



# ROADEx

Implementing Accessibility



---

# 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

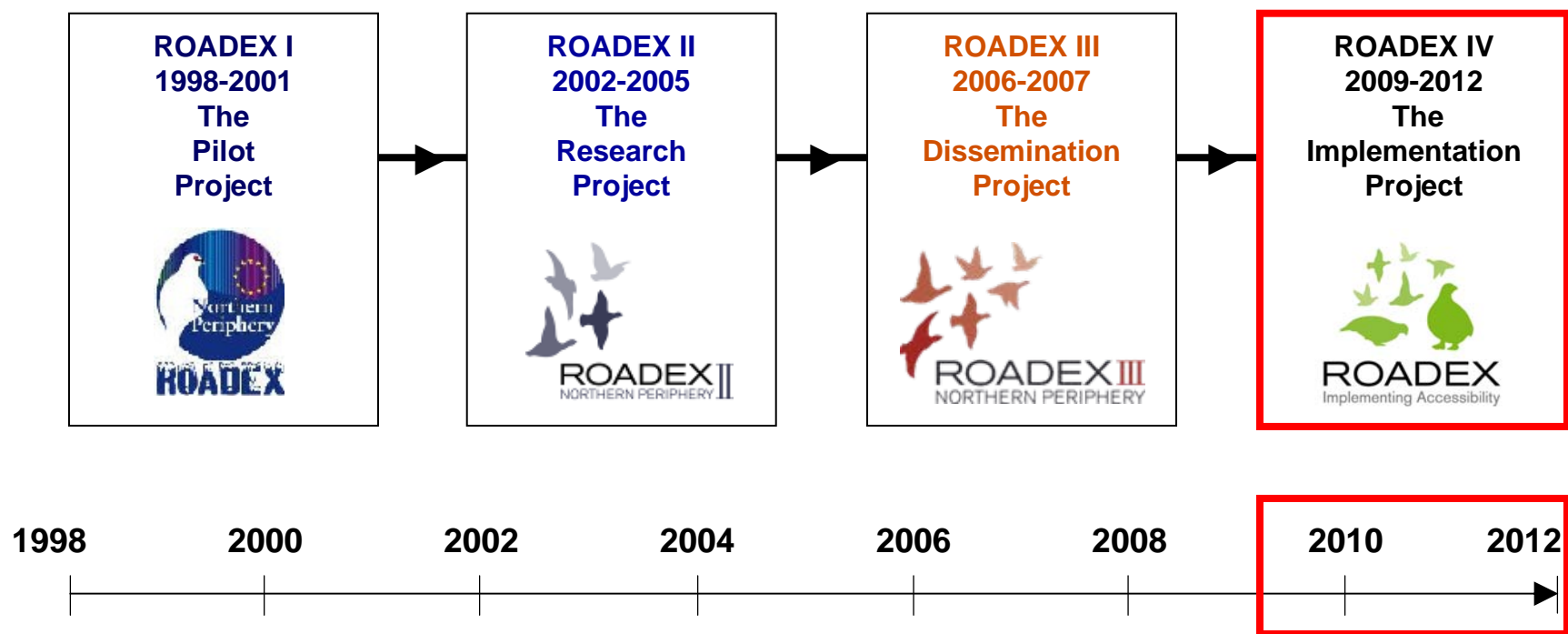


Vehicle-Human vibration

# EU Northern Periphery Programme



# The ROADEX projects 1998 - 2012:



# The ROADEx Partners:



Lead Partner, The Swedish Transport Administration  
Northern Region, The Swedish Forest Agency



TRAFIKVERKET



Skogsvårdsstyrelsen  
DALARNA – GÄVLEBORG



Centre for Economic Development, Transport and the  
Environment, Lapland, Keski-Suomi and Savo Karelia regio



Centre for Economic Development,  
Transport and the Environment



The Government of Greenland



The Icelandic Road Administration



The Northern Region, Norwegian Public Roads Administration



The Highland Council, Forest Enterprise,  
Comhairle Nan Eilean Siar



Forest Enterprise



National Roads Authority,  
Department of Transport, Ireland



Comhshaoil, Oidhreacht agus Rialtas Áitiúil  
Environment, Heritage and Local Government

