



**SCC LOCAL COMMITTEE IN  
SPELTHORNE**

**STAINES TOWN CENTRE  
TRAFFIC MODEL**

**19 JUNE 2006**

**KEY ISSUE:**

To report to the Committee on the progress of the development of a 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. This report outlines the progress over the past year and work to be undertaken in the forthcoming months.

**OFFICER RECOMMENDATIONS:**

The Committee is asked to note the content of this report. A full report will be submitted to the September meeting.

## 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 for a S-Paramics model of Staines Town Centre to be developed. The traffic model will also be used to test and plan future projects and schemes, providing an ongoing traffic strategy for the town centre.
- 1.2 The development of a good traffic model is the most time consuming element of the project. A series of measures need to be followed to ensure that the traffic model is robust and producing results that are sensible and reflective of traffic patterns and conditions within Staines Town Centre.
- 1.3 Prior to the agreement of the build of a traffic model of Staines Town Centre, the traffic signals in the town centre were validated by the Intelligent Transport Systems Group. Traffic signal validation involves checking all the equipment, data inputs and physical location of the signals. This was undertaken as part of the County Council's ongoing maintenance, and identified issues regarding the traffic signals, including problems with the associated equipment and the functionality at some junctions. Detailed findings of the signal validation were described in the Committee report item 13 dated 25 April 2005.

## 2 TRAFFIC SURVEYS

- 2.1 Accurate traffic surveys are essential for the development of a traffic model. The more information that can be obtained, the more realistic the simulation of the traffic model.
- 2.2 The traffic surveys had to be postponed for 5 months until late October 2005. The reasons for the delay are as follows. The validation of the traffic signals took longer than was forecasted. It was important to wait for the signal validation to finish before the traffic surveys took place to ensure that the model reflects 'normal' traffic flow conditions. The validation finished just before the school holidays, at which time traffic flows had already begun to reduce. Similarly, it is not advised to undertake traffic surveys during school holidays, as this does not represent 'normal' traffic flow conditions. The traffic surveys were then planned for mid September. Unfortunately, the A308 London Road resurfacing works were postponed and rescheduled for 12 September 2005 for a period of 6 – 7 weeks.
- 2.3 Consequently, the traffic surveys were carried out on the 20 October 2005.
- 2.4 The consultant, *CTS Traffic & Transportation*, was commissioned to carry out the majority of the manual classified turning counts and all of the registration plate matching surveys. The remainder of the surveys, which included queue length and journey time surveys, were undertaken by *Surrey County Council's Transport Survey Team*.

2.5 Analysis of the data from the traffic surveys showed that the peak and inter peak hours, to the nearest quarter of an hour, are:

- AM peak hour (07:45 – 08:45 hours), weekday
- Inter peak hour (11:45 – 12:45 hours), weekday
- PM peak hour (17:15 – 18:15 hours), weekday

2.6 Both the AM and PM peak hours represent the hours with the largest number of vehicles totalled from the Manual Classified Turning Counts within the AM and PM peak periods. The inter peak hour, however, represents the hour where the vehicles exiting and entering the Town Centre car parks are at the daily maximum.

2.7 **Table 2.1** shows the distribution of trips through the Town Centre network acquired from the registration plate matching surveys.

Movement	Time Period		
	AM Peak (07:15 – 09:15)	Inter Peak (11:15 – 13:15)	PM Peak (16:45 – 18:45)
External to External (Through Trips)	5654	3124	5843
External to Internal Trips	1660	2584	1361
Internal to External Trips	916	2744	2151
Internal to Internal Trips	5	4	3
<b>Totals</b>	<b>8235</b>	<b>8456</b>	<b>9358</b>

**Table 2.1: Distribution of trips acquired from the registration plate matching survey on 20<sup>th</sup> October 2005 (Lowest accuracy for an individual site = 84%)**

2.8 In the AM peak, 69% of trips are those which travelled through Staines Town Centre. There are also more trips that travelled into the Town Centre than out of the Town Centre.

2.9 In comparison, in the inter peak, the number of through trips reduces to 37% of all vehicle movements. There are much higher numbers of vehicles originating from outside the Town Centre and terminating within the Town Centre. Likewise, there are much high numbers of vehicles beginning their journey in the Town Centre and driving out of the Town Centre. It is likely that a large proportion of these trips are shopping trips.

2.10 In the PM peak, 62% of trips are those which travelled through Staines Town Centre. This is similar in magnitude to the AM peak, and it is expected that the majority of these movements are the return trip from places of work and education. There are more trips that are travelling out of the Town Centre than

into the Town Centre. This is probably due to people travelling home from places of work within the Town Centre, and returning home from shopping.

- 2.11 **Annexe A** shows the observed queue lengths for Thursday 2 March and Tuesday 7 March 2006. Queue lengths were collected along Wraysbury Road, Laleham Road and Kingston Road, for vehicles queuing into the Town Centre during peak periods.
- 2.12 The queue length graphs in **Annexe A** show that there was great variation in queue lengths between the two days on which queues were observed. One of the largest differences was along Laleham Road during the morning peak period. On Thursday 2 March, the maximum queue length was approximately 250 metres, whilst, at the same location and at a similar time, the queue length was greater than 600 metres on Tuesday 7 March. This large daily variation of queue lengths seems characteristic of Staines Town Centre. Along the approach roads to the Town Centre queues appear to vary in length from one extreme to another. Some day's, queues will be extremely large, and others, at the same time of day and location, will be non-existent. Furthermore, a large queue along Kingston Road, for example, does not necessarily mean there is a large queue along Wraysbury and Laleham Road, and vice versa.
- 2.13 Journey time surveys took place at the same time as the queue length surveys on Thursday 2 March and Tuesday 7 March 2006. Graphs showing the average journey times for each day, together with maps of the routes observed and descriptions of timing points, are located in **Annexe B**. Please note that the scale of the axes varies from graph to graph.
- 2.14 The journey time graphs show that the network had greater delay on Thursday 2 March than Tuesday 7 March in both peak periods, shown by the larger journey times along both routes. Furthermore, journey times along both routes and days are shorter in the AM peak period than the PM peak period.
- 2.15 For route A (anticlockwise), journey times are fairly similar for both days on which they were observed for the first half of the route. This is between Staines Bridge and the Bus Station. The second half of the route, from the bus station, passed the Two Rivers Shopping Complex and back to Staines Bridge, however, there is greater variation between the journey times observed on each day.
- 2.16 For route B (clockwise) in the AM peak period, there was additional delay between timing points A to G on Thursday 2 March, compared with Tuesday 7 March. Timing points A to G are those between the Crooked Billet Roundabout and just west of Staines Bus Station. Apart from this, the remainder of the journey times along the route are near identical. This is similar in the PM peak period. However, there is also additional delay between timing points N and O along Staines Bridge in the direction of the Town Centre. Furthermore, less delay was experienced between the timing points J and L, heading out of town from the pelican crossing along Clarence Street to Egham Roundabout, on Thursday 2 March.

