SURREY
COUNTY COUNCIL

SURREY COUNTY COUNCIL'S LOCAL COMMITTEE IN EPSOM AND EWELL

EPSOM TOWN CENTRE - TRAFFIC MODELLING 4 JUNE 2007

KEY ISSUE:

To inform Members of progress made in developing the traffic model for Epsom Town Centre and on testing options for transportation-related improvements.

SUMMARY:

At a meeting with Members on 1 June 2006, three junctions were prioritised for testing in the traffic model. To date, two options have been tested as part of the overall strategy to assess the impacts of the conflicting demands between pedestrian accessibility and reducing congestion in the town centre.

The first option proposes the introduction of an 'Early Cut-Off' on the High Street (east) approach to the Spread Eagle junction. The model predicts significant benefits in reducing congestion in the High Street, to the west of the junction.

The second option proposes the introduction of full signalisation at the junction of B280 West Street with Station Approach, including pedestrian facilities, and the linking of the signals to the current Urban Traffic Control (UTC) system. The model also predicts significant benefits in reducing congestion.

A forward programme of work is included for information, which includes the above improvements and further proposals for testing and monitoring.

OFFICER RECOMMENDATIONS:

The Committee is asked to:

(i) Note the progress made to date on the testing of options using the traffic model.

1. INTRODUCTION

1.1 This report summarises the work undertaken to develop the traffic model for Epsom town centre and describes the strategy for implementing a package of accessibility improvements and congestion reducing measures.

1.2 The report summarises the results of the option testing carried out to date and a forward programme of work is provided for information. Details of the proposals developed will be brought back to the Local Committee as appropriate.

2. BACKGROUND

2.1 A town centre accessibility study has previously been undertaken to identify issues relating to pedestrian accessibility and congestion. In order to address some of these issues, it was proposed that a detailed traffic model be developed to assess the likely impact of any possible improvements schemes.

2.2 During the development of the traffic model, two workshops were held with Members to explain the processes involved in developing the Paramics traffic model and to demonstrate the technology involved. These workshops were held on 3 April 2006 and 18 July 2006 at the Network Management Information Management Centre (NMIC).

2.3 A Members meeting was also held on 1 June 2006 to discuss the priority of options to be tested in the traffic model. It was agreed that initially three sites would be tested as follows:

i) Spread Eagle junction, including consideration of:
a) the provision of an early cut off on High Street (east), and
b) improving existing pedestrian crossing facilities.

ii) West Street junction with Station Approach for the provision of traffic signals and pedestrian crossing facilities on Station Approach. The impact on the South Street junction with West Street will be included.

iii) South Street junction with Ashley Avenue for the provision of traffic signals and pedestrian crossing facilities.

2.4 A possible fourth priority for testing was identified at the junction of High Street with East Street, Upper High Street and Church Street.

3. STRATEGY

3.1 The principal aim of the study was to build a detailed traffic model for the town centre capable of testing possible options to improve pedestrian accessibility and reduce congestion.

3.2 Figure 1 illustrates the complex issues that congested urban town centres like Epsom face on a daily basis. Therefore careful consideration is needed to ensure that the impact of any significant changes to the highway network is fully understood before implementation.

3.3 The existing UTC system adapts the traffic signal timings by detecting and responding to changes in traffic patterns to minimise congestion. However, the interaction with the needs of the pedestrian to access the town, and incidents such as on-street parking and front access deliveries, significantly reduces the overall operational efficiency of the UTC system.

3.4 In the event of the introduction of further pedestrian accessibility improvements, it is likely that the operational performance of the UTC system would deteriorate even more, unless action was taken to redress the balance. The recent introduction of Decriminalised Parking Enforcement (DPE) within the town centre, with its subsequent benefit in reducing congestion, has enhanced the potential to introduce further pedestrian accessibility improvements.

