

# ITS and asset management systems in LRA



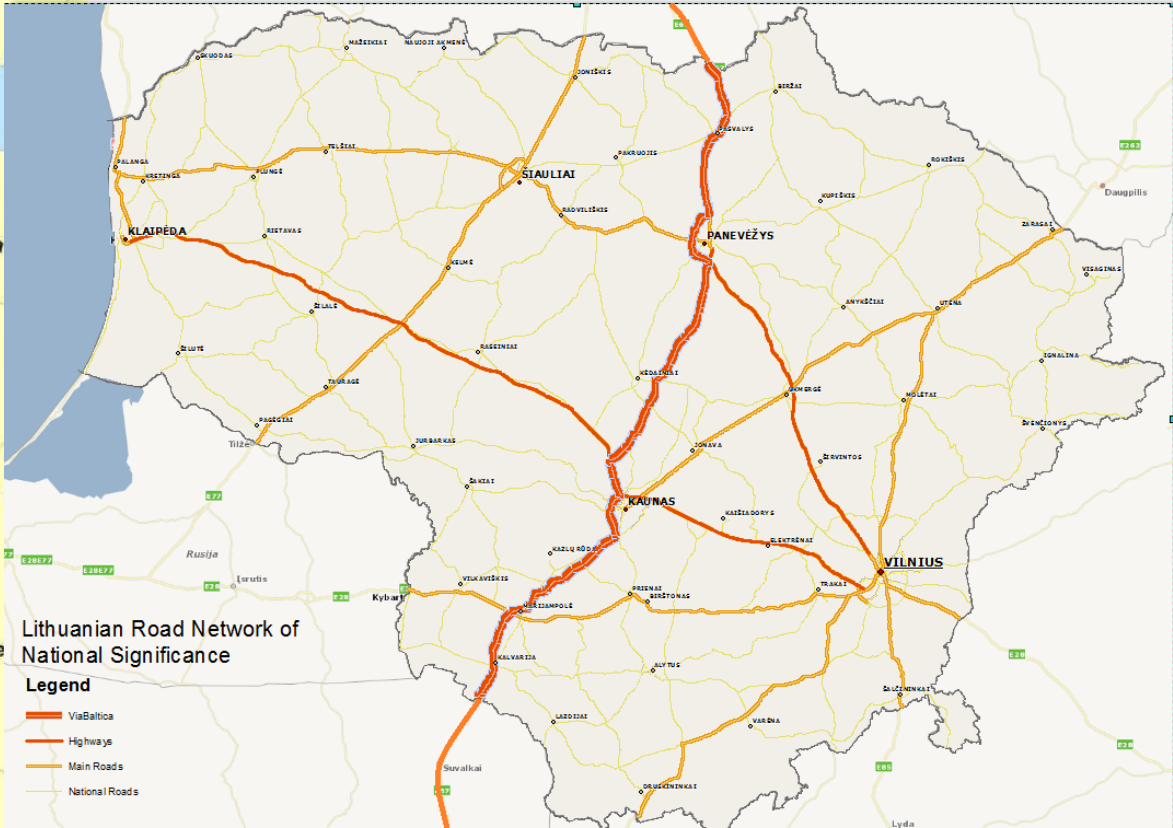
Laurynas Ivinskis



**LITHUANIAN ROAD  
ADMINISTRATION**



National Roads 21.250 km



# JOHN'S WEATHER FORECASTING STONE

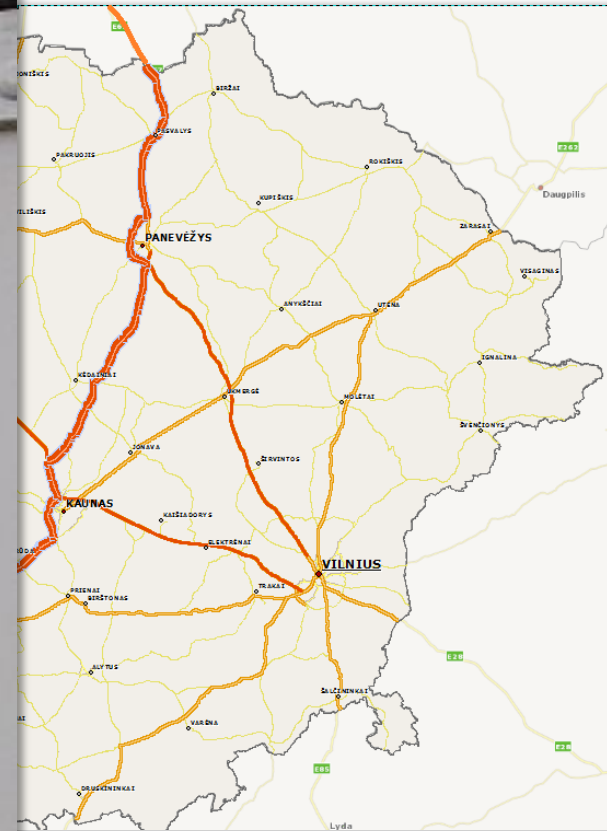
## CONDITION

Stone is Wet  
Stone is Dry  
Shadow on Ground  
White on Top  
Can't See Stone  
Swinging Stone  
Stone Jumping Up & Down  
Stone Gone

## FORECAST

Rain  
Not Raining  
Sunny  
Snowing  
Foggy  
Windy  
Earthquake  
Tornado

ds 21.250 km



info.lt



LITHUANIAN ROAD  
ADMINISTRATION

# Perspective on ITS

- ITS directive 2010/40/EU and its specifications
  - Free safety-related minimum Traffic Info
  - EU-wide Real-Time Traffic information (road data, traffic data)
  - EU-wide Multi-Modal Travel Information



# Current situation in Lithuania



**trafficinfo.lt**

**Traffic Information Centre  
TIC**



Information  
distribution



**112**

Emergency  
Response centre

Traffic  
IS

Powered By  
**ORACLE**

esri



# Current situation in Lithuania



**trafficinfo.lt**

**Traffic Information Centre  
TIC**



**Traffic IS**

Powered By  
**ORACLE**

esri

**Information distribution**



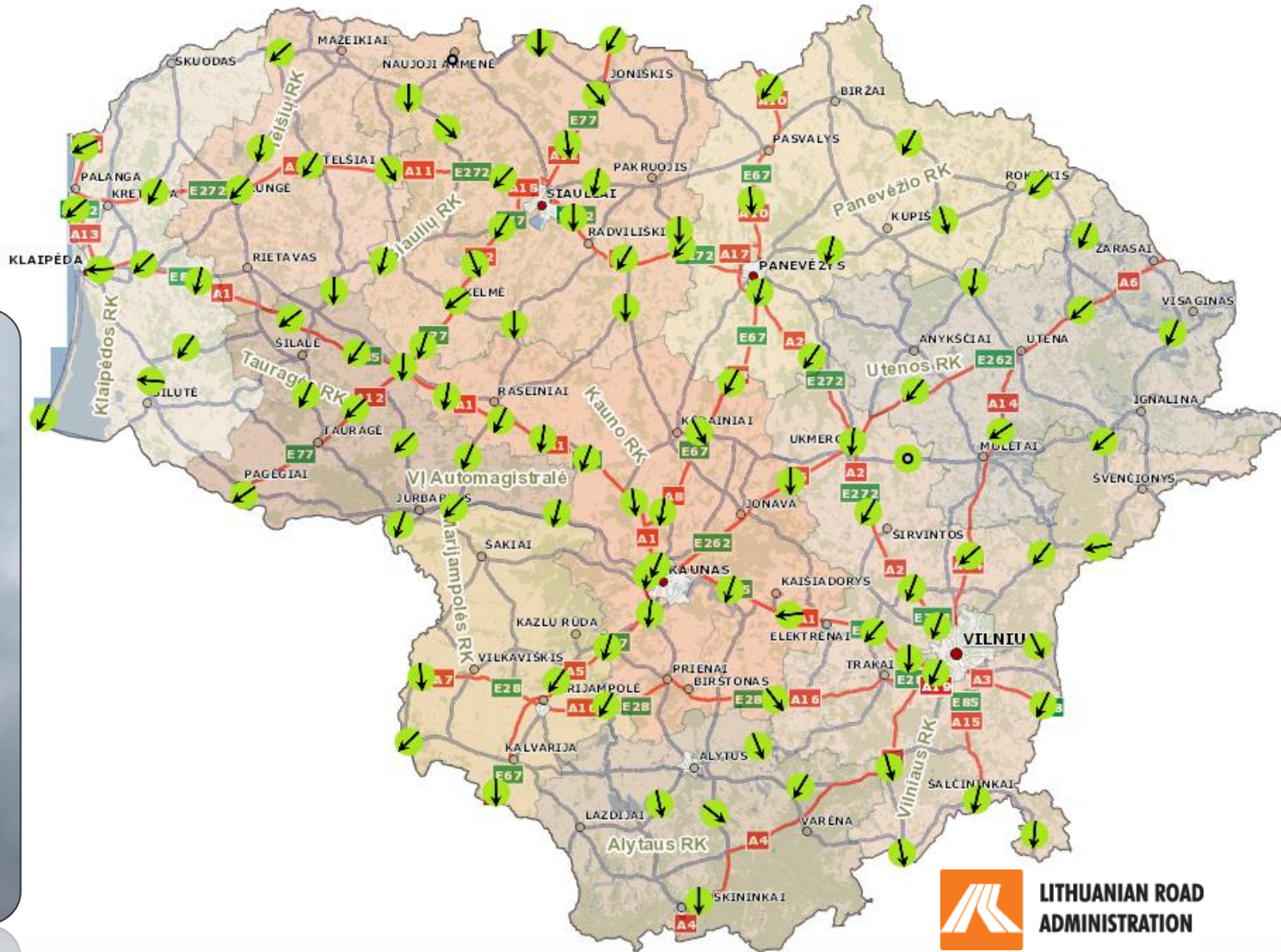
**112**

**Emergency Response centre**





# Equipment on Road – 107 RWIS



# Equipment on Road – 267 Cameras





# Equipment on Road – 65 online traffic counters



# Current situation in Lithuania



Traffic IS

A screenshot of the Traffic IS software interface, showing a map with red lines indicating traffic flow or incidents. Below the map, it says "Powered By ORACLE" and "esri".

Traffic Information Centre  
TIC

A photograph of the Traffic Information Centre (TIC) control room. Two operators are seated at a desk with multiple computer monitors. A large wall-mounted screen displays a map. The wall behind them has the "eismoinfo.lt" logo.

Information distribution

Icons representing information distribution methods: a smartphone, a DAB radio, and a map.

112

Emergency Response centre

The logo for the 112 Emergency Response centre, featuring the number "112" in large red font and a red telephone handset icon.







