



# SUSTAINABLE WINTER SERVICE FOR ROAD USERS

## XIII INTERNATIONAL WINTER ROAD CONGRESS

QUÉBEC, FEBRUARY 8 TO 11, 2010

---

### CONGRESS GUIDE

---



Québec 





# WELCOME TO THE CITY OF QUÉBEC

## Table of Contents

- 04** MESSAGES FROM DIGNITARIES
- 06** CONGRESS COMMITTEES
- 07** TECHNICAL SESSIONS
- 12** POSTER SESSIONS
- 16** TECHNICAL VISITS
- 19** WINTER CITY MAYORS' SESSION  
AND MINISTERS' SESSION
- 21** OPENING CEREMONY, BANQUET  
AND CLOSING SESSION
- 22** EXHIBITION AND LOCATION  
OF CONGRESS ROOMS
- 23** INTERNATIONAL SNOWFLOW  
CHAMPIONSHIP AND EQUIPMENT  
DEMONSTRATIONS
- 24** USEFUL INFORMATION
- 25** ECO-RESPONSIBLE CONGRESS  
AND PARTNERS
- 26** PROGRAM AT A GLANCE

SBN 978-2-550-57864-2 (print version)

ISBN 978-2-550-57865-9 (PDF)

Legal deposit – Bibliothèque et Archives nationales du Québec, 2010

Legal deposit – Library and Archives Canada, 2010

Printed on Rolland Enviro 100, which contains 100% post-consumer fibre, is Environmental Choice, Processed Chlorine Free as well as FSC Recycled certified and manufactured by using biogas energy.



Position **FSC**  
- minimum -







# MESSAGES FROM DIGNITARIES



**QUÉBEC MINISTER  
OF TRANSPORT**

I am pleased to welcome you to the XIII International Winter Road Congress. This international event, which is being held in the City of Québec, provides a unique opportunity to share expertise and gain invaluable knowledge on winter service.

Québec is proud to be a member government of the World Road Association and is honoured to be hosting, in its capital, this international Congress. I am convinced that Québec will take this opportunity to showcase the technology, innovation and best practices it has developed.

During the activities planned for this Congress, you will have a chance to not only learn about Québec's winter service expertise but also to discuss work practices with your colleagues. These discussions will certainly help improve the mobility and safety of road networks facing harsh winters. These conversations will surely help to address the growing interest among businesses to make more environmentally friendly forms of transportation.

I wish you a pleasant stay in our beautiful heritage city of Québec and hope your meetings are successful!

**JULIE BOULET**



**PRESIDENT  
OF THE WORLD ROAD ASSOCIATION**

As President of the World Road Association and as a Quebecer, I am very honoured to welcome you to the XIII International Winter Road Congress, taking place in the City of Québec. During your stay, you will experience the pulse of this city, which through its history, architecture and quality of life, is unquestionably the snow capital of the Americas. The opening ceremony, which is open to everyone, will give you a good idea of this vitality.

The theme of the Québec Congress, "Sustainable Winter Service for Road Users," marks a significant shift in perspective in how the World Road Association experts conduct their work. It is no longer centered on traditional management but instead, user needs and sustainable development.

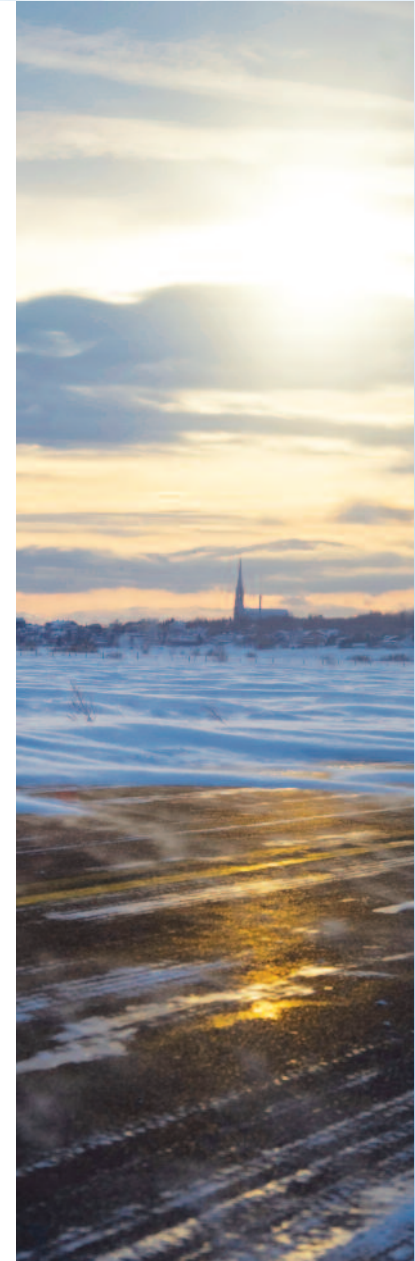
It is against this backdrop that you will attend the Winter City Mayors' Session, where you will discuss the economic governance of sustainable urban mobility and winter service. Ensuring the mobility of road users while remaining environmentally friendly is one of their biggest challenges. You will also have the privilege of attending the Ministers' Session on how to promote winter mobility adapted to the climate. The answers to the questions addressed during that session are essential in the current context of climate change that is affecting all the continents.

Also, the technical sessions on the six major themes will bring about issues that will give food for thought for all of us and the work program of the winter service committee members for next year. Lastly, the impressive exhibition area is a great showcase for the exhibitor's know-how.

I know that you will take advantage of this remarkable gathering of experts and of the successful sharing of knowledge and experiences. I also want to thank everyone who organized this Congress and who will ensure its successful delivery so that you can make the most of your stay in this wonderful city.

Welcome to the City of Québec!

**ANNE-MARIE LECLERC**







**FIRST DELEGATE  
OF CANADA TO PIARC,  
PRESIDENT OF THE CANADIAN  
NATIONAL COMMITTEE AND  
DIRECTOR, AUTOROUTE 30  
AND QUÉBEC PROJECTS**

Québec is hosting the XIII International Winter Road Congress and I would like to join the World Road Association in extending a most cordial welcome to delegates who are coming from around the world to enjoy the hospitality of the Québécois and the European charm of the City of Québec. You will have the chance to meet winter road maintenance experts and several international exhibitors who will share their respective country technics.

The Canadian pavilion is a popular place to learn more about the techniques used to deal with Canadian winters from coast to coast. Technical areas will allow you to learn more about topics related to winter weather conditions. This congress will be an opportunity to discuss what Canada and other countries share in terms of sustainable winter road conditions and on how to improve road infrastructure management techniques used to make roads safer and more efficient in a national and international setting.

The congress celebrates Canadian winters with an International Snowplow Championship in the afternoon of Wednesday, February 10. You also have the opportunity to take part in the festivities of the 56<sup>th</sup> Québec Winter Carnival, which is being held during that time.

Looking forward to seeing you there!

MARTIN **LELIÈVRE**



**MAYOR  
OF THE CITY OF QUÉBEC**

The City of Québec, the capital of snow, welcomes you to the XIII International Winter Road Congress.

With over 300 centimetres of snow that falls each year, the City of Québec is the place for all those who choose to take part in all aspects of winter. In terms of winter transportation, both imagination and skill will play a major part in ensuring efficient, safe and environmentally friendly services for all road users.

This first Congress on North American soil is a first-class international forum for individuals and institutions affected by sustainable winter service. By sharing our expertise, we can develop innovative projects to address the challenges we are facing, while still preserving the richness of our nordicity.

I invite you to discover the many attractions of our renowned city during your stay. Experience the festive spirit during the Québec Winter Carnival activities as well as the City of Québec's art, culture, nature and cuisine.

Welcome to the City of Québec!

RÉGIS **LABEAUME**



**PRESIDENT  
OF THE ORGANIZING  
COMMITTEE OF THE  
XIII INTERNATIONAL WINTER  
ROAD CONGRESS AND  
QUÉBEC'S DEPUTY MINISTER  
OF TRANSPORT**

I wish to welcome you to the city of Québec for the XIII International Winter Road Congress. On behalf of the Organizing Committee, I am honoured to welcome you to this event which offers you a rich and diversified program.

The core of this Congress is, without doubt, its Technical Program. More than 130 specialists from approximately twenty countries will share their experiences during the Technical and Poster Sessions. A special Winter City Mayors' Session as well as a Ministers' Session will be held for the first time this year. Delegates may also observe Québec's expertise in the field during one of 7 Technical Visits. Finally, other activities, which I am sure will interest you, include the international-level exhibition, the equipment demonstrations and the International Snowplow Championship, a first in the history of the PIARC winter road congresses.

I am certain that the discussions you will have during this event will be beneficial to developing improved and innovative practices in the field of winter services.

Your presence at this Congress is a reflection of your commitment to improving mobility on the winter road network. I thank you and wish you a pleasant stay in Québec's national capital.

I look forward to meeting you!

MICHEL **BOIVIN**



# CONGRESS COMMITTEES

Preparing this Congress required the participation of several key players. The Organizing Committee and the Technical Committee B5 collaborated with several stakeholders to make this Congress a scientific gathering that will benefit the entire international road community interested in winter service.

Organizing Committee President, Mr. Michel Boivin, Québec's Deputy Minister of Transport, was able to count on the support of several branches within his department and especially the Québec 2010 Office, the standing secretariat for this Congress, in order to ensure that the work was completed on time.

The Office received substantial help from the following organizations in organizing this important Congress:

- American Association of State Highway and Transportation Officials (AASHTO)
- Association québécoise du transport et des routes (AQTR)
- City of Québec
- Ministère des Relations internationales du Québec (MRI)
- Ministère du Développement économique, de l'Innovation et de l'Exportation (MDEIE)
- PIARC-Québec Committee
- Specialty Vehicles and Transportation Equipment Manufacturers' Association (AMETVS)
- Transport Canada

The Office also received support from the Government of Canada for simultaneous interpretation and translation services needed for the many documents and activities at this bilingual Congress (English and French).

The content of the congress was placed under the responsibility of the Executive Committee of the World Road Association (PIARC). The Congress Scientific Committee consisted of experts of the PIARC Technical Committee B5 "Winter Service", chaired by Ms. Gudrun Öberg of the Swedish National Road & Transport Research Institute, in Sweden. The committee has looked after the selection of communications and programming of various technical sessions with the support of the PIARC General Secretariat.

The 45 members of this committee work in organizations managing road systems in 29 countries:

- Andorra
- Argentina
- Austria
- Belgium
- Canada
- Canada-Québec
- Chile
- Czech Republic
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- Iceland
- Iran
- Italy
- Japan
- Latvia
- Morocco
- Norway
- Romania
- Slovakia
- Slovenia
- Spain
- Sweden
- United Kingdom
- United States

Thank you to all who have participated in organizing this 13<sup>th</sup> edition which is being held in North America for the very first time.



# TECHNICAL SESSIONS

## TOPIC I – WINTER SERVICE PLANNING, MANAGEMENT AND IMPLEMENTATION

Names of presenters  
are indicated in blue.

### Session T1-1A

Tuesday, February 9 – 2:00 p.m. to 3:30 p.m. - Room 302AB

#### Overview of National Strategies & Policies (1<sup>st</sup> part)

Chair: **Jukka KARJALAINEN** – Co-chair: **Ahdelhamid JANATI**

Organisation of the Work for Winter Roads Maintenance in the Spanish National Road System (117)

Rosario CORNEJO ARRIBAS, Ángel SÁNCHEZ and Luis AZCUE (Spain), presented by **Vicente VILANOVA MARTINEZ-FALERO**

Winter Maintenance Policy in Finland (35)

**Tuovi PÄIVIÖ-LEPPÄNEN** and Anne LEPPÄNEN (Finland)

Winter Service Planning and Management in Slovakia (124)

**Jan SEDIVY** (Slovak Republic)

### Session T1-1B

Tuesday, February 9 – 4:00 p.m. to 5:30 p.m. - Room 302AB

#### Overview of National Strategies & Policies (2<sup>nd</sup> part)

Chair: **David PALMITJAVILA** – Co-chair: **Jukka KARJALAINEN**

Latvian Experience in Assignment, Implementation and Valuation of Winter Maintenance Works (114)

**Janis KASTANOVSKIS** (Latvia)

Sustainable Winter Maintenance on the Swiss National Roads (216)

Albert MATHIS, Anne GILLARDIN and J. SCHATZMANN (Switzerland), presented by **Jürg RÖTHLISBERGER**

Issues of and Measures for Ensuring Winter Road Traffic in Japan (192)

Kazushige WATANABE (Japan), presented by **Masanori WAKAO**

Estonian Road Management Organisation (44)

**Jyri RIIMAA** (Estonia)

### Session T1-2A

Wednesday, February 10 – 8:30 a.m. to 10:00 a.m. - Room 302AB

#### Winter Maintenance Management Methods (1<sup>st</sup> part)

Chair: **Masaru MATSUZAWA** – Co-chair: **Jukka KARJALAINEN**

Managing Winter Serviceability during an Adverse Weather Condition (AWC) with the Aid of Advanced Technological Systems, Spanish Experience in Sporadically Exposed Geographical Areas (210)

Jorge LUCAS HERRANZ, Javier PAYÁN DE TEJADA, Ángel SANCHA, Oscar BELTRÁN and **Ignacio SÁNCHEZ-SALINERO** (Spain)

Assessment of Winter Road Traffic Performance Using Taxi Probe Data (91)

**Kazunori MUNEHICO**, Naoto TAKAHASHI and Satoshi KASAI (Japan)

Performance Measurement of Winter Road Management (85)

**Naoto TAKAHASHI**, Roberto TOKUNAGA and Motoki ASANO (Japan)

Road Weather Management Program (RWMP) Performance Measurement (56)

Roemer ALFELOR, **Paul PISANO**, Chris CLUETT, Deepak GOPALAKRISHNA and Leon OSBORNE (USA)

### Session T1-2B

Wednesday, February 10 – 10:30 a.m. to noon - Room 302AB

#### Winter Maintenance Management Methods (2<sup>nd</sup> part)

Chair: **Masaru MATSUZAWA** – Co-chair: **Kuno MÄNNIK**

Cost-Benefit Analysis of Road Snow Removal Projects: Theory and Application (200)

Shin KIRIKOSHI, Masanori MIURA, Kazuo ABE and **Junichi OSHIMA** (Japan)

Follow up Study of Winter Standard as a R&D Project (110)

Torgeir VAA and **Ivar HOL** (Norway)

Snowplow Deployment Management Method Considering Attributes of Region and Route (53)

**Tetsuya OGAMI**, Masatoshi MAKINO, Yuji YANAGISAWA and Kazuya YAMAGUCHI (Japan)

The Winter Model – A First Test Calculation (71)

**Staffan MÖLLER** (Sweden)

### Session T1-3

Thursday, February 11 – 8:30 a.m. to 10:00 a.m. - Room 302AB

#### Interaction between Road Users and Agencies

Chair: **David PALMITJAVILA** – Co-chair: **Kuno MÄNNIK**

Understanding and Incorporating Customer Needs in a Road Administration (202)

**Mara CAMPBELL** and Agneta WARGSJÖ (USA and Sweden)

Interaction in Road Maintenance Planning – From Customer Needs to Road Winter Maintenance in Finland (201)

**Pasi PATRIKAINEN** and Ari KALLIOKOSKI (Finland)

Winter Service Strategies for Increased European Road Safety – The Results of COST Action 353 (52)

**Christian HOLLDORB** (Germany)

Winter Operations Coalition for Coordinated Operations and Maintenance in the Western States (46)

**William HOFFMAN**, Ralph PATTERSON, Lisa BURGESS and D. TOWNSEND (USA)

### Session T1-4

Thursday, February 11 – 10:30 a.m. to noon - Room 302AB

#### Challenges of Contracting

Chair: **Kuno MÄNNIK** – Co-chair: **Ahdelhamid JANATI**

Assessing New Winter Maintenance Management Approaches at the Ministère des Transports du Québec (25)

**Yves BERGER** and Steve ARSENAULT (Canada-Québec)

Sustainable Winter Service in a P3 Contract in New Brunswick (123)

**Coleen GORMAN-ASAL** and **Kevin RICHARD** (Canada)

Maintenance Contracts – Exchange of Data between Contractor and Client (89)

**Jon DAHLEN** (Norway)

Development of Road Maintenance Expertise (108)

**Øystein LARSEN** (Norway)



## TOPIC 2 – SAFETY AND MOBILITY IN WINTER: SOCIAL, ENVIRONMENTAL AND ECONOMIC ASPECTS

### Session T2-1

Tuesday, February 9 – 2:00 p.m. to 3:30 p.m. - Room 204AB

#### Accident and Traffic: Flow Analysis

Chair: **Horst HANKE** – Co-chair: **Xavier COCU**

Wintertime Road Conditions and Accident Risks in Passenger Car Traffic (40)  
**Markus PÖLLÄNEN** (Finland)

Long-term Trends in Snowfall-related Crash Risk (144)  
**Jean ANDREY**, **Derrick HAMBLY** and **Brian MILLS** (Canada)

A Multilevel Disaggregate Model for Quantifying the Safety Effect of Winter Road Maintenance (156)

**Taimur USMAN**, **Liping FU**, **Luis F. MIRANDA-MORENO** and **Max S. PERCHANOK** (Canada)

Side Friction as a Parameter to Optimize Winter Operations (126)  
**Torgeir VAA**, **Ivar HOL** and **Ole OLSEN** (Norway)

### Session T2-2

Tuesday, February 9 – 4:00 p.m. to 5:30 p.m. - Room 204AB

#### Optimized Driver Information for Better Road Safety

Chair: **Horst HANKE** – Co-chair: **Masaru MATSUZAWA**

Delivery of a Product for Conveying Information Concerning Winter Road Conditions to Users, and the Steps Taken to Ensure Delivery of a Quality Product (21)  
**Sylvain NOËL** and **François BÉLAND** (Canada-Québec)

Cooperative Initiatives to Protect Winter Road Transportation in Niigata City (74)  
**Naoki IMAMORI**, **Kazunori NISHIYAMA** and **Satoru YOSHIZAWA** (Japan)

Discussion on the Practical Application of DSRC in Measures to Counter Visibility Hazards in Cold Areas with Heavy Snowfall (93)

**Kazuhiisa KAWAMATA**, **Yuichi KARINO**, **Jun-ichi TANAKA** and **Yoshio YAMAMURA** (Japan)

Determining the Most Effective Locations of Illuminated Delineators for Improving Visibility on Expressways under Snowstorm Conditions using a Driving Simulator (191)  
**Toru HAGIWARA**, **Akira KAWAMURA**, **Kazuya TOMIYAMA**, **Shin TOZUKA** and **Tomonori OHIRO** (Japan)

### Session T2-3

Wednesday, February 10 – 8:30 a.m. to 10:00 a.m. - Room 204AB

#### Special Traffic Problems and Solutions in Wintertime

Chair: **Xavier COCU** – Co-chair: **Horst HANKE**

Bus Accidents in Winter Time (68)  
**Mattias HJORT**, **Mats WIKLUND** and **Gudrun ÖBERG** (Sweden)

The Importance of Winter Maintenance for Cyclists (163)  
**Anna NISKA** (Sweden)

Traffic Calming Measures in Winter Conditions (148)  
**Catherine BERTHOD** (Canada-Québec)

Thermal Behaviour of Porous Asphalt (203)  
**André-Gilles DUMONT** and **Mehdi OULD-HENIA** (Switzerland)

Block Dispatching for HGVs on Problematic Road Sections during Extreme Winter Weather Conditions (99)  
**Ralf ROOS**, **Susanne SCHULZ** and **Matthias ZIMMERMANN** (Germany)

### Session T2-4

Thursday, February 11 – 8:30 a.m. to 10:00 a.m. - Room 204AB

#### Sustainable Winter Maintenance in Road Tunnels

Chair: **Pierre SCHMITZ** – Co-chair: **Vidar ENGMO**

Technical Committee C4 and Sustainable Winter Maintenance in Road Tunnels (193)  
**Pierre SCHMITZ** (Belgium)

Winter Operation of Road Tunnels in Québec: the Ville-Marie and Louis-Hippolyte-Lafontaine Tunnels (194)  
**Alexandre DEBS** and **Gabrielle VIGER** (Canada-Québec)

Winter Operation and Maintenance of Tunnel in North Eastern Minnesota (220)  
**Duane HILL** (USA)

Water Infiltration and Ice Problems in Rock Tunnels in Sweden (and the Nordic Countries) (246)  
**Per ANDERSSON** and **Bernt FREIHOLTZ** (Sweden)

#### REMINDER TO SPEAKERS

You are asked to report to the Speaker Ready Room (room 201B) the day before your technical session to review your presentation.



