GREEN LIGHT

TURNING OFF LONDON'S TRAFFIC LIGHTS AT NIGHT

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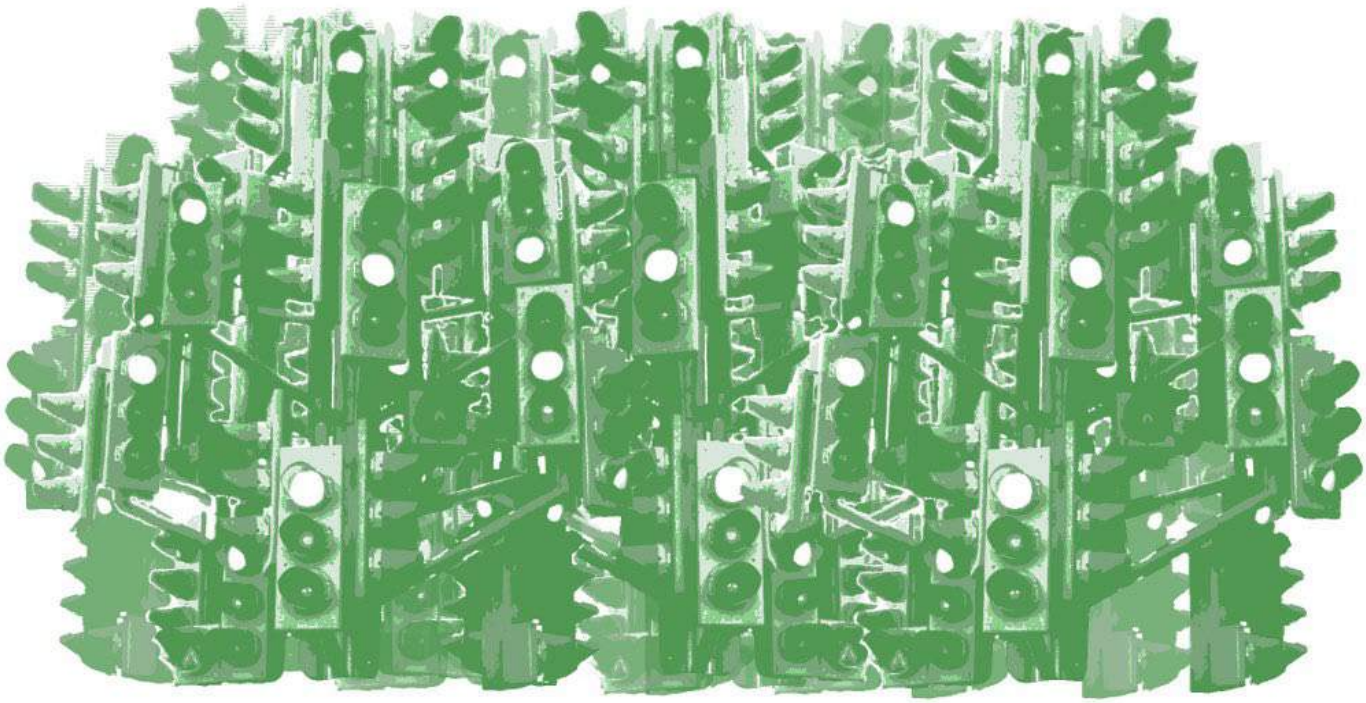
2014

CONTENTS



INTRODUCTION

Every year Londoners waste over 170 million hours sitting in traffic.[1] The total cost of this to London's economy is more than £4 billion.[2] Whilst this is not a problem that can be solved with one simple solution, it nevertheless emphasises why it is crucial that Transport for London (TfL) and London's boroughs explore any avenue that might both reduce those figures and boost economic growth.

To this end, there is a strong argument for encouraging both home working and flexible working in London. The former potentially reduces the costs of congestion to zero. The latter, by shifting commuting from peak hours to less busy times, benefits both those who work flexibly and those who are unable to do so but experience a reduction in peak journey times. A similar effect can be achieved by London continuing its impressive record in modal shift and by persuading commuters to walk or cycle wherever possible. The reports *Home Works* and *Commuter Payback* by Roger Evans suggest how this could be done.

