

## **SLOUGH BOROUGH COUNCIL**

**REPORT TO:** Neighbourhood and Community Services Scrutiny Panel **DATE:** 5<sup>th</sup> December 2011

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### **FOR INFORMATION**

#### **SYNCHRONISATION OF TRAFFIC SIGNALS ON THE A4 (BETWEEN THREE TUNS CROSSROADS AND HUNTERCOMBE ROUNDABOUT)**

##### **1 Purpose of Report**

The purpose of this report is to describe the first year of operation of the traffic signal SCOOT regions operating along the western section of the A4, between Three Tuns crossroads and Huntercombe roundabout. There have been a number of positive results, as well as some challenges. A range of improvements have been implemented since this time last year, either as permanent or experimental changes. A number of further improvements are identified in this report. These are subject to the normal constraints of budget availability and priority.

##### **2 Recommendation(s)/Proposed Action**

The Committee is requested to note the report.

##### **3 Community Strategy Priorities**

The community strategy priorities are:

###### **Celebrating Diversity, Enabling inclusion**

Improving the general traffic flow on the A4 will contribute to inclusion by improving journey times for buses, which will improve access facilities for groups such as the disabled.

###### **Adding years to Life and Life to years**

General improvement to local facilities, facilitated by reduced journey times will provide additional leisure time and less stress associated with travelling.

###### **Being Safe, Feeling Safe**

Reduced congestion reduces driver frustration and can result in more patient and cautious driver behaviour.

###### **A Cleaner, Greener place to live, Work and Play**

Reduced carbon footprint facilitated by reduced journey times and reduced congestion. Reducing the number of stops can lead directly to more efficient engine operation and reduced emissions.

## **Prosperity for All**

A reduction in journey time allows an increase in leisure time. Journey time has a notional financial value used in traffic modelling analysis. Reduced journey times on the A4 can be shown to contribute to a substantial financial saving to the community.

### **4 Other implications**

#### **(a) Financial**

There are no new financial implications arising out of this report. All costs relating to this project can be met from existing budgets in the immediate term.

#### **(b) Risk Management.**

There are tactical and operational risks associated with every modification to the SCOOT regions. The main strategic risk is the continued availability of resources and budget to be able to maintain and operate the SCOOT regions to an acceptable level of performance, and to continue to review and improve sites within the regions.

#### **(c) Human Rights Act and Other Legal Implications**

No Human Rights Act implications.

The experimental road closures described below have been implemented using Traffic Regulation Orders made under the Road Traffic Regulation Act 1984.

#### **(d) Equalities Impact Assessment**

The ongoing work to improve the A4 corridor has no impact upon any group more so than any other. The journey time reduction will benefit all groups equally.

### **5 Supporting Information**

#### **Positive results of SCOOT operation**

In Autumn 2010 the council completed the installation and commissioning of SCOOT (**S**plit **C**ycle **O**ffset **O**ptimisation **T**echnique) on the western section of the A4 Bath Road, between Three Tuns crossroads and Huntercombe roundabout. There are three SCOOT regions on the A4 Bath Road altogether:

- St Andrew's Way to Pitts Road pedestrian crossing – including 10 junctions and two pedestrian crossings;
- Pitts Road pedestrian crossing to Windmill Way pedestrian crossing – including two junctions and two pedestrian crossings;
- Windmill Way pedestrian crossing to Ledgers Road – including two junctions and one pedestrian crossing.

The westernmost SCOOT region is the largest. It was set up to provide eastbound linking between 7:00 am and 12:00noon, and westbound linking between 12:00noon and 11:00pm. Some Members may recall this as the "Green Wave" that operated on the A4 some years ago. Between 11:00pm and 7:00am the junctions are not linked, and operate a Vehicle Actuated (VA) mode.

Following the implementation of the westernmost SCOOT region a number of positive results have been observed:

- Journey times on the A4 itself have improved significantly.
- Previously there was no linking evident and drivers were typically stopped at multiple junctions when travelling along the corridor. SCOOT has reduced the

number of stops by providing sequential linking of green lights. The best operation of the system can be observed in very light traffic conditions, where it is now possible to travel the full length of the region without being stopped at all, whilst travelling at 30mph or 40mph as the speed limits dictate. In medium traffic conditions drivers can reasonably expect to be stopped once or twice. In heavy traffic conditions this may increase.

Officers have received numerous anecdotal reports from drivers using the A4 Bath Road, reporting that the performance of the corridor has improved.

The importance of the central SCOOT region – between Pitts Road pedestrian crossing and Windmill Way pedestrian crossing – was illustrated on Thursday 4<sup>th</sup> August 2011, when SCOOT failed at 8:30am. This SCOOT region includes Three Tuns crossroads. Officers restored SCOOT operation at 9:50am. In less than two hours the queue on the northbound approach had extended all the way to the M4, and then onto the M4 for approximately 2 miles in both directions. Officers immediately took steps to identify the fault and to work with Siemens (our traffic signals maintenance contractor) to reduce the risk of a similar failure. We have also reviewed and revalidated the fall-back mode of operation at Three Tuns crossroads, to reduce the impact of any future failure.

