Modelling Safety – The In-Safety Approach

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Modelling Aspects

Modelling Driver Behaviour

Route Choice
- Assignment
- Routing

Vehicle Movement
- Lateral
- Longitudinal

Macroscopic Models
- Consider safety in choosing route
  - requires information of safety levels on route segments

Microscopic Models
- Define safety critical situations
  - Surrogate parameters
- Investigate driver behaviour in these safety critical situations
Defining Road Safety Level

- Definition of parameters for classifying road based on safety and existing road characteristic data
- Classification of urban and extra-urban roads
- Upgrade of supply model Software
- Upgrade of grafical user interface software for showing road classification
Assignment Considering Safety

(1)

- Macroscopic (Planning) Model
- Traffic Assignment Techniques
  - Minimising the cost
  - Cost mainly a function of travel time and distance

→ Also able to store other information such as accident statistics on links
Cost function in most general form:

\[
\text{Cost} = \text{PPM} \times \text{Time} + \text{PPK} \times \text{Dist} + \text{PPU}(i) \times \text{DATA}(i)
\]

PPM: pence per minute, “Value of time”
PPK: pence per km
PPU: pence per unit, “Value of safety”
Microsimulation for Safety Assessment

- Parameters for safety assessment:
  - Time to Collision (TTC) and derivatives (TET and TIT)
  - Time to Accident (TA)
  - Small headways
  - Post-encroachment-time

- Definition of scenarios

- Influence of Driver Parameters on Safety Parameters
  - Adaption of Driver Behaviour in critical situations