National Research Council Canada

SUMMARY REPORT

Industry Workshop on Intelligent Transportation Systems

June 6th 2017, Ottawa

PREPARED BY:

Intersol

Head Office: 300-205 Catherine Street, Ottawa, ON K2P 1C3 | Tel: 613-230-6424 Fax: 613-567-1504
www.intersol.ca
Montreal • Toronto • Calgary • San Francisco

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Executive Summary

On June 6th, 2017, the National Research Council of Canada (NRC) hosted a 1-day workshop with industry stakeholders to initiate discussions around developing a national Intelligent Transportation Systems (ITS) program in Canada. The event took place at the NRC Sussex Drive research facilities in Ottawa.

This report serves as a summary of the proceedings and outcomes of the workshop.

Purpose of the Workshop

The purpose of the workshop was to engage Canadian industry to ensure a relevant and achievable program that establishes a robust ITS ecosystem to enable our country to capitalize on the estimated trillion dollar global industry, as well as make Canada an international ITS player and a world leader in exporting technology in specific niche areas.

Participants

The invitation-only event brought together 36 attendees; 16 from relevant federal departments, and 20 from leading Canadian industry organizations from across the full spectrum of the ITS industry, as well as from the Information and Communications Technology (ICT), telecommunications, software and application, and video processing spaces. Those unable to attend in person were invited to participate via webinar.

To consult the list of participants, refer to Appendix A.

Agenda Overview

The workshop agenda featured a number of presentations showcasing leading-edge ITS technology developments, lessons learned and thought leadership, followed by facilitated discussions that fostered an environment of rich exchange and discussion. The format of the agenda placed an emphasis on sharing the perspectives of all participants. It also provided important opportunities for business to business networking to foster cross-sector collaboration.

To consult the workshop agenda, refer to Appendix B.

Workshop Outcomes

There was lots of engagement and a great buzz throughout the day's discussions. By the end of the day, workshop participants had articulated a vision for the future of intelligent transportation systems in Canada, explored strategies and approaches to make this vision a reality, and proposed some priority areas for action. A high-level summary of this work has been captured below. More details can be found in the body of this report.

1. A Vision for the Future

Participants' vision for the future of ITS in Canada centered on the increasing availability and use of innovative home-grown ITS market solutions to improve the speed, safety, capacity, efficiency and resiliency of our transportation system. The vision featured a collaborative, cohesive ITS ecosystem that facilitates the integration of services across all modes of transportation, as well as a thriving Canadian industry that sells and exports leading-edge ITS technology abroad. Canadian international leadership in exporting ITS technology was also an important element of this vision for the future.

Workshop participants articulated a number of important social, economic and environmental benefits of deploying ITS technology solutions in Canada, as well as key success factors that would support achieving their vision of the future.

Outcomes of these discussions have been summarized on pages 2 and 3 of this report.

2. Strategies and Approaches

In their discussions, workshop participants highlighted a number of strategies and approaches required to make their vision of the future a reality. These strategies and approaches focused on:

- Advancing ITS research, development and deployment;
- Developing more flexible procurement policies and strategies;
- Promoting ITS technology;
- Training highly qualified personnel;
- Promoting Canadian ITS technologies abroad;
- Positioning Canada as a global leader;
- Developing new business models, and;
- Developing architectures and standards for interoperability.

More details on the outcomes of this discussion can be found on page 4 of this report.

3. Priorities for Action

At the end of the day, 4 main areas for action (in no particular order of priority) emerged from the workshop discussions:

1. Supporting the development of ITS technologies that are used domestically and sold globally
2. Developing the right networks, business models and models of engagement to encourage the implementation of ITS solutions
3. Developing highly qualified personnel to serve the needs of Canadian industry and society
4. Identifying niche technology areas where Canada has a clear competitive advantage

For each of these areas, workshop participants identified one or two priorities that Canadian industry, government and other stakeholders need to focus on in the next 12 to 18 months in order to move forward.

Outcomes of this discussion have been summarized on page 5 of this report.

Next Steps

- The stakeholder insights and suggestions that emerged from these workshop discussions will serve to inform the development of a robust program proposal for a national ITS program for Canada.
- More engagement with stakeholders is also planned.

Introductory Session

Welcome and Opening Remarks

Michel Dumoulin, General Manager of NRC's Automotive and Surface Transportation, and Marie-Chantal Ross, Program Leader for the NRC's Fleet Forward 2020 Program, welcomed participants to the workshop and set the context for the day by providing an overview of NRC's vision for a national ITS program. They noted some compelling reasons why now is the right time for such a program, shared highlights of a scan of international and academic activities in the area of ITS[1], and provided an overview of next steps, which include engaging with provinces, municipalities and universities, undertaking market studies, and developing a program proposal.

