

Innovations in Winter Maintenance Management in Lithuania

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**LITHUANIAN ROAD
ADMINISTRATION**

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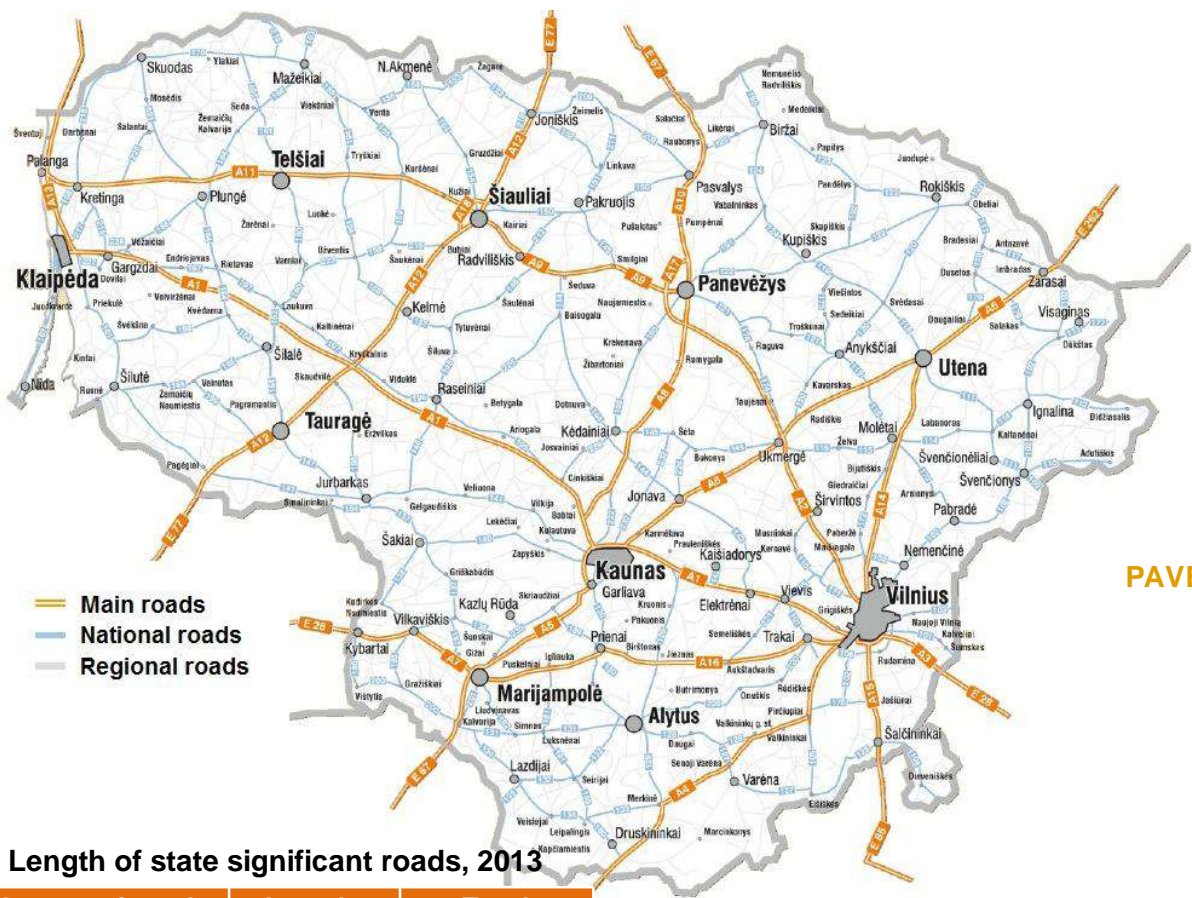
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1. INTRODUCTION



- Lithuania lies in the northern part of temperate climate zone and the climate is described as moderately cold with snowy winter.
- Due to special climate, Lithuanian roads are operated in winter conditions up to 5 months per year.
- Winter road maintenance becomes the most principal part of routine maintenance in this region.

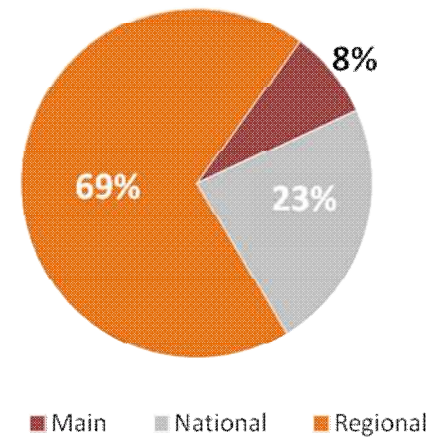
2. Lithuanian Road Network



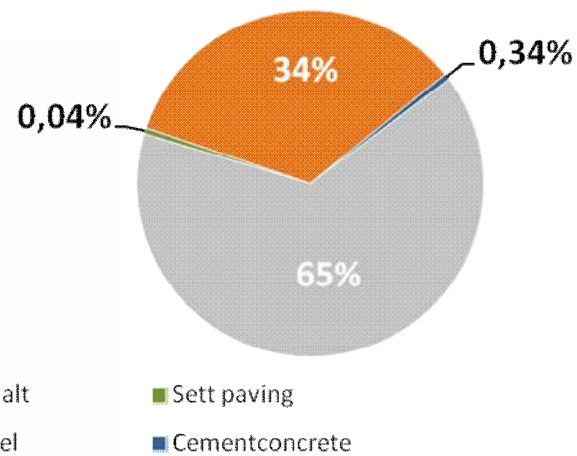
Length of state significant roads, 2013

Groups of roads	Length, km	Total length, km
Main	1 746	21 242
National	4 929	
Regional	14 567	

GROUPS OF STATE SIGNIFICANCE ROADS



PAVEMENT TYPES OF STATE SIGNIFICANCE ROADS



3. The Structure of Road Maintenance Management

CONTRACTING TERRITORIES



□ The green bold *line* shows the contract of motorways

THE MINISTRY OF TRANSPORT AND COMMUNICATIONS



LITHUANIAN ROAD ADMINISTRATION (LRA)



10 Regional State Enterprises
1 Motorway State Enterprise

- 11 profit-seeking state-owned companies (one-year road maintenance contracts in the non-tender manner).
- 10 contracts are based on the territorial principle (except motorways).

3. Maintenance Levels of State Roads

- ❑ Winter road maintenance is performed according to the standards and maintenance levels described in the **Road Maintenance Manual**.

Requirements for winter road maintenance according to maintenance levels

Road Group	Maintenance level	Road maintenance service works	Road must be cleaned and spreaded*	Traffic may be interrupted	Comments
Main	I	24 h	within 2 h	not more than 2 h	Vilnius-Kaunas, VIA BALTICA
	II	4 – 22 h	within 3 h	not more than 3 h	
National	II	6 – 19 h	within 4 h	not more than 8 h	
	III	9 – 18 h	within 8 h	not more than 8 h	National roads with traffic volume ≤ 700 veh./day
Regional	I	6 – 19 h	within 5 h	not more than 8 h	Regional roads with traffic volume ≥ 1000 veh./day
	II	9 – 18 h	within 24 h	not more than 8 h	Only dangerous sections of high traffic regional roads
	III	9 – 18 h*	only after main and national roads	not more than 48 h	* only after main and national roads

Extreme weather conditions:

- more than 6 hours of uninterrupted snow and /or blizzard,
- more than 24 hours of snow and/or blizzard with intervals,
- frozen road is covered with ice after rain or freezing rain,
- frozen road is covered with ice more than twice in 24 hours,
- daytime temperature does not rise above 8°C.

