<table>
<thead>
<tr>
<th>Original Prepared by</th>
<th>Reviewed by</th>
<th>Approved by</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAME: Roger Ferreira</td>
<td>NAME: Barbara Sim</td>
<td>NAME: Roger Ferreira</td>
</tr>
<tr>
<td>DATE: 21 February 2008</td>
<td>SIGNATURE</td>
<td>SIGNATURE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Revision Prepared by</th>
<th>Reviewed by</th>
<th>Approved by</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAME: Roger Ferreira</td>
<td>NAME: Jonathan Whittaker</td>
<td>NAME: Roger Ferreira</td>
</tr>
<tr>
<td>DATE: 28 May 2008</td>
<td>SIGNATURE</td>
<td>SIGNATURE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Revision Prepared by</th>
<th>Reviewed by</th>
<th>Approved by</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAME: Roger Ferreira</td>
<td>NAME: Jonathan Whittaker</td>
<td>NAME: Roger Ferreira</td>
</tr>
<tr>
<td>DATE: 6 June 2008</td>
<td>SIGNATURE</td>
<td>SIGNATURE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Revision Prepared by</th>
<th>Reviewed by</th>
<th>Approved by</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAME: Roger Ferreira</td>
<td>NAME: Tim Waller-Davies</td>
<td>NAME: Roger Ferreira</td>
</tr>
<tr>
<td>DATE: 11 October 2008</td>
<td>SIGNATURE</td>
<td>SIGNATURE</td>
</tr>
</tbody>
</table>

Copyright Jacobs Engineering U.K. Limited. All rights reserved.

No part of this report may be copied or reproduced by any means without prior written permission from Jacobs Engineering U.K. Limited. If you have received this report in error, please destroy all copies in your possession or control and notify Jacobs Engineering U.K. Limited. This report has been prepared for the exclusive use of the commissioning party and unless otherwise agreed in writing by Jacobs Engineering U.K. Limited, no other party may use, make use of or rely on the contents of this report. No liability is accepted by Jacobs U.K. Limited for any use of this report, other than for the purposes for which it was originally prepared and provided. Opinions and information provided in the report are on the basis of Jacobs Engineering U.K. Limited using due skill, care and diligence in the preparation of the same and no warranty is provided as to their accuracy. It should be noted and it is expressly stated that no independent verification of any of the documents or information supplied to Jacobs Engineering U.K. Limited has been made.
## Contents

1 Introduction 1-1
   1.1 Vision 1-1
   1.2 Policy Context 1-1
   1.3 Partners delivering the KTS Vision 1-2
   1.4 Individual and shared Objectives of the KTS Transport Strategy 1-3
   1.5 Report Outline 1-4

2 The Transport Environment 2-6
   2.1 Introduction 2-6
   2.2 Highways 2-6
   2.3 Public Transport 2-9
   2.4 Walking and Cycling 2-11
   2.5 Air Quality and Noise 2-14

3 Development of the Transport Strategy 3-1
   3.1 Introduction 3-1
   3.2 Forecasts of Land Use and Trip Generation 3-1
   3.3 Transport Schemes 3-3
   3.4 Committed Transport Schemes 3-3
   3.5 Individual Elements of the Transport Strategy 3-4
   3.6 Strategic Transport Investment Package Schemes 3-13
   3.7 The KTS Transport Model and Benefits of STIPS 3-16
   3.8 Accessibility Strategy 3-20

4 Conclusions 4-1

Appendix A - Transport Modelling and Forecasting 4-4
   A.1 The KTS Transport Model 4-4
   A.2 Modelling Scenarios 4-4
   A.3 2025 Do Minimum Network Assumptions 4-5
   A.4 2025 STIPS Network Assumptions 4-5
A.5 Modelling Network Performance 4-6
Appendix B - Policy Documents 4-16
Appendix C - Transport Strategy Action Plans 4-18
Appendix D - Junctions that exceed 85% Volume Capacity Ratios 4-29
Appendix E - References 4-31
Appendix F - Glossary of Commonly Used Terms 4-32
1 Introduction

1.1 Vision

The Thames Gateway as a major planning concept emerged in the 1990s. It is now Europe’s largest regeneration project and was identified as one of four key growth areas by the Government’s Sustainable Communities Plan. Within the Government’s Thames Gateway initiative, Kent Thameside is recognised as a priority area for regeneration and investment.

Kent Thameside, comprising Dartford and Gravesham Boroughs north of the A2 Trunk Road, will provide a new major employment focus and extensive housing constructed on brownfield land across the area. Ebbsfleet Valley is identified as one of the four principal economic drivers for the whole of the Thames Gateway, and is centred on the new domestic and international transport hub at Ebbsfleet. The emerging South East Plan prepared by SEERA and expected to be adopted in 2008 provides the statutory framework for the regeneration of the Kent Thameside area with a target of 25,000 new homes and approximately 50,000 new jobs by 2026.

The vision is to work with local communities to make Kent Thameside a thriving, attractive, inclusive and successful community presenting a high quality place to live, work, invest and visit. A key part of this vision is that Kent Thameside should be a sustainable development.

To this end the strategy is to promote employment and housing on a scale, and in locations, that will enable as many needs as possible to be met locally, reducing the need for long distance travel. For remaining trips where walking and cycling are not an option, the aim must be to maximise accessible public transport provision within both existing and new urban development and to strongly encourage its use.

It is recognised that car use will remain the only realistic option for some trips. However it is envisaged that measures to restrain car use for trips where public transport is a valid alternative will be needed alongside public transport improvements as part of an overall travel demand management strategy. The Kent Thameside area along with key development areas and major committed transport schemes are shown in Figure 1.1

1.2 Policy Context

The principles of the Thames Gateway spatial framework were established in the Regional Spatial Strategy (also Regional Planning Guidance RPG9a), and are based around the consolidation of the existing regional pattern of town and country, maximising the potential offered by the area’s supply of brownfield land and exploiting the opportunity offered by the new Channel Tunnel Rail Link (now referred to as HS1) and the River Thames.

At the core of the framework are two new regional commercial and business hubs directly served by the new HS1.

1. The western end of the Gateway, around Canary Wharf/ Stratford
2. The centre of the Gateway in Kent Thameside, focused on the new HS1 station at Ebbsfleet, and the adjoining major brownfield sites at Eastern Quarry, Swanscombe and Northfleet.

Following on from the initial Thames Gateway Planning Framework published in 1995, a number of planning policy documents, transport studies and strategies have been produced. The Kent Thameside Transport Strategy must be developed within the framework of these local, regional and national policy objectives.

The national policy objectives, set out in the Government’s Sustainable Communities Plan, provide a long term vision for new communities and underpin the recent philosophy of growth areas such as Kent Thameside. On a regional scale the South East Plan provides a draft policy framework for development with the region and the sub-region of Kent Thames Gateway up to 2026. The Kent & Medway Structure Plan provides the planning framework that guides decisions on development in Kent and Medway and will continue to do so until the South East Plan is formally adopted, which is expected to be during 2008 / 2009.

Kent County Council’s vision for transport has been developed through the ten Local Strategic Partnerships (LSPs) working on the new Community Strategy for Kent, and through the LTP’s (Local Transport Plan for Kent 2006 – 2011) extensive community engagement process. Reducing social exclusion and congestion, protecting the environment and improving public transport are amongst the top three issues in eight out of the ten LSP community strategies. The strong relationship between the community strategies and LTP has ensured that KCC’s vision for transport is entirely consistent with the long term aims of Kent’s local authorities and their partners. The Local Transport Plan sets out the transport vision for the County for 2025 as developed with partners and the plan sets out a strategy to achieve the vision.

Finally the local development policies and objectives of Gravesham and Dartford are in the Borough councils Adopted Local Plans and emerging Local Development Frameworks.

A more comprehensive listing of relevant local, regional and national policy documents are attached in Appendix B.

1.3 Partners delivering the KTS Vision

Responsibility for the Thames Gateway as a whole lies with the Department of Communities and Local Government (DCLG).

The Kent Thameside Delivery Board (KTSDB) has been set up as a partnership between local and central Government and developers to co-ordinate and oversee development in the Kent Thameside area.

A separate Kent Thameside Transport Group has been set up, comprising representatives of the Kent Thameside Delivery Board, Kent County Council (KCC) the highway authority for the non-trunk roads, Highways Agency (HA) the highway authority for the trunk roads, and Dartford and Gravesham Borough Councils the local planning authorities and drivers of the Local Development Frameworks (LDF). The Transport Group has responsibility for developing a Transport Strategy to support development in Kent Thameside and is supported by the consultants acting for KCC (Jacobs) and for the HA (Faber Maunsell). There are also separate transport consultants advising the Local Boroughs and the private developers.
1.4 Individual and shared Objectives of the KTS Transport Strategy

Each of the partners identified above supports the overall vision for Kent Thameside, and shares the same broad objectives. However each partner organisation also has its own local objectives and priorities on transport issues.

The KTSDB Partners have the following individual objectives

Kent County Council

- **Accessibility**
  “Kent County Council will support independence and reduce social exclusion by improving transport links to key destinations and bringing services closer to communities”

- **Demand Management**
  “Kent County Council will seek to reduce the demand for transport both within and through Kent”

- **Environment, Heritage and Communities**
  “Kent County Council will stabilise and, where possible, reverse the adverse effect of transport and its infrastructure on the natural and built environment and on local communities”

- **Health**
  “Kent County Council will improve the health of Kent residents by reducing the impact of transport, encouraging increased physical activity and enhancing access to key health facilities”

- **Integration**
  “Kent County Council will encourage integration to maximise the use of sustainable modes and therefore widen choice for Kent residents”

- **Keep Kent Moving**
  “Kent County Council will manage and maintain the local highway network to maximise the safe and efficient use of road space and provide reliable journey times”

- **Road Safety**
  “Kent County Council will strive to provide a safe and secure transport system for all users throughout the county”

- **Sustainable Regeneration**
  “Kent County Council will promote development that reduces the need to travel while supporting the local economy”

- **UK Connections**
  “Kent County Council will press for more efficient, sustainable transport links with London and the rest of the UK”

- **UK Gateway**
  “Kent County Council will ensure that international traffic covers its costs, minimises the impact on Kent and its residents and maximises the use of rail”

Dartford Borough Council

- **Enable travel choices that support economic activity and growth via the planning process.**
- **Ensure accessibility to services and facilities by various travel modes via partnerships.**
• Maintain and improve (where possible) air quality with regard to vehicle emissions, especially in declared Air Quality Management Areas (AQMAs), via the planning process and partnership working.
• Encourage pedestrian and cyclist travel by creating with others, strategically linked local networks with appropriate resting and cycle parking facilities.
• Encourage public transport travel via partnerships to ensure competitive journey times, fares and frequencies; quality vehicles; and appropriate services information provision.
• Manage car trips using demand management techniques and kerb-space management solutions.
• Accommodate residual car travel via strategically allocated off-street parking facilities especially when cars are used as part of a multi-mode journey.
• Maintain the viability of Dartford town centre.

Gravesham Borough Council

• Keep Gravesham moving in the context of major development.
• Upgrade the public transport system.
• Manage the highway network to maximum efficiency.
• Ensure adequate car parking without compromising other objectives.
• Ensure sufficient funding to finance transport enhancements.
• Reduce the impact on residents of poor air quality from all sources.
• Maintain the viability of Gravesend town centre
• Consistency of the KTS Transport Strategy with the emerging LDF for Gravesham.

Highways Agency

• Engage in the planning process and support the Government's sustainable development agenda.
• Influence travel behaviour, minimise the number of trips at source, and promote sustainable travel choices.
• Promote measures to overcome constraints on sustainable economic development; where these constraints include strategic road capacity, preference should be given to solutions other than new road capacity.
• To ensure that developers manage down the traffic impact of their developments and where capacity is exceeded, ensure that local conditions on the strategic road network will be no worse with the development than if it had not taken place.

The KTS Transport Strategy needs to ensure that the overall vision can be delivered without any key individual objectives having to be sacrificed.

1.5 Report Outline

The following chapters of this report can be summarised as follows:

• Chapter 2 will outline the transport environment.
• Chapter 3 will describe the developments and the transport strategy for the area.
• Chapter 4 will offer conclusions.
• The Appendices provide details on the transport modelling and forecasting, policy documents, the Transport Strategy Action Plans, potentially overloaded junctions and references.
• There is also an Appendix F that has a glossary of commonly used technical terms.

This is a Technical Summary Report and the more detailed reports that went into the development of this summary report are referenced in Appendix E. It should be noted that this Summary Document reflects the position up to October 2008 and will evolve over time as more information and data becomes available and as more studies are completed.
2 The Transport Environment

2.1 Introduction

Kent Thameside comprises the boroughs of Dartford and Gravesham. It lies within the Thames Gateway region of Kent earmarked for major re-development in line with Government plans. The area is intersected by the M25 / A282 on a north – south axis with the Dartford Crossing leading into Essex. To the west lies London whilst to the east there are the Medway Towns and to the north is the River Thames. The A2 Trunk Road forms the southern boundary of the KTS area. The KTS area and key transport links are shown in Figure 1.1.

2.2 Highways

The KTS area is served by a hierarchy of existing roads from strategic trunk roads to classified principal roads and local roads. The A2 Trunk Road and the M25/A282 are the two trunk roads in the area and are the responsibility of the Highways Agency whilst principal and local roads are managed by Kent County Council.

The A2/M2 Trunk Road carries strategic traffic between London and Kent destinations such as the Medway Towns, Canterbury and the port of Ramsgate. It also provides an alternative route to the M20 for the Port of Dover and to Channel Tunnel shuttle services at Folkestone. For KTS related traffic the A2 Trunk Road is used primarily by traffic heading into London and beyond and is the key arterial route for traffic access to Ebbsfleet station and the regional shopping centre at Bluewater. In the future the A2 Trunk Road will also provide a key access for the Eastern Quarry and Ebbsfleet developments both located in the Ebbsfleet Valley (refer to Figure 1.1).

The other major route passing through the area is the M25 / A282. This caters mainly for strategic traffic avoiding London and is also a key route for local KTS traffic that wants to head north into Essex and beyond via the Dartford Crossing.

Widening and junction improvements are currently being carried out at a number of points on the local trunk road network with an expected completion during the latter half of 2008.

The KTS urban areas are connected to the trunk road network in a number of locations. Dartford is connected to the A2 at:

- A2018 Dartford Heath Interchange.
- B255/A296 Bean Interchange which also provides access to Bluewater.

Dartford is connected to the A282/M25 via the A206 at junction 1a and the A225/A296 Princes Road Interchange (junction 1b). The A206 also provides access to the Crossways Business development and Greenhithe.

The Gravesend urban area of Gravesend is connected to the A2 Trunk Road at the following interchanges:

- Ebbsfleet Junction.
- Pepperhill Junction.
- A227 Tollgate.
• **Marling Cross for local traffic via Valley Drive.**

The Ebbsfleet area has witnessed major network changes associated with the Channel Tunnel Rail Link works. In 2007 the opening of the Ebbsfleet Link road joined the A2 Trunk Road / Ebbsfleet junction with the A226 Thames Way. It forms the main access to Ebbsfleet station as well as creating a new route to and from Northfleet, Gravesend and the A2 Trunk Road. This new link will relieve the Pepperhill and A227 Tollgate junctions as well as taking traffic away from B262 Springhead Road. Note Springhead Road has now been downgraded from the A2260 to be part of the B262.

Between Dartford and Gravesend lie major development areas of Ebbsfleet, Stone, Greenhithe, Swanscombe and Northfleet. The A226 is the main arterial connection along with the A206 Crossways Boulevard (STDR 1). The latter road is the main access link into the Stone and Greenhithe development areas.

At the same time, both Dartford and Gravesend are already re-designing their town centre highway network operation to enhance public transport and the local environment. Within Dartford there are plans to revise the gyratory system whilst in Gravesend town centre there is the Transport Quarter Redevelopment and the associated Rathmore Road proposal. The long term future of the Gravesend Town Centre one way system is still to be considered.

Longer term future plans within the KTS area include the commitment to dual the A226 Thames Way known as STDR4 associated with the Eastern Quarry and Ebbsfleet developments. More details on future highway schemes are provided in Chapter 3.

### 2.2.1 Traffic Conditions and Local Hotspots

Like many parts of the UK the Kent Thameside area is heavily affected by commuter based traffic and tends to be a weekday morning peak (0700 – 1000) and evening peak period (1600 – 1900) issue.

However Kent Thameside is somewhat different in the nature and characteristics of its traffic composition when compared to its nearest neighbour London. In London the peaks are sustained over a longer period of the day and the profile of the traffic has flattened from congestion, through peak spreading. However in Kent Thameside the congestion is not as intense as London and is more a peak hour issue with the shoulders of the peak generally having lower levels of traffic and congestion. Therefore overloaded junctions in Kent Thameside tend to recover back to being within capacity quicker than in many areas of London. However it should be noted as one approaches the trunk road network the peak traffic profile is more flattened and more similar to London conditions. As a benchmark comparator average speeds in outer London for the evening peak are around 40 kph whilst in the KTS area average speed for the equivalent time period is around 59 kph.

A very high proportion of the Kent Thameside traffic is London related and therefore intense traffic movements are found on and at the approaches to the trunk road network and the principal roads that feed into London like the A226 / A206 corridor. Traffic movements are also attracted to the M25 / A282 trunk road corridor to cross over the Dartford Crossing to access other parts of the South East. Locally Bluewater in Kent Thameside is one of the largest shopping centres in the UK and is also a major attractor of traffic. However the shopping centre does not open until 1000 on a weekday so the associated traffic movements are more a weekday
evening peak and a Saturday issue. There is also intense traffic activity in the two town centres of Dartford and Gravesend on the weekdays and on a Saturday associated with retail and other business activities.

Generally in Kent Thameside due to the importance of retail activity combined with commuter work based traffic the weekday evening peak is more congested than the morning peak. The network performance statistics are provided for the AM and PM peaks in Tables A.1 and A.2 respectively in Appendix A.

Key current traffic hotspots in Kent Thameside include the following:

- Some of the junctions along the A2 corridor including Bean Junction
- A282 Dartford Crossing
- B262 Hall Road / Springhead Road
- A226 London Road / St Clements Way
- The town centre areas of Gravesend and Dartford

Bean Junction is closely associated with the Bluewater shopping centre and therefore tends to be an evening peak and Saturday issue associated with retail traffic. Key hotspot queuing locations include Bean Southern Roundabout and the eastbound off slip from the A2. A major concern for the Highways Agency who is the highway authority for Bean junction is for traffic not to block back onto the main A2 carriageway with the proposed developments in Kent Thameside.

A282 Dartford Crossing is a significant bottleneck in Kent Thameside and the capacity constraint is associated with the crossing itself although the toll booths can also act as a constraint. Dartford Crossing is a regional issue that extends far beyond the Kent Thameside area so the future planning of crossing the Thames in this area will not be specific to the Kent Thameside proposals. Section 3.8 refers to the other studies that are ongoing to address this crossing constraint.

The B262 Hall Road / Springhead Road is a roundabout junction that allows access to a major Sainsbury store and provides a route into Gravesend via Hall Road. It enables traffic from Gravesend and Northfleet to access the A2 via Pepperhill junction. The junction is constrained by nearby properties and will be difficult to expand capacity however the queues are for a limited period of the peak today. The plan is with the opening of the Ebbsfleet Link Road as an alternative access to the A2 the traffic levels on Springhead Road can be managed down with suitable traffic calming measures. A traffic calming scheme is currently being developed for Springhead Road by the developers of nearby Springhead Park.

The A226 London Road / St Clements Way is another location where the junction can become overloaded for some parts of the peak but is not overloaded continuously in the peak period. The congested arms include Station Road Approach which is affected by poor visibility and queuing eastbound traffic on London Road from a nearby pedestrian crossing when called. The junction is also affected by a large number of heavy goods vehicles. There is also queuing on London Road westbound where the queues extend back to The Avenue and beyond.

The town centres of Gravesend and Dartford do have some localised congestion hotspots around the gyratory system but again it is not sustained continuously throughout the peak period. The modelling has identified the crossing at Parrock Street in Gravesend as one area of congestion.
The current and future transport network performance has been assessed using the Kent Thameside Transportation Model (KTS Model) along with micro-simulation models. More details of modelling work and a summary of results obtained are provided in Appendix A. In Appendix D is a list of locations from the KTS Model where the volume / capacity ratio exceeds 85% both today (2005) and in the future for 2025. The volume capacity ratio is an indicator of locations that may experience overloading of junctions at least during some periods of the peak.

