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XIII INTERNATIONAL WINTER ROAD CONGRESS

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WORLD ROAD ASSOCIATION
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SUSTAINABLE WINTER SERVICE FOR ROAD USERS

A Role of ITS in Road Winter Maintenance

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SCOPE OF ROAD WINTER MAINTENANCE (RWM)

The main RWM differences comparing to other road works:

- there is no clear investing vector for spent resources;
- activities counteract changeable natural traffic hazards, which are predicted/estimated only for a certain extent;
- activities usually have short term effect;
- activities are simultaneously applied to the whole road network.

The abovementioned equitable reasons indicate:

despite well structured methodology, that may provide clear performance criteria and variety of organizational and technological measures for achieving them, there are **still many controversial questions in RWM.**

CHALLENGES OF ROAD WINTER MAINTENANCE

The principal actors involved in RWM may not always share the same point of view, because:

- target group (road users) is interested, that winter will not significantly affect traffic and wishes to get support on actual traffic situation;
- performance group (contractors) is interested in the profit from performed works;
- control group (road administrations) is interested in prudent use of allocated resources.

The driving force of RWM is the necessity to ensure more and more qualitative road service with limited resources, that asks for synergetic approach.

Intelligent Transportation system (ITS) provides a proper platform for achieving this goals.

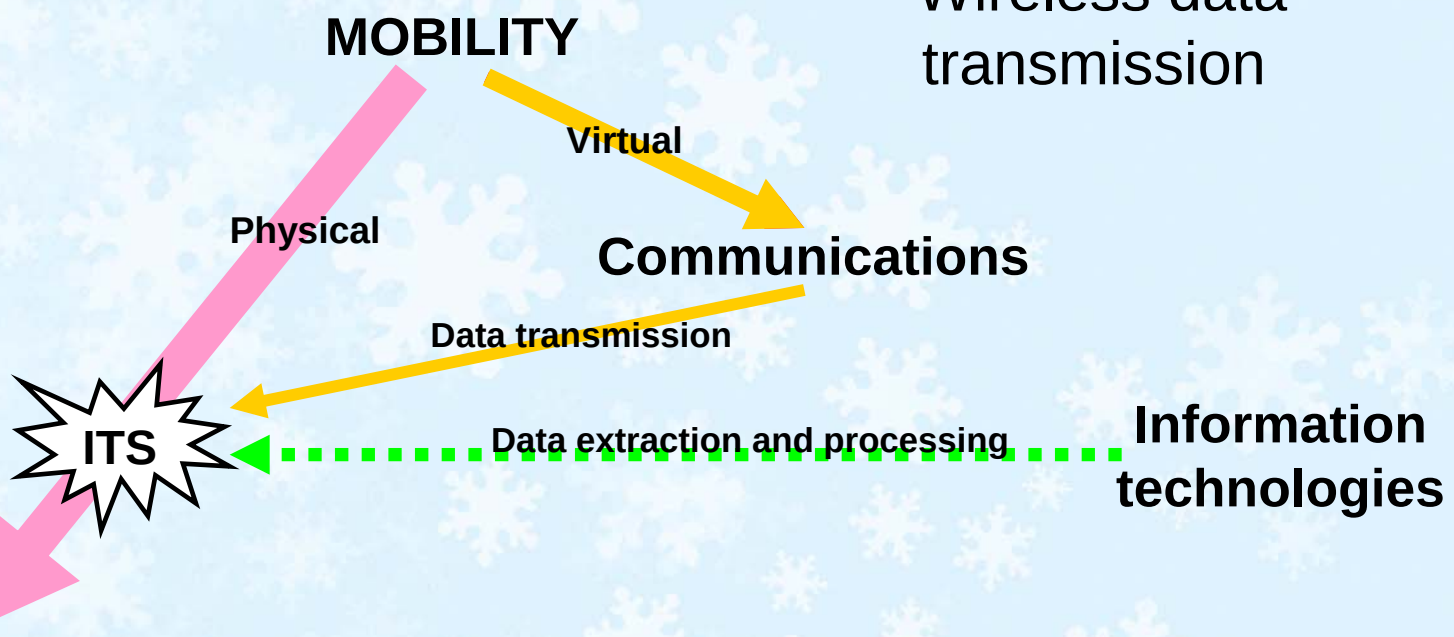
ASPECTS RELATED TO ROLE OF ITS IN ROAD WINTER MAINTENANCE

