



## **SCC LOCAL COMMITTEE IN SPELTHORNE**

### **STAINES TOWN CENTRE TRAFFIC MODEL**

**11 DECEMBER 2006**

#### **KEY ISSUE:**

To report to the Committee on the progress of option testing using the traffic model of Staines Town Centre.

#### **SUMMARY:**

The Committee agreed on 25 April 2005 for a traffic model of Staines Town Centre to be developed. The report presented in June 2006 outlined the progress over the past year in the development of the traffic model. This report details the main findings of the option testing that has been undertaken using the model, as follows:

- The junction of A308 High Street with A308 South Street and Mustard Mill Road – the default signal timings have been checked and altered accordingly.
- Kingston Road Bus Lane – the shortening of the bus lane by 18m and 32m has been tested for the AM and PM peak hours. Results show benefits in the morning peak.
- The introduction of the right turn from Kingston Road to A308 London Road at the junction with A308 High Street – initial option testing has shown that a pedestrian

only stage will not work, and future option testing will incorporate parallel pedestrian stages. Option testing is not complete, but the findings will be presented to the Committee meeting.

### **OFFICER RECOMMENDATIONS:**

The Committee is asked to note the content of this report.

## **1 INTRODUCTION & BACKGROUND**

- 1.1 Due to concerns raised by the Chamber of Commerce about the efficiency and effectiveness of traffic signals within the town centre, the Committee agreed on 25<sup>th</sup> April 2005 to the development of an S-Paramics model of Staines Town Centre. The aim of the traffic model was to provide a tool with which future projects and schemes could be planned and tested, providing an ongoing traffic strategy for the town centre.
- 1.2 In October 2006 the Staines Town Centre Model was prepared for option testing. From the feedback provided at the Committee Meeting in June 2006, it was decided that the first stage of option testing would focus on the problems experienced on the east side of Staines Town Centre, namely the A308 between the Crooked Billet and the junction of High Street with A308 South Street and Mustard Mill Road.
- 1.3 This report summarises the main developments that have been made on the testing of options within the east side of Staines Town Centre. This work involves the following junctions and infrastructure which are reported below:
  - The junction of A308 High Street with A308 South Street and Mustard Mill Road;
  - Kingston Road Bus Lane; and
  - The junction of A308 London Road with Kingston Road and A308 High Street.

## **2 THE JUNCTION OF A308 HIGH STREET WITH A308 SOUTH STREET & MUSTARD MILL ROAD**

- 2.1 There has been public concern about the operation of the junction of A308 High Street with A308 South Street and Mustard Mill Road. At times, it has been witnessed that vehicles were queuing along A308 High Street on a red light when there were no vehicles along the South Street arm which had the green light. Once vehicles from A308 High Street turn left into A308 South Street or right into Mustard Mill Road there is a long stretch of carriageway before being delayed again, which further highlights this problem.
- 2.2 A308 South Street southbound and Mustard Mill Road northbound are often traffic free, particularly in comparison to A308 High Street westbound, from which vehicles would have travelled. This can be attributed to the following four

reasons: the railway bridge at the junction is a pinch point in the network; there is approximately a 60:40 split of traffic making the left and right turn manoeuvres, respectively; both the left and right turn manoeuvres have small turning radii making vehicles slow down through the junction, and; the number of lanes, and hence capacity, increases along A308 South Street.

- 2.3 Nevertheless, investigation into the SCOOT system, which coordinates and controls the traffic signals within the town centre, showed that the junction had not been operating properly due to a BT line failure. Consequently, SCOOT was unable to detect the amount of vehicle demand at the A308 High Street arm of the junction, and the traffic signals were operating under default values. The default values, however, were established at a time when traffic demand through the town centre was different. It was found that the default values did not attribute enough green time to A308 High Street arm of the junction, so Traffic Systems immediately rectified this problem.
- 2.4 The junction will be monitored over the forthcoming months to assess this change.