2.3 Public Transport

The area has a well established bus network and is served by the suburban services of Southeastern Railway, with London commuting being significant. In addition, the area is served by the developing Fastrack 'bus rapid transit' network. To accommodate the growth in the area the 'Vision' document ‘Looking to the Future’, published by the Kent Thameside Association in 1995, described the principle of Public Transport Orientated Development and envisaged a bold and ambitious substantial increase in the modal share for public transport, with the suggestion that for journeys to work mode share could rise from 18% to even as high as 40%.

The current modal share for journeys to work by bus is around 4% in Dartford and 9% in Gravesend, whilst rail is around 15% in Dartford and 8% in Gravesend. Car travel for journeys to work is about 60% in both boroughs according to the 2001 census.

The area has four key transport hubs, namely Dartford and Gravesend town centres, Bluewater/Greenhithe, and Ebbsfleet railway station. The importance of Ebbsfleet will increase when HS1 Domestic trains start running from 2009. It is served by Fastrack, as well as having 5,500 spaces (with permission for 9,000 car parking spaces) to accommodate rail passengers arriving by car known as rail heading. However it is important the transport strategy promotes the public transport aspect of Ebbsfleet station to encourage more sustainable modes of travel. Neither Dartford nor Gravesend has a true bus station, interchange between buses and trains are not ideal, and signage between groups of bus stops merits improvement.

A new 'Transport Quarter' proposal for Gravesend is being developed in a limited area and is at the outline planning stage. The scheme needs to balance the priority for buses across the network versus the needs of other road users and careful planning is required to ensure buses are not diverted via circuitous routes, and to ensure that the capacity is sufficient for future levels of bus services.

Bluewater Shopping Centre has a modern bus station and Greenhithe has a new bus interchange with Fastrack services and is the designated rail station for Bluewater. Bluewater Shopping Centre is a major attractor for travel in the KTS area and therefore the rail and bus stations serving this centre have the potential to become significant transport hubs with increased development in the area.

Most bus services in the area are operated by one company – Arriva, who offer a range of daily, weekly and monthly tickets in addition to traditional single and return fares. Some bus routes from the west are operated as part of the London Buses network. At present, tickets are not inter-available between the two operators, and Arriva do not use smartcard technology. Through bus-rail ticketing has been recently introduced in Gravesend, through the 'PLUSBUS' national scheme. There are no plans at present to extend this across the wider Thameside area but it should be an objective as part of the transport strategy to extend the scheme considering...
the high usage of rail commuting in the area. PLUSBUS should encourage users to use public transport for the entire journey and reduce car journeys to rail stations thus encouraging further sustainable travelling in the area.

A key element of the public transport network is Fastrack, a high quality bus based rapid transit system with potential to upgrade to tram operation in the future. Figure 2.1 shows the location of the existing Fastrack routes in Kent Thameside as well as the proposed routes associated with key developments. About half the final network will be on dedicated bus only routes, and there will be bus priority at many junctions where buses cross or join public roads. In addition there is potential for some local improvements for example where Fastrack runs on private roads within Bluewater and the Darent Valley Hospital complex. The Fastrack service opened in 2006 (Route B) and has already exceeded initial expectations. Based on research and surveys reported in the Fastrack document titled ‘The first six months’ some of the findings for the new Fastrack service were as follows:

- The top three reasons that people are using Fastrack are frequency (25%), convenience (21%) and traffic free routes (15%)
- Passenger numbers growing since ‘day 1’ to now exceed forecasts by well over 50%
- Achieved a 95% overall customer satisfaction rating
- The service can attract and retain new passengers, with surveys indicating 19% having switched from previous car use
- Integrated the service into Kent Thameside area with minimal adverse impact on other key local bus routes
- Introduced the first branded and comprehensively marketed zonal fare system in Kent
- Nearly 40% of passengers are using Fastrack to go to work or school/college with shopping being the second highest reason for using the service.
- The service to Darent Valley Hospital is also well used reflected in the 9% health trip purpose from a recent survey

The Fastrack scheme is implemented by a multi partner delivery board, which has successfully brought together local councils, private developers and the bus operator. Significant funding has gone into Fastrack, and long term developer funding has been secured. It has been a policy that Fastrack services commence at the earliest possible stage of development, so that travel habits can be established around public transport. Fastrack Route A which serves the Bridge Development opened in June 2007 and is the first development in the UK where the public transport infrastructure has been planned, built and made operational before the arrival of commercial or residential occupiers.

The conventional local bus network is relatively stable, offering good coverage and reasonable service levels during weekday daytimes. Some routes in Gravesend were upgraded in 2005 under the 'Kickstart' scheme, and this has delivered an increase in patronage of around 20%. There remain, however gaps in the service, particularly early mornings, evenings and on Sundays, when the level of service is poor in comparison to that offered by Fastrack or in neighbouring Greater London. There are some bus lanes and bus priority measures in the area for 'conventional' bus services; there is scope to improve and expand on these, although road space is limited in some areas, particularly in the historic town centre of Gravesend. If a significant level of transfer from car use to public transport is to be achieved, then considerable efforts will have to be put into seeking opportunities to offer buses
Existing & Proposed Fastrack Bus Services in Kent Thameside

Figure 2.1

KEY

Existing Fastrack Routes
- Route A
- Route B

Proposed Fastrack Routes
- Route B
- Route C
- Route D

Based upon or reproduced from Ordnance Survey maps with the permission of the Controller of Her Majesty's Stationary Office. © Crown Copyright Reserved Licence No. 14587088.
further priority measures. To this end, alignments for new bus lanes or busways for routes planned for implementation in 2011 or 2018 need to be identified and protected as soon as possible, before town centre land is lost to development.

Many new international destinations were brought within reach of KTS with the opening of Ebbsfleet International railway station in 2007, with UK destinations following in 2009 with the introduction of domestic high speed trains. Further rail based possibilities include the nearby Crossrail scheme, now approved by Government to run to Abbey Wood, with the alignment safeguarded as far east as Hoo Junction to the east of Gravesend. The current rail network, while at capacity in the London area, offers a comprehensive service for travel between central London and KTS, although facilities at stations – particularly the intermediate stations between Dartford and Gravesend – have scope for improvement, especially in terms of accessibility. A number of schemes have already been identified in Network Rail plans, but await funding. Network Rail has also identified a number of rail improvements in the area via the Rail Utilisation Strategy (RUS) and includes options on extending train and platform lengths by 2012.

There is a significant level of commuting to London by coach from the area, although it is recognised that these coach services are vulnerable to traffic congestion particularly in London. Neither the existing rail nor coach networks offer direct ‘orbital’ journeys to destinations such as Bromley or Croydon; and the prospect of funding such services in the foreseeable future seems remote.

Both boroughs are well served by taxis, although some taxi ranks are little used by the trade and the public. Taxis have the potential to be a useful part of the public transport network, offering flexibility for occasions when bus travel is not practical. However it needs to be recognised that taxis can contribute to vehicle emissions and congestion to the same extent as the private car and therefore should be treated as a lower order public transport alternative.

2.4 Walking and Cycling

Around a fifth of all households in Dartford and Gravesham do not own a car, meaning that walking and cycling will constitute many of their journeys. Other concerns such as congestion, health and social exclusion mean that walking and cycling needs to be increasingly important during Kent Thameside’s development. The 2001 census data indicates that walking and cycling is slightly less popular for travelling to work amongst Gravesham and Dartford residents than in the rest of the Southeast of England (Walking 7% - 8%; Cycle 1% compared with 10% and 3% respectively), so that extra effort may need to be put into promoting these modes. To put in context the wider transport mode split journeys to work is around 4% in Dartford and 9% in Gravesend for bus travel, whilst rail is around 15% in Dartford and 8% in Gravesend. Car travel to work dominates and is about 60% in both boroughs.

Dartford and Gravesend town centres both have similar characteristics in that they each have a pedestrianised core surrounded by roads carrying relatively high volumes of fast moving traffic which severs the town centre from its surroundings. In Dartford’s case severance is exacerbated by a number of unwelcoming subways, rather than at grade crossings on key desire lines. However both Dartford and Gravesham are reviewing the town centre layouts and plans are being developed to improve the local environment.
National Cycle Route 1 runs east-west through Kent Thameside following the A2 Trunk Road for much of its length. Although it serves both town centres, members of the public have identified a number of problems associated with cycling in Kent Thameside. In and around Dartford town centre these include roads that are heavily trafficked or crowded with parked cars, a pedestrianised High Street and a series of short hills to the east and to a lesser extent to the west. Gravesend has the potential for a useful cycle network on strategic links outside the town centre. Principal among these are the A226 Thames Way and A226 Rochester Road.

However there are not yet any cycle-friendly connections into the town centres apart from one route alongside the River Thames, and there is also a lack of cycle parking at a number of key locations as well as little provision for storage of associated equipment.

The ‘Green Grid’ is an important concept for Kent Thameside. First introduced by RPG 9a, its objective is to join the primary green spaces with a continuous pedestrian and cyclist path adjacent to the River Thames, with improved links to existing communities and new links to and through new development sites. The Green Grid concept is already being energetically promoted and developed by Dartford and Gravesham Boroughs and when complete is expected to comprise an extensive framework of attractive open spaces, linked by green corridors, footpaths and parkland. This is shown in Figure 2-2.

The Public Rights of Way (PROW) network in Kent Thameside consists of 111.8km of footpaths, 3.7km of bridleways and 5.8km of byways. Some of these are long distance paths such as the Weald Way and Darent Valley Path, while others provide short links to the riverside or open green space. Other important focal points for leisure walking and cycling include the North Downs, a series of country parks, such as the Cobham Shorne Countryside Partnership and town centre facilities such as Central Park, Dartford and the Riverside Leisure Area, Gravesend.
Figure 2-2: Kent Thameside Green Grid (Source: Landscape Design Associates)
2.5 Air Quality and Noise

Dartford Borough Council and Gravesham Borough Council have identified areas within Kent Thameside where air quality is considered to be poor and the measurements of NO₂ and PM₁₀ are likely to be close to or exceed national Air Quality Management Area (AQMA) limits. Areas identified include the town centres, the A2 and A282 trunk roads, Northfleet Industrial area, A226 London Road and Bean Interchange. Once an AQMA has been declared, the Local Authority must produce an Air Quality Action Plan and work with Partner Agencies to seek an improvement in air quality. Traffic noise is also a relevant environmental concern for the Local Authorities.

The Transport Strategy therefore needs to take full account of the AQMAs and Action Plans already identified by the Local Authorities, and use them as a basis for an Air Quality Action Plan for KTS as a whole.

A number of measures either proposed or under consideration in the Transport Strategy that could improve air quality and/or noise include the following:

- A targeted parking strategy that takes into account accessibility to encourage a modal shift away from the private car.
- Intelligent transport schemes (ITS) like variable message signing to car parks to reduce wasteful journeys and to avoid congestion.
- Traffic management schemes to decongest the town centre areas such as schemes to discourage through traffic.
- Variable speed limits such as on the trunk roads have proven to be a very effective means of reducing congestion.
- Selective network improvements to remove bottlenecks at congestion hotspots.
- Road pricing as part of a demand management strategy.
- Reduced car trips by encouraging alternative modes and more car sharing through travel plans and other demand management initiatives.
- Development policies that discourage long distance trips by containing housing and jobs locally.
3 Development of the Transport Strategy

3.1 Introduction

There are major development proposals and associated transport schemes proposed for the Kent Thameside area in the next 20 years. The South East Plan prepared by SEERA provides the statutory framework for the regeneration of the Kent Thameside area with a target of 25,000 new homes and 50,000 new jobs by the year 2026. The details of the forecast land use is based on a spreadsheet database provided by Gravesham and Dartford Borough Councils which provides a best guess estimate of the projected number of houses and Gross Floor Area (GFA) of commercial development by location in the Kent Thameside area for 2011, 2018 and 2025. The land use estimate is being refined as the LDF process develops and many of the sites already have planning permission.

Of transport schemes identified by the Strategy, some are committed with a secured funding source. Others are part of the Strategic Transport Investment Package Schemes (STIPS) which are not yet committed but are seen as enabler schemes to underpin the development and need to be further developed. All the schemes will be described in this chapter.

Transport modelling and forecasting studies have been conducted to assess future transport demand and network performance and details are provided in Appendix A. To support the transport modelling appropriate transport schemes and demand management solutions need to be investigated and analysed and these are described in this chapter.

3.2 Forecasts of Land Use and Trip Generation

The Kent Thameside Development Area will eventually comprise approximately 60 separate developments spread over a large area of predominantly former industrial land between Dartford and Gravesend. The key development locations are highlighted in Figure 1.1. Some of the more significant developments in the area are Eastern Quarry, Ebbsfleet, Northfleet West Sub Station, Swanscombe Peninsula, Northfleet Embankment, The Bridge, Ingress Park, Stone Gate – St James Lane Pit, Waterstone Park, and North East Gravesend (including the Canal Basin). A number of these schemes are mixed use development comprising both residential dwellings and employment and some of the bigger developments will also include schools, hotels and retail. The idea is for dwellings and jobs and services to be provided locally to reduce the need for long distance work, education and other utility trips. Details of the individual developments are obtainable from the Local Planning Authorities, GBC and DBC.

Development forecasts used for the transport assessment; focus on an assessment date of 2025, when the development will be largely in place (SEERA planning date is 2026). Development forecasts have also been developed for the interim years of 2011 and 2018. The SEERA planning framework acts as a control over the forecast development schedule. A delivery programme for transport schemes over the next 20 years is still being developed, and this will need to reflect more detailed phasing of the developments currently being reviewed by Gravesham and Dartford Borough Councils.
The number of trips, and hence of vehicle movements, forecast in the transport model to arise from each new development are derived from TRICS® 2007a. This is a transport database of observed traffic movements taken at a large number of actual development sites in the UK. A review of the trip generation from the TRICS database was carried out in 2007 and a list of the forecast land use developments and associated PM traffic generations are shown in Table 3.1 for the forecast 2011 and 2025 development scenarios. Note 2011 is assumed to represent the early opening phase of the development and 2025 is the end phase. The transport assessment in this report is more focused on the weekday PM peak which is the worst time period for overall traffic conditions in the KTS area.

The existing developments and trips in the KTS area are also shown in Table 3.1 to put in context the scale of the 2011 and 2025 proposed developments. It is the 2025 development scenario which determines the overall scale of transport schemes required whilst the interim years help to determine the timing for these schemes. The timing of schemes will be reviewed in further versions of the transport strategy when further information is provided by developers and more detailed work is conducted on the likely build rate of the various developments.

Table 3.1: Comparison of KTS Existing and Future Land Use and Trip Generations (PM Peak)

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Households</th>
<th>GFA (m²)</th>
<th>Departure Trips</th>
<th>Arrival Trips</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005 Existing KTS Developments</td>
<td>75,165</td>
<td>1,719,000</td>
<td>29,500</td>
<td>28,700</td>
</tr>
<tr>
<td>2011 KTS Proposed Developments</td>
<td>9,654</td>
<td>555,000</td>
<td>6,700</td>
<td>5,100</td>
</tr>
<tr>
<td>2025 KTS Proposed Developments</td>
<td>25,150</td>
<td>1,490,000</td>
<td>19,600</td>
<td>14,800</td>
</tr>
<tr>
<td>Total for 2011</td>
<td>84,819</td>
<td>2,274,000</td>
<td>36,200</td>
<td>33,800</td>
</tr>
<tr>
<td>Total for 2025</td>
<td>100,315</td>
<td>3,209,000</td>
<td>49,100</td>
<td>43,500</td>
</tr>
</tbody>
</table>

Notes: GFA is the Gross Floor Area in square metres for commercial development. The Departure Trips are the 3 hour average hourly vehicular trips departing the KTS area and the Arrival Trips are the 3 hour average hourly vehicular trips arriving in the KTS area. Through traffic is excluded from the trips. Existing household figures are from the 2001 census and Existing GFA are extracted from National Statistics whilst 2025 are extracted from the Local Authorities estimate. Existing departure and arrival trips are extracted from the 2005 KTS Model 2025 departure and arrival trips are extracted from the forecast land use schedule provided by the Local Authorities fed into the TRICS database. The PM peak is the worst-case scenario.

Table 3.1 shows that the proposed KTS developments will increase households in the area by just over 10% in 2011 whilst commercial floor area will increase by about 25%. However the overall transport infrastructure for the KTS area will be determined by the end phase around 2025 when the full development is in place. By 2025 households will increase by about a third compared with today whilst commercial gross floor area will almost double in the area. In the PM peak departure trips are more driven by commercial development as people leave work places and though the commercial development would have almost doubled by 2025 the associated trips generated is only expected to increase by about 65%. This reflects the growing trend in the UK towards more restrictive car policies which is being captured in the TRICS trip generation database on which the 2025 forecast trips are based. The trips generated for 2025 are probably still at the higher end of
the likely forecast as they reflect trip rates from existing development sites in TRICS. It is expected over time as more travel plans and restrictive car policies get filtered into development planning the average trip rates in TRICS for developments will further decrease. The arrival trips are about half the existing trips for the KTS area with the 2025 developments and this will be driven by the residential developments and some of the commercial development for the PM peak like the retail centres.

3.3 Transport Schemes

The schemes included in the Transport Strategy can be broken down into two groups. These are 1) already committed schemes; and 2) the package of additional schemes identified as likely to be necessary to underpin the KTS Developments. The latter group are referred to as the Strategic Transport Investment Package Schemes (STIPS) and have been developed through analysis and transport modelling work and will be discussed further below. The STIPS schemes are still being developed and may be subject to review and further iterations as the transport strategy develops.

3.4 Committed Transport Schemes

Across the South East region there has been a significant investment and commitment of funding for a number of major strategic and regional schemes. Table 3.2 is a list of all the known schemes either located in Kent Thameside or considered to have an impact on the area, which have committed funding. These do not include the schemes prioritised separately as part of the Strategic Transport Investment Package Schemes discussed later in this chapter. Figure 1.1 shows the location of the major committed transport schemes for the area, note the rail schemes are either not shown or only partially shown on Figure 1.1 as they extend way beyond the KTS area.

Table 3.2: Committed Transport Schemes

<table>
<thead>
<tr>
<th>Scheme</th>
<th>Estimated Cost (£m)</th>
<th>Funding Source</th>
<th>Delivery*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Public Transport, Walking and Cycling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local Transport Plan (LTP) Pedestrian/ Cycle improvements</td>
<td>1.65</td>
<td>LTP</td>
<td>Short-term</td>
</tr>
<tr>
<td>Fastrack Thames Way</td>
<td>10.03</td>
<td>Government</td>
<td>Short-term</td>
</tr>
<tr>
<td>Fastrack Everard's Link Phase 2</td>
<td>5.24</td>
<td>Government/ Developer</td>
<td>Short-term</td>
</tr>
<tr>
<td>Fastrack The Bridge</td>
<td>30.00</td>
<td>Developer</td>
<td>Completed</td>
</tr>
<tr>
<td>Fastrack Ebbsfleet</td>
<td>19.50</td>
<td>Developer</td>
<td>Short-term</td>
</tr>
<tr>
<td>Fastrack Ingress Park</td>
<td>3.00</td>
<td>Developer</td>
<td>Short-term</td>
</tr>
<tr>
<td>Greenhithe Station</td>
<td>3.00</td>
<td>Network Rail</td>
<td>Short-term</td>
</tr>
<tr>
<td>Dartford, Northfleet and Gravesend station improvements</td>
<td>15.00</td>
<td>Government</td>
<td>Short-term</td>
</tr>
<tr>
<td>Fastrack Eastern Quarry</td>
<td>14.75</td>
<td>Developer</td>
<td>Medium-term</td>
</tr>
<tr>
<td><strong>Sub total</strong></td>
<td><strong>102.17</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rail schemes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Channel Tunnel Rail Link (HS 1)</td>
<td>5900</td>
<td>LCR / Government</td>
<td>Infrastructure Completed</td>
</tr>
<tr>
<td>Crossrail</td>
<td>16000</td>
<td>Government/ Business</td>
<td>Long-term</td>
</tr>
</tbody>
</table>
Sub total 21,900

<table>
<thead>
<tr>
<th>Local Highway schemes</th>
<th>65.94</th>
<th>HA</th>
<th>Near completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>M25 Junction 1b to 3 Improvement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A2 Trunk Road / A282 Improvement</td>
<td>120.00</td>
<td>HA</td>
<td>Completed</td>
</tr>
<tr>
<td>A2 Trunk Road Bean to Cobham</td>
<td>122.00</td>
<td>HA</td>
<td>Near completion</td>
</tr>
<tr>
<td>Sub total</td>
<td>307.94</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall total</td>
<td>22,310.11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Short Term schemes are those that are to be implemented by 2011, Medium Term by 2018 and Long Term by 2026. Near completion are schemes that are scheduled to finish in 2008.

