The ROADEX Projects
Exchanging information on low volume roads across the European Northern Periphery

Ron Munro, Project Manager, ROADEX IV
The ROADEX Project:

[Images of various road projects and equipment in different environments, such as forests, snowy areas, and construction sites.]

www.roadex.org
The “ROADEX” co-operation

- A “trans-national” network of Northern Periphery roads organisations committed to:
  - Share best practice
  - Research and develop new knowledge
  - Implement and test new solutions
- Running for 12 years over 4 projects
- Supported by EU funding from the Interreg IIIb Northern Periphery Programme.
The Northern Periphery Programme area
## The ROADEX IV Partners:

<table>
<thead>
<tr>
<th>Flag</th>
<th>Partner Name</th>
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<tbody>
<tr>
<td>🇸🇪</td>
<td>Lead Partner, The Swedish Transport Administration Northern Region, The Swedish Forest Agency</td>
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<tr>
<td>🇫🇮</td>
<td>Centre for Economic Development, Transport and the Environment, Lapland, Keski-Suomi and Savo Karelia regions</td>
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<tr>
<td>🇩🇰</td>
<td>The Government of Greenland</td>
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<td>🇳🇴</td>
<td>The Icelandic Road Administration</td>
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<td>🇳🇴</td>
<td>The Northern Region, Norwegian Public Roads Administration</td>
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<tr>
<td>🇸🇪</td>
<td>The Highland Council, The Western Isles Council, Forestry Commission Scotland</td>
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<tr>
<td>🇮🇪</td>
<td>The National Roads Authority, The Department of Transport, Ireland</td>
</tr>
<tr>
<td>🇨🇦</td>
<td>Associate Partner: The Forest Engineering Research Institute of Canada, (FERIC)</td>
</tr>
</tbody>
</table>

Project Consultant: Roadscanners Oy, Finland
The ROADEX Partner areas
Why are we collaborating?

- **Common problems** of:
  - Mature road networks in peripheral areas
  - Low traffic volumes
  - Lifeline roads to remote communities
  - Limited budgets
  - Increasing user expectations
  - Changing climate

- Looking for **sustainable solutions**:
  - Affordable
  - Fit for purpose
  - Environmentally sustainable

- All need to get **MORE from LESS**
ROADEX IV
4 projects since 1998:

- **ROADEX I** 1998-2001 The Pilot Project
- **ROADEX II** 2002-2005 The Research Project
- **ROADEX III** 2006-2007 The Dissemination Project
- **ROADEX IV** 2009-2012 The Implementation Project

Timeline

The ROADEX PILOT PROJECT
1998-2001

• created the network
• identified and reported best practices and procedures in winter maintenance and road condition management
• started the knowledge sharing
The ROADEX Pilot Project Results

- 2 State of the Art Reports
  - Winter maintenance
  - Road condition management
- A multi-media CD-ROM
- The www.roadex.org website
- Test reports on road trials
- Technical papers in Oslo, Trondheim, Barcelona, Helsinki and Sapporo
ROADEX II - The Research Project

The Highland Council, Forest Enterprise & The Western Isles Council

Northern Region of The Norwegian Public Roads Administration & The Norwegian Road Haulage Association

Northern Region of The Swedish National Road Administration

Lapland and Keski-Suomi districts of Finra, Metsähallitus, Lapin Metsäkeskus, Metsäliitto & Stora-Enso

Project consultants: Roadscanners Oy
ROADEX II (2002-2005)

The Problem:

End User Needs: Increasing Heavy Traffic

Road Owner Obligations: Road Network Performance

How to close the Gap?

Reaction / Decision Making

LOAD / TRAFFIC RESTRICTIONS

MAINTENANCE / REHABILITATION MEASURES

NO MEASURES

Modern production "the management of logistical chains"

Reducing road funding

The Problem:

Modern production "the management of logistical chains"

Reducing road funding

The Problem:

Modern production "the management of logistical chains"

Reducing road funding

The Problem:
The ROADEX II Project 2002-2005

The ROADEX II solution:

- Map the weak sections of road and **FOCUS** in on them
- **Understand** the processes causing the problems
- **Innovate** - find new ‘fit for purpose’ structures and treatments
ROADEX II “The Research Project” outputs

1. A user perspective on ROADEX II test areas’ road network service level
2. Permanent deformation
3. New material treatment techniques
4. Managing spring thaw weakening on low volume roads
5. Socio-economic impacts of road conditions on low volume roads
6. Drainage on low volume roads
7. Dealing with bearing capacity problems on low volume roads constructed on peat
8. Environmental guidelines & checklist
9. Structural Innovations
10. Monitoring, communication and information systems & tools for focusing actions
11. Road management policies for low volume roads – some proposals

All reports available at www.roadex.org
The ROADEX III  "The Dissemination Project"