However, while such changes would be a step in the right direction, they are only part of the answer. Many journeys in London are unavoidable. Rather than pretending that this is not so and seeking to punish drivers, TfL and London's boroughs should be constantly striving to reduce congestion and make traffic flow more smoothly.

This has to be done at the same time as making significant budgetary savings. Both TfL and all of London's councils have seen significant reductions in their Government grants over the last four years. Therefore they need to find substantial savings. There are many and varied ways in which this can be done – and the purpose of this report is not to examine these - but investigating all current spending and considering if money is being spent effectively must be at the heart of what London's boroughs do.

1. https://www.tfl.gov.uk/cdn/static/cms/documents/Technical-Note-3-Total-vehicle-delay-in-London.pdf
2. RNPR/Traffic Note 4: Total vehicle delay for London 2008/09 TfL, January 2010

BACKGROUND

When the Congestion Charge was introduced to London it was a very controversial decision. However, the stated reason behind it was to reduce congestion in London at peak-times because this was seen as a drain on London's economy. Consequently there was no suggestion that the charge should apply for 24 hours a day. This should not be surprising since congestion is not a constant problem and the costs of congestion to London's economy vary at different times of the day. A solution that might be effective during peak hours might be completely unnecessary – or even counterproductive – at off-peak times.

This is also why bus lanes are rarely operative for 24 hours of the day. There are times of the day when it may be necessary to create separate road space for buses and there are times when it makes more sense to allow all vehicles to use all the road space. That flexibility is a key part of effective road management.

TRAFFIC LIGHTS

Traffic lights have a vital role to play in managing day to day operations on the road network, regulating traffic flow and helping to keep pedestrians moving. London has seen rapid growth in the use of traffic lights over the last 10 years, from about 4,800 in 2000 to over 6,000 today.[3]

Although their growth has slowed in recent years, total numbers of traffic lights are still increasing. Concerns have arisen that some signals are causing unnecessary delays for both road traffic and pedestrians. Traffic signals also add to the level of visual clutter and obstacles on the street, contrary to the Mayor's objectives for improving urban realm, as set out in 'Better Streets'. Given tighter funding constraints going forward, the affordability of maintaining such a high number of signals is questionable.

To put this into context, TfL operates 6,200 traffic signal sites with around a quarter of a million individual lamps, 149 Variable Message Signs and 56 Over-height Vehicle detectors across London.[4] There are over 2600 standalone pedestrian crossings and over 2,500 of these are traffic junctions.[5]

There are three reasons why traffic lights are used. The first of these is safety. There are some junctions where traffic signals play an important role in reducing the chance of accidents or injuries. The second is amenity. Traffic signals can be useful in providing a safe route to a school or reducing the effect of a major road segregating a community. The third reason – and the one that has been the key driver in the growth of traffic lights over the last decade – is to help implement wider transport policies, such as bus and cycle priority.

TfL recently awarded new traffic signals maintenance contracts, worth around £317m for up to eight years, which will see the capital's 6,000 traffic signals upgraded and maintained to the latest green standards.[6] With this in mind this roughly equates to £6,600 per year per light in maintenance costs. New technologies such as greener LED lights and SCOOT timing of lights have led to saving in disruption and operation costs but, it is highly questionable whether the vast increase that London has seen in traffic light numbers can be justified.