## TOPIC 3 – WINTER SERVICE INFORMATION SYSTEM

Names of presenters  
are indicated in blue.

**Session T3-1** Tuesday, February 9 – 2:00 p.m. to 3:30 p.m. - Room 301AB

### Monitoring & Observing Weather & Road Conditions

Chair: **Martin HOBBS** – Co-chair: **Richard CHARPENTIER**

Discrimination of Surface Status of Pavements by Extracting Image Data (41)  
**Mario MARCHETTI** and Rémy CLAVERIE (France)

Classification of Winter Road Surface Conditions Based on Continuous Friction Measurement (154)  
Feng FENG, **Liping FU** and Max S. PERCHANOK (Canada)

A Centre of Expertise for the Coordination between Vehicle and Infrastructure Applied to Mobile Road Information Systems (171)

**Goze Bertin BÉNIÉ**, Étienne MORIN, Barry PÉKILIS and Pierre BOLDUC (Canada-Québec)

Advanced Snow and Ice Control Measures for Hokkaido's Expressways (195)  
**Tomonori OHIRO**, Shin TOZUKA and Takeshi KOBAYASHI (Japan)

**Session T3-2** Tuesday, February 9 – 4:00 p.m. to 5:30 p.m. - Room 301AB

### Forecasting Weather & Road Conditions

Chair: **Paul PISANO** – Co-chair: **Mario MARCHETTI**

Optima: Road Weather Informations Dedicated to Road Sections (29)  
**Odile COUDERT** (France)

Night Icing Potential Prediction System (63)  
**Paul RICHARD** and **Paul J. DELANNOY** (Canada)

Developments in Road Weather Forecasting (103)  
**Peter MASON** and Aileen SEMPLE (United Kingdom)

Combining Meteorological and Geographic Information Systems to Increase the Capacity of Road Weather Forecasts (218)  
**Gerald SPREITZHOFFER** and Reinhold STEINACKER (Austria)

**Session T3-3A** Wednesday, February 10 – 8:30 a.m. to 10:00 a.m. - Room 301AB

### Decision Support Systems (1<sup>st</sup> part)

Chair: **Martin HOBBS** – Co-chair: **Richard CHARPENTIER**

The Clarus Regional Demonstrations (55)  
**Paul PISANO**, Ben MCKEEVER and Fred KLEIN (USA)

Multifunction Software for Winter Serviceability Management (70)  
**Christelle WEBER** (France)

A Role of ITS in Road Winter Maintenance (115)  
**Boriss JELISEJEVS** (Latvia)

An Overview of the Pooled Fund Study Maintenance Decision Support System (151)  
**John MEWES**, Robert HART, Leon OSBORNE and Dave HUFT (USA)

**Session T3-3B** Wednesday, February 10 – 10:30 a.m. to noon - Room 301AB

### Decision Support Systems (2<sup>nd</sup> part)

Chair: **Mario MARCHETTI** – Co-chair: **Larry BROWN**

Development and Calibration of Frost Depth and Thaw Duration Predictors Based on the Weather Information (11)  
Jun YANG, Fazal MABOOD and **Susan L. TIGHE** (Canada)

Innovative Solutions for Managing Winter Service (72)  
**Serge HAMEL** (Canada-Québec)

Spreading Agent Management System as Part of an All-embracing Winter Maintenance Management System (78)  
**Horst HANKE** (Germany)

Development of a System for the Flexible Shifting of Snow Removal Sections Using Real-time Positioning Information on Snow Removal Machinery (105)  
**Masatoshi MAKINO**, Norihiro SASAKI, Yuji YANAGISAWA, Keita ONODERA and Masao TOYOSHIMA (Japan)

**Session T3-4A** Thursday, February 11 – 8:30 a.m. to 10:00 a.m. - Room 301AB

### Vehicle-based Technologies (1<sup>st</sup> part)

Chair: **Martin HOBBS** – Co-chair: **Miguel TREMBLAY**

A Discussion of Advancements in Data Collection and Provision using Next Generation ITS Technology in Regions of Cold and Heavy Snow (34)  
Kazuhiro HARUYAMA, Kunio MITSUI, **Hirohiko HATTORI** and Masatoshi YOKOTA (Japan)

The Introduction of the Snow Vehicle Position Monitoring System and its Effectiveness (66)  
Tāmotsu KOIKE, Koji NAKAMURA and **Masatoshi YOKOTA** (Japan)

Improving Road Weather Products with Vehicle Probe Data (134)  
**Sheldon DROBOT**, Michael CHAPMAN, Elena SCHULER, Gerry WIENER, William MAHONEY III, Paul PISANO, Ben MCKEEVER and Andrew STERN (USA)

Winter Service Management and Service Vehicle Activity Reports (215)  
**Einar PALSSON** (Iceland)

**Session T3-4B** Thursday, February 11 – 10:30 a.m. to noon - Room 301AB

### Vehicle-based Technologies (2<sup>nd</sup> part)

Chair: **Paul PISANO** – Co-chair: **Mario MARCHETTI**

Developing a Second-Generation Mobile Road Weather Station (20)  
**Claude LAPOINTE** (Canada-Québec)

Info-Neige – For Easy and Effective Management of Snow Loading Operations (145)  
**Paulo FERREIRA** and Charles PAUZÉ (Canada-Québec)

Methods to Generate Information on Weather and Road Condition in terms of Specific Road Sections Online as well as in the Vehicle for Driver and Traveller (141)  
**Karl E. SCHEDLER** (Germany)

Potential of Automatic Field Data Capture in Winter Maintenance on Roads (162)  
**Rainer HESS** (Germany)



## TOPIC 4 – SNOW AND ICE CONTROL TECHNIQUES AND TECHNOLOGIES

### Session T4-1A

Tuesday, February 9 – 2:00 p.m. to 3:30 p.m. - Room 202

#### Innovative Techniques for Snow Removal (1<sup>st</sup> part)

Chair: **Alan CHAMBERS** – Co-chair: **Mohamed EL MOUNIR**

Two Plows – One Operator – The Use of Two Plows on an Arterial Highway in Northern New Brunswick (45)

Mike CORBETT and **Roméo POITRAS** (Canada)

Securing the Wintertime Traffic Flow by Means of Multi-Vehicle Snow Removal (60)

**Yuji TAHARA** (Japan)

High Speed Plough / Environmental Plough (73)

**Pontus GRUHS** (Sweden)

Development of Snow Removal Machinery for Optimizing Sidewalk Snow Removal (242)

**Yasushi NITTA**, Kouki ASO and Hyoei MIYAMURA (Japan)

### Session T4-1B

Tuesday, February 9 – 4:00 p.m. to 5:30 p.m. - Room 202

#### Innovative Techniques for Snow Removal (2<sup>nd</sup> part)

Chair: **Rick NELSON** – Co-chair: **André PANS**

Winter Airport Maintenance: Developing a Unique Expertise (142)

**Jimmy GAGNÉ** (Canada-Québec)

New Ecological Material for the Winter Treatment (198)

**Jean-Claude TURTSCHY** and Joseph MUCARIA (Switzerland)

Tanker for Hot De-Icing of Roads and Highways (225)

**Andrea ZAVITTERI** and **Stefano NERVO** (Italy)

The Application of the Cavitation Cleaning Vehicle in Snow and Ice Operations (67)

**Shuuji OKOSHI** and Hiroyuki TOKIEDA (Japan)

### Session T4-2

Wednesday, February 10 – 8:30 a.m. to 10:00 a.m. - Room 202

#### The Environment and Snow Control

Chair: **Manfred SKERLAN** – Co-chair: **André PANS**

Analysis of a Particular Observed Accidentology on Dry and Salted Pavement (51)

Jean LIVET, **Stéphanie POISSONNIER** and **Alice BAZILE** (France)

Implementing Passive Snow and Ice Control Measures (37)

**Leland D. SMITHSON** (USA)

Relationship between Tree Density and Visibility Improvement of Highway Snowbreak Woods (174)

**Yasuhiko ITO**, Takeshi YAMADA and Masaru MATSUZAWA (Japan)

Efforts to Improve the Visual Environment on Expressways that Pass through Areas of Snowstorm and Drifting Snow (57)

Koichi ABE and **Toru TAKAHASHI** (Japan)

### Session T4-3

Wednesday, February 10 – 10:30 a.m. to noon - Room 202

#### Techniques for the Application of Deicing Chemicals

Chair: **Roberto GIANNETTI** – Co-chair: **Mohamed EL MOUNIR**

GPS Controlled Salt Spreading and Section Based Forecasts (98)

**Bo SOMMER** and Freddy KNUDSEN (Denmark)

Ice Control with Brine Spread with Nozzles on Highways -

Implementation of Brine Spreading Technologies in Denmark (101)

Lars BOLET and **Jens Kristian FONNESBECH** (Denmark)

Feasibility Study of an Automatic System of Spreading of Sodium Chloride Brine in the North of France (12)

**Luc DURIEZ** (France)

Distribution of Spreading Agents on the Road Surface (183)

**Günter HAUSMANN** and Horst BADEL (Germany)

### Session T4-4

Wednesday, February 10 – 10:30 a.m. to noon - Room 204AB

#### Measurement of Pavement Surface Condition

Chair: **Rick NELSON** – Co-chair: **André PANS**

Assessment of Devices Used to Measure Road Friction in Winter Conditions (24)

**Steve ARSENAULT** (Canada-Québec)

Skid Resistance of Porous Asphalt Pavement under Winter Conditions (83)

**Kimio MARUYAMA**, K. FUSE and M. KUMAGAI (Japan)

Prediction of Sliding Resistance on Asphalt Pavement Surface due to the Freezing of a Sodium Chloride Solution (84)

**Akihiro FUJIMOTO**, Hiroshi WATANABE and Teruyuki FUKUHARA (Japan)

Direct Low Lateral Slip Roadgrip Measurement Compared with Surface Reflection of Three Laser Beams (169)

**Niclas ENGSTRÖM**, Roland LARSSON, Henrik ANDRÉN and Lennart FRANSSON (Sweden)

### Session T4-5

Thursday, February 11 – 8:30 a.m. to 10:00 a.m. - Room 202

#### Analysis of the Spread Rate of Chemical Deicers

Chair: **Freddy KNUDSEN** – Co-chair: **André PANS**

Optical Recognition of Road De-Icing Product *Graind'sel* Project (42)

Denis JOUIN, **Didier GILOPPÉ** and Philippe PECQUENARD (France)

Testing of Spreaders for Snow and Ice Control - Methods and Results (96)

**Tine DAMKJÆR** and Krister PERSSON (Denmark)

Optimized Spreading of Salt and Brine in Winter Service (79)

**Horst HANKE** (Germany)

Remote Determination of Residual De-icer with an Optical Spectroscopic Tool (28)

**Mario MARCHETTI**, Rémy CLAVERIE, Jean LIVET, Ivana DURICKOVIC, Patrice BOURSON, Jean-Marie CHASSOT, Marc D. FONTANA and Thomas KAUFFMANN (France)



## TOPIC 4 – (continued)

Names of presenters  
are indicated in blue.

