MULTI OBJECTIVE FRAMEWORK TO OPTIMISE PLANNING OF ROAD WORKS

Henny L. ter Huerne
Twente University
Outline

• Introduction
• The Theoretical Framework, within:
  • road management and maintenance
  • traffic effects: 4-step model
  • externalities hindrance and nuisance
• Using the developed framework
• Conclusions
Framework Lay Out

4-step model

Information

Trip generation

Trip distribution

Modal split

Route choice

Demand control

Mobility management

Traffic flow patterns

Traffic flow changes

Traffic nuisance

Experience

Asphalt, the sustainable road to success
Road management and maintenance: Theoretical Framework: part i
Considering the balance between:

- Construction method, and,
- Remaining traffic throughput.

Construction method: following factors may be included:

- Procedures and work hours,
- Equipment needed,
- Day or night,
- Planning,
- Etc.
Traffic effects during Road works: theoretical framework part ii

4-step model

- Trip generation
- Trip distribution
- Modal split
- Route choice

- Information
- Demand control
- Mobility management
- Traffic flow patterns

Capacity change → Traffic management
Traffic effects: the 4 step model

Availability of the network and links:

1. travellers make a trip (Trip generation),
2. destination of trip (Trip distribution),
3. which transport mode (Mode choice), and,
4. what route (Route assignment).
Externalities hindrance and nuisance; theoretical framework part iii
Hindrance vs Nuisance

Objective Hindrance: Three levels:
- Area based
- Network based
- Traveller based

Subjective hindrance: Nuisance
- Information provision
- Credibility of administration and/or contractor
- Duration road block
- Time day or night
Using the framework

6 process steps

– planning road maintenance,
– method construction work be done,
– traffic management, capacity change
– manipulate level trip generation/trip distribution,
– mobility management on mode choice
– information on travel times, road blocks & re-routing,
Using the framework: Presentation of the model calculation results:

- Little extra costs, large decrease of hindrance & nuisance
- Optimum situation? Acceptable costs and acceptable hindrance & Nuisance
- Much extra costs and slow decrease of hindrance & nuisance
Conclusions

• Model is good usable for cyclic road maintenance planning and gives idea about costs and hindrance and nuisance.

• 4 step model plays a central role within theoretical framework

• Two extensions:
  1. deals with road works management,
  2. deals with changed traffic flows; hindrance & nuisance,

• Model is usable for LCA analysis (also sustainability issues)

• Makes clear to politics what best choices are related to costs,

  Hindrance and Nuisance.

Asphalt, the sustainable road to success