- 2.17 The implications of the observed variations in journey times and queue lengths will be reported to the September meeting of this Committee.

### 3 MODEL DEVELOPMENT

- 3.1 The basic dimensions of the traffic model network were constructed before the traffic surveys took place. This included: kerb-lines, road type, road widths, number of lanes, junctions, car parks, zones, and bus infrastructure and services.
- 3.2 Zones are locations where vehicles enter and exit the model. In total, the traffic model has 15 zones. Out of the 15 zones, 9 represent car parks within the Town Centre. The car parks are: Two Rivers Shopping Centre (Zones 2, 3 and 4), Staines Railway Station, Kingston Road, Elmsleigh (includes both surface and multi-storey car parks), Tothill, Riverside, and Bridge Street car parks. The model zone plan is shown in **Annexe C**.
- 3.3 The model runs for the following two hour time periods:
- AM peak period (07:15 – 09:15 hours), weekday
  - Inter peak period (11:15 – 13:15 hours), weekday
  - PM peak period (16:45 – 18:45 hours), weekday
- 3.4 The time periods encompass the peak hours as noted in paragraph 2.5. Time before and after the peak hours is required to enable the Town Centre to become congested. Although the entire time period is based on observed data, only results from the peak hours will be reported and analysed.
- 3.5 The traffic survey data has provided data for vehicle proportions, flow profiles for vehicles exiting the zones, and information to build the demand matrices for each time period.
- 3.6 The model has been calibrated using data obtained from **Split Cycle Offset Optimisation Technique Urban Traffic Control (SCOOT UTC)**. SCOOT UTC controls the traffic signals within Staines Town Centre. SCOOT UTC is an online computer that continuously monitors traffic flows over the whole network and optimises signal timings to decrease delay and improve traffic flow. Signal timing and traffic flow data across the Town Centre region was acquired from SCOOT.
- 3.7 Each junction within the model was isolated and fed turning count and SCOOT data to ensure that it was functioning correctly. This involved checking that stop-lines were correctly positioned, visibility and headways were appropriate, and that the observed demand could be replicated, amongst others. In this way, each junction within the model was calibrated.
- 3.8 An important part of this study has been the connection of the traffic model with SCOOT UTC. This is a new development within transport planning, aimed at

making model simulation more realistic and thereby obtains more accurate results from the traffic model.

- 3.9 To ensure that SCOOT UTC is operating effectively and in the same way as it does on site in the traffic model, the SCOOT signal timings and traffic flow inputs also had to be calibrated.
- 3.10 Model validation is the final check that the model is performing reliably and sensibly and is producing robust results. The Department for Transport (DfT) issues guidelines, which should be met to ensure that a traffic model has validated successfully. This involves the comparison of observed with modelled values for traffic flows, journey times and queue lengths. Only when the values are statistically similar, will the model be fit for option testing.

#### 4 OPTION TESTING

- 4.1 Once the traffic model has met DfT guidelines for each of the peak hours, option testing will commence.
- 4.2 Option testing is the modelling of a scheme to produce results, which can be directly compared with the base situation. In this way, transport schemes can be analysed, and if the results give a positive outcome, in relation to the schemes' objectives, then the scheme can be progressed further. If the results show a negative outcome, the scheme can be withdrawn or modified for further testing. In this way, a good traffic model can allow many schemes to be tested and assessed quickly and relatively cheaply. This method of planning reduces the risk of schemes being built which have an unplanned detrimental effect to the transport network.
- 4.3 At this stage, precise details about the nature of the option testing have not been finalised. The model will be able to be used to test minor alterations and adjustment to the carriageway and/or traffic signals. The following highway schemes are being considered for testing using the Staines Town Centre traffic model.
- **Ban the right turn from A308 High Street to Mustard Mill Road, at the junction with A308 South Street.**
  - **Introduce the right turn for the manoeuvre from Kingston Road to A308 London Road at the junction with A308 High Street.**

#### 5 FINANCIAL IMPLICATIONS

- 5.1 The cost of the validation of the traffic signals was borne by the Intelligent Transport Systems Group.

- 5.2 The estimated cost of the build of a validated S-Paramics model of Staines Town Centre is £47,000. To date, approximately £35,000 has been spent, £24,000 of which was on the traffic surveys, and £11,000 has been spent on officer time.
- 5.3 Initially this study was to be funded through the Local Allocation 2005 / 2006 however, it was established that it would be more appropriate to fund the work through S.106 contributions for Staines Town Centre. Funding for option testing is currently under review.

## **6 PROGRAMME**

- 6.1 The provisional programme is as follows:

June & July 2006:	Validate AM, inter peak and PM peak hour models
July to September:	Option testing of different schemes within the town centre
September:	Present the main results and analyses to the September Committee Meeting

## **7 SUSTAINABLE DEVELOPMENT IMPLICATIONS**

- 7.1 There may be positive and negative implications concerned with commercial development and the prosperity of the business within the town.

## **8 CRIME & DISORDER IMPLICATIONS**

- 8.1 There are no implications.

## **9 EQUALITIES IMPLICATIONS**

- 9.1 There are no implications.

## **10 MONITORING**

- 10.1 No monitoring can be defined at this stage.

## **11 CONCLUSION**

- 11.1 The development of a traffic model of Staines Town Centre is nearing completion. This report documents progress to date and outlines the programme for the next four months.