### **Challenges identified in the first year of operation of the SCOOT regions**

The performance of the SCOOT region depends on the number of interruptions to the traffic flow, and the volume of traffic. The system relies on vehicles forming platoons, and moving through the network smoothly in well defined platoons from one end to the other. Any interruptions to a platoon of vehicles will cause the sequential linking to be disrupted. For example vehicles stopping to set down or pick up passengers. For example vehicles emerging from or entering premises adjacent to the road. For example a driver who reacts slowly as the lights change to green. Even in ideal conditions a platoon will naturally spread as it travels along the corridor. As the volume of traffic increases, the road ahead of a platoon is more likely to be full of traffic waiting at the next junction downstream. Therefore in very heavy traffic conditions, sequential linking is not possible.

There are 10 junctions altogether in the westernmost SCOOT region. To achieve sequential linking the overall cycle time of the region is dictated by the size of the largest junctions – at Dover Road and Elmshott Lane. Therefore drivers waiting at the smaller junctions – for example Leigh Road, or Ipswich Road – perceive that they are waiting unnecessarily, as the opposing traffic they can see at their junction has cleared some time before their movement is released. What is happening is that these drivers are waiting for the sequential progression, which is dictated by traffic at the larger junctions. In this situation the system is operating correctly, but not always as drivers would expect.

The prioritisation of the A4 corridor has resulted in longer delays for drivers waiting to access the A4 from its side roads. This is an inevitable consequence of establishing sequential linking along the A4. It would, in theory, be possible to re-allocate time back to the side roads, but this could only be done at the expense of the A4. Anecdotal evidence suggests that even with the increased delays in the side roads, the reduced journey time on the A4 has resulted in a reduction in overall journey time.

The operation of SCOOT depends critically on the performance of detectors installed in the carriageway surface. There are approximately 100 detectors in the

westernmost SCOOT region – a combination of traditional inductive loops and also wireless magnetometers. It is these detectors that monitor traffic flow and enable SCOOT to respond in real time to prevailing traffic conditions. We have had a number of technical problems with the detectors over the last year, which have constrained the operation of the region. For example:

- In St Andrew's Way the detectors were faulty for some time, and officers had to fix the time allocated to St Andrew's Way between set limits. This means that SCOOT was not able to respond to traffic queuing in St Andrew's Way as it normally would. At the time of writing the detector issues have been resolved, and officers are planning to remove the timing constraints from St Andrew's Way in the next couple of weeks – this may help to alleviate the queuing on this road.
- We had a similar problem with the detection in Station Road, Burnham, which resulted in the queue extending all the way to the railway bridge at times during the morning rush hour. This queuing diminished when the detection was fixed.
- The council was supplied with a faulty batch of magnetometers, which affected performance across the westernmost region. These were replaced free of charge by the council's supplier.

During the year we have been changing the way we communicate with our traffic signal controllers, which in the SCOOT regions are controlled from a server in the council's offices. Previously each controller was connected to the server with a fixed telephone line. These are very expensive to rent and becoming obsolete so they are not well supported by telecommunications providers. Fixed lines are highly vulnerable to damage by utility companies. We are rolling out 3G wireless communication links to 50 sites across the borough, including the SCOOT regions. 3G communication is wireless, and so is not vulnerable to damage by utility companies. It is also between 5 and 6 times cheaper. However being wireless it is vulnerable to variable performance of the council's 3G provider's mobile telephony network. This depends on the locations of transmitters, and the number of devices connected to those transmitters at any one time. In practice this means there is a slightly greater risk that SCOOT will not be fully operational at any given time. Officers are investigating the impact of this, and working with our 3G provider to investigate performance concerns. The switchover from the fixed telephone line to the 3G link was very smooth at some sites, but others were disconnected from SCOOT for an extended period. Drivers may well have experienced a reduction in performance for those periods. For example at the time of writing the Ledgers Road junction has not been coordinated with the Montem Lane junction for a number of weeks, resulting in congestion in the network around these two junctions. This latter problem should be resolved sometime in December, when a new broadband connection to the Montem Lane junction is due to be installed.

### **Improvements within the SCOOT regions since December 2010**

Officers have kept the western A4 corridor under continual review during the last year, and have implemented a number of improvements – some permanent and some on an experimental basis:

- At the junction with Walpole Road, the sequencing has been changed to remove a conflict between westbound right-turning traffic (into Walpole Road) and the eastbound ahead movement.
- At Station Road, Burnham, after this road was resurfaced the two-lane approach to the junction was extended. Officers have designed further signs and road markings to encourage drivers to make better use of the two lane approach, and to use both lanes to turn right onto the A4 – this is the heaviest movement. These modifications will help reduce the queue length on this approach.

- At Dover Road, the entrance to the service road has been closed on an experimental basis. Previously vehicles entering and leaving the service road interrupted the traffic flow on the approach to the A4, and also the traffic leaving the A4 to travel up Dover Road. This change has smoothed the operation of this arm of the junction, and stopped the use of the service road as a rat-run.
- At Wellcroft Road we have closed the gap in the central reserve on an experimental basis and switched off the traffic signals at this junction. This has significantly improved the traffic flow at this junction. To facilitate removal of the traffic signals, we have extended the 30mph limit to just west of Galvin Road, and restricted access to Wellcroft Road to a left-in-left-out basis only.
- At Glentworth Road we have closed the access between the service road and the A4 on an experimental basis. This has prevented right-turn manoeuvres from the service road on to the A4, which previously disrupted traffic in both directions on the western arm of Three Tuns crossroads. This experiment has had mixed results – we have observed drivers driving over the footway to access the service road, and also drivers turning right unlawfully from Cranbourne Road. Officers will review the results of this experiment and may well try an alternative solution.
- At Three Tuns crossroads we have:
  - Modified the westbound approach adjacent to Quadrivium Point to assist left turn capacity – this has been made possible by the reduction of speed limit to 30mph – which in turn reduces the visibility requirements for the access into Quadrivium Point;
  - Designed new signs and road markings on the northbound approach to encourage the use of lane 2 by right-turning traffic – this will be implemented in the next few weeks, and will make better use of the approach capacity;
  - Started the design for a change to the layout on the eastbound approach, which would make use of the bus layby for additional lane capacity on the approach – this would enable us to extend the dedicated right-turn lane. This change is likely to be implemented in early 2012 if budgets allow.

### **Further possible improvements within the SCOOT regions**

A number of further improvements have been identified by officers, but have not been developed to date. Some of these are being promoted by local developers in the context of their respective ambitions and planning conditions. Those promoted by the council are subject to the normal constraints of budget availability and priority:

- At St Andrew's Way officers are investigating possible options to reduce the queue length and also resolve safety concerns associated with the service road.
- At Walpole Road officers have investigated whether it would be feasible to provide a dedicated westbound right turn facility – unfortunately this is not feasible. However officers have observed the number of right-turners is very low, so it may be possible to ban the right turn at this junction and divert drivers around Huntercombe Roundabout.
- At the Bath Road Retail Park adjacent to Burnham Lane the land owner is proposing to widen the exit from the retail park to 3 lanes, to reduce congestion within their car park. This improvement is expected to provide a modest benefit to the A4, as the overall junction capacity will be increased. These works are expected to commence early in 2012.
- At Dover Road SEGRO is developing plans to improve pedestrian crossing over Dover Road and to widen the approach to the A4.
- At Cippenham Lane there is currently a very large KEEP CLEAR marking that constrains the approach capacity unnecessarily. This marking could be halved in size to make this approach more efficient. It would also be possible to extend the

2-3 lane approach but only at the expense of closing the service road entrance and removing a parking layby.

- At Ipswich Road, Leigh Road and Galvin Road SEGRO are developing plans to support their long term master plan, which could result in substantial modifications to these junctions.
- At Twinches Lane officers are reviewing the service road access with a view to improving junction efficiency and resolving safety concerns.
- At Three Tuns crossroads there are further possibilities for increasing the approach capacity on both the northbound and southbound approaches, which will be investigated as resources and priority allow. These changes would mean re-aligning the central reservation on the approaches.
- At Stoke Poges Lane it would be beneficial to encourage drivers to use both lanes to turn right, similar to Station Road, Burnham. Some drivers are doing this already contrary to the existing road markings.

### **Heart of Slough**

The Heart of Slough scheme will provide a new SCOOT region in the town centre, with potential for future links to Ledgers Road, Herschel Street and Tescos as resources and budgets allow.

At the time of writing the old Brunel Roundabout has been decommissioned, and traffic is now using the new crossroads. However Members should be aware that the scheme is only part complete, and so the full benefits of the new system cannot possibly be realised. For example the system is operating with virtually no detection – it cannot monitor traffic and has therefore been programmed with a fixed timetabled sequence. This sequence cannot adapt to change traffic conditions, and therefore will feel awkward to drivers at times when the fixed sequence does not suit the prevailing traffic conditions. Furthermore the new signals cannot coordinate with the old signals that are still in place at Windsor Road (pedestrian crossing) and Brunel Way. In addition parts of the area are still active construction sites, which means the full design capacity is not available on all approaches – a good example of this is High Street West and Windsor Road, where two lanes have been designed, but only one lane is currently available. This means that we have been able to improve some movements, but at times some arms are experiencing delays.

The scheme is expected to be completed early in 2012, at which point officers will be able to configure the traffic signals to optimise their performance, and realise the full benefits of the scheme.

## **6 Conclusion**

The deployment of SCOOT on the western A4 corridor has resulted in a significant positive benefit for drivers using this route. There have been some technical challenges in the first year of operation, which we are working to overcome. Officers will continue to keep this corridor under continual review, and bring forwards further improvements as an when resources and budgets allow.

## **7 Background Papers**

*Traffic light synchronisation on the A4 (between the Tuns and Huntercombe Spur) report to Neighbourhood & Renewal Scrutiny Panel on 1<sup>st</sup> December 2010*