The Northern Region, Lead Partner  
Dalarna-Gävleborg Regional Board of Forestry

Finra, Savo-Karjala District

The Municipality of Sisimiut

The Icelandic Public Roads Administration

The Northern Region

The Highland Council, Forest Enterprise, The Western Isles Council

Project consultant: Roadscanners Oy
ROADEX III - The Dissemination Project

Task A
Dissemination of knowledge
- 8 Executive Summaries
- E-learning Packages
- ROADEX Website
- 6 Language Translations
- 14 Seminars

Task B
Continuing Research
- Drainage
- Deformation mitigation
- Health Issues
- Road policies
- Greenland case study

Task C
Extension funding
- E-learning extension
- Greenland video
- ROADEX video
- 2 Seminars
- Brochures
ROADEX III
Task A
8 Executive summaries translated into 6 Partner languages available at
www.roadex.org
local seminars across NPP to over 1,500 delegates
2.3 Mode 1 Rutting

What is Mode 1 rutting?

In weaker granular materials, local shear close to the wheel may occur. This gives rise to dilative heave immediately adjacent to the wheel track where granular material can undergo large plastic shear strains and consequent dilation, leading to relatively loose material. This rutting can therefore be considered to be largely a consequence of inadequate granular material shear strength in the aggregate relatively close to the pavement surface.

Evidence from both trial pavements and from theory has demonstrated that the maximum shear in Mode 1 rutting is felt at a depth of approximately 1/3rd of the width of the wheel or width of the wheel pair where twin tyres are used. In pavements with significant traffic wander (wide lanes, roads with no markings, roads without existing ruts) the depth may even be a little deeper. Similarly, in pavements which have a significant asphalt layer the critical depth is likely to be rather deeper from the surface than a third of the wheel width due to the effects of the asphalt in changing the stress distribution within the pavement. Research results from the ROADEX III project showed that in general the most critical depth is at a
ROADEX III research projects

B1  Drainage guidelines
B2  Permanent deformation – road user & road owner
B3  Driver health & vibration issues
B4  Social and economic need for low volume roads
B5  Greenland case study
ROADEX IV “The Implementation Project”

- to implement the ROADEX methods & strategies and have them accepted on the Partner road networks
ROADEX IV project structure

Dissemination
- Website
- Knowledge Centre
- Consultancy
- eLearning

Demonstrations
- 7 countries
- 11 Partners
- 23 projects

Research
- Climate change
- Vehicle vibration
- Road widening
<table>
<thead>
<tr>
<th>Demonstration projects</th>
<th>Drainage maintenance</th>
<th>Low impact vehicles &amp; TPC</th>
<th>Forest road policies</th>
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<tbody>
<tr>
<td>Timo Saarenketo</td>
<td>Pauli Kolisoja</td>
<td>Svante Johansson</td>
<td></td>
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<tr>
<td>Design against rutting</td>
<td>Roads on Peat</td>
<td>Driver vibration</td>
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<tr>
<td>Pauli Kolisoja</td>
<td>Ron Munro</td>
<td>Johan Granlund</td>
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ROADEX IV demonstration projects

Location of a demonstration project
## Local demonstration projects:

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<tr>
<th>No</th>
<th>Location</th>
<th>Description</th>
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<tr>
<td>1</td>
<td>Greenland</td>
<td>Drainage maintenance guidelines</td>
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<td>Timo Saarenketo, Roadscanners Oy</td>
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<td>2</td>
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<td>Road friendly vehicles and CTI</td>
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<td>Pauli Kolisoja, Tampere University of Technology</td>
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<td>3</td>
<td>Ireland</td>
<td>Forest Road management and maintenance policies</td>
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<td>Svante Johansson, Roadscanners Sweden AB</td>
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<td>4</td>
<td>Ireland</td>
<td>Rutting, from theory to practice</td>
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<td>Pauli Kolisoja, Tampere University of Technology</td>
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<tr>
<td>5</td>
<td>Highland</td>
<td>Roads on Peat</td>
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<td>Ron Munro, Munroconsult Ltd</td>
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<td>6</td>
<td>Western Isles</td>
<td>Analysis of health problems due to vibration</td>
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<td>Johan Granlund, Vectura Consulting AB</td>
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</table>

- 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
ROADEX Solutions

- **New survey methods** to help designers focus on problem sections and make correct diagnoses;
- **New risk assessments methods** for heavy traffic on public and forest roads;
- **New models** for designing road structures against permanent deformation;
- **New guidance** for rehabilitating low volume roads;
- **New training packages** for in-house & external staff;
- **New techniques** for real time road condition monitoring;
- **New information** for political decision makers regarding the importance of rural road conditions;
- And many others …..
The ROADEX Project:

[Images of construction and survey work in remote locations, with logos and website URL: www.roadex.org]
Thank you

www.roadex.org