Involved ITS domains:

- Traffic data gathering
- Dissemination of traffic information
- Adaptive traffic management
- Decision making support tools

Core technologies:

- GIS
- Dynamic databases
- GNSS
- Remote sensing
- Wireless data transmission

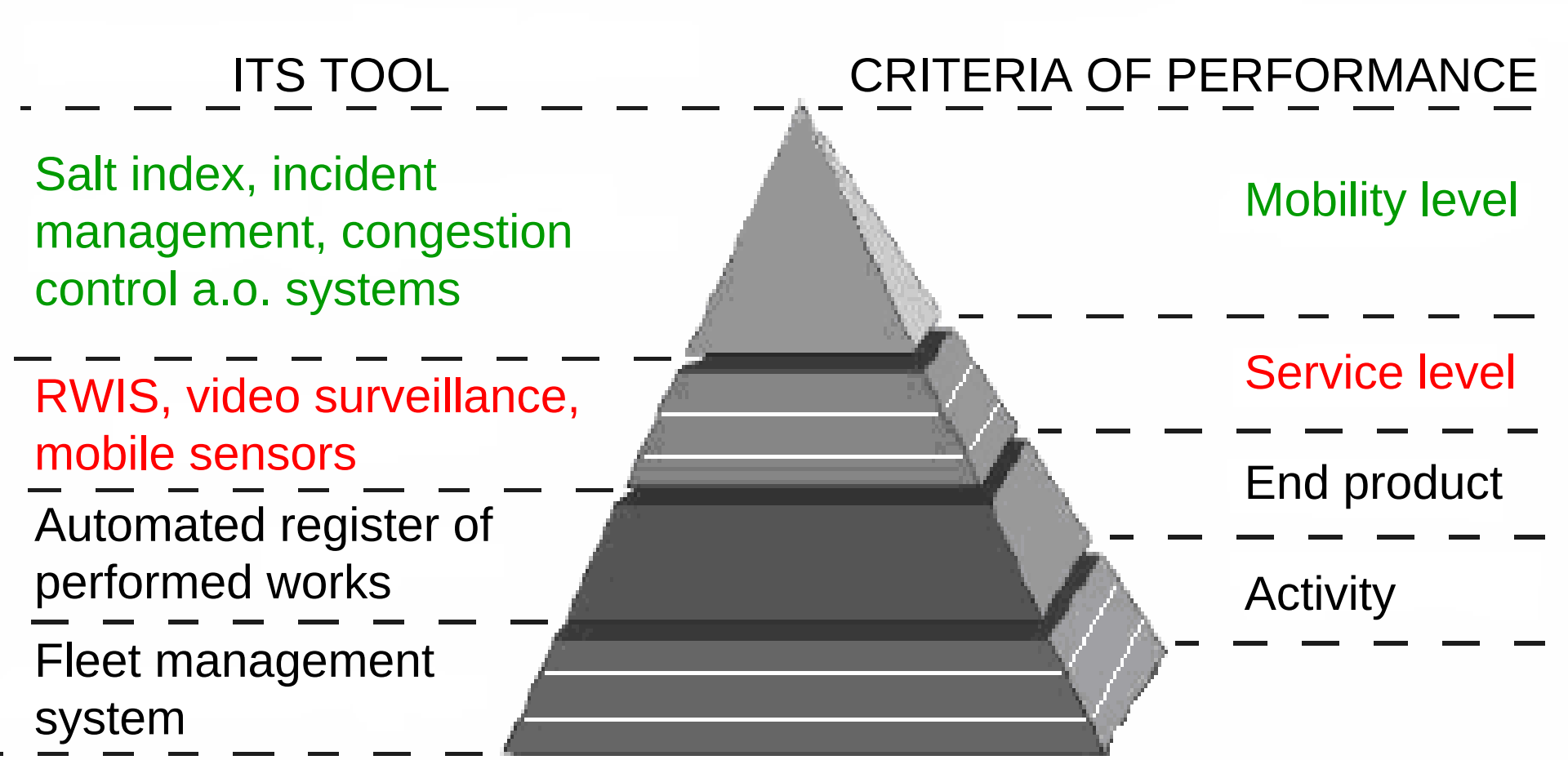


Goals: improved effectiveness, safety and accessibility

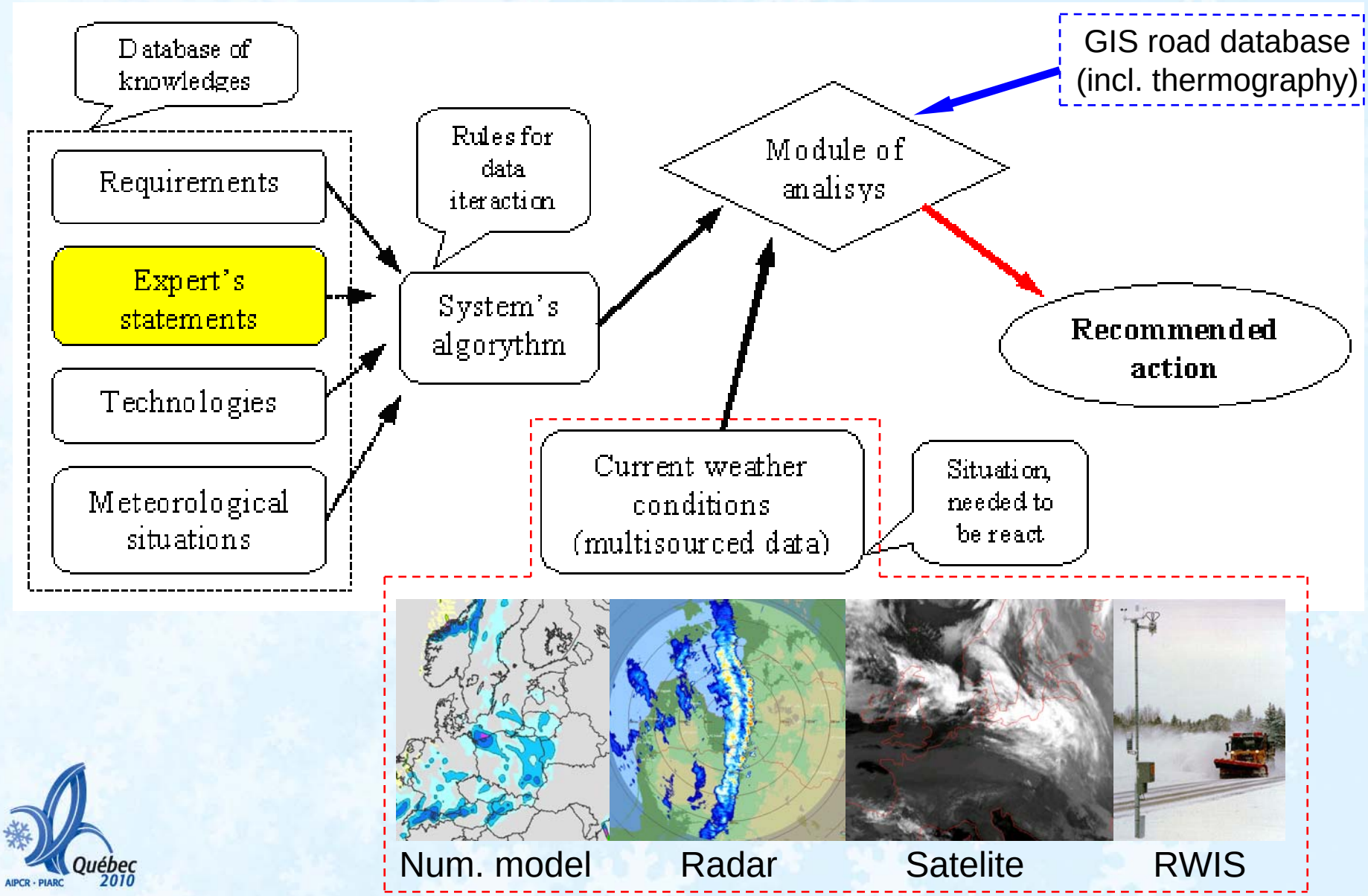
MUTUAL LINKS BETWEEN ITS AND ROAD WINTER MAINTENANCE

