HeavyRoute:
Pre-trip routing application
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Brussels, 10.06.2009
Contribution of PTV:

1. Aggregation of formats and sources of available dynamic data
2. Development of the „pre-trip routing application“ supporting truck profile specific route calculation
3. VISUM simulation of truck routing for the South of Sweden
Pre-trip routing application

Aim of the pre-trip routing application:
Providing the best alternative route for a heavy goods vehicle, based on additional parameters like:

1. fuel consumption
2. CO$_2$-emissions
3. effects on the infrastructure
4. traffic safety and driver comfort
# Pre-trip routing application

## What has been done:

1. Definition of HeavyRoute modes (lowest fuel consumption, traffic safety, driver comfort, …)

2. Additional truck attributes were integrated in a NAVTEQ Sweden map

3. The defined project use cases were implemented:
   a. routing a heavy goods vehicle based on a specific truck profile & a selected mode
   b. obtaining 5 allowable routes
   c. obtaining the recommended route out of the 5 allowable routes
   d. navigation of the driver according to the chosen recommended route
## Additional truck attributes

These truck attributes were included in the Sweden map (data base NAVTEQ):

<table>
<thead>
<tr>
<th>Physical Restrictions</th>
<th>Hazardous Materials Restrictions</th>
<th>Legal Restrictions</th>
<th>Warning Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height Restriction</td>
<td>All trucks with hazardous goods forbidden</td>
<td>Trucks not allowed</td>
<td>Steep hill downwards ahead</td>
</tr>
<tr>
<td>Weight Restriction</td>
<td>All trucks with explosive and inflammable goods forbidden</td>
<td></td>
<td>Steep hill upwards ahead</td>
</tr>
<tr>
<td>Weight per Axle</td>
<td>All trucks with natural goods that can be harmful for the water forbidden</td>
<td></td>
<td>Sharp curves</td>
</tr>
<tr>
<td>Width Restriction</td>
<td></td>
<td></td>
<td>Lateral wind</td>
</tr>
<tr>
<td>Length Restriction</td>
<td></td>
<td></td>
<td>Risk of grounding</td>
</tr>
</tbody>
</table>
Route request I

To receive a route the user can select one of the predefined vehicle profiles:

<table>
<thead>
<tr>
<th>Vehicle class</th>
<th>Vehicle profile</th>
<th>Type</th>
<th>Type</th>
<th>Gross weight (tons)</th>
<th>No. axles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nordic European</td>
<td>TT/AT</td>
<td>Semi trailer or articulated truck</td>
<td>50-60</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>Mid European</td>
<td>TT/AT</td>
<td>Semi trailer or articulated truck</td>
<td>34-40</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Rigid truck</td>
<td>RT</td>
<td>Rigid truck</td>
<td>14-20</td>
<td>3</td>
</tr>
</tbody>
</table>

…OR

The user can create his own vehicle profile depending on the actually used heavy goods vehicle.
Route request II

Additionally the user can choose the following vehicle info:

- Selection of the emission class of the used truck (Euro 1 – Euro 4)
- Selection of the actual load class of the vehicle (empty = 0%; partially loaded = 50%; full = 100%)
- Noise reduction (Yes – No)

The route request includes the following information:

- Starting and end point
- Starting date/time
- HeavyRoute mode for the calculation of recommended routes
Calculation of 5 allowable routes

To obtain the 5 allowable routes a routing is done taking into account all relevant parameters (additional truck attributes, vehicle data and selected mode).

User interface of the routing application
The recommended route

The 5 allowable routes are displayed with all relevant costs.

The user of the system can choose one of the routes depending on his desired mode.

The chosen route can be handed over via a dedicated interface to the truck navigation system of PTV.
Routing example: Truck navigation simulation

Route Description

Length: 3.3 km Duration: 0:03 h
0 m 0:00 h
Start onto Nynäsvägen

Cancel Simulation Navigation

Route Description

Length: 3.6 km Duration: 0:05 h
0 m 0:00 h
Start onto Nynäsvägen

Cancel Simulation Navigation
Field Tests in Sweden – October 2008

The results of the pre-trip routing application were tested in Sweden:

• Four runs of the test routes took place

• All data were logged per route for each of the four runs

• The whole field tests were documented in terms of protocols, deliverables and pictures
Thank you for your attention!