Further development of RWIS and it's new potential marketplaces in Latvia

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RWIS of Latvian national road network

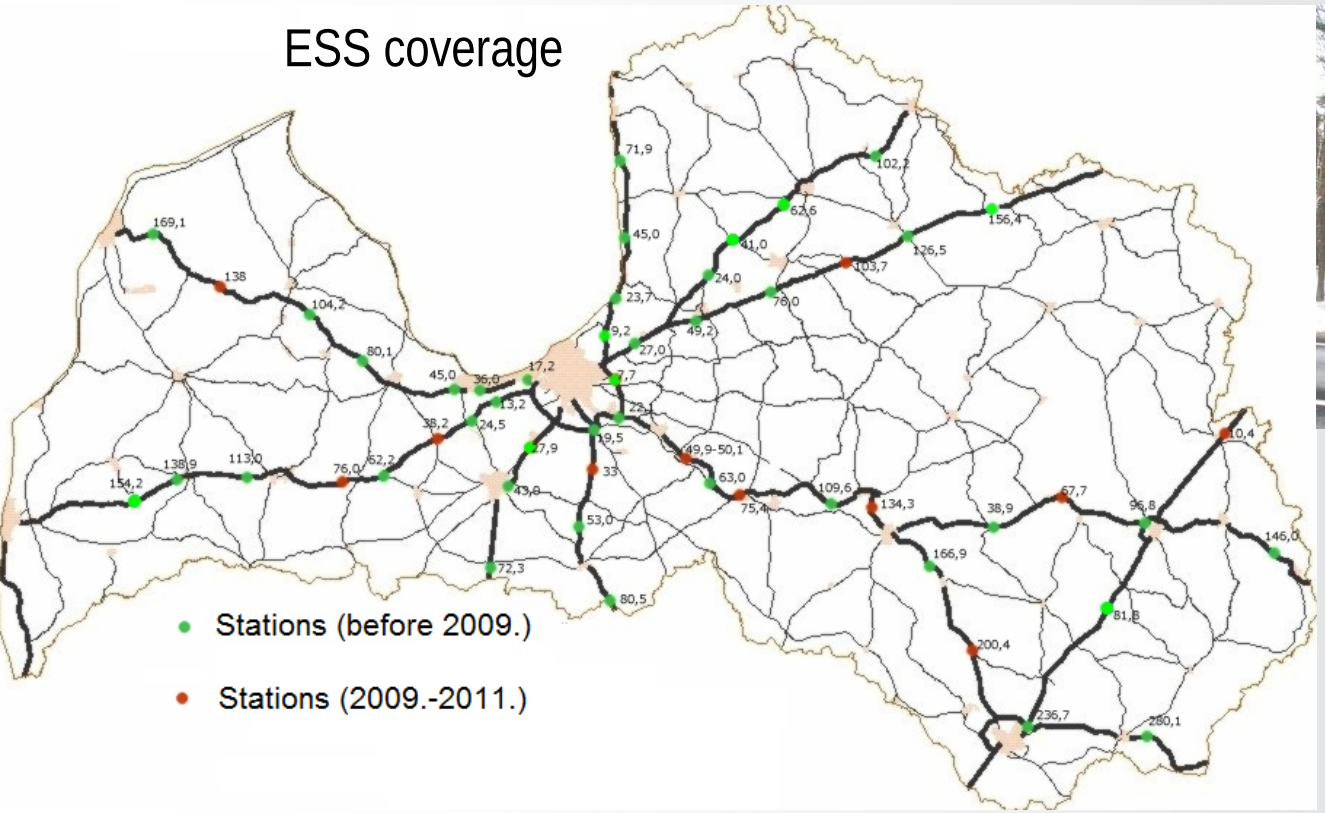
General information of RWIS:

- Developed since 1997. by national road administration, initially only for specific needs of road winter maintenance;
- Included 53 typical ESS combined with other road/traffic sensing devices and central system for data processing;.
- Web-based user interfaces for professional and public needs.

