Quality assurance in road operations and maintenance in Lithuania

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Length of state significant roads, 2014

<table>
<thead>
<tr>
<th>Groups of roads</th>
<th>Length, km</th>
<th>Total length, km</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main</td>
<td>1 745</td>
<td></td>
</tr>
<tr>
<td>National</td>
<td>4 936</td>
<td>21 254</td>
</tr>
<tr>
<td>Regional</td>
<td>14 574</td>
<td></td>
</tr>
</tbody>
</table>

Lithuanian Road Network

Lithuanian road network

Groups of state significance roads

- Main: 69%
- National: 23%
- Regional: 8%
- State: 69%
- Municipal: 25%
- Private: 6%
The green bold line shows the contract of motorways.

- 11 state-owned companies
- 3 year road maintenance contracts in the non-tender manner.
1. **STANDARDS**
   levels, outcome-based criteria, performance criteria

2. **OPERATING TECHNOLOGIES**

3. **ECONOMIC RATES**
   according to levels

4. **GUIDELINES**
   for technical supervision and take over

5. **METHODOLOGY**
   of works accounting

6. **RATES OF RESOURCES**
   on the number of personnel, equipment, materials (for bills of quantities)

**ORGANIZATION OF ROAD MAINTENANCE**

**ROAD MAINTENANCE MANUAL**

- **Planning**
  [1 3 6]

- **Production**
  [1 2 4 5]

- **Monitoring Supervision Acceptance**
  [1 2 4 5]
# Monitoring / Supervision

## Road Maintenance Manual

<table>
<thead>
<tr>
<th>TYPE</th>
<th>Routine Maintenance</th>
<th>Periodic Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Daily Inspections</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main roads -1/day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>National – 2/week</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regional – 1/month</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(25% roads)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Special Inspections</strong></td>
<td>1/month</td>
<td>According to schedule (May, October)</td>
</tr>
<tr>
<td><strong>Special Control Insp.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>According to schedule (May, October)</td>
<td>Constantly when works are performed</td>
<td>Every Month</td>
</tr>
<tr>
<td><strong>Supervision</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RoadMaster Supervisor</td>
<td>Road Master</td>
<td></td>
</tr>
<tr>
<td>Supervisor</td>
<td>Supervisor</td>
<td></td>
</tr>
<tr>
<td>Representatives of LRA and State companies</td>
<td>Supervisor</td>
<td>Supervisor and representative of LRA</td>
</tr>
<tr>
<td><strong>Acceptance of works</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Road compliance with standards; Impose a Penalty</td>
<td>Reinspection; General Act on Road Maintenance Quality</td>
<td>Control of periodic maintenance works and quality of materials</td>
</tr>
</tbody>
</table>

**Objectives**

- Immediately eliminate dangerous defects;
- Provide small scale works;
- Road compliance with standards;
- Impose a Penalty;
- Reinspection;
- General Act on Road Maintenance Quality;
- Control of periodic maintenance works and quality of materials;
- Take over of periodic maintenance works.
Traffic information system

Road and weather information application

107 automatic road weather stations
267 video cameras
65 online traffic counters

The most dangerous meteorological event

Freezing rain

Precipitation intensivity

The least dangerous meteorological event

Precipitation intensivity

< 3°C

3°C

3°C

Dangerousness
Traffic information system

Road maintenance vehicle tracking application

Allows to keep track all road maintenance machines.

Contractors can control their employees more effectively or to keep fuel consumption records and organize work.
Traffic information system

Very functional system:

- determine what parameters will be shown on the map;
- set the alarm for the appearance of extreme weather conditions;
- select road maintenance mechanisms;
- define parameters of mechanisms;
- form graphs and reports.
Measurements of road surface friction

RCM411 and µTec user’s interface

<table>
<thead>
<tr>
<th>Color</th>
<th>Surface state</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>Dry</td>
</tr>
<tr>
<td>Light blue</td>
<td>Moist</td>
</tr>
<tr>
<td>Blue</td>
<td>Wet</td>
</tr>
<tr>
<td>Violet</td>
<td>Slushy</td>
</tr>
<tr>
<td>White</td>
<td>Snowy</td>
</tr>
<tr>
<td>Red</td>
<td>Icy</td>
</tr>
</tbody>
</table>

Mobil optical friction measurement device RCM 411

15 optical friction measurement devices RCM411.
The report of special road inspection performed with mobile optical friction meter RCM 411

Data from the measurement devices are sent to the central server of the Traffic Information System.

System allows to form graphs and reports.

LRA have realised the Manual of Friction Measurements and Winter Service Road Master Guide
Lithuanian road information system

DATA SETS

Infrastructure dataset
Centerlines and parameters of roads and bridges, junctions, pavement layers, lay-bys, lighting, steel guard rails, traffic monitoring and management devices, horizontal marking, road and kilometer signs, crossings, culverts.

Road safety and environment protection data
Information about accidents, black spots and dangerous sections, speed hums, pedestrian and bicycle ways, noise barriers, wildlife underpass, wildlife fence, greenery, road wastewater treatment plants.

Road reconstruction projects dataset
Information about road projects, reconstruction, maintenance and other works

DATA PROVIDERS
Road maintenance (State) enterprises
Contractors for road construction
Map service providers
Contractors for data collection
Lithuanian road information system

LAKIS WEB
Lithuanian road information system

LAKIS WEB

Application for search, modify and export road infrastructure data
Lithuanian road information system

PAVEMENT QUALITY DATA

Pavement quality information and road view (in every direction) every 20 m
Future plans

- Thermomapping, forecast and decision making application;
- Develop asset management system;
- Incorporate local roads (~60 k km) into our infrastructure dataset;
- Road and traffic information service development (ITS directive);
- Tablets and smartphones integration.
Thank you!