### Session T4-6

Thursday, February 11 – 10:30 a.m. to noon - Room 202

#### Prevention or Dealing with Snow/Ice

Chair: **José DEL PINO ALVAREZ** – Co-chair: **Mohamed EL MOUNIR**

The Use of Phase Change Materials to Delay Pavement Freezing (187)

**Xavier COCU**, Dominique NICAISE and Said RACHIDI (Belgium)

Winter Maintenance and Urban Installations (32)

**Stéphanie POISSONNIER** (France)

Best Practices in Winter Maintenance from the U.S. Domestic Scan Program (77)

David RAY, **Steven M. LUND** and William HOFFMAN (USA)

Infrastructure for the Disposal of Snow in Montréal (143)

**Michel FRENETTE** (Canada-Québec)

## TOPIC 5 – WINTER SERVICE SUSTAINABLE TRANSPORTATION

### Session T5-1

Tuesday, February 9 – 2:00 p.m. to 3:30 p.m. - Room 205BC

#### Salt and the Road Right-of-Way

Chair: **Frank RIZZARDO** – Co-chair: **Didier GILOPPÉ**

Research on Minimizing the Environmental Impacts of De-Icing (7)

**Morton SATIN** (USA)

Research on Environmental Impact of Spread De-icing Salts (58)

**Yuichiro YAMAMOTO**, Shinri SONE, Keiko KIMURA and Yoshiharu NAMIKAWA (Japan)

Effect of Dissolved Deicing Salts on the Mobility of Metals in Contaminated Urban Soils (165)

Amandine BOMMEL, Julie TERNISIEN and Jean-Sébastien DUBÉ (France and Canada-Québec)  
presented by **Didier GILOPPÉ**

A Methodology for the Spatial Analysis of the Impacts of Road Deicing Salts on Surface Water (137)

Pierre-Olivier LAUSECKER, **Caroline MAUDUIT** and Ethel JACQUOT (France)

### Session T5-2

Tuesday, February 9 – 4:00 p.m. to 5:30 p.m. - Room 205BC

#### Alternatives to Salt & Salt Quality

Chair: **Aldis LACIS** – Co-chair: **Frank RIZZARDO**

Efficiency of Runway De-Icing Chemicals in Practice (26)

**Ville ALATYPPÖ** and Kirsti JUTILA (Finland)

Feasibility Study on the Suitability of Automated Acetic Acid Cryoprotectant Dispersion Systems on Urban Expressways (87)

**Hisatoshi MURAKAMI**, Mitsuhiro HAYASHIDA and Hiroyuki NAKAJIMA (Japan)

The Environmental Sub-model of the Swedish Winter Model – Updated Algorithms for the Description of Salt Damage to Roadside Environment (88)

**Göran BLOMQVIST** and Mats GUSTAFSSON (Sweden)

The Importance of the Quality of Deicing Materials (185)

**Olga NAGLIC** (Slovenia)

### Session T5-3

Wednesday, February 10 – 8:30 a.m. to 10:00 a.m. - Room 205BC

#### Salt, Snow – Sustainable Options

Chair: **Fumihiko HARA** – Co-chair: **Didier GILOPPÉ**

Sustainable Development and Winter Viability: the Case of Public Markets for Road Salts in France (54)

**Gérard SPECKLIN** and Michel MATRAT (France)

Road's De-Icing Agents and Sustainable Development (119)

Charles-Henri ROCHEFEUILLE (France), presented by **Nathalie DEGRYSE** and **Marie-Pierre FLÉCHON**

Road Heating System Using Hot Spring Water as the Renewable Heat Source (179)

Hironobu MIKKAICHI, Yoichi OGITA, **Hidenori MOGI** and Yoshiaki OHASHI (Japan)

Snow Melting System Using Shallow Ground Heat at "Michi-No-Eki", Hachi-Kita (186)

**Hiroshi WATANABE**, Toshihiro TANAKA, Kazuki KAWASAKI and Teruyuki FUKUHARA (Japan)

### Session T5-4

Wednesday, February 10 – 10:30 a.m. to noon - Room 205BC

#### History of Maintenance in Various Countries

Chair: **Didier GILOPPÉ** – Co-chair: **Fumihiko HARA**

History of Sustainable Winter Road Maintenance Service in Latvia from 1919 to 2009 (111)

**Indra DZIEDATAJA** (Latvia)

Winter Maintenance and Sustainable Development (204)

Tibor URICA, Katarína ZGUTOVA, **Martin PTONÁK** and Peter PAZUR (Slovak Republic)

Anas Winter Road Management Projected into the Future with Innovative Technologies (233)

**Amleto PASQUINI** (Italy)



## TOPIC 6 – WINTER SERVICE AND CLIMATE CHANGE IMPACTS

**Session T6-1** Thursday, February 11 – 10:30 a.m. to noon - Room 204AB

### Winter Service and Climate Change Impacts

Chair: **Jan ÖLANDER** – Co-chair: **Odile COUDERT**

Reducing Maintenance Requirements on Permafrost-Affected Highways: Permafrost Test Sections along the Alaska Highway, Yukon (18)  
Donna REIMCHEN, Bill STANLEY, **Robin WALSH**, Guy DORÉ and Daniel FORTIER (Canada)

Real-time Frost Depth Forecast Model for Thaw-induced Axle Load Limitation Management (138)  
Skuli THORDARSON, Nicolai JONASSON, Einar SVEINBJORNSSON, Anton H. THOROLFSSON and Gudjon ORN BJORNSSON (Iceland) presented by **Björn ÓLAFSSON**

Analysis of Regional Climate Model Simulations of Transport-related Climate Indices over Southern Québec (227)  
**Diane CHAUMONT** and Ross BROWN (Canada-Québec)

Federal Highway Administration's Development of a Strategy to Address Adaptation to Climate Change (229)  
**Michael CULP**, Paul PISANO and Fred KLEIN (USA)

What Impact Will Climate Change Have on Roads in Sweden and How to Deal with It (243)  
**Håkan NORDLANDER** (Sweden)

## SPECIAL SESSION

Thursday, February 11 – 8:30 a.m. to noon - Room 205BC

### Snow and Ice Databook 2010

During the XIII International Winter Road Congress, the Technical Committee B5, in cooperation with the Québec Organizing Committee, will take the opportunity to present the third edition (2010 edition) of the *Snow and Ice Databook* to congress participants.

This reference tool is intended to support and facilitate the exchange of experience between various international experts specializing in the field of winter service through cooperation between experts from the 25 countries included in this document.

After presenting a summary of the document according to a standard theme for all the contributing countries, several authors will present an overview of the climatic and operational realities in their countries.

## POSTER SESSIONS

The poster sessions will be held on level 4 in the exhibition hall. Each poster will be displayed during all the poster sessions (half a day). Each author will stand by his or her poster during the coffee break between technical sessions to provide detailed information of his or her presentation and answer questions.

The posters are presented by theme and sorted by **poster number**. If the topic of a poster is the subject of a technical session presentation, the number of that session will appear **in red**.

## TOPIC 1 – WINTER SERVICE PLANNING, MANAGEMENT AND IMPLEMENTATION

### POSTER SESSION P1

Tuesday, February 9 – 2:00 p.m. to 5:30 p.m.

- 19 Technical Guide: Global Approach of Winter Maintenance (Charles-Henri ROCHEFEUILLE, France)
- 46 Winter Operations Coalition for Coordinated Operations and Maintenance in the Western States (William HOFFMAN, USA) – **T1-3**
- 52 Winter Service Strategies for Increased European Road Safety - The Results of COST Action 353 (Christian HOLLDORF, Germany) – **T1-3**
- 108 Development of Road Maintenance Expertise (Øystein LARSEN, Norway) – **T1-4**
- 123 Sustainable Winter Service in a P3 Contract in New Brunswick (Coleen GORMAN-ASAL and Kevin RICHARD, Canada) – **T1-4**
- 132 Experiences with Statewide Route Planning for Winter Maintenance on Roads (Ralf ROOS, Germany)
- 202 Understanding and Incorporating Customer Needs in a Road Administration (Mara CAMPBELL, USA) – **T1-3**

### POSTER SESSION P2

Wednesday, February 10 – 8:30 a.m. to noon

- 43 Operational Integration between the Province of Alessandria and the Motorway Concession Holders for Snow/Ice Emergency Management in Road Networks - The Case of Former National Road 456 "del Turchino" (Piergiuseppe A. DEZZA, Italy)
- 149 Snow Removal Operation: Foremen Training Program (Élise THERRIEN, Canada-Québec)

### POSTER SESSION P3

Thursday, February 11 – 8:30 a.m. to noon

- 71 The Winter Model – A First Test Calculation (Staffan MÖLLER, Sweden) – **T1-2B**
- 110 Follow up Study of Winter Standard as a R&D Project (Ivar Hol, Norway) – **T1-2B**
- 184 Refinement of Snow Removal Unit Cost Curve Based on Snow Removal Costs (Takahiro OKAWADO, Japan)



## TOPIC 2 – SAFETY AND MOBILITY IN WINTER: SOCIAL, ENVIRONMENTAL AND ECONOMIC ASPECTS

### POSTER SESSION P1

Tuesday, February 9 – 2:00 p.m. to 5:30 p.m.