The main directions of RWIS future development in Latvia are noticed:

- technical upgrading of existing and ESS to measure growing amount of data in more effective and precise way;
- integration of RWIS with other related systems and data sources to get new analytical products for road industry, as well as to cover secondary road network with low-cost sensing technologies (to encourage decision-making tools for road winter maintenance and management;
- RWIS data use for new marketplaces through involvement in common meteorological models and merged with other data through unified ITS platform.

Placement of ESS network along Latvian national roads



New and old type ESS placement at the roadside

53 stations (mainly Vaisala ROSA) are combined with weather cameras (Axis, Mobotix with IR regime for night time) and real-time traffic counters (inductive loops).

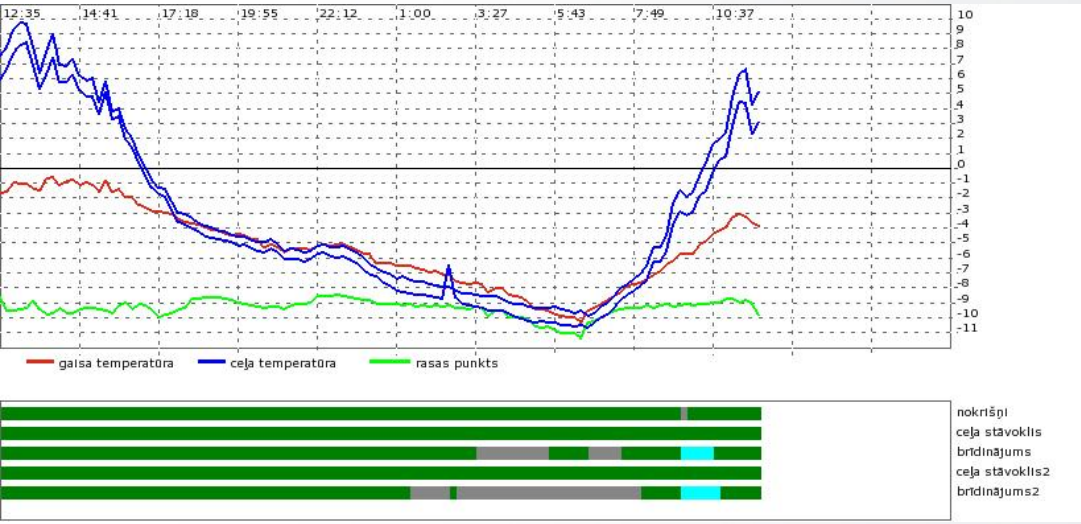
Distance between ESS along the main national road network (1600km.) is 20–50km.

RWIS software is in-house developed by road administration.

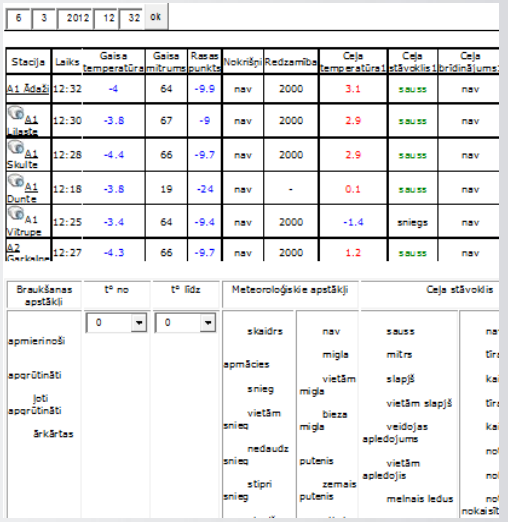
ESS technical maintenance is outsourced.