ITS related data, generated in the process of RWM	ITS specialized services for the purposes of RWM
Common characteristics of driving conditions	*Basic services*
Real-time data on activity of winter maintenance fleet	Road weather information system
	Road video surveillance system
Mobile traffic sensing from winter maintenance fleet	Fleet management systems
	Combined and derivative services
Data on specific traffic situations (accidents, obstacles etc.), traced by winter maintenance staff	Complex weather resources, models
	Expert systems for decision making in providing and evaluating of RWM
Definition of road service levels (once per season or when necessary)	Automated register of performed winter works

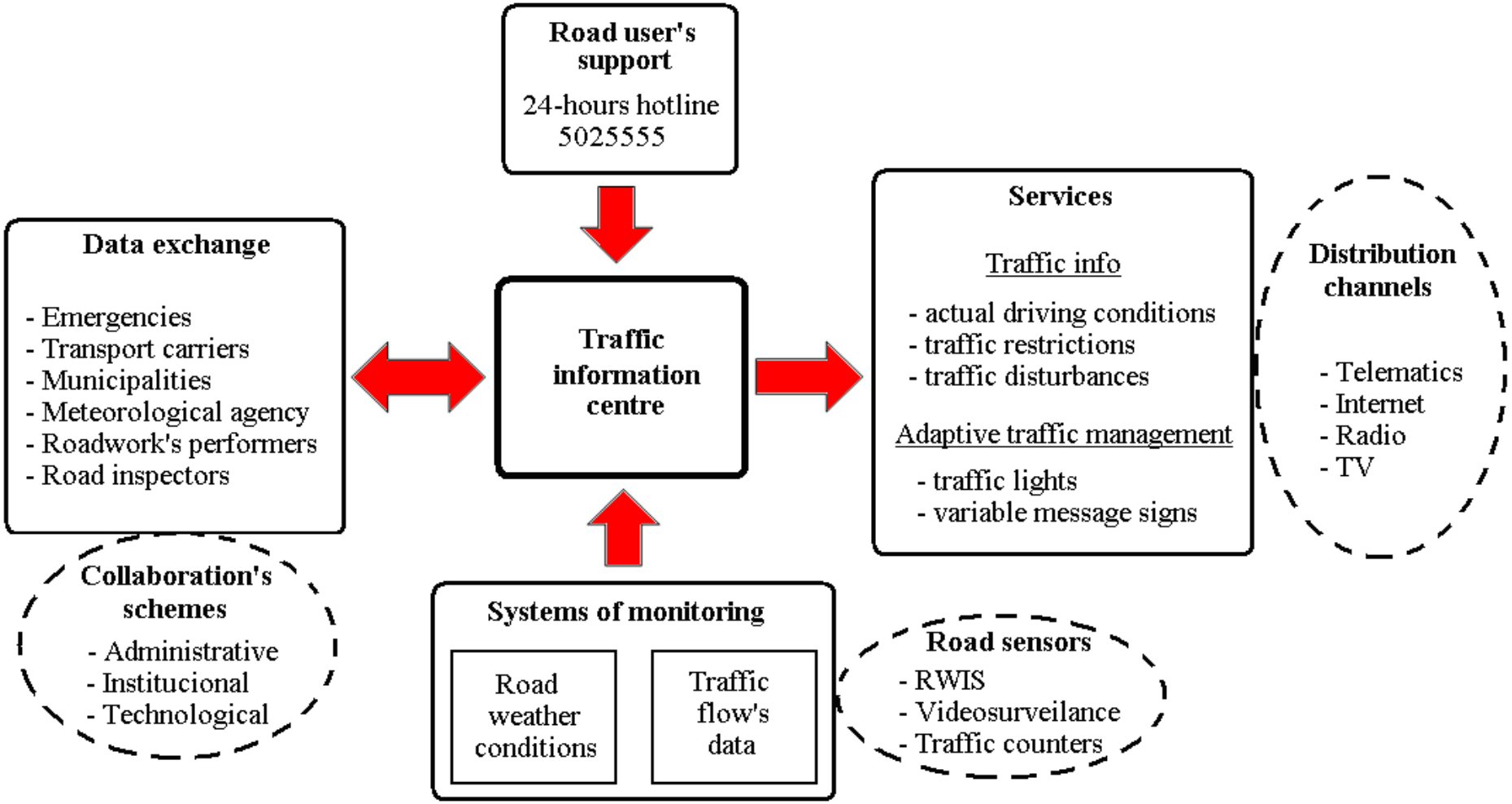
ITS SOLUTIONS USABLE FOR MANAGING ROAD WINTER MAINTENANCE



