

# Getting more out of modelling to assess the impacts of ITS Strategies

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# Intelligent Transport Systems

## Growing evidence of wider environmental benefits

- The Eddington Transport Study (2006)
- Improve the efficiency of transport networks
  - Maximise the amount of time driving at a steady state
  - Minimise the time spent accelerating, decelerating and idling
- Reduced emissions production from smoothing traffic flows and speeds.
- Most significant at lower urban speeds and heavily congested motorways.
- Diurnal profiles important as measures do not apply all day.

# Modelling ITS Strategies

## Limitations with conventional traffic modelling

- Conventional traffic modelling allows for limited analysis of the impacts of ITS strategies
- Limited consideration of
  - Network detail
  - Spatial differences such as vehicle / driver behaviour between lanes.
  - Temporal variation
  - Output data based on aggregated data.

# Micro-Simulation Modelling

## Improved Spatial and Temporal Analysis of ITS Schemes

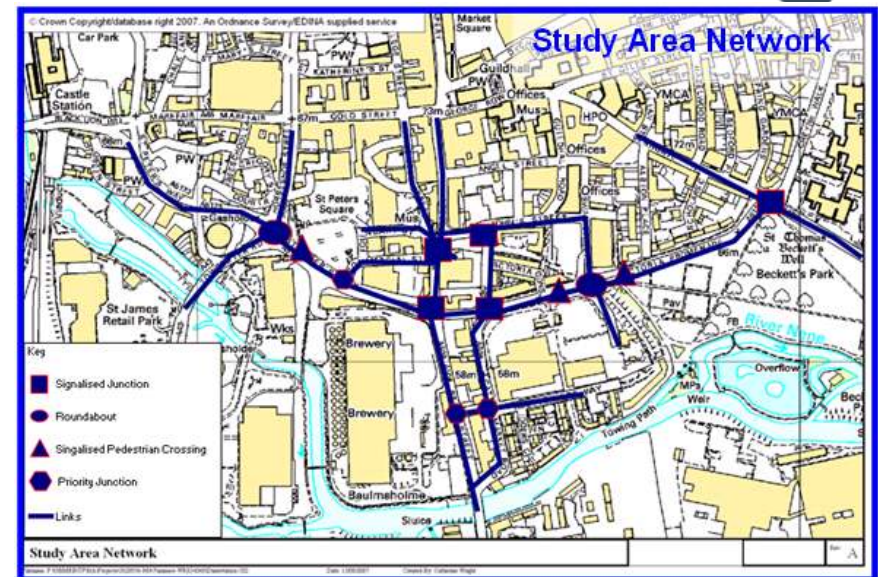
- Model individual vehicles start to finish.
- Disaggregated detailed traffic flow.
- Detailed statistical information.
- Accurately assess performance and behaviour of individual vehicles and their drivers.
- Including consequences of stop-start behaviour in congested road networks.
- More sophisticated methods of assessing ITS schemes including improved spatial and temporal analysis.