### **3 KINGSTON ROAD BUS LANE**

- 3.1 Kingston Road bus lane is approximately 130m in length and terminates at the bus stop within as little as 24m of the junction of A308 London Road with Kingston Road and A308 High Street. The termination of the bus lane within such close proximity to the junction means that there is only enough room for 4 cars to legally sit behind of the traffic signal stop line in the nearside lane.
- 3.2 It was considered that by shortening the bus lane, allowing more vehicles to queue in the nearside lane to await the green light at the junction, the efficiency of Kingston Road green time and thus the throughput for the left turn into A308 High Street would be improved. In turn this may reduce queue lengths along Kingston Road and journey times for vehicles travelling from Kingston Road to the rest of the model network.
- 3.3 Two versions of this option test were simulated using the Staines Traffic Model. The first moved the end of the bus lane by 18m, in line with the exit from George Street at its junction with Kingston Road, and the second version a distance of 32m from its original position, in line with the entrance to George Street. This would enable approximately 7 and 9 cars to legally sit behind of the traffic signal stop line in the nearside lane, for versions 1 and 2 respectively. A detailed map showing the extent of the bus lane terminus in both versions of the option test is shown in **Annexe A**.
- 3.4 In both versions of the option test, the bus stop remains in its current location. It is felt that nothing will be gained by moving it. The current siting of the bus stop provides the public with good access to amenities along A308 High Street and London Road and the northern end of Kingston Road. Furthermore, its current use is comparatively low and therefore has minimal impact on traffic flow.

- 3.5 The results from the option tests showed that in the AM peak hour these relatively minor changes to the end of the bus lane have the potential to reduce delay to the network, queue lengths along Kingston Road, and journey times for some of the routes travelling through the junction of A308 London Road with Kingston Road and A308 High Street. In the PM peak, however, the results are less clear on whether any additional benefit from the relocation of the end of the bus lane can be achieved. A break down of the AM and PM peak hour results is shown in **Annexe B**.
- 3.6 In the AM peak hour, for some statistics, such as queue lengths and some journey times, version 2 is worse than version 1. The total network delay, however, is lower for version 2 than version 1. This is likely to be a result of the adaptive nature of SCOOT. The extra capacity provided by the relocation of the bus lane terminus enables more vehicles to enter A308 High Street. In turn this results in fewer vehicles from A308 London Road being able to enter A308 High Street. SCOOT gives greater importance to vehicles on the A308 London Road arm of the junction than Kingston Road, because it is a principal road and queuing can effect the operation of the Crooked Billet. As a result, SCOOT shortens the green time for vehicles on Kingston Road, to reduce the delay for vehicles travelling westbound along A308 London Road. Nevertheless, overall network delay is reduced and the results show an overall improvement on the base situation, in the AM peak.
- 3.7 To minimise the delay to buses travelling northbound along Kingston Road, the relocation of the end of the bus lane should only be considered with the introduction of bus priority at its signalised junction of A308 London Road with A308 High Street. The controller equipment that controls the traffic signals on-street within Staines was modernised in 2005. Amongst other benefits, this has enabled bus priority to be incorporated in the control of the traffic signals.

#### **4 THE JUNCTION OF A308 LONDON ROAD WITH KINGSTON ROAD & A308 HIGH STREET**

- 4.1 At present, vehicles wanting to travel from Kingston Road to the Crooked Billet are unable to turn right at its junction with A308 London Road and High Street, and are diverted via Fairfield Avenue. This diversion takes vehicles away from their destination towards the town centre, before turning right at the signalised junction of A308 High Street with Fairfield Avenue west, which in turn brings vehicles to another signalised junction of A308 London Road with Fairfield Avenue east, before reaching the Crooked Billet. This diversion is thought to reduce capacity for A308 High Street westbound between Fairfield Avenue east and west, and reduce throughput for vehicles travelling east and westbound along A308 London Road, due to the signalling arrangements that are required for this movement.
- 4.2 Survey data collected on the 20<sup>th</sup> October 2005 has shown that demand for this right turn movement from Kingston Road to A308 London Road was very high during all peak periods. **Table 4.1** shows the number of vehicles that make this manoeuvre for each time period, and the proportion of these vehicles in relation

to the total number of vehicles that exit Kingston Road arm at its junction with A308 London Road and A308 High Street.

