction 5 is a grade separated roundabout. The eastbound on slip and the westbound off slip join a parallel carriageway to Junction 6. The roundabout is linked to a minor road to the north and the A20 to the south.

9.3.2 The major movements at this junction occur between the M20 and the A20 to the south. This movement averages approximately 10,000 vehicles during a 12 hour period with a peak hour volume of approximately 1,500 vehicles.

| ISSUES   |   |
|--|---|
| Queuing  | None  |
| Merges & Diverges  | E/B Merge is substandard                        |
| Collision Records  | Two Fatal Collisions<br>Five Serious Collisions |
| <ul style="list-style-type: none"> <li>The major traffic movement is from the A20 to the M20 Eastbound parallel link in the AM peak with the reverse movement in the PM peak.</li> <li>A number of side impact collisions have been recorded at the junction.</li> <li>A20 contains three lanes plus a dedicated slip. There is only a one lane exit into Coldharbour Lane and one lane exit onto M20 eastbound on slip. Therefore one of these lanes is redundant.</li> <li>Eastbound on slip is constrained by the close proximity of the railway bridge to the east of the junction.</li> </ul> |   |

### OPTION 1.0 – Do Nothing

#### COMMENTS

The option to do nothing at junction 5 is likely to have severe safety implications. The 2006 analysis concluded that the Eastbound on-slip merge is substandard therefore an increase in traffic volumes will only add to the existing problem. In order to rectify this, the existing Type A merge will require modification to a Type F or H merge if future traffic volumes are to be accommodated.

The urban extension does not seem to have a direct impact on traffic volumes at Junction 5 however the proposed increase in housing and employment within the town centre will introduce additional trips using this junction.

|      |     |          |   |        |   |
|------|-----|----------|---|--------|---|
| COST | n/a | CAPACITY | ★ | SAFETY | ★ |
|------|-----|----------|---|--------|---|

| OPTION 1.1 – Partial Signalisation   |         |          |     | Figure 9.3.1 |     |
|--|---------|----------|-----|--------------|-----|
| <p><b>SOLUTION</b></p> <p>Provide traffic signals on the two M20 approaches and the A20 approach.</p> <p>The approach from Coldharbour Lane remains as a give way entry due to the low number of vehicle movements on this arm.</p> <p>The dedicated left slip road from the A20 to the M20 west will be converted from a painted hatch marking to a solid kerbed island to enable mounting of a signal post. The dedicated left slip will remain unsignalised.</p> <p>Signalising junction 5 improves it's operation enabling the junction to manage 2016 and 2026 predicted volumes.</p> <p>As highlighted in the base line conditions the eastbound merge is substandard. In order to redesign this merge to standard a type F or H merge is required. However the presence of structures on the M20 results in a type B (Parallel merge) being the only solution. The auxiliary lane could only be approximately 200m in length. Therefore a departure in standard would be required if any merge improvement were to be included.</p> |         |          |     |              |     |
| <p><b>COMMENTS</b></p> <p>The main issue at junction 5 will be the right turn movement from the A20 Link road to the M20 East. This movement could result in queuing on the M20 eastbound off slip. However by signalising this approach the junction operation improves.</p> <p>TRANSYT models of the predicted traffic for 2016 and 2026 indicate that there are no major issues with traffic in the future scenarios if the junction undergoes partial signalisation.</p> <p>The Eastbound merge requires a lane gain (Type F or H merge, TD22/06), but this can not be accommodated. An auxiliary lane does enable more time for the slip road traffic to merge with the parallel link but the standard for this is a minimum of 230 metres and will therefore need to be approved as a departure from standard.</p>   |         |          |     |              |     |
| COST   | 405,000 | CAPACITY | ★★★ | SAFETY       | ★★★ |

## OPTIONS

### 9.4 M20 Junction 6 – Cobtree Roundabout

9.4.1 M20 Junction 6 – Cobtree Roundabout is a grade separated roundabout from the M20 and A229. The junction forms half of a dumbbell arrangement. The roundabout has an off slip from the eastbound parallel link from junctions 5-6 and an on slip back onto the M20. To the south of the junction the A229 links to Running Horse roundabout via link roads.