CONCEPT OF ADVANCED DECISION MAKING TOOL FOR ACTIVITIES OF RWM



PRINCIPAL ARCHITECTURE OF LATVIAN ROAD NETWORK'S ITS



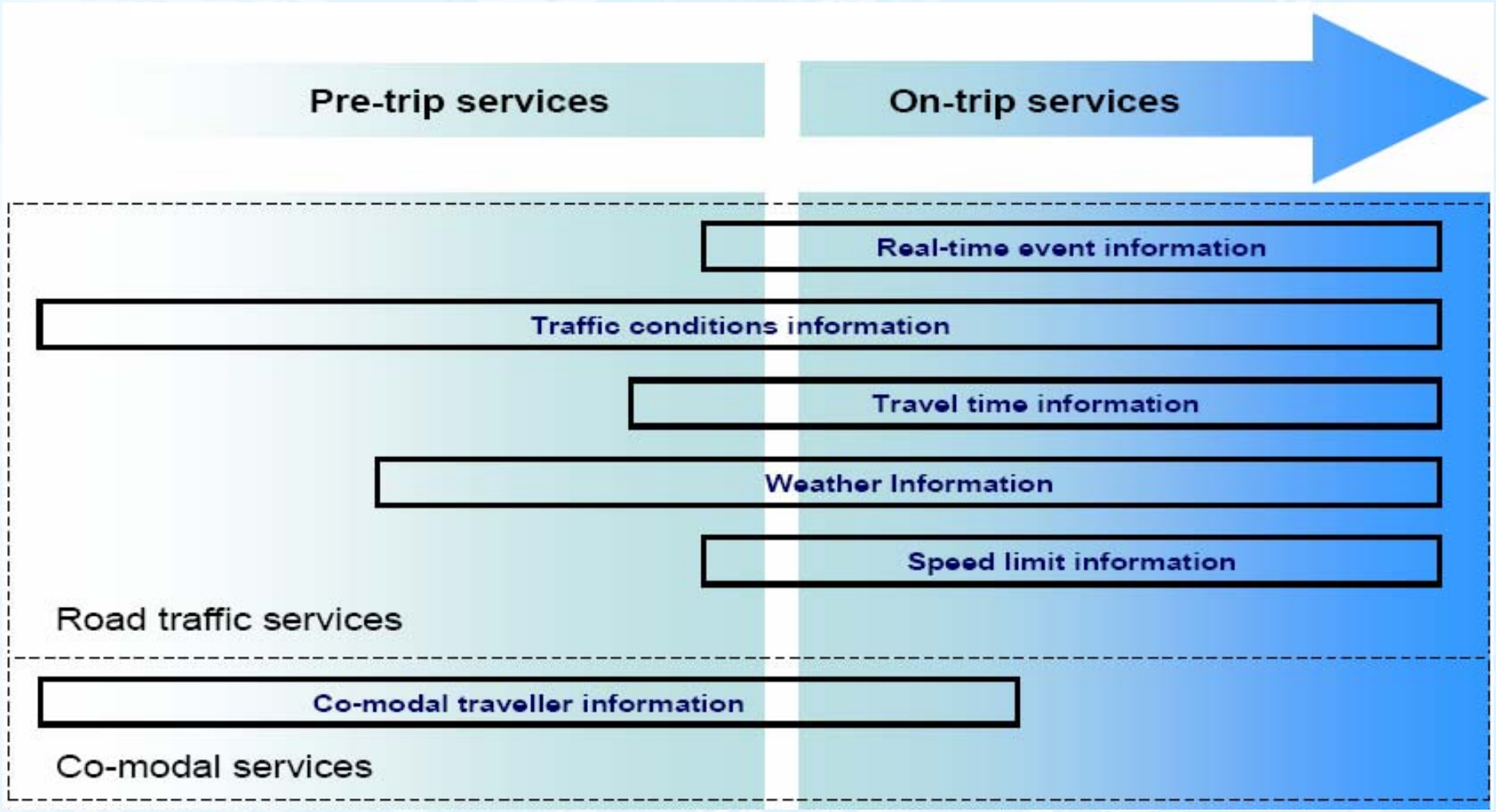
CORNERSTONES OF COST EFFECTIVE ITS DEPLOYMENT IN LATVIA
(with emphasis on traffic information dissemination)

