



## Information systems for improving winter maintenance and the exchange of information

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## Initiative

### PIARC 2004-2007 Strategic Plan

#### Issue 3.4.1 - *Improve winter maintenance and operational information systems*

#### Strategies :

- **Optimize** the decision making process and the use of decision aid tools;
- **Promote** the sharing of pertinent winter operations data (eg. RWIS data etc.) across jurisdictions.

# Process

***REVIEWING CURRENT  
PRACTICES AND  
RECOMMENDATIONS***



***DRAFTING A REPORT TO BE  
USED AS THE BASIS FOR  
DISCUSSION***



***PROVIDING LINKS TO OTHER  
ORGANIZATIONS***

## Work Group 3.4.1

**Richard Charpentier (Head)** – *Canada-Québec*

**Paul Delannoy** – *Canada*

**Horst Hanke** – *Germany*

**Patrick Hughes** – *United States*

**Yasuhiko Kajiya** – *Japan*

**Mario Marchetti** – *France*

**Jan Olander** – *Sweden*

**Paul Pisano** – *United States*

## Methodology for the report

### Two sections :

- The results of a survey of 21 organizations;
- A complementary analysis based on the key information that was collected for each topic.

***The objective of the report is to provide the reader with an overview and quick links to more specific information.***

# Organisations surveyed



## Themes of the questionnaire

### ***System components and data collection***

- Standards for sensors
- Type of data collection
- Construction and maintenance of station
- Types of sensors
- Terminology of surface condition sensors
- Mobile road weather stations

### ***Data processing and integration***

- Data sharing
- Management indicators
- Decision support systems
- Public access to data
- Impact on costs and consumption of salt
- Data exchange formats

## References used

**Reference was made to four main sources :**

- *Communications and proceedings from international congresses;*
- *Work carried out in the context of programs;*
- *Summary documents produced by international organizations;*
- *Websites belonging to specific organizations.*



## Contents of the report

- ***Instrumentation for information systems***
- ***Management of facilities and data***
- ***Standardization***
- ***Development of support tools***
- ***Use of in-vehicle sensors***
- ***Information sharing***
- ***Management indicators***
- ***Benefits of information systems***

## Instrumentation for information systems

**Sensors and components of information system are more varied than ever before.**

***The choices made by organizations correspond to their strategies and to the unique characteristics of their road environment.***

## Management of facilities and Data

**The survey identified several data management methods :**

- Fully managed by the public sector;
- Management shared between the public and private sectors;
- Fully managed by the private sector.

***Data management depends on the use of data and the level of standardization of the data.***

# Standardization

**Several initiatives aimed at developing standards are currently underway :**

- A greater number of topics;
- International harmonization of standards.

## ***Standardization topics***

- TERMINOLOGY
- CHARACTERISTICS OF SENSORS
- RELIABILITY OF DATA
- DATA FORMAT
- METADATA
- COMMUNICATIONS
- INFORMATION MESSAGES

## Development of support tools

The collected data can be used at several levels in order to develop :

- Decision support systems;
- Systems for communicating with users;
- Winter maintenance management systems (for example: post winter economical analysis).

***In some countries, reference is also made to expert systems.***

# Decision support system (Québec)

Système d'aide aux décisions de viabilité hivernale - Microsoft Internet Explorer

Fichier Edition Affichage Favoris Outils ?

Précédente Recherche Favoris

Adresse [http://givre:7777/sadvh/\\_security\\_check](http://givre:7777/sadvh/_security_check) OK Liens Portail DSEI eduZone - La solution globale d'apprentissage LiveLink

Système d'aide aux décisions de viabilité hivernale Québec

Accueil Courrier Portail Québec

Rapports Préférences Quitter

Station Stornoway

Actuel		Prévision	
<b>Température</b>			
Air ambiant :	25.6 °C	CR5000 1.3	
Point de rosée :	18.1 °C	Longitude :	-71,2
Surface de la chaussée :	49.7 °C	Latitude :	45,7
Sous la chaussée à -10 cm :	ND	Altitude :	460
Point de congélation :	ND	Vent	12.3 km/h →
Humidité relative :	62.3 %	<b>Précipitation</b>	
Pression atmosphérique :	96.7 kPa	■	
Visibilité :	3100 m	Age :	2.2 min.

[Graphique](#) -- [Paramètres avancée](#)

Québec

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## Use of in-vehicle sensors

**Intelligent Transportation Systems can also be used to provide information for improving winter maintenance :**

- Measurement of atmospheric and road parameters throughout an itinerary;
- Measurement of friction coefficients;
- Information concerning the travel, functioning, and operation of maintenance vehicles.

## Information sharing

### **Data sharing takes place at several levels :**

- Within an organization;
- Between organizations;
- Within a province, state, or country;
- Between several countries.

***The type of information that is intended for road users varies depending on the country.***



# Information sharing (Wallonia Region, Belgium)

http://routes.wallonie.be/trafiroutes/meteo.do - Microsoft Internet Explorer

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Précédente Rechercher Favoris

Adresse http://routes.wallonie.be/trafiroutes/meteo.do

FR - NL - DE Wallonia Portal - Home - Site map - Help - Contacts

**W**  
RÉGION WALLONNE

Motorways and Roads of Wallonia  
Trafiroutes

You are here: Weather

Motorways and roads of Wallonia Site

- Home
- Traffic
  - Map
  - List of events
  - Searches
  - Mail
- Equipment
  - Car parks
  - Text panels
  - Cameras
- The weather
  - The weather stations
  - Snow conditions
- External links

News items

Fermeture de l'A27 (E42) à Lommersweiler

0800 48 400  
To notify a traffic problem to Perex

Measurements recorded by the weather stations

Climatic conditions are decisive for network operation. That is why the MET's weather stations are continuously taking measurements.

By placing the pointer on a station, you will obtain the temperature and the humidity of the air together with the wind speed and direction in real time.

**Arlon** Map of Wallonia  
E411(A4) - BK 180.9  
Wind direction North  
Wind speed: 0 km/h  
Temperature: 10.0 °C  
Humidity of the air: 82 %  
12/09/2007 - 22:00

Legal notice - Privacy - Ombudsman - Accessibility - Top of page

http://routes.wallonie.be/trafiroutes/meteo.do#

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# Information sharing (Baltic)

Baltic Roads en - Microsoft Internet Explorer

Fichier Edition Affichage Favoris Outils ?

Précédente Rechercher Favoris

Adresse <http://www.balticroads.net/en/index.htm>

OK Liens Portail DSEI eduZone - La solution globale d'apprentissage LiveLink

**WWW.BALTICROADS.NET**

Welcome to [www.balticroads.net](http://www.balticroads.net) service, which is provided in co-operation between the National Road Administrations of Finland, Estonia, Latvia, Lithuania and Russia.

You can see the current road weather conditions in the Baltic Sea Region.

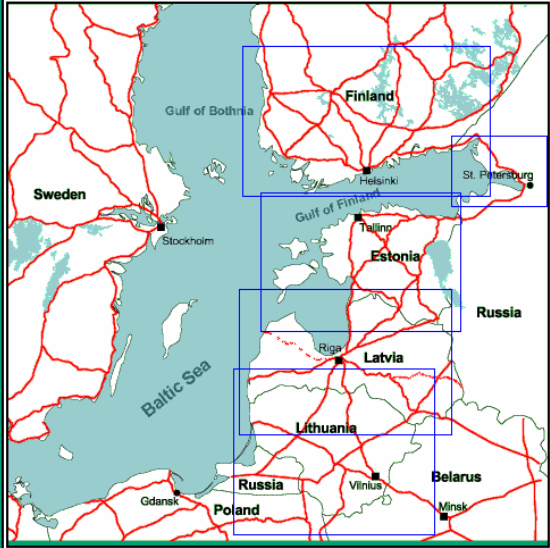
The information is based on automatic Road Weather Information Systems of the concerned countries.

**Disclaimer**

**HAVE A SAFE JOURNEY !**

- Finnish Road Administration
- Estonian Road Administration
- Latvian Road Administration
- Lithuanian Road Administration
- Leningrad Region Road Committee
- Comments and suggestions for site

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Sweden Finland Estonia Latvia Lithuania Poland Russia Belarus