3. https://www.tfl.gov.uk/cdn/static/cms/documents/Item05-STP-9-Nov-2010-Traffic-Signals.pdf
4. https://www.tfl.gov.uk/info-for/media/press-releases/2014/july/delivering-the-future-of-london-s-traffic-signals
5. http://www.london.gov.uk/mayor/economic_unit/docs/traffic-signals.pdf
6. https://www.tfl.gov.uk/info-for/media/press-releases/2014/july/delivering-the-future-of-london-s-traffic-signals

TRAFFIC LIGHT REMOVAL

The Mayor was elected in May 2008 on a pledge to smooth traffic flow. Consequently by November 2009 TfL had identified around 140 traffic signals across London that may no longer be useful for traffic, pedestrian or safety purposes.[7]

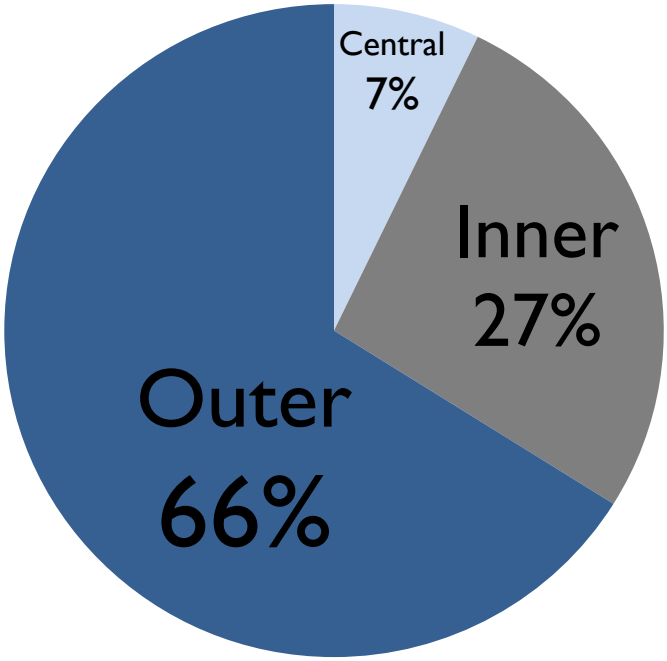
By March 2010 TfL had concluded that the total benefits in terms of time savings and reduced traffic disruption of signal-controlled junctions can be as much as £800,000 a year, excluding pedestrian and safety benefits.[8] However, they also found that in some cases, the use of signals creates financial disbenefits, and in certain circumstances the use of the lights only provided benefits during peak hours.

The average estimated cost of removing a traffic signal is £6,000 per site[9] – less than their annual maintenance. Although it should be noted that this cost does not include the replacement of the signals with appropriate and safe traffic management measures such as zebra crossings or priority junctions.

COST OF DELAYS

As already stated, it is estimated that London's road congestion costs the economy £4bn per year, with an average cost of around £17 per hour delay to a vehicle in London.[10] As London's population swells to 10 million by 2030, the forecast increase in congestion will cost the London economy an additional £1 billion per year.[11]

Total annual vehicle delay distribution by area[12]



7. https://www.tfl.gov.uk/cdn/static/cms/documents/Item11-Smoothing-Traffic-Flow.pdf
8. https://www.tfl.gov.uk/cdn/static/cms/documents/Item11-Smoothing-Traffic-Flow.pdf
9. https://www.tfl.gov.uk/cdn/static/cms/documents/Item05-STP-9-Nov-2010-Traffic-Signals.pdf
10. RNPR/Traffic Note 4: Total vehicle delay for London 2008/09 TfL, January 2010)
11. https://www.tfl.gov.uk/cdn/static/cms/documents/rtf-report-chapter-1.pdf
12. https://www.tfl.gov.uk/cdn/static/cms/documents/Technical-Note-3-Total-vehicle-delay-in-London.pdf

ASSESSING SAFETY REQUIREMENTS

In high-frequency traffic the right signals can reduce collisions by up to 15% at certain junctions.[13] However it is worth considering that signalling will not always be advantageous as, although it reduces right angle collisions, it can increase rear shunts.[14]

There is limited evidence that signal-controlled roundabouts are safer than normal roundabouts, particularly for cyclists.[15] Nevertheless there are some traffic lights which are critical to making specific junctions safe and, clearly, there should be no thought of removing or altering these.

