



# Retime greens means greener roads

**By using the latest microsimulation techniques, Transport for London has been able to change traffic signal timings to improve air quality**

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**W**ith tackling emissions on London roads high on the Mayor's Transport Strategy agenda my team at Transport for London (TfL) have been hard at work looking at the different options that we have to help combat this issue.

Work has already started on introducing the low emission bus zones that will see the exclusive use of buses with top-of-

the-range engines and exhaust systems that meet or exceed the highest Euro VI emissions standards. TfL has also started to deliver our plan to introduce around 3,000 Ultra Low Emission double decker buses in central London by 2019 and the new Ultra Low Emission Zone will be in place from 8 April 2019.

In addition, we have started work to see how we can reduce emissions using our traffic signals strategies.

## Model

Our award-winning Modelling team have spent the last year working with Dr James Tate from the University of Leeds, Institute of Transport Studies to develop a VISSIM-PHEM model. This will be an effective tool for testing our emission reduction strategies before trialling them on street.

A VISSIM Microsimulation model was constructed to replicate the on-street conditions and provide detailed assessment ▶



*“ It demonstrated that a healthier street environment for locations such as Putney High Street can be achieved by using different traffic signal strategies, which is an exciting prospect for us ”*



of vehicle emissions with and without the emissions reduction strategy. The VISSIM is connected to an offline copy of one of our Urban Traffic Control (UTC) cells which replicates the signal timings and the behaviour of SCOOT that was in effect, as well as the actual traffic flows on street on the trial and control days.

To provide comparison of vehicle emissions in both scenarios, the VISSIM data for every vehicle is exported to leading emissions modelling software PHEM. This uses the speed, gradient, position, acceleration of every simulated vehicle for every second to calculate the emissions. The accumulated data is compiled to provide a detailed picture of the impact on vehicle emissions

### Comparisons

We also used PHEM to get emissions data direct from our iBus data files. iBus produces a data file for each individual bus on its journey second by second. Similar to the VISSIM data, this actual bus trajectory data was used in PHEM to produce accurate comparisons of trial and control day bus emissions.

The strategy was live-tested on street in two separate trials on Putney High Street. The first took place on two weekdays after

a week of testing. It was accompanied by a large survey, including turning counts, journey times, vehicle trajectory data and bus journeys, as well a significant amounts of SCOOT data. Two neutral days were also surveyed in the same way to act as a control in comparisons.

### Reduction

Trial two was extended to two weeks, including weekends. This allowed a greater period of time for traffic conditions to settle, as well as a more robust test of a refined strategy.

*“ We have identified another five town centre locations where we think a trial like this will also work ”*

Results from the VISSIM-PHEM model for general traffic showed a clear reduction in emissions on Putney High Street. Results calculated from actual bus trajectory data also showed a reduction in emissions. It demonstrated that a healthier street



environment for locations such as Putney High Street can be achieved by using different traffic signal strategies, which is an exciting prospect for us.

As my colleague Joe Birdseye, Principal Network Manager at Transport for London said, “With air quality high on the agenda, and as guardians of the signal timings in London, we applied microsimulation modelling expertise and a bold strategy to influence air pollution in a busy pedestrian area.”

The results mean that we can now use the model to test other strategies offline and assess the emissions impacts of proposed schemes. We have identified another five town centre locations where we think a trial like this will also work. We are now seeking funding and engagement with the local boroughs to get the trials started.

Working with experts such as Dr James Tate has really helped us to develop this new kind of modelling and the results will greatly help us in achieving our Healthy Streets Vision as part of the Mayor of London, Sadiq Khan’s Transport Strategy.

**■ The Healthy Streets Approach uses 10 evidence-based indicators of what makes streets attractive places. Working towards these will help to create a healthier city. Creating positive experiences of using our streets will help Londoners decide to walk, cycle and use public transport. See also:**

- <http://content.tfl.gov.uk/healthy-streets-for-london.pdf>
- <https://tfl.gov.uk/modes/buses/improving-buses>
- <https://tfl.gov.uk/modes/driving/ultra-low-emission-zone>

**The VISSIM-PHEM model is an effective tool for testing our emission reduction strategies before trialling them on streets**

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