The ROADEX IV Project

Ron Munro, Munroconsult Ltd

ROADEX Climate Change Workshop
Inverness, Tuesday 19th October 2010
ROADEX Introduction

- ROADEX history
- Demonstration projects
- Research projects
- ROADEX elearning
- Website

Vehicle-Human vibration
EU Northern Periphery Programme
The ROADEX projects 1998 - 2012:

- **ROADEX II** (2002-2005) The Research Project
- **ROADEX III** (2006-2007) The Dissemination Project
- **ROADEX IV** (2009-2012) The Implementation Project
The ROADEX Partners:

- **Lead Partner, The Swedish Transport Administration Northern Region, The Swedish Forest Agency**
- **Centre for Economic Development, Transport and the Environment, Lapland, Keski-Suomi and Savo Karelia region**
- **The Government of Greenland**
- **The Icelandic Road Administration**
- **The Northern Region, Norwegian Public Roads Administration**
- **The Highland Council, Forest Enterprise, Comhairle Nan Eilean Siar**
- **National Roads Authority, Department of Transport, Ireland**
- **Associate Partner:** The Forest Engineering Research Institute of Canada, (FERIC)
- **Project Consultant: Roadscanners Oy, Finland**
Project structure

- Dissemination
  - Website
  - Knowledge Centre
  - Consultancy
  - eLearning

- Demonstrations
  - 7 countries
  - 11 Partners
  - 23 projects

- Research
  - Climate change
  - Vehicle vibration
  - Road widening
# Demonstration projects

<table>
<thead>
<tr>
<th>Project</th>
<th>Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage maintenance</td>
<td>Timo Saarenketo</td>
</tr>
<tr>
<td>Road friendly vehicles &amp; TPC</td>
<td>Pauli Kolisoja</td>
</tr>
<tr>
<td>Forest road policies</td>
<td>Svante Johansson</td>
</tr>
<tr>
<td>Design against rutting</td>
<td>Pauli Kolisoja</td>
</tr>
<tr>
<td>Roads on Peat</td>
<td>Ron Munro</td>
</tr>
<tr>
<td>Driver vibration</td>
<td>Johan Granlund</td>
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</tbody>
</table>
Locations of the demonstrations

• Location of a demonstration project
## Local demonstration projects:

<table>
<thead>
<tr>
<th>No</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Greenland</td>
<td>Drainage maintenance guidelines - to be managed by Dr Timo Saarenketo of Roadscanners Oy, author of the ROADEX drainage reports</td>
</tr>
<tr>
<td>2</td>
<td>Iceland</td>
<td>Road friendly vehicles and CTI - to be managed by Professor Pauli Kolisoja of the Tampere University of Technology, author of the ROADEX report on permanent deformation.</td>
</tr>
<tr>
<td>3</td>
<td>Ireland</td>
<td>Forest Road management and maintenance policies - to be managed by Svante Johansson of Roadscanners AB, author of the ROADEX reports and policies on the socio-economic impacts of low volume roads.</td>
</tr>
<tr>
<td>4</td>
<td>Ireland</td>
<td>Rutting, from theory to practice - to be managed by Professor Pauli Kolisoja of the Tampere University of Technology, author of the ROADEX report on permanent deformation.</td>
</tr>
<tr>
<td>5</td>
<td>Highland</td>
<td>Roadscanners AB, author of the ROADEX reports and policies on the socio-economic impacts of low volume roads.</td>
</tr>
<tr>
<td>6</td>
<td>Western Isles</td>
<td>Roads on Peat - to be managed by Ron Munro of Munroconsult Ltd, author of the ROADEX reports on roads constructed on peat.</td>
</tr>
<tr>
<td>7</td>
<td>Sweden</td>
<td>Analysis of health problems due to vibration - to be managed by Johan Granlund, Vectura Consulting AB, author of the ROADEX III Task B report “Health Issues Raised by Poorly Maintained Road Networks”</td>
</tr>
</tbody>
</table>

### NPP Application:

- 7 countries
- 13 Partners
- 6 categories
- 23 projects
The ROADEX Knowledge Centre
ROADEX Research Projects

- Climate change
- Vehicle and human vibration
- Road widening
ROADEX E-Learning packages

E-Learning
An extension of the e-learning project. This permits the production of additional educational material and graphics to make the package more complete and attractive to users.

Lesson 1
Permanent Deformation
The importance of the road network to a society can be compared with the vascular system of a human body.

Lesson 2
Road Construction Over Peat
The importance of the road network to a society can be compared with the vascular system of a human body.

Lesson 3
Drainage of Roads
The importance of the road network to a society can be compared with the vascular system of a human body.

Lesson 4
Environmental Considerations for Low Volume Roads
The importance of the road network to a society can be compared with the vascular system of a human body.
The ROADEX website: www.roadex.org
The ROADEX Project:

www.roadex.org
Climate Change Adaptation
Research Task RE1: Climate change adaptation

Lead Persons: Ron Munro, Adriána Hudecz & Arne Villumsen, ARTEK

Task description:
A research project to identify adaptation strategies for road maintenance to meet the effects of climate change

Output:
A practical guidance document for local roads engineers
Climate Change Adaptation
Impact of climate change on road maintenance

Changes in weather conditions

Changes in methods & frequency

Changes in the cost of maintenance

Changes in the condition of the road network

“Impact of climate change on road maintenance” by Olli Mäkelä et al, Finnish Road & Traffic, 2009

Freeze-thaw damage  Flooding  Winter conditions  Rutting
Climate Change Adaptation

ROADEX and Climate Change

“What to do” and “How to do it” rather than research.

The aim will be to give guidance on

• Improved risk strategies
• Improved design standards
• Improved drainage guidelines

...to be able to better manage the effects of climate change on road networks...
## Climate Change Adaptation

### Task plan:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
<th>Complete?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Prepare summary of current prediction models and effects</td>
<td>✔️</td>
</tr>
<tr>
<td>2</td>
<td>Identify key contacts in Partner organisations</td>
<td>✔️</td>
</tr>
<tr>
<td>3</td>
<td>Identify climate change strategies in Partner countries and organisations</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Summarise good practice</td>
<td></td>
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<tr>
<td>5</td>
<td>Design questionnaire for views of local engineers</td>
<td>✔️</td>
</tr>
<tr>
<td>6</td>
<td>Contact practical engineers in areas with Questionnaire</td>
<td>✔️</td>
</tr>
<tr>
<td>7</td>
<td>Summarise good practice</td>
<td></td>
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<tr>
<td>8</td>
<td>Produce guidance document</td>
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</tbody>
</table>
Open discussion
Climate Change - possible impacts:


- Disruption of the network by extreme weather events (rain, snow, high temperatures)
- Damage to roads through deterioration, deformation and subsidence
- Flooding from rivers, seas and inadequate land drainage
- Severance of routes by landslides and avalanches
- Damage to roadside infrastructure by high winds
- New challenges to road safety
Climate Change - possible impacts (2):

• **Temperature**
  - Carriageway effects
  - Frost damage (including freeze-thaw cycles and frost heave)
  - Permafrost effects
  - Winter maintenance
  - Increase of sea level

• **Precipitation**
  - Floods
  - Erosion of roads and bridges
  - Drainage problems
  - Landslides
www.roadex.org