

TRANSPORT FOR LONDON

BOARD

**SUBJECT: SMOOTHING TRAFFIC FLOW**

**DATE: 24 MARCH 2010**

---

**1 PURPOSE AND DECISION REQUIRED**

- 1.1 To update the Board on the actions being taken by TfL to deliver the Mayor's smoothing traffic flow agenda, which seeks to improve the reliability and predictability of journeys in the Capital.
- 1.2 An update on TfL's work to smooth traffic flow in the Capital was considered by the Surface Transport Panel at its meeting on 10 November 2009.

**2 BACKGROUND**

- 2.1 The road network in London is at or over capacity for motorised vehicles at significant periods of the day, meaning that resilience is low and traffic disruption common. The average daily motor vehicle traffic flow in London is 27,400 vehicles, 40 per cent higher than flows in other urban areas in England (e.g. Tyne and Wear, Greater Manchester, Merseyside, etc). London has around 20 per cent of the UK's congestion, costing London's economy at least £2 billion a year. Around a third of this is on the Transport for London Road Network (TLRN), over two thirds is on the TLRN and Borough Principal Road Network combined.
- 2.2 The causes of motor vehicle congestion are complex and actual traffic growth over the last few years has been small, partly due to investment in alternative modes (e.g. walking, cycling, and public transport improvements). Some of these modal shift measures, along with the impact of major utility infrastructure improvement programmes, and urban realm improvements, have impacted negatively on network capacity for motorised vehicles.
- 2.3 Section 5.6 of the draft Mayor's Transport Strategy (MTS) sets out the Mayor's aim to manage effectively the road network to make the most of available road space and to introduce measures to smooth traffic flow, manage congestion and improve journey time reliability.

**3 STAKEHOLDER ENGAGEMENT**

- 3.1 TfL introduced a Smoothing Traffic Flow (STF) online forum, and held a series of individual and group round table sessions on its STF strategy with key stakeholders, including motorist, business, disability and other transport user organisations, and policy makers, such as London Councils and London boroughs.

- 3.2 More recently, TfL also hosted a 'Managing the Road Network' Summit on 12 March 2010, attended by London boroughs, business and transport user groups, utilities and London Assembly Members. The summit provided a useful opportunity for attendees to hear more about the Mayor's STF vision from his Transport Advisor, Kulveer Ranger. Presentations by the RAC Foundation and London First gave the road user's perspective, recognising the need for effective demand management measures as well as policies to maximise available road capacity and to reduce disruption and delay caused by planned and unplanned events. Thames Water and London boroughs also gave presentations on their efforts to reduce disruption caused on the London road network. The Managing the Road Network Summit will be an annual event.
- 3.3 A clear consensus has emerged around the importance of improving the predictability and reliability of journeys.
- 3.4 Customer research carried out by TfL in the summer of 2009 confirmed that the majority of those surveyed agreed with the definition of smoothing traffic flow as "delivering more reliable journey times and more free flowing travel conditions than at present".
- 3.5 TfL has developed a strategy and framework of actions, focused on smoothing traffic flow in London. It identified the need for, and progress in developing, a measurable outcome around journey time reliability (JTR) to demonstrate smoother traffic flow.

#### **4 JOURNEY TIME RELIABILITY (JTR)**

- 4.1 Traffic speeds and flow volumes have traditionally been used to measure the levels of congestion on the TLRN. In contrast to the main transport modes (bus, rail, underground etc), there has not previously been an easy to understand measure of road traffic journey time reliability. The draft MTS defines journey time reliability as: "the percentage of journeys completed within five minutes of a specified typical journey time", which, to be representative of all journeys across London, has been determined to be an average 30 minute journey.
- 4.2 TfL has been analysing its records to provide baseline and historic trend JTR data that will help TfL set future JTR targets for both the TLRN as a whole and individual corridor routes. Traffic congestion and the reliability of journey times on the road network across London vary by route, mode, direction of travel, time of day and traffic volume. On radial routes into and out of central London, reliability varies significantly between inbound and outbound directions. Data analysis is ongoing and TfL intends to undertake a pilot project, aimed at improving journey time reliability on the A40 (which has so far shown to be one of the least reliable corridors in the am peak), before setting specific JTR targets or ambitions for any particular area or route.

#### **5 MANAGING THE ROAD NETWORK AND SMOOTHING TRAFFIC FLOW**

- 5.1 The draft MTS sets out six key themes to manage the road network effectively and implement the smoothing traffic flow agenda:
  - (a) maximising the efficient and reliable operation of the road network;

- (b) minimising the impact of planned interventions on the road network with the potential to disrupt traffic flows;
- (c) minimising disruption from unplanned events (accidents, emergencies etc) as they occur and returning the network to its planned steady state operation as soon as possible;
- (d) achieving modal shift from car journeys towards more sustainable modes;
- (e) where feasible, and where there is an overall congestion reduction and local economic and environmental benefit, developing the road network; and
- (f) maintaining road network assets in a good state of repair.

5.2 TfL is progressing actions in relation to all six themes, including the delivery of projects and programmes to manage demand, encouraging modal shift, and maintaining and developing the road asset. This update focuses on the operational side of smoothing traffic flow, namely maximising available road capacity, through the efficient operation of the road network, and by minimising disruption and delays caused by planned and unplanned events.

## **6 MAXIMISING THE EFFICIENT AND RELIABLE OPERATION OF THE ROAD NETWORK**

6.1 Developing a better understanding of the performance of the road network to identify pinch-points and hot spots, and target interventions to improve JTR for all users is key to maximising the effective operation of London's roads. Traffic signals are in most cases more effective at maximising the flows of vehicles and pedestrians than other junction types. This was supported by a recently published GLA-commissioned study by Colin Buchanan which modelled the impact of removing traffic signals at five junctions in London. It concluded that the total benefits (in terms of time savings and reduced traffic disruption) of signal-controlled junctions can be as much as £800,000 a year, excluding pedestrian and safety benefits. However, it also found that in some cases, the use of signals creates small financial disbenefits (see 'signals removal' at paragraph 6.12-6.13 below). TfL will continue to develop its dynamic traffic control systems to improve the overall performance of the network.

### **Signal Timing Reviews**

6.2 In April 2009, TfL committed to review 1,000 sets of its 6,000 signals each year. So far this year, TfL has reviewed 675 traffic signals, achieving an increase of 5.7 per cent in the number of occasions when all queued traffic will have cleared through the junction during the first green phase. The reviews have also achieved an increase of 1.2 per cent in the number of occasions when all pedestrians waiting to cross the road will have cleared the kerb during the first green man period. The remaining 325 signal sites will have been reviewed by year end.

### **Split Cycle Offset Optimisation Technique (SCOOT)**

6.3 SCOOT is an automated, intelligent traffic signal control system which can alter signal timings in real time to reduce stops and delays for traffic. Sensors in the road detect when traffic is building up and computers then adjust signal timings

to respond to the traffic conditions. SCOOT is effective in smoothing variations in traffic flow, and responding to disruptions caused by accidents and other unplanned incidents.

- 6.4 This financial year (2009/10) SCOOT will have been installed at a further 367 sites across the Capital. Over the next four years, SCOOT will be installed at a further 655 traffic signals, resulting in 50 per cent of London's 6,000 traffic signals being operated by SCOOT. Under normal traffic conditions, SCOOT can reduce delays by up to 12 per cent and stops by up to eight per cent. During an incident, such as a road accident, SCOOT can yield up to a 29 per cent reduction in delays and reduce stops by up to 25 per cent.

### **System Activated Strategy Selection (SASS)**

- 6.5 SASS works with SCOOT, iBus or any other system. It uses network intelligence to automatically activate a different pre-programmed signal timing operation at one or more sets of traffic signals in order to respond to a particular traffic problem (for example a bridge lift at Tower Bridge) to help pre-empt traffic congestion. A noteworthy example is the introduction of SASS in February 2009 at the car park exit at The O2 Arena. Prior to the implementation of SASS, there were reports of clearance times for vehicles exiting the O2 of over 90 minutes. With the SASS strategy now in place, the O2 car parking management team have reported an average clearance time of 17 minutes.
- 6.6 SASS has intervened at critical traffic signals on the network some 78,000 times in the year to date, keeping the network free flowing.
- 6.7 Since May 2008, the SASS programme has been expanded and is currently used in some 50 critical locations across London including many important gyratory systems (including Hanger Lane), keeping them free flowing.
- 6.8 The London Streets Traffic Control Centre (LSTCC) also makes extensive use of traffic signals to manage traffic around incidents and events on the network. The LSTCC actively manages on average 10,000 incidents per year and is involved in facilitating the smooth running of 750 events per annum.

### **Pedestrian Countdown at Traffic Signals**

- 6.9 Research undertaken in early 2009 showed that many people (up to 60 per cent) do not understand the current arrangement of pedestrian signals in London. They often assume it is only safe to cross while the green man is displayed. The green man is actually an "invitation" to start to cross, not the actual time allowed to get from one side of the road to the other. The "blackout period", following the green man, continues to give pedestrians right of way to complete their crossing.
- 6.10 A Pedestrian Countdown system will help signalised junctions operate more efficiently, by providing pedestrians with clear information about how long they have left to cross the road, and, depending on pedestrian demand, reallocating any saved green man time to traffic or other pedestrian phases. Results from TfL's off-street pedestrian countdown trials indicate that 75 per cent of people understand the proposed countdown system.
- 6.11 TfL is working closely with the Department for Transport (DfT) and Highways Agency to secure the necessary approvals to undertake on-street trials of Pedestrian Countdown at eight carefully selected traffic signals in summer

2010. The submission went to the DfT on 8 March and, subject to approval, TfL hopes to install the first trial site in early June 2010 and the remaining seven shortly afterwards.

### **Signals Removal**

- 6.12 TfL has identified around 140 traffic signals across London that may no longer be useful in traffic, pedestrian or safety terms. TfL is collecting data on traffic flows and accidents for these signals in order to verify this. The data will be available by the end of March 2010. At present, TfL is engaging with London borough Highway Authorities to ascertain their general views on signal removal.
- 6.13 Two trials are underway in the London Borough of Ealing, sponsored by the borough, in which the signals have been covered and replaced by temporary zebra crossings and give-way junctions. The trials started in December 2009 and the results are expected during the spring of 2010. In addition, 28 other sets of traffic signals have been removed by highway authorities this financial year; 10 of these are on the TLRN. In order to reduce further the number of signals being installed, all schemes incorporating new signals are being reviewed to determine whether alternative means of control might be feasible.

## **7 MINIMISING DISRUPTION FROM PLANNED WORKS**

- 7.1 It is estimated that every year in London there are over 500,000 holes dug on the road network. In 2008/09, roadworks accounted for 37 per cent of the duration of serious and severe disruption. The estimated total cost of works disruption in 2008 for all London highway authorities (including TfL) was £752 million, the TLRN making up £296 million. Although some of these roadworks are unplanned emergencies, a substantial proportion are planned activities (such as scheduled utility works or highway maintenance).

### **Mayor's Code of Conduct for Roadworks**

- 7.2 The Mayor's Code of Conduct for Roadworks, introduced in April 2009, brought together TfL and the five main utility companies (National Grid, BT Openreach, Virgin Media, EDF Energy and Thames Water) undertaking works on London's roads. Signatories to the Code agreed to provide information boards at their work sites, noting who is doing the work, how long it will last and the reason for any delays or inactivity. The Code of Conduct also called on its members to work outside peak hours, cooperate with joint working and to consider 'plating' over holes in the road, wherever possible. The Code resulted in an increase in the number of works being undertaken outside of peak hours and greater use of plating over open excavations to return the road to traffic at peak times.
- 7.3 Putting the Code of Conduct into action, Thames Water and Southern Gas Networks have been working 'side by side' along Borough High Street, in central London, since November 2009. A single contractor has been engaged by them to simultaneously replace aging gas and water mains. Works by electricity supplier EDF and TfL itself have also been combined with the shared Thames Water - Southern Gas Networks programme. For the duration of the works, Borough High Street will be closed southbound between Southwark Street and Marshalsea Road (until July 2010). Although this still inevitably causes some inconvenience and delays for road users, the overall duration of the works has been cut by around seven months.

- 7.4 TfL has organised another type of joint working – a ‘workathon’. More than 100 different sets of works were completed by 23 separate organisations during a single weekend closure of a section of Upper Thames in December 2008. If these works had been undertaken sequentially during separate closures, they could have caused over three months’ worth of delay.
- 7.5 The Code of Conduct has now been strengthened to include targets and two additional measures – improved reinstatement of the carriageway and footway; and response to surface defects caused by roadworks. In addition, it has now been signed by TfL and an additional utility, Southern Gas Networks. This means that almost 95 per cent of the works being undertaken on the TLRN are covered by the Code. TfL is keen to extend the coverage of the Code and is engaging with the London Boroughs to encourage them to sign up. The Mayor’s Code of Conduct for Roadworks has been well received and it forms the basis of a National Code of Conduct the National Joint Utilities Group (NJUG) intends to launch later this year. NJUG hopes the National Code will build upon the success achieved in London and will promote best practice and positive change across the country.

### **London Permit Scheme**

- 7.6 The UK’s first permit scheme for roadworks started in London on 11 January 2010. It covers TfL’s road network (the ‘red routes’) and the roads of the 16 boroughs that have chosen to participate in the first phase of the programme. Utility companies and other organisations that want to dig up the roads will need to apply for a permit before they can start. This has provided TfL and the boroughs with greater opportunity to coordinate works, organise more ‘workathons’, like the one on Borough High Street, and avoid the situation where the same stretch of road is dug up repeatedly by different companies. Those companies that break the terms of their permit, or work without a permit, will be fined (maximum of £5,000 fine for working without a permit and maximum fine of £2,500 for breaking a permit condition).
- 7.7 The London Boroughs of Croydon and Bromley are due to launch their permit schemes on 1 April 2010 and a further seven boroughs are expected to make applications to the DfT to operate a permit scheme. This would take the total number of London boroughs operating roadwork permit schemes across London to 25, which, together with TfL’s network will, cover 76 per cent of all roads in the Capital.
- 7.8 In its first two months of operation, TfL received more than 7,000 permit applications under the London Permit Scheme for roadworks. Of these, almost 1,000 were refused. This alone has helped to reduce disruption.
- 7.9 The Mayor’s Code of Conduct on Roadworks and the London Permit Scheme will help highway authorities and utilities to plan, coordinate and manage the many roadworks taking place in London better. However, these in themselves will not incentivise shorter works durations. The Mayor and TfL has therefore lobbied the DfT to implement the necessary regulations to allow the introduction of increased Section 74 works overstay charges and a targeted lane rental scheme, which would see charges applied to works taking place at the busiest times, at the most congested locations to help incentivise shorter works durations and better working practices.

## **Increase in Section 74 Overstay Charges**

- 7.10 On 1 March 2010, the DfT launched a consultation on plans to increase Section 74 overrun penalties from the current maximum daily charge of £2,500 to up to £25,000 a day. TfL will be responding to the consultation in support of such an increase. The implementation of any increase could not happen before October 2010.

## **Lane Rental – Section 74A**

- 7.11 TfL is continuing discussions with the DfT on a potential targeted lane rental scheme, which would see charges being avoided by works promoters, if, for example, they undertook works at non traffic sensitive times or employed innovative working practices to allow the carriageway to return to traffic use at peak times. The DfT would need to consult on and then amend existing legislation to enable this. The consultation is scheduled to start in summer 2010, with a view to introducing new regulations in October 2011.

## **8 MINIMISING DISRUPTION FROM UNPLANNED EVENTS AND INCIDENTS**

- 8.1 There will always be unplanned events on the road network – emergencies, road traffic accidents, breakdowns, burst water mains etc – which cannot be planned for in advance. In 2008/09, almost 40 per cent of serious and severe disruption was caused by accidents and breakdowns.
- 8.2 TfL is analysing data to determine if there are any patterns in the type and location of ‘unplanned disruption’ occurring on the network. For example, in London in 2008/09 almost 34 per cent of serious and severe disruption caused by unplanned incidents occurred on just four corridors – Marylebone/Euston Roads, Blackwall Tunnel, A406 North Circular Road, and A40 – which represent only 3.2 per cent of the road network in London. TfL will be undertaking more detailed analysis on the cause/effect nature of such events to identify and eliminate the potential causes. It will also develop real time modelling capability to help improve the effectiveness of its response to such incidents.
- 8.3 The new Surface Transport and Traffic Operations Centre (STTOC), which opened in September 2009, has brought together for the first time the London Streets and Metropolitan Police Traffic Control Centres and the London Buses command and control centre, delivering significant benefits in respect of improved communication and responsiveness to events occurring on the network.
- 8.4 The London Streets Traffic Control Centre (LSTCC) monitors feeds from over 1,300 traffic cameras to detect and respond to incidents and congestion. It leads on managing traffic around, and advising motorists of, such incidents. It uses 131 Variable Message Signs (VMS) to advise motorists already en route of delays. It enters information into the London Transport Information System (LTIS) which is a dedicated information portal for members of the transport industry and media that feeds online and radio information services.
- 8.5 TfL is working on a range of options to improve its real time information to road users, including through the deployment of additional roadside variable message signs (both permanent and mobile), and investigating how its real time incident information could better be used by satellite navigation service

providers.

## **9 EQUALITY AND INCLUSION IMPLICATIONS**

- 9.1 In seeking to smooth traffic flow and improve journey time reliability in the capital, TfL will be considering and attempting to balance the needs of all road users, including drivers, pedestrians and cyclists. TfL's engagement with stakeholders on the smoothing traffic flow strategy will ensure there is opportunity for all transport user groups to have an input.

## **10 RECOMMENDATION**

- 10.1 The Board is asked to NOTE the report.

## **11 CONTACT**

- 11.1 Contact: David Brown, MD Surface Transport  
Number: 020 3054 0178  
Email: [DavidBrownMD@tfl.gov.uk](mailto:DavidBrownMD@tfl.gov.uk)