Crossrail is a major rail scheme recently approved by Government and the current plan is that it will terminate at Abbey Wood in South East London, just outside the Kent Thameside area. The Crossrail route is safeguarded by the Department for Transport for extension into the Kent Thameside area up to Hoo Junction (to the east of Gravesend).

Capital costs shown in Table 3.2 appear to be dominated by the rail schemes; however this is partly because the rail schemes are more regional in nature with benefits and expenditure extending well beyond the KTS area.

A number of other public transport initiatives are also highly likely in the area, and these can be summarised as follows:

- 2008/9 National smart card scheme for buses (driven by national concessionary scheme).
- 2009 Update of Southeastern Railway’s timetable with the introduction of the HS1 Domestic services to London St Pancras.
- 2014 Current Southeastern Railway’s franchise ends.
- Other rail schemes and initiatives emerging from Network Rail RUS studies.

No improvements to bus capacity in the area proposed have been identified except for the Fastrack bus services and the other bus services are assumed to continue as today in the model forecasting. No changes are assumed either for the coach services in the KTS area which are also included in the KTS Model.

Table 3.2 includes only the larger of the various committed transport schemes funded by developers promoted through the standard Section 106 agreements, and only these larger schemes have been included in the modelling work.

### 3.5 Individual Elements of the Transport Strategy

In early 2007 the KTS Transport Group was tasked with developing in more detail the transport strategy for the area and various transport studies were commissioned for the KTS area to investigate the following topics:

- Demand Management
- Public Transport
- Walking and cycling
- Parking
- Urban Traffic Management & Control (UTMC)
- Wider Traffic Management
- Trunk Road Management
More detailed reports are available on each of these elements and references are provided in Appendix E.

From these various studies, action plans were drawn up to further develop the transport strategy in downstream work - see Appendix C. It should be noted these were outline studies discussing broad strategies to take forward into more detailed work and the action plans reflect this. Where sufficient work has been done to work up a scheme then by and large these have been included in the KTS Transport Model for scheme assessment which is discussed in the Appendix A.

An accessibility strategy remains to be developed to refine the Transport Strategy so that no groups are disadvantaged by the transport and demand management solutions so far proposed. This study should make reference to the Accessibility Strategy for Kent (ASK) and will be a key action in coming months.

3.5.1 Demand Management

Travel Demand Management is a relatively new approach to travel issues that has developed over the last 20 years. Instead of planners assuming that economic development and increased prosperity will inevitably be accompanied by a proportionate increase in traffic on the roads – the ‘Predict and Provide’ approach of the nineteen sixties and seventies - they aim instead to manage the travel needs associated with any given level of development. Demand management involves maximising the efficient use of the network and ensuring users make a well informed decision of the travel options open to them. It aims to discourage use of the private car by encouraging more sustainable modes of travel such as walking, cycling and use of public transport.

Demand Management is a two pronged approach. On the one hand it aims to reduce the need to travel (by, for instance locating key services close to residential areas and encouraging initiatives such as video conferencing and tele-working). On the other it aims to reduce the congestion and pollution resulting from the trips that remain necessary by encouraging development in locations accessible by public transport, by improving walking and cycling networks and by introducing workplace and school Travel Plans, car sharing and individual travel marketing backed up, where appropriate, by controls on parking.

Based on empirical research from Department for Transport and others, and experiences from other towns in the UK, a suggested range of KTS demand management initiatives, with possible indicative trip reduction benefits, are shown in Table 3.3. In reading the table it should be noted that:

- The trip reductions in Table 3.3 are averages, and will vary between different sites depending on location, land use, accessibility and a number of other factors.

- Different degrees of trip reduction are likely to be achieved in new developments and in existing developments (where it is generally harder to influence travel patterns). These are therefore shown separately in the table.

- Initiatives centred on improved walking and cycling will only impact shorter journeys so again are shown separately.

Trip reductions will also vary between journey purpose, for instance between home and work based trips. Percentages shown in the table apply only to the particular journey type referenced. For this reason percentage reductions in a particular
journey type achieved by different Demand Management measures will be cumulative, however the overall reduction attributable to a particular measure (car clubs for example) will be a weighted average of the reductions achieved over the different trip types.

It is recommended that demand management trip reduction targets should be set for around 2018 or sooner taking into account the major development programme. It should be appreciated that more downstream detailed work will be needed to validate these possible indicative trip reduction estimates for the KTS area as, while comparable examples have been sought, they are based on demand reductions achieved in other locations. However, it illustrates what is possible with active demand management policies.

It is noted that the potential trip rate reductions that can be achieved by wider Demand Management measures have not been incorporated into the transport modelling carried out to date. The existing forecasting can therefore be regarded as conservative in this respect. Once more detailed work has been carried out on the potential impact of demand management measures, the benefits of this approach can be incorporated in future modelling work.

Table 3.3: Summary of Possible Demand Management Initiatives for the KTS Area

<table>
<thead>
<tr>
<th>Demand Sector (New Developments Only)</th>
<th>Sub-component</th>
<th>Possible Car Trip Reduction</th>
<th>Enabling Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home Based Work</td>
<td>Employment developments</td>
<td>15%</td>
<td>Workplace Travel Plans</td>
</tr>
<tr>
<td></td>
<td>Residential</td>
<td>5%</td>
<td>Spill over benefits from investment and marketing in new walking and PT infrastructure</td>
</tr>
<tr>
<td></td>
<td>Residential</td>
<td>2.5%</td>
<td>Car Clubs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Demand Sector (Existing Developments)</th>
<th>Sub-component</th>
<th>Possible Car Trip Reduction</th>
<th>Enabling Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home Based Work</td>
<td>Land uses that are not residential</td>
<td>5%</td>
<td>Spill over benefits from investment and marketing in new walking and PT infrastructure</td>
</tr>
<tr>
<td>Home Based Work - Local Trips within KTS</td>
<td>All land uses</td>
<td>6%</td>
<td>Investment in cycle infrastructure</td>
</tr>
<tr>
<td>Home Based Other</td>
<td>Education</td>
<td>11%</td>
<td>Implementation of School Travel Plans</td>
</tr>
<tr>
<td></td>
<td>Land uses that are not residential</td>
<td>6%</td>
<td>Spill over benefits from new walking, cycling and PT investment and marketing</td>
</tr>
</tbody>
</table>
Demand Sector (Existing Developments) | Sub-component | Possible Car Trip Reduction | Enabling Measure
--- | --- | --- | ---
Non Home based other | All land uses | 6% | Spill over benefits from new walking, cycling and PT investment and marketing

It has to be recognised that it is simply impractical to develop a highway network that would allow all the trips generated by the future Kent Thameside area to be made by car, and that to facilitate the plans for the area a substantial degree of modal shift to more sustainable modes will have to be achieved. At the same time there needs to be a balance struck between encouraging sustainable transport modes on the one hand and maintaining accessibility on the other particularly for the more rural areas to the south of the A2 Trunk Road.

In this context it needs to be recognised that public transport provision is generally good for east – west movements within the KTS area but north-south movements are less well served. For longer distance traffic from widely dispersed areas across Kent and beyond the car will therefore of necessity continue to be the preferred mode. The continuing viability of existing town centre areas also has to be recognised as a key objective.

There are also a number of more radical Demand Management initiatives, some currently beyond the control of the Local Authority, that if implemented could deliver traffic reduction benefits to KTS. These include national road pricing or road tolling, fuel price escalator taxes and environmental taxes. Note that the current Local Transport Bill in Parliament proposes updating existing legal powers so that, where local areas wish to develop proposals for local road pricing schemes, they will have the freedom and flexibility to do so, whilst ensuring the scheme is consistent and interoperable. Currently road pricing is not politically acceptable to the local authorities in the Kent area so this is more likely to be introduced on the trunk road network where it will be driven by Central Government.

3.5.2 Public Transport

Public transport is central to the Kent Thameside development, and managing congestion in the area. Rail based transport is the most efficient means of mass movement of people. Similarly a bus is a very efficient user of road space and takes up the equivalent of around 2 cars but can carry the equivalent of around 12 cars in passengers. Therefore in the future planning of transport in the KTS area and for tackling congestion it is important to prioritise public transport over the private car. It is for this reason the Kent Thameside Transport Model was converted from a highway model to a multi-modal transport model with a public transport module added so the wider planning of transport in the area can be advanced to tackle congestion and to develop the public transport planning aspect of the development namely Fastrack. Further details on this model are provided in Appendix A.

A number of options for future development over the period to 2018 and beyond have been identified to improve public transport that go beyond the already significant improvements expected from additional Fastrack bus and rail services;
many of these require further discussion with stakeholders (e.g. land owners) before they can be implemented. These schemes and options fall under the following categories:

- Marketing public transport
- Bus and train services
- Vehicle design/ buses
- Infrastructure / interchange
- Safety and security
- Information
- Ticketing
- Highways, including bus priority
- Park and ride
- Partnerships and working arrangements
- Taxis

Details of the strategy public transport action plans under each of the headings described above are provided in Appendix C.

The public transport strategy will need to ensure that the public transport network should be marketed as a whole, with different grades of service, the highest of which will be Fastrack. This will integrate the public transport services as a product worthy of use for local residents and those visiting the area. Fastrack remains at the centre of the public transport strategy and the various routes proposed are listed in Table 3.2 and the location of the routes is shown in Figure 2.1. A strategy objective will be to work with partners and service providers for a wholesale review of bus services in Kent Thameside to ensure the entire service is brought up to a minimum standard and does not allow non-Fastrack services to be neglected.

On rail, HS 1 Domestic Services remains the core railway improvement in the KTS area with the new services starting in late 2009. This will provide a step change in rail capacity into Central London with a journey time saving of around 45 minutes from the Gravesham area over the classic routes. However the proposed Thameslink service to Dartford has now been dropped following the South London Route Utilisation Strategy published in March 2008. In addition the RUS recommendation is that the Dartford to Victoria line remains an 8-car service with the option to extend to a 10-car or 12-car service in the future. The RUS rail review was conducted by Network Rail to meet the challenges of overcrowding and facilitate the continued growth that the railway now faces.

3.5.3 Walking and Cycling

The Kent Thameside Walking and Cycling strategy has focussed both on the existing infrastructure and what can be done to make a difference to existing residents and communities, and on how new developments can be best linked to the existing spatial pattern and what more needs to be done to ensure that walking and cycling is the first choice for people for short journeys in Kent Thameside.

Reducing the need to use the car for everyday trips to work, school and the shops by creating a high quality walk and cycle environment is a key part of the strategy, however the strategy also aims to promote and increase levels of leisure walking and cycling. It is important that the network continues to be maintained and enhanced especially where new developments have the opportunity to link in to the
network and help achieve the objective of a comprehensive Green Grid network within Kent Thameside as detailed in section 2.4.

The long term objective of the strategy is to provide a reasonably direct, hub and spoke type routes into the town centres as well as other key locations linking in where possible with the ‘Green Grid’ proposals. The cycle network schemes have been developed into three categories; low cost and committed proposals that are effectively quick wins and will deliver a ‘bronze standard’ network. Medium cost proposals and/or schemes with some minor issues that would be needed to deliver a ‘silver standard’ service. Finally there are the higher cost proposals and/or schemes with some major issues at this stage; these would deliver a ‘gold standard’ cycle network. These different graded schemes are described in the Kent Thameside Walking and Cycling Strategy report referenced in Appendix E. It is expected funding will be prioritised using Kent County Council's PIPKIN appraisal tool.

A walking and cycling summary action plan is provided in Appendix C.

3.5.4 Parking

Parking controls, installation, management and enforcement within the county of Kent is a devolved highway function carried out by the 12 Districts under licence agreements with Kent County Council. Whilst each of the District Councils operates as a separate entity they do all work to agreed county wide policies and have to get approval for any schemes from Kent County Council. Although each individual District may have localised problems and solutions they do also recognise the need to fit into a wider strategic objective including the KTS Transport Strategy

The Kent Thameside Parking Strategy is essentially a high level evidence based study that identifies suitable parking action plans to support ambitious modal shift targets across the area by 2025. The results of this study are based upon the development and trip assumptions included in the Kent Thameside Transport Model and assumed car trip reduction targets initiated by significant travel demand management measures and public transport improvements. It is acknowledged that the development assumptions and car trip reduction targets maybe subject to considerable change throughout the lifetime of this study. Regular reviews of this strategy will help to identify localities where the car trip reduction targets are in danger of rising above the expected levels and measures put in place to maintain the predicted targets.

The overall aim of these actions is to create a framework within which measures can be introduced to control and limit the number of vehicles entering the urban centres when other more sustainable modes of transport are available. It does, however, recognise that this is not always possible and provision must be made to cater for situations where it is not possible to make journeys other than by car and to encourage limited car based journeys to transport interchanges. It is important that other modes of transport such as cycling, bus and walking should be promoted to transport interchanges, e.g. railway stations.

The study identifies a number of strategy options and parking action plans for existing town centres and future development up to 2011 and beyond, many of which require further consultation with key stakeholders. It is crucial that the timing of each of the options such as price increases, car park refurbishments and the implementation of new control parking zones (CPZ) / residents’ schemes are closely controlled as each has a knock on effect on the other, possibly putting the whole...
parking strategy at risk if the timings are incorrect. This is best developed at a local level to ensure that kerb space is correctly controlled before changes to off street parking take place.

The parking options fall under the following general categories:

- Improving town centre parking
- Pricing
- Parking Standards
- Travel Plans
- Park and Ride
- Third Party Parking
- Cycle Parking

Among measures that have been considered to restrain car use are the use of low levels of parking provision at new developments and a review of town centre parking charges. However these general principles will need to be applied in the context of a review of accessibility by non car means for particular locations / user groups.

‘Park and ride’ is seen as a long term way of helping to manage car trip levels; further work is required to ascertain whether or not it is feasible, and if so at which locations. The time scales and figures can be adjusted as appropriate. The Tollgate park and ride study is investigating the feasibility of a commuter coach park and ride site on the site of the old A2.

A simultaneous and steady approach to the introduction of new parking controls, improvements in appearance and management of car parks as well as tightening of residential parking standards in locations where alternative transport is easily accessible will make a significant contribution to achieving the car trip reduction targets. Dartford Borough Council has plans to rationalise the on-street parking around the local station for rail heading users by proposing a 120 space car park at Victoria Road. This will cater for the more rural areas to the south of the borough that need to rail head as public transport accessibility to the rail station is poor. The net effect is not to increase parking overall in the town centre as the scheme is more driven to improve the local environment and reduce on-street parking in residential areas.

It needs to be recognised that some of the major parking sites in Kent Thameside are not under the direct control of the Local Authorities and there are other stakeholders involved in car parking; examples include Bluewater Shopping Centre, Darent Valley Hospital, Ebbsfleet Station and some of the car parks in the town centres. Gravesham Council recently transferred ownership of the car park at St Georges Shopping Centre to the owners of the centre with a similar arrangement also at the Thames Gateway Shopping Centre. Therefore for the parking policy to work a partnership arrangement is needed between private car park owners and the Local Authority all working to a common objective.

A parking summary action plan is provided in Appendix C.

### 3.5.5 Urban Traffic Management & Control

It is recommended that allowance is made for a dedicated Traffic Management Centre (TMC) within KTS, to which all proposed systems can be linked. In the short term, these functions can be handled by the Kent Highway Services TMC in Maidstone, but with increasing development, local management of the traffic and information would be beneficial. The proposed TMC would use the same design...
model and operational procedures as the KHS TMC. The TMC would house an Urban Traffic Management & Control (UTMC) common database with all system being controlled from this. Key Intelligent Transport Systems that require installation to allow effective operation are:

- Variable Message Signs (VMS) on all strategic corridors to provide information to road users on congestion and forth coming events. A further VMS network to guide vehicles to car parks is also proposed and has been proven to have a significant benefit on traffic movements.
- A comprehensive network of Automatic Number Plate Recognition (ANPR) cameras forming an inner and outer cordon would allow the collection of journey times and origin and destination data. Careful analysis would allow traffic patterns to be identified leading to implementation of effective strategies to manage congestion.
- Closed Circuit Television Cameras (CCTV) to allow operators to view the road network.
- Implementation of traffic signal control systems such as SCOOT (Split Cycle Offset Optimisation Technique) and UTC (Urban Traffic Control) in areas such as Dartford town centre and Old Road in Gravesend, allowing coordination of traffic signals and changes to signal timing plans to be made remotely.
- Real Time Information (RTI) to be provided at bus stops, shopping centres as well as via websites to enable travellers to prepare their journeys before setting out.
- Alterations to the road network are proposed, ranging from the installation of traffic signal controlled junctions at more junctions in the urban areas to revising the traffic flow in key parts of the urban area like the town centres.

More details on a UTMC summary action plan is provided in Appendix C.

### 3.5.6 Wider Local and Principal Road Traffic Management

The KTS area can be subdivided into various distinct traffic areas which include the Dartford and Gravesend town centre urban areas, the inter-urban area between Dartford and Gravesend which will contain the major new development areas such as Ebbsfleet Valley and the trunk road areas forming the A2 Trunk Road and the M25 / A282. All of these areas have different requirements in terms of traffic management. The traffic management strategy for the trunk roads is separately addressed under the trunk roads sub-section below.

Both Dartford and Gravesham are involved in developing town centre transport schemes which revise the working of the local roads. These are being developed to make the environment more public transport and pedestrian friendly and not necessarily to enhance highway capacity. Micro-simulation models are being employed to help develop the town centre proposals. Both town centres are looking at making changes to their one-way gyratory systems however proposals are still at the development and evaluation phase.

Along the A226 London Road corridor between Dartford and Gravesend a VISSIM traffic model was developed and from this a revised traffic signalling strategy is recommended for further development. These schemes are reported in the 2007 Jacobs Northwest Kent Thameside Micro-simulation Transport Model report referenced in Appendix E. It should be noted that all these traffic management improvements will need more detailed work to verify the exact nature of the scheme and therefore are not currently confirmed.
The Ebbsfleet Valley area is dominated by developments promoted by the private developer Land Securities. A traffic management plan (known as the Transport Management Toolkit) has been devised as part of the Transport Strategy contained in the August 2006 planning application for Eastern Quarry. There is also a separate but similar traffic management plan for the Ebbsfleet Transport Strategy. It proposes a range of possible measures from a traffic management toolkit together with how these might be triggered and applied. Land Securities propose that the developments be monitored against a target set of traffic generation forecasts predicted for the surrounding network. If the targets are exceeded provision is made for some toolkit demand management type measures to be implemented.

3.5.7 Trunk Road Management

The Government’s stance is no longer to provide for unlimited road traffic growth and in working with developers the Highways Agency will expect to see proposals that include ways to reduce the traffic impact of their development. The Highways Agency policy is to ensure that development proposals include measures that facilitate both the reduction of traffic and mitigate the effects of development traffic on the local and strategic highway network.

The Highways Agency is developing integrated demand management strategies for the A2 Trunk Road and these could involve the following:

- Upgrading to Controlled Motorway standards, including Variable Speed Limits
- Providing vehicle priority lanes
- Access Management on entry slip roads
- Increased installation of VMS displays and CCTV cameras; and
- Enforcement of Variable Speed Limits and vehicle priority lanes

The lane management for the A2 will potentially allow the introduction of high occupancy priority lanes and/or restrictions on usage for certain classes of vehicles at certain times. A scheme development is under preparation by the Highways Agency but the technical details have not yet been resolved. Wider network conditions beyond the KTS area need to be taken into account in the assessment as they maybe offsetting dis-benefits on sections of the local network. The key benefits which will guide Highways Agency in the emerging scheme design will include the following:

- Improvements in journey time reliability
- Savings through reductions in incidents
- Savings in environmental costs in the form of reduced emissions from related pollution
- Increased overall vehicular throughput thus reducing dis-benefits to suppressed traffic

The Highways Agency are also considering additional integrated demand management schemes for the M25 but the A2 Trunk Road plans described above are more advanced. The Highways Agency has also identified improvements at Bean and Ebbsfleet Interchanges as a priority to facilitate the additional traffic from the KTS developments. These schemes are still under consideration and include signalling the access junctions, increasing the length of the trunk road merge and diverge layouts and better lane separation. A major challenge along the A2 corridor
in the Kent Thameside area is the close spacing of junctions and this may ultimately determine what demand management schemes are possible in the area.