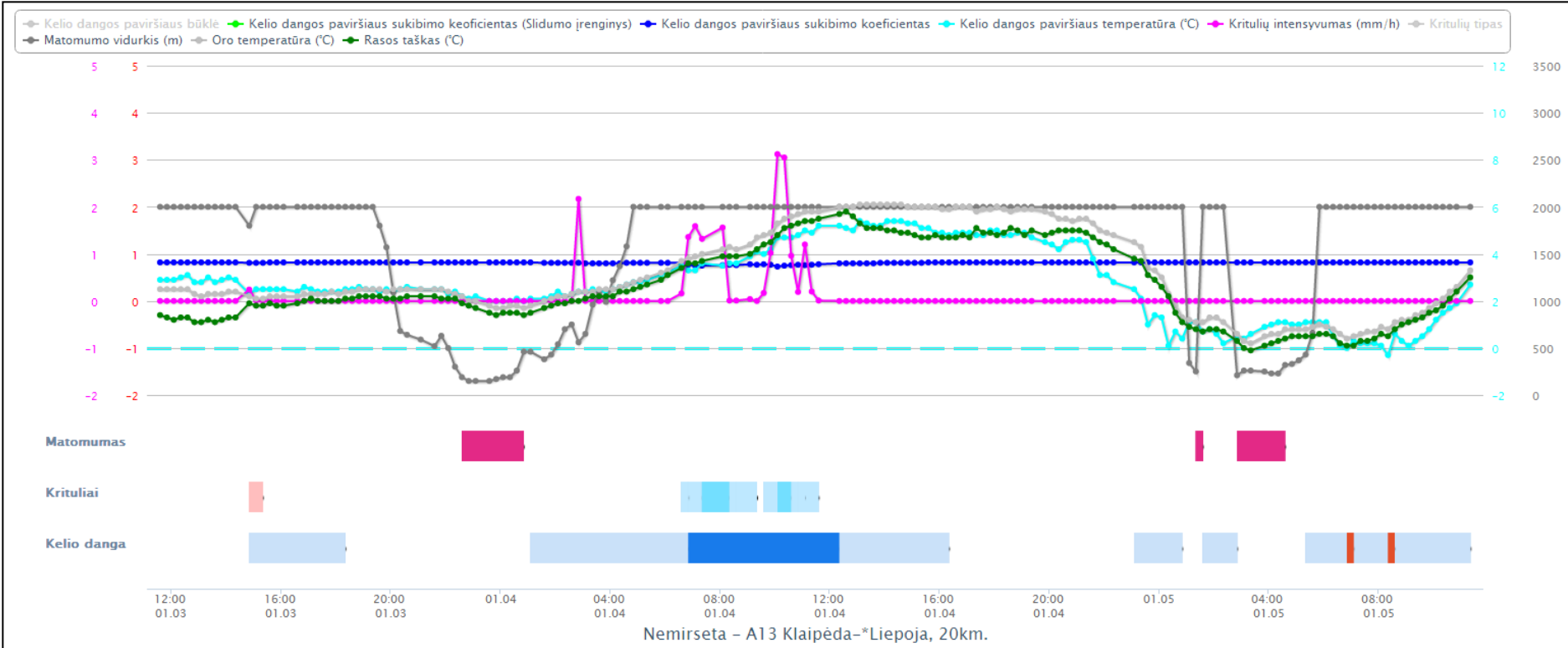
# Traffic Information System

The screenshot displays a traffic information system interface. On the left, a sidebar contains four camera thumbnails with their respective locations and timestamps:

- Grįžti į sumažintus vaizdus**  
Didžioji Riešė į Utaną, A14 14.2 km, 2013-08-23 14:50
- Didžioji Riešė į Vilnių, A14 14.2 km, 2013-08-23 14:50
- Didžiulio ež., A1 19.29 km, 2013-08-23 14:50
- Dieveniškės, 104 25.99 km, 2013-08-23 14:50

The main area shows a live camera view of a multi-lane highway with several vehicles. A 'Groti' button is located above the main view. In the top right corner of the main view, there is a date and time stamp '2013-08-23, EEST, 14:41:00' and the 'eismoinfo.lt' logo. A white van with 'TERMODATIKS' branding is visible in the bottom right corner of the main view.

# Traffic Information System



2014-01-04 10:05:20



2014-01-04 10:20:25



2014-01-04 10:35:22

# Traffic Information System

- RWIS information;



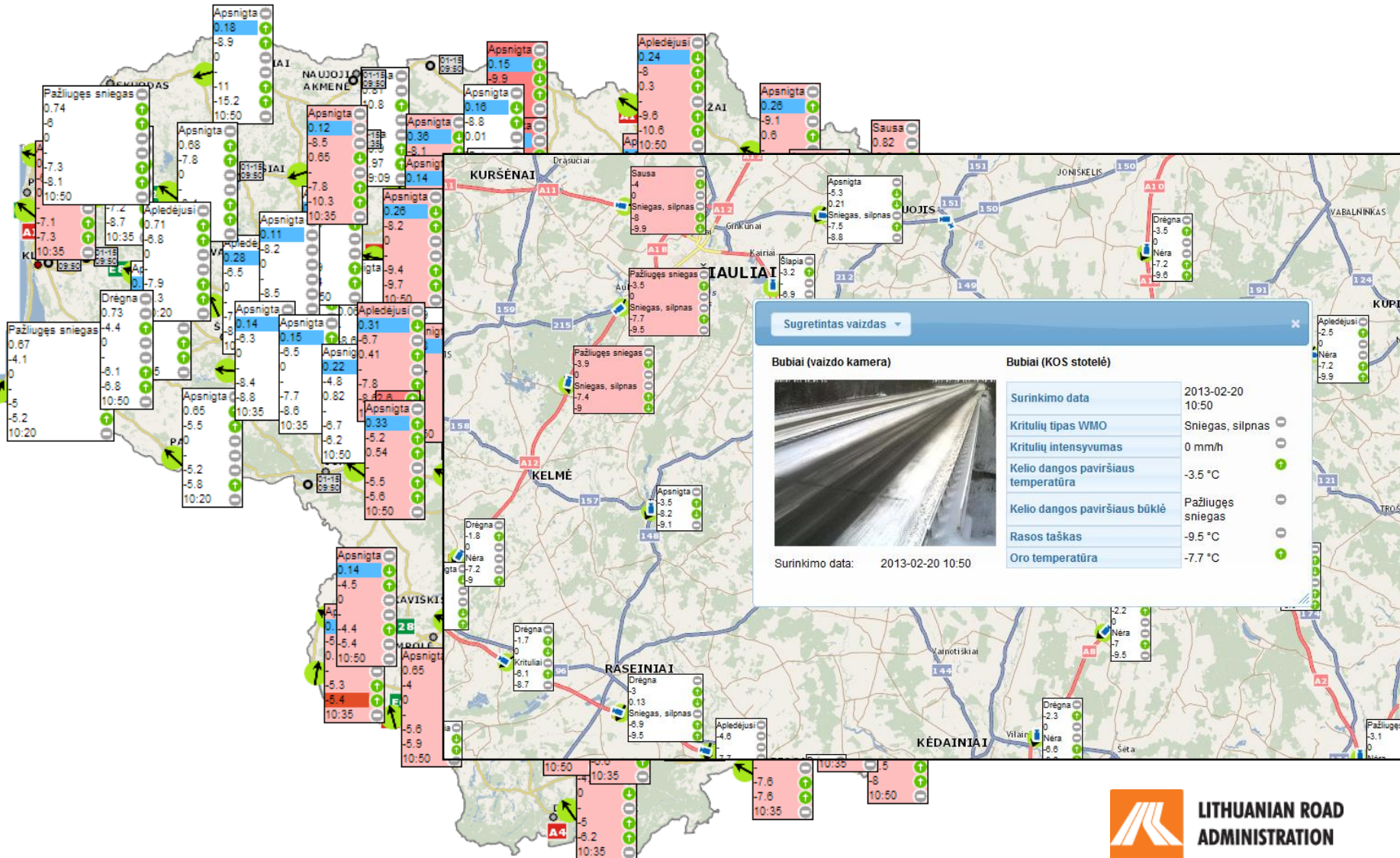
*trafficinfo.it*



LITHUANIAN ROAD  
ADMINISTRATION



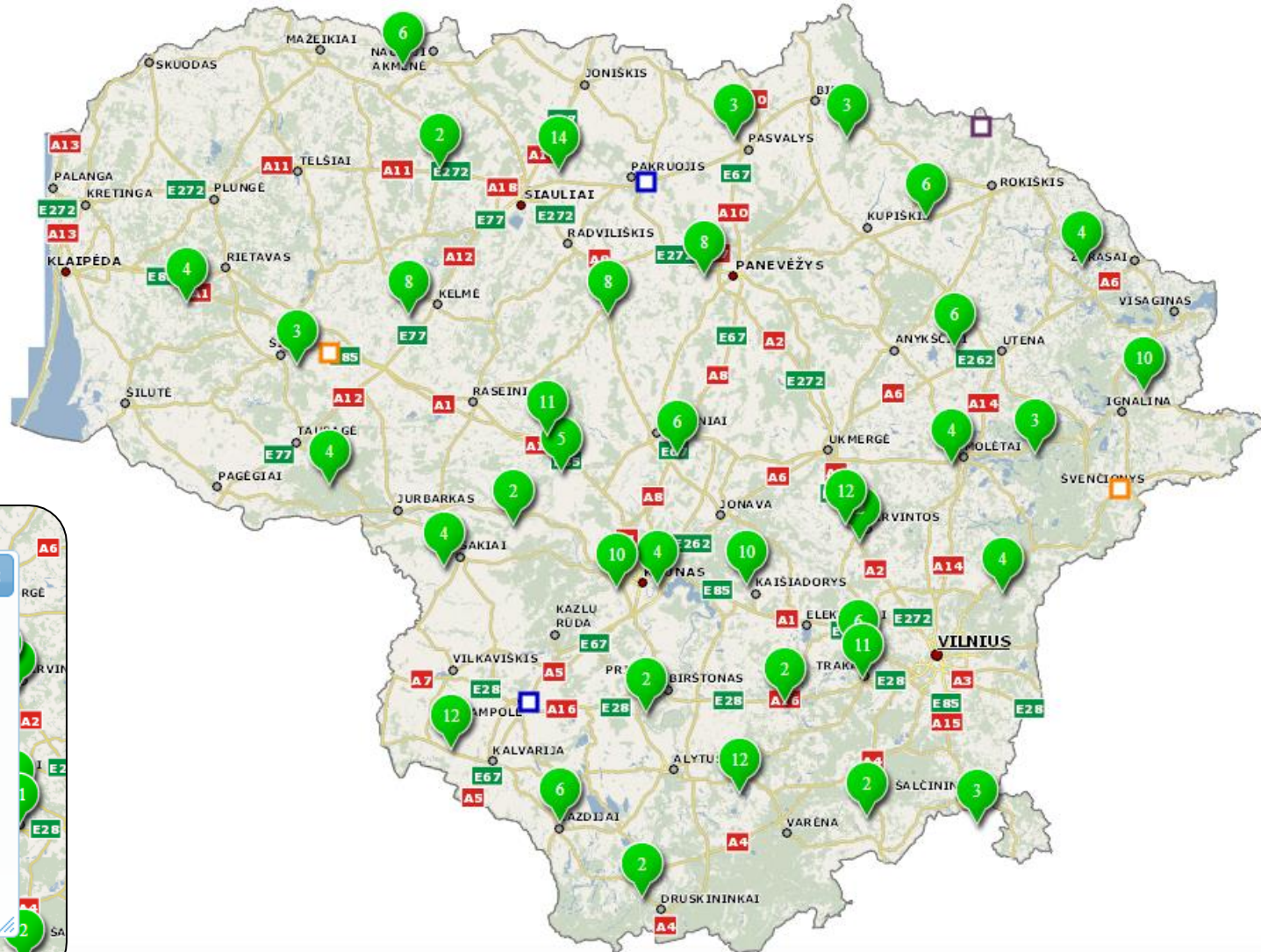
# RWIS application



# Traffic Information System

- RWIS information;
- Road maintenance vehicle tracking with friction measurement integration;

# Road maintenance vehicle tracking

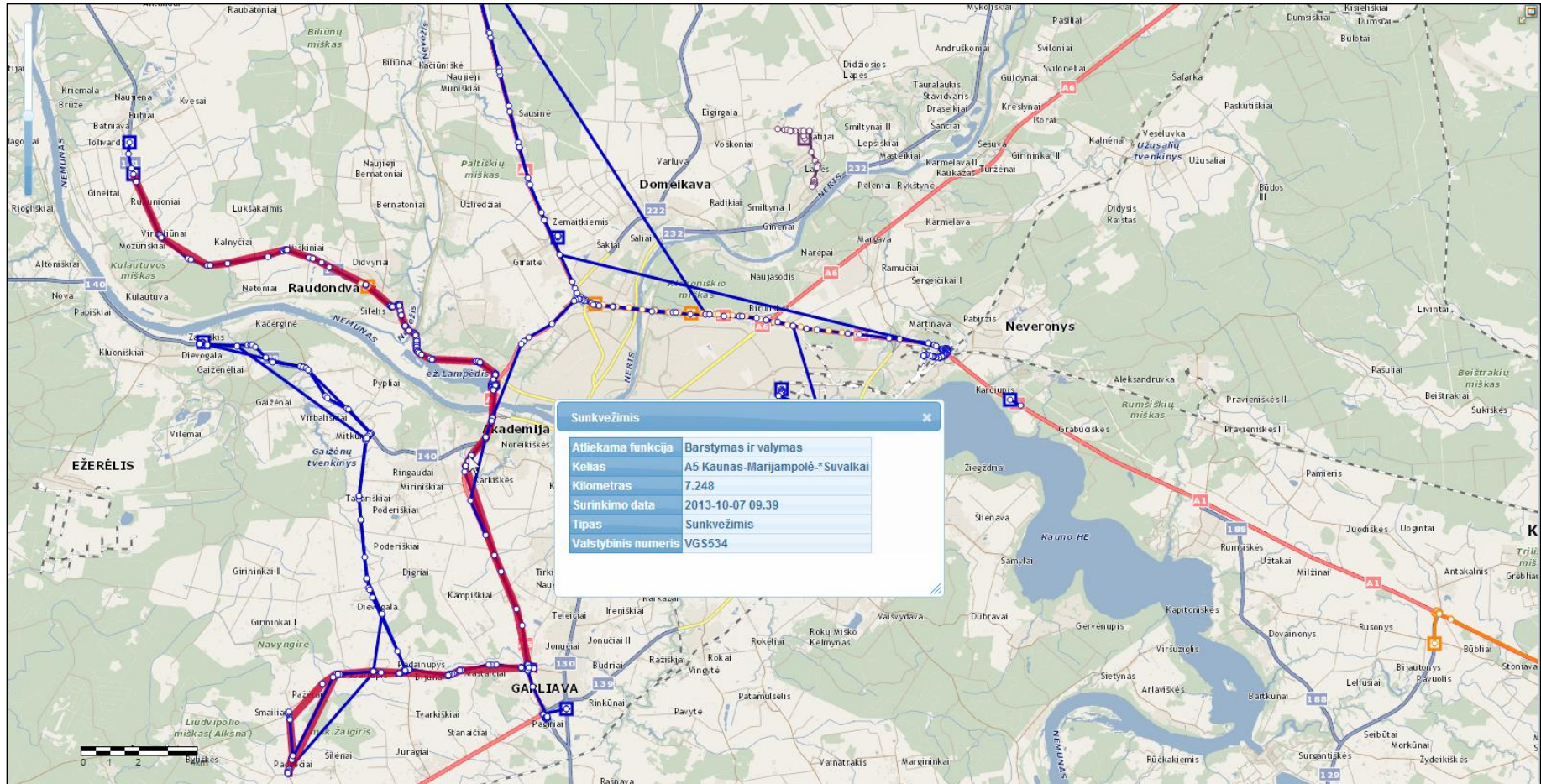


**Kauno regiono keliai**

- 0141LY Autogreideris
- 2266LG Autogreideris
- 2594LY Traktorius
- 4539LY Traktorius
- 6468LL Traktorius
- 7719LH Traktorius
- 9004LD Traktorius
- 9174LD Autogreideris
- BRN093 Sunkvežimis
- CFV973 Sunkvežimis
- FOU342 Sunkvežimis



# Road maintenance vehicle tracking

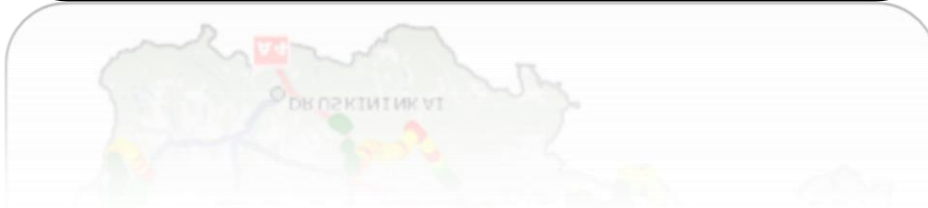
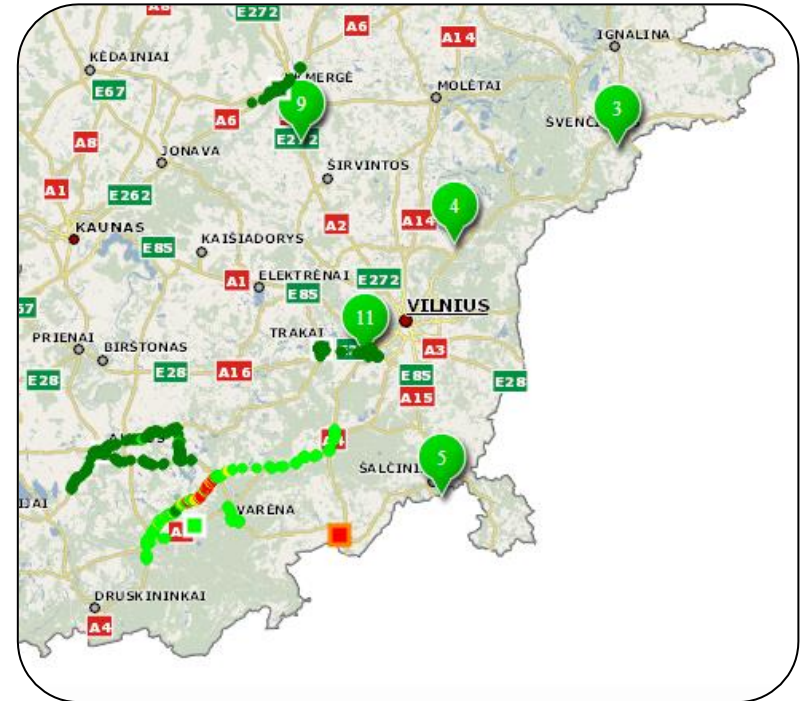
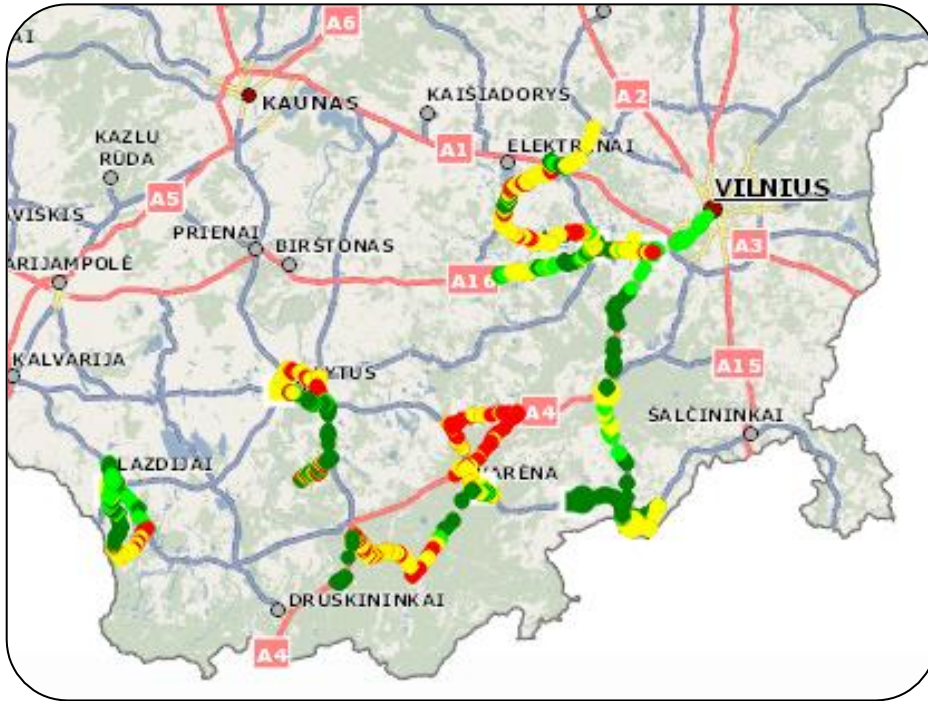


# Friction measurement integration



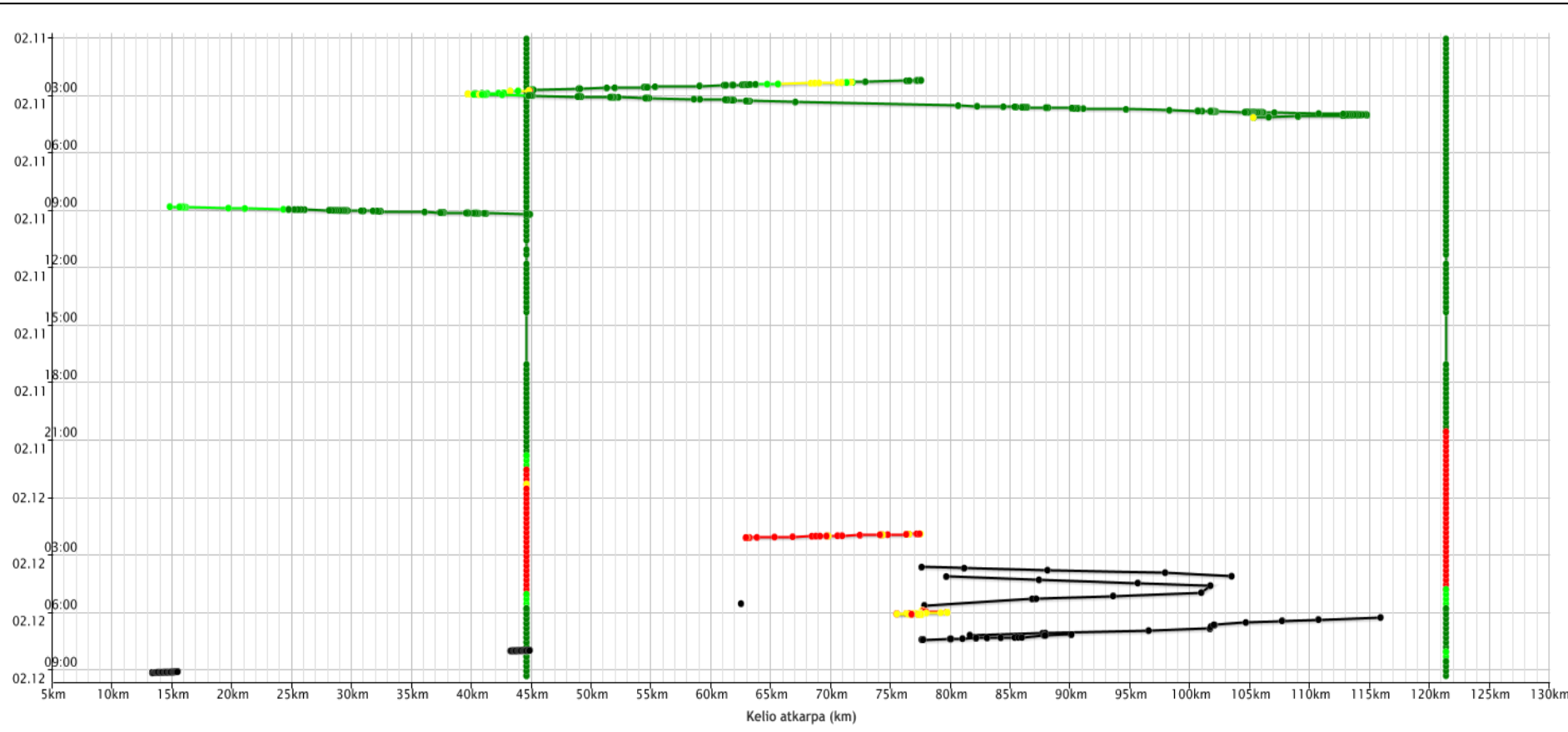


# Friction measurement integration





# Road maintenance vehicle tracking and Friction measurement integration



# Traffic Information System

- RWIS information;
- Road maintenance vehicle tracking with friction measurement integration;
- Traffic monitoring;