9.4.2 The major movements at this junction occur between the A229 North and the A229 South, the majority of this traffic is travelling in the direction of the M20 West, and the M20 West to the A229 North. These movements average approximately 10,600 vehicles during a 12 hour period with a peak hour volume of approximately 1,500 vehicles.

| ISSUES  |  |
|---|--|
| Queuing   | Major Queuing is Apparent in the AM Peak |
| Merges & Diverges   | None                                     |
| Collision Records   | One Serious Accident                     |
| <ul style="list-style-type: none"> <li>• Largest flow from A229 North to A229 South during AM Peak and returning during PM peak.</li> <li>• Junction connects to Running Horse roundabout to the south.</li> <li>• Improvement is restricted by land constraints surrounding the junction.</li> </ul> |  |

| OPTION 2.0 – Do Nothing   |     |          |   |        |    |
|---|-----|----------|---|--------|----|
| COMMENTS  |     |          |   |        |    |
| <p>The existing situation at Cobtree roundabout suggests that during the peak period's congestion occurs. This situation will only deteriorate further in future years as traffic volumes increase.</p> <p>Due to land and infrastructure constraints no physical improvements are possible at this junction. However, perhaps Junction 6 as a whole can act as a congestion hotspot which will restrain traffic from entering the highway network. This could promote modal shift.</p> |     |          |   |        |    |
| COST  | N/A | CAPACITY | ★ | SAFETY | ★★ |

**9.5 M20 Junction 6 – Running Horse Roundabout**

9.5.1 M20 Junction 6 Running Horse Roundabout is a grade separated roundabout from the M20 and A229. The junction forms half of a dumbbell arrangement. The roundabout is a five arm roundabout. One arm of the roundabout forms the westbound on and off slip for the M20. To the north are the link roads to Cobtree Roundabout linking the eastbound movements.

9.5.2 The major movement at this junction occurs between the A229 North and the M20 West. This movement averages approximately 8,500 vehicles during a 12 hour period with a peak hour volume of approximately 1,200 vehicles.

| ISSUES   |  |
|--|--|
| Queuing  | Major Queuing is Apparent in the AM Peak |
| Merges & Diverges  | None                                     |
| Collision Records  | No Serious or Fatal Accidents            |
| <ul style="list-style-type: none"> <li>• Largest flow from A229 North to M20 West during AM Peak.</li> <li>• Junction connects to Cobtree roundabout to the north as forms part of junction 6.</li> <li>• Improvement is restricted by land constraints surrounding the junction.</li> </ul> |  |

|                                |
|--------------------------------|
| <b>OPTION 3.0 – Do Nothing</b> |
|--------------------------------|

|   |
|---|
| COMMENTS  |
| <p>If no improvements are carried out at Junction 6 – Running Horse Roundabout the increase in traffic will cause increased congestion. In the AM peak there is currently queuing from the A229 north. This queuing will increase back to Cobtree Roundabout in future years. The general operation and safety of the roundabout will be compromised by future year traffic, however this could support the promotion of modal shift to more sustainable modes.</p> |

|      |     |          |   |        |    |
|------|-----|----------|---|--------|----|
| COST | N/A | CAPACITY | ★ | SAFETY | ★★ |
|------|-----|----------|---|--------|----|

## OPTIONS

### 9.6 M20 Junction 7

9.6.1 M20 Junction 7 is a grade separated roundabout. The westbound on slip and the eastbound off slip forms a lane gain and lane drop from junction 6. The roundabout is linked to the A249 from the north and south.

9.6.2 The major movement at this junction occurs between the A249 north and the M20 west. This movement averages approximately 10,000 vehicles during a 12 hour period with a peak hour volume of approximately 1,100 vehicles.

| ISSUES   |   |
|--|---|
| Queuing  | A249 North queue to around 300 vehicles in AM peak<br>M20 East queue to around 20 vehicles in AM peak |
| Merges & Diverges  | No Issues   |
| Collision Records  | Three Serious Accidents   |
| <ul style="list-style-type: none"> <li>Major Movements are between A249 North and M20 West and the M20 west to A249 South.</li> <li>50% of accidents are Rear shunt.</li> <li>Queuing on the A249 over 300 vehicles long.</li> </ul> |   |

| OPTION 4.0 – Do Nothing  |     |          |   |        |   |
|--|-----|----------|---|--------|---|
| COMMENTS   |     |          |   |        |   |
| The option to do nothing at Junction 7 is not possible. This junction currently experiences an excess demand at peak hours which results in a high level of queuing which only deteriorates in future years. |     |          |   |        |   |
| Without effective control and management the safe and efficient operation of the trunk road and junction is in jeopardy.   |     |          |   |        |   |
| COST   | N/A | CAPACITY | ★ | SAFETY | ★ |

| OPTION 4.1 – Partial Signalisation   |         |          |    | Figure 9.6.1 |    |
|--|---------|----------|----|--------------|----|
| <b>SOLUTION</b>  |         |          |    |              |    |
| <p>Convert the M20 eastbound approach and the two A249 approaches to signals whilst leaving the M20 westbound as a giveway.</p> <p>In addition the lane markings on the circulatory carriageway and M20 eastbound approach will be modified to improve visibility of the signal heads. There are additional lane markings to improve navigation for motorists.</p> <p>The two dedicated left slips from the A249 south to the M20 westbound and M20 westbound to the A249 north will remain as dedicated slips.</p> <p>The merges and diverges remain as standard.</p>   |         |          |    |              |    |
| <b>COMMENTS</b>  |         |          |    |              |    |
| <p>A TRANSYT analysis has been conducted to determine the capacity of this junction.</p> <p>The major issue at this junction is the high level of right turn traffic from the A249 north to the M20 westbound. Signalisation will allow smoother, safer operation of the overall junction based on the base year traffic.</p> <p>In the future year scenarios it continues to show a high level of queuing on the A249 north but signalisation allows access to be controlled on to the M20.</p> <p>Although the M20 westbound off slip would not have a queuing issue if it remains a giveway entry, signalisation could further aid access control onto the M20.</p> |         |          |    |              |    |
| COST   | 200,000 | CAPACITY | ★★ | SAFETY       | ★★ |

| OPTION 4.2 –Hamburger   |           |          |     | Figure 9.6.2 |   |
|---|-----------|----------|-----|--------------|---|
| <b>SOLUTION</b>   |           |          |     |              |   |
| <p>Convert the junction to a hamburger junction arrangement with a new link from the A249 north to the M20 west. This would enable the A249 north movement to the M20 west to become a priority movement.</p> <p>This movement will require 2 lanes and therefore will result in a 3 lane exit on the M20 slip road (W), which are currently 2 lanes.</p> <p>In order to accommodate the additional lane either the merge will need to be amended to a 3 lane merge, which is not possible due to it requiring a lane gain, or signals will be required on the slip road to control the 2 conflicting movements, therefore keeping the slip road 2 lanes.</p> |           |          |     |              |   |
| <b>COMMENTS</b>   |           |          |     |              |   |
| <p>Due to physical constraints the link between the A249 north and the M20 west may be difficult to incorporate.</p> <p>This option is considered to have safety issues due to the poor design of the slip road arrangement.</p>  |           |          |     |              |   |
| COST  | 1,970,000 | CAPACITY | ★★★ | SAFETY       | ★ |

## OPTIONS

### 9.7 M20 Junction 8

9.7.1 M20 Junction 8 is a grade separated roundabout. The roundabout has a link road to the A20 east of Maidstone. To the north there are the Motorway services.

9.7.2 The major movement at this junction occurs between the A20 link and the M20 west. This movement averages approximately 8,500 vehicles during a 12 hour period with a peak hour volume of approximately 1,400 vehicles.

| ISSUES  |                          |
|---|--------------------------|
| Queuing   | None                     |
| Merges & Diverges   | W/B Merge is substandard |
| Collision Records   | Two Serious accidents    |
| <ul style="list-style-type: none"> <li>Largest flow from A20 link to M20 westbound during AM Peak and returning during PM peak.</li> <li>Westbound on slip currently a type B Parallel Merge, however TD22/06 suggests this should be more of a lane gain type E or F merge.</li> <li>The westbound on slip is constrained by a railway bridge west of the junction.</li> </ul> |                          |

| OPTION 5.0 – Do Nothing  |     |          |   |        |   |
|--|-----|----------|---|--------|---|
| COMMENTS   |     |          |   |        |   |
| The option of doing nothing at junction 8 would lead to an increase in queuing on the A20 link road as the left turn movement increases. The general operation of the roundabout is not affected, however there is an increased right turn movement from the M20 eastbound to the A20 link. This does not severely impact on the operation of the remainder of the junction. |     |          |   |        |   |
| COST   | n/a | CAPACITY | ★ | SAFETY | ★ |

|  |           |          |   |        |     |
|--|-----------|----------|---|--------|-----|
| <b>OPTION 5.1 – Partial Signalisation with Dedicated Slip to M20 West</b>  |           |          |   |        |     |
| <b>Figure 9.7.1</b>  |           |          |   |        |     |
| <b>SOLUTION</b>  |           |          |   |        |     |
| <ul style="list-style-type: none"> <li>• Signalise the two M20 approaches and the A20 link with the services left as a giveaway entry.</li> <li>• A dedicated left slip to the westbound M20 slip road is to be added on the A20 link. Due to the high number of vehicles on the slip road the current layout would be unable to cope with the increased traffic. The slip road would therefore become a two lane slip road with traffic from the roundabout in the offside lane.</li> </ul> |           |          |   |        |     |
| <b>COMMENTS</b>  |           |          |   |        |     |
| <p>A TRANSYT assessment of the junction has been carried out to assess the operation of the junction in future year scenarios. This shows that the operation of the junction is not affected by the increase in traffic.</p> <p>However the offside lane will be lightly trafficked with approximately 120 vehicles per hour where as the dedicated lane will be carrying in excess of 1800 vehicles per hour and will be operating over capacity.</p>                                       |           |          |   |        |     |
| COST   | 1,145,000 | CAPACITY | ★ | SAFETY | ★★★ |

|  |           |          |     |        |    |
|--|-----------|----------|-----|--------|----|
| <b>OPTION 5.2 – Partial Signalisation with 2 Lane Dedicated Slip to M20 West</b>   |           |          |     |        |    |
| <b>Figure 9.7.2</b>  |           |          |     |        |    |
| <b>SOLUTION</b>  |           |          |     |        |    |
| <ul style="list-style-type: none"> <li>• Signalise the two M20 approaches and the A20 link with the services left as a giveaway entry.</li> <li>• A two lane dedicated left slip to the westbound M20 slip road is to be added on the A20 link. Due to the high number of vehicles on the slip road the current layout would be unable to cope with the increased traffic.</li> <li>• Where the dedicated left slip meets the slip road will require a traffic signal junction. The exit from the roundabout will need to be modified to a two lane exit.</li> </ul>   |           |          |     |        |    |
| <b>COMMENTS</b>  |           |          |     |        |    |
| <p>The two lanes on the dedicated slip allows for it to contain more capacity as with the two lanes on the exit.</p> <p>The signal junction where the dedicated lane meets the slip road would mean that the HGV's on the A20 approach and roundabout would be able to position themselves on the nearside lane allowing easier merging with the motorway traffic.</p> <p>Where the traffic from the roundabout enters the slip road the two lanes will allow for more capacity on the short link, due to the low number of vehicle negotiating this manoeuvre a minimum green time will be required on this link which will enable more efficient flow passing along the dedicated slip from the A20.</p> <p>A TRANSYT model of this configuration shows that there are no capacity issues with this arrangement.</p> |           |          |     |        |    |
| COST   | 1,500,000 | CAPACITY | ★★★ | SAFETY | ★★ |

| OPTION 5.3 – Lane Drop and Lane Gain   |   |          | Figure 9.7.3 |        |   |
|--|---|----------|--------------|--------|---|
| <p><b>SOLUTION</b></p> <ul style="list-style-type: none"> <li>• Incorporate a type C lane drop at taper diverge on the westbound off slip from the M20 with a type F lane gain with ghost island merge on the west bound on slip.</li> <li>• This option can be used with both options 5.1 and 5.2 above.</li> </ul>   |   |          |              |        |   |
| <p><b>COMMENTS</b></p> <p>Whilst this option is feasible based on 2026 predicted traffic flows. The main issue is that the M20 has a high proportion of HGV's due to the Dover Ferry Port. The concern is that the HGV's will have to weave on the approach to the junction and will also have to weave with the high number of vehicle merging from junction 8 to the west of the junction.</p> <p>This option can however, be design within the standards identified in TD22/06.</p> |   |          |              |        |   |
| COST   | - | CAPACITY | ★★           | SAFETY | ★ |