When the introduction of a traffic light is being considered, the decision is subject to TfL's *Design Standards for Signal Schemes in London*.[16] If a traffic light has been introduced because a road is exceptionally busy during peak hours, the criteria would rightly ensure that the traffic light remains operative at that time. Under this policy proposal, TfL's Design Standard would assess the safety of other periods separately. Where the criteria suggest that the traffic lights should be turned off at these times, TfL and London's boroughs should do so.

IN OPERATION

When traffic lights are turned off at night, there would be no signalling but there would be explanatory signage. The rules of these junctions, when lights are off would be precisely the same as when a junction is operating with flashing amber lights. That is to say that the right of way would be enforced. In other words, if two cars enter a junction at the same time then the car to the right would have priority – as they would at a roundabout.

In this scenario, pedestrians have the highest priority and would have right of way over vehicles. In many parts of the world, including in North America, a similar system of three or four-way stop-signed junctions is already in operation. Many other European countries, such as Spain and France, turn off their traffic lights at night in order to ease congestion and this policy has been trialled in other parts of the UK.

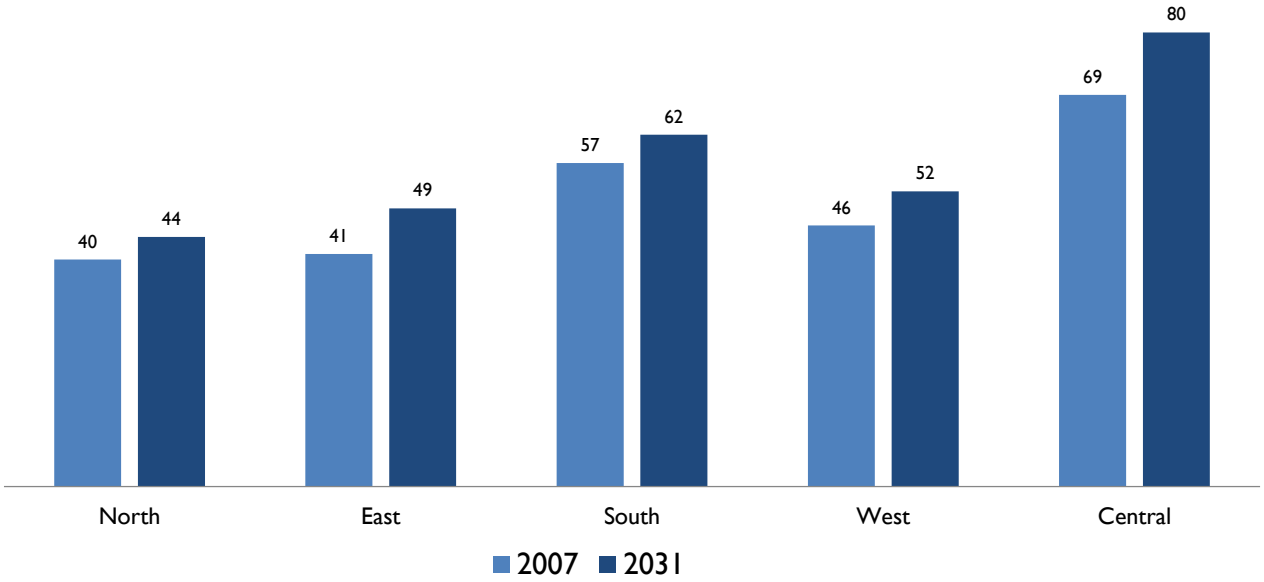
ECONOMIC IMPACTS

In the 2009 GLA Economics study *Economic impact of traffic signals*, which modelled the economic benefits of removing traffic lights, a statistically relevant representation of junctions in London were broken down by times of days including late night delays. This study showed removing traffic lights led to an overall savings in time per vehicle at all junctions studied, reducing delays by 14% overall.[17] Using the volume of traffic during a 6 hour period, between 12-6am, the estimated average reduction of delays by turning off the traffic signals would be 53 minutes a day per junction. The average saving if applied to the 2,532 relevant junctions (which is the number of signals excluding pelican and toucan crossings) would equate to 2,251 hours saved a day. The average off-peak value of time per vehicle according to the DfT is £13.41 an hour,[18] this means these hours saved would equate to £30k a day across London in saved time, and would equal £11m in savings a year.