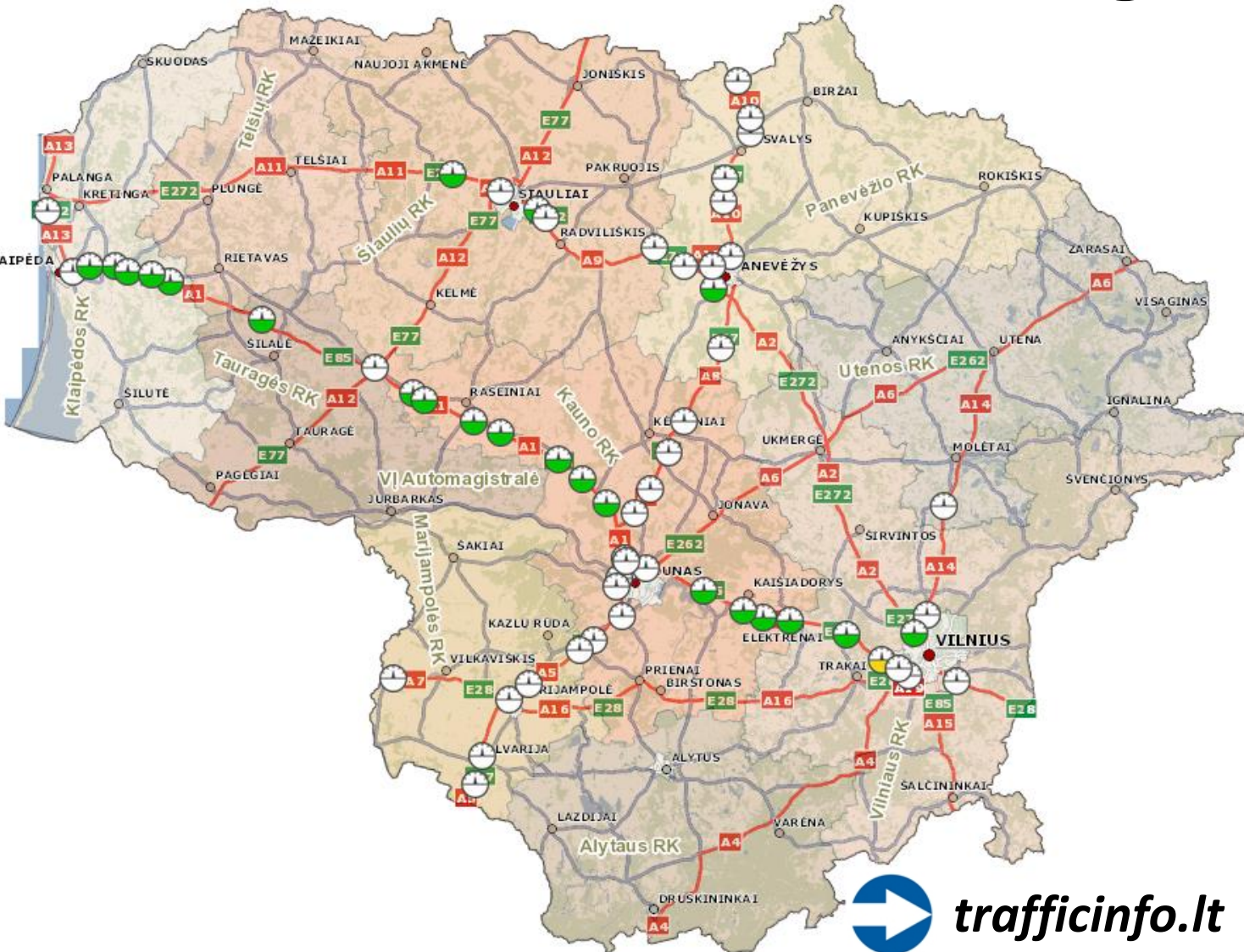


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# Traffic monitoring



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# Traffic Information System

- RWIS information;
- Road maintenance vehicle tracking with friction measurement integration;
- Traffic monitoring;
- VMS control;

# Traffic Information System

- RWIS information;
- Road maintenance vehicle tracking with friction measurement integration;
- Traffic monitoring;
- VMS control;

# Dynamic speed limit systems

Traffic management via Dynamic speed limit systems on A1 (E85) and Via Baltica (E67) 2015-2020





# Traffic Information System

- RWIS information;
- Road maintenance vehicle tracking with friction measurement integration;
- Traffic monitoring;
- VMS control;
- Restrictions and obstacles;




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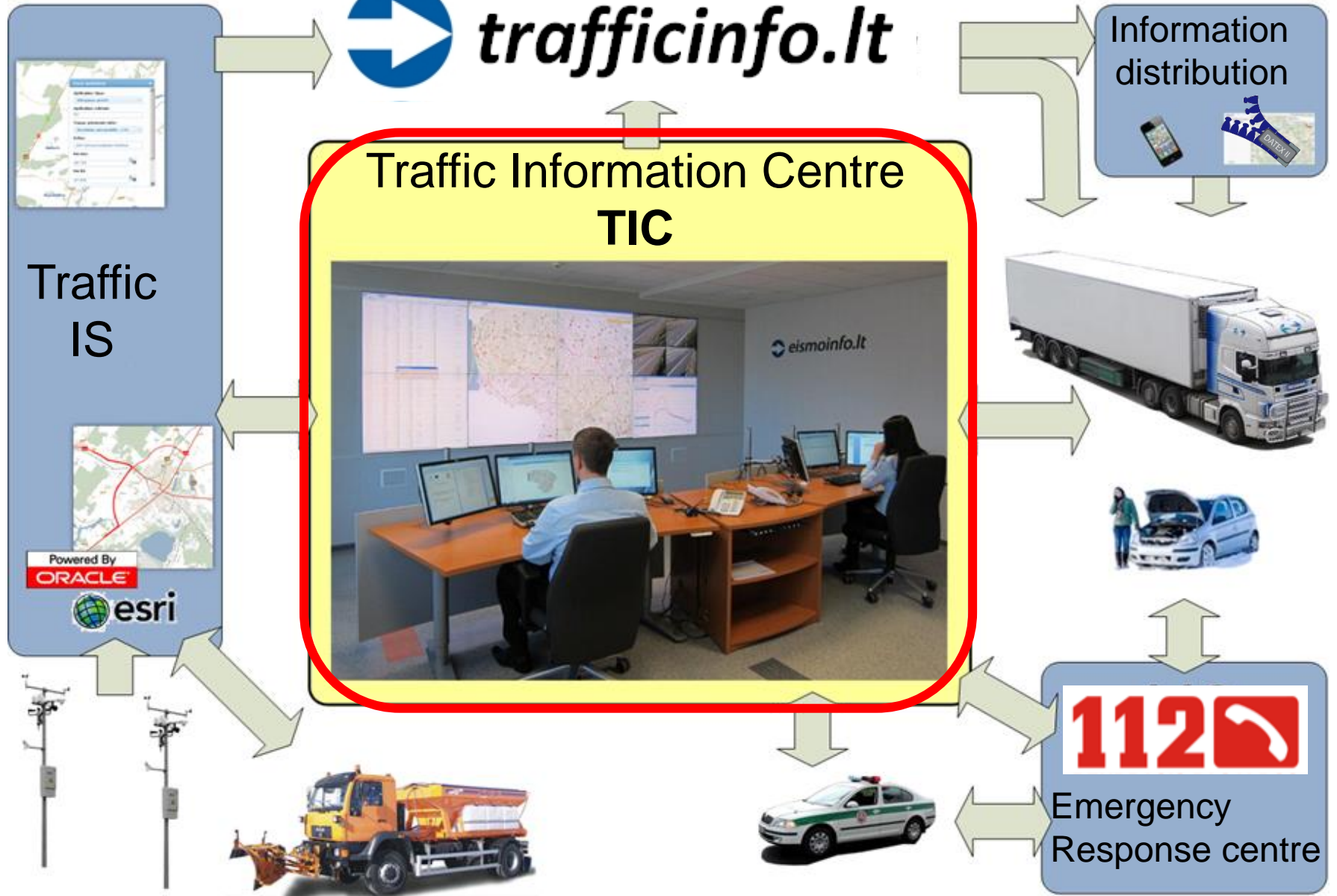


# Traffic Information System

- RWIS information;
- Road maintenance vehicle tracking with friction measurement integration;
- Traffic monitoring;
- VMS control;
- Restrictions and obstacles;
- Equipment state;
- Administration app.  *trafficinfo.lt*



# Current situation in Lithuania



# Current situation in Lithuania



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**Traffic Information Centre  
TIC**



**Information  
distribution**



**112**

**Emergency  
Response centre**

**Traffic  
IS**

Powered By  
**ORACLE**

**esri**



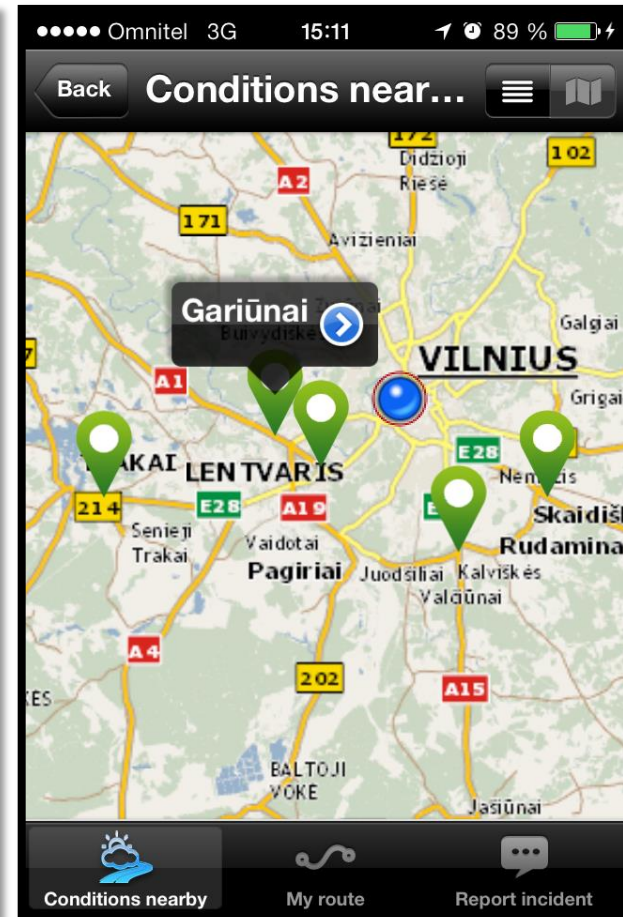
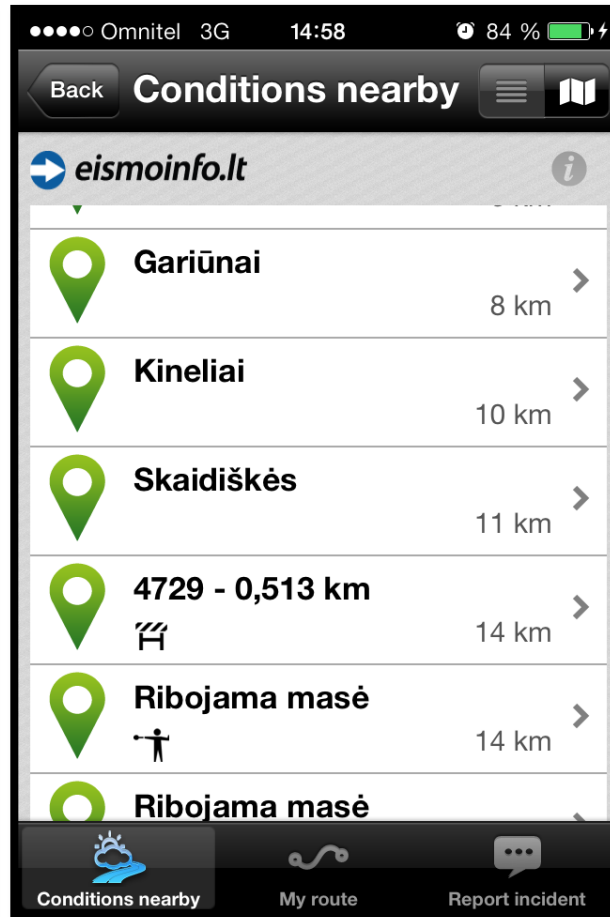
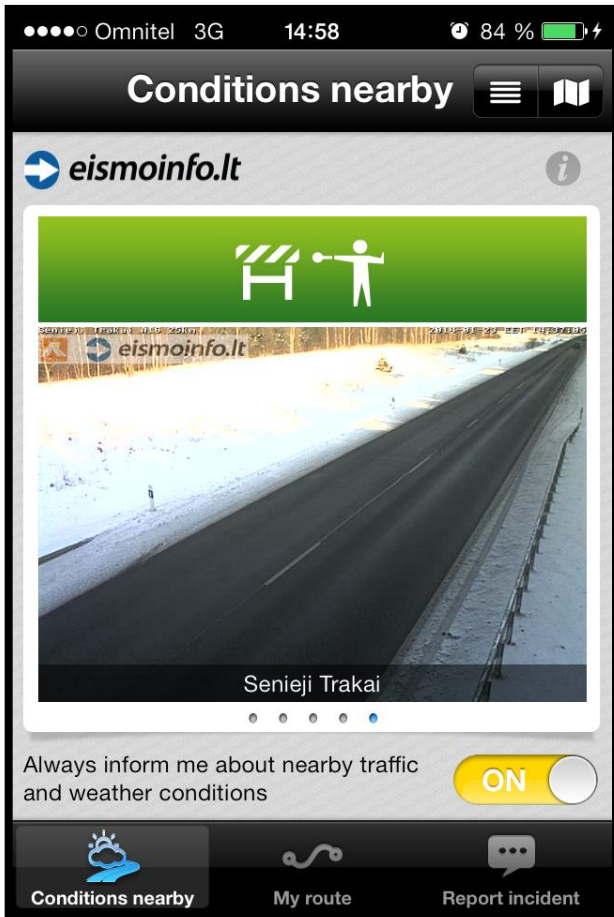
# Data distribution