3.5.8 Project Cordon

As part of the M20 Controlled Motorway scheme the Highways Agency (HA) has agreed to provide support facilities on the two diversion routes and one all purpose road between the M20 and M2 between Maidstone and the Medway towns. The relevant Local Authorities (LAs) and the HA agreed to work in partnership to ensure that any facilities provided would meet their mutual needs and help manage the consequences of any diversions on the local network.

The facilities being provided are:

- number plate reading technology: to provide journey times;
- inductive loop technology: to provide speed, flow and other traffic data;
- limited CCTV coverage of the Cordon area;
- Variable Message Signs (VMS): on the local road network, the all purpose road approaches to the motorway; and
- Enhanced Message Signs (EMS) on the motorway approaches to motorway junctions.

The data feeds will be fused with those from existing and proposed technology on the Kent County Council network to maximise the coverage of the area.

When the message signs on the LA network are not being used to display strategic diversion messages, set by the Route Control Coordinator (RCC), the Local Authority will be able to display agreed message sets to supplement VMS signing currently being installed around Maidstone and Medway.

The project will enable coordinated traffic management, irrespective of nominal responsibilities, to reduce journey times. Although centred on the Maidstone area, the techniques used will have wider benefits throughout the County, by directing traffic away from, or around, congested parts of the network including the A2 and M25 / A282 trunk roads in the Kent Thameside area.

3.6 Strategic Transport Investment Package Schemes

The overall thrust of the Transport Strategy has been to manage down demand for travel with a wide variety of measures described in section 3.5 above. It is assumed with the development of the public transport network including Fastrack and the new HS1 Domestic train services from Ebbsfleet there will be a significant modal shift in favour of public transport between today and 2025. This modal shift to public transport is discussed in Appendix A, section A5.5.

However, notwithstanding the combined impacts of the various elements of the transport strategy it is inevitable with the scale of development proposed that the operation of the highway network will be significantly less effective in 2025 as compared to today. Just to put in context based on Table 3.1, in the PM peak today there are around 58,000 trips with either an origin or destination in Kent Thameside and by 2025 this is expected to grow to 93,000 trips, a 60% increase in traffic. This traffic growth estimate is considered to be at the high end because it is based on current trip rates and it will be necessary for this growth to be tempered by active demand management policies. The KTS Transport Model has been used to predict the combined impacts of the committed transport schemes, and additional transport
schemes against the additional trips that will be generated by new development. It should be appreciated the KTS Transport Model is providing a conservative forecast as it does not yet include any of the demand management policies discussed in this report.

The modelling work has identified a number of local traffic bottlenecks that will need to be tackled to balance capacity as evenly as possible across the network. Given the predictions of significantly increased congestion as compared today it is also considered to be essential for there to be an overarching Urban Traffic Management Control system including active measures to control and manage flows on the strategic road network (A2 Trunk Road, A282 and M25).

A package of 11 transport schemes has been developed referred to as the Strategic Transport Investment Package Schemes (STIPS) to minimise the adverse traffic impacts of development. These schemes will need to be delivered over the next 10-15 years and consequently design development will be refined in future years. The full benefits of some of these schemes are difficult to model at this stage particularly the proposed UTMC and A2 Demand management proposals as they are still being developed. These are nevertheless essential to effectively manage the scale of people travelling on the network through to the design year 2025.

The 11 strategic transport improvements are described in Table 3.4 together with a brief summary of the scheme objectives. The schemes have an estimated total cost of some £185m and are required over an above the substantial programme of schemes already committed shown in Table 3.2.

These 11 schemes can be viewed as enabler schemes to facilitate the KTS developments. The 11 STIPS schemes do not encompass all the transport strategy initiatives described above and will be subject to review as the strategy studies develop. At the moment some of these costs in Table 3.4 are best guess estimates and it is expected as the schemes are engineered in more detail more precise cost estimates can be provided. Figure 3.1 indicates the location of the 11 STIPS schemes in Kent Thameside, and it should be noted that the Urban Traffic Management & Control system is an area wide scheme and is not specific to a particular location.

Table 3.4: Strategic Transport Investment Package Schemes (STIPS)

<table>
<thead>
<tr>
<th>Scheme</th>
<th>Cost* £m</th>
<th>Timing</th>
<th>Brief Description of Proposed Works</th>
<th>Scheme Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>A2 Ebbsfleet Junction Improvements</td>
<td>30</td>
<td>2014 / 15</td>
<td>Modification of access junctions and changes to merge and diverge lanes.</td>
<td>Improve access between the A2 and Ebbsfleet, Eastern Quarry and Northfleet Embankment.</td>
</tr>
<tr>
<td>A2 Bean Junction Improvements</td>
<td>30</td>
<td>2015 / 16</td>
<td>Signalling of access junctions, changes to merge and diverge lanes, improved lane separation. Possible new bridge.</td>
<td>Improve access between the A2 and Eastern Quarry and Bluewater.</td>
</tr>
<tr>
<td>Demand Management on A2 Trunk Road</td>
<td>35</td>
<td>2013 / 14</td>
<td>Introduction of controlled motorway standards (including variable speed)</td>
<td>Regulate and manage traffic on the local strategic road network to</td>
</tr>
<tr>
<td>Project Description</td>
<td>Budget</td>
<td>Year</td>
<td>Objectives</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------------</td>
<td>--------</td>
<td>------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>B262 Hall Road Junction Improvement</td>
<td>3</td>
<td>2017 / 18</td>
<td>Junction capacity improvements and traffic calming on Springhead Road. Relieve congestion bottleneck on local strategic road network.</td>
<td></td>
</tr>
<tr>
<td>A226 London Road / B255 St Clements Way Junction Improvement</td>
<td>7.5</td>
<td>2014 / 15</td>
<td>Junction capacity improvement through the provision of an underpass. Relieve congestion bottleneck on local strategic road network.</td>
<td></td>
</tr>
<tr>
<td>Urban Traffic Management &amp; Control across Kent Thameside</td>
<td>8</td>
<td>2015 / 16</td>
<td>Introduction of traffic signal control system, additional signalised junctions, VMS, CCTV and real time information. Reduce highway traffic and manage traffic flows more efficiently to reduce congestion.</td>
<td></td>
</tr>
<tr>
<td>A226 Thames Way Dualling STDR4</td>
<td>12.5</td>
<td>2017 / 18</td>
<td>Upgrade of existing single carriageway to dual to provide additional capacity. Improve access to Ebbsfleet on the local strategic road network.</td>
<td></td>
</tr>
<tr>
<td>Dartford Town Centre</td>
<td>10</td>
<td>2012 / 13</td>
<td>Revise traffic circulation on ring road and improved bus access (Lowfield Street) for development. Improve access for public transport and support development proposals.</td>
<td></td>
</tr>
<tr>
<td>Rathmore Road Link</td>
<td>10</td>
<td>2013 / 14</td>
<td>Provision of Rathmore Road Link and other highway improvements including changes to one-way system in Gravesend town centre. Improve town centre environment, access for public transport and support development proposals.</td>
<td></td>
</tr>
<tr>
<td>A206 / Marsh St, Dartford Improvements</td>
<td>3</td>
<td>2018 / 19</td>
<td>Convert the roundabout to a signalised junction. Improve access to north Dartford on the local strategic road network.</td>
<td></td>
</tr>
<tr>
<td>Fastrack Northfleet to Garrick Street</td>
<td>12.5</td>
<td>2016 / 17</td>
<td>Provision of a dedicated public transport link through new developments. Improve public transport access to major development area.</td>
<td></td>
</tr>
<tr>
<td>Contingencies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administration Costs</td>
<td>1.34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>185</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*In 2008 prices.

The majority of the estimated cost of the STIPS schemes is focused on predominantly highway related schemes. This is because they will be implemented to complement the package of schemes that are already committed and funded among which public transport measures (including HS1 Domestic services, Crossrail and additional Fastrack bus services) predominate. The package does, however, include public transport, demand management and traffic management proposals. A degree of flexibility has been built into the package to allow for the addition or deletion of schemes as development proceeds and transport conditions change across the network.
The Strategic Transport Investment Package Schemes

Based upon or reproduced from Ordnance Survey maps with the permission of the Controller of Her Majesty's Stationary Office (Crown Copyright).
The expected source of funding for the STIPS schemes is as follows:

- Eastern Quarry contribution £40.00m
- Regional Funding Allocation £25.00m
- DfT Contribution £26.00m
- DCLG Contribution £23.00m
- Housing Tariff £54.06m
- Commercial Tariff £6.92m

**Total** £174.98m

The intention is for the funding contributions to be placed into a communal fund from which allocations will be made for the construction of the individual schemes. The shortfall between the level of funding and the current estimated cost for the package will be covered by interest earned on positive cash balances during the years that the fund is in credit and by efficiency savings in the schemes themselves.

A substantial proportion of the cost of the package will be raised from the planned new developments. Funding has already been secured for the package through the Section 106 Agreement for Eastern Quarry and further funding will be raised through the introduction of a Planning Tariff for new housing and commercial development. The tariff proposal has been developed specifically to fund STIPS schemes and will not replace other conventional Section 106 contributions for site specific transport measures or other community infrastructure.

Funding for walking, cycling, public transport, parking and demand management components have yet to be confirmed and should be considered high priority schemes. It is expected that funding for schemes that are not picked up through STIPS would be secured through the LTP process or from developer contributions. Whatever source of funding is secured it is expected that, unless priority is clearly dictated by the Strategy, funding will be prioritised using Kent County Council’s PIPKIN appraisal tool.

### 3.7 The KTS Transport Model and Benefits of STIPS

The benefits of the STIPS schemes are quantified with the assistance of the KTS Transport Model backed up with various detailed micro-simulation models developed in Kent Thameside. This section will only provide a brief summary of the modelling results and for more details the reader is referred to Appendix A where there is a description of the KTS Transport Model and more detailed forecasting output.

Note the existing as well as two forecast year horizons have been modelled representing 2005, 2011 and 2025. The 2005 period represents the traffic conditions **in 2005 before** the Fastrack scheme opened, 2011 represents the opening phase of the developments with limited committed transport schemes and no STIPS yet built, and 2025 Do Minimum represents full development with full committed transport schemes. The 2025 STIPS scenario includes full development with full committed transport schemes as well as the STIPS schemes. Further details on the modelling assumptions are provided in Appendix A. It should be noted the KTS Model represents **the average hour of the 3 hour peak period** for both morning and evening weekday peaks and therefore there will be times within the 3 hour peak where conditions will be worse than what is illustrated in the model representing the height of the peak.
To put in context the traffic levels in 2025 will be far higher than in 2005 with the massive amount of development in the area assumed therefore it is inevitable that traffic conditions will be to a lower standard than they are currently despite the massive increase in transport infrastructure proposed.

It can be seen from Tables A.1 and A.2 in Appendix A that the STIPS programme as currently modelled would provide a reduction in overall junction delays of respectively 24% in the AM peak and 21% in the PM peak by 2025. The package also provides a 3% improvement in terms of average speeds and travel times across the network in 2025. It should be appreciated that the average speed and travel times are measured across the whole network in Kent Thameside whilst the overcapacity queuing is only measured against those junctions affected. This is why the percentage change benefit is more significant for queuing than area wide statistics like speeds and travel times shown in Tables A.1 and A.2 in Appendix A. For example the M25 is not affected by the STIPS proposals but the traffic volumes on this section of the KTS network are very significant and as a result will smooth out the average speed and overall travel time benefits in the KTS area from the STIPS programme. Therefore one has to investigate the localised benefits from the STIPS package in more detail to appreciate the benefits which are done below.

3.7.1 Junction Improvement Benefits

Two of the key highway bottlenecks identified in the modelling for the future are A226 London Road with St Clements Way junction and B262 Hall Road with Springhead Road junction. The flows and delays for the AM and PM peak for 2005, 2011 and 2025 Do Minimum and STIPS are shown in Tables 3.5 and 3.6 below.

Table 3.5: A226 London Road with St Clements Way Junction

<table>
<thead>
<tr>
<th>Approach Arm</th>
<th>2005 Base</th>
<th>2011</th>
<th>2025 Do Minimum</th>
<th>2025 STIPS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Flow</td>
<td>AM PM</td>
<td>Flow Delay (sec)</td>
<td>Flow Delay (sec)</td>
</tr>
<tr>
<td>London Road (east)</td>
<td>970 560</td>
<td>16  20</td>
<td>1078 842</td>
<td>35  66</td>
</tr>
<tr>
<td>St Cl. Way (south)</td>
<td>760 940</td>
<td>12  13</td>
<td>944 1644</td>
<td>13  19</td>
</tr>
<tr>
<td>London Road (west)</td>
<td>310 530</td>
<td>14  19</td>
<td>600 360</td>
<td>17  177</td>
</tr>
<tr>
<td>Station Rd</td>
<td>770 1120</td>
<td>11  18</td>
<td>965 836</td>
<td>12  73</td>
</tr>
</tbody>
</table>

*Note: Queues and delays are averages across the various lanes for each approach arm.

At the A226 London Road with St Clements Way junction the average delay per vehicle approaching from St Clements Way South goes from 13 seconds in the PM today to about 130 seconds (over 2 minutes) by 2025 in the Do Minimum without STIPS. With the STIPS improvement in 2025 the delay drops back to 35 seconds which is comparable with today when one considers the flow on the link increases from 940 vehicles to about 1260 vehicles by 2025. London Road also has similar reduction in delay benefits with the implementation of STIPS by 2025.

Table 3.6: B262 Springhead Road with Hall Road Junction

<table>
<thead>
<tr>
<th>Approach Arm</th>
<th>2005 Base</th>
<th>2011</th>
<th>2025 Do Minimum</th>
<th>2025 STIPS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Flow</td>
<td>AM PM</td>
<td>Flow Delay (sec)</td>
<td>Flow Delay (sec)</td>
</tr>
<tr>
<td>Springhead Road (north)</td>
<td>910 760</td>
<td>22  109</td>
<td>843 805</td>
<td>41  138</td>
</tr>
<tr>
<td>Hall Road</td>
<td>750 680</td>
<td>56  11</td>
<td>817 918</td>
<td>71  29</td>
</tr>
<tr>
<td>Springhead Road (south)</td>
<td>1680 2090</td>
<td>10  10</td>
<td>2408 2535</td>
<td>15  36</td>
</tr>
<tr>
<td>Wingfield Bank</td>
<td>220 440</td>
<td>29  25</td>
<td>320 639</td>
<td>3022 1729</td>
</tr>
</tbody>
</table>

*Note: Queues and delays are averages across the various lanes for each approach arm.

For the B262 Springhead Road with Hall Road junction this is already a problem junction today with an average vehicle delay of 109 seconds in the PM peak from Springhead Road North. This approach increases to an average delay of 249 seconds (or over 4 minutes) per vehicle by 2025 Do Minimum without STIPS. With the STIPS improvement the average delay drops back to 90 seconds which is comparable with today even though the traffic has increased by about 82%. Note the traffic flows are less in the 2025 Do Minimum compared with the STIPS because more traffic is stuck in queues in the Do Minimum dropping the flow throughout on the link. Wingfield Bank which is the access to the Sainsburys in Gravesend the average delay per vehicle goes up from 25 seconds in the PM to over 30 minute delay in 2025 Do Minimum. This represents gridlock type conditions and the traffic volume on Springhead Road is such that the access traffic from Sainsbury just cannot get out. In reality if this was allowed to happen where no improvement was forthcoming to this junction, people would be deterred from using Sainsburys with such high delays and would be an intolerable situation. With STIPS the average delay per vehicle drops back to 184 seconds which is still high and more detailed study is needed to see what further improvements can be made at this junction. It is the intention of the highway authority to traffic calm Springhead Road (with the opening of the Ebbsfleet Link Road as an alternative route to the A2) which has not yet been fully assessed and modelled, and this will hopefully improve the local conditions yet further.

3.7.2 Local Journey Time Savings Benefits

As discussed earlier the overall travel time savings across the network with the STIPS schemes is only around 3% but this figure masks significant localised travel time savings on key routes in Kent Thameside.

There will be travel time savings brought about by congestion relief and typical PM peak travel time savings by car with the STIPS schemes in place for 2025 are as follows:

- Between Bluewater and either Dartford or Gravesend Station a saving of about 4 minutes around a 20% benefit
- Between Bluewater and Greenhithe Station a saving of about 4 minutes around a 50% benefit
- Between Gravesend Station and Greenhithe Station a saving of about 3 minutes around a 17% benefit
- Between Dartford Station and Eastern Quarry or Ebbsfleet Station a saving of about 2 minutes around a 10% benefit

The journey times for public transport are extracted for the most convenient mode and route and could involve either rail or bus or a combination of both. By public transport the travel time savings in the network are generally more modest than by car as STIPS is focussed on highway congestion relief so people travelling by railways will not benefit from STIPS. Fastrack will also see limited benefit as it is already protected from highway congestion by segregated track and bus priority where it shares road space with the car. The exception to these modest savings by public transport is users of the Northfleet to Garrick Street Fastrack scheme which is part of STIPS. Users will benefit from the re-alignment of the Fastrack scheme through the proposed new roads in the Northfleet Embankment development where it has been assumed Fastrack buses will have faster running times as it is not using the existing congested streets with improved bus priority. It should be noted that the model has had to make assumptions on the Fastrack routing and bus stops through the Northfleet Embankment development as the scheme is still being engineered.
and therefore the travel time savings on this route are subject to review. On the other routes not affected by the re-aligned Fastrack route through the Northfleet Embankment there will be some limited travel time savings with the STIPS schemes mainly for buses by 2025 where it benefits from congestion relief brought about by the STIPS proposals. For the PM peak typical public transport savings are as follows:

- Between Greenhithe Station and Gravesend Station a saving of about 8 minutes around a 44% benefit, associated with the Fastrack Northfleet to Garrick Street scheme discussed earlier
- Between Eastern Quarry and Gravesend Station a saving of about 2 minutes around a 11% benefit
- Between Ebbsfleet Station and Gravesend Station a saving of about 1 minute around a 9% benefit

Although some of the travel time savings may seem modest they affect thousands of people making journeys and accumulated over a year will bring about significant economic benefits. Further details on the travel time savings benefits are provided in Section A.5.4 of Appendix A.

3.7.3 Additional STIPS Scheme Benefits not currently Modelled

Not all the STIPS schemes listed in Table 3.4 are modelled and these include the proposed Demand Management on the A2 Trunk Road, the proposed UTMC system for the KTS area and the Dartford Town Centre scheme. These schemes either do not yet have worked up details that can be modelled or have yet to be endorsed by the highway authority, however in due course it is expected more of these schemes will be included in the modelling. In addition some of the softer schemes discussed earlier associated with demand management like better walking and cycling, and travel plan initiatives have also not been modelled at this stage.

Therefore network performance benefits associated with the STIPS schemes modelled are considered conservative as they are without the three STIPS schemes listed above. These additional STIPS schemes have been investigated with the promoters as well as taking into account evidence from other case studies and are discussed below.

(a) A2 Demand Management

The proposals under consideration for the A2 Demand Management were discussed in Section 3.5.7 of this report. These schemes have not yet been fully defined by HA and at this stage potential benefits can only be inferred from looking at case studies on similar schemes implemented elsewhere in the UK.

Case studies have now been conducted by the HA on the M25 Controlled Motorway scheme and the M42 Active Traffic Management (ATM) scheme, some of which features maybe implemented on the A2/M2 corridor.

The overall conclusions from these studies can be summarised as follows:

- Smoother and more reliable journeys in certain periods. The M42 study found journey time variability had been reduced between 22% and 32%.
- Capacity had increased by an average 7 – 9% with 4 Lane Variable Mandatory Speed Limits on the M42.
The 4-Lane Variable Mandatory Speed Limits (VMSL) reduced average journey times by up to 24% compared with a 3-Lane VMSL system.