Principal RWIS indications for road maintenece staff

Graphical trends



Measured parameters

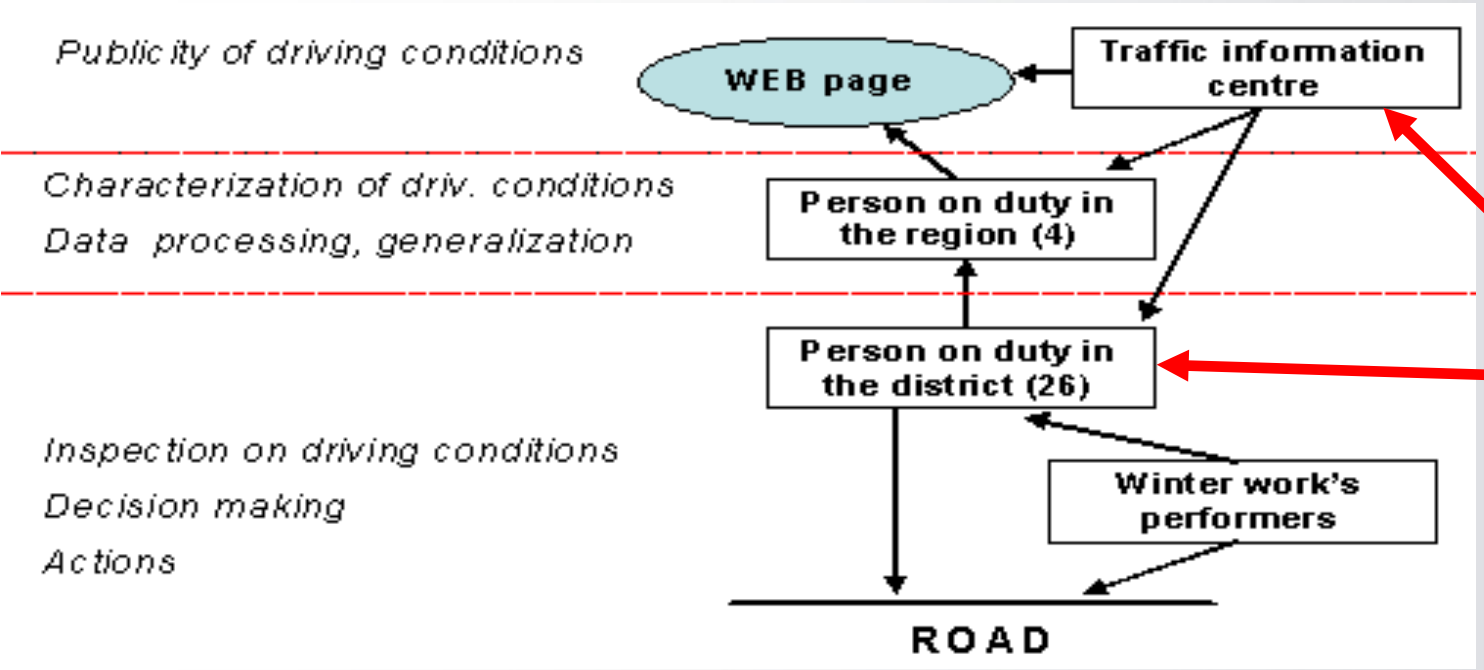


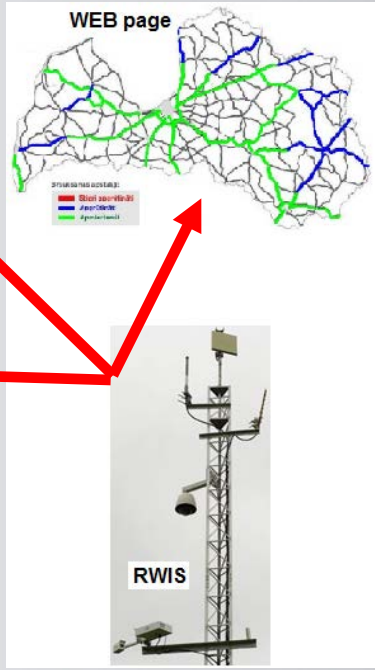
Camera images

The main user interfaces (web) of RWIS data are:

- **winter staff's webpage** *(limited access)* – multisourced feed of road (full range of RWIS data, traffic profiles, videosurveilance) and specific meteorological (forecasts, alarms, radar and satellite images, numerical models ect.) information for needs of road maintenance;
- **www.balticroads.net** *(public access)* – international portal on road weather conditions (real-time data, mostly descriptive for driving conditions) in Baltic countries, which is aiming on public use;
- **GIS of road network** *(public access)* – full range RWIS data, for needs of network's management and planning (a module for public use as interactive route planner will be soon on LSR web page).