- Traffic data exchange using Datex II
- Single Point of Access
- Mobile app using TPEG service
- [www.trafficinfo.lt](http://www.trafficinfo.lt) and [www.eismoinfo.lt](http://www.eismoinfo.lt)

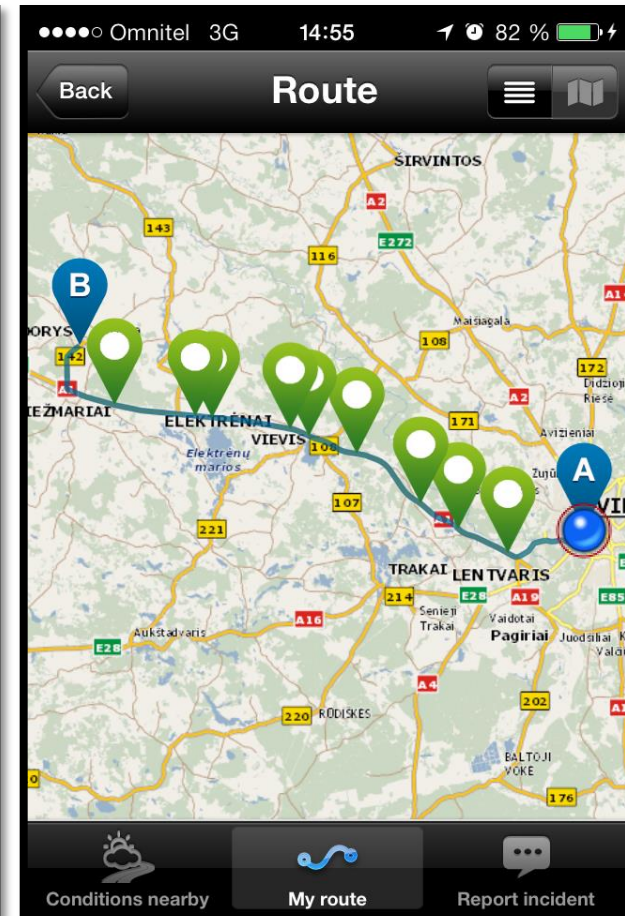
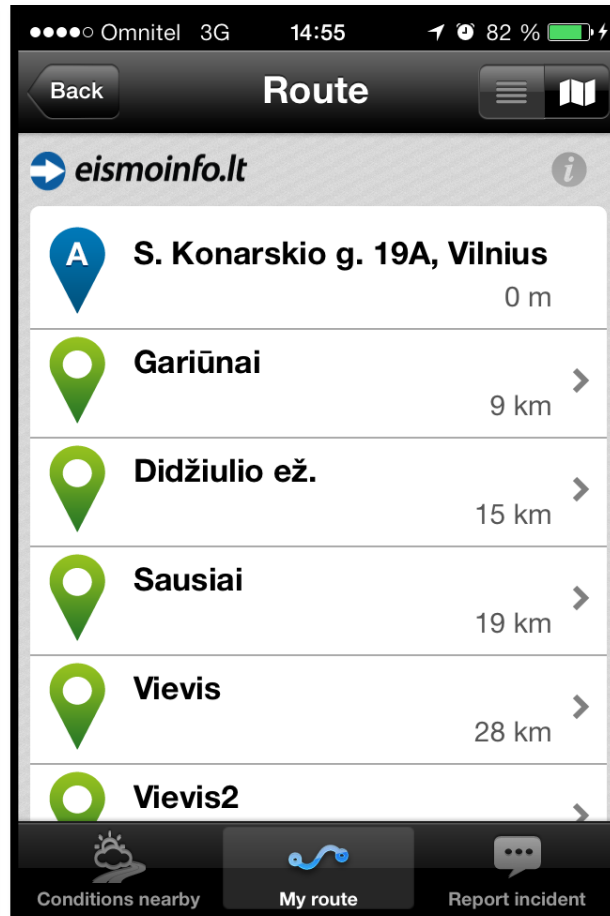
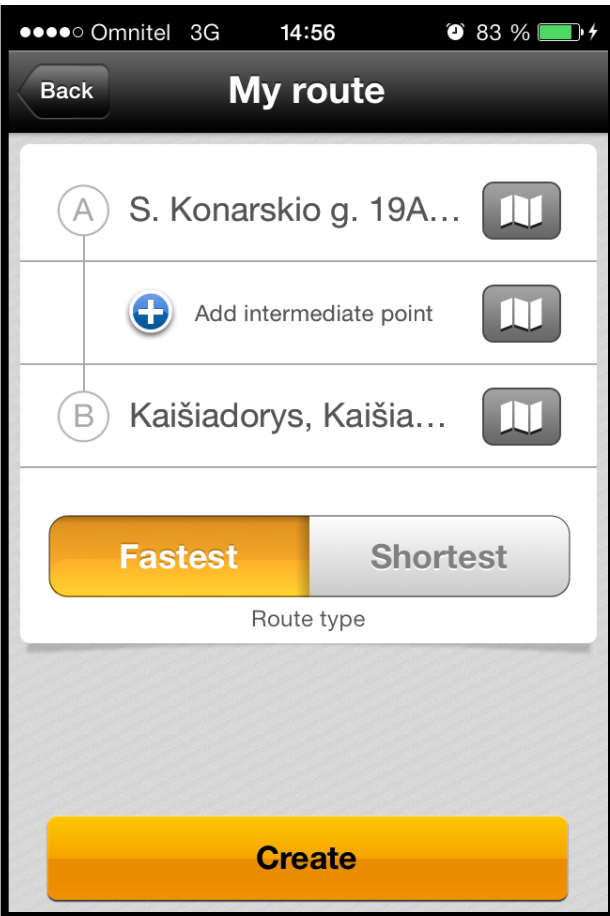




# iOS / Android App

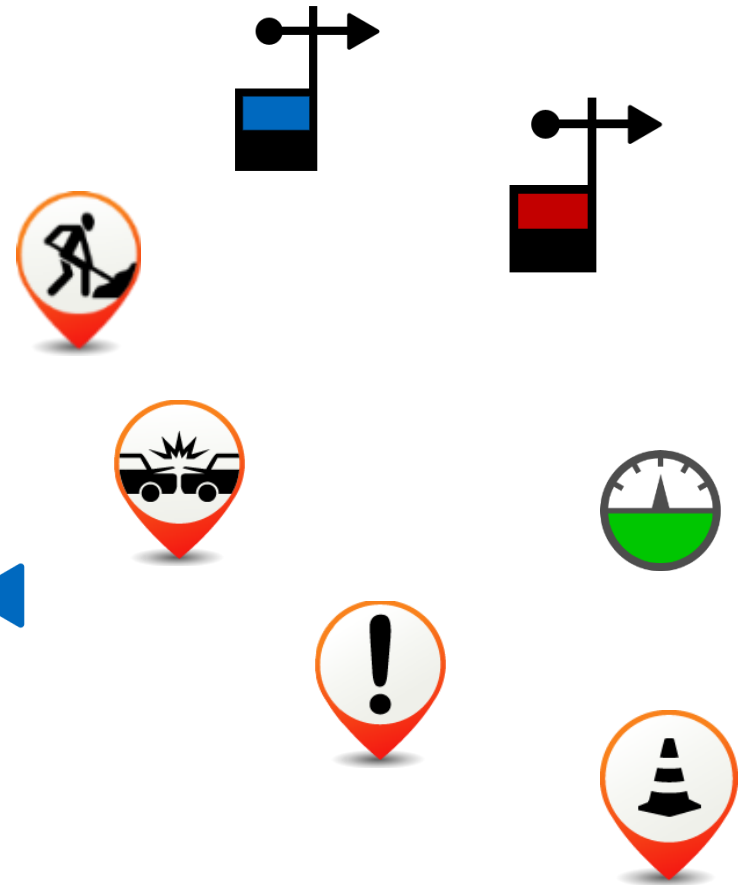


# iOS / Android App



# www.trafficinfo.lt

- Road weather conditions
- Pavement conditions
- Road works
- Traffic restrictions
- Accidents
- Traffic problems
- Cameras
- Planned road works
- Strategic noise map
- Traffic volume
- Pavement information





# www.trafficinfo.lt



Station	<a href="#">Sintautai</a> « <a href="#">Next</a> <a href="#">Previous</a> »				
Collection date:	2014-01-24 09:35	2014-01-24 09:20	2014-01-24 09:05	2014-01-24 08:50	2014-01-24 08:35
Photo:					