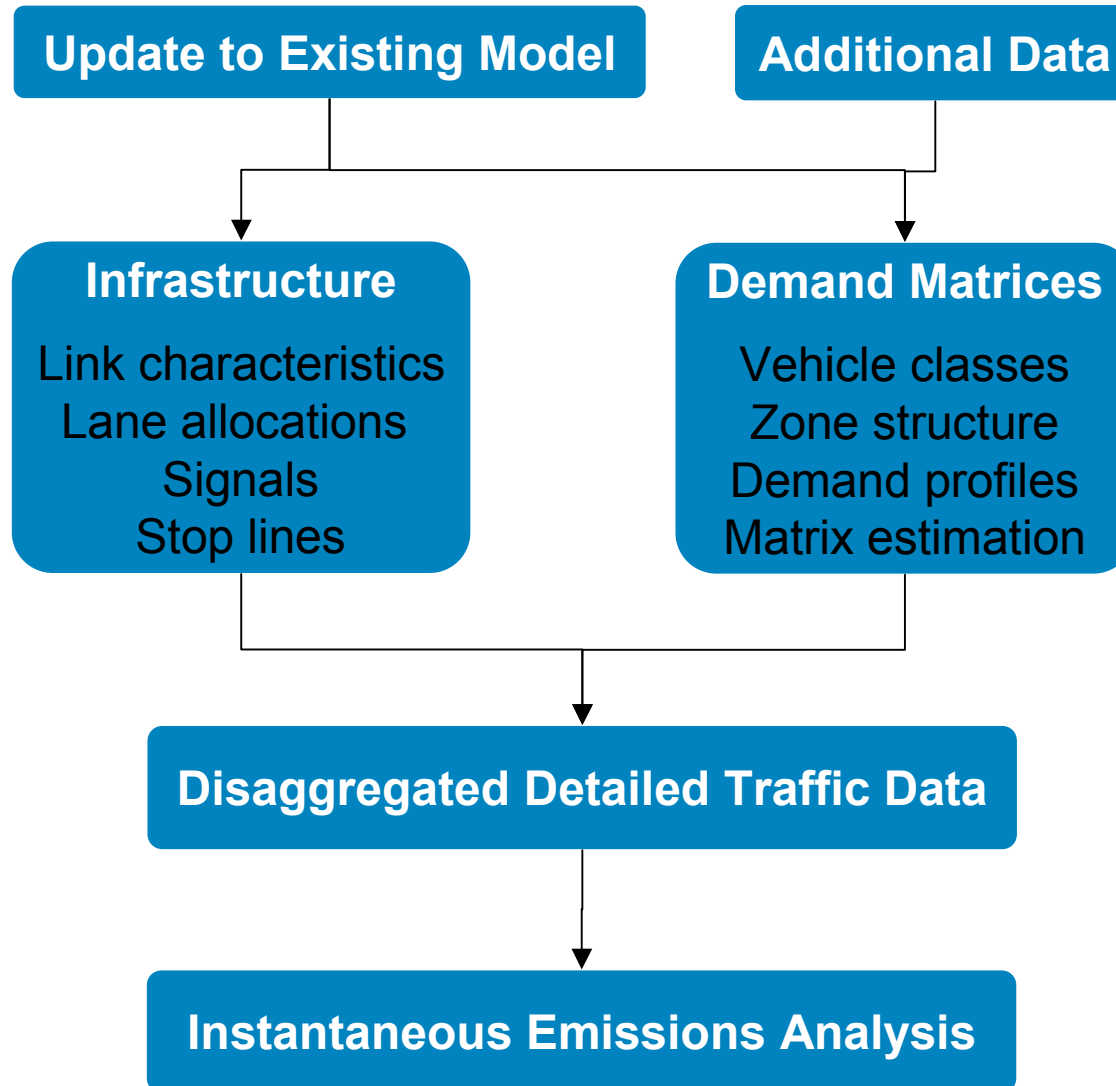
# Research

## Micro-Simulation and Vehicle Emissions Modelling

- Victoria Promenade Air Quality Management Area Northampton.
- Developed existing Paramics micro-simulation traffic model
- Incorporated instantaneous emissions model.
- Investigate the potential impact of future strategies on vehicular emission production.