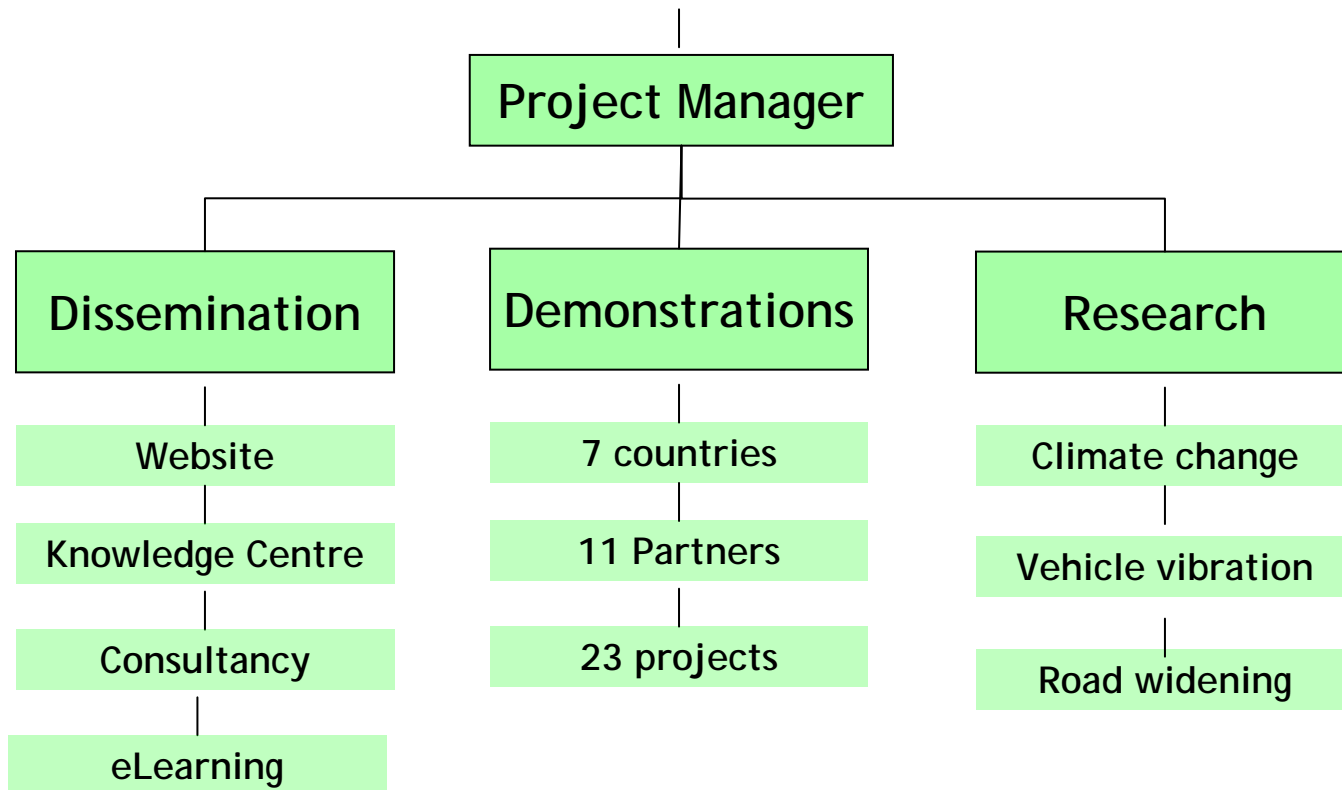


Associate Partner:  
The Forest Engineering Research Institute of Canada, (FERIC)



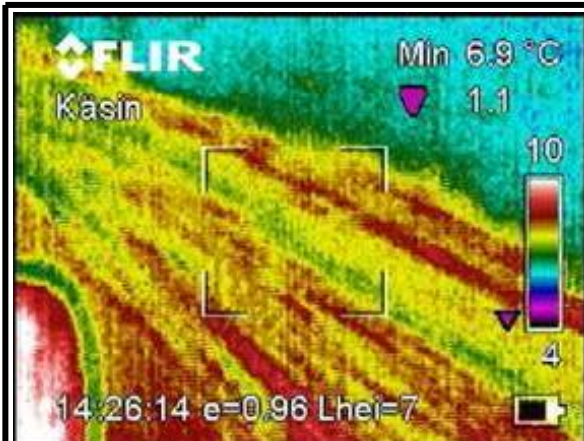
Project Consultant: Roadscanners Oy, Finland