3. Maintenance Levels of State Roads

Map of winter road maintenance according to maintenance levels



Main roads, level I



Main roads, level II



National roads, level II

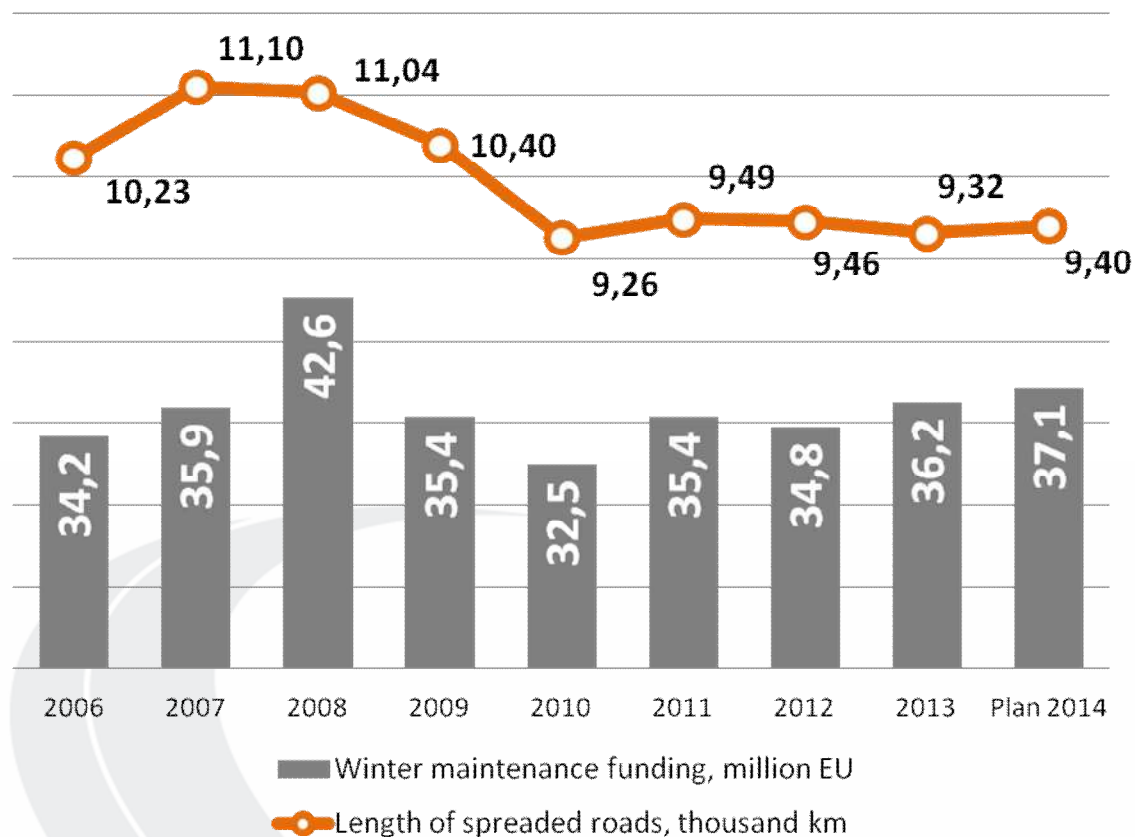


Regional roads, level III



4. Winter Road Maintenance Funding

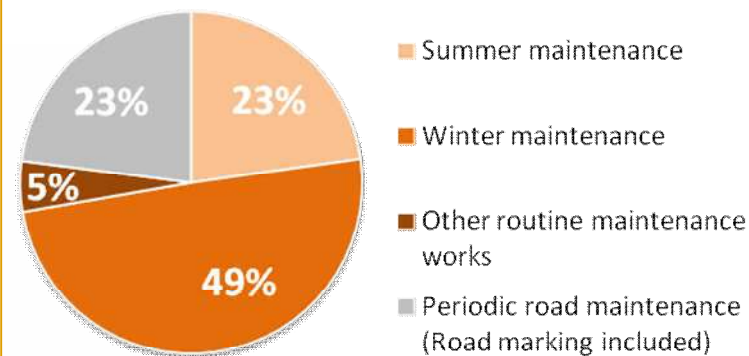
Winter road maintenance funding and length of spreaded roads



Funds for winter road maintenance for 1 km of state significance roads, 2013

Road Group	Maintenance level	Funds for 1 km, Euros
Main	I	8658
	II	5348
National	II	2634
Regional	I	1420
	III	803

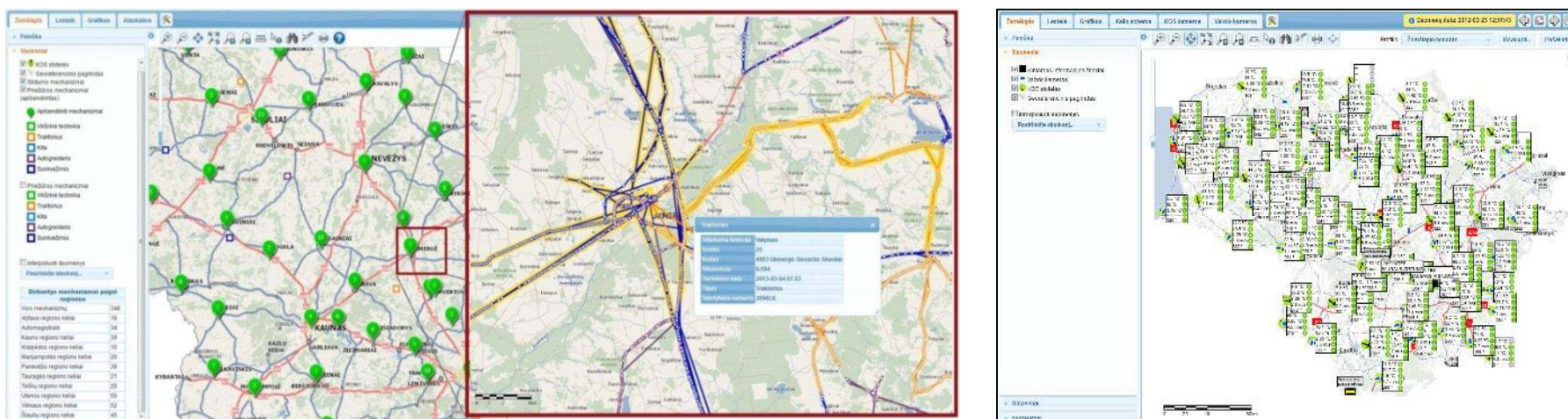
Structure of road maintenance financing (2013)