| OPTION 5.4 – Modified Type H Alternative Ghost Island Merge with Auxiliary Lane   |         |          | Figure 9.7.4 |        |     |
|---|---------|----------|--------------|--------|-----|
| <p><b>SOLUTION</b></p> <ul style="list-style-type: none"> <li>• The westbound merge would be converted to a type H merge to enable two lanes of traffic to merge with the M20. The hard shoulder of the merge is restricted by the railway bridge to the west of the junction and with therefore need to be constructed with an emergency access route along the bridge parapet.</li> <li>• This option can be used with both options 5.1 and 5.2 above.</li> </ul> |         |          |              |        |     |
| <p><b>COMMENTS</b></p> <p>This option allows for the vehicles on the slip road greater ease to merge with the motorway traffic. However the hard shoulder will need to be discontinued for the last 300 metres of the merge. The issue with this is that if a vehicle breaks down on this section of highway it will block access to vehicles on this section of slip road.</p> <p>This will also require a departure from standard to be authorised.</p>           |         |          |              |        |     |
| COST  | 450,000 | CAPACITY | ★★★          | SAFETY | ★★★ |

**9.8**

**Suggested Strategy**

9.8.1

Based on the above options considered for infrastructure improvements, it is suggested that the following schemes are brought forward as part of the highway strategy:

- Signalisation of Junction 5 and provision of an auxiliary lane on the eastbound on slip (option 1.1)
- Signalisation of Junction 7 (option 4.1)

## OPTIONS

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- Signalise of Junction 8 and improvements to the westbound merge (option 5.2 and 5.4).
- Amend Coldharbour roundabout signal timings

It should be noted that all options are subject to detailed design, departures from standards and road safety audits. This strategy is not to provide huge infrastructure schemes which will enable lots of spare capacity. The intent is to provide options which are in line with the policies of KCC and MBC and will therefore compliment the surrounding network. The strategy for Maidstone is not only dependant on the results from this analysis but will also be influenced by future work and analysis and therefore the strategy for Maidstone NGP may change in the future.

### 10 TRANSPORT STRATEGY

#### 10.1 Introduction

- 10.1.1 This study has been undertaken by the HA in partnership with KCC and MBC. The objective of the study is to develop an integrated transport strategy that takes account of the development of land around Maidstone with particular emphasis on the proposed urban extension to the south east of Maidstone. A total of 10,080 housing units and 13,000 jobs are proposed within Maidstone by the year 2026.
- 10.1.2 The transport strategy is derived from Governmental policies and KCC's local policies. Transport policy is to promote and give highest priority to walking cycling and public transport with efforts to reduce car use through travel plans and other initiatives. Highway improvements have also been included within the strategy however is only to be implemented when the effect of other measures have been considered.
- 10.1.3 However it has been concluded that the scale of the development will inevitably have significant impact on the road network. Junction 8 is predicted to be the most affected junction along the M20, due to the high volume of traffic accessing the urban extension via this junction and provision of the SEML. The 2026 forecasts a 49% increase in traffic from 2006 base year due mostly to traffic generated from the development area but also from continual growth of existing traffic movements. The forecast development will also have an impact on neighbouring junction such as junctions 7, 6 and 5 which decreases respectively. Consequently the study has considered a number of road improvements at the aforementioned junctions and their vicinity, alongside a number of demand management techniques.
- 10.1.4 The Core Strategy will need to be supported by a Transport Strategy that assesses all the methods of controlling vehicle trips, as promoting a Strategy that relies solely on highway improvement schemes to create additional capacity will not find favour, and is not in accordance with Circular 02/07.
- 10.1.5 The actual approach that will be used will be a combination of a number of measures. The County Council's Urban Traffic Management and Control project, currently in its early stages, will provide the means of managing traffic in the town centre to try to prevent gridlock and even out the queues and delays that form on the network. It will also allow coordination between the County's network and the M20, through close working contact with the HA's Regional Control Centre at Godstone (Surrey). Measures such a new quality bus links, cycleways, park and ride and reduced parking standards will need to play an important role, in achieving this strategy.
- 10.1.6 The main challenges will come with the need to constrain the demand for trips by car, using a combination of encouragement for sustainable transport and discouragement of individual car trips.
- 10.1.7 **Encouragement** could take the form of:-
- Sustainable layouts of mixed developments, incorporating public transport services, and opportunities for walking and cycle trips
  - Improved priority for buses wherever possible, both at key junctions and along key links. This can be achieved in some part by management through UTMC and bus priority technology, but would also involve consideration of either additional road space for buses, or reduction of road space for cars.

- Promotion of Travel Plans (workplace, home, school)
- Extension of Park and Ride services (there are already plans for a larger site on the A249 at Newnham Park next to Junction 7)
- Extension of the Cycle Network
- Extension of the Kent Carshare Scheme
- Extension of the KCC Car Club initiative

### 10.1.8 **Discouragement** could take the form of :-

- Reduced parking provision (home and workplace)
- Lower priority for cars on the road network
- Access controls on motorway
- Fiscal management (i.e. tolls, congestion charging)

## 10.2 **Public Transport**

10.2.1 Improved public transport links will be essential if the urban extension is to come forward as a sustainable community. An increase in congestion levels within the town centre and a good public transport strategy should therefore promote a modal shift from the car to more sustainable methods of transport such as the bus.

10.2.2 Public transport services to the east of Maidstone will be required in order to serve the proposed urban extension community. This service will have to be of high quality and frequency. These services will need to connect either directly or indirectly to residential and employment areas and for maximum effect should be introduced early in the development of the area. This will ensure a choice of mode is available for a large proportion of the trips within the urban extension. Potential public transport routes will require investigation by KCC.

10.2.3 KCC should also consider potential park and ride sites on the north side of the M20, along the A229 and A259 corridor to relieve pressure on the M20 junctions.

## 10.3 **Travel Plans**

10.3.1 In order to ensure that the urban extension does not rely entirely on the private car there is a need for the development sites to produce individual travel plans which are complementary to each other. Travel plans are used to assist individuals and organisations in the promotion of alternative transport modes that are more sustainable than single occupancy private journeys. Reduced traffic congestion, protection of the environment, healthier lifestyles and less social exclusion are just some of the benefits of such plans.

10.3.2 Travel plans are seen as a valuable part of employee relations and good business planning for employees. There are many actions that could be included in a travel plan for employers and it is unlikely that a single plan will incorporate them all. Each travel plan produced will require a set of targets and have mechanisms for monitoring and penalties should the targets not be met.

10.3.3 Travel plans for residential areas are less well developed. Key issues that affect trips generation are household occupancy, car availability and opportunities for a choice of travel by an alternative mode. To ensure trip generation from residential development is low there will need to be a number of measures possibly car clubs, subsidised public transport and high quality infrastructure for slow modes.

10.3.4 This complies with the Regional Spatial Strategy for the South East which highlights a number of SMART objectives considered capable of reducing the level of private car travel.

10.3.5 The implementation of robust travel plans is estimated to reduce car trips by approximately 10%.

### **10.4 Parking Restraint**

10.4.1 Maidstone currently experiences capacity issues, especially within the town centre. The incorporation of public transport provisions such as bus lanes/bus priority, will only result in a further reduction in road capacity. This will end in traffic travelling slower which in turn will increase the release of harmful emissions into the environment. Town centre parking restraint and charging policy and measures will be needed to achieve a balance between future traffic demand and capacity. In addition parking restraint will be required at all new and redeveloped employment sites to encourage modal shift. A typical parking standard for office type developments is 1:30 when considering mean trip rates. Therefore in order to gain a 5% reduction in car trips due to parking restrictions a 5% reduction in parking ratio is required. Therefore a parking standard of 1:32 will be considered appropriate, for all developments coming forward, as a minimum.

### **10.5 Alternating shift patterns**

10.5.1 Altering start and finish times of shift patterns of major employers within Maidstone can help to reduce the amount of traffic travelling within the city during peak times. (Shifts that generally start and finish outside the peak). This technique could be considered by new employees and implemented through a travel plan.

### **10.6 Internet**

10.6.1 The use of the Internet can help inform people of available travel methods available to them within Maidstone. The developer of the urban extension should work closely with MBC and KCC in order to develop a travel website for the urban extension which will provide correct information, possibly real time information on public transport, cycle and walking link, and car clubs to the residents of the urban extension.

### 10.7 Traffic Control Centre

10.7.1 A traffic control centre is the operational hub of any transport system. From this centre many intelligent transport systems can be managed and controlled on a daily basis. Such centres can control traffic signals, variable message signing, traffic cameras, bus stop signing, pollution facilities etc. Collaboration between the local authorities and the HA would ensure that both local and trunk roads are operating efficiently.