# Project structure





# Demonstration projects



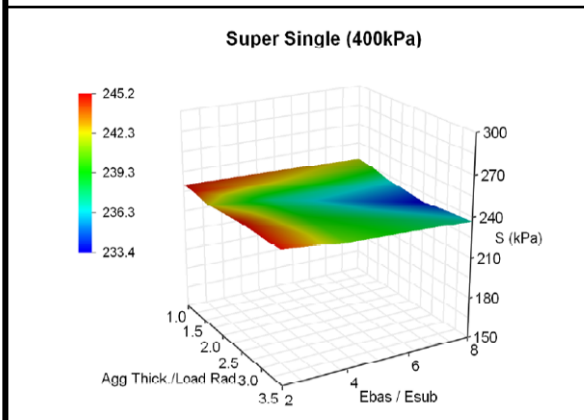
**Drainage maintenance**  
Timo Saarenketo



**Road friendly vehicles & TPC**  
Pauli Kolisoja



**Forest road policies**  
Svante Johansson



**Design against rutting**  
Pauli Kolisoja



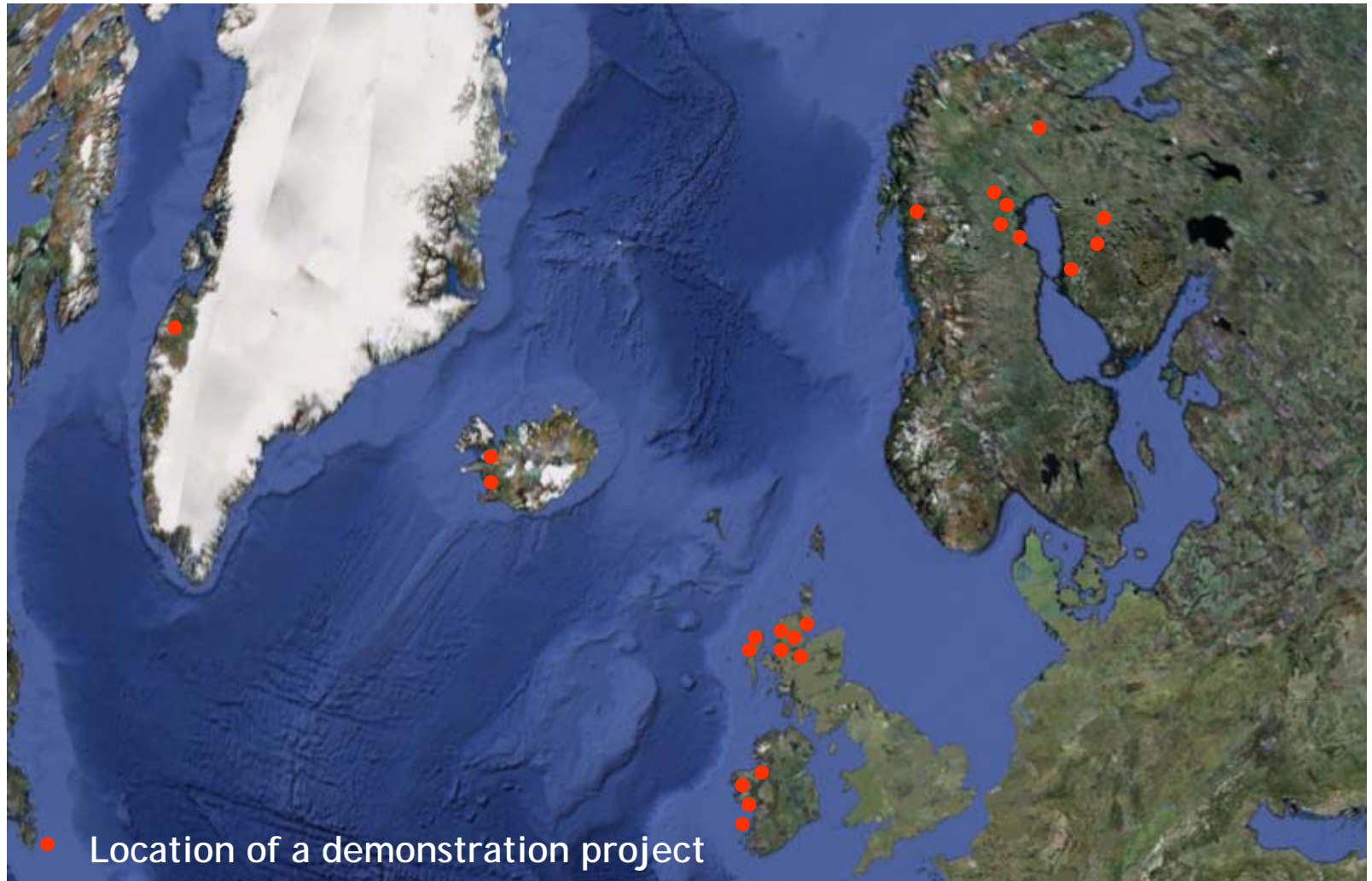
**Roads on Peat**  
Ron Munro



**Driver vibration**  
Johan Granlund



# Locations of the demonstrations



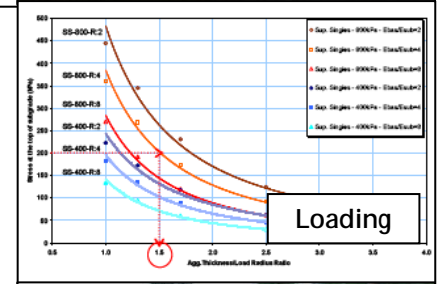
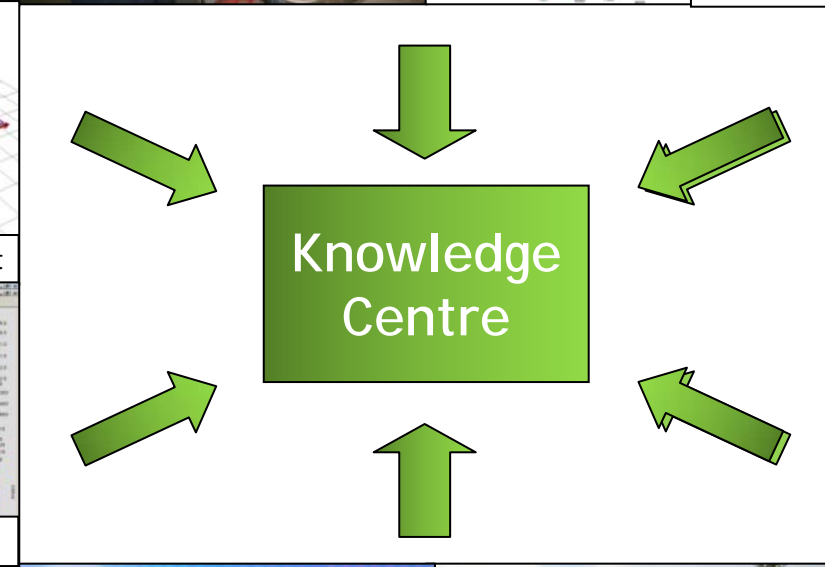
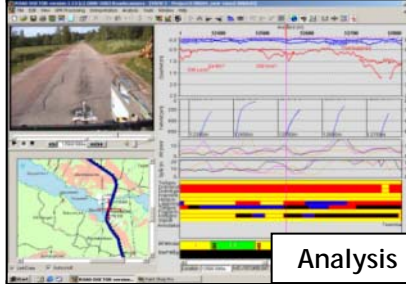
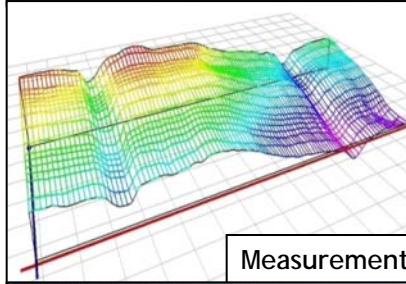
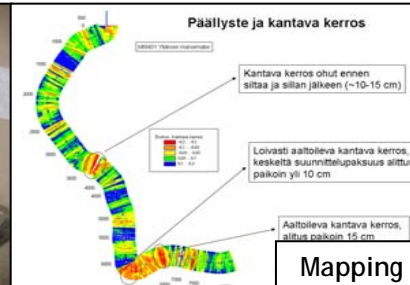
# Local demonstration projects:

## NPP Application:

- 7 countries
- 13 Partners
- 6 categories
- 23 projects

No	Location	Description
1	Greenland	Drainage maintenance guidelines - to be managed by Dr Timo Saarenketo of Roadscanners Oy, author of the ROADEX drainage reports
2	Iceland	
3	Ireland	
4	Ireland	
5	Highland	
6	Western Isles	
7	Sweden	
8	Finland	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.
9	Highland	
10	Sweden	
11	Ireland	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.
12	Highland	
13	Sweden	
14	Finland	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.
15	Iceland	
16	Highland	
17	Western Isles	
18	Sweden	
19	Kerry	Roads on Peat - to be managed by Ron Munro of Munroconsult Ltd, author of the ROADEX reports on roads constructed on peat.
20	Donegal	
21	Finland	Analysis of health problems due to vibration - to be managed Johan Granlund, Vectura Consulting AB, author of the ROADEX III Task B report "Health Issues Raised by Poorly Maintained Road Networks"
22	Norway	
23	Highland	