Setting the Context

To set the context for the workshop discussions, the morning featured a number of insightful presentations showcasing leading-edge ITS technology developments, as well as national and international thought leadership and lessons learned in the ITS domain. Brief summaries of the workshop presentations have been included here. For more details, refer to the presentation decks (available upon request).

Marije de Vreeze, Manager of ITS Netherlands[2], discussed how the Netherlands was able to create a national ITS program that brought them international recognition. She provided an overview of the *Better Informed on the Road* Roadmap (2013-2023), highlighted a number of challenges faced, and identified lessons learned in overcoming those challenges. She emphasized the importance of having a shared vision, having an optimal number of partners, taking an adaptive approach, and building trust between government and industry. For more information, refer to the Connecting Mobility website[3].

Brian Roberts, Vice-President Global Services for Wavefront (Canada's Centre of Excellence for Wireless Commercialization) talked about the importance of creating a robust ecosystem and the power of partnerships. He shared lessons learned from a Canadian accelerator and emphasized the importance of: mapping the ITS ecosystem (to better understand strengths and weaknesses), effectively communicating with stakeholders, tapping into existing knowledge and monitoring progress/results.

Patrick Lauzière, Vice-President Technology and Development for Orange Traffic[4], talked about ongoing work at Orange Traffic and shared their vision for the future. He emphasized the need to stimulate innovation in Canadian companies, spoke to the opportunity to leverage the extraordinary knowledge Canada has in the ITS field, and touched on the need to explore synergies between finance and technology to make business models work better with regard to bringing technologies to market.

Janneke van der Zee, General Manager of ITS Canada (the national thought leader on advanced technologies and their application to the Canadian transport system), highlighted the role and mission of ITS Canada and provided an overview of the organization's membership, technical committees, and partnerships with other transportation organizations. She highlighted a number of innovative technologies that will shape the future, and invited all interested parties to see Canadian ITS innovation in action at the 25th ITS World Congress, an event being co-hosted by ITS Canada and ITS America in Montreal on October 29 – November 2, 2017.

[1] A published report of this scan will be available shortly (upon request). It covers: international ITS activities, demonstration projects, international government collaborations, policies, guidelines, strategic plans and roadmaps.

[2] The Connekt/ITS Netherlands network consists of over 200 public and private parties who work on the application of traffic and transport solutions to make mobility smart, sustainable and social.

[3] Connecting Mobility Website URL: https://www.connectingmobility.nl/EN+Home/default.aspx

[4] Orange Traffic's mission is to optimize safety and fluidity on the road in an innovative way.

Summary of Workshop Discussions

The focus of the afternoon was on engaging workshop participants in interactive discussions around the development of a national ITS program in Canada. The purpose of the first exercise was to articulate a vision for the future of intelligent transportation systems in Canada that describes what success will look like. The group brainstormed a preferred future and articulated specific elements of their vision. Next, they identified a number of strategies and approaches required in order to achieve this vision. Finally, they identified a set of priority areas, along with one or two important initial steps that are required from industry, government and other actors to move forward.

In each of these discussions, workshop participants discussed the topic at their table groups and then drew together the main threads for report back in a plenary session. Seating was pre-assigned to ensure a good mix of perspectives during the discussions, and a note-taker at each table captured highlights of the discussions through the use of an online flipchart. A summary of the discussion outcomes has been presented here.

A Vision for the Future of Intelligent Transportation Systems in Canada

In this first exercise, workshop participants brainstormed a preferred future and articulated the following elements of their vision:

- Increased availability and use of innovative home-grown ITS market solutions to improve the speed, safety, capacity, efficiency and resiliency of our transportation system.
- A collaborative, cohesive ITS ecosystem that facilitates the integration of services across all modes of transportation.
- A thriving Canadian industry that sells and exports leading-edge ITS technology abroad.
- Canada recognized as a world leader in exporting technology in specific niche areas.

With increasing traffic congestion and the rising costs of providing additional transportation infrastructure, workshop participants identified a number of important social, economic and environmental benefits of deploying ITS technology solutions in Canada. The benefits and outcomes in the table below formed an important part of stakeholders' vision for the future of ITS in Canada.

Key Benefits			
Efficiency	**Economic**	**Social**	**Environmental**
• Increased capacity of existing transportation infrastructure. • Increased speed of inter and intra-city transportation. • Improved flow of traffic/congestion.	• Reduction in infrastructure capital and maintenance costs. • More exporting of Canadian ITS technology. • Increased competitiveness of Canadian businesses. • Job growth. • Increased tourism.	• Improved personