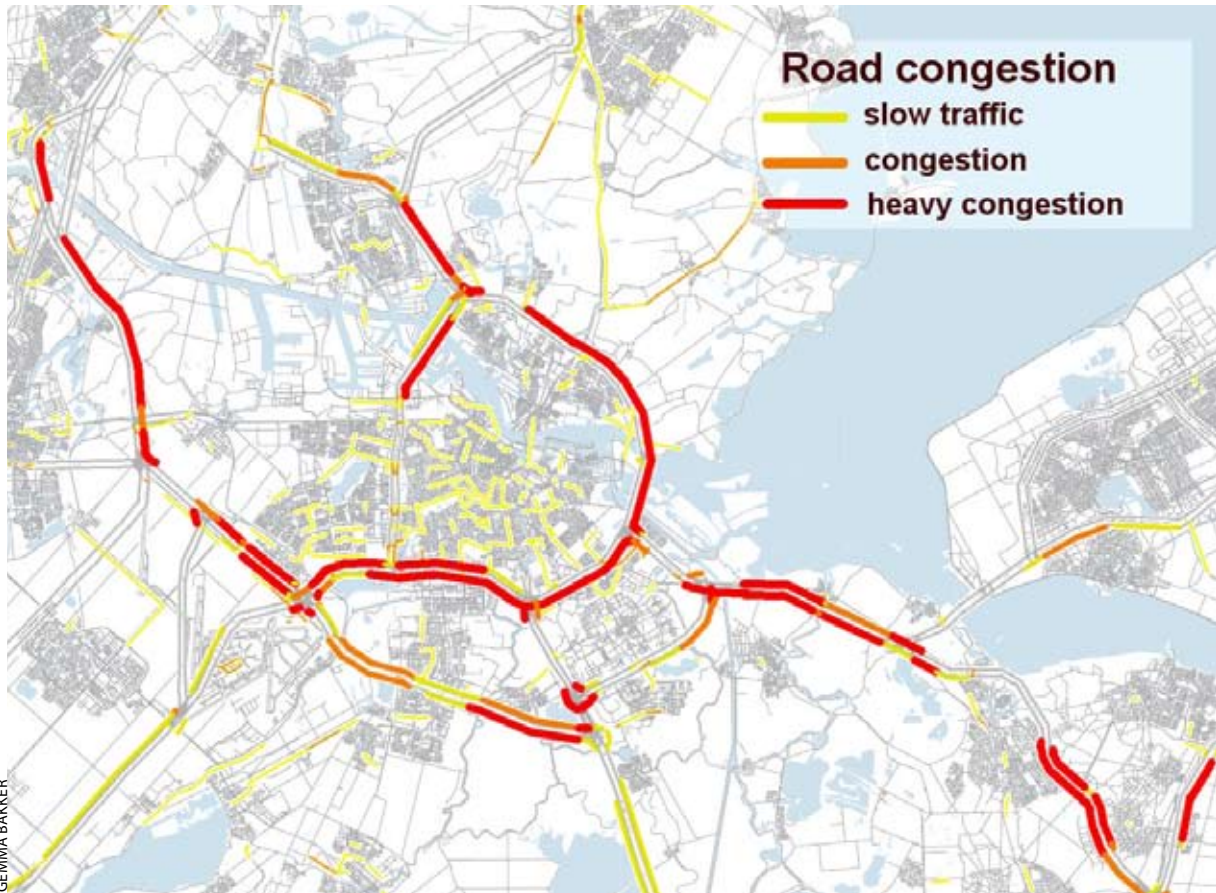


# Prediction



## Why is prediction important for the implementation of road user charging?

Prediction is the full range of activities carried out in advance of implementation in order to aid understanding of the impacts of road user charging. It incorporates both empirical survey work and model-based studies designed to test the performance of scheme options. Prediction exists to aid understanding of how proposed schemes will perform against the objectives set.

## What information is provided by the prediction process to support implementation and decision making?

Prediction methods can provide information in advance on the expected effects of a scheme in terms of:

- Demand Impacts; the effects of charging on road travel demand and the likelihood of switching to alternative modes, times of day, destinations;

- Supply Impacts; the redistribution of traffic across transport networks and the consequent changes in travel times, travel distances and delays;
- Second Order Impacts; effects on economic wellbeing of the area and trends towards relocation of residence, employment and activity;
- Objective Output Indicators; such as - distributional impacts on equity affecting the population; changes in emissions, air pollution, noise affecting the environment; changes in the levels of marginal external congestion cost affecting efficiency; amount of revenue raised to be redistributed; in general the prediction process should cover impacts relevant to each of the agreed objectives of a given scheme;
- Short and Long-Run impacts; disruption during implementation, opening day effects, changes in impacts over time due to lagged responses, need for mitigation measures and migration strategies.

All of these can be used to support the scheme design process by helping identify the best charging method, the most appropriate charging locations and the optimal level of charge.



### What further research is needed?

There are some knowledge gaps in the modelling and prediction of the impacts of road user charging schemes.

- Modelling of different schemes:** Distance based charging and cordon schemes can generally be modelled reasonably accurately. However, because conventional modelling makes a per trip assumption, it is difficult to model area-based charging schemes. While there are models that provide tour-based representations of travel patterns, these have not yet been adopted widely.
- Modelling of exemptions and discounts:** Within the conventional modelling framework, it is difficult, if not impossible to match data to trips in the assignment. Similarly some schemes might allow for a maximum daily charge, however attempting to model this within most current tactical level models is not feasible.
- Static Nature of Models:** Models used for predicting the impacts of road user charging are generally static and they are unable to handle dynamic changes e.g. predicting the influx of traffic into the charge area at the end of the congestion charge period.
- Modelling the possibility of purchasing monthly tickets/passes:** If users can purchase a fixed price monthly pass, this would affect their timing, frequency and mode choice, since once that pass is purchased, the marginal cost of using that pass is zero.

### What can we conclude at present?

The following DOs and DON'Ts should help to increase the likelihood of a successful road user charging implementation.

#### DOs

Carry out surveys to assess traveller attitudes to and acceptance of proposed road user charging schemes, surveys to gauge behavioural responses to particular scheme designs, and surveys to assess the expected effects on business and economic activity

Carry out modelling and forecasting of demand responses of users, resulting changes in traffic flows and their implications for system performance

Consider modelling of land use changes, since the main long-run benefits of road user charging may come from the evolution of development and activity patterns to become more transport-efficient

Model, where possible, the distributional impacts of road user charging across the population of travellers, residents, business in order to assess equity impacts

Model the environmental impacts of road user charging schemes in terms of vehicle emissions and noise to assess the extent to which existing environmental problems are likely to be reduced, increased or transferred as a result of the scheme

#### DON'Ts

Do not rely purely on model outputs without applying professional judgement

Do not adopt models which are too simplistic to reflect the range of likely behavioural responses

Do not rely on behavioural responses obtained from other contexts

Do not use models without segmenting for value of time especially when significant differences are expected when charging is introduced