Stockholm Helsinki Tallinn Riga Vilnius Minsk

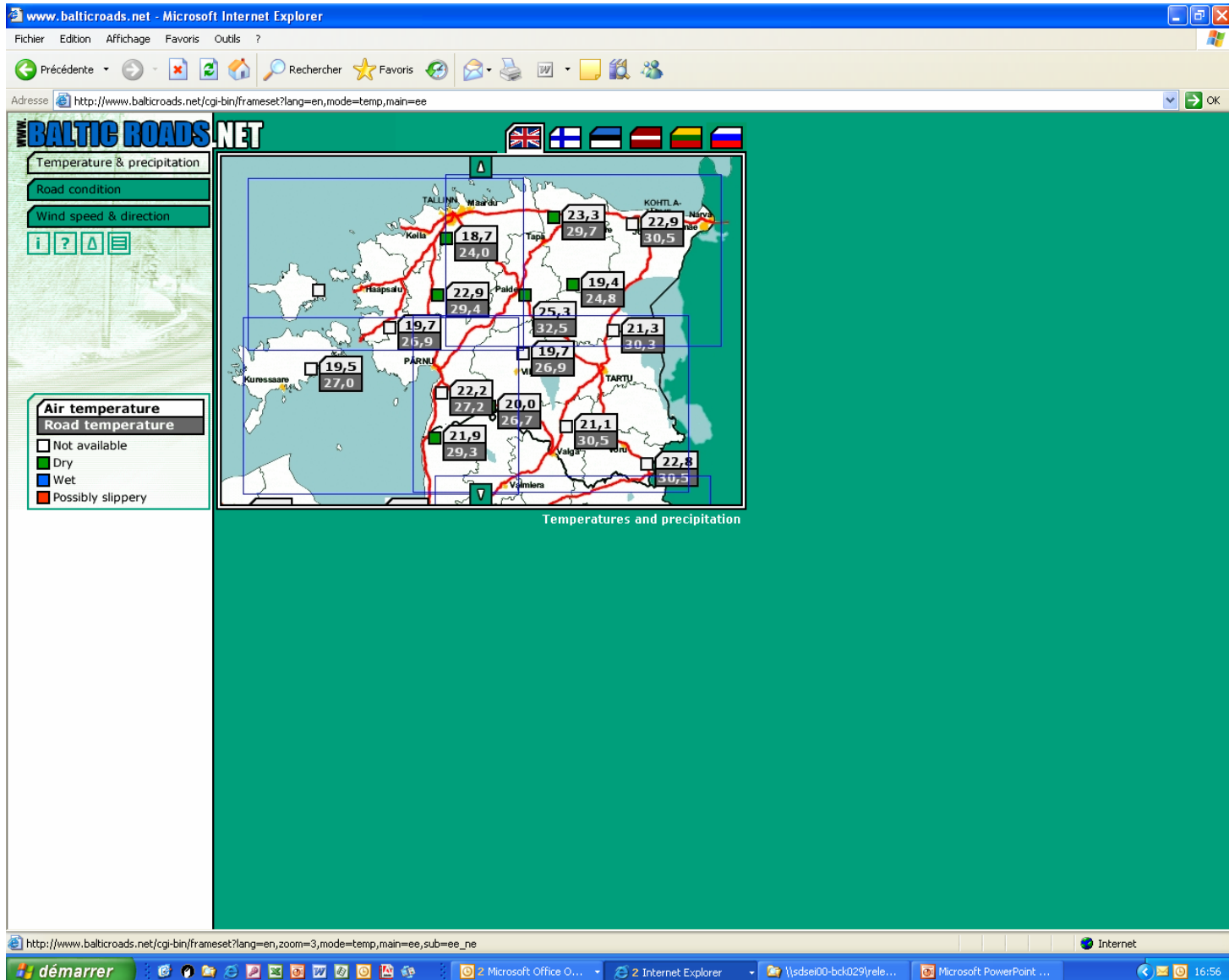
Gulf of Bothnia Gulf of Finland

Baltic Sea

Internet

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# Information sharing (Baltic)



## Management indicators

**Many organizations currently have or are working toward developing indicators for :**

- Winter severity;
- Performance;
- The use of melting agents;
- Environmental impact.

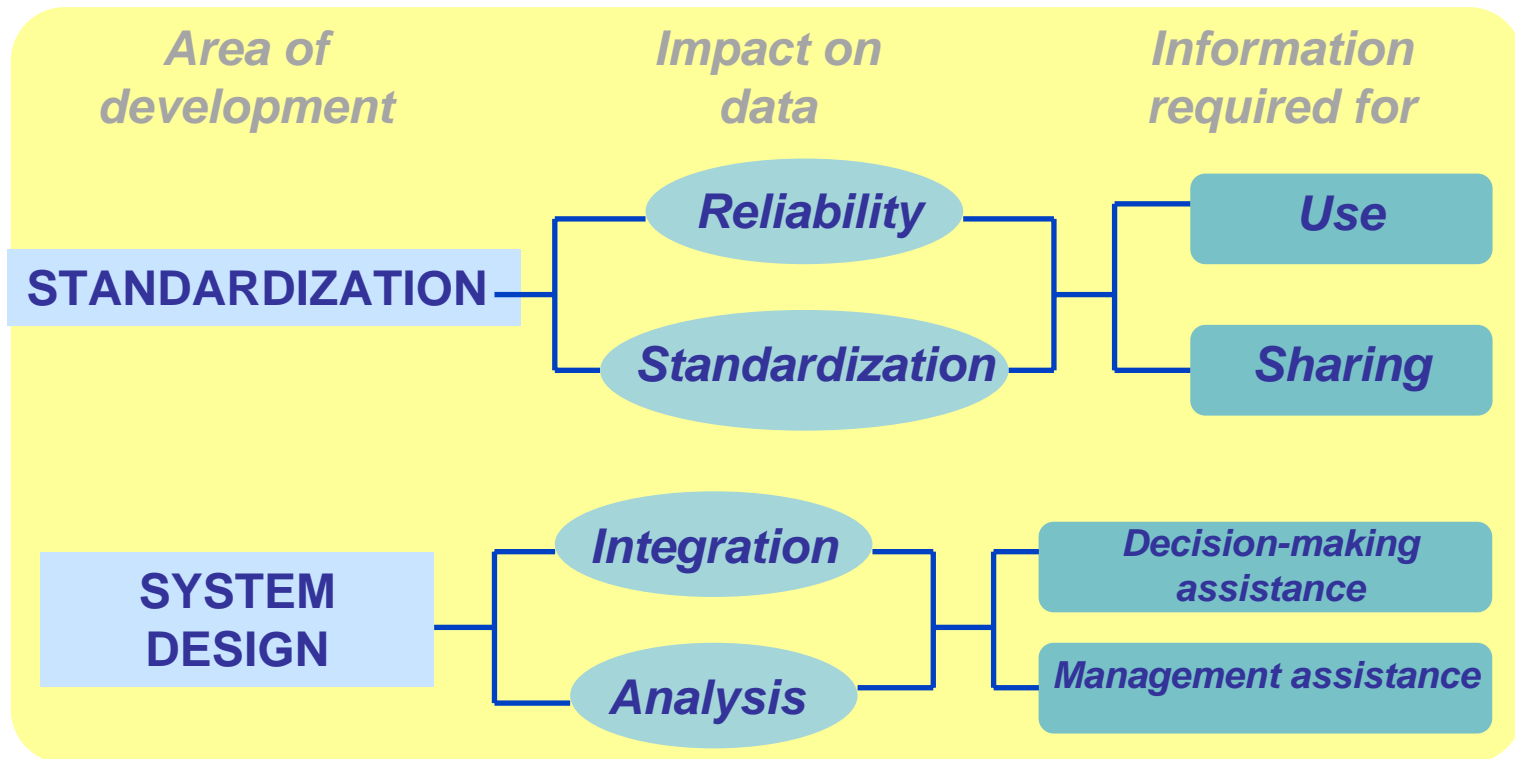
***The data that are generated by information systems are processed using calculations, algorithms, or weightings.***

## Benefits of information systems

**Taking the following factors into consideration, it is very difficult to determine the effectiveness of an information system :**

- Difficulties in terms of developing indicators;
- The constant evolution of winter maintenance;
- Other factors that contribute to improving support for winter maintenance.

# Conclusions



## Perspectives

**Information systems = provide great benefit already and continue to offer the promise of great potential, especially in the following areas :**

- Production projects that are underway in the context of international harmonization of standards;
- The possibilities for using the data that are obtained from the information systems.

## Perspectives

***The future of the various types of systems now depends on the benefits of the data and the sharing of expertise and information.***



## Attainment of objectives

***Reviewing current practices and recommendations***

***Providing links to other organizations***

***Drafting a report to be used as the basis for discussion***

## Publishing of the report

***Publish on the Web site of PIARC –  
Autumn 2007***

***Thanks: Étienne Morin, Québec  
Steve Arsenault, Québec***



# ***THANK YOU FOR YOUR ATTENTION***



AIPCR • PIARC

XIII<sup>e</sup> Congrès international de la viabilité hivernale  
International Winter Road Congress  
Du 8 au 12 février 2010  
February 8 to 12, 2010

**Technical Committee 3.4 – Winter Maintenance  
Work group 3.4.1**