# Developing the Existing Traffic Model

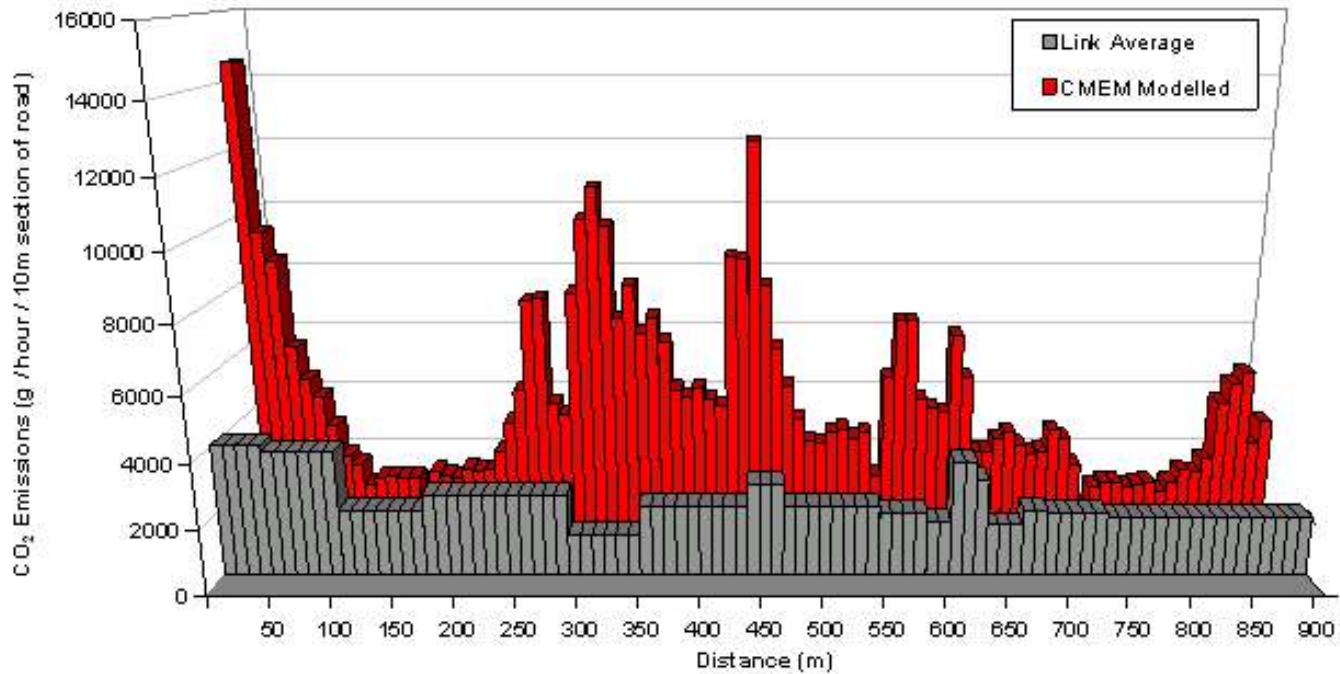


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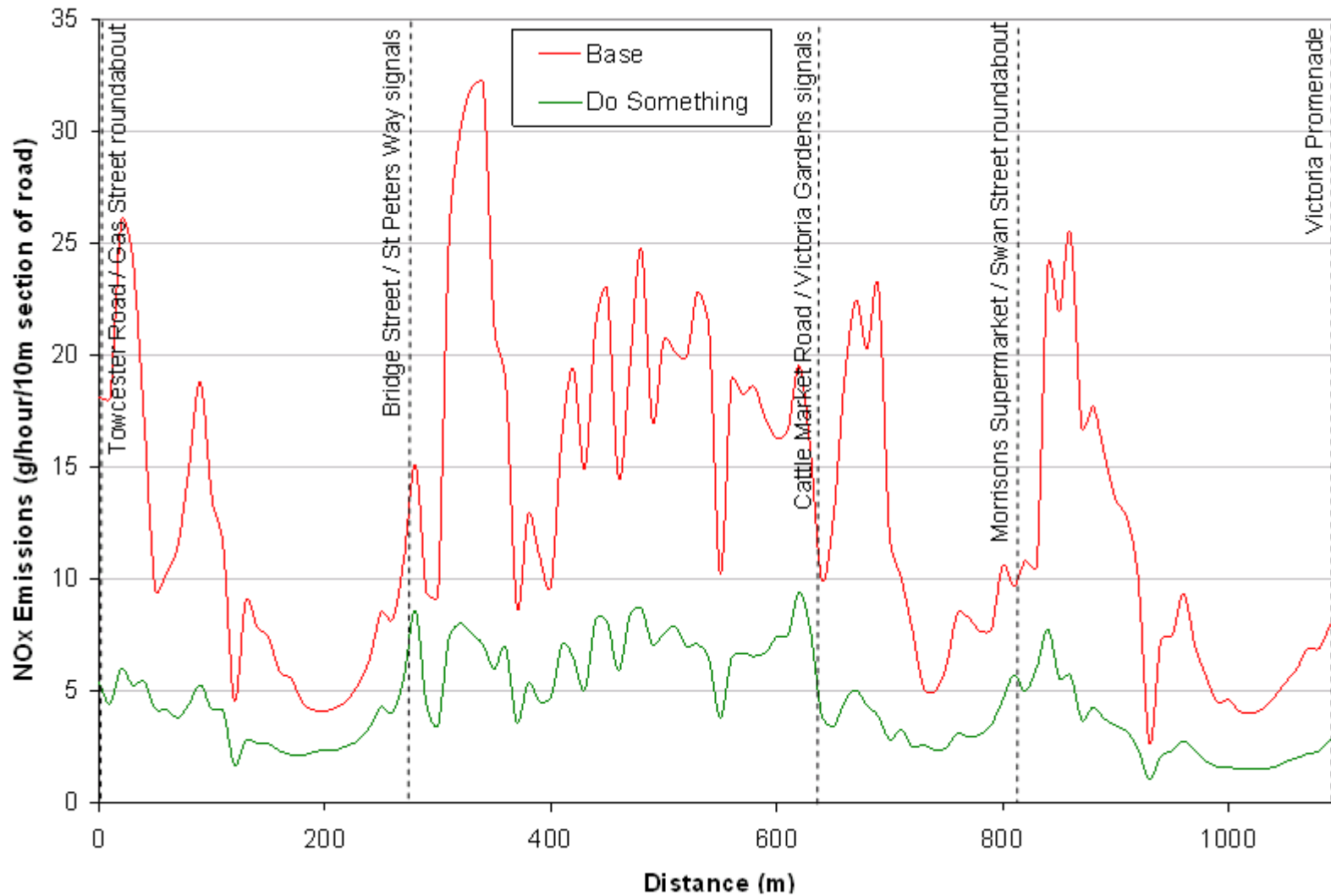
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# Emissions Analysis



# Emissions Analysis of Strategies



# Issues & Way Forward

## Need for operational models focused on ITS schemes

- Period averages v guidance requirement
- Instantaneous effects – ITS works in, micro-simulation reflects, emissions ?
- New UK emission factor datasets – Still driving cycle based
- Transient modes are key (ACDI)
- Can bolt emissions onto micro-simulation, but...
- Instantaneous emissions models – require >> inputs, outside many schemes
- Need an intermediate step

# Issues & Way Forward

## Need for operational models focused on ITS schemes

- Data Mining approach to emissions model definition
- Maintaining “busy” traffic regime – sign transient benefit
- Dispersion – met data limitation
- One size does not fit all
- DfT Feasibility report
  - advanced motorway signalling & traffic management
  - role of ATM versus widening - as relative benefit.
  - would not have been seen with conventional methods.