**Reported by: Gemma Thomas, Transport Studies and Data Manager**

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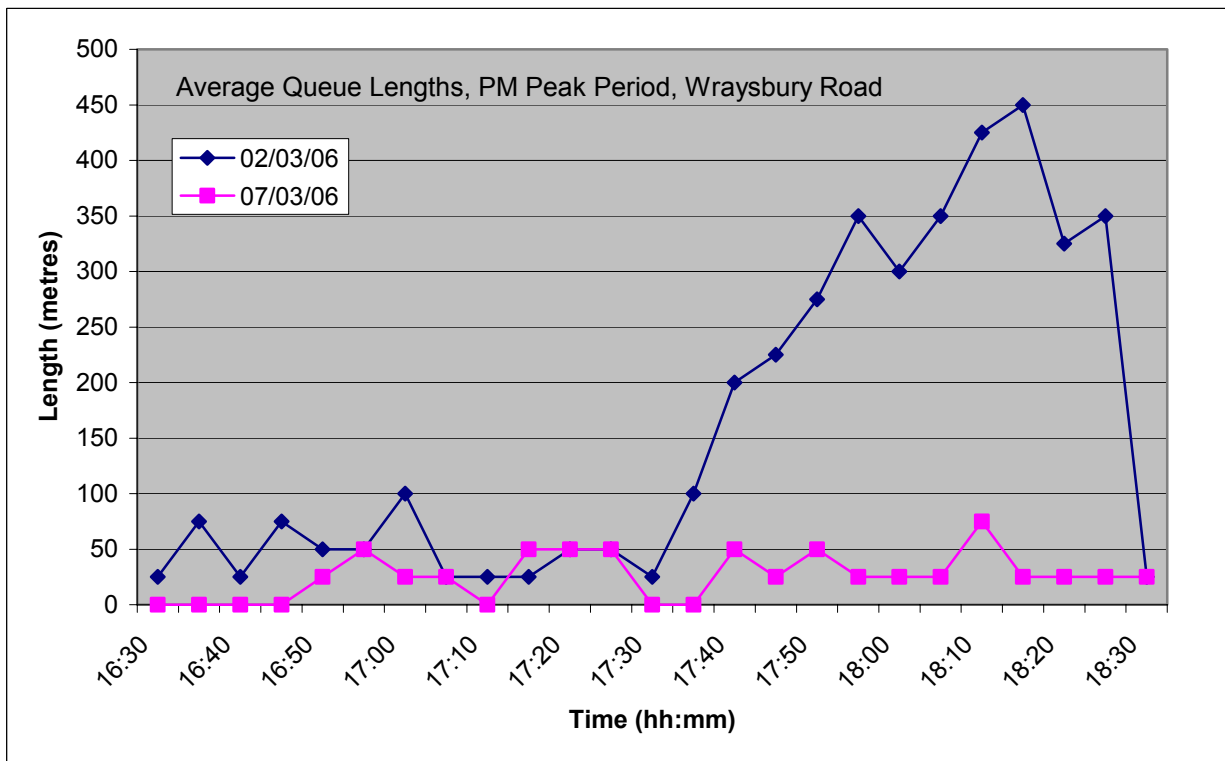
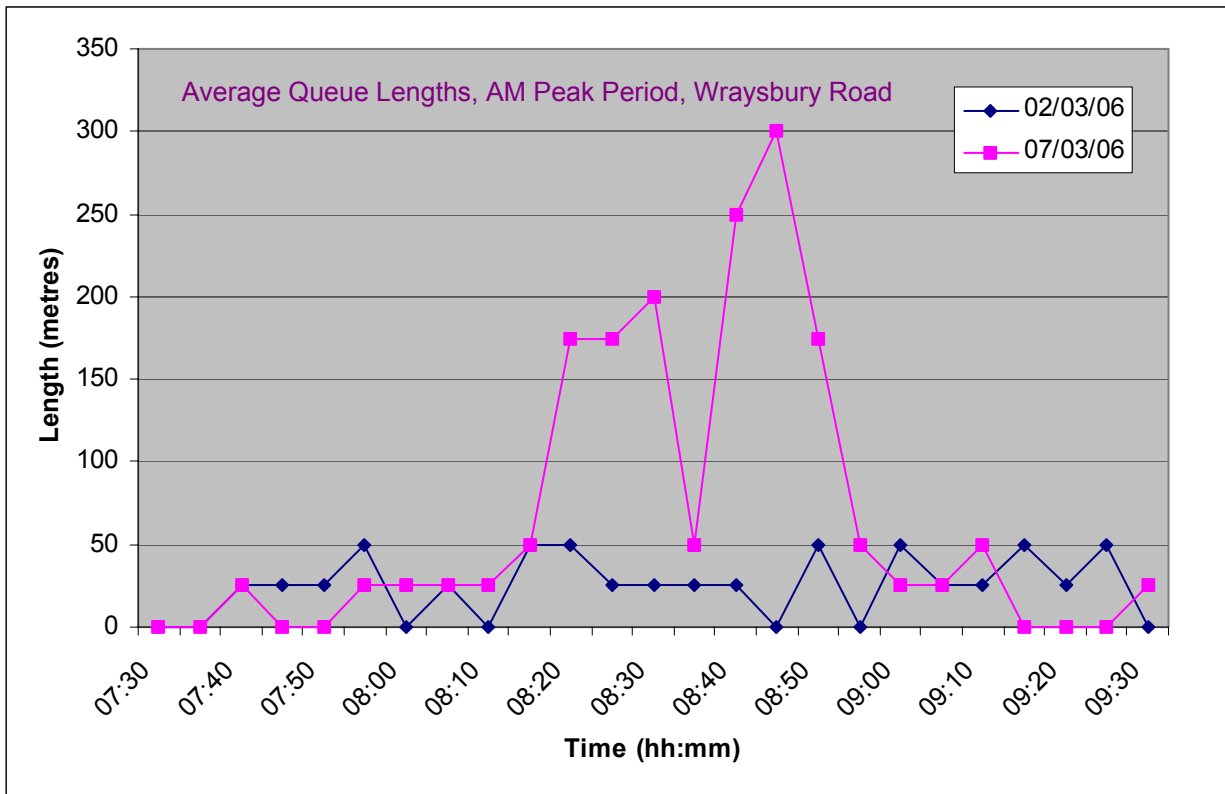
**LEAD/CONTACT OFFICER: Annette Williamson, Local Transportation Manager**

