CHANGES TO ROAD MAINTENANCE AND OPERATIONS ON ELECTRIC ROADS

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THE AIM

to investigate other maintenance issues than cracks potholes or irregularities

Focus on

• winter road maintenance
• drainage
• side verge area
• road equipment – safety rails as well as ERS infrastructure
THE METHOD

Compare between ERS and non-ERS roads,

Understand the road system and the contract that regulates the road standards and maintenance

Methods or results from previous studies have been used for estimations
ERS CONCEPT IN SWEDEN

Techniques considered
In rural areas
On motorways with at least 1+2 lanes
  *always one lane without ERS – less vulnerable*

The same standards on the roads
  *Same friction levels*
  *Same demands regarding irregularities, cracks etc.*
  *Same demands for drainage, harvesting of road sides etc.*

Maintenance contractor
  *ERS-contractor or regular contractor with responsibility for ERS as well?*
WINTER ROAD MAINTENANCE

Maintenance contract

- Uphold good friction by snow ploughing and anti-icing measures
- Snow ploughing on motorway – parallel driving one vehicle in each lane
- Best solution is that one vehicle operate on the ERS lane

ERS

- Specific brushes to remove snow from rails
- Different type of snow ploughing blades
- De-icing nozzles for overhead lines
- Inductive techniques not affect the winter maintenance

Impact

- Investments in new equipment
- Changed maintenance routes/changed maintenance areas
DRAINAGE

Maintenance contract

Water may damage road
Risks for aquaplaning
Remove obstacles that creates pooling on road

ERS

Rails become barriers
Utility cuts may cause settlements in pavement
Cracks between rails and pavement
Drainage pipes in conductive rails – may clog up

Impact

Increased maintenance and operation
Inspections of ERS
More frequent and more close monitoring or roads
Flushing drainage pipes will impact traffic

Further tests are needed
SIDE VERGE AND ROAD EQUIPMENT

Maintenance contract

All vegetation cut to a width of 10 meter

Annual cost for road side cutting in Sweden is close to one billion SEK

Motorways in rural areas – no lights – no safety rails

Safety zones where no safety rails are needed

ERS

Conductive overhead – poles within the safety zone – safety rails
CUTTING ROAD SIDE VERGE

Impact

Study by Bäckström (2014)*:

- Increased time to cut road side verge with obstacles
  - 17 min/km - no safety rails
  - 35 min/km - with safety rails

- 22 litre/h

Costs for cutting road side verge might increase by 50% on ERS roads

* A. Bäckström, Röjning och slätter med flerarmad slättermaskin, SBUF Inf. 1419, p. 10, 2014
CONCLUDING REMARKS

Impact on maintenance and operations
Closer monitoring of roads
  Cracks and sealings
  Raised rails above road surface
  Drainage pipes in rails
Cutting road side verges
Increased costs of maintenance

Need large-scale tests
Thank you!

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