


TRANSPORT & MOBILITY LEUVEN TREMOVE

The Transport Demand Module



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Contact group meeting
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TRANSPORT & MOBILITY LEUVEN TREMOVE

Overview

- ◆ Basic principles
- ◆ Private transport
- ◆ Business transport
- ◆ Calibration
- ◆ Simulation



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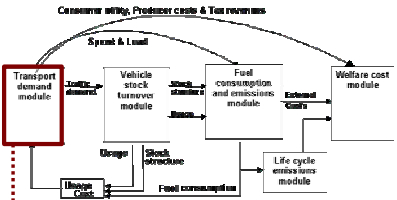
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Basic principles



..... Modelling of transport demand for each country for 1995 - 2020.

TREMOVE does not forecast transport demand !
It reproduces the SCENES forecast model as baseline
TREMOVE will model scenarios

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Basic principles

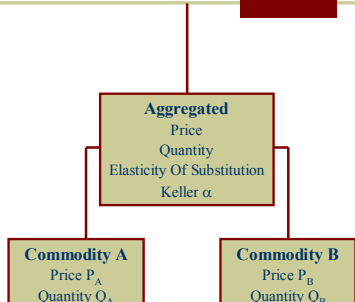
- ◆ Demand for **Private transport** is part of decision process of all households
- ◆ Demand for **Business transport** is part of decision process of all firms

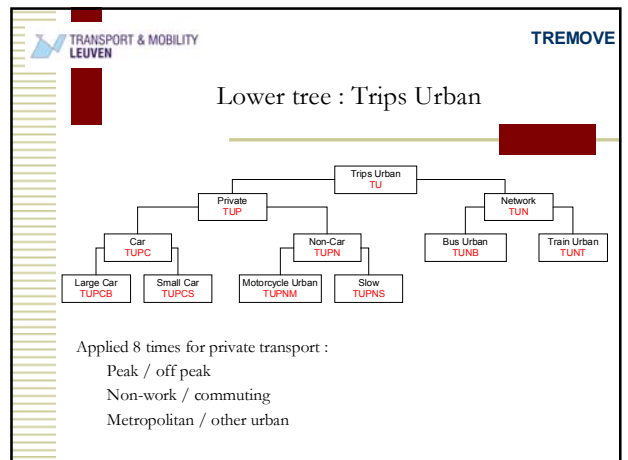
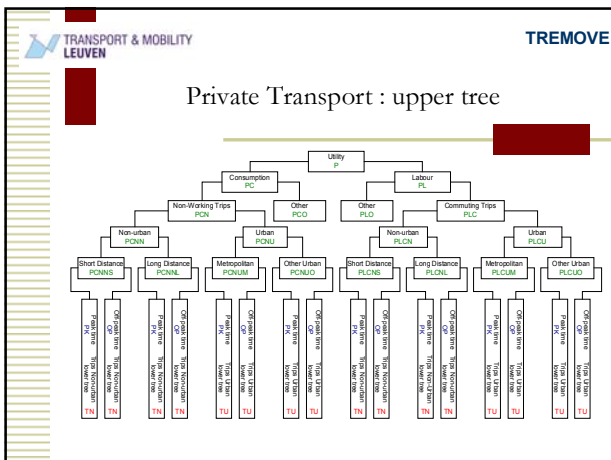
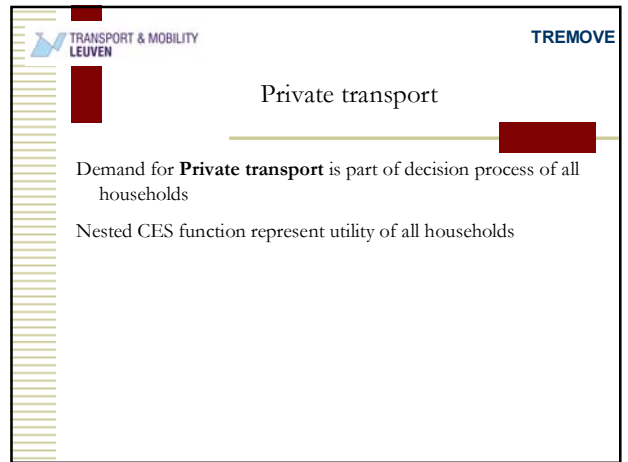
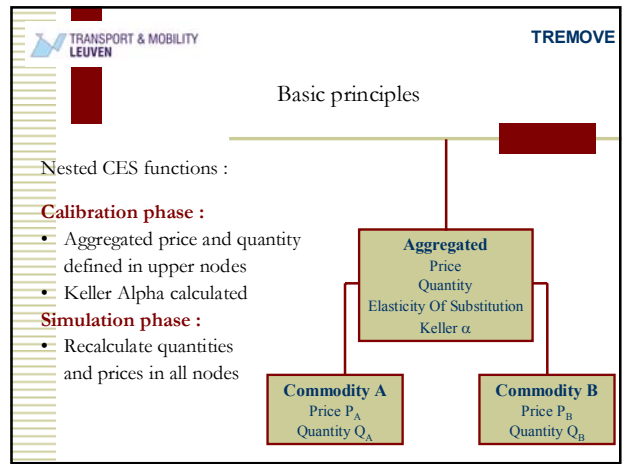
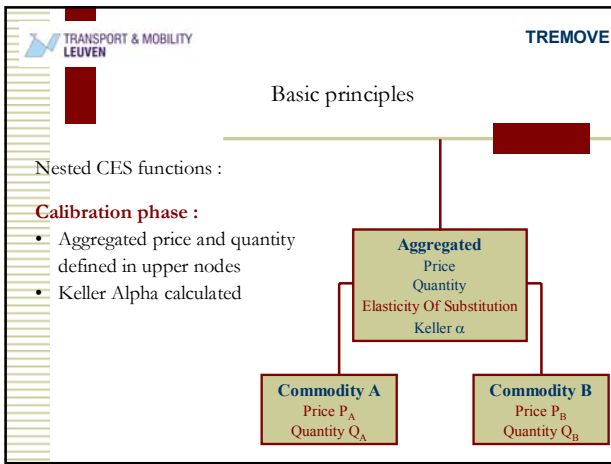
These decisions are modelled with
Nested Constant Elasticity of Substitution functions
(Nested CES)

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Basic principles

Nested CES functions :





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Lower tree : Trips Non-urban

Applied 8 times for private transport :

- Peak / off peak
- Non-work / commuting
- Long distance / short distance

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Private Transport

- 2 trip motives : commuting – non-work
- 3 regions : metropolitan – other urban – non-urban
- 4 road types : metropolitan – other urban – motorway – other roads
- 2 distance classes (within non-urban area) : short (<500 km) and long (>500 km)
- 2 time periods : peak period – off peak
- 7 trip modes : small car – large car – motorcycle – slow – bus – train – plane

Private CES function :

- 136 lowest nodes
- 137 EOS

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Business transport

Demand for **Business transport** is part of decision process of all firms

Nested CES function represent costs of all firms

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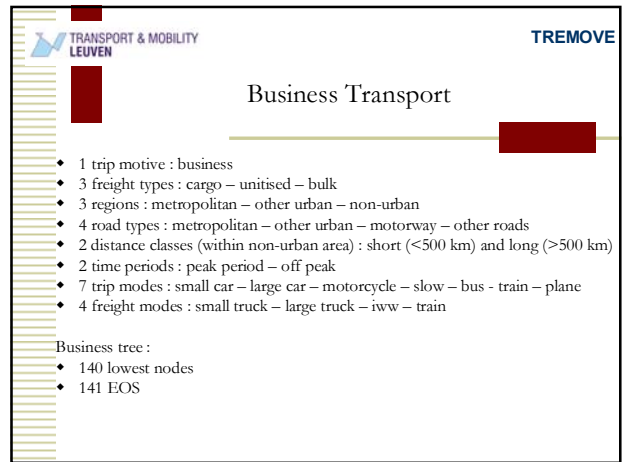
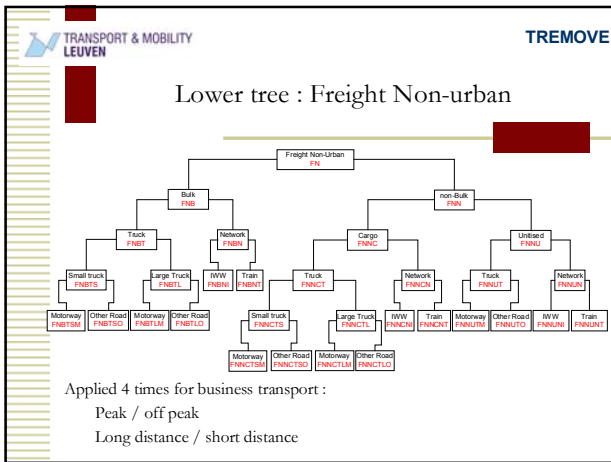
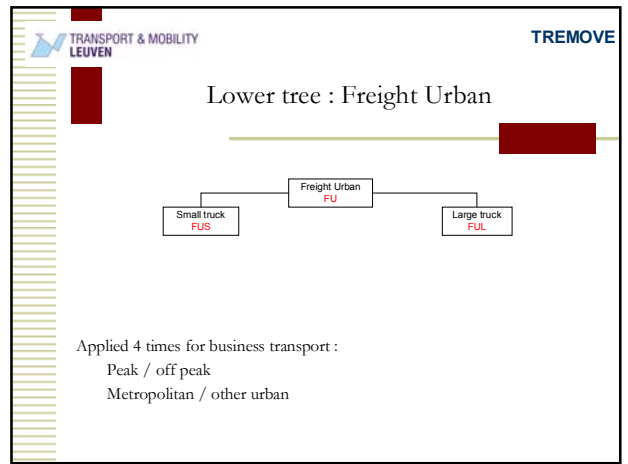
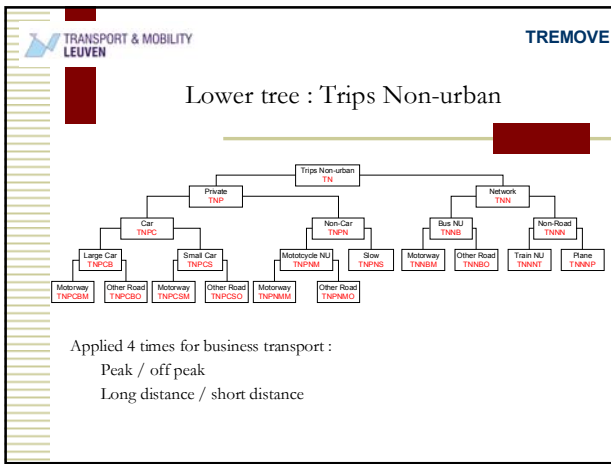
Business Transport : upper tree

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Lower tree : Trips Urban