### 10.8 HA Demand Management Mechanisms

10.8.1 Alongside the measures above which the Council would be responsible for implementing, the HA need to consider the following mechanisms to also reduce the demand to travel:

- The junctions on the M20 at Maidstone are in close proximity to each other. Through the use technological measures, including traffic signals, VMS, selective vehicle technology, internet etc to enable the network to be actively managed thus ensuring safety, journey reliability and informed travellers.
- Consider the use of access control to ensure safety and journey reliability on the trunk road network.
- Proactively engaging and influencing the land use planning process.
- Consider vulnerable road users and where appropriate, encourage the implementation of infrastructure that will provide a safe route for all users.
- The provision of the HA Traffic Officers (HATOs) to operate on the trunk road system to keep traffic moving around collisions and make road users journeys as safe and reliable as possible.

10.8.2 To ensure the successful delivery of this strategy, the HA will need to work with MBC and KCC to deliver a demand management strategy.

10.8.3 It is essential that this demand management strategy is adapted alongside any highway improvement measures to ensure that the impact of predicted future growth on the M20 corridor is managed, effectively and as efficiently as possible.

### 10.9 Infrastructure required

10.9.1 Even with the above demand management measures, highways improvements are still required to both the local and strategic road network as highlighted with Maidstone's Local Transport Plan. These consist of

- South East Maidstone Strategic Link
- Junction 8 signalisation and improvements to merge
- Junction 7 signalisation and improvement to junction
- Junction 5 signalisation and improvement to junction
- Coldharbour roundabout – improve signal timings
- The development of the All Saints Relief Road for environmental reasons.

- The inclusion of service bays on Upper Stone Street to prevent the obstruction of through traffic on the A229.

**10.10 Phasing**

10.10.1 The recommended phasing of the implementation of the developments is as follows

| Phase | Transport Infrastructure  | Development Phasing   |
|-------|---|---|
| 1     | Agreement of development plans and transport proposals for major developments.<br><br>Design and Implementation of the South East of Maidstone (SEML) Strategic Link. | Prior to any development taking place.<br><br>The SEML and the associated phasing of this infrastructure requires further study work to determine the exact impact of the scheme. |
| 2     | Full Signalisation of Junction 8  | 1000 houses and corresponding employment in urban extension   |
| 3     | Incorporation of the 2-lane dedicated slip road from the A20 to the M20 westbound. Paired with a type H merge   | >1000 houses and corresponding employment   |
| 4     | Signalisation of Junction 7   | Prior to any development taking place that will have a detrimental affect on Junction 7   |
| 5     | Signalisation of Junction 5   | Will be required to accommodate future year traffic   |
| 6     | Amend Coldharbour Roundabout signal timings   | Will be required to accommodate future year traffic   |

Table 10.5.1 - Phasing of Infrastructure for Maidstone Trunk Road Improvements

**10.11 Funding**

10.11.1 KCC will need to reach agreement in principal for the proposed developments to make specific contribution to sustainable forms of transport. These commitments need to be co-ordinated in order to develop complementary networks of pedestrian, cycle and bus routes within Maidstone.

10.11.2 In addition it has been identified that in order for the development to proceed the proposed South East Maidstone Strategic Link will be required, which will provide assess to the M20 via junction 8, to allow long distance traffic to gain access to commercial development in the Parkwood area, and also provide a spine to link other residential and commercial development. It is proposed that developers will fully fund this road scheme in order for their developments to come forward.

10.11.3 Contribution will be sought from specific developments and there will, by necessity, need to be a flexible and phased approach for all junction and road improvements.

Tariff Strategy

- 10.11.4 The transport system within areas of the Maidstone is under pressure as a result of current and predicted levels of development. Existing problems will be made worse and new problems created on the highway network unless sufficient investment is undertaken to mitigate against the impact of new development.
- 10.11.5 It is recommended that contributions will be sought from all developments, which are expected to have a cumulative transport impact within Maidstone. The impact of any development in traffic terms is clearly relative to the new traffic generated by the development, and it is intended, therefore that trip rate generation be used as the means by which the scale of contribution from differing types of development will be determined.
- 10.11.6 The pooling of funds with regard to this tariff will be vital to meet costs of strategic highway improvements to the Maidstone network and the required demand management methods, these will be provided and used by the whole community. Immediate localised improvements for particular developments will be provided through the use of S278 agreements with the Local Highway Authority or the Highway Agency in the event of work to a trunk road, or planning approval conditions where appropriate.

### 11 CONCLUSION

11.1.1 The HA were asked to respond to the proposals for Maidstone to achieve New Growth Point status. In the DCLG's response to Maidstone's proposals, there were two areas of concern in which Maidstone were recommended to consult with the HA, these were:

- Sustainability of locating employment development near to the M20
- Appraisal of current and future constraints on the M20 around Maidstone

11.1.2 In order to enable the HA and KCC to understand the impact of the proposed development on the highway network, and to inform the evidence based assessments regarding transport, it was considered necessary to undertake this study. The aim was to gain a better understanding of the transport implications of the proposals which in turn would enable all authorities involved to address the following questions

- **How would the growth proposals impact on existing transport networks?**

The proposed development size will have a major impact on the transport network.

- **What interventions are necessary to deal with these impacts?**

This report has in section 10 identified the details on all measures recommended to relieve the impact, of the development proposals. It should be noted that these measures will not completely remove congestion, but instead should go some way to managing the demand and ensuring that the safe and efficient operation of the trunk road is maintained.

- **To what extent have alternatives to investment in new infrastructure been explored by authorities as a means of providing the necessary capacity to cater for the proposed additional growth (i.e. reducing the need to travel, smarter choices, demand management etc)?**

Consideration has been given to more sustainable transport methods. Through the exploration of SMART objectives the implementation of travel plans, car share schemes, teleworking, public transport initiatives and parking restraints, is predicted to reduce the overall impact of trips generated from the additional development. In addition a demand management strategy should be put in place through collaboration with all interested parties. Section 8 of this report considers the likely trip reduction on the future matrix as alternative to investment in new infrastructure.

- **What would be the impact on the growth proposals if these interventions were not delivered?**

If these sustainable transport methods were not implemented within Maidstone then the amount of development would need to be reconsidered as the transport network would become over capacity. This would result in reduced accessibility into and out of Maidstone.

## CONCLUSION

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- **Is there room for changes in the proposal that would lessen the transport impact?**

The site of the urban extension is considered sufficient enough to create a reasonable level of internal trips due to the allocation of jobs and residential areas. This will also support the public transport link into the centre of Maidstone, to make it become viable.

- **What are the ballpark costs of each of the transport interventions necessary to support the growth?**

Section 9 of this report reviews the cost of each of the proposed improvements. Ballpark costs have been derived for the infrastructural improvements recommended.

- **Are there sufficient resources to deliver the growth?**

It is considered that through developer funding, and a detailed phasing program there will be sufficient resources available to deliver the growth.

11.1.3 The measures and indicative junction designs highlighted within this report are regarded as a package of measures which will work towards alleviating the impact on both the strategic and local road network. However the stress on the network will remain, with existing congestion levels increasing from that experienced today.

## 11.2 Risks

11.2.1 However, it is important to note the number of risks association with the development proposal

- Kent International Gateway – The proposal for an international gateway to be situated to the Southwest of the M20 junction 8 has not been considered within this assessment. However if the proposal is to come forward, this will have severe implications on the design at junction 8, the surrounding road network and the ability for the urban extension to come forward in it's entirety.
- Parking Restrictions – Parking Restrictions have been highlighted as a feasible method to reduce car travel and has been used to reduce the future trip estimations. However, if this is considered undeliverable due to commercial viability then an alternative option will be required to reduce trips. In addition if the parking restrictions were to be implemented strict targets, measures and monitoring processes will need to be in place to ensure compliance and success.
- Travel Plans – It is imperative that the delivery of travel plans are implemented successfully and achieve the required percentage reduction in traffic growth.
- Public Transport Service – In order to ensure that the urban extension is sustainable the public transport service will need to achieve specific targets. These will be determined when detailed analyses/design has been undertaken.
- South East Maidstone Strategic Link – The SEML should be in place prior to any development taking place. Therefore this will need to be deliverable and fully funded through the developer.

## CONCLUSION

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- Strong collaboration between authorities – In order to devise a transport strategy that is both achievable and sustainable it is strongly recommended that collaboration between KCC, MBC, and other relevant authorities.
- Junction improvements – Improvements to the M20 junctions is essential before any development will go forward. It is recommended that developers devise joint contributions in order to fund the relevant schemes.

### 11.2.2

If any of the criteria has not been implemented to a sufficient standard there is every likelihood that the urban extension will not proceed due to the implications on the strategic network. In addition, if the authorities do not work together in the delivery of the demand management requirements of the strategy, and consequently do not achieve the level of modal shift required, the cost of the infrastructure required will become insurmountable, with major improvements required at Junction 7 and 8 and possibly some contributions to the widening of the M20 between Junction 3 – 5 (which is being considered by another study).