High levels of congestion relief benefits were found on very congested parts of the M42 but it was stressed that this needs to be applied with care and it is unlikely to give the same level of benefit from every application as the impact will be dependent on site specific conditions.

- Reduction in stress for drivers
- Reductions in the number and severity of accidents
- Reductions in traffic noise, vehicle emissions and fuel consumption
- Improved driver behaviour

Separate to the HA studies the Commission for Integrated Transport has also suggested that controlled motorways would be a good way of controlling carbon emissions.

Focussing on the KTS area itself a feasibility study has now been undertaken into a park and ride site for the old A2 between Pepperhill and Cobham which will become redundant with the current A2 widening scheme due to open in 2009. This scheme could form part of the A2 Demand Management strategy. A commuter coach park and ride scheme is estimated to remove between 1% - 2% of existing private car users to commuter coaches, whether it is for the short section between Tollgate and the existing informal park and ride site at Bean or further along the A2 towards Inner London.

(b) KTS Area Wide UTMC Scheme

Based on Transport Research Laboratory work (TRRL LR1014, more details in Appendix E), a typical UTC SCOOT traffic signal scheme can lead to a reduction in delays of between 12% - 20%. It is harder to quantify the benefits from a wider UTMC scheme which includes other technology like Variable Message signage and it would be potentially be misleading to extract benefits from other areas with UTMC and apply it to the KTS area.

(c) Dartford Town Centre Scheme

The Dartford Town centre scheme will remove highway capacity with the removal of the one-way system and thus lead to some loss in highway network performance. However the scheme is being primarily developed to improve public transport access, improve the air quality with less road vehicles and will bring about an improved local ambience with less vehicular traffic and thus make it a better pedestrian and shopping environment. This in itself will assist with regenerating the town centre and this will have wider economic benefits.

3.8 Accessibility Strategy

The various strands of the Transport Strategy are interlinked and will work together to ensure that travel throughout the Kent Thameside area is as sustainable overall as possible.

Generally in the Kent Thameside area transport provision is biased towards an east to west direction linking the two urban areas of Dartford and Gravesend. There are a number of roads and public transport services discussed earlier serving east to west movements. The only fixed road link to the north side of the River Thames into Essex is the Dartford Crossing, which suffers from congestion as a national trunk road link and the next nearest fixed road link is the Blackwall Tunnel in inner London.
which also suffers from congestion. There is a road vehicle and pedestrian ferry crossing at Woolwich and a pedestrian only ferry crossing, at Gravesend; however the ferries both have very low capacity. Due to the significant congestion at the Dartford Crossing, consultants for the Department for Transport are currently investigating long term capacity in the Lower Thames and identifying possible options, including new river crossings, by the end of 2008. Potentially viable options will be assessed in more detail in a further phase of the study. To inform the Government’s study, Kent and Essex County Council have commissioned consultants to first review potential options for crossing downstream of Dartford and then to develop two options in further detail. The study for the two authorities will also explore potential funding mechanisms for the construction and operation of a new crossing. There are also proposals to construct a fixed link road bridge called the Thames Gateway Bridge which will have public transport services near Thamesmead however this is currently subject to a second public inquiry and is not supported by the new Mayor of London in its current form.

In terms of public transport access to the north, the HS1 rail link at Ebbsfleet, also crosses the River Thames, near the Dartford Crossing, before heading into London, however this scheme is London focussed and does not serve nearby Essex directly. There is also the Docklands Light Railway in East London which is being extended to cross the River Thames into nearby Woolwich Arsenal, this is expected to be completed in the early half of 2009 but again this link is London focussed and does not directly serve Essex or Kent.

It can be concluded that overall accessibility to the north of the KTS area suffers from severance by the river and accessibility is generally considered poor particularly into nearby Essex. It will obviously improve over the KTS forecast period if one or both of the two new bridge crossings currently under investigation is built. Accessibility is also relatively poor to the south of the KTS area in comparison to east to west movements because of A2 Trunk Road related severance and inferior public transport services from the rural catchment.

In summary because accessibility is not to a uniform high standard across the KTS area it needs to be recognised that for some people the only realistic mode of travel will continue to be the private car and therefore any restrictive demand management policies need to take into account this reality. However to ensure that all areas and user groups are adequately served, and to identify any areas where special measures may be needed, a full accessibility assessment will need to be carried out, and an accessibility strategy developed as part of the detailed development of the Transport Strategy. This will be particularly relevant in respect of parking policy with public transport accessibility and car based demand restraint looked at as an integrated whole to give people a realistic choice to their car and to minimise the threat of social exclusion. This KTS accessibility strategy needs to be in line with Kent County Council’s wider Accessibility Strategy for Kent (ASK) document.

Finally as part of the Transport Strategy on accessibility it would be expected that any new proposed developments would have to have a full accessibility strategy supplied with the planning application to ensure that it addressed all of the accessibility issues associated with the proposed development. A key criterion for acceptability would be the standard of accessibility to the proposed development for non-car traffic users. Note this is already Local Authority policy for new developer led planning applications so is not an additional requirement emanating from this Transport Strategy.
The emerging South East Plan provides the statutory framework for the regeneration of the Kent Thameside area with a target of 25,000 new homes and 50,000 new jobs by the year 2026. The Kent Thameside Model has been updated to represent the 2011, 2018 and 2025 development scenarios and to carry out option testing to identify highway schemes and other transport improvements. This will help to support the expected level of development and to assist with the development of a high level Transport Strategy for Kent Thameside.

The eventual Transport Strategy for Kent Thameside needs to reflect the overall vision for Kent Thameside but it is essential that it also reasonably accommodates the local objectives of the various stakeholders (summarised in Section 1.4).

Reviewing the existing situation, it is concluded that in the existing (2005 base) scenario the highway network already has some congestion but works reasonably well in comparison with other congested areas in the South East of England and the M25 corridor. Looking to the future the area has a major transport challenge by the sheer scale of the development proposals with households expected to increase by about a third and commercial developments expected to almost double, compared with the existing situation.

However, the results of the modelling work have shown that, even when a number of committed and funded transport schemes (Table 3.2) are taken into account, and despite generally good public transport provision, the very high level of development planned for the area will significantly affect the future operation of the highway network. The results indicate that the PM peak will be the worse time period of the day for highway traffic conditions and by 2011 at the opening phase of the developments the network performance will be similar to today. Focussing on the more congested PM peak by 2025 a sample of typical travel routes in the network indicate performance will deteriorate by around 25% compared with existing travel times and overall average speeds will drop from about 59kph today to about 46kph if only committed transport schemes are built. Overcapacity queuing is expected to increase over 16 fold with only the committed schemes assumed. It is clear that further local transport measures will be necessary to enable the successful development of the area.

A number of particular congestion hotspots have been identified (such as the B262 Springhead Road/Hall Road junction and the St Clements Way junction) and a package of additional schemes and proposals have been developed and tested in the model that will underpin the transport needs of the planned development. In all, a total of 11 additional Strategic Transport Investment Package Schemes (STIPS) have been identified at a total cost of £185 million which includes contingencies and administration costs.

If the STIPS package schemes can be implemented they will help to further improve the 2025 highway network performance. Overcapacity queues will reduce by about 21% compared with the 2025 Do Minimum scenario, overall journey time is expected to improve by about 3% and average speeds will increase from 46 kph to 48 kph representing an approximate 7% improvement. It is worth noting that the network performance improvement is conservative as not all the STIPS schemes are modelled and additional benefits are expected. In addition the overall network speed and journey time benefits mask the full extent of the localised benefits realised from the STIPS schemes and will include substantial reductions in delays at
key junctions and much improved journey times on key routes across the Kent Thameside area as reported. As an example a typical car journey from Bluewater to Gravesend Station in the PM peak will reduce from 21 minutes to 17 minutes with STIPS in 2025 a saving of 4 minutes, which is a benefit of around 20%. Time savings have been demonstrated for other typical journeys across Kent Thameside in this report.

The highway improvements identified are focused on relieving specific bottlenecks and congestion hotspots, rather than on increasing highway capacity to match demand. It is accepted, in line with Government policy, that the transport strategy cannot entirely depend on providing more highway capacity, and that transport provision has to work hand in hand with a demand management strategy to reduce and manage the need to travel, particularly by car.

Alongside the STIPS schemes, a range of town centre improvement, demand management and traffic management schemes are being developed and separate outline studies have been conducted to underpin these different components of the transport strategy. These cover parking strategy, public transport improvements, walking and cycling improvements, demand management, Urban Traffic Management & Control proposals, town centre schemes, trunk road proposals and targeted highway improvements. Among the further measures that should be investigated is provision of more bus priority for non-Fastrack buses, but this will be a challenge in the urban areas because of limited space.

Congestion benefits delivered by the STIPS package will further improve when three of the STIPS schemes not currently modelled are further developed and their cumulative impact can be tested in the model. Based on case studies taken from other locations across the UK the A2 Demand Management Strategy will realise additional benefits such as improved journey time reliability, and less carbon emissions with improved traffic flows. The area wide UTMC scheme not yet developed and modelled will also realise additional benefits mainly from reduced delays in the network and the Dartford Town centre scheme will bring about an improved local town centre environment and all the associated environmental and economic benefits.

On public transport (PT) there is a huge growth in usage predicted over the next 20 years with an increased PT mode share from about 18% today for journeys to work increasing to about 27% by 2025. This mode shift is caused by Fastrack services, the new HS 1 Domestic rail services and increased highway costs relative to public transport costs predicted over the next 20 years encouraging a modal shift away from the private car. A target of the Transport Strategy should be to get the PT forecast modal share above 30% with the KTS Model when the accessibility and parking strategy is further developed and the wider demand management strategy emerges. At the moment there is no noticeable difference in public transport usage between the two 2025 forecast scenarios; as there are no significant additional public transport schemes in the STIPS proposals. The major public transport schemes are mainly covered in the Committed Schemes (see Table 3.2) which are already in both forecast scenarios.

National and regional policies promoted by central Government such as road pricing, workplace parking levy and high occupancy vehicle lanes could also have an impact in the future, though the case for these has not yet been proven as part of the recommended package. Note the current Local Transport Bill in Parliament proposes updating existing legal powers so that, where local areas wish to develop
proposals for local road pricing schemes, they will have the freedom and flexibility to do so, whilst ensuring the scheme is consistent and interoperable.

To help fund the STIPS schemes, a tariff scheme has been developed. This is intended specifically to provide funding for the Strategic Transport Investment Package Schemes and will not replace other conventional Section 106 contributions to site specific transport measures or other community infrastructure. However there is a need for flexibility to allow the addition or deletion of schemes as development proceeds and transport conditions change across the network.

Finally it needs to be recognised that this is an evolving Transport Strategy that will be further developed and enhanced as more detailed work is conducted.
A.1 The KTS Transport Model

The Kent Thameside Transport Model (KTS Model) is the primary tool for assessing the transport impacts of expected development around the Kent Thameside regeneration area. It is a multi-modal transport model representing vehicular travel demand with the SATURN software used for the highways (cars and commercial vehicles) and the TRIPS software used for public transport (rail, bus, and coach). The basic travel demand data input into the model is derived from traffic count, ticketing data and roadside interview survey data together, with predicted trip generation and travel mode that will arise from the various development scenarios considered. There is also a mode choice demand model which links the SATURN and TRIPS models. This can take account of traveller’s decisions on how to make particular trips, in response to changing travel costs. The output is a post mode choice demand matrix which is assigned to the highway and public transport network to assess network performance. The KTS Model is validated against 2005 transport conditions and was later updated to reflect the Fastrack services that opened in 2006. Forecasts have been prepared for the 2011, 2018 and 2025 scenarios based on the land use forecasts prepared by the two local boroughs. The subsequent trip generations for the 2025 scenario from the land use forecasts provided in Table 3.1 of the main report section earlier were included in the KTS Model. For more details on the modelling work refer to the KTS Model references in Appendix E.

To support the KTS Model there are also a number of micro-simulation transport models focussing on different parts of the Kent Thameside area and these models assess detailed transport operational issues mainly associated with road vehicles on the highway. The HA has developed a KTS Trunk Road VISSIM model of the A2 Trunk Road and M25/A282 and connecting junctions. There is also a VISSIM model of the Dartford town centre, a Paramics model of Gravesend town centre and the Ebbsfleet area. Kent County Council has also developed a VISSIM model of the North West KTS area, and together with the other models provides full micro-simulation modelling coverage of the entire Kent Thameside. All of these micro-simulation models use forecast transport demand from the KTS Model therefore making it a common database across the area. These micro-simulation model results are not reported here but they have been used to assist with developing the Strategic Transport Investment Package Schemes discussed earlier.

A.2 Modelling Scenarios

The objective of the KTS modelling to date is to quantify the network performance benefits from the various STIPS and to compare it with the Do Minimum scenario of already committed transport schemes. To do this one has to model the 2025 full development with and without the Strategic Transport Investment Package Schemes. The schemes modelled can therefore be summarised as follows:

- **2005 Base Scenario** – the 2005 scenario before the Fastrack scheme was introduced and represents the year the current KTS Model was validated.
- **2011 Opening Year Scenario** – 2011 is assumed to be the opening year of the developments for modelling purposes and is based on the 2011 KTS land use developments and it was assumed most of the Committed transport schemes would be in place except those Fastrack routes associated with...
developments that come after 2011. None of the STIPS schemes were assumed to be in place by 2011.

- **2025 Do Minimum Scenario** – the 2025 KTS full land use developments with the committed transport network schemes **but without the Strategic Transport Investment Package Schemes**.
- **2025 STIPS Scenario** – the 2025 KTS full land use developments with the committed transport network schemes **and with the Strategic Transport Investment Package Schemes**.

Both 2025 scenarios include the full land use development as shown in Table 3.1 from the main report earlier with 25,000 homes as per the South East Plan. For comparison purposes the 2005 base year scenario and 2011 opening year modelling results is also reported to benchmark against forecast conditions.

### A.3 2025 Do Minimum Network Assumptions

In terms of forecast network assumptions the 2025 Do Minimum Scenario only includes the committed network schemes shown in Table 3.2. Note the walking and cycling schemes in Table 3.2 are not included in the KTS Model as these trips are not explicitly modelled and will have a marginal effect on highway network performance.

In addition the Crossrail scheme is not modelled although the HS1 domestic services scheme is included. It could be argued that by not modelling Crossrail it is a conservative assumption in terms of highway congestion as this additional public transport scheme will further de-congest the highway by encouraging more people who may have used the private car to use the railway. The Crossrail scheme will terminate in Abbey Wood in south east London which is served by rail services from Dartford and Gravesham. It is not expected that people in the KTS area will drive by car to south east London to catch this service at Abbey Wood as they will be deterred by congestion and lack of local parking.

### A.4 2025 STIPS Network Assumptions

For the 2025 STIPS network scenario this includes the committed schemes modelled in the Do-Minimum scenario as well as the STIPS schemes listed in Table 3.4. The STIPS schemes are still being developed and assumptions were made about the schemes for modelling. Some schemes have not been modelled because of insufficient information and the modelling can be considered on the conservative side. Therefore the modelling has to be viewed as work in progress and will be refined as more details of schemes become available.

Assumptions relating to the scheme designs for the A2 Trunk Road / B259 Ebbsfleet Interchange, A2 Trunk Road / B255 Bean Interchange and B262 Springhead Road / Hall Road roundabout have been made on the basis of scheme drawings provided by the Highways Agency and its agent Faber Maunsell. Without intervention, modelling work shows that the B262 Springhead Road / Hall Road junction is likely to become a major bottleneck by 2025. The Highways Agency scheme for the B262 Springhead Road / Hall Road junction was modelled in the KTS Model. Note Kent County Council wish to downgrade the status of the B262 Springhead Road with the opening of the new Ebbsfleet Link road and are keen to traffic calm this road and to discourage through traffic from using it. The overall aim is to refrain from increasing the capacity of the junction by discouraging additional traffic from using it with traffic control measures. The traffic calming strategy for the B262 Springhead Road is not
yet fully confirmed but some attempt was made at modelling traffic calming on this link.

Demand Management on the A2 Trunk Road has not been modelled in the KTS Model largely because a workable definitive scheme has not yet been developed and agreed with the Highways Agency. It should be appreciated that the A2 Trunk Road Demand Management strategy in the KTS area provides particular challenging problems largely associated with the close spacing of junctions. Demand management schemes for the trunk roads were discussed in Section 3.5.7 and include variable speed limits and ramp metering onto the A2.

As yet no definitive UTMC schemes have been developed for the KTS area that can be modelled and would need more detailed design work. Only outline proposals and ideas have been developed to date, reported in Jacobs (2007) Kent Thameside – UTMC Study report. The next stage of work to be commissioned on developing the UTMC proposals has now started but no results have yet been made available for this report or for modelling.

Town centre improvement schemes promoted by Dartford Borough Council were still under development when the strategic modelling was conducted and have not been included. In fact this scheme may remove highway capacity in certain locations and is still under review and is likely to evolve over time. In any case town centre highway schemes usually have localised effects and do not materially affect the wider strategic network. The Gravesend town centre scheme was included in the model but is still being developed and is likely to change by the consultants working on the scheme for Gravesham Borough Council from what is currently assumed.

Micro-simulation modelling is being used to separately assess traffic management schemes in the KTS area.

A.5 Modelling Network Performance

A.5.1 Overall Highway Network Performance

The overall highway network performance for the KTS modelled area is shown in Table A.1 and Table A.2 for the AM and PM peak respectively for existing (2005), opening year (around 2011) and 2025 conditions. The tables clearly indicate that the PM peak has more traffic than the AM peak and as a consequence has a lower network performance. The tables indicate by 2011 when the development is in its early stages the traffic demand levels do increase and as a result the network performs marginally worse than compared with existing conditions. There is additional highway capacity in the 2011 scenario compared with the base 2005 conditions as 2011 will include the current widening works on the trunk roads. Also Fastrack was not present in the 2005 model as the scheme opened in 2006.

Concentrating on the more critical PM peak from Table A.2 it can be seen that with the additional development that will be in place by 2025, and with committed transport schemes only (Do Minimum), trip numbers will increase by about 38% overall, average traffic speeds will decrease and queuing will increase substantially compared to existing conditions. In assessing the network performance one should take into context the huge increase in demand from 2005 to 2025 caused by the major developments proposed for the KTS area. There are around 58,000 trips in 2005 (PM peak) with either an origin or destination in the KTS area (see Table 3.1) growing to around 92,000 trips by 2025; this is around a 60% growth in traffic over the next 20 years.
When the 2025 STIPS package is included in Table A.2, the network performance is still worse than at present but improved relative to the Do Minimum, with a 3% reduction in overall travel time and around a 3.3% increase in average speeds. The biggest benefit is overcapacity vehicle queuing which reduces by 21% with the STIPS schemes. In the AM peak the reduction is 24% in overcapacity queues. To relate the overall network performance statistics with typical journey times for the PM peak to benchmark the network refer to Tables A.4 – A.7. In section 3.7.3 earlier a commentary is provided centred around case studies on the likely additional benefits from the STIPS schemes not yet modelled because of lack of details at this stage of the study. The modelling results in Tables A.1 and A.2 are therefore considered to be on the conservative side in terms of benefits and are robust for scheme appraisal.

It should be appreciated that not all the STIPS schemes are proposed purely for highway capacity improvements like some of the trunk road or town centre schemes. The motivation for some of the STIPS schemes is to manage traffic demand and improve the environment; therefore these may not necessarily provide network performance improvements or transport benefits for economic appraisal.