- 31 Assessing the Mobility Effect of Alternative Winter Road Maintenance Standards (Liping FU, Canada)
- 82 New Research in Traffic Flow and Capacity on Wintry Roads – Possibilities for a Comprehensive Winter Maintenance Management System (Thorsten CYPRA, Switzerland)
- 194 Winter Operation of Road Tunnels in Québec: the Ville-Marie and Louis-Hippolyte-Lafontaine Tunnels (Alexandre DEBS, Canada-Québec) – **T2-4**

### POSTER SESSION P2

Wednesday, February 10 – 8:30 a.m. to noon

- 40 Wintertime Road Conditions and Accident Risks in Passenger Car Traffic (Markus PÖLLÄNEN, Finland) – **T2-1**
- 126 Side Friction as a Parameter to Optimize Winter Operations (Torgeir VAA, Norway) – **T2-1**
- 144 Long-term Trends in Snowfall-related Crash Risk (Jean ANDREY, Canada) – **T2-1**
- 156 A Multilevel Disaggregate Model for Quantifying the Safety Effect of Winter Road Maintenance (Luis F. MIRANDA-MORENO, Canada) – **T2-1**

### POSTER SESSION P3

Thursday, February 11 – 8:30 a.m. to noon

- 99 Block Dispatching for HGVs on Problematic Road Sections during Extreme Winter Weather Conditions (Susanne SCHULZ, Germany) – **T2-3**
- 163 The Importance of Winter Maintenance for Cyclists (Anna NISKA, Sweden) – **T2-3**
- 203 Thermal Behaviour of Porous Asphalt (André-Gilles DUMONT, Switzerland) – **T2-3**



## TOPIC 3 – WINTER SERVICE INFORMATION SYSTEM

### POSTER SESSION P1

Tuesday, February 9 – 2:00 p.m. to 5:30 p.m.

- 34 A Discussion of Advancements in Data Collection and Provision Using Next Generation ITS Technology in Regions of Cold and Heavy Snow (Hirohiko HATTORI, Japan) – **T3-4A**
- 55 The Clarus Regional Demonstrations (Paul PISANO, USA) – **T3-3A**
- 66 The Introduction of the Snow Vehicle Position Monitoring System and its Effectiveness (Masatoshi YOKOTA, Japan) – **T3-4A**
- 134 Improving Road Weather Products with Vehicle Probe Data (Sheldon DROBOT, USA) – **T3-4A**
- 141 Methods to Generate Information on Weather and Road Condition in terms of Specific Road Sections Online as well as in the Vehicle for Driver and Travellers (Karl E. SCHEDLER, Germany) – **T3-4B**
- 145 Info-Neige – For Easy and Effective Management of Snow Loading Operations (Paulo FERREIRA, Canada-Québec) – **T3-4B**
- 162 Potential of Automatic Field Data Capture in Winter Maintenance on Roads (Rainer HESS, Germany) – **T3-4B**

### POSTER SESSION P2

Wednesday, February 10 – 8:30 a.m. to noon

- 11 Development and Calibration of Frost Depth and Thaw Duration Predictors Based on the Weather Information (Susan L. TIGHE, Canada) – **T3-3B**
- 29 Optima: Road Weather Informations Dedicated to Road Sections (Odile COUDERT, France) – **T3-2**
- 41 Discrimination of Surface Status of Pavements by Extracting Image Data (Mario MARCHETTI, France) – **T3-1**
- 63 Night Icing Potential Prediction System (Paul RICHARD and Paul J. DELANNOY, Canada) – **T3-2**
- 103 Developments in Road Weather Forecasting (Peter MASON, United Kingdom) – **T3-2**
- 154 Classification of Winter Road Surface Conditions Based on Continuous Friction Measurement (Liping FU, Canada) – **T3-1**
- 171 A Centre of Expertise for the Coordination between Vehicle and Infrastructure Applied to Mobile Road Information Systems (Étienne MORIN, Canada-Québec) – **T3-1**
- 195 Advanced Snow and Ice Control Measures for Hokkaido's Expressways (Tomonori OHIRO, Japan) – **T3-1**

### POSTER SESSION P3

Thursday, February 11 – 8:30 a.m. to noon

- 70 Multifunction Software for Winter Serviceability Management (Christelle WEBER, France) – **T3-3A**
- 72 Innovative Solutions for Managing Winter Service (Serge HAMEL, Canada-Québec) – **T3-3B**
- 86 Using Friction Measurements to Improve Winter Road Surface Management (Motoki ASANO, Japan)
- 115 A Role of ITS in Road Winter Maintenance (Boriss JELISEJEVS, Latvia) – **T3-3A**
- 151 An Overview of the Pooled Fund Study Maintenance Decision Support System (John MEWES, USA) – **T3-3A**
- 175 Road Weather Data Concerns (Étienne MORIN, Canada-Québec)

## TOPIC 4 – SNOW AND ICE CONTROL TECHNIQUES AND TECHNOLOGIES

### POSTER SESSION P1

Tuesday, February 9 – 2:00 p.m. to 5:30 p.m.

- 77 Best Practices in Winter Maintenance from the U.S. Domestic Scan Program (Steven M. LUND, USA) – **T4-6**
- 96 Testing of Spreaders for Snow and Ice Control-Methods and Results (Tine DAMKJAER, Denmark) – **T4-5**
- 183 Distribution of Spreading Agents on the Road Surface (Günter HAUSMANN, Germany) – **T4-3**

### POSTER SESSION P2

Wednesday, February 10 – 8:30 a.m. to noon

- 45 Two Plows – One Operator – The Use of Tow Plows on an Arterial Highway in Northern New Brunswick (Roméo POITRAS, Canada) – **T4-1A**
- 169 Direct Low Lateral Slip Roadgrip Measurement Compared with Surface Reflection of Three Laser Beams (Niclas ENGSTRÖM, Sweden) – **T4-4**
- 198 New Ecological Material for the Winter Treatment (Jean-Claude TURTSCHY, Switzerland) – **T4-1B**
- 225 Tanker for Hot De-Icing of Roads and Highways (Andrea ZAVITTERI and Stefano NERVO, Italy) – **T4-1B**
- 242 Development of Snow Removal Machinery for Optimizing Sidewalk Snow Removal (Kouki ASO and Hyoei MIYAMURA, Japan) – **T4-1A**
- 260 Benefits of EGNOS/EDAS in Winter Services Vehicles Management (Mauro MATTIO, Italy)

### POSTER SESSION P3

Thursday, February 11 – 8:30 a.m. to noon

- 12 Feasibility Study of an Automatic System of Spreading of Sodium Chloride Brine in the North of France (Luc DURIEZ, France) – **T4-3**
- 28 Remote Determination of Residual De-icer with an Optical Spectroscopic Tool (Mario MARCHETTI, France) – **T4-5**
- 37 Implementing Passive Snow and Ice Control Measures (Leland D. SMITHSON, USA) – **T4-2**
- 98 GPS Controlled Salt Spreading and Section Based Forecasts (Bo SOMMER, Denmark) – **T4-3**
- 101 Ice Control with Brine Spread with Nozzles on Highways - Implementation of Brine Spreading Technologies in Denmark (Jens Kristian FONNESBECH, Denmark) – **T4-3**
- 129 Evaluation of GPS-controlled Spreading of Salt (Niclas ODERMATT, Sweden)
- 174 Relationship between Tree Density and Visibility Improvement of Highway Snowbreak Woods (Yasuhiko ITO, Japan) – **T4-2**

## TOPIC 5 – WINTER SERVICE SUSTAINABLE TRANSPORTATION

### POSTER SESSION P1

Tuesday, February 9 – 2:00 p.m. to 5:30 p.m.

- 62 Introduction of a Salt Controlling System to Assure Economic Salt Consumption (Josef NEUHOLD, Austria)
- 146 York Region Roads – Sustainable Integration of Roads Maintenance and Urban Forest Needs (Ian BUCHANAN, Canada)
- 153 Road Snow Control Measures that Consider Landscape and the Environment: A Case Study of Hokkaido (Masayoshi WATANABE, Japan)

### POSTER SESSION P2

Wednesday, February 10 – 8:30 a.m. to noon

- 26 Efficiency of Runway De-Icing Chemicals in Practice (Ville ALATYPPÖ, Finland) – **T5-2**

### POSTER SESSION P3

Thursday, February 11 – 8:30 a.m. to noon

- 27 Corrosive Effects of Potassium Formiate (Ville ALATYPPÖ, Finland)
- 54 Sustainable Development and Winter Viability: the Case of Public Markets for Road Salts in France (Gérard SPECKLIN, France) – **T5-3**
- 88 The Environmental Sub-model of the Swedish Winter Model – Updated Algorithms for the Description of Salt Damage to Roadside Environment (Göran BLOMOVIST, Sweden) – **T5-2**
- 119 Road's De-Icing Agents and Sustainable Development (Nathalie DEGRYSE and Marie-Pierre FLÉCHON, France) – **T5-3**
- 233 Anas Winter Road Management Projected into the Future with Innovative Technologies (Amleto PASQUINI, Italy) – **T5-4**

## TOPIC 6 – WINTER SERVICE AND CLIMATE CHANGE IMPACTS

### POSTER SESSION P1

Tuesday, February 9 – 2:00 p.m. to 5:30 p.m.

- 18 Reducing Maintenance Requirements on Permafrost-Affected Highways: Permafrost Test Sections along the Alaska Highway, Yukon (Yukon) (Robin WALSH, Canada) – **T6-1**
- 138 Real-time Frost Depth Forecast Model for Thaw-induced Axle Load Limitation Management (Björn ÓLAFSSON, Iceland) – **T6-1**
- 229 Federal Highway Administration's Development of a Strategy to Address Adaptation to Climate Change (Michael CULP, USA) – **T6-1**
- 231 Adjusting Seasonal Load Restrictions with Climate Change (Max PERCHANOK, Canada)



The Société de l'assurance automobile du Québec  
and Contrôle routier Québec

## As leaders in road safety, we have expertise in winter road conditions, thanks to:

- our recognized jurisdiction in monitoring snow removal and transport traffic control;
- awareness campaigns during snow removal operations;
- regulations that take into account our reality.

**Come and see us at  
the Pavillon du Québec!**



Québec 

With the participation of:  
• Société de l'assurance automobile  
• Contrôle routier

# TECHNICAL VISITS

## USEFUL INFORMATION

Registration for the technical visits was completed during your Congress registration. If you registered for a visit, you have already received, along with your Congress delegate kit and your nametag, a sheet indicating the visit you have selected.

On this page you will find all the information you need to fully enjoy your visit. **In the interest of all participants, please follow the schedule carefully.** You will meet your accompanying person at the meeting place. Do not forget to bring a bag if you want to easily carry around the documentation that will be handed to you.

### V1 MINISTÈRE DES TRANSPORTS QUÉBEC SERVICE CENTRE

*Part of the visit will take place outside. It is strongly recommended that you wear warm clothing, especially to cover your ears and hands as well as thick-soled boots.*

**V1A** MEETING TIME: 12:45 p.m. - Convention Centre Hall  
DEPARTURE: 1:00 p.m.

Your visit begins at the Service Centre and moves on to the Snowplow Championship, which you can watch starting at 3:15 p.m. You can then return to the Québec City Convention Centre aboard a shuttle at the time of your choice.

**V1B** MEETING TIME: 1:00 p.m. - Convention Centre Hall  
DEPARTURE: 1:15 p.m.

Your visit begins at the site of the Snowplow Championship and moves on to the Service Centre. You will return to the Québec City Convention Centre around 5:00 p.m.

### V2 QUÉBEC INTEGRATED TRAFFIC MANAGEMENT CENTRE

*This visit will take place entirely in heated areas..*

**V2A** MEETING TIME: 12:45 p.m. - Convention Centre Hall  
DEPARTURE: 1:00 p.m.

Your visit begins at the Québec integrated traffic management centre and moves on to the Snowplow Championship, which you can watch starting at 3:00 p.m. You can then return to the Québec City Convention Centre aboard a shuttle at the time of your choice.

**V2B** MEETING TIME: 1:00 p.m. - Convention Centre Hall  
DEPARTURE: 1:15 p.m.

Your visit begins at the site of the Snowplow Championship and moves on to the Québec integrated traffic management centre. You will return to the Québec City Convention Centre around 5:00 p.m.

### V3 COORDINATION OF SNOW REMOVAL AND EMERGENCY RESPONSES IN THE CITY OF QUÉBEC

*This visit will take place entirely in heated areas.*

**V3A** MEETING TIME: 12:45 p.m. - Convention Centre Hall  
DEPARTURE: 1:00 p.m.

Your visit begins at City of Québec facilities and moves on to the Snowplow Championship which you can watch starting at 3:45 p.m. You can then return to the Québec City Convention Centre aboard a shuttle at the time of your choice.

**V3B** MEETING TIME: 12:45 p.m. - Convention Centre Hall  
DEPARTURE: 1:00 p.m.

Your visit begins at City of Québec facilities and moves on to the Snowplow Championship, which you can watch starting at 3:45 p.m. You can then return to the Québec City Convention Centre aboard a shuttle at the time of your choice.

### V4 THE CITY OF QUÉBEC SNOW-MELTING FACILITY

*Part of the visit will take place outside. It is strongly recommended that you wear warm clothing, especially to cover your ears and hands as well as thick-soled boots.*

**V4A** MEETING TIME: 12:45 p.m. - Convention Centre Hall  
DEPARTURE: 1:00 p.m.

Your visit begins at the snow-melting facility and moves on to the Snowplow Championship, which you can watch starting at 3:00 p.m. You may then return to the Québec City Convention Centre aboard a shuttle at the time of your choice.

**V4B** MEETING TIME: 1:00 p.m. - Convention Centre Hall  
DEPARTURE: 1:15 p.m.

Your visit begins at the site of the Snowplow Championship and moves on to the snow-melting facility. You will return to the Québec City Convention Centre around 5:00 p.m.

### V5 MANAGEMENT OF LÉVIS WASTE SNOW DISPOSAL FACILITIES

*Part of the visit will take place outside. It is strongly recommended that you wear warm clothing, especially to cover your ears and hands as well as thick-soled boots.*

**V5A** MEETING TIME: 12:45 p.m. - Convention Centre Hall  
DEPARTURE: 1:00 p.m.

Your visit begins at the waste snow disposal facilities and moves on to the Snowplow Championship, which you can watch starting at 3:40 p.m. You can then return to the Québec City Convention Centre aboard a shuttle at the time of your choice.

**V5B** MEETING TIME: 1:30 p.m. - Convention Centre Hall  
DEPARTURE: 1:45 p.m.

Your visit begins at the waste snow disposal facilities. You will be returned to the Québec City Convention Centre around 4:25 p.m. The schedule for this visit will not allow you to attend the Snowplow Championship.



## V6 QUÉBEC-LÉVIS FERRY CROSSING

Part of the visit will take place outside. The temperature is always colder on the river than on land. It is strongly recommended that you wear warm clothing, especially to cover your ears and hands as well as thick-soled boots. During the visit, you will be required to climb several stairs and navigate through narrow passageways (machine room).

**V6A** MEETING TIME: 12:45 p.m. Convention Centre hall  
DEPARTURE: 1:00 p.m.

Your visit begins on the ferry and moves on to the Snowplow Championship, which you can watch starting at 2:30 p.m. You may then return to the Québec City Convention Centre aboard a shuttle at the time of your choice.

**V6B** MEETING TIME: 1:40 p.m. Convention Centre hall  
DEPARTURE: 1:50 p.m.

Your visit begins on the ferry and moves on to the Snowplow Championship, which you can watch starting at 3:30 p.m. You may then return to the Québec City Convention Centre aboard a shuttle at the time of your choice.

## V7 QUÉBEC CITY AIRPORT: MAINTENANCE OF AIRCRAFT MOVEMENT AREAS

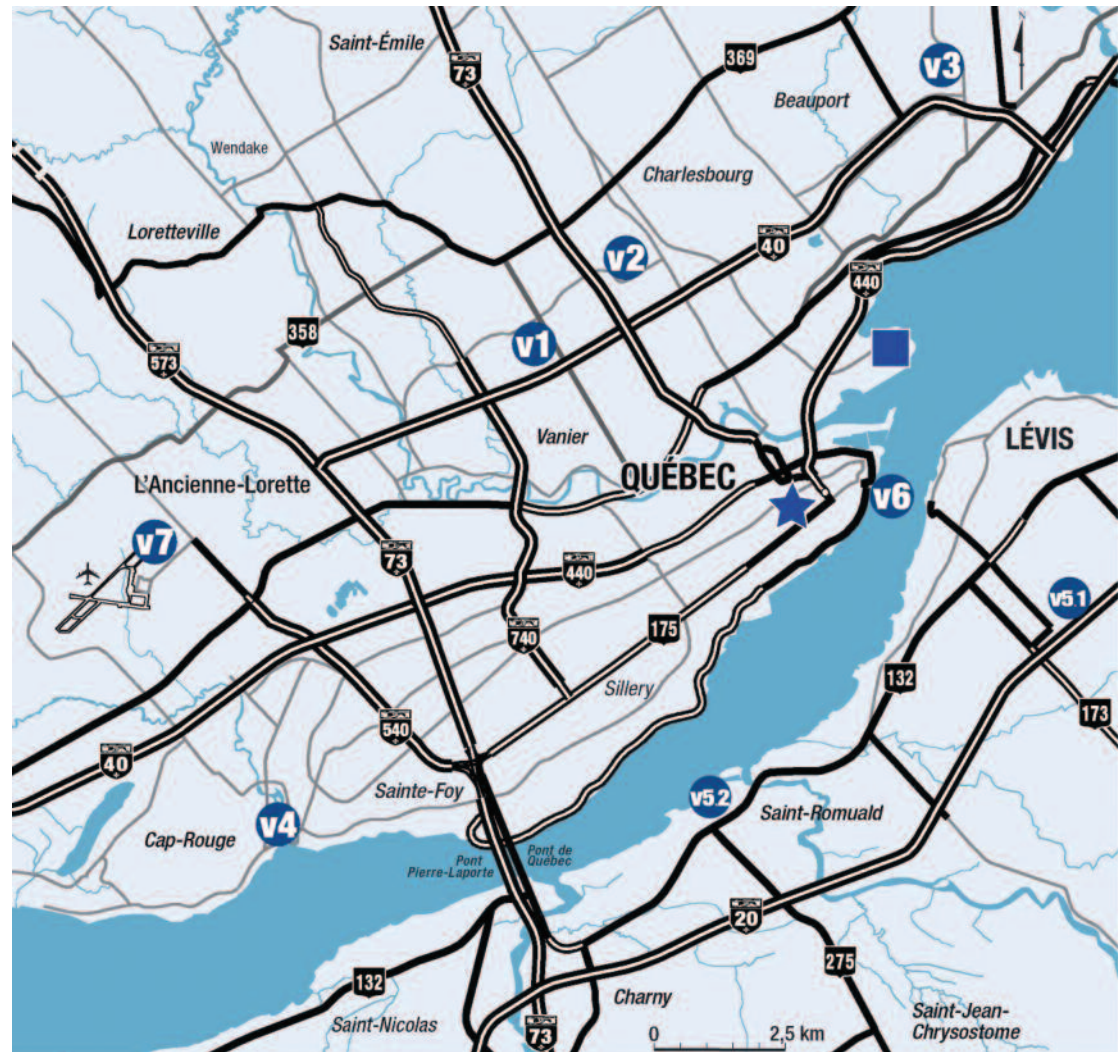
This visit will take place entirely in heated areas.

**V7A** MEETING TIME: 12:45 p.m. Convention Centre hall  
DEPARTURE: 1:00 p.m.

Your visit begins at the airport and moves on to the Snowplow Championship, which you can watch starting at 3:30 p.m. You can then return to the Québec City Convention Centre aboard a shuttle at the time of your choice.

**V7B** MEETING TIME: 1:00 p.m. Convention Centre hall  
DEPARTURE: 1:15 p.m.

Your visit begins at the Snowplow championship and moves on to the airport. You will be back at the Québec City Convention Centre around 5:15 p.m.



★ Québec City Convention Centre

■ Baie de Beauport : International Snowplow Championship



# Le Centre de gestion de l'équipement roulant (CGER)

Managing a fleet of more than **8,000** vehicles and equipment units, **CGER (Centre de gestion de l'équipement roulant)** counts on **66** mechanical workshops in the four corners of Québec to provide you with quality service wherever you are.

Our dynamic and experienced team offers you all services intended to support you in managing fleet, including :


- ❄ fleet management analysis;
- ❄ vehicle leasing;
- ❄ vehicle repair and maintenance;
- ❄ engineering services;
- ❄ driver training.

## OUR CUSTOMERS

Ministries  
Public agencies  
Municipal bodies



Centre de gestion  
de l'équipement  
roulant

Québec 



# WINTER CITY MAYORS' SESSION AND MINISTERS' SESSION

This Congress is a unique opportunity to bring together all players in the road field concerned with winter service issues. On Tuesday, February 9, managers, researchers and entrepreneurs will have an opportunity to hear transport ministers and mayors of winter cities discuss current political issues during the two sessions.

## WINTER CITY MAYORS' SESSION (subject to change)

**Tuesday, February 9, 8:30 a.m., Room 200**

For the first time at the International Winter Road Congress, there will be a session for the mayors of winter cities. Since an increasing number of people are living in cities, the objective of the World Road Association is to open its doors and allow for discussions on urban issues. This session, co-organized with the City of Québec, will provide a platform for elected officials to speak, allowing delegates of all fields to familiarize themselves with the issues facing cities and their strategies.

In order to respond to ever-increasing demands of the population in terms of transport system efficiency, travelling safety and environmental concerns, the mayors of winter cities will have an opportunity to explain the approaches and measures they have adopted in their cities to deal with **winter service and financial governance of sustainable urban mobility**. Northern cities face the same dilemma in offering quality services to users while guaranteeing efficient operations. The sharing of experiences from various areas of the globe will benefit people seeking to discuss solutions that are adapted to their unique constraints.

## MINISTERS' SESSION

**Tuesday, February 9, 10:15 a.m., Room 200**

Users are continuously demanding more services. They want to travel safely at all times without increasing their travel time. For countries that have winter conditions such as snow and freezing rain, meeting this demand comes at a high cost. When users step out of their vehicles and once again become residents and taxpayers, they want these services provided at the lowest possible cost.

Faced with such contradictory expectations, **can governments, within a perspective of sustainable development, promote winter mobility that is adapted to the climate**, a mobility that differs from the one experienced in other seasons? In response to this challenge, each Minister will have an opportunity to express their policies on vehicle regulations, infrastructure accessibility, intermodality and public transit as part of a structured debate surrounding three issues: the economy, road safety and reducing the ecological footprint.





## MINISTER'S MESSAGE

Québec is very happy to welcome you this winter season, to introduce you to Québec's transportation expertise.

Over time, our industry has carved out a choice niche on the international market. No matter what the sector - automobiles (parts and systems suppliers), special vehicles, delivery trucks, converted vehicles, utility trucks), recreational vehicles (snowmobiles, personal watercraft, all-terrain vehicles, motorcycles), intercity buses, urban buses (standard and hybrid) or the railway industry (commuter train and subway cars) – many Québec companies stand out in the rest of the world.

The Québec land transportation equipment industry includes nearly 900 firms, employs over 40,000 people and generates more than \$10 billion in revenue. This industry is characterized by major order givers, particularly Bombardier Transportation, Bombardier Recreational Products (BRP) and Volvo Group, and by a large number of small and medium enterprises (SME), which supply the major order givers. Some SMEs have even developed their own lines of vehicles in small-scale production.

In addition, several major research centres carry on their activities in the land transportation equipment sector. Their research includes light materials, such as aluminum, plastic, magnesium, and composites, as well as electric motorization and lithium-based batteries.

The 2010 International Winter Road Congress is the ideal opportunity to "fill up" with new knowledge, consider advantageous business opportunities and give birth to strategic partnerships.

Take full advantage of your stay. There's every reason to believe that this Congress will be a remarkable success!

The Minister of Economic Development,  
Innovation and Export Trade

**Clément Gignac**



# OPENING CEREMONY, BANQUET AND CLOSING SESSION

## OPENING CEREMONY

**Monday, February 8, 3:00 p.m., Room 200**

Come feel the enthusiasm the Congress' organizing committee has put into welcoming you to the opening ceremony. They have slated an array of Québec artists who will be presenting lively and original performances, creating a friendly and perfect winter atmosphere for the Congress. The President of PIARC, the Québec Minister of Transport, the Mayor of the City of Québec as well as special guests will be in attendance at the opening of this Congress and will be taking the podium to welcome you.

At the same time, the Chair of the World Road Association's B5 Technical Committee and the president of the Congress' organizing committee will be presenting the program for the Congress to help you choose among the various scheduled activities.

Following this ceremony, please attend the official opening of the exhibition and come discover the various exhibitors, including the national pavilions, which are known for their lively and personalized welcome.

## BANQUET

**Wednesday, February 10, 7:00 p.m., Room 200**

The evening before your departure, to showcase the pleasure we had in working together to improve our winter practices, there will be a banquet with typically Québec touches. After the sculptural performance by Mr. Michel Lepire, the evening will be capped off by a folk music performance by the Famille Painchaud, a group of dynamic and talented musicians. Semi-formal or formal wear is recommended. Your ticket (nametag with snowflake or coupon) will be required to get in.

## CLOSING SESSION

**Thursday, February 11, Noon, Room 200**

The Congress will end on Thursday, February 11 during the last meal which will be accompanied by various speeches and technical conclusions, summarizing the main points of what was discussed over the three days. A presentation in images of future congresses of the World Road Association will encourage you, we hope, to participate in upcoming World Road Association gatherings.



# CONGRESS EXHIBITION

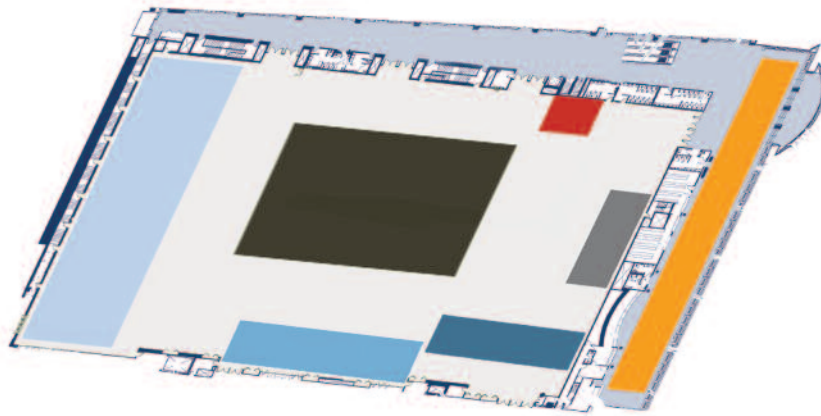
## MONDAY TO THURSDAY, ROOM 400

The international exhibition is an integral part of the Congress. With more than a 100 exhibitors and a dozen national pavilions, there will be more than 6,000 m<sup>2</sup> (65,000 pi<sup>2</sup>) of know-how and innovations presented to Congress delegates. Enhanced by the presence of always impressive national pavilions, the exhibition is undeniably the meeting and reference place for discussing and demonstrating the latest products and services for sustainable winter road service.

The official opening will take place on Monday, February 8 starting at 4:30 p.m. Several national committees will take advantage of this opportunity to inaugurate their national pavilion. The Open House Day on February 9 will undoubtedly be a high point of the exhibition by making it possible to welcome other visitors and maximize possible meetings between exhibitors and Congress participants.

The exhibit hall will include several features and activities. It will be used as a gathering place for breakfast (8:00 to 8:30 a.m.) and coffee breaks. Please note that on Tuesday and Wednesday, between 11:00 a.m. and 1:00 p.m., you can purchase lunch at an affordable price.

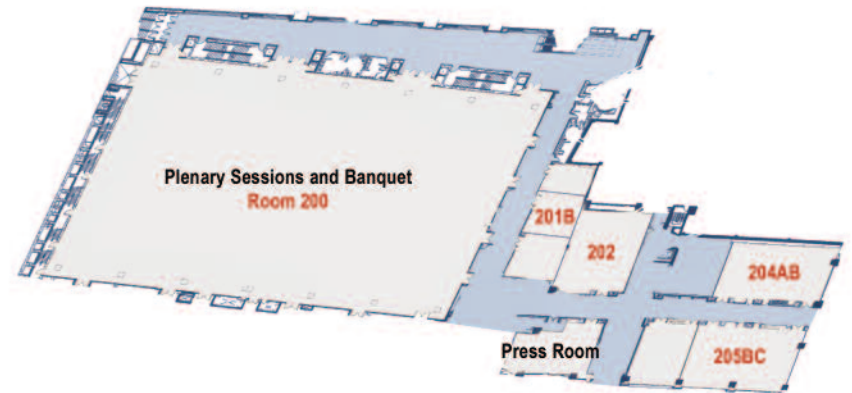
### LEVEL 4



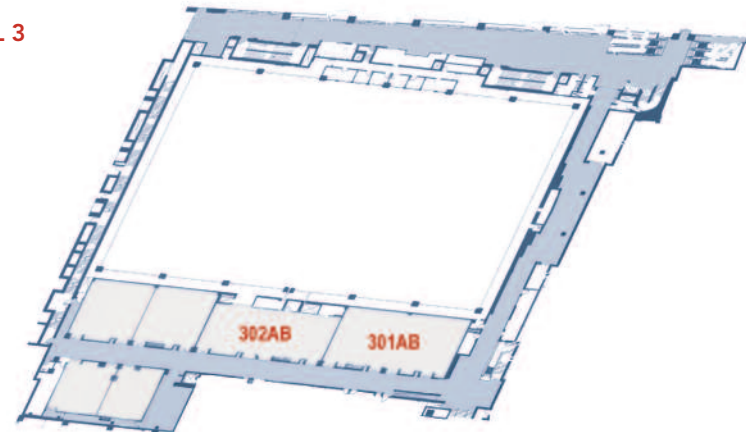
- Posters
- Vehicule Demonstration
- Hall
- Info
- Internet
- National Pavilions
- Restaurant

# LOCATION OF CONGRESS ROOMS

### LEVEL 2



### LEVEL 3





# INTERNATIONAL SNOWPLOW CHAMPIONSHIP AND EQUIPMENT DEMONSTRATIONS

**WEDNESDAY, FEBRUARY 10,  
FROM 1:30 P.M. TO 5:00 P.M., BAIE DE BEAUPORT**

## **INTERNATIONAL SNOWPLOW CHAMPIONSHIP: A FRIENDLY COMPETITION!**

The very first International Snowplow Championship will take place at the baie de Beauport site, near the St-Lawrence River, only 4 km from the Québec City Convention Centre.