Maximal orientation on widespread “light” technologies (GNSS, wireless data transmission, existing and still widely used customer interfaces) which can make reasonable ITS jump without massive investments in real infrastructure (wiring, extensive roadside telematics etc.)

Equipment used in ITS subsystems need to be as multifunctional as possible (e.g. video surveilance: videoimage→ traffic counting→ active traffic sensors)

In-depth public private partnership in ITS field, when public authorities provide only necessary framework (widening of road monitoring systems for traffic related data gathering and public access to them, etc.), but service provision to road users is developed by market

PATTERN OF DEALING WITH TRAFFIC INFORMATION, ORIENTED ON ROAD USER'S NEEDS



DISSEMINATION OF TRAFFIC INFORMATION (effective practical scheme)

Data source

Public information
- Road administrations
- Regional governments
- Emergency services

Partnerships
- Transportation companies
- Public transportation officials
- Parking facilities
- Aviation officials

Private sources
- Radio stations
- Internet pages
- Info agencies

Other sources
- Satellite and radar images
- Weather forecasts
- CO affiliates

Commercial operators

Data fusion

Modeling

Service types:
- Floating car data
- Road weather
- Accidents
- Timetables
- Parking facilities
- Road camera images
- Public events
- Road maintenance
- De-tour info

Information distribution:
- By area, route, location
- As speech
- As web site
- As SMS/MMS
- As image
- As RDS_TMC

Clients

Navigation device manufacturers

Navigation services

Mobile operators

Web portals

Media providers

Logistics and fleet operators

Traffic consultants

Map application providers

National and local authorities

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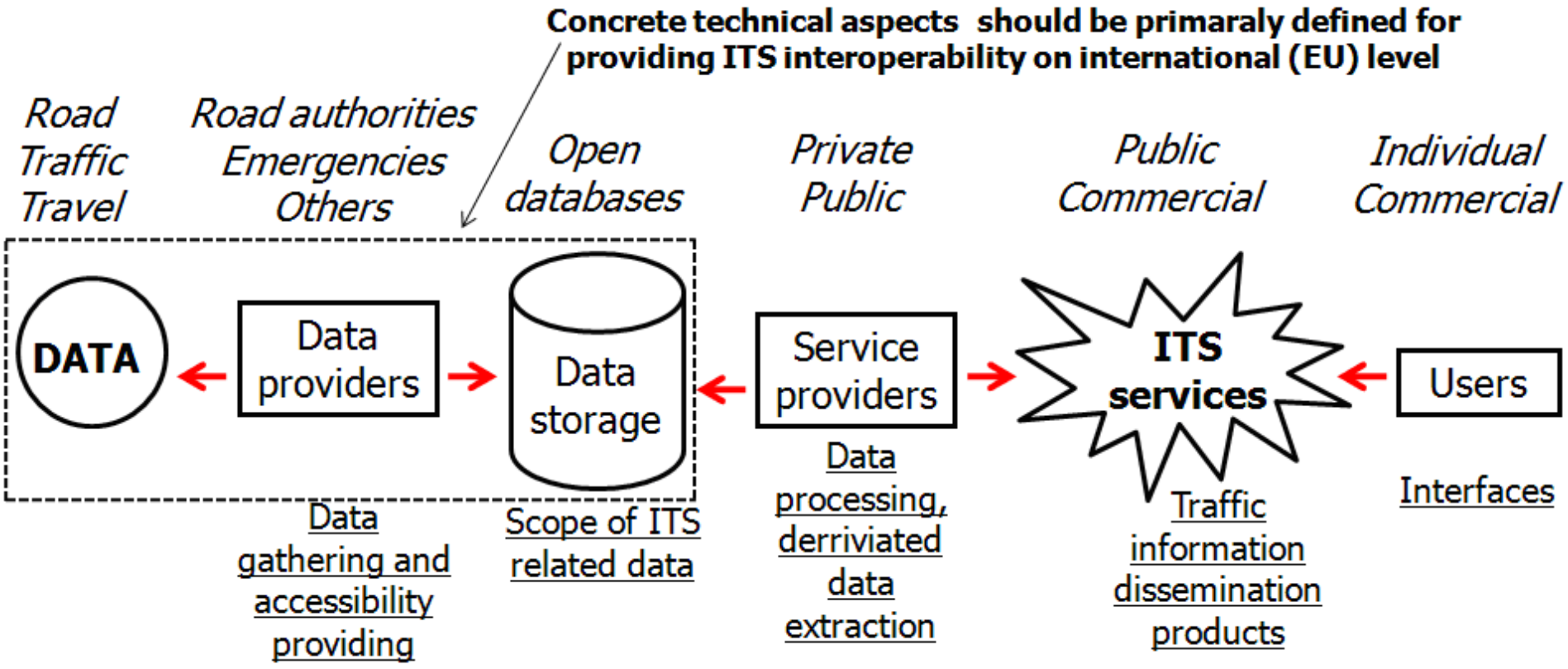
ITS RELATED DATA FLOW WITH RESPECT OF COMING EU DIRECTIVE ON ITS