Table A.1: Overall KTS Area AM Peak Highway Network Performance

<table>
<thead>
<tr>
<th></th>
<th>Trips Loaded (Vehicles per Hour)</th>
<th>Travel Time (Vehicle Hours)</th>
<th>Distance Travelled (Vehicle Kms)</th>
<th>Average Speed (Kph)</th>
<th>Overcapacity Queues (Delayed Vehicle Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005 Base</td>
<td>67,365</td>
<td>8,698</td>
<td>536,491</td>
<td>61.7</td>
<td>79</td>
</tr>
<tr>
<td>2011 Opening year</td>
<td>76,121</td>
<td>10,993</td>
<td>638,874</td>
<td>57.5</td>
<td>270</td>
</tr>
<tr>
<td>2025 Do Minimum</td>
<td>90,937</td>
<td>14,956</td>
<td>772,310</td>
<td>51.6</td>
<td>1,295</td>
</tr>
<tr>
<td>2025 STIPS</td>
<td>90,619</td>
<td>14,540</td>
<td>772,865</td>
<td>53.2</td>
<td>985</td>
</tr>
<tr>
<td>Difference between 2025 Do Minimum and 2025 STIPS</td>
<td>-0.4%</td>
<td>-3.0%</td>
<td>0.7%</td>
<td>3.0%</td>
<td>-24%</td>
</tr>
</tbody>
</table>

Explanatory Notes:
The Trips Loaded are the total number of vehicle trips either starting or ending in the KTS area. This figure also includes through trip movements in the KTS area. Travel time is the total travel time recorded for the number of vehicles in the KTS area. Distance Travelled is the total distance travelled for the number of vehicles in the KTS area. Average speed is the Distance Travelled divided by the Travel Time. Overcapacity Queues are queues in the KTS area which extend beyond those expected due to geometric design delays. For example queues that form at a junction because of a red light but clear within the cycle are a geometric delay and not overcapacity queue delays. However if demand exceeds network capacity and a vehicle does not clear the junction signal in one cycle then it forms part of the overcapacity queue. It represents the congested delays in the network.
Table A.2: Overall KTS Area PM Peak Highway Network Performance

<table>
<thead>
<tr>
<th></th>
<th>Trips Loaded (Vehicles per Hour)</th>
<th>Travel Time (Vehicle Hours)</th>
<th>Distance Travelled (Vehicle Kms)</th>
<th>Average Speed (Kph)</th>
<th>Overcapacity Queues (Delayed Vehicle Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005 Base</td>
<td>71,157</td>
<td>9,521</td>
<td>565,816</td>
<td>59.4</td>
<td>158</td>
</tr>
<tr>
<td>2011 Opening year</td>
<td>80,954</td>
<td>11,826</td>
<td>665,170</td>
<td>56.2</td>
<td>491</td>
</tr>
<tr>
<td>2025 Do Minimum</td>
<td>98,685</td>
<td>17,098</td>
<td>793,395</td>
<td>46.4</td>
<td>2583</td>
</tr>
<tr>
<td>2025 STIPS</td>
<td>98,397</td>
<td>16,622</td>
<td>797,659</td>
<td>48</td>
<td>2035</td>
</tr>
<tr>
<td>Difference between 2025 Do Minimum and 2025 STIPS</td>
<td>-0.3%</td>
<td>-2.8%</td>
<td>0.5%</td>
<td>3.3%</td>
<td>-21.2%</td>
</tr>
</tbody>
</table>

Explanatory Notes:
The Trips Loaded are the total number of vehicle trips either starting or ending in the KTS area. This figure also includes through trip movements in the KTS area. Travel time is the total travel time recorded for the number of vehicles in the KTS area. Distance Travelled is the total distance travelled for the number of vehicles in the KTS area. Average speed is the Distance Travelled divided by the Travel Time. Overcapacity Queues are queues in the KTS area which extend beyond those expected due to geometric design delays. For example, queues that form at a junction because of a red light but clear within the cycle are a geometric delay and not overcapacity queue delays. However, if demand exceeds network capacity and a vehicle does not clear the junction signal in one cycle then it forms part of the overcapacity queue. It represents the congested delays in the network.

The overall network results above indicate that the PM peak is the more critical peak and for brevity only the PM peak more detailed results will be reported below.

A.5.2 KTS Speed Performance by Road Type

Table A.3 summarises the PM peak speed performance in the KTS area disaggregated by road type and for the non-trunk roads it is broken down between the Gravesham and Dartford borough boundaries. The strategic roads in Table A.3 are the trunk roads M25 / A282 and A2 Trunk Road, the principal roads are the classified non-trunk roads like the A296 Watling Street and A226 London Road and the local roads are the un-classified local roads and streets in the two boroughs. Note only the more important local roads are included in the model. The strategic trunk roads are the responsibility of the Highways Agency whilst the other roads are the responsibility of Kent County Council.

The speed is recorded on the M25 / A282 trunk road up to Junction 1a and does not include the speeds at the Dartford Crossing and at the toll plazas. The minimum unofficial benchmark threshold speeds set by the KTS Transport Group for the highways are as follows:

- 20 kph (12mph) Local Roads
- 50 kph (31mph) Principal Roads
- 80 kph (50mph) Trunk Roads

Note the benchmark speeds above are for the peak periods only and take into consideration junction and other accepted network delays.

Table A.3 shows that with current 2005 conditions for the local roads and the principal roads in both Dartford and Gravesend, the network is achieving the minimum speed threshold benchmarks and shows a network performance that is
typical for many suburban towns across the South East. However minimum speeds are not being achieved on the trunk roads except for the A2 Trunk Road westbound direction which is the contra peak movement in the PM peak. To help address this relatively poor network performance on the strategic trunk roads the Highways Agency are currently widening the A2 Trunk Road and the M25 / A282. It should be noted the KTS Model has not yet incorporated the demand management strategy for the A2 currently under development by the HA and therefore the results reported reflect work in progress and not the final optimised results.

Note there are other generic transport benchmarks for the KTS area in keeping with Government policy including better accessibility for public transport, encouraging sustainable modes of transport like walking and cycling and promoting a modal shift away from the private car.

### Table A.3: PM Average Speeds by Road Type – With and Without STIPS

<table>
<thead>
<tr>
<th>Road / Location</th>
<th>Direction / Area</th>
<th>Target Minimum Speed (KPH)</th>
<th>Base</th>
<th>2011 Development Scenario</th>
<th>2025 Development Scenarios</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Base 2011 Development</td>
<td>PM</td>
<td>Do Minimum</td>
<td>STIPS</td>
</tr>
<tr>
<td>A2</td>
<td>Westbound</td>
<td>80</td>
<td>94</td>
<td>90</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2025 Development Scenarios</td>
<td>PM</td>
<td>Do Minimum</td>
<td>STIPS</td>
</tr>
<tr>
<td></td>
<td>Eastbound</td>
<td>80</td>
<td>71</td>
<td>71</td>
<td>63</td>
</tr>
<tr>
<td>M25</td>
<td>Northbound</td>
<td>80</td>
<td>64</td>
<td>63</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>Southbound</td>
<td>80</td>
<td>63</td>
<td>63</td>
<td>42</td>
</tr>
<tr>
<td>Principal Roads</td>
<td>Dartford</td>
<td>48</td>
<td>56</td>
<td>57</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td>Gravesend</td>
<td>48</td>
<td>62</td>
<td>58</td>
<td>50</td>
</tr>
<tr>
<td>Local Roads</td>
<td>Dartford</td>
<td>20</td>
<td>25</td>
<td>24</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Gravesend</td>
<td>20</td>
<td>32</td>
<td>26</td>
<td>21</td>
</tr>
<tr>
<td>Average Speeds</td>
<td></td>
<td>59</td>
<td>57</td>
<td>46</td>
<td>48</td>
</tr>
</tbody>
</table>

With significantly increased demand in the KTS area resulting from new developments it is expected that average speeds would fall below 2005 conditions by 2011 and certainly by 2025 and this is shown in Table A.3. By 2025:

- **Dartford local road speeds are just above the benchmark speeds for the Do Minimum scenario and improve with the STIPS schemes.**
- **Principal road speeds are also just above the benchmark speed in the 2025 Do Minimum and also improve with the STIPS schemes.**
- **Trunk road speeds are considerably below the benchmark in all the scenarios with and without the STIPS schemes.**

The trunk road results materialise because the STIPS schemes provide more capacity on the local network which enables more traffic to use the trunk road network which in turn reduces the speeds (in line with the speed flow curves in the KTS Model). The Highways Agency is currently undertaking a demand management strategy on the A2 Trunk Road to help improve the network performance and is discussed in Section 3.5.7. The speeds on the M25 are worse in
the northbound direction in the KTS area due to the queuing traffic approaching the Dartford Crossing. The constraints from the Dartford Crossing are being investigated in separate studies as discussed in Section 3.8. One way to improve trunk road speeds is through signalising the access junctions and metering (limit access flows) the traffic that joins the A2 Trunk Road, this is under investigation by the Highways Agency. However there is the risk that holding back traffic on the County roads by access control onto the trunk roads may only transfer the problem to another part of the network and does not necessarily address the core issue of excessive demand for a given network capacity. Therefore at the core of the Transport Strategy remains the challenge of active demand management proposals to reduce the need to travel by the private car and to measure the benefits where possible with the transport model.

In summary the trunk roads experience the most significant drop in speeds and there is certainly a case for some form of active demand management scheme to minimise the significant drop in its speed performance. A demand management strategy is currently being developed by the HA and its consultants and therefore the modelling results reported reflect work in progress and not the optimised final solution. For the local and principal roads in both Dartford and Gravesham the aim should be to improve the speeds further with the UTMC and other proposals not yet developed in detail and hence modelled. Note the speeds from the KTS Model represent an average hour over the 3-hour peak so during certain parts of the peak period, the performance could be significantly worse on the ground than what is shown in the model. The area wide speeds for the local and principal roads reflect the averages across a wide number of roads and speed performance on individual roads could fluctuate significantly from the figures reported in Table A.3.

A.5.3 Junction Performance

In terms of junction performance in the base 2005 scenario, there are a few locations on the trunk road corridor and around Gravesend which are congested in the peak. Conditions are also fairly congested around the Dartford Crossing. In 2011 conditions are fairly similar to the base 2005 conditions. However in the 2025 Do-Minimum Scenario there are considerably more junctions in the KTS area which become congested including more sections of the trunk road network as well as roads in both Dartford and Gravesend. Measuring the volume-capacity ratio (at over 85%) as a proxy for congested junction locations the following results are found:

- 8 overloaded junctions in the base 2005 PM network.
- 14 overloaded junctions in the 2011 PM Opening Year
- 37 overloaded junctions in the 2025 PM Do-Minimum.
- 32 overloaded junctions in the 2025 PM STIPS scenario.

More detailed junction analysis is available from the micro-simulation models and the locations of the junctions from the KTS Model output are listed in Appendix D.

A.5.4 Typical Average Journey Times across the KTS area

The KTS Model was interrogated to derive typical journey times between primary locations within the area comparing car with public transport. Tables A.4 and A.5 compare existing 2005 PM peak journey times between car and public transport respectively. Tables A.6 and A.7, show the forecast 2025 PM peak journey times for the same locations by car and public transport for the Do Minimum and STIPS scenario respectively. It will be noted at a number of locations like Eastern Quarry there are no journey times in the existing 2005 scenario because the development is
not yet built. Walk times are excluded in the tables to make it a fair comparison between the modes but the wait time for public transport is included. All times are rounded to the nearest minute and the model represents the average peak hour conditions taken over the three hour peak period and may not necessarily represent the worst peak travel times of the day. As would be expected the car travel times increase by 2025 compared with 2005 due to increased congestion.

Generally public transport is slower than the car but not in all cases and remains competitive. Public transport journeys are by bus and/or rail; whichever is quicker.

Comparing the Do Minimum with the STIPS schemes in 2025 generally the travel times are quicker with the STIPS schemes with a few exceptions. Some of the car travel time savings are as follows:

- Between Bluewater and either Dartford or Gravesend Station a saving of about 4 minutes around a 20% benefit
- Between Bluewater and Greenhithe Station a saving of about 4 minutes around a 50% benefit
- Between Gravesend Station and Greenhithe Station a saving of about 3 minutes around a 17% benefit
- Between Dartford Station and Eastern Quarry or Ebbsfleet Station a saving of about 2 minutes around a 10% benefit

The journey times for public transport are extracted for the most convenient mode and route and could involve either rail or bus or a combination of both. By public transport the travel time savings in the network are generally more modest than by car as STIPS is focussed on highway congestion relief so people travelling by railways will not benefit from STIPS. Fastrack will also see limited benefit as it is already protected from highway congestion by segregated track and bus priority where it shares road space with the car. The exceptions to these modest savings by public transport are users of the Northfleet to Garrick StreetFastrack scheme which is part of STIPS. Users will benefit from the re-alignment of the Fastrack scheme through the proposed new roads in the Northfleet Embankment development where it has been assumed Fastrack buses will have faster running times as it is not using the existing congested streets with improved bus priority. It should be noted that the model has had to make assumptions on the Fastrack routing and bus stops through the Northfleet Embankment development as the scheme is still being engineered and therefore the travel time savings on this route are subject to review. On the other routes not affected by the re-aligned Fastrack route through the Northfleet Embankment there will still be some limited travel time savings with the STIPS schemes mainly for buses by 2025 where it benefits from congestion relief brought about by the STIPS proposals. For the PM peak typical public transport savings are as follows:

- Between Greenhithe Station and Gravesend Station a saving of about 8 minutes around a 44% benefit, associated with the Fastrack Northfleet to Garrick Street scheme discussed earlier
- Between Eastern Quarry and Gravesend Station a saving of about 2 minutes around a 11% benefit
- Between Ebbsfleet Station and Gravesend Station a saving of about 1 minute around a 9% benefit
### Table A.4: PM 2005 Car Typical Average Travel Times (all times in minutes)

<table>
<thead>
<tr>
<th>From</th>
<th>Dartford Station</th>
<th>Bluewater</th>
<th>Eastern Quarry</th>
<th>Ebbsfleet Station</th>
<th>Gravesend Station</th>
<th>Greenhithe Station</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dartford Station</td>
<td>na</td>
<td>10</td>
<td>na</td>
<td>na</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Bluewater</td>
<td>10</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>Eastern Quarry</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Ebbsfleet Station</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Gravesend Station</td>
<td>18</td>
<td>11</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>12</td>
</tr>
<tr>
<td>Greenhithe Station</td>
<td>10</td>
<td>3</td>
<td>na</td>
<td>na</td>
<td>12</td>
<td>na</td>
</tr>
</tbody>
</table>

Notes: Times extracted from KTS Model. For car journeys those locations with a public car park modelled a search time is added to the journey time.

### Table A.5: PM 2005 Public Transport Typical Average Travel Times (all times in minutes)

<table>
<thead>
<tr>
<th>From</th>
<th>Dartford Station</th>
<th>Bluewater</th>
<th>Eastern Quarry</th>
<th>Ebbsfleet Station</th>
<th>Gravesend Station</th>
<th>Greenhithe Station</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dartford Station</td>
<td>na</td>
<td>17</td>
<td>na</td>
<td>na</td>
<td>17</td>
<td>22</td>
</tr>
<tr>
<td>Bluewater</td>
<td>18</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>24</td>
<td>7</td>
</tr>
<tr>
<td>Eastern Quarry</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Ebbsfleet Station</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Gravesend Station</td>
<td>20</td>
<td>26</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>29</td>
</tr>
<tr>
<td>Greenhithe Station</td>
<td>24</td>
<td>7</td>
<td>na</td>
<td>na</td>
<td>16</td>
<td>na</td>
</tr>
</tbody>
</table>

Notes: Times extracted from KTS Model. For public transport walk times are excluded but waiting time is included. The most efficient public transport mode in terms of journey times is used.
### Table A.6: PM 2025 Car Typical Average Travel Times (all times in minutes)

<table>
<thead>
<tr>
<th>From</th>
<th>Dartford Station</th>
<th>Bluewater</th>
<th>Eastern Quarry</th>
<th>Ebbsfleet Station</th>
<th>Gravesend Station</th>
<th>Greenhithe Station</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DM</td>
<td>DS</td>
<td>DM</td>
<td>DS</td>
<td>DM</td>
<td>DS</td>
</tr>
<tr>
<td>Dartford Station</td>
<td>na</td>
<td>na</td>
<td>16</td>
<td>15</td>
<td>20</td>
<td>18</td>
</tr>
<tr>
<td>Bluewater</td>
<td>16</td>
<td>12</td>
<td>na</td>
<td>na</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Eastern Quarry</td>
<td>21</td>
<td>20</td>
<td>6</td>
<td>6</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Ebbsfleet Station</td>
<td>21</td>
<td>20</td>
<td>9</td>
<td>9</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Gravesend Station</td>
<td>22</td>
<td>22</td>
<td>13</td>
<td>14</td>
<td>14</td>
<td>13</td>
</tr>
<tr>
<td>Greenhithe Station</td>
<td>12</td>
<td>13</td>
<td>4</td>
<td>4</td>
<td>7</td>
<td>7</td>
</tr>
</tbody>
</table>

Notes: Times extracted from KTS Model. For car journeys those locations with a public car park modelled a search time is added to the journey time. DM is the 2025 Do Minimum scenario and DS is the 2025 Do Something or STIPS scenario.

### Table A.7: PM 2025 Public Transport Typical Average Travel Times (all times in minutes)

<table>
<thead>
<tr>
<th>From</th>
<th>Dartford Station</th>
<th>Bluewater</th>
<th>Eastern Quarry</th>
<th>Ebbsfleet Station</th>
<th>Gravesend Station</th>
<th>Greenhithe Station</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DM</td>
<td>DS</td>
<td>DM</td>
<td>DS</td>
<td>DM</td>
<td>DS</td>
</tr>
<tr>
<td>Dartford Station</td>
<td>na</td>
<td>na</td>
<td>16</td>
<td>16</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Bluewater</td>
<td>17</td>
<td>17</td>
<td>na</td>
<td>na</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Eastern Quarry</td>
<td>24</td>
<td>24</td>
<td>6</td>
<td>6</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Ebbsfleet Station</td>
<td>21</td>
<td>21</td>
<td>9</td>
<td>9</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Gravesend Station</td>
<td>19</td>
<td>19</td>
<td>21</td>
<td>25</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>Greenhithe Station</td>
<td>17</td>
<td>17</td>
<td>4</td>
<td>5</td>
<td>9</td>
<td>9</td>
</tr>
</tbody>
</table>

Notes: Times extracted from KTS Model. For public transport walk times are excluded but waiting time is included. The most efficient public transport mode in terms of journey times is used. DM is the 2025 Do Minimum scenario and DS is the 2025 Do Something or STIPS scenario.

### A.5.5 Public Transport Use

According to the 2001 census about 18% of the journeys to work (excludes non-motorised transport) are by public transport (PT) from the KTS area which includes people commuting into London. This mode share is reflected in the base 2005 KTS Model. By 2025 the public transport mode share forecast from the KTS Model increases to around 27%. This higher public transport mode share comes about because of improved public transport mainly from Fastrack but also from the new HS1 train services. Higher car travel costs in 2025 compared with today through
increased congestion and increased parking charges (beyond inflation) also contribute to a higher public transport mode share in Kent Thameside. Note an increased fuel price for private road vehicles beyond inflation has not been assumed in the current modelling but this would also encourage a higher public transport modal shift. The forecast PT mode share is a significant improvement compared with existing conditions however it is still below neighbouring London Boroughs of Bromley and Bexley where the PT mode share for journeys to work is over 30% today. Therefore there is probably still room for further improvement over the coming years and will be a challenge for the Transport Strategy and policy makers. The accessibility and parking strategies, when fully worked up in more detail, should further increase the PT mode share indicated by the KTS Model, taking it to over 30%.

Projected public transport use from the KTS Model is shown in Table A.8 in terms of passenger kilometres. Table A.8 indicates that passenger kilometres will more than double in 2025 compared with the 2005 scenario and this is welcomed and positive as an outcome from the modelling. In 2005 there were no Fastrack schemes in place. This huge growth is facilitated in the future through a step change in public transport with additional Fastrack services and the introduction of HS1 Domestic rail services from Ebbsfleet in 2009. It should be noted that within the KTS Model public transport is not calibrated by individual lines or routes and therefore only the overall public transport demand by sub-modes (i.e. Bus, Rail, Coach, Fastrack) has been reported from the model. However, although not calibrated at individual route level, overall boarding levels and mode share for the various public transport sub-modes do validate fairly well in the KTS Model and therefore measuring public transport at an aggregate level should provide confidence in the forecasting. Also the Fastrack element of the KTS Model has now been validated from 2006 observed Fastrack data so this element of the public transport assessment is considered fairly robust.

Table A.8 shows no noticeable difference in public transport usage between the two 2025 forecast scenarios; this is because there are no significant additional public transport schemes in the STIPS proposals, the major public transport schemes being mainly covered in the Committed Schemes (see Table 3.2) which are already in both forecast scenarios.