13. http://www.tfl.gov.uk/cdn/static/cms/documents/literature-review-of-road-safety-at-traffic-signals-and-signalised-crossings.pdf
14. Ibid
15. Ibid
16. https://www.tfl.gov.uk/cdn/static/cms/documents/design-standards-signal-schemes.pdf
17. http://www.london.gov.uk/mayor/economic_unit/docs/traffic-signals.pdf
18. Sheet 1.3.5, an average of Car, LGV, and OGVs. PGV (bus and taxi's) were excluded as the traffic breakdowns do not include that detail, if it was included adding this value would push up the overall figure. https://www.gov.uk/government/publications/webtag-tag-data-book-may-2014

With 819 thousand hours of delay a year, a cost 0.72 litres of fuel an hour of idling[19], and an average fuel price of £1.27/litre[20] - this would equal a fuel savings of £749k a year. Combining this with the previously calculated savings this puts the total to £12m in saved time and fuel.

Indicative increase in seconds delay per kilometre travelled by motorised traffic[21]



Obviously not every junction could be turned off at night. Each junction will need to be accessed and those with a very high night-time volumes of traffic, or other safety concerns, would not fit the criteria for this system. Nevertheless many of the junctions across London would be suited to this system and could help save millions of pounds of people's time, but also fuel, emissions, and other operating costs, over every year of the system's operation. As has been noted, if even 80%[22] of these junctions were suitable then savings of £10m a year could be made across London.

19. http://www.theaa.com/public_affairs/news/cut-traffic-queues-to-cut-co2.html

20. http://www.theaa.com/motoring_advice/fuel/

21. Forecast by TfL's strategic models based on committed transport investment and forecast growth to 2031 https://www.tfl.gov.uk/cdn/static/cms/documents/rtf-report-chapter-1.pdf

22. It was decided to discount the busiest roads/junctions in London from this plan, they only make up 11% of all roads by distance, (https://www.gov.uk/government/statistical-data-sets/rdl01-road-lengths-miles) but by mile they're 13 times more congested (https://www.gov.uk/government/statistical-data-sets/tra01-traffic-by-road-class-and-region-miles). It was decided to nearly double this 11% figure, discounting 20% of all roads, to keep our estimates conservative. This scheme is well suited to late night traffic flows on minor roads.

CONSEQUENCES

The advantages of this change would be manifold:

- Vehicle emissions would be reduced due to a decline in idling. This would also save money for motorists as less fuel would be wasted.
- Journey times would be reduced. This would provide a boost to the economy as the cumulative impact of shorter journey times represents a substantial saving. This means that deliveries are completed sooner, workers are able to get home sooner and taxi drivers are able to complete more journeys over the course of a night.
- This cultural change would give councils useful data for their road management. There is plenty of anecdotal evidence that certain traffic lights are misplaced or unnecessary or even detrimental to the efficient flow of traffic. The status quo has created a scenario where it is much easier to make the case to introduce traffic lights than to remove them and once they are in place it is easier to leave them on for 24 hours a day. Just as the Mayor has sought to persuade London's boroughs to remove speed bumps, breaking this habit will help to deliver improvements for all road users.

RECOMMENDATIONS

1. Where it is deemed safe, TfL and London's Boroughs should turn off London's traffic lights between midnight and 6am.
2. TfL should, as a pilot, turn off traffic lights at 100 junctions during daytime off-peak hours. London's Boroughs should look for opportunities to do the same.
3. TfL should perform regular wide scale reassessments of their current traffic lights to see if any are redundant under their current standards.

FEEDBACK

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