# www.trafficinfo.lt


eismoinfo.lt

Lt En Lv Ru Pl    

News Traffic map Road schema Help

Places and roads search

Search

+370 5 232 9677 

Traffic information Routing



Additional information

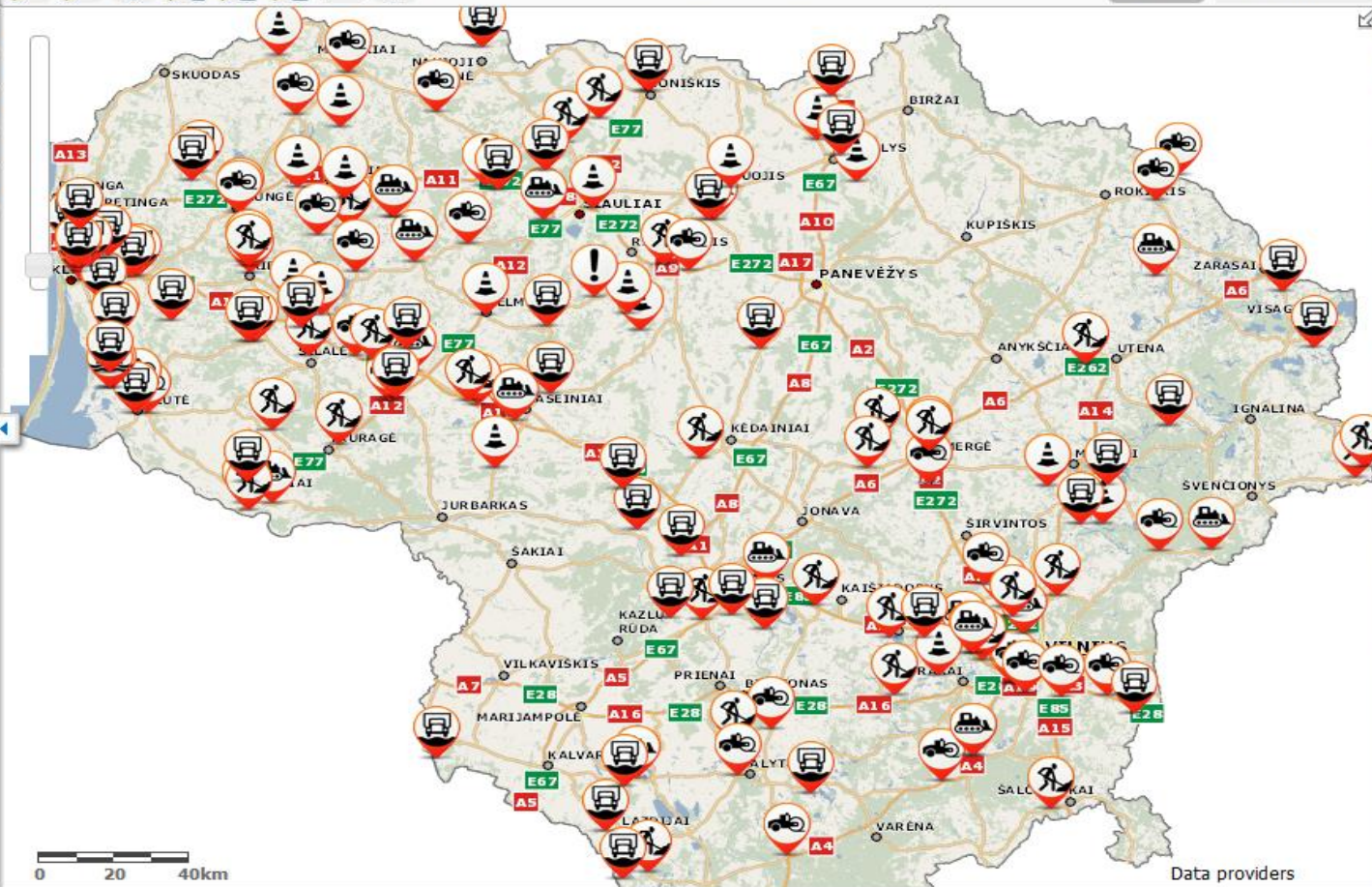
Map

Orthophoto

- Weather information +
- Cameras +
- Traffic intensity +
- Traffic restrictions +
- Variable message signs +