In summary, there is a huge growth in public transport usage predicted over the next 20 years with an increased PT mode share from about 18% today for journeys to work increasing to at least 27% by 2025. This mode shift is caused by additional Fastrack services, the new HS 1 Domestic rail services and increased highway costs relative to public transport costs predicted over the next 20 years, all encouraging modal shift away from the private car. Further development of the accessibility and parking strategies and the emerging wider demand management strategy, when factored into the KTS Model, is expected to show additional mode shift towards PT. Assuming that measures within the developed strategies are appropriate, targeted and subsequently fully implemented then it could reasonably be expected that the 'journey to work' PT mode share would exceed 30%. This should be the aim.
### Table A.8: PM Peak Public Transport Passenger Kilometres

<table>
<thead>
<tr>
<th>PT Modes</th>
<th>Base 2005</th>
<th>2025 Do Minimum</th>
<th>Do Minimum Percentage Differences</th>
<th>2025 STIPS Scenario</th>
<th>STIPS Scenario Percentage Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus</td>
<td>14,300</td>
<td>26,137</td>
<td>+ 83%</td>
<td>29,875</td>
<td>+ 14%</td>
</tr>
<tr>
<td>Rail</td>
<td>328,333</td>
<td>704,230</td>
<td>+ 114%</td>
<td>698,924</td>
<td>- 0.75%</td>
</tr>
<tr>
<td>Coach</td>
<td>6,937</td>
<td>8,483</td>
<td>+ 22%</td>
<td>10,074</td>
<td>+ 19%</td>
</tr>
<tr>
<td>Fastrack</td>
<td>n/a</td>
<td>23,483</td>
<td>n/a</td>
<td>23,184</td>
<td>- 1.3%</td>
</tr>
<tr>
<td>Total</td>
<td>349,570</td>
<td>762,333</td>
<td>+ 118%</td>
<td>762,057</td>
<td>- 0.04%</td>
</tr>
</tbody>
</table>

**Notes:** Differences are between Do Minimum and Base and STIPS Scenario and Do Minimum

Note in Table A.8 there is a very small reduction in the STIPS passenger kilometres using Fastrack compared with Do Minimum predicted for 2025. This is because in STIPS there is only one new Fastrack scheme proposed which is the Northfleet to Garrick Street scheme into Gravesend and this scheme realigns the Fastrack scheme (which is already present in the Do Minimum) into the Northfleet development so it is not adding any significant new capacity. The differences can therefore be attributed to slight modelling variability (with possibly some model noise) and is not a significant effect to be of concern.
## Appendix B - Policy Documents

<table>
<thead>
<tr>
<th>Theme</th>
<th>Document</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Transport</td>
<td>DETR (1998): A New Deal for Transport – Better for Everyone</td>
<td>The five aims of a sustainable transport strategy include improving safety; promoting accessibility; contributing to an efficient economy; promoting integration; and protecting the environment.</td>
</tr>
<tr>
<td>National Transport</td>
<td>DT (2004) The Future of Transport</td>
<td>A long term strategy for a modern, efficient and sustainable transport system backed up by investment. The Government aims to increase walking and cycling by making it a more convenient, attractive and realistic choice for more short journeys, especially those to work and school.</td>
</tr>
<tr>
<td>National Transport</td>
<td>HMSO (2006) The Eddington Transport Study</td>
<td>Be smarter with the way we use our transport resources. Prioritising investment on those parts of the system which are critical in supporting economic growth and where it is clear that these networks are not performing.</td>
</tr>
<tr>
<td>National Planning</td>
<td>DETR (2001) PPG 13 – Transport</td>
<td>LAsh should carry out land use policies and transport programmes in ways to reduce the growth in localised journeys, encourage alternative means of travel and reduce environmental impacts. The main aim is to reduce the reliance on the private car.</td>
</tr>
<tr>
<td>National Planning</td>
<td>ODPM (2003) The Sustainable Communities Plan</td>
<td>Sets out the Government’s long-term vision for new communities. It recognises that a step-change in approach is needed to deliver sustainable communities, which are more than just housing. Underpins the recent philosophy of growth areas such as the Thames Gateway.</td>
</tr>
<tr>
<td>National Planning</td>
<td>ODPM (2005) PPS 1 – Delivering Sustainable Development</td>
<td>Development plans should promote high quality design and layout, contain clear access policies and include community involvement in creating sustainable communities.</td>
</tr>
<tr>
<td>National Planning</td>
<td>DCLG (2007) Manual for Streets</td>
<td>This expects designers to place a high priority on meeting the needs of pedestrians, cyclists and public transport users, and produce more traditional street patterns which are easier to assimilate into existing built-up areas.</td>
</tr>
<tr>
<td>Regional Planning</td>
<td>HMSO (1995) RPG 9a: The Thames Gateway Planning Framework</td>
<td>Establishes the principles of the spatial pattern of the Gateway, through the consolidation of the existing regional pattern of town and country, maximising the potential offered by the area’s supply of brownfield land and exploiting the opportunity offered by HS1 and the River Thames. The ‘Green Grid’ is an important concept for Kent Thameside, the objective being to join the main open areas with the River Thames frontage, in addition to links to existing communities and new development areas.</td>
</tr>
<tr>
<td>Regional Planning</td>
<td>SEERA et al. (2004) Growth and Regeneration in the Thames Gateway</td>
<td>Provides an inter-regional planning approach to the Thames Gateway. The policies in it will be taken forward through the Regional Spatial Strategies.</td>
</tr>
<tr>
<td>Regional Planning</td>
<td>SEERA (2006) The South East Plan (Draft)</td>
<td>The Plan provides a draft policy framework for the region up to 2026. Emphasises the need to make the most of existing capacity, combined with increased investment in public transport, cycling and pedestrian access. The Plan seeks to adopt stronger parking policies linked with a programme of access improvements and reasonable provision for residential development. High importance is attached to demand management initiatives.</td>
</tr>
<tr>
<td>Strategic Planning</td>
<td>The Department for Transport Circular 02/2007; Planning and the Strategic Network</td>
<td>This circular explains how the Highways Agency (the Agency), on behalf of the Secretary of State for Transport, will participate in all stages of the planning process with Government Offices, regional and local planning authorities, local highway/transport authorities, public transport providers and developers to ensure national and regional aims and objectives can be aligned and met.</td>
</tr>
<tr>
<td>County Transport</td>
<td>KCC (2005) Local Transport Plan 2 (2006-2011)</td>
<td>Key themes include accessibility, healthier lifestyles, integration, mobility and road safety. Specific targets for cycling and sustainable travel mode share to schools. Effective management of parking is central to delivering the LTP2.</td>
</tr>
<tr>
<td>County Planning</td>
<td>KCC/ Medway Council (2006) Kent and Medway Structure Plan</td>
<td>The Plan was adopted in 2006 and sets out the strategic planning framework for development across Kent and Medway. Policy SP1 states that the objective is “to provide good and safe accessibility to jobs and services for all sections of the community in Kent, and to improve the environment and health of the community by reducing congestion and pollution, widening the choice of transport available and by developing public transport, walking and cycling.”</td>
</tr>
<tr>
<td>Local Planning</td>
<td>Dartford Borough Council (2002) Dartford Borough Local Plan 2nd Review</td>
<td>It focuses on the need to meet the expected high levels of growth up to 2011 in a way that is sustainable. This includes the promotion of an integrated transport strategy for the Borough which minimises the need to travel, reduce car dependence and encourage the use of more sustainable modes of travel.</td>
</tr>
<tr>
<td>Local Planning</td>
<td>Dartford Borough Council (2008) Dartford Core Strategy Preferred Options</td>
<td>The Core Strategy is a planning document containing a spatial vision and objectives for Dartford to 2026 and a strategy for how this will be achieved. It is part of the Local Development Framework – a set of plan documents which cover different aspects of planning in the borough.</td>
</tr>
<tr>
<td>Theme</td>
<td>Document</td>
<td>Notes</td>
</tr>
<tr>
<td>-----------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Local Planning</td>
<td>Gravesham Borough Council (2001) Gravesham Borough Local Plan Second Review</td>
<td>Sets out the policies for the development and use of land up to 2011. Issues include:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Walking and cycling routes are seen as an integral part of the Green Grid.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ The need to maintain adequate, accessible, attractive and secure public car parking in the Town Centre to meet the needs of shoppers and to maintain the Town’s economic vitality.</td>
</tr>
<tr>
<td>Local Planning</td>
<td>Gravesham Borough Council (2007) Consultation on Core Strategy Key Issues and Options</td>
<td>The Core Strategy is the key part of the Gravesham Local Development Framework. It sets out the broad pattern of development across the Borough over the next 20 years and how this will be achieved.</td>
</tr>
</tbody>
</table>
Appendix C - Transport Strategy Action Plans

Public Transport Action Plans

It is difficult to produce a detailed action plan with definite timescales for what is a large area, where there are a number of options available for some situations, and other schemes are dependent on other developments taking place which in turn may depend on finance becoming available, or the actions of private sector developers.

Also, Network Rail, DfT and Southeastern Railway have already produced a number of plans relating to railway infrastructure and train services, we have intentionally not repeated these in this section, nor have we repeated plans and proposals for Gravesend’s Transport Quarter.

The following section should be regarded as a guide.

SHORT TERM – PRIOR TO 2011

Known Plans
2007 – International train services from Ebbsfleet now in place.
2007 – Proposed diversion of Fastrack route B via Ebbsfleet now in place.
   (May need to consider enhancement of 480 / 490 between Gravesend and Greenhithe).
2008 / 09 – National smart card scheme for buses (driven by national concessionary scheme.)
2009 – Domestic train services from Ebbsfleet, Major update of Southeastern Railway timetable.
2011 – Proposed introduction of Fastrack route C (circular via Swanscombe Peninsula.)

A – Marketing
Develop marketing strategy for public transport in the area.

Consider locations for further information kiosk / enquiry points.

B – Bus and Train Services
Protect A2 Trunk Road corridor south of Gravesend as public transport corridor like for a coach park and ride.

Further study to investigate viability of SE Gravesend – Ebbsfleet bus service.

Seek opportunities to enhance bus service frequency and coverage and hours of operation, particularly evening and Sunday services.

C – Fastrack Buses
Fastrack buses introduced in 2006 / 07 will require refurbishment at a 5 year point, to maintain ‘premium’ status.

Continue to monitor developments such as hybrid fuel technology, for the Fastrack fleet.
**D – Infrastructure**

Undertake detailed review of bus stations and interchanges to assess suitability for expanded network / enhanced frequencies / larger buses.

Need for improved bus interchange in Dartford (or possible bus station) and Gravesend to be kept in mind with town centre regeneration planning.

Carry out detailed bus stop audit against best practice / accessibility criteria, and set strategy / programme of prioritised improvements. (Implementation could follow after marketing review, as local corporate image may be proposed.)

Discuss signage with train operating companies and borough councils with view to improving signage to and between public transport stops / stations. (Implementation may be guided by marketing strategy.)

Continue to ensure that resources are directed to maintenance of roadside equipment.

Infrastructure developments / changes in areas that may be served by Fastrack should be compatible with articulated bus or light rail vehicle operation, all other infrastructure should be designed to be compatible with full size buses.

Seek opportunities to improve facilities and accessibility at railway stations.

Lobby for eastward extension of Crossrail.

**E – Safety and Security**

Continue to roll out CCTV coverage of bus stops.

Pilot schools education programme for using public transport.

**F – Information**

Analysis of current status of Real Time Passenger Information (RTPI) system.

Continue to roll out RTPI displays and ‘next stop’ information, including information at busy locations other than bus stops (e.g. shopping centres) and via major employers.

Publicise ‘Traveline TXT’ facility, and seek integration with RTPI system so that real time information can be given by SMS message.

**G – Ticketing and Payment Methods**

Smartcards likely to be introduced for concessionary fares in 2008 / 09.

Develop strategy towards introducing smartcard ticketing for other passengers, with functionality to cover a range of travel habits.

Liaison with train operating companies and Transport for London (TfL) over ticketing compatibility issues.

Keep mobile phone ticketing under review – still developing at present.

Consider introduction of ‘Thameside Zone’ as a PlusBus option.
H – Highway Issues and Bus Priority
Highway schemes and improvements on existing or potential bus routes to be made ‘future proof’ – allowing for possibility of articulated buses or light rail vehicles on Fastrack routes, 12-13 metre long buses on non Fastrack routes where practical.

Protect A2 Trunk Road corridor south of Gravesend as public transport corridor like for a coach park and ride

Identify and protect a bus link into Northfleet Embankment as well as into Gravesend Town Centre.

Liaise with Darent Valley Hospital and Bluewater management over possible improvements to bus access and priority.

Roll out of further Selective Vehicle Detection at traffic signals.

Investigate priority measures for buses emerging from Greenhithe, Station Road.

Bus Priority to be included in Gravesend Town Centre plans (e.g. Rathmore Road Link), alternative bus route to be investigated if road network south of Gravesend Station to become two-way.

Bus links for Denton / NE Gravesend require further consideration (dependent on progress with development) – links may need prior identification and protection.)

I – Park and Ride
Further consideration of park and ride from Bluewater and Ebbsfleet – liaison with site owners.

Protect site at Tollgate.

J – Partnerships and Working Arrangements
Establish Punctuality Improvement Partnership.

Involve bus operators in design of bus related facilities and infrastructure.

Seek bus operator / bus service manager representation in local business community.

Seek greater community involvement in transport provision.

Explore options for moving towards network franchise arrangement.

K – Taxis
Review taxi ranks in consultation with trade, taking into account accessibility and security issues as well as plans for town centre redevelopments.

Improve signage at taxi ranks following review (and in light of marketing strategy).

Include taxi rank locations in public transport information.
MEDIUM TERM – 2011 TO 2018

Known Plans
Northfleet Bus Garage identified as housing site by ARRIVA. Need to liaise with ARRIVA on future bus garaging and possible locations
2014 – Dartford and Gravesham Councils existing bus shelter contracts expire.
2014 – Current Southeastern Railway franchise ends.
2018 – Proposed introduction of Fastrack route D via Northfleet Embankment.

A – Marketing
Continue to review marketing strategy in line with available data from smartcard use.

B – Bus and Train Services
Continue to bring key bus services’ hours of operation and frequency into line with Fastrack.
Consider introduction of all-night bus service.
Consultation for 2014 re-franchise of Southeastern network.

C – Buses
Fastrack buses introduced in 2006 / 07 will require replacement at about 2013 / 14 to maintain ‘premium’ status of Fastrack (vehicles may be suitable for cascade to other local services). Prior consideration will be needed whether to stay with conventional technology, or move to light rail / hybrid / trolleybus / articulated bus, as well as to funding source(s) – this will need to take into account lead time of construction / vehicle sourcing if light rail is adopted.
Fastrack buses introduced in 2011 will require refurbishment around 2014 / 15.
Experience with 2013 / 14 batch of buses will guide decision for 2018 batch of buses for route D, and to replace 2011 buses.
Buses on key service 480 / 490 will reach end of life – possible opportunity for cascade of current Fastrack A / B vehicles if new vehicles can not be justified.

D - Infrastructure
Identify potential bus depot sites and consider future depot ownership issues in the light of Northfleet Garage redevelopment (This may be required sooner, depending on developer interest in site.)
Form strategy for renewal of bus shelter contracts for 2014. May be economies of scale in the two Boroughs collaborating, may also bring benefits of network identity in wider Kent Thameside.

E – Safety and Security
Continue to roll out CCTV coverage of bus stops.
Expand schools education programme, and repeat for new pupils.

F - Information
Continue to expand RTPI / on bus information – may become routine expectation.
Some existing equipment may need renewal / replacement. New technology may develop that could render existing systems obsolete – need to monitor situation.

**G – Ticketing and Payment Methods**
Continue to roll out smart card ticketing, possible introduction of mobile phone ticketing.

Review suitability of existing electronic ticket machines.

**H – Highway Issues and Bus Priority**
Further bus priority to be investigated as and when future development considered, or when land becomes available. Identify and protect links prior to 2018 phase of Fastrack.

**I – Park and Ride**
Likely implementation of Tollgate if it is not practical to proceed with Bluewater and Ebbsfleet.

Review need for park and ride for Gravesend and Dartford town centres in the light of demand for long stay parking.

**J – Partnerships & Working Arrangements**
Develop business plan towards franchising arrangements.

**K – Taxis**
Continue to review ranks in the light of town centre developments, possible changes to vehicle design / accessibility requirements.

**LONG TERM – POST 2018**

**A – Marketing**
Fastrack franchise to be reviewed – may also see other local bus services brought into franchise / quality contract situation, which would give opportunity to renew and re-launch ‘Thameside Public Transport’ brand.

**B – Bus and Train Services**
Continue to bring key bus services’ hours of operation and frequency into line with Fastrack.

2018 final stage of Fastrack may be appropriate point to introduce ‘area franchise’ for local bus services.

Review future needs in the light of experience and proposed developments – further phases of Fastrack, either to new developments or upgrading existing local bus services, may be appropriate.

Crossrail comes in on or around this time leading to improved rail connections at nearby Abbey Wood.

**C – Buses**
Fastrack buses on route C will be due for renewal / cascade in 2018/19. Fastrack fleet will continue to require regular refurbishment and renewal to maintain premium / ‘state of the art’ status.
At each stage of vehicle renewal, consider upgrade to articulated bus / hybrid / trolley bus / light rail, bearing in mind lead times for procurement of vehicles and infrastructure.

**D - Infrastructure**
Continue programme of maintenance / renewal.

**E – Safety and Security**
Continue to roll out CCTV coverage of bus stops / renew existing equipment in the light of technology then available.

Review schools education programme.

**F - Information**
Continue to expand RTPI / on bus information – may become routine expectation.

Some existing equipment may need renewal / replacement. New technology may develop that could render existing systems obsolete – need to monitor situation.

**G – Ticketing and Payment Methods**
If area franchise introduced, offers opportunity for review of fares and ticketing policy.

Continued development of smartcards and mobile phone ticketing.

**H – Highway Issues and Bus Priority**
Review needs in light of experience, technology available and planned future developments – e.g. further phases of Fastrack.

**I – Park and Ride**
Review arrangements in the light of demand.

**J – Partnerships and Working Arrangements**
Possible introduction of area franchise to coincide with final phase of current Fastrack plans.

**K – Taxis**
Continue to review ranks in the light of developments.
Urban Traffic Management & Control (UTMC) Action Plans

The UTMC action plan can be summarised as follows:

2007 - 2011
• Dartford Town Centre car park guidance Variable Message Signs (VMS) to be installed. Gravesend VMS was introduced in 2007.
• Construct bus pre signal junctions. Make sure appropriate equipment is installed in traffic signal controllers to allow priority to Fastrack C services starting 2011.
• Identify and prioritise key junctions for traffic signal control to be installed.
• Install RTPI on 50% of bus stops. Key routes and stops to be identified and installed first. Note this is an indicative target that came out from the UTMC study and a detailed study is now being conducted on this issue and the target may change following completion of the studies.
• Identify key routes to install ANPR cameras for journey time information and traffic monitoring.
• Install CCTV networks on Fastrack A and B routes to allow monitoring of traffic and bus stop activity.
• Expand Kent Traffic and Travel website to provide more data to users.
• Assess and take measures to ensure that the HA and Kent UTMC systems can fully exchange data.

2011 - 2018
• Install VMS network to provide travel information.
• Complete ANPR network. Identify any additional sites required.
• Install CCTV cameras at key junctions.
• Complete RTPI network.
• Check infrastructure for Fastrack D services.
• Installation of SCOOT networks upon completion of junction upgrades.
• Traffic Management Centre (TMC) site to be identified and constructed. All appropriate communications links to be installed including link up with Kent TMC and the Highway Agency’s Godstone Regional Traffic Control Centre.

2018 – 2025
• Extend UTMC systems to include new developments upon completion.

A number of actions are considered on going and will recur throughout the life of the UTMC action plan.