This world first will take place Wednesday afternoon, February 10, at the same time as the technical visits for Congress delegates. This way, depending on the schedule, delegates will be able to participate in the championship activities before or after their technical visits.

Those who did not register for any visits may watch the entire competition, if they wish. A shuttle bus will be making frequent trips between the Québec City Convention Centre and the baie de Beauport.

**First departure from the Québec City Convention Centre: 1:30 p.m.**

Twenty or so snowplow operators from three continents will be participating in the competition. They will have to perform many difficult manoeuvres on a specially prepared obstacle course. Mechanical inspections based on the standards in force in the represented countries will also be used to evaluate the participants.

The International Snowplow Championship will not only provide an opportunity to crown a world champion, it will also be a chance to share experiences and highlight the role of snow removal vehicle operators during the winter months.

## **OUTSIDE EQUIPMENT DEMONSTRATIONS: WHERE THE REAL ACTION STARTS!**

At the same baie de Beauport site, only a few meters from the Snowplow Championship site, companies participating in the exhibition will put on an equipment demonstration in real winter conditions. Various types of vehicles and prototypes will take turns operating for twenty minutes or so to demonstrate their power and capabilities.

The demonstrations will be held at the same time as the Snowplow Championship and will take place during the afternoon.

## **SPECTATORS: WE HAVE ALSO THOUGHT OF YOU!**

Spectators at the two events will get to sit and watch in a warm and friendly atmosphere. They can also get closer to the action by taking a seat in one of the heated tents where they can hear the rumbling engines of the snow blowers and snowplows.

Space has also been set aside in the buildings located near the Championship and equipment demonstrations sites in order to provide the best view of the action and provide coffee breaks.

## A NETWORK AT YOUR SERVICE

### 28 OFFICES SPREAD ACROSS 17 COUNTRIES



#### AMERICAS

Atlanta  
Boston  
Chicago  
Los Angeles  
Mexico  
New York  
Santiago  
São Paulo  
Washington

#### EUROPE

Barcelona  
Berlin  
Brussels  
London  
Milan  
Munich  
Paris  
Rome  
Vienna

#### ASIA

Beijing  
Damascus  
Hong Kong  
Mumbai  
Seoul  
Shanghai  
Taipei  
Tokyo

## USEFUL INFORMATION

### NAMETAG

The nametag you receive when registering will provide you with access to various activities based on your status (exhibitor, delegate, media, etc.). Please make sure it is visible at all times.

### WINTER CLOTHES

In order to fully enjoy winter in Québec, you must dress warmly. For comfort, wear several layers of clothing that can be removed depending on the temperature. It is important to protect your extremities by wearing a hat, scarf, warm gloves and a good pair of boots. You may leave your boots in the Québec City Convention Centre hall and put on your regular shoes for optimal comfort during the day.

### CASH, CREDIT CARDS, TRAVELLER'S CHEQUES AND EXCHANGE OFFICES

- The Canadian dollar is divided into 100 cents. There are banknotes in 5, 10, 20, 50 and 100 dollar denominations and coins of 1, 5, 10, 25 cents as well as 1 and 2 dollar coins.
- Visa, MasterCard and American Express credit cards are generally accepted.
- Traveller's cheques are generally accepted in major hotels, in certain restaurants and department stores. Otherwise, they must be cashed at an exchange office or a bank.
- The exchange office closest to the Québec City Convention Centre is Corporation d'échange Canada, located at 835 Wilfrid-Laurier Avenue.
- Some businesses accept U.S. currency but they offer a less competitive rate than exchange offices.
- Banking institutions are generally open from 10:00 a.m. to 3:00 p.m., Monday to Friday.

### TAXES AND TIPS

Tipping is left to the customer's discretion. It is recommended to leave a tip of 15% of the total cost before tax. A federal Goods and Services Tax (GST) of 5% is added to all purchases along with the Québec Sales Tax (QST) of 7.5%.

### USEFUL TELEPHONE NUMBERS

Jean-Lesage International Airport: 418 640-2600

Château Laurier Hotel, Québec: 418 522-8108

Delta Hotel, Québec: 418 647-1717

Hilton Hotel, Québec: 418 647-2411

Loews Le Concorde Hotel: 418 647-2222

Tourist Information: 418 641-6290 - 835 Wilfrid-Laurier Avenue, Québec

Taxi: 418 525-5191 and 418 522-2001

Emergency: 9-1-1 (a toll-free number from any type of telephone)

Visit our website at  
[www.mri.gouv.qc.ca](http://www.mri.gouv.qc.ca)

Relations  
internationales

Québec 



# ECO-RESPONSIBLE CONGRESS

The XIII International Winter Road Congress has been organized in an eco-responsible manner. On the advice of the Québec City Convention Centre's eco-advisor, three objectives have been set: reduce greenhouse gas emissions, reduce waste and use regional businesses.

Various steps have been taken in preparing the congress to reduce its ecological footprint:

- **No (or almost no) paper!** A dynamic screen display at the Québec City Convention Centre and lecturer presentations in digital format only.
- **Eco-responsible kit:** Made in Québec using a renewable resource, cotton, and reusable writing case made of 100% recycled paper.
- **Caring for the community:** Extra food will be sent to a community organization.
- **Reduced transportation:** Local suppliers and hotels located near the Québec City Convention Centre have been selected. A donation will be made to a foundation to partially offset the Congress' transportation impact.

Visit the Web site for a full list of steps taken!

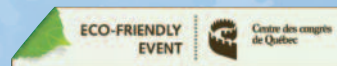
## YOU CAN BE ECO-RESPONSIBLE TOO!

As a participant at the 2010 Congress, you can also contribute to an environmentally-friendly event by adopting the following practices:



- Use recycling stations;
- Take only the documents and items you really need;
- Use drinking water fountains instead of buying bottled water;
- Dispose of your nametags by placing them in a recycling bin provided for this purpose at the end of the Congress;
- Guess which exhibitor designed and built the most eco-responsible stand.

A green team will be on site during the Congress to inform you of recycling and composting practices. Come meet the eco-advisor in the exhibit hall during the Congress and get information on what can you do for the environment.



# THANKS TO OUR PARTNERS

The Organizing Committee wishes to thank [Transport Canada](#) and [the City of Québec](#) for their support in holding the Congress as well as its partners for their contribution to the success of the event.

## PLATINUM



## GOLD



## SILVER



## FRIENDS OF THE CONGRESS

BPR

# PROGRAM AT A GLANCE

<b>MONDAY</b> <b>FEBRUARY 8</b>	3:00 p.m. to 4:30 p.m.	Opening ceremony • <b>Room 200</b>						
	4:30 p.m. to 7:00 p.m.	Exhibition: Official opening • <b>Room 400</b>						
<b>TUESDAY</b> <b>FEBRUARY 9</b>	8:30 a.m. to 9:45 a.m.	Winter City Mayors' Session: Winter Service and the Economic Governance of Sustainable Urban Mobility (subject to change) • <b>Room 200</b>						
	10:15 a.m. to noon	Ministers' Session: How to Promote Winter Mobility Adapted to the Climate? • <b>Room 200</b>						
	<b>ROOM</b>	<b>302AB</b>	<b>204AB</b>	<b>301AB</b>	<b>202</b>	<b>205BC</b>	<b>400</b>	
	2:00 p.m. to 3:30 p.m.	<b>T1-1A</b> Overview of National Strategies & Policies	<b>T2-1</b> Accident and Traffic: Flow Analysis	<b>T3-1</b> Monitoring & Observing Weather & Road Conditions	<b>T4-1A</b> Innovative Techniques for Snow Removal	<b>T5-1</b> Salt and the Road Right-of-Way	Poster session P1	Exhibition 8:00 a.m. to 6:00 p.m.
4:00 p.m. to 5:30 p.m.	<b>T1-1B</b> Overview of National Strategies & Policies	<b>T2-2</b> Optimized Driver Information for Better Road Safety	<b>T3-2</b> Forecasting Weather & Road Conditions	<b>T4-1B</b> Innovative Techniques for Snow Removal	<b>T5-2</b> Alternatives to Salt & Salt Quality			
<b>WEDNESDAY</b> <b>FEBRUARY 10</b>	8:30 a.m. to 10:00 a.m.	<b>T1-2A</b> Winter Maintenance Management Methods	<b>T2-3</b> Special Traffic Problems and Solutions in Wintertime	<b>T3-3A</b> Decision Support Systems	<b>T4-2</b> The Environment and Snow Control	<b>T5-3</b> Salt, Snow – Sustainable Options	Poster session P2	Exhibition 8:00 a.m. to 1:00 p.m.
	10:30 a.m. to noon	<b>T1-2B</b> Winter Maintenance Management Methods	<b>T4-4</b> Measurement of Pavement Surface Condition	<b>T3-3B</b> Decision Support Systems	<b>T4-3</b> Techniques for the Application of Deicing Chemicals	<b>T5-4</b> History of Maintenance in Various Countries		
	2:00 p.m. to 5:00 p.m.	Equipment demonstrations International Snowplow Championship			<b>Meeting point:</b> <b>Main lobby of the Québec City Convention Centre</b>			
		Technical visits (details page 16)						
7:00 p.m. to 11:00 p.m.	Banquet - Show • <b>Room 200</b>							
<b>THURSDAY</b> <b>FEBRUARY 10</b>	8:30 a.m. to 10:00 a.m.	<b>T1-3</b> Interaction Between Road Users and Agencies	<b>T2-4</b> Sustainable Winter Maintenance in Road Tunnels	<b>T3-4A</b> Vehicle-based Technologies	<b>T4-5</b> Analysis of the Spread Rate of Chemical Deicers	<b>Special session</b> Snow and Ice Databook 2010 (Break at 10 a.m.)	Poster session P3	Exhibition 8:00 a.m. to noon
	10:30 a.m. to noon	<b>T1-4</b> Challenges of Contracting	<b>T6-1</b> Winter Service and Climate Change Impacts	<b>T3-4B</b> Vehicle-based Technologies	<b>T4-6</b> Prevention or Dealing with Snow/Ice			
	Noon to 3:00 p.m.	Closing session (meal included) • <b>Room 200</b>						