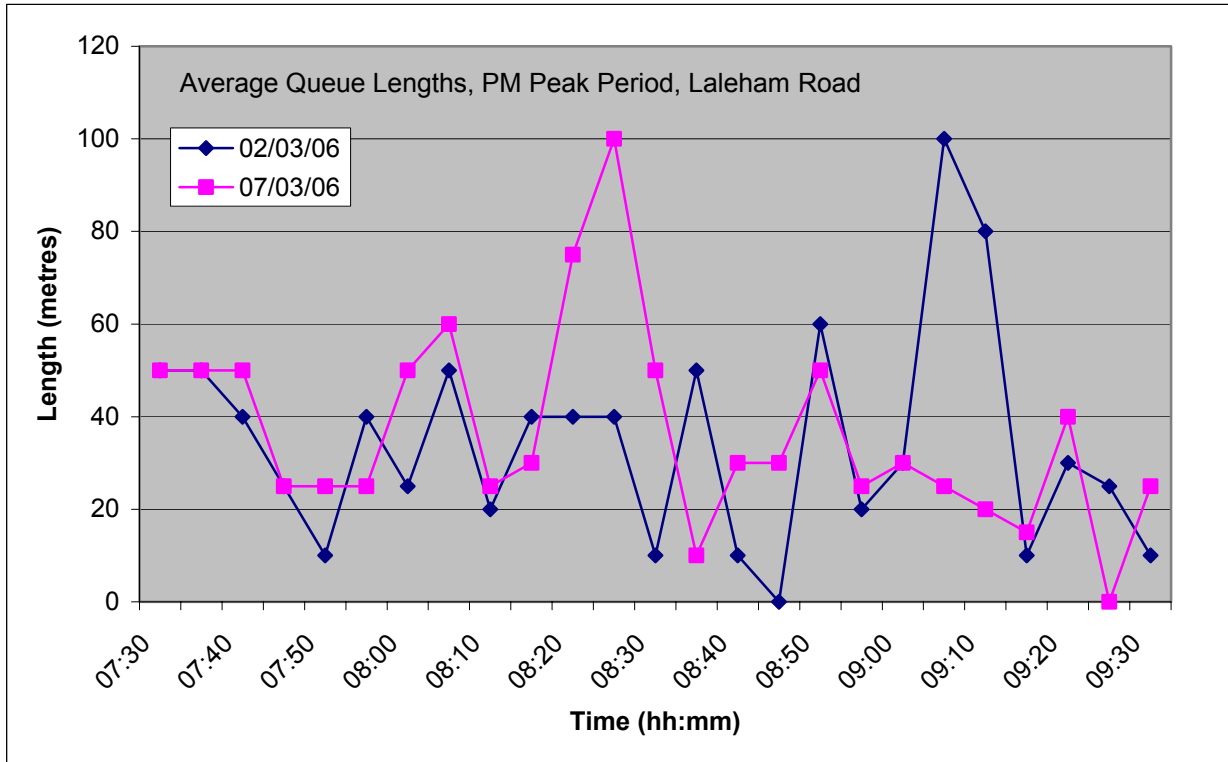
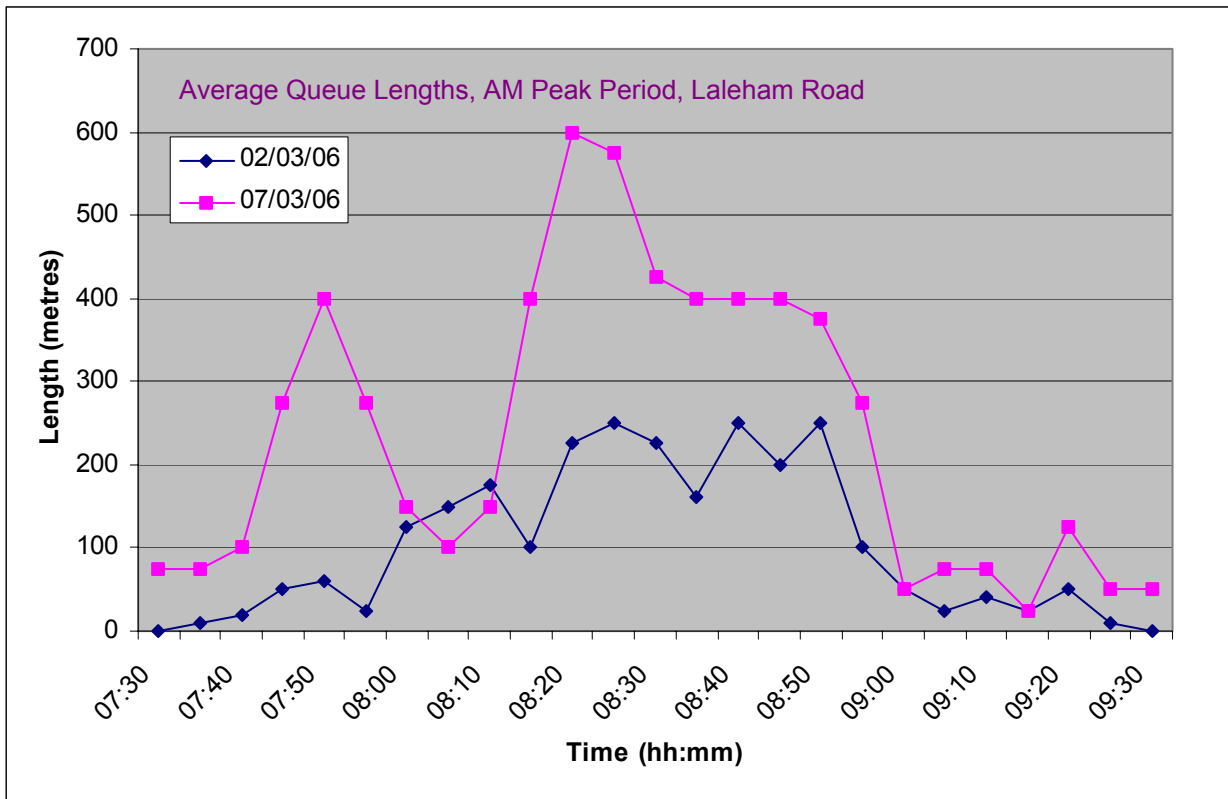
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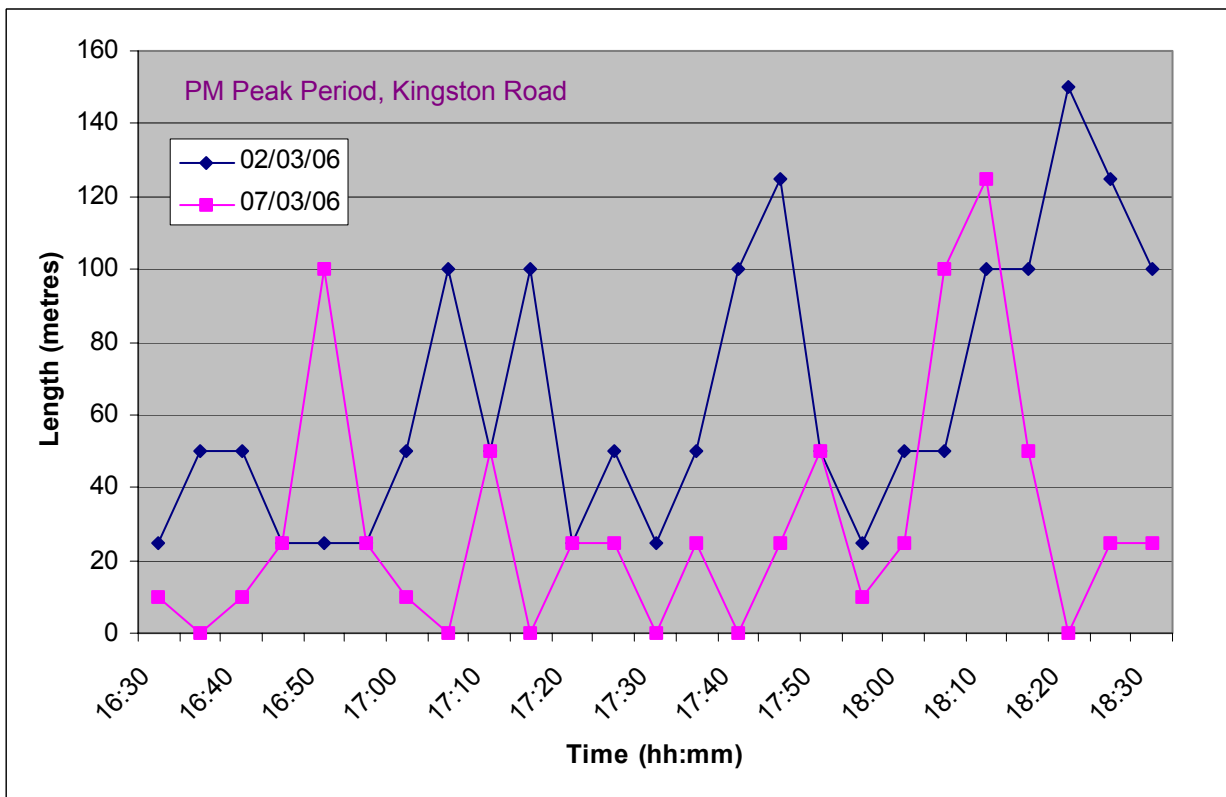
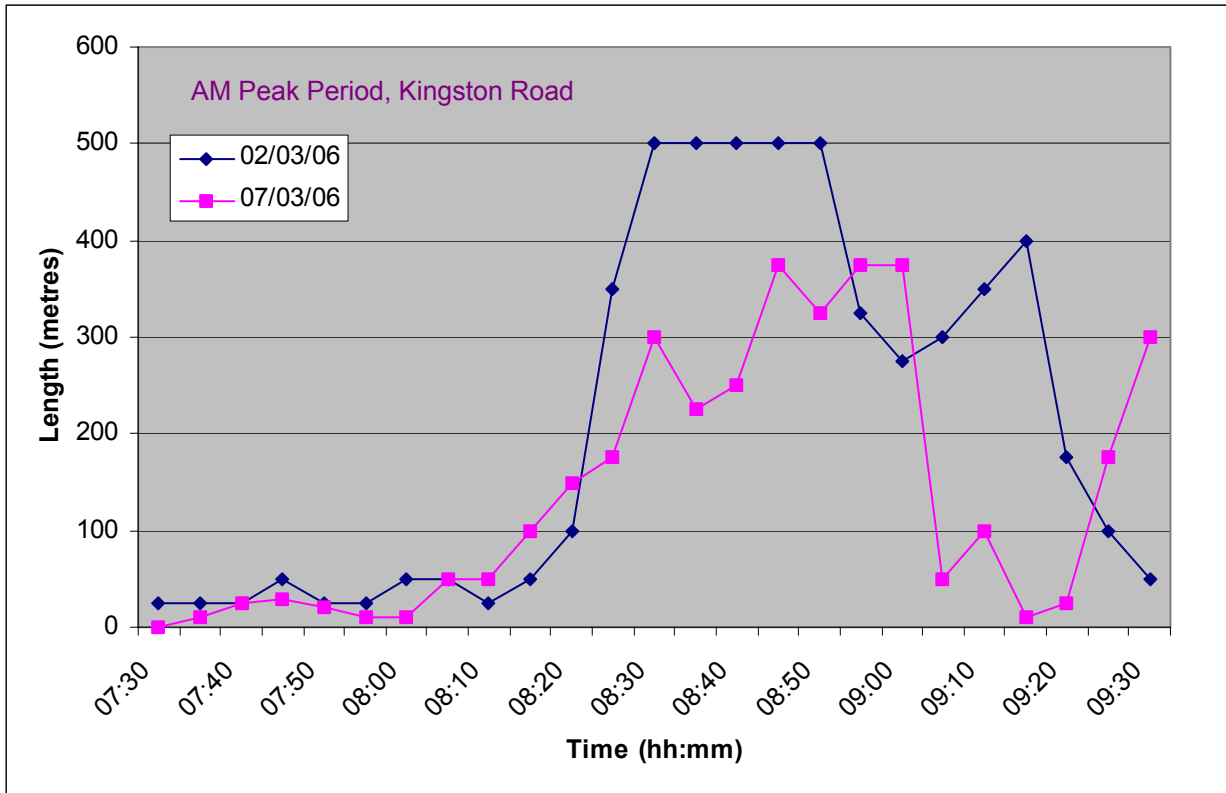
**BACKGROUND PAPERS: Validation of Traffic Signals and Modelling of Traffic Flows, Committee report item 13 dated 25 April 2005, and Committee report item 12 dated 21 March 2005.**

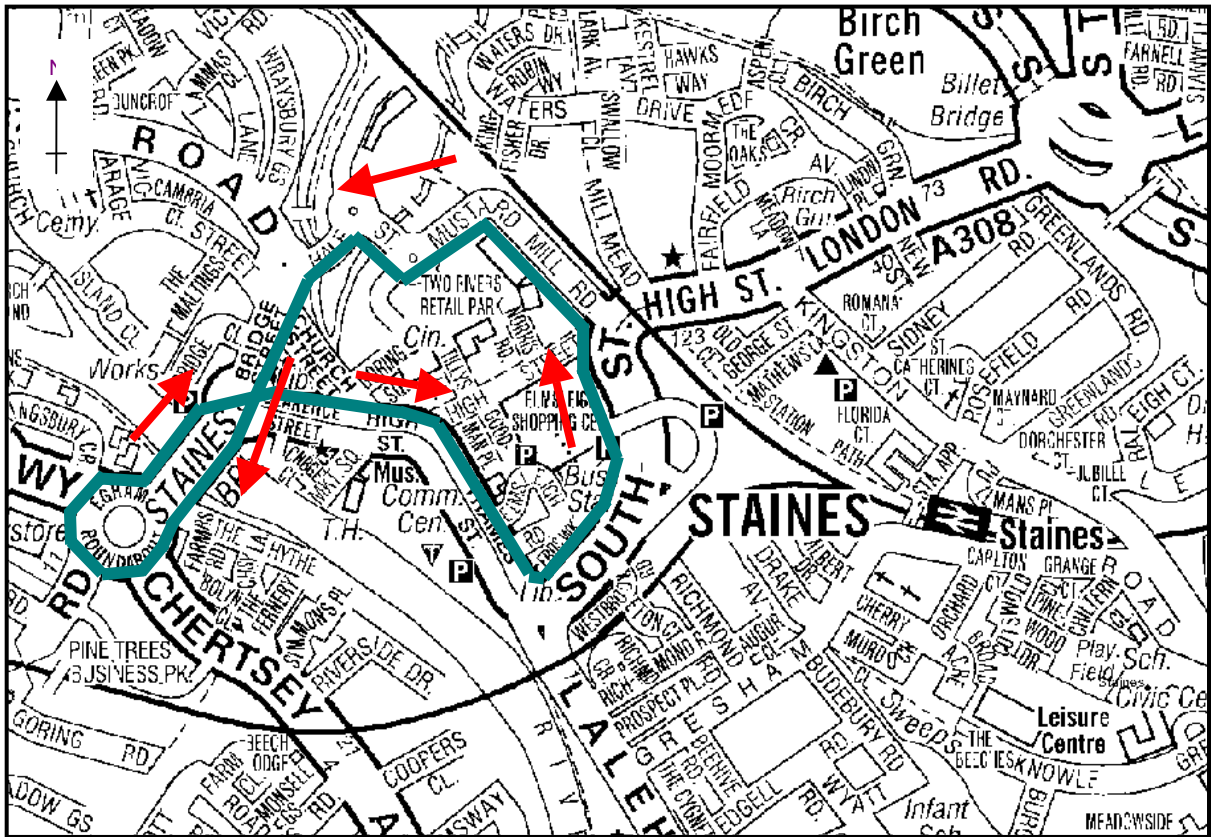
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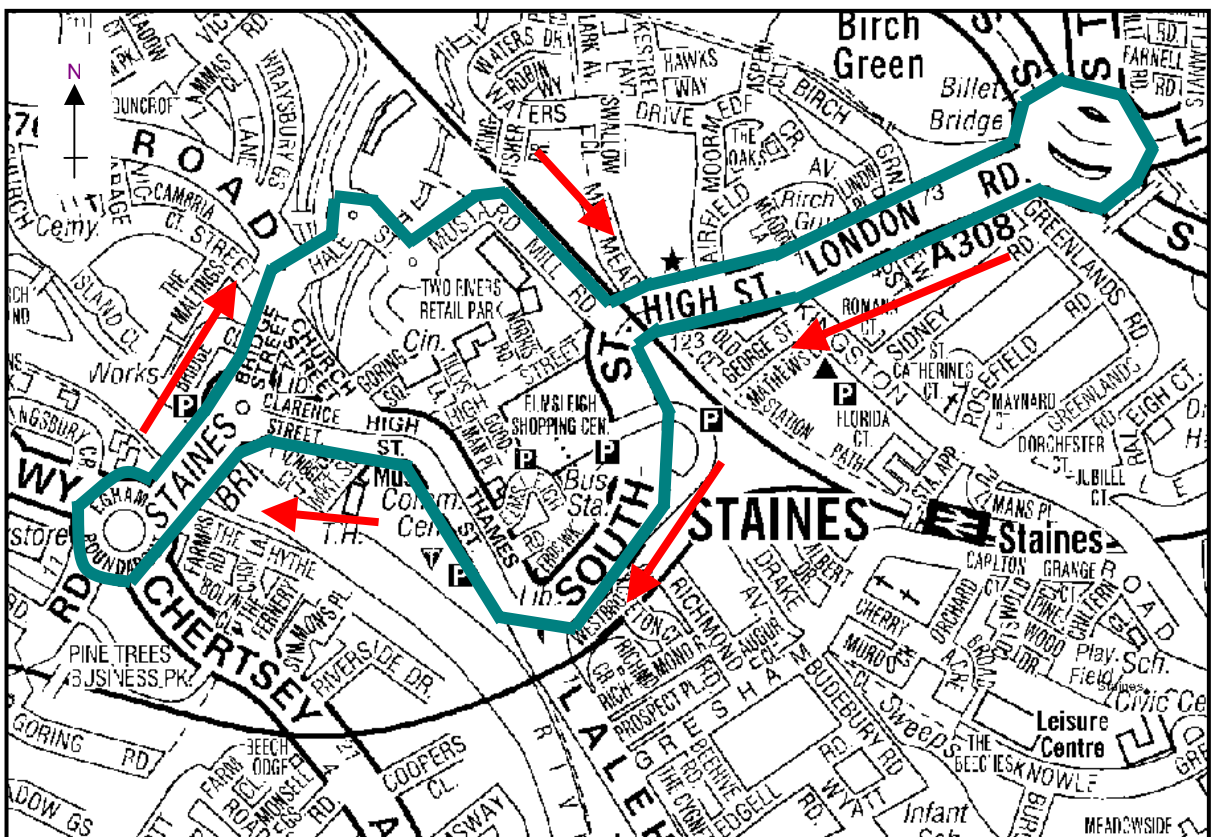








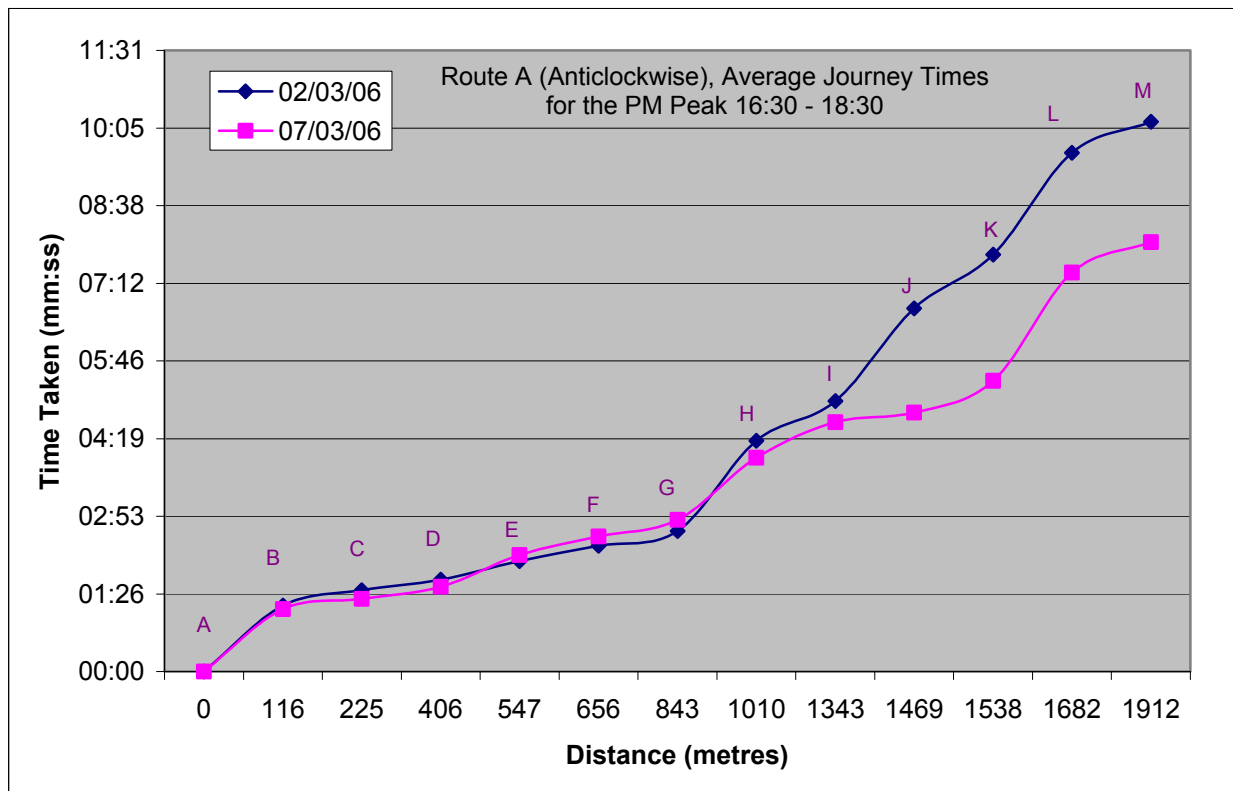
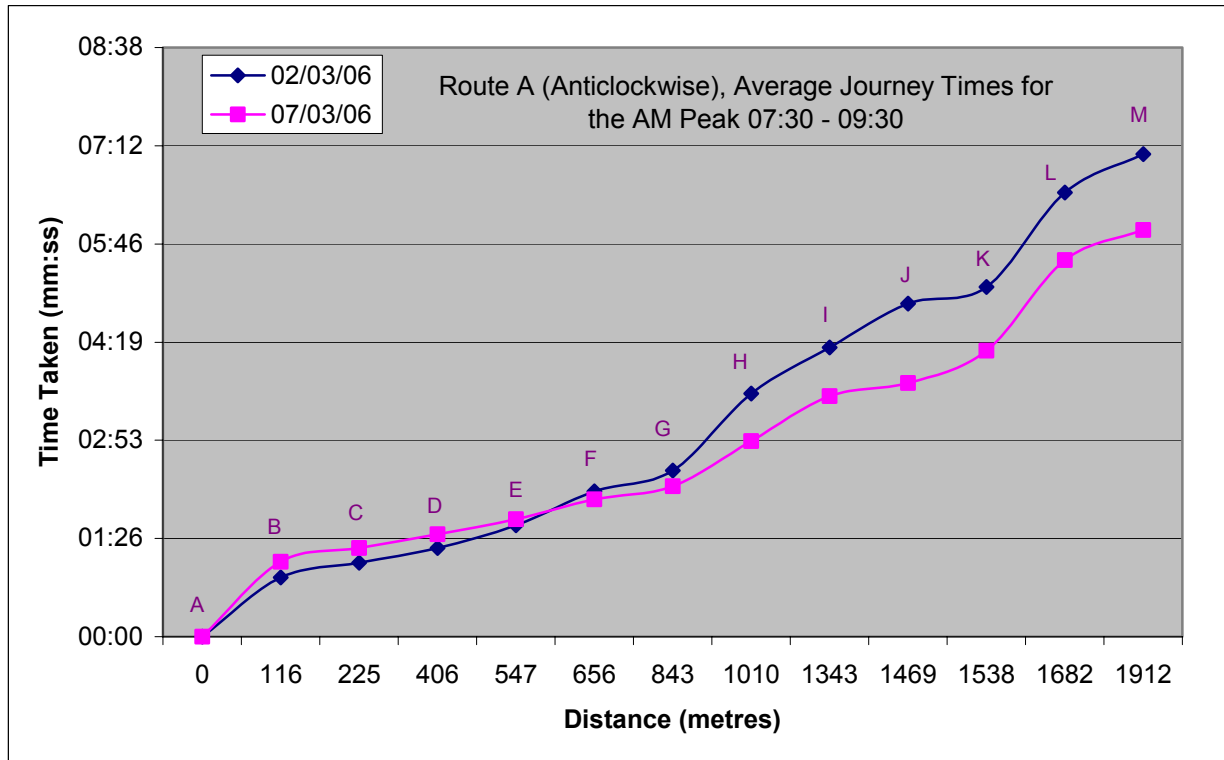
JOURNEY TIME ROUTE A (ANTICLOCKWISE)

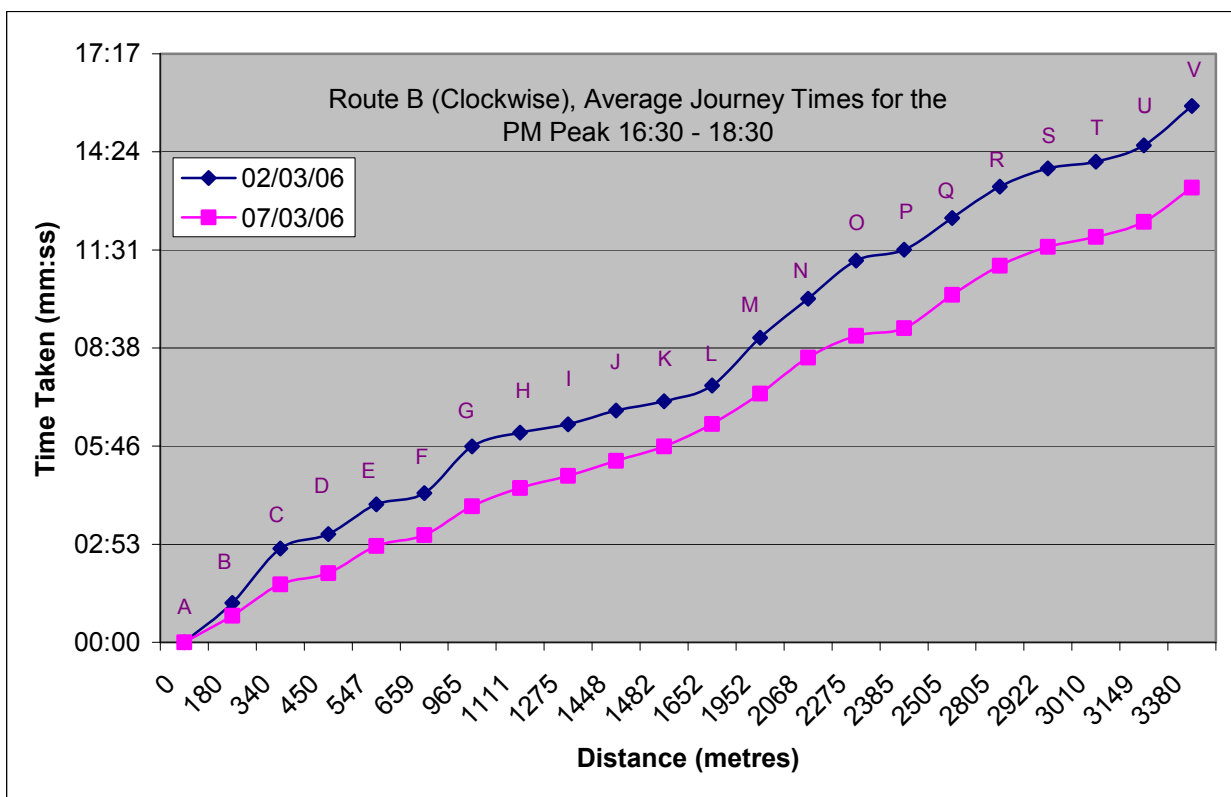
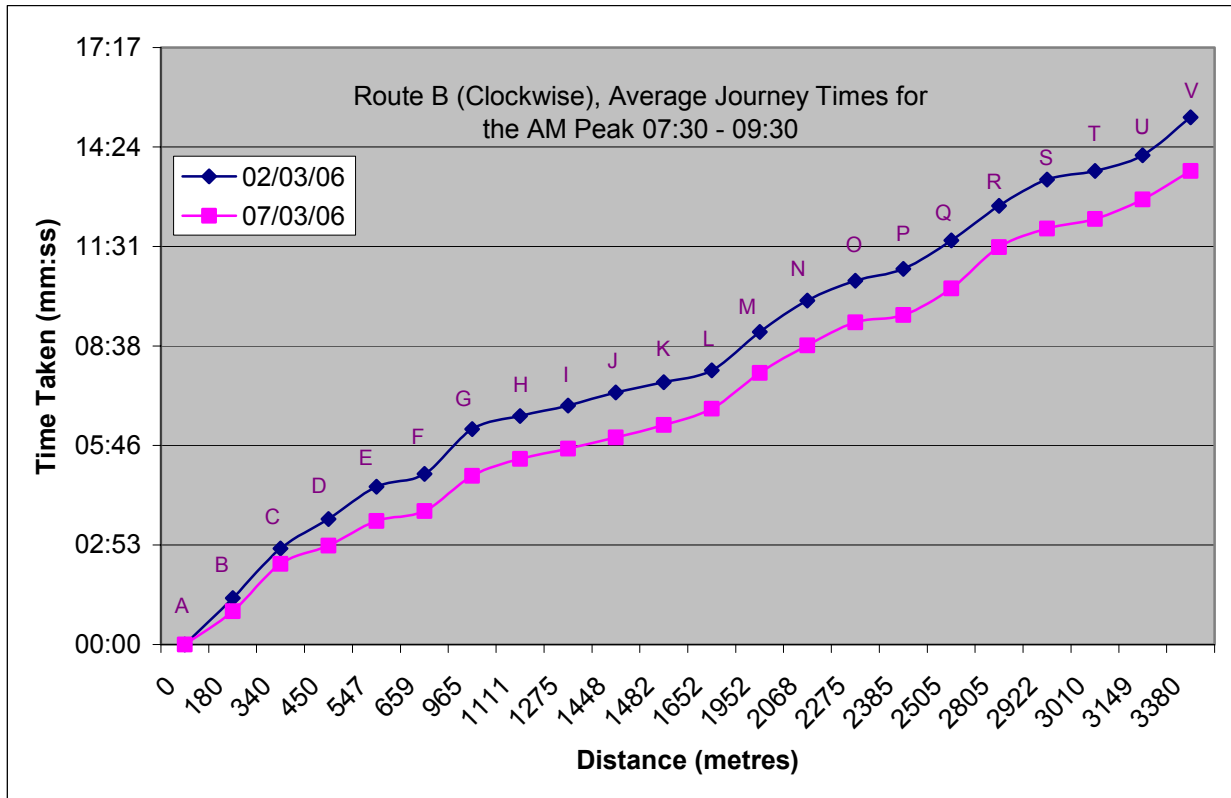




JOURNEY TIME ROUTE B (CLOCKWISE)

### JOURNEY TIME SURVEY ROUTES' TIMING POINTS

Time Point	Location
<b>Route A (Anticlockwise)</b>	
A	Enter Staines Bridge once left Egham Roundabout
B	Cross Staines Bridge stop line at the junction with Bridge Street & Clarence Street
C	Cross Clarence Street Pelican Crossing stop line
D	Cross High Street Pelican Crossing stop line
E	Cross Thames Street stop line at the junction with Elmsleigh Road
F	Cross Thames Street stop line at the junction with South Street & Laleham Road
G	Cross South Street stop line at the junction with the Bus Station
H	Cross South Street stop line at the junction with Mustard Mill Road & High Street
I	Enter Two Rivers Retail Park Roundabout from Mustard Mill Road
J	Enter Hale Street from the Premier Lodge Roundabout
K	Cross Hale Street stop line at the junction with Wraysbury Road & Bridge Street
L	Cross Bridge Street stop line with the junction of Clarence Street & Staines Bridge
M	Enter Egham Roundabout from Staines Bridge
<b>Route B (Clockwise)</b>	
A	Enter London Road from the Crooked Billet Roundabout
B	Cross London Road stop line at the junction with Fairfield Avenue
C	Cross London Road stop line at the junction with Kingston Road & High Street
D	Cross High Street Pelican Crossing stop line
E	Cross High Street stop line at the junction with South Street & Mustard Mill Road
F	Pass under Elmsleigh Multi storey Car Park Ramp
G	Cross South Street stop line at the junction with Laleham Road & Thames Street
H	Cross Thames Street stop line at the junction with Elmsleigh Road
I	Cross High Street Pelican Crossing stop line
J	Cross Clarence Street Pelican Crossing stop line
K	Cross Clarence Street stop line at the junction with Staines Bridge & Bridge Street
L	Enter Egham Roundabout from Staines Bridge
M	Enter Staines Bridge from Egham Roundabout
N	Cross Staines Bridge stop line at the junction with Bridge Street & Clarence Street
O	Cross Bridge Street stop line at the junction with Wraysbury Road & Hale Street
P	Enter Premier Lodge Roundabout from Hale Street
Q	Enter Mustard Mill Road from Two Rivers Retail Park Roundabout
R	Cross Mustard Mill Road stop line at the junction with High Street & South Street
S	Cross High Street Pelican Crossing stop line
T	Cross High Street stop line at the junction with London Road & Kingston Road
U	Cross London Road stop line at the junction with Fairfield Avenue
V	Enter Crooked Billet Roundabout from London Road





**Key**  
 Model Network   
 Zone   
 External Zones = 1, 6, 7, 11 & 14



**Zone Plan**

Zone 1 = Wraysbury Road	Zone 9 = Kingston Road Car Park
Zone 2 = Two Rivers Retail Development	Zone 10 = Elmsleigh Car Park
Zone 3 = VUE Cinema	Zone 11 = Laleham Road
Zone 4 = Two Rivers Shopping Centre	Zone 12 = Riverside Car Park
Zone 5 = Fairfield Avenue	Zone 13 = Tothill Car Park
Zone 6 = London Road	Zone 14 = Staines Bridge
Zone 7 = Kingston Road	Zone 15 = Bridge Street Car Park
Zone 8 = Staines Railway Station	