# The ROADEx Knowledge Centre






# ROADEx Research Projects




# ROADEX E-Learning packages

[Extranet Login](#)   [Login](#)




**Latest News:** 13 August 2008. After being hosted for a few months on a temporary web site the e-learning package is now running directly from the ROADEX web site's server.



## 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.

[Home](#)  
[E-Learning](#)  
Lesson 1  
Permanent Deformation  
Lesson 2  
Road Construction Over Peat  
Lesson 3  
Drainage of Roads  
Lesson 4  
Environmental Considerations for Low Volume Roads  
[Consultancy and Knowledge Centre](#)




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

[Continue](#) [Download Lesson 1](#) 4.1MB




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.

[Continue](#) [Download Lesson 2](#) 4.1MB




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.

[Continue](#) [Download Lesson 3](#) 4.1MB



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.

[Continue](#) [Download Lesson 4](#) 4.1MB




© ROADEX 2001-2006. All Rights Reserved. [Contact Webmaster](#)



# The ROADEX website: [www.roadex.org](http://www.roadex.org)

Latest News: 15.07.2010. ROADEX meets FPInnovations. Scotland, Finland and Sweden were happy to host TPCS expert Al Bradley of FPL... more.



## ROADEX Services


The ROADEX Project offers a number of services to its Partner organisations to support the continual improvement of the organisations and the rural road networks they manage.

[Home](#)  
[About Us](#)  
[Background](#)  
[ROADEX Services](#)  
[Consultancy](#)  
[The ROADEX Knowledge Centre](#)  
[The Partner Knowledge Bank](#)  
[Demonstration Projects](#)  
[Research Projects](#)  
[ROADEX E-Learning](#)  
[News](#)  
[Contacts](#)

### The ROADEX Consultancy Service

A consultancy service to support the in-house teams in the application of ROADEX technologies


[Continue](#)



### The ROADEX Knowledge Centre

The place where all published ROADEX publications and media can be accessed


[Continue](#)




### The Partner Knowledge Bank


The Partner area of the website where Partners can share in-house information on low volume roads

[Continue](#)



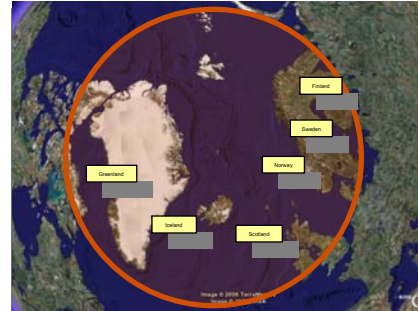
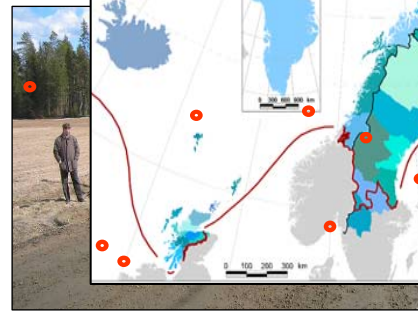
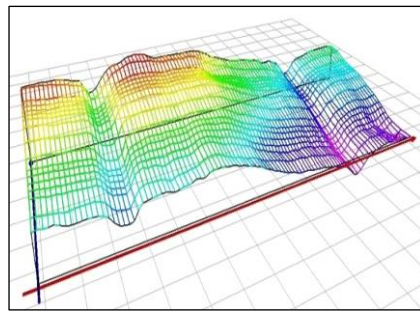


THIS PROJECT IS BEING PART-FINANCED BY EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND



Northern Periphery Programme  
2007-2013

# The ROADEx Project:





---

# 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:

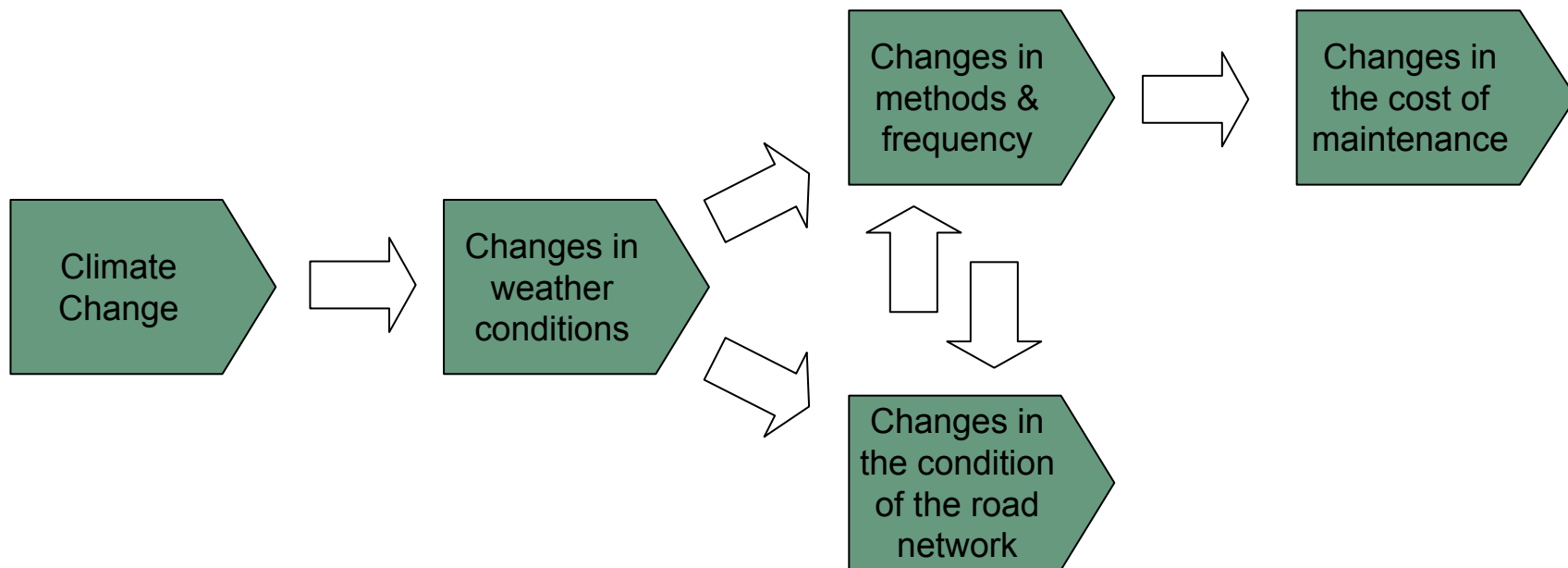
A practical guidance document for local roads engineers





# Climate Change Adaptation

## Impact of climate change on road maintenance



***“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

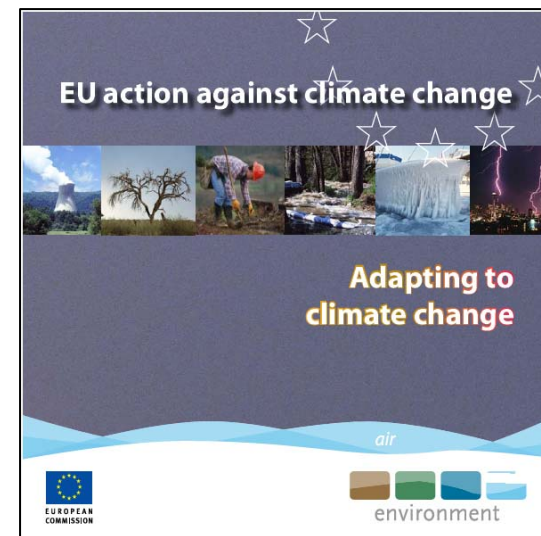
## ROADEx and Climate Change

“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:

Stage	Description	
1	Prepare summary of current prediction models and effects	✓
2	Identify key contacts in Partner organisations	✓
3	Identify climate change strategies in Partner countries and organisations	
4	Summarise good practice	
5	Design questionnaire for views of local engineers	✓
6	Contact practical engineers in areas with Questionnaire	✓
7	Summarise good practice	
8	Produce guidance document	



# Open discussion

# Climate Change - possible impacts:

(*"The Changing Climate: Impact on the Department of Transport"*, 2004)

- 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





**ROADEx**  
Implementing Accessibility

[www.roadex.org](http://www.roadex.org)