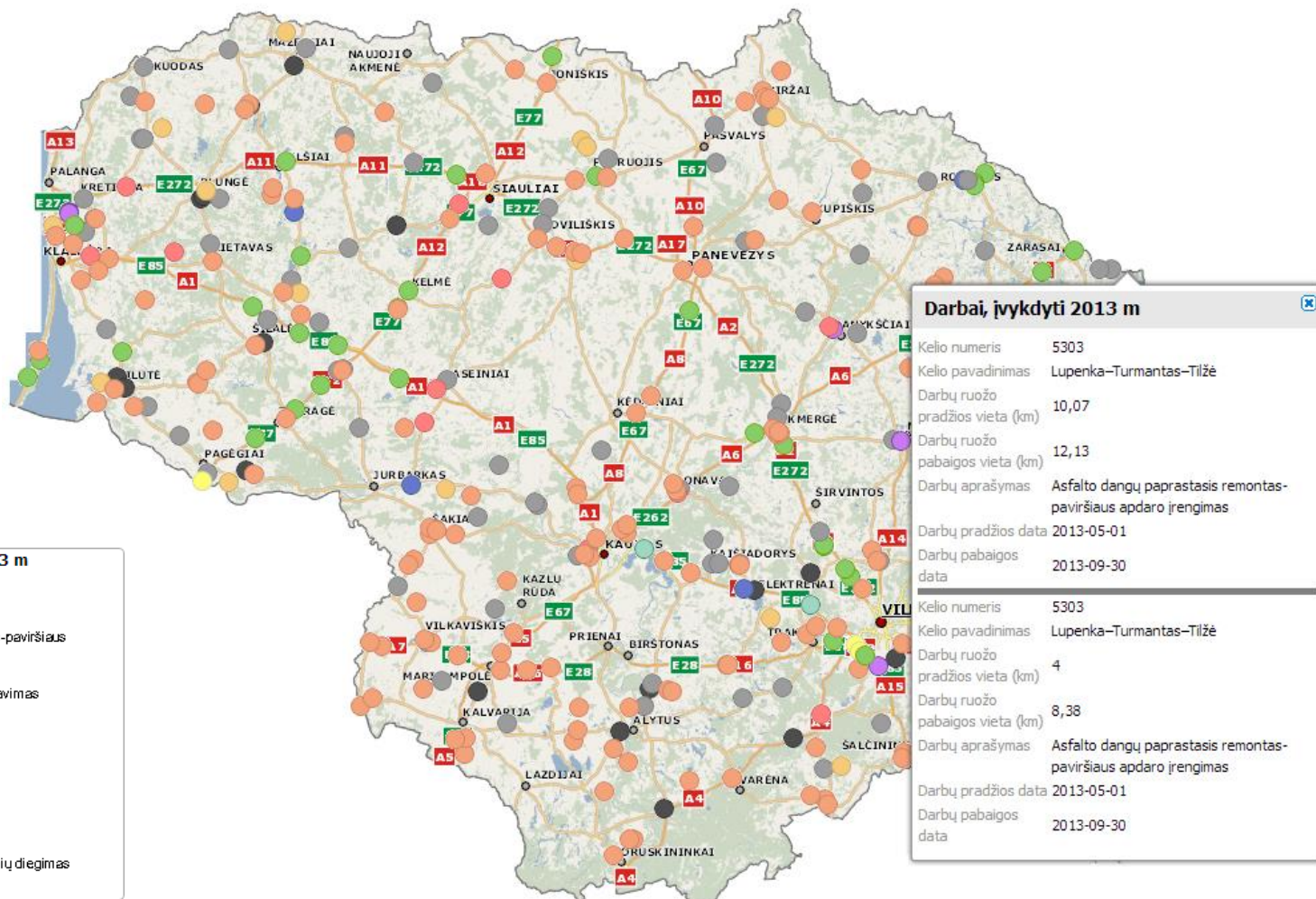
### Traffic restrictions

-  Road reconstruction
-  Road marking
-  Road construction
-  Road maintenance



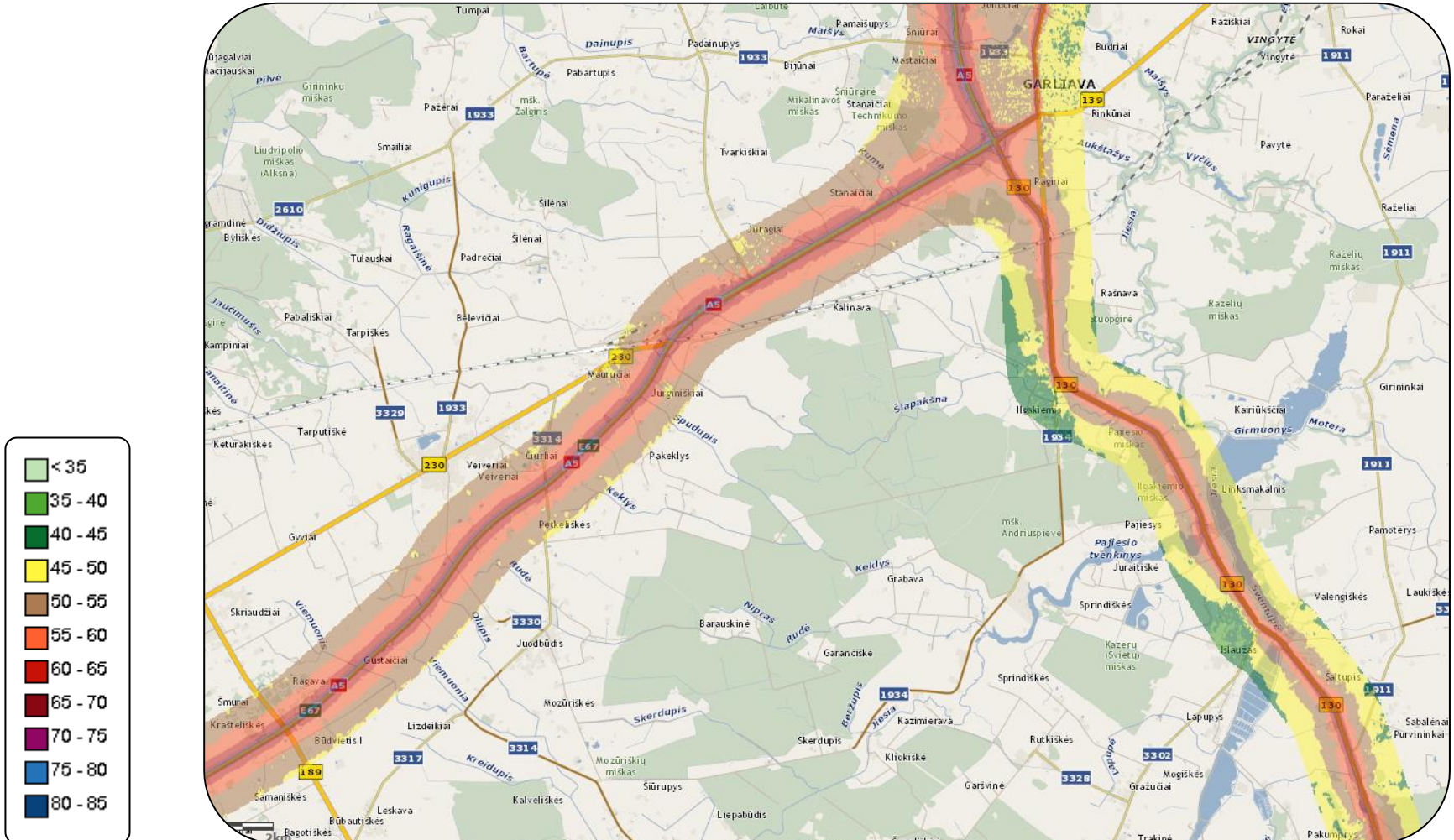


# [www.trafficinfo.lt](http://www.trafficinfo.lt) – information about planned road works





# [www.trafficinfo.lt](http://www.trafficinfo.lt) – strategic noise maps

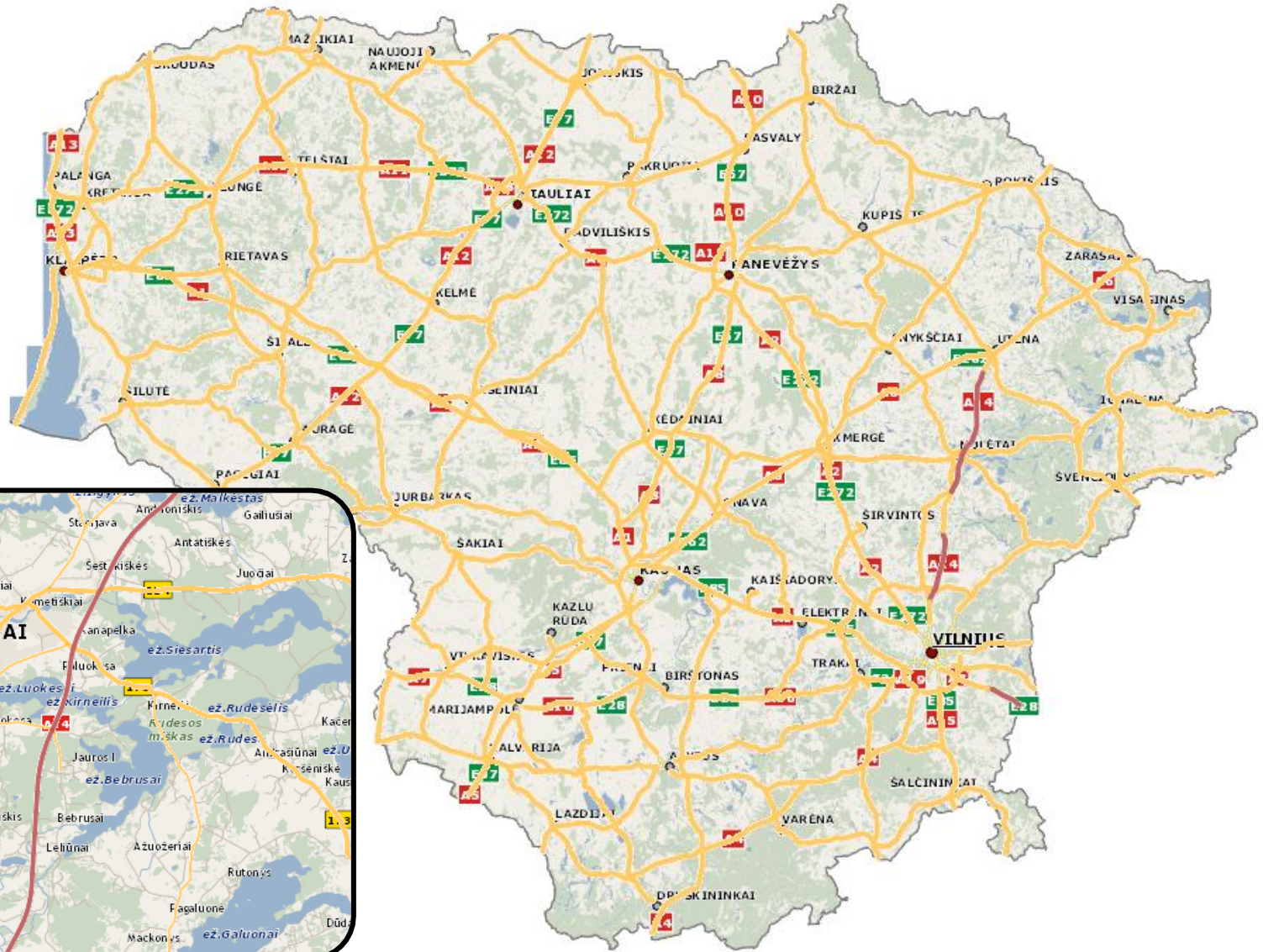








# [www.trafficinfo.lt](http://www.trafficinfo.lt) – pavement information





# Future plans

- Thermomapping, forecast and decision making application;
- Multimodal public transport information system;
- RDS-TMC
- Multifunctional traffic enforcement system;
- Average speed control system;
- Electronic toll collection

# Ensure high level of traffic information availability

- Create RDS-TMC and TPEG services



**trafficinfo.lt**

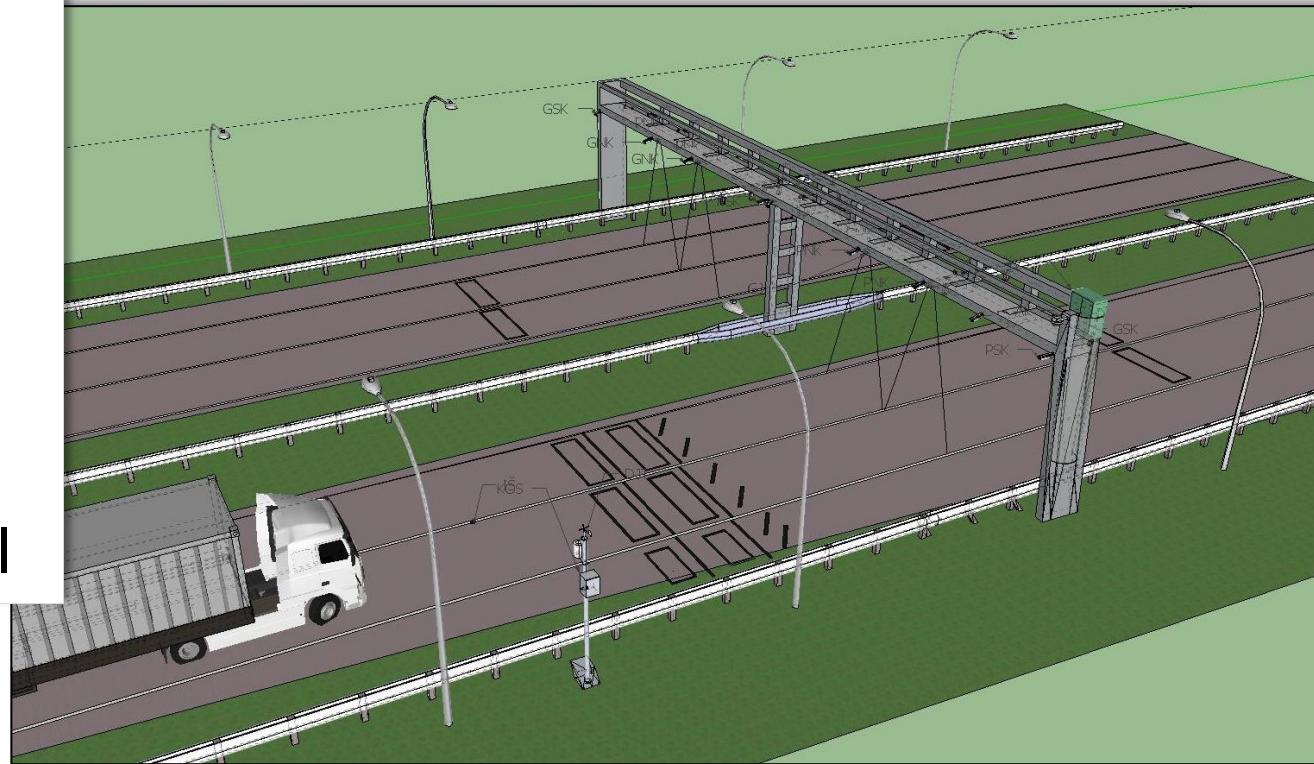


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# Traffic enforcement system

Pilot project – 3 posts (2014-2017)

- WIM
- speed control, average speed control
- Height control
- Technical control



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# Traffic enforcement system



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# Electronic toll collection

- GNSS



- DSRC





# LITHUANIAN ROAD INFORMATION SYSTEM

- SE "Alytaus regiono keliai"
- SE "Kauno regiono keliai"
- SE "Klaipėdos regiono keliai"
- SE "Marijampolės regiono keliai"
- SE "Panevėžio regiono keliai"
- SE "Šiaulių regiono keliai"
- SE "Tauragės regiono keliai"
- SE "Telšių regiono keliai"
- SE "Utenos regiono keliai"
- SE "Vilniaus regiono keliai"
- SE "Automagistralė"



# Data sets

<b>Infrastructure dataset</b>	<b>Road safety and environment protection data</b>	<b>Road reconstruction projects dataset</b>
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.	Information about accidents, black spots and dangerous sections, speed humps, pedestrian and bicycle ways, noise barriers, wildlife underpass, wildlife fence, greenery, road wastewater treatment plants.	Information about road projects, reconstruction, maintenance and other works

# Data providers

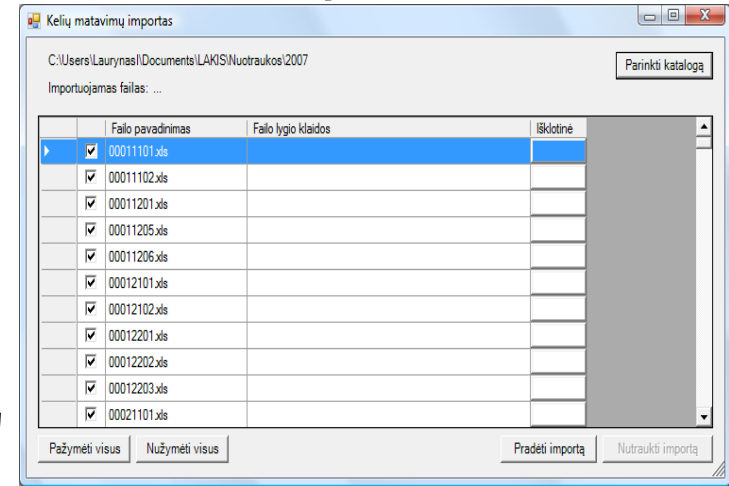
- Road maintenance (state) enterprises
- Contractors for road construction
- Map service providers
- Contractors for data collection

# Road pavement inspection

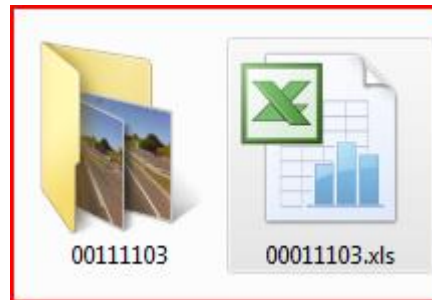




# Collection of pavement quality data



Tool for import



Data converted to excel file and directory with pictures

# Pavement quality data

Paiska pagal kelia | Paiska pagal koordinates

Kelio Nr.

Km. nuo  iki  Matavimų kryptis   Tik su nuotrauka

Surasti

Važiuojamoji dalis	Kelio numeris	Km	Juosta	Matavimo data	Matavimo kryptis
Viena/pirma važi...	A1	17.7	1	2010-08-20	Kilometražo didėj...
Viena/pirma važi...	A1	17.84	1	2010-08-20	Kilometražo didėj...

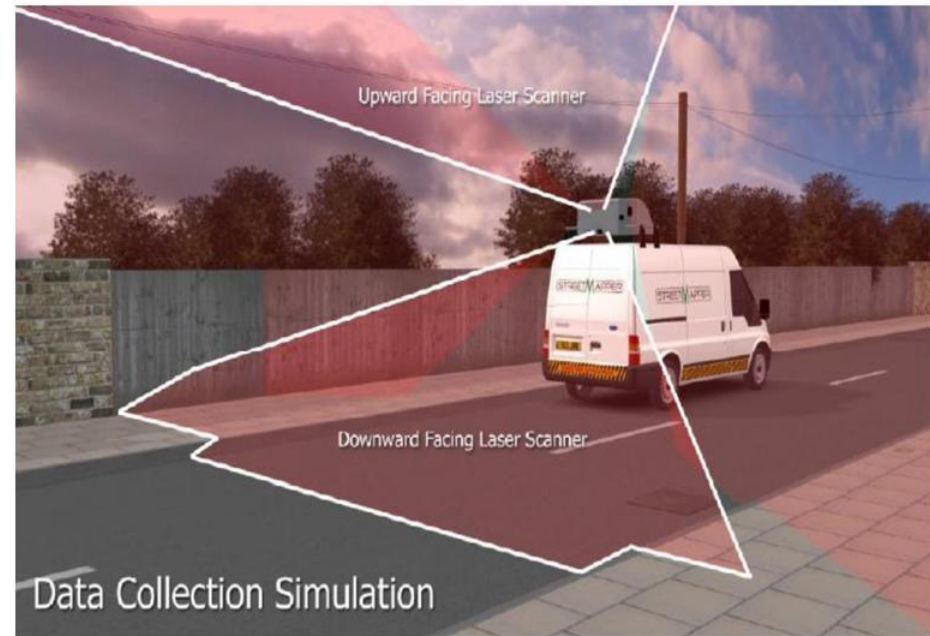


Važiuojamoji dalis	1	Kelio numeris	A1
Vieta, km.	17860	Nelygumas (dešinė), m/km.	0.76
Nelygumas (kaire), m/km.	0.65	Veže (kaire), mm.	6.6
Veže (dešinė), mm.	3.8	Veže (max), mm.	6.6
Kreivė, m.	1	Išilginis nuolydis, %	2.06
Skersinis nuolydis, %	-2.02	Šiurkštumas (dešinė), mm.	0.68
Šiurkštumas (kaire), mm.	0.63	Y pagal LKS-94	569373.72
X pagal LKS-94	6060660.78	Altitudė	97.41
Nuotraukos vardas	017840.jpg	Defektų plotas, %	0.83
Km	17.84	Nuotrauka	<a href="http://akis.lakd.lt/bylos/keliu/matavimai/A1/e32478fb-Sab9-4d31-9f7-664-004100000000">http://akis.lakd.lt/bylos/keliu/matavimai/A1/e32478fb-Sab9-4d31-9f7-664-004100000000</a>