Applied 4 times for business transport :

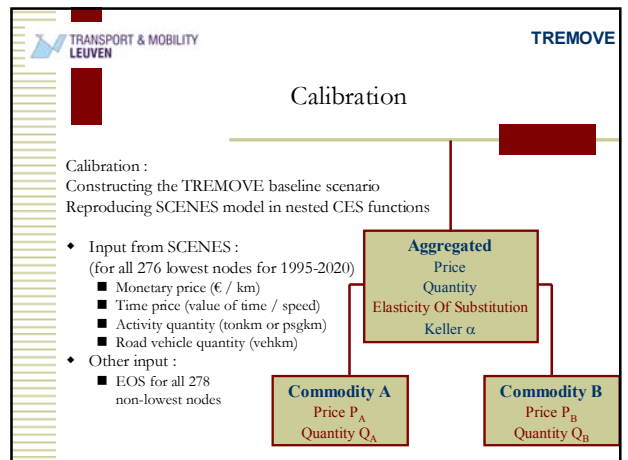
- Peak / off peak
- Metropolitan / other urban



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Calibration

Purpose :

- Calculating aggregated prices and costs in non-lowest nodes
- Calculating Keller α for all non-lowest nodes
- Calibrating congestion curve :

Traveltime for each road type depends on all vehicle quantities of all road modes during that period.
 e.g. : travel time during peak period for motorways depends both on small cargo trucks and on non-work motorcycle trips.

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Calibration

From SCENES output to TREMOVE input :

Aggregation :

- ♦ From network to area
- ♦ Trip motives
- ♦ Freight types

Disaggregation

- ♦ Peak / off-peak period
- ♦ Small / large cars

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Simulation

Modelling scenarios :

e.g. changes in monetary prices
 ⇒ New time prices and speeds
 ⇒ New quantities

```

  graph TD
    A["Commodity A  
Price PA  
Quantity QA"] --> B["Aggregated  
Price  
Quantity  
Elasticity Of Substitution  
Keller α"]
    C["Commodity B  
Price PB  
Quantity QB"] --> B
    B --> D["Simulation"]
  
```

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