5. Research and Implementation of New Standards

- ❑ It is planned that in 2014 a **NEW ROAD MAINTENANCE MANUAL** version will be formally approved and put into use in the field of winter road maintenance.
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- ❑ A new study of **EFFECTIVE WINTER ROAD MAINTENANCE IN LITHUANIA** ordered by the LRA is being prepared by Vilnius Gediminas Technical University.

6. Traffic Information System



- Information about road condition, traffic, road surface temperature, air temperature, visibility, frost depth.
- **103** automatic road weather stations
- **125** video cameras.
- In 2014, up to **300** video cameras.
- Contractors can control their employees more effectively or keep fuel consumption records and organize work.

7. Measurements of Road Surface Friction



- In 2012 first mobile friction meters **RCM 411** and **μ Tec** used.
- **RCM 411** meters for road surface condition and thickness of water or pure ice and friction value.
- **μ Tec** is for calculations of road surface friction with mobile phone.

8. Winter Road Maintenance Cost Indexing

Winter Severity Index:

$$\check{ZSI} = a \frac{K_{fact.}}{K_{av.}} + b \frac{P_{fact.}}{P_{av.}} + c \frac{T_{0 fact.}}{T_{0 av.}} + d \frac{L_{fact.}}{L_{av.}}$$

$K_{fact.}$ - factual values of precipitation over the period, mm;

$K_{av.}$ - average perennial values of precipitation over the period, mm;

$P_{fact.}$ - factual number of days with snowstorms and drifting snow over the period, days;

$P_{av.}$ - average perennial number of days with snowstorms and drifting snow over the period, days;

$T_{0 fact.}$ - factual number of days with air temperature conversions over 0 °C, days;

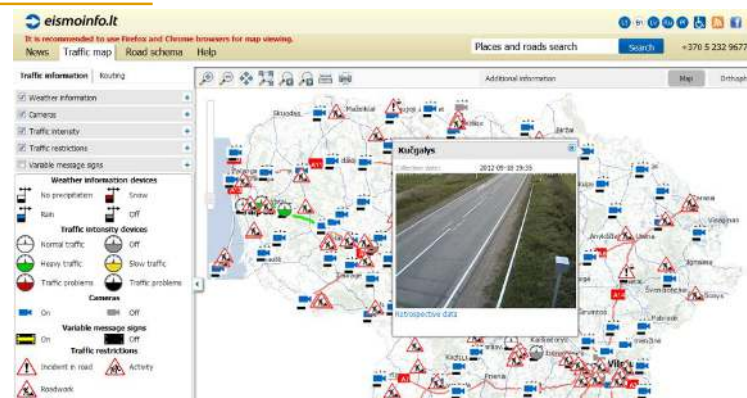
$T_{0 av.}$ - average perennial number of days with air temperature conversions over 0 °C, days;

$L_{fact.}$ - factual number of days with freezing rain, days;

$L_{av.}$ - average perennial number of days with freezing rain, days;

a,b,c,d,e - weight factor.

9. Cooperation With Road Users



TRAFFIC INFORMATION CENTRE

- In 2011 the Traffic Information Centre was established.
- It collects, organizes and provides information about traffic conditions on roads.
- Website www.eismoinfo.lt provides information about road and traffic conditions.



APPLICATION FOR SMARTPHONES

- In 2012 free application 'Traffic Info' was presented for smartphones.
- More than **10,000** users have already downloaded this application.

10. Conclusions

- ❑ A breakthrough in **IT** sector.
- ❑ Research in new technologies, materials, standards and work methods in the field of road maintenance:
- ❑ More efficient execution of maintenance activities, their control and to save funds and reasonable quality of winter road maintenance.
- ❑ However, information technology base should be improved and integrated more deeply into the winter road maintenance system, operators, road masters and other related personnel should be trained and contractors should be encouraged to use IT in the wider area of winter road maintenance works.

Thank you for attention!