Time period	Number of Vehicles	Proportion of Total Number of Vehicles Exiting Kingston Road Arm of Junction
AM 07:45 – 08:45	350	52%
Inter Peak 11:45 – 12:45	220	43%
PM 17:15 – 18:15	401	48%
12-hour 07:00 – 19:00	3056	46%

**Table 4.1: Demand for the right turn manoeuvre from Kingston Road to A308 London Road at its junction with A308 High Street**

- 4.3 Several versions of this option test have been designed and modelled. The latest versions of this option test consider parallel pedestrian stages where people are able to cross at the same time as some traffic movements. An example of this is the pedestrian crossings at the junction of A308 High Street with A308 South Street and Mustard Mill Road. Initial testing has been positive showing that a parallel pedestrian crossing arrangement reduces vehicle delay whilst maintaining all of the current pedestrian crossings.
- 4.4 Preliminary testing also showed that the relocation of the end of the bus lane is more critical with this option. This is because the large demand for the right turn from Kingston Road to A308 London Road can prevent vehicles being able to turn left into A308 High Street, and therefore is more likely to cause vehicles wanting to make the manoeuvre to illegally enter the bus lane.
- 4.5 Full analysis of this option testing has not been completed. A safety audit has to be carried out to ensure that it is viable before more detailed modelling will be undertaken. The results from this option test will be presented to the Committee meeting.

## 5 FINANCIAL IMPLICATIONS

- 5.1 Funding for the option testing of the east side of Staines Town Centre has been estimated at £6,000. To date, approximately £2,000 has been spent on officer time.
- 5.2 Funding for further option testing will need to be addressed once the exact nature of the schemes is known.

## 6 PROGRAMME

- 6.1 The provisional programme is as follows:

January:	Finalise the option testing of the right turn from Kingston Road to A308 London Road at its junction with A308 High Street.
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February: Assess which schemes can be tested to the west side of Staines Town Centre.

March: Report back to the Committee on the findings.

## **7 SUSTAINABLE DEVELOPMENT IMPLICATIONS**

7.1 Implications will depend on the option testing scheme.

## **8 CRIME & DISORDER IMPLICATIONS**

8.1 There are no implications.

## **9 EQUALITIES IMPLICATIONS**

9.1 There are no implications.

## **10 MONITORING**

10.1 Officers have carried out informal monitoring of the operation of the traffic signals at the junction of A308 High Street with A308 South Street and Mustard Mill Road.

## **11 CONCLUSION**

11.1 Option testing of the east side of Staines Town Centre is well underway. This report documents progress to date and outlines the programme for the next three months.