3.5 The strategy for introducing improvements in the town centre is therefore to:

i) maximise the opportunity to make improvements by addressing issues which result in the existing UTC system not being utilised to its full potential.

ii) identify options for reducing congestion and/or improving pedestrian accessibility.

iii) test options to assess the impact of the conflicting demands between reducing congestion and improving pedestrian accessibility on the operational efficiency of the town centre.

iv) develop a programme of improvements, with phased implementation and monitoring.

4. METHODOLOGY

4.1 Previous traffic modelling techniques have lacked the necessary refinement to accurately evaluate complex urban town centres like Epsom, until now. The SCOOT Link interface is an innovative modelling tool, developed by the County Council's Transport Studies Team, to allow

detailed traffic models to actively communicate with Urban Traffic Control (UTC) systems.

4.2 The UTC system uses on-street vehicle detectors to allow information on traffic volumes and queues to be collected from inductive detector loops located on all the approaches to signalised junctions within the town centre. The locations of these detector loops are replicated within the detailed traffic model. The UTC system adjusts traffic signals timings in frequent, small increments to address the changes in traffic demands to minimise congestion and delays. The detailed traffic model therefore reflects the actual changes in traffic conditions throughout the day.

4.3 Using this methodology, an AM peak period model was developed. Extensive checks were carried out to ensure that the traffic model accurately represented observed traffic conditions throughout the peak period. These checks also ensured that the model achieved the required levels of validation to be deemed appropriate as a tool to:

i) test options to assess the impact of the conflicting demands between reducing congestion and improving pedestrian accessibility on the operational efficiency of the town centre.

ii) develop a programme of improvements for implementation and monitoring.

5. PROGRESS TO DATE

5.1 Since the last meeting with members, work has been undertaken to complete the validation of the detailed traffic model and test the first two priority options, for which the results are described below. The third priority option for the junction of South Street with Ashley Avenue will be tested, subject to funding and the availability of resources.

6. OPTION TESTING

Option 1 - The Spread Eagle Junction

6.1 At present the right turn from High Street (west) into Ashley Road is uncontrolled and does not receive a regular amount of green time. Queues regularly build up and block back to other junctions in High St (west), resulting in delays and congestion to other junctions to the west of the town centre. This causes further congestion and inefficiency in the performance of the road network.

6.2 In order to reduce congestion and queuing caused by traffic turning right into Ashley Road, an ‘Early Cut-Off’ was tested in the model by stopping traffic from High Street (east) a few seconds earlier to allow the

uncontrolled right-turning traffic to proceed without having to wait for a gap in the traffic. The results are described below.

Option 2 – B280 West Street junction with Station Approach

6.3 At present, the junction of B280 West Street with Station Approach and Rosebank operates as a priority give-way junction. The junction has a high degree of pedestrian and vehicle conflict, as it is used by pedestrians to access the station and town centre, and for pupils to access Roseberry School. Recent improvements have included a Puffin Crossing to the east of the existing junction to help pupils cross West Street. The entry width to Station Approach has been reduced and a junction table introduced to reduce vehicle speeds and promote pedestrian priority.

6.4 The concept of a four-stage traffic signal junction added to the UTC system has been tested in the traffic model, incorporating pedestrian facilities. The signal staging tested was as follows:

i) Stage 1 allows for all movements from West Hill with traffic turning right into Rosebank gap-seeking.
ii) Stage 2 allows all movements from South Street.
iii) Stage 3 is demand actuated and is only called when vehicles trigger a detector loop in Rosebank.
iv) Stage 4 is an 'all red' pedestrian stage.

6.5 It should be noted that Option 2 assumes that Option 1 is already implemented. The results are described below.

7. TRAFFIC MODEL RESULTS

7.1 A full detailed technical analysis of the options is summarised in the County Council's *report "Epsom Town Centre Study – Preliminary Option Testing Report, Version1, Nov. 2006".* The report includes a full description of the modelling methodology and summarises the key results of the options tested to date.

7.2 The traffic model has been run at least 10 times for each option to allow for daily variation in traffic patterns and to achieve statistically robust results. Output from the traffic model has been analysed including average journey times, speeds and vehicle delays.

Journey Times

7.3 Table 1 below shows a comparison between the average journey times for the base model and Options 1 and 2 for a selection of key routes through the town centre in the am peak hour.

7.4 The model predicts significant reduction in journey times on the majority of the routes tested. Option 1 shows a reduction in journey time of 3

minutes between West Street and Dorking Road. Option 2 reduces the journey time to all destinations for all routes coming from the Dorking Road area, with the largest journey time reduction being 4 minutes between West Street and Epsom Road.

Route	Base	Option 1	*Diff*	Option 2	*Diff*
Epsom Rd – Dorking Rd	546	488	**-58**	370	**-177**
Dorking Rd – Epsom Rd	454	374	**-80**	386	**-68**
Epsom Rd – West St	567	538	**-29**	422	**-144**
West St – Epsom Rd	768	782	**14**	516	**-251**
Dorking Rd – West St	211	148	**-64**	193	**-18**
West St – Dorking Rd	905	758	**-147**	824	**-81**
Dorking Rd – Upp High St	569	496	**-73**	390	**-179**

Table 1 - Comparison of Averaged Vehicle Journey Times

Vehicle Speeds

7.5 When comparing Option 1 to the base case, the average speed for most routes is predicted to increase from 10mph to 12 mph. When Option 2 is introduced the overall average speed is predicted to increase a further 1 mph to 13 mph.

Vehicle Flows and Delays

7.6 A comparison of peak hour traffic flows entering and leaving the town centre shows that Option 1 is predicted to increase the vehicle throughput by 100 vehicles compared to the base model. In addition the total network delay is predicted to reduce by approximately 10%.

7.7 For Option 2, peak hour traffic flows entering and leaving the town centre are predicted to increase by 350 vehicles compared to the base model. In addition the total network delay is predicted to reduce by approximately 15%.

8. FORWARD PROGRAMME AND FINANCIAL IMPLICATIONS

8.1 The proposed forward programme of work and financial implications for 2007/08 are shown in Table 2 below.

Location	Proposal	Work Type	Funding Source	Estimated Cost 07/08
Spread Eagle Junction	Modification to signal timings to reduce delay for right-turn from High Street into Ashley Road, and monitoring	Implementation	Developer	£2,000
Spread Eagle Junction	Consider improved pedestrian facilities	Feasibility & Design	Developer	£15,000
B280 West Street/Station Approach/A24 South Street	Traffic signals with controlled pedestrian crossings	Feasibility, design, construction	Developer (£100k) LTP (£200k)	£300,000
A24 South Street j/w Ashley Avenue	Traffic signals with controlled pedestrian crossings	Feasibility & Design	Developer	£15,000

Table 2: Forward Programme

9. SUSTAINABLE DEVELOPMENT IMPLICATIONS

9.1 This project seeks to identify and implement a package of highway and traffic management improvements in Epsom town centre to optimise the operation of the road network. The objective is to reduce congestion and improve accessibility for pedestrians.

10. CRIME & DISORDER IMPLICATIONS

10.1 Crime and disorder implications will be given careful consideration as schemes are developed, particularly with respect to alterations to street lighting, visibility and measures for vulnerable users.

11. EQUALITIES IMPLICATIONS

11.1 Equalities implications will be given careful consideration as schemes are developed, particularly with respect to providing for those with mobility and accessibility needs.

12. CONCLUSION AND REASONS FOR RECOMMENDATION

12.1 To date two options have been tested using the detailed traffic model as part of the overall strategy to assess the impact of the conflicting demands between pedestrian accessibility and reducing congestion in the town centre.

12.2 The first option seeks to introduce an 'Early Cut-Off' at the Spread Eagle junction, on the approach from High Street (East). The model predicts significant benefits in reducing congestion in the High Street to the west of the junction. As part of the overall strategy it is recommended that this be implemented as a short-term measure, including a period of monitoring. It is also recommended that further pedestrian accessibility improvements be considered at the Spread Eagle junction as part of the on-going forward programme.

12.3 The second option proposes an expansion of the current UTC system to introduce full signalisation at the junction of B280 West Street with Station Approach, including pedestrian facilities. The model also predicts significant benefits in reducing congestion in South Street with a slight increase in the volume of traffic passing through the town centre. It is recommended that this option be developed further to establish a suitable junction improvement scheme and that the scheme be programmed for implementation in 2007/08.

12.4 Further investigation of options, including the junction of South Street with Ashley Avenue, is included in the forward programme, shown in Table 2, for information. This further work will be progressed subject to the availability of resources.

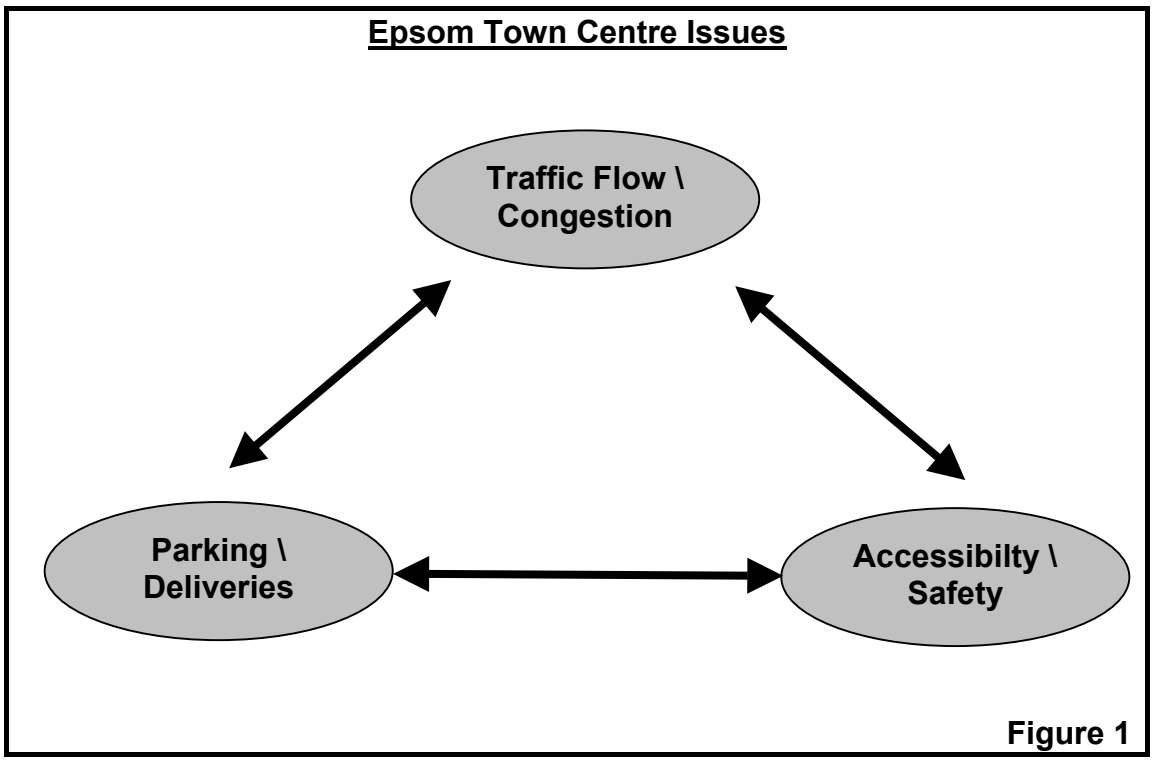

Figure 1

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