• SCOOT network validation.
• Diversion routes and congestion reducing strategies to be checked for effectiveness and revised if required.
• Traffic signals health checks.
• Update communications infrastructure and UTMC equipment to be in line with technological advancements.
Walking and Cycling Action Plans

The recommended goals for the period up to 2011 and post 2011 is as follows:

2011
By 2011 the following should have been achieved:
- Implement the quick wins identified in the Kent Thameside Cycle Strategy.
- Achieve Local Transport Plan (LTP) targets in relation to cycle trips in Kent Thameside and sustainable access to schools.
- Stabilise share of walking and cycle journeys to work compared to the 2001 census, given the national trends in declining walking and cycling observed subsequently.
- Improve access and security to increase walking and cycle modal share for journeys to railway stations.
- Improve pedestrian access between Northfleet and Ebbsfleet International stations.
- Carry out a comprehensive programme to resurface/improve the maintenance of town centre footways.
- Increase the size of the Public Rights of Way (PROW) network and increase the proportion which is bridleway status to foster increases in cycling and horse-riding.
- Provide the basis of a high quality riverside walk/cycle route between the River Darent and Gravesend.
- Provide a re-launched and enhanced Darent Valley path with cycle facilities between the River Thames and Hawley.
- Re-launch the Wealdway and produce a Northwest Kent walks pack.
- Improved walking and cycling along the old A2 Trunk Road alignment which is due around 2009

2011 +
Post 2011, the objective should be to:
- Reverse the long-term decline in walking and cycling journeys to work.
- Implement low car developments in town centres.
- Introduce an improved way marking scheme within Dartford and Gravesend using local vernacular themes while being easy to use and reducing the amount of street clutter.
- Carry out a comprehensive resurfacing programme for footways in existing residential areas.
- Ensure that pedestrian and cyclist needs are taken into account for the planning of key highway schemes such as the Denton Relief Road and Peninsula Way.
- Install dropped kerbs on all key radial routes and priorities identified by Access Groups.
- Secure “Access for All” funding and implementation for measures to improve accessibility at all the North Kent line stations between Dartford and Gravesend.
- Improve access between southern Gravesend, Ebbsfleet, Eastern Quarry and the North Downs PROW network to the south of the A2 Trunk Road. Provide a complete Thames path with the final links through a redeveloped Northfleet Embankment site and links through to existing settlements to the south.
- Use future Rights of Way Improvement Plans to increase the size of the network and amount available to cyclists and equestrians.
- Carry out feasibility studies into the converting of one of the tunnels between Bluewater and Eastern Quarry 2 for use by cycles and pedestrians only.
Increase the proportion of Kent Thameside residents who use the PROW network at least every six months to 50%. Implement the comprehensive cycle network identified for 2025 through the completion of further cycle links, such as routes between Slade Green and The Bridge, and Stone Gate and Stone Village. Meet targets identified by future LTPs, such as further increases in cycling and sustainable travel to school.

Parking Action Plans

Parking provision is recognised as an area where the demands of the overall vision of a sustainable Kent Thameside may conflict with local objectives and preferences. The proposed accessibility assessment will provide a useful reality check on this aspect and feed usefully into a debate with key stakeholders as to the next stage of developing the Parking Strategy.

Parking action plans can be summarised as follows:

2007-2011

1 Car Parks:
- Improve security, lighting and pedestrian facilities within all town centre Multi-storey car parks (MSCPs).
- Increase CCTV and patrols at peripheral long stay car parks.
- All car parks to meet Park Mark for Safety standard.
- Suitable parking amenities for pedal and motorised cycles to be introduced at all suitable car parking sites.
- Ensure all town centre car parks are DDA compliant and offer spaces reserved for Blue badge holders.
- Improve pedestrian links and disabled access at Milton Place Car Parks.
- Expand existing Shopmobility schemes to all town centre and retail/leisure developments.
- Seek additional weekday Gravesend rail user spaces in Thamesgate or Parrock Street short stay car parks.
- Introduce Dartford town centre Controlled Parking Zone (CPZ) scheme and acquire new 120 space long stay car park at Victoria Road to accommodate displaced existing commuter parking.
- Annual review of town centre demand and supply.
- Heritage Quarter, Gravesend and Lowfield/Market Street, Dartford developments assumed complete.
- Bluewater to improve real time parking and driver information.

2 Signing and Information:
- Install real time parking information in Dartford town centre.
- Distribute publicity materials regarding car park destinations and recent improvements.
- Improve town centre signage to car parks.

3 Enforcement:
- Improve and introduce signage, markings and Traffic Regulation Orders (TROs) where necessary.
- Increase patrols in line with the introduction of new schemes to facilitate effective enforcement.
‘Use surplus ring fenced monies generated by the issue of on street Penalty Charge Notices (PCNs) (as detailed in the licence agreements with the district councils) to fund improvements to parking facilities or sustainable transport schemes.

Further parking controls to be introduced on streets surrounding all KTS stations.

Area wide resident permit schemes near to public transport interchanges and employment centres.

4 Pricing:

- Increase parking charges for Gravesend rail users to reflect Ebbsfleet prices.
- Increase Dartford rail user parking charges as a means of containing the existing amount of rail heading.
- Introduce parking charge at Greenhithe station.
- Stepped increase in town centre long stay parking charges to £5.00 per day by 2011 in line with regeneration and increased kerb space management.
- Introduce pricing mechanism to encourage peak spreading.
- Increase price of short stay parking in line with rate of inflation plus an x% as regeneration and services within the urban centres come on line and the kerb space is managed. The tariff will have to consider its’ pricing relative to other areas and private parking along with accessibility issues and cost of travel by other modes.
- Integrate long stay parking charges into the localised price increase x% beyond the targeted £5.00 after 2011.
- Introduce Workplace Parking Levies (WPLs) at employment developments particularly adjacent to public transport interchanges.

5 Policy:

- Discourage any net increase in town centre long stay parking except maybe for station traffic where rail heading may benefit the wider network.
- Encourage the use of space efficient forms of transportation e.g. cycling and motorcycling by means of pricing incentives and parking facility improvements.
- Employment, Retail and Leisure parking standards to be considered at a 25% reduction of current SPG 4 levels.
- Residential parking standards in urban villages where good public transport links exist to be considered at 1.5 spaces per dwelling with additional provision available through shared/leased off peak parking at nearby private Non Residential land uses.
- Residential parking standards in town centres to be considered at 1 space per dwelling – visitor/casual off peak parking available in public off street car parks.
- Parking strategy to be submitted with all major development applications to ensure that it conforms to surrounding area objectives.
- High quality travel plans and travel demand toolkits to be submitted with all new development applications.

6 Travel Demand Management:

- Set up KTS Travel Plan Partnership – KCC, DBC, GBC and key stakeholders.
- Promote work place travel plans.
- Promote residential travel plans.
- Promote travel plans at existing developments.
7 Further Work

- Conduct area wide surveys into public perceptions of parking quality, prices and requirements.
- Build partnership with third party car park providers and involve in parking strategy.
- Conduct Park and Ride feasibility study.
- Review Parking Strategy 2011 in line with LTP3 and incorporate in completed GBC and DBC LDFs.
- Conduct investigation work into improvements in bus/rail interchange at Dartford station.

A number of Actions are considered ongoing and will recur throughout the life time of the Parking Strategy.

2011+

- Reintegrate Westgate MSCP with Dartford town centre, introduce active frontage and improved security and pedestrian facilities.
- Expand real time parking information to outer cordon on town centre approaches.
- Introduce real time parking information to third party controlled parking destinations throughout KTS.
- Invest in parking enforcement technology i.e. number plate recognition and cameras, CCTV enforcement.
- Transport Quarter, Gravesend assumed complete.
- Permanent solution required for additional Gravesend rail user parking demand.
- Seek town centre weekday long stay spaces in under utilised short stay spaces (in the event of no park and ride).
- Consider widespread introduction of WPLs.
- 2011-2018 – Residential Parking Standards in urban villages 1.3 spaces per dwelling (with additional provision available through shared/leased off peak parking at nearby Private Non Residential land uses) where supported by strong public transportation links.
- 2018-2025 – Residential Parking Standards in urban villages 1 space per dwelling (with additional provision available through shared/leased off peak parking at nearby Private Non Residential land uses) where supported by strong public transportation links.
- 2018+ Consider car free residential developments where supported in areas that have access to strong sustainable transport networks.
- Construct park and ride facility subject to outcome of Feasibility Study.

The Parking Strategy and action plans should remain flexible and be reviewed every 5 years to remain consistent with reviews of Local Transport Plans and Local Development Frameworks.
Junctions that exceed the 85% volume-capacity ratios overall are very likely to be overloaded at some time during the peak period and would need detailed investigation with junction models to confirm whether there is a problem. Therefore one should treat the KTS Model results on which this list is supplied as indicative only that there maybe a junction problem that needs addressing with more detailed studies. These junctions should be monitored as the development progresses and traffic levels increase. The junction locations for 2005 and 2025 are shown below.

<table>
<thead>
<tr>
<th>2005 PM Base</th>
<th>2025 PM Without STIPS Schemes</th>
<th>2025 PM With STIPS Schemes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 A2 eb merge area at A282 J2</td>
<td>A2 eb merge area at A282 J2</td>
<td>A2 eb merge area at A282 J2</td>
</tr>
<tr>
<td>2 A2 eb diverge area at Bean</td>
<td>A2 eb diverge area at Bean</td>
<td>A2 eb diverge area at Bean</td>
</tr>
<tr>
<td>3 A2 eb merge area at Tollgate</td>
<td>A2 eb merge area at Tollgate</td>
<td>A2 eb merge area at Tollgate</td>
</tr>
<tr>
<td>4 A2 eb diverge area at Tollgate 1</td>
<td>A2 eb diverge area at Tollgate 1</td>
<td>A2 eb diverge area at Tollgate 1</td>
</tr>
<tr>
<td>5 A2 eb diverge area at Tollgate 2</td>
<td>A2 eb diverge area at Tollgate 2</td>
<td>A2 eb diverge area at Tollgate 2</td>
</tr>
<tr>
<td>6 A2 eb diverge area at Marlings Cross 1</td>
<td>A2 eb diverge area at Marlings Cross 1</td>
<td>A2 eb diverge area at Marlings Cross 1</td>
</tr>
<tr>
<td>7 A2 eb diverge area at Marlings Cross 2</td>
<td>Crossing Facility on Parrock St Gravesend TC</td>
<td>A2 eb diverge area at Marlings Cross 2</td>
</tr>
<tr>
<td>8 Crossing Facility on Parrock St Gravesend TC</td>
<td>Crossing Facility on Parrock St Gravesend TC</td>
<td>Crossing Facility on Parrock St Gravesend TC</td>
</tr>
<tr>
<td>9 A226 Rochester Rd and B261 (Lion Rbt)</td>
<td>A226 Rochester Rd and B261 (Lion Rbt)</td>
<td>A227 Tollgate and Coldharbour Rd</td>
</tr>
<tr>
<td>10 A227 Tollgate and Coldharbour Rd</td>
<td>A227 Tollgate and Coldharbour Rd</td>
<td>A226 West St and access to St George’s Centre</td>
</tr>
<tr>
<td>11 A226 West St and access to St George’s Centre</td>
<td>A226 West St and access to St George’s Centre</td>
<td>A226 West St and access to St George’s Centre</td>
</tr>
<tr>
<td>12 B262 Springhead Rd and Hall Rd Rbt</td>
<td>A2 Ebbsfleet interchange Western rbt</td>
<td>A2 Ebbsfleet interchange Eastern rbt</td>
</tr>
<tr>
<td>13 A2 eb merge area at Pepperhill</td>
<td>A2 eb merge area at Pepperhill</td>
<td>A2 eb merge area at Pepperhill</td>
</tr>
<tr>
<td>14 A2 eb merge area at Southfleet</td>
<td>A2 eb merge area at Southfleet</td>
<td>A2 eb merge area at Southfleet</td>
</tr>
<tr>
<td>15 A2 eb diverge area at Southfleet</td>
<td>A2 eb diverge area at Southfleet</td>
<td>A2 eb diverge area at Southfleet</td>
</tr>
<tr>
<td>16 A2 Ebbsfleet interchange Western rbt</td>
<td>Eastern Quarry southern access to A296 Watling St</td>
<td>Eastern Quarry southern access to A296 Watling St</td>
</tr>
<tr>
<td>17 A2 Ebbsfleet interchange Eastern rbt</td>
<td>Eastern Quarry northern access to Mounts Rd / Alkerden Lane</td>
<td>Eastern Quarry northern access to Mounts Rd / Alkerden Lane</td>
</tr>
<tr>
<td>18 A2 eb merge area at Bean 1</td>
<td>A2 eb merge area at Bean 1</td>
<td>A2 eb merge area at Bean 1</td>
</tr>
<tr>
<td>19 A2 eb merge area at Bean 2</td>
<td>A2 eb merge area at Bean 2</td>
<td>A2 eb merge area at Bean 2</td>
</tr>
<tr>
<td>20 Eastern Quarry southern access to A296 Watling St</td>
<td>Eastern Quarry northern access to Mounts Rd / Alkerden Lane</td>
<td>Eastern Quarry northern access to Mounts Rd / Alkerden Lane</td>
</tr>
<tr>
<td>21 A226 London Rd / B255 St</td>
<td>A226 London Rd / B255 St</td>
<td>A226 London Rd / B255 St</td>
</tr>
<tr>
<td>23</td>
<td>Crossing facility east of A226 London Rd / B225</td>
<td>Crossing facility east of A226 London Rd / B225</td>
</tr>
<tr>
<td>24</td>
<td>A226 London Rd / Mounts Rd Greenhithe</td>
<td>A226 London Rd / Mounts Rd Greenhithe</td>
</tr>
<tr>
<td>25</td>
<td>A226 London Rd / B255 The Avenue</td>
<td>A226 London Rd / B255 The Avenue</td>
</tr>
<tr>
<td>26</td>
<td>A226 London Rd / Knockhall Chase</td>
<td>A226 London Rd / Knockhall Chase</td>
</tr>
<tr>
<td>27</td>
<td>A282 J1a nb merge area</td>
<td>A282 J1a nb merge area</td>
</tr>
<tr>
<td>28</td>
<td>A282 J1a sb merge area</td>
<td>A282 J1a sb merge area</td>
</tr>
<tr>
<td>29</td>
<td>A206 Crossways Boulevard approach to A282 J1a eastern rbt</td>
<td>A206 Crossways Boulevard approach to A282 J1a eastern rbt</td>
</tr>
<tr>
<td>30</td>
<td>A206 Bob Dunn Way and Marsh St</td>
<td>A206 Bob Dunn Way and Marsh St</td>
</tr>
<tr>
<td>31</td>
<td>A206 Bob Dunn Way and Joyce Green Lane</td>
<td>A206 Bob Dunn Way and Joyce Green Lane</td>
</tr>
<tr>
<td>32</td>
<td>A206 Bob Dunn Way and A2026 Burnham Rd</td>
<td>A206 Bob Dunn Way and A2026 Burnham Rd</td>
</tr>
<tr>
<td>33</td>
<td>A206 Thames Rd and B2186 Crayford Way</td>
<td>A206 Thames Rd and B2186 Crayford Way</td>
</tr>
<tr>
<td>34</td>
<td>A225 Princes Rd / A296 Park Rd / B260 Green St Green Rd rbt, Dartford</td>
<td>A225 Princes Rd / A296 Park Rd / B260 Green St Green Rd rbt, Dartford</td>
</tr>
<tr>
<td>35</td>
<td>A226 East Hill / A296 Park Rd, Dartford</td>
<td>A226 East Hill / A296 Park Rd, Dartford</td>
</tr>
<tr>
<td>36</td>
<td>Crossing facility at A226 East Hill, Dartford</td>
<td>Crossing facility at A226 East Hill, Dartford</td>
</tr>
<tr>
<td>37</td>
<td>A226 East Hill and Home Gardens, Dartford</td>
<td>A226 East Hill and Home Gardens, Dartford</td>
</tr>
<tr>
<td>38</td>
<td>Hythe St south of Westgate Rd, Dartford town centre</td>
<td>Hythe St south of Westgate Rd, Dartford town centre</td>
</tr>
<tr>
<td>39</td>
<td></td>
<td>B261 Old Road West and Pelham Rd</td>
</tr>
<tr>
<td>40</td>
<td></td>
<td>B262 Springhead Rd and Waterdales</td>
</tr>
<tr>
<td>41</td>
<td></td>
<td>Bluewater Access rbt</td>
</tr>
<tr>
<td>42</td>
<td></td>
<td>Eastern Quarry western access south of Alkerden Lane</td>
</tr>
</tbody>
</table>
Appendix E - References

(i) Reference Sources

Fastrack: The first six months, A report by the Fastrack Delivery Executive

(ii) Technical Notes Underpinning the KTS Strategy

## Appendix F - Glossary of Commonly Used Terms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANPR</td>
<td>Automatic Number Plate Recognition</td>
</tr>
<tr>
<td>AQMA</td>
<td>Air Quality Management Area</td>
</tr>
<tr>
<td>ASK</td>
<td>Accessibility Strategy for Kent</td>
</tr>
<tr>
<td>CCTV</td>
<td>Closed Circuit Television</td>
</tr>
<tr>
<td>CPZ</td>
<td>Controlled Parking Zone</td>
</tr>
<tr>
<td>DBC</td>
<td>Dartford Borough Council</td>
</tr>
<tr>
<td>DCLG</td>
<td>Department for Communities and Local Government</td>
</tr>
<tr>
<td>DDA</td>
<td>Disability Discrimination Act</td>
</tr>
<tr>
<td>DfT</td>
<td>Department for Transport</td>
</tr>
<tr>
<td>EMS</td>
<td>Enhanced Message Signs</td>
</tr>
<tr>
<td>GBC</td>
<td>Gravesend Borough Council</td>
</tr>
<tr>
<td>HA</td>
<td>Highways Agency</td>
</tr>
<tr>
<td>HS 1</td>
<td>High Speed 1 – formerly known as Channel Tunnel Rail Link</td>
</tr>
<tr>
<td>ITS</td>
<td>Intelligent Transport Systems</td>
</tr>
<tr>
<td>KCC</td>
<td>Kent County Council</td>
</tr>
<tr>
<td>KTS</td>
<td>Kent Thameside</td>
</tr>
<tr>
<td>KTSDB</td>
<td>Kent Thameside Delivery Board</td>
</tr>
<tr>
<td>LDF</td>
<td>Local Development Framework</td>
</tr>
<tr>
<td>LTP</td>
<td>Local Transport Plan</td>
</tr>
<tr>
<td>MSCP</td>
<td>Multi-storey Car Park</td>
</tr>
<tr>
<td>PCN</td>
<td>Penalty Charge Notice</td>
</tr>
<tr>
<td>PIPKIN</td>
<td>Prioritising Investments Programmes for Kent's Integrated Network</td>
</tr>
<tr>
<td>PROW</td>
<td>Public Rights of Way</td>
</tr>
<tr>
<td>PT</td>
<td>Public Transport</td>
</tr>
<tr>
<td>RCC</td>
<td>Route Control Coordinator</td>
</tr>
<tr>
<td>RPG 9a</td>
<td>Regional Planning Guidance 9a - Thames Gateway Planning Framework</td>
</tr>
<tr>
<td>RTI</td>
<td>Real Time Information</td>
</tr>
<tr>
<td>RTPI</td>
<td>Real Time Passenger Information</td>
</tr>
<tr>
<td>RUS</td>
<td>Route Utilisation Study</td>
</tr>
<tr>
<td>SCOOT</td>
<td>Split Cycle Offset Optimisation Technique – (Traffic Signals)</td>
</tr>
<tr>
<td>SEERA</td>
<td>South East England Regional Assembly</td>
</tr>
<tr>
<td>SPG 4</td>
<td>Supplementary Planning Guidance 4 – Kent Vehicle Parking Standards</td>
</tr>
<tr>
<td>STDRI</td>
<td>South Thameside Development Route 1 – A206 Crossways Boulevard</td>
</tr>
<tr>
<td>STDRA</td>
<td>South Thameside Development Route 4 – A226 Thames Way</td>
</tr>
<tr>
<td>STIPS</td>
<td>Strategic Transport Investment Package Schemes</td>
</tr>
<tr>
<td>Tfl</td>
<td>Transport for London</td>
</tr>
<tr>
<td>TMC</td>
<td>Traffic Management Centre</td>
</tr>
<tr>
<td>TRO</td>
<td>Traffic Regulation Order</td>
</tr>
<tr>
<td>UTC</td>
<td>Urban Traffic Control</td>
</tr>
<tr>
<td>UTMC</td>
<td>Urban Traffic Management &amp; Control</td>
</tr>
<tr>
<td>VMS</td>
<td>Variable Messaging Signs</td>
</tr>
<tr>
<td>WPL</td>
<td>Workplace Parking levy</td>
</tr>
</tbody>
</table>