Decision-making algorithm for road winter maintenance and traffic info dissemination



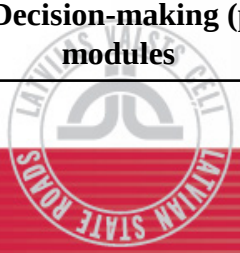


The other kinds of RWIS data use in road industry are (where additional data for sub-representative or analysis is provided rather, than a control of certain threshold values):

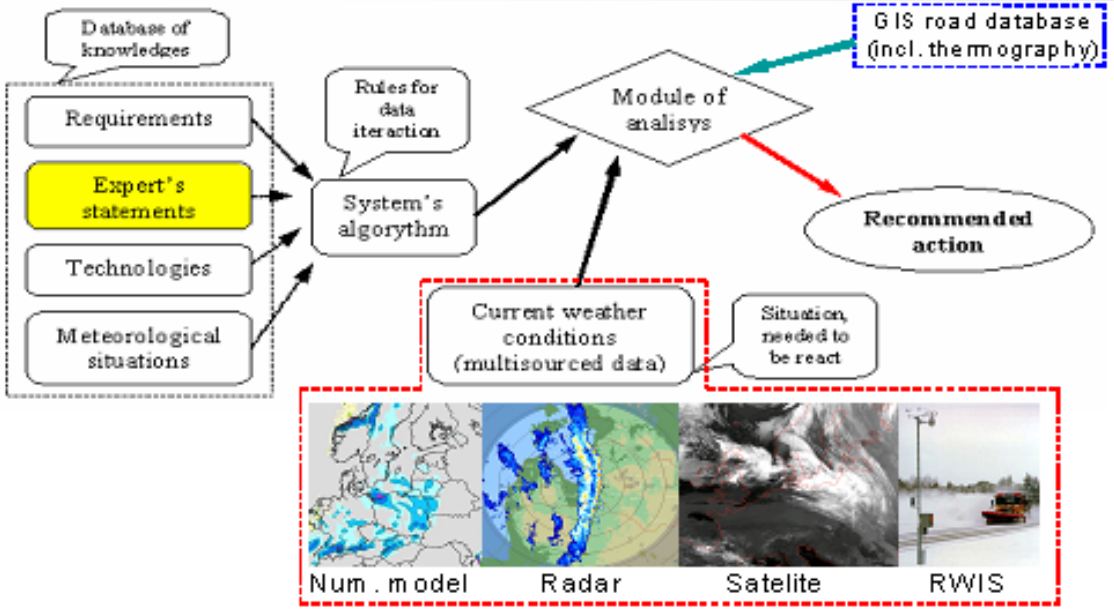
- monitoring of pavement temperature in a period of spring thawing;
- monitoring of pavement temperature in a period of summer heat;
- monitoring of actual ESS data during a process of road construction;
- use of ESS statistic data for guidelines optimisation on road maintenance and management.

Development directions of existing RWIS

Improved functionality	*Added value*	*Tools*
Better sensing quality; min. of damage of ESS	More precise data input to RWIS; savings for maintenance of ESS	Revision of ESS placing, calibration and maintenance guidelines; optimising of data transfer ESS – RWIS core
Broader ESS network	Optimal ESS coverage of the main road network for implementation of proactive services (more dense, than now); ESS introduction to other roads	Gradual expansion of classic ESS along the main roads. Low-cost ESS introduction to secondary roads
Extra sensing equipment for ESS	Control of road subbase's state; traffic control (where still not), other measurements, taking into account, that ESS provide ready to use in-place infrastrure	Probe sensors; traffic counters etc.
ESS partial functionality for another road devices	More primary meteorological data (temperature, humidity ect.) on spots, where no ESS installation	Cameras with graphical input of weather sensors
Extra signalling devices for ESS	Traffic information at roadside; speed control in hazardous driving conditions	Electronic screens; variable message signs (VMS)
Road weather data between ESS	Input in high-accuracy decision-making services along specific road stretches	Thermal mapping of road network
Data from mobile sensors	Actual data, measured along full stretches	Equipment on contractor's fleet (skid meters; surface's analysers, ect.)
Data interoperability	Effective data input to a common ITS platform (sharing between actors) and feedback as proactive services	Probably data exchange in XML format, through DATEX II nodes
Decision-making (proactive) modules	Derivative services, as input to automated: antiicing treatment; adaptive spreading; advisory traffic info, tech. indices ect.	Programs, based on multisourced data integration and analysis

