Roads on Peat
Ron Munro, Project Manager ROADEX IV
Inverness, 18 April 2011
Roads on Peat:

Outline:

• Peat
• Survey methods
• Construction methods
• Maintenance methods
• Wind farms

Floating road on peat, Ireland, 2010
4 reports on the ROADEX website:

- ROADEX III Executive Summary, 2006 “Managing Peat Related Problems on Low Volume Roads”
Rocks on Peat

Peat across the Northern Periphery

- Palsa mires
- Fens
- Raised bogs
- Blanket Bogs
Peatlands:

- “swamps, mires, fens, and bogs”
- poor material for a road foundation?
- predominantly water + dead plant fragments
- up to 95% water, m/c up to 2000%
- variable shear strength, 2kPa to 40kPa
- primary consolidation & secondary compression
- settlement & deformation
Roads on Peat

“The ROADEX method”:

- 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
Rads on Peat

DATA COLLECTION:

- Falling Weight Deflectometer (FWD)
  - bearing capacity of the road
- Drill core data
  - road structure verification & quality
- Digital video
  - pavement condition documentation
- Profilometer
- Ground Penetrating Radar
  - road structures
  - subgrade soil quality
  - reasons for road defects

DATA PROCESSING AND ANALYSIS:

- ‘Road Doctor’ by Roadscanners Oy
- ArcView
Rods on Peat

Integrated Analysis of survey data

Typical integrated analysis screen from “Road Doctor” software
Class Evaluation

0  No immediate risk for major pavement failure. Local pavement cracking and an increase of rut depth may occur.

1  Pavement failure and rutting may occur but only after continued transportation. Initially these failures will focus on sites where the bound layers are deteriorating or have debonded.

2  Pavement distress (rutting and cracking) will appear on the road a short time after timber transport starts, but they should not cause immediate problems for road users.

3  Severe pavement distress will appear immediately after timber transport is started (less than 5000 axle loads). These major damages may cause problems for road users.
Rehabilitation of Roads on Peat

ROADEX methodology

Five stages:

- collect data, identify the underlying problem through surveys
- analyse the collected data & understand the processes at work,
- innovate, select the most suitable rehabilitation measures,
- monitor the work during construction
- record and share the experience from the project
Rehabilitation of Roads on Peat

Buoyancy effects & “do no more harm”

Road on a sound foundation

Floating road on peat

Effects of new drains on a floating road
Rehabilitation of Roads on Peat

Minor carriageway settlement and irregularities

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<tr>
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<tr>
<td>4</td>
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<tr>
<td>5</td>
<td>Excavation limit</td>
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Rehabilitation of Roads on Peat

Use of steel grids:

Full width, no joints
Rehabilitation of Roads on Peat

Carriageway settlement

Cross sections through lightweight rehabilitation structures
Rehabilitation of Roads on Peat
ROADEX sharing experience
Forssa-Somero Road, Finland
Rehabilitation of Roads on Peat

A837 Ledbeg, Scotland

Dec 2004
Rehabilitation of Roads on Peat

B871 Loch Rosail Tyre Bale Embankment
Rehabilitation of Roads on Peat
Rehabilitation of Roads on Peat

Use of tyre bales in a forest road, Ireland, 2006 (J Dempsey)
Rehabilitation of Roads on Peat

Transition wedges

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*Longitudinal section through a transition wedge*
Rehabilitation of Roads on Peat

Summary:

- Identify the underlying problems through survey
- Understand the processes causing the problems
- Innovate - find ‘fit for purpose’ solutions
- Try not cause any further harm
- Be innovative - and share knowledge, even the failures!
Windfarm access roads on peat

FCE/SNH “Floating Roads on Peat” guidelines
Windfarm access roads on peat

Mechanically stabilised embankment with geogrids
Windfarm access roads on peat
Windfarm access roads on peat
Floating roads on peat - research

GPR cross-section
Floating roads on peat - research

Typical floating gravel road cross-section with GPR
Floating roads on peat - research

GPR cross section with a two grid system
Iron age trackway, c4,000 BC, Derraghan, County Longford, Ireland

Thank you
www.roadex.org