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

# LIDAR + 360° imagery





# Drone



# LAKIS WEB

Trankiai Paieska

Perstumi žemėlapi

Kelio objektų Kelio Nr. Kelio pav. Padėties Kelių matavimų Adresų Rasti Ataskaita

Topo Ortofoto Tuščias Darbiniai sluoksniai

- LAKIS elementai
  - Aplinkosauga
  - Dangos kokybė
  - Eismo apskaita
  - Eismo saugumas
  - Inventorika
  - Kelio parametrai
  - Kita
  - Teritorija
  - Remontai
  - Tiltai, kliūtys, pralaidos
  - Keliai
  - Kelių priežiūra
  - Eismo informacija
  - Planuojami objektai
  - Kelių paieškai
  - Kelių tinklas
  - Kėlias

79 km

Prisijungėte kaip Operatorius 1 [Atsijungti]

© Lietuvos automobilių kelių direkcija prie Susisiekimo ministerijos, 2008-2013 Duomenų teikėjai



# LAKIS WEB





# LAKIS WEB

LAKD objektų peržiūra ir redagavimas

Keliai | Objektai | Teritorija

Pavadinimas: \_\_\_\_\_

Intervalas, km nuo \_\_\_\_\_ iki \_\_\_\_\_

Atstumas nuo ašinės linijos, m: \_\_\_\_\_

- Objekto pavadinimas
- Sustojimo aikštelės (Inventorika)
- Aikštelės plotas (Inventorika)
- Apylankos (Esmo informacija)**
- Apšviesti kelio ruožai (Inventorika)
- Apšvietimas (Inventorika)
- Aptvėrimai (Aplinkosauga)

[Akustinės sienutės \(Aplinkosauga\)](#)

Aplinkosauga     Dangos kokybė  
 Esmo apskaita     Esmo informacija  
 Esmo saugumas     Inventorika  
 Kelių priežiūra     Kelių tinklas  
 Kšta     Regionas  
 Remontai     Tiltai

Kelio tipas: Magistralinis, Krašto  
Objektai: Akustinės sienutės

Surasti    Kelių matavimai

Viršomino triukšmo zonos Lden | Viršomino triukšmo zonos Ln | Želdynai  
Akustinės sienutės | Aptvėrimai | Aptvėrimo vartai | Požeminės gyvūnų perėjos | Vandens valymo įrenginiai

KelioNr	Pradžia,km	Pabaiga,km	Važ. dalis	Padidinti	Perstumti
A1	37,4	38,87	Antra važiuojam...	🔍	👤
A1	37,739	38,233	Viena/pirma važi...	🔍	👤
A1	53	54	Viena/pirma važi...	🔍	👤
A1	53	55	Viena/pirma važi...	🔍	👤
A5	3,732	4,222	Antra važiuojam...	🔍	👤
A5	3,734	4,196	Viena/pirma važi...	🔍	👤
A5	57,314	57,468	Viena/pirma važi...	🔍	👤
A5	57,34	57,464	Antra važiuojam...	🔍	👤

Rodoma įrašų: 11 iš 11 galimų

**Ivede** 121

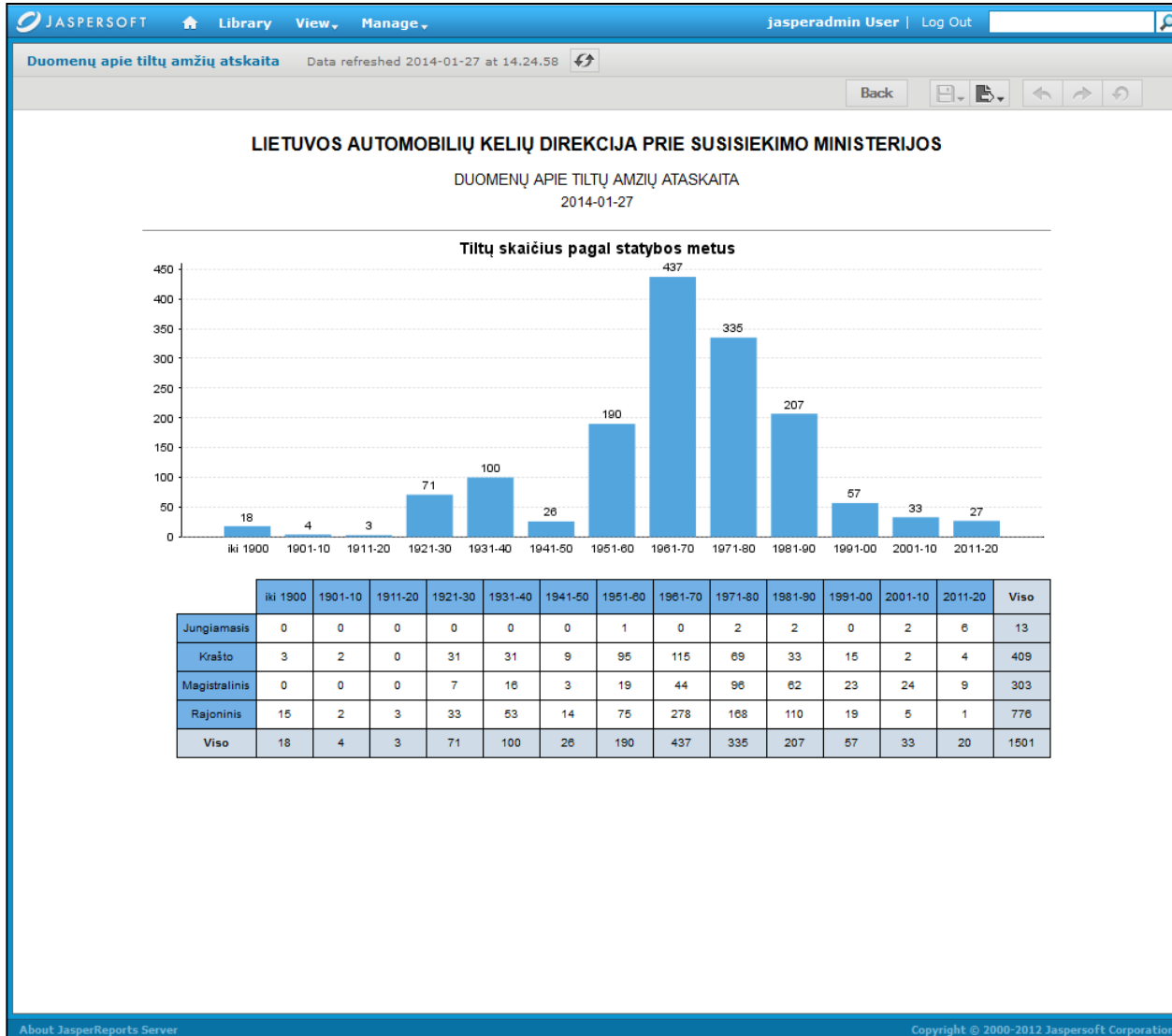
Ivedimo data: 2009-03-05 15:02:43  
Redagavo: 76  
Redagavimo data: 2009-04-16 14:28:44

**KelioNr** A11  
**Pradžia,km** 113,6  
**Pabaiga,km** 113,94

Ivedimo tipas: Pagal santykinę padėtis  
**Važ. dalis** Viena/pirma važiuojamoji dalis  
Statusas: Egzistuojantis  
Įrengimo data: 2008-12-05 15:09:42  
Sutarties numeris: \_\_\_\_\_  
Rangovas: \_\_\_\_\_  
Finansavimo šaltinis: \_\_\_\_\_  
Prižiūrinti įmonė: VĮ "Klaipėdos RK"  
Matavo: VĮ "Klaipėdos RK"  
Remonto data: 2008-12-05 15:09:42  
Akust. sienut. Tipas: Garsą atspindinti  
Statybinė medžiaga: Metalas  
Aukštis, m. \_\_\_\_\_  
Kaina su įrengimu, 1 m. \_\_\_\_\_

Application for search, modify and export road infrastructure data

# LAKIS WEB



Jasper Server for  
generating interactive  
user customizable  
reports

# LAKIS WEB

JASPERSOFT Library View Manage jasperadmin User | Log Out

1.10 VĮ prižiūrimų valstybinės reikšmės kelių tinklas kelių tarnybose Data refreshed 2014-01-27 at 14.26.19

Page 1 of 2

LIETUVOS AUTOMOBILIŲ KELIŲ DIREKCIJA PRIE SUSISIEKIMO MINISTERIJOS

VĮ prižiūrimo valstybinės reikšmės kelių tinklo kelių tarnybose 2012 m. duomenų ataskaita  
2014-01-27

VĮ	KT	Magistraliniai keliai, km	Krašto keliai, km	Rajoniniai keliai, km	Iš viso valst. reikšmės kelių, km	Jungiamieji keliai, km	Iš viso, km
Kauno RK	Raseinių KT	0.000	143.680	360.427	504.107	0.000	504.107
Iš viso VĮ		187.083	320.050	1867.584	2874.717	17.980	2692.677
Klaipėdos RK	Klaipėdos KT	0.000	162.311	296.402	458.713	0.887	459.600
Klaipėdos RK	Kretingos KT	78.850	73.730	336.499	487.079	10.420	497.499
Klaipėdos RK	Šilutės KT	0.000	127.830	431.904	559.734	0.000	559.734
Klaipėdos RK	Skuodo KT	0.000	85.296	276.532	361.828	0.000	361.828
Iš viso VĮ		78.850	449.167	1341.337	1867.354	11.307	1878.661
Marijampolės RK	Marijampolės KT	80.653	121.241	338.591	540.485	5.910	546.395
Marijampolės RK	Šakių KT	0.000	124.378	401.026	525.404	0.000	525.404
Marijampolės RK	Vilkaviškio KT	39.927	118.814	347.530	506.271	0.853	507.124
Iš viso VĮ		120.580	364.433	1087.147	1572.160	6.763	1578.923
Panevėžio RK	Biržų KT	0.000	107.159	345.940	453.099	0.000	453.099
Panevėžio RK	Kupiškio KT	0.000	101.829	242.395	344.224	0.000	344.224
Panevėžio RK	Panevėžio KT	88.025	116.062	440.222	644.309	7.105	651.414
Panevėžio RK	Pasvalio KT	46.808	57.951	308.348	413.105	0.000	413.105
Panevėžio RK	Rokiškio KT	0.000	123.935	459.003	582.938	0.000	582.938
Iš viso VĮ		134.831	506.936	1795.908	2437.675	7.105	2444.780
Šiaulių RK	Akmenės KT	0.000	96.730	245.990	342.720	0.000	342.720
Šiaulių RK	Joniškio KT	33.700	82.310	286.290	402.300	0.000	402.300
Šiaulių RK	Kelmės KT	43.700	106.260	362.982	512.942	5.410	518.352
Šiaulių RK	Pakruojo KT	0.000	139.790	350.062	489.852	0.000	489.852
Šiaulių RK	Radviliškio KT	39.321	80.610	380.980	500.911	2.731	503.642
Šiaulių RK	Šiaulių KT	102.500	97.630	330.958	531.088	9.940	541.028
Iš viso VĮ		219.221	603.330	1957.262	2778.813	18.081	2797.894

Filter column: VĮ

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Jasper Server for generating interactive user customizable reports



# Future plans

- 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 for attention**