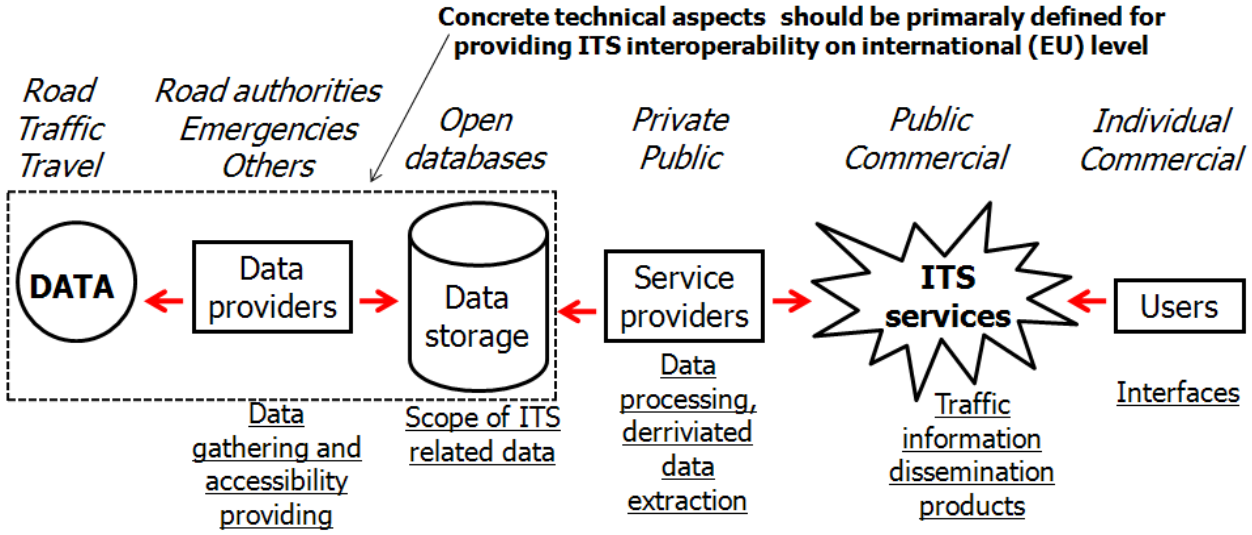


RWIS data integration for the main services (in progress)



Expert system's concept for automated decision-maikng in winter road maintenance

Harmonized data flow throughout ITS architercture for traffic info dissemination



New identified marketplaces for RWIS data in Latvia

Marketplace	***RWIS contribution***	***Status of interest***
Project of speed cameras	Sharing of physical infrastructure	Initial negotiation with Police
Investigations (under private data protection law)	Camera images, statistical road weather data	Cooperation with official bodies
Common meteorological information	ESS data input will provide broader sensor's network	Partnership in progress
Logistic planners for heavy traffic	Data on pavement critical conditions, when heavy traffic is not desirable or even restricted	Initial interest (especially from forest industry)
Operators of municipal and forest roads	Accessibility of neighbouring ESS real-time data for professional needs	Partnership in progress
Commercial traffic information services	Accessibility of ESS real-time data under unified ITS framework	Initial negotiation with some actors
Agriculture	Data on road sub-base conditions as input for specific soil forecasts	Initial interest