Principal classification and specifying, as well as, compatibility aspects of ITS related data need to be agreed in the nearest future, e.g. data ranking:

- **by basic category** (road, traffic and travel data)
- **by activity status** (static, variable and real-time)
- **by necessary form** (minimal amount and extra data)
- **by responsibility for data provision** (road units, emerg. services etc.).

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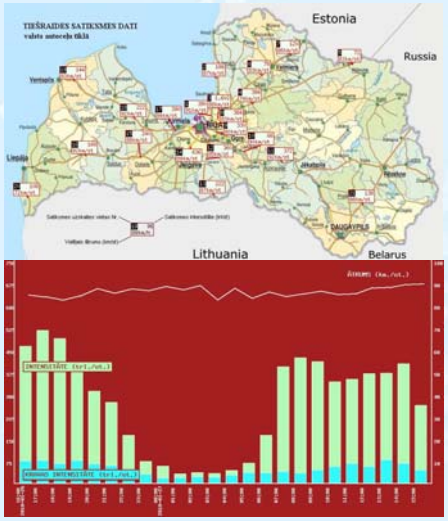
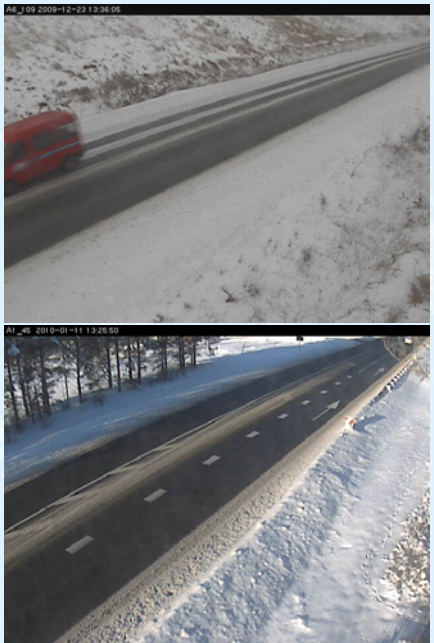
LATEST ROAD WINTER MAINTENANCE RELATED ITS PROJECTS IN LATVIA (2009)

- Automation of existing traffic counters with respect of getting real-time transport flow data (21 point near the main roads)



Output for RWM:
<u>indication of existing traffic obstacles</u>
(e.g., slippery pavement)

- Deployment of video surveillance system, as addition to existing RWIS stations (45 points at main roads)



Output for RWM:
<u>visual awareness on driving conditions</u>
(good addition to RWIS for decision making)

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MAIN TASKS FOR FURTHER DEVELOPMENT OF LATVIAN ITS WITH RESPECT OF RWM

Improvement of decision making tools to widen strategic and technological scope of RWM (anti-icing, more anti-skid materials and their application forms) providing more flexible approach, as well as, support road management for better performance evaluation (salt index, etc.)

Better information provision on actual driving conditions to road users, with emphasis on interactive and on-line services

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