**Reported by: Annette Williamson, Local Transportation Manager**

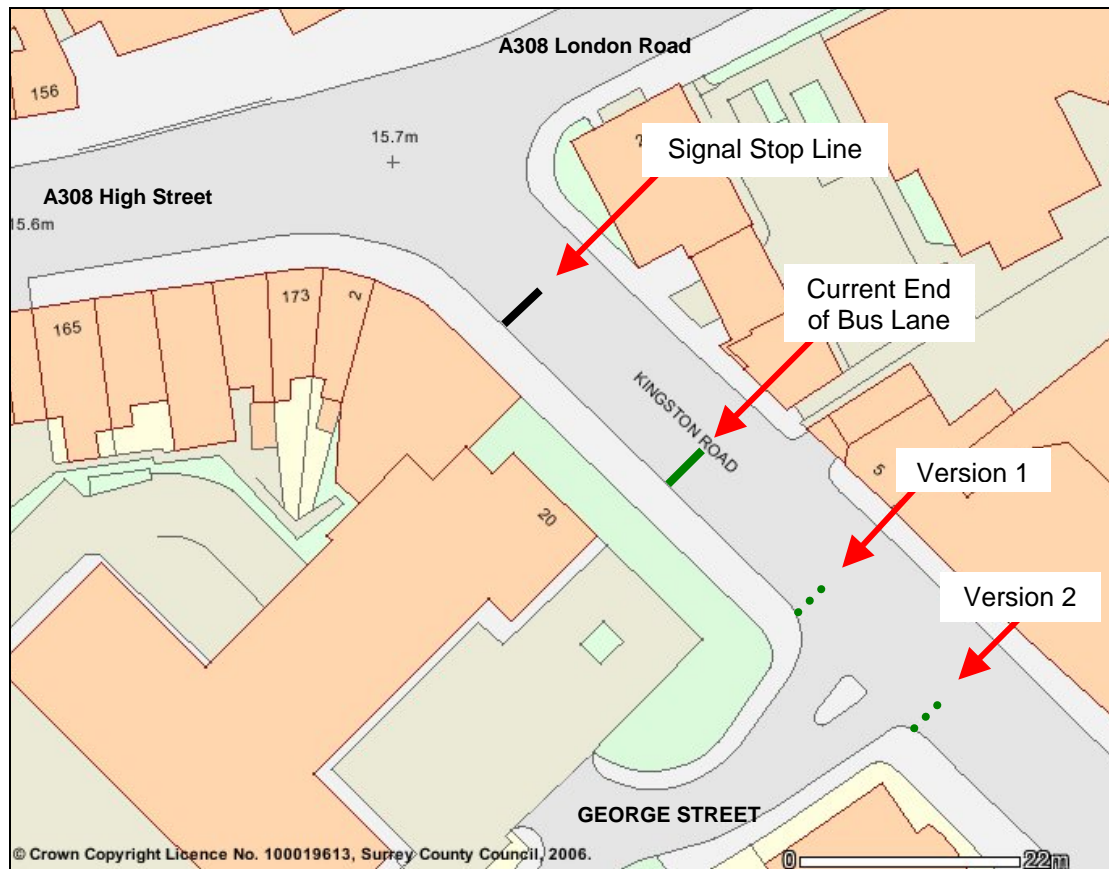
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**LEAD/CONTACT OFFICER: Gemma Thomas, Transport Studies & Data Officer**

**TELEPHONE NUMBER: 08456 009 009**

**BACKGROUND PAPERS: Validation of Traffic Signals and Modelling of Traffic Flows, Committee report item 13 dated 25 April 2005, Committee report item 12 dated 21 March 2005 and Committee Report item 17 dated 19 June 2006.**

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**Annexe A: Current position of the end of Kingston Road Bus Lane and the locations of its terminus tested in versions 1 and 2**



All presented results are taken from an average of 10 runs to account for daily variation.

### **Total Network Delay (seconds)**

The Total Network Delay (TND) is the aggregate time spent by all vehicles traversing the network in a set time period.

<b>Model</b>	<b>AM Peak Hour (07:45 – 08:45)</b>	<b>PM Peak Hour (17:15 – 18:15)</b>
Base	986459	1002035
Version 1	958220	1005490
Version 2	946606	963080

### **Journey Times (seconds)**

#### **AM Peak Hour (07:45 – 08:45)**

<b>Route</b>	<b>Base</b>	<b>Version 1</b>	<b>Version 2</b>
Kingston Road to Crooked Billet	312	257	272
Kingston Road to South Street	266	202	233
South Street to Kingston Road	100	116	109
South Street to Crooked Billet	111	132	123
Crooked Billet to Kingston Road	131	134	118
Crooked Billet to South Street	218	227	189

#### **PM Peak Hour (17:15 – 18:15)**

<b>Route</b>	<b>Base</b>	<b>Version 1</b>	<b>Version 2</b>
Kingston Road to Crooked Billet	309	288	247
Kingston Road to South Street	218	203	167
South Street to Kingston Road	104	107	107
South Street to Crooked Billet	144	146	146
Crooked Billet to Kingston Road	151	159	150
Crooked Billet to South Street	193	200	182

### **Kingston Road Northbound Queue Lengths (metres)**

#### **AM Peak Hour (07:45 – 08:45)**

<b>Measurement</b>	<b>Base</b>	<b>Version 1</b>	<b>Version 2</b>
Maximum	159	106	123
Average	83	59	67

#### **PM Peak Hour (17:15 – 18:15)**

<b>Measurement</b>	<b>Base</b>	<b>Version 1</b>	<b>Version 2</b>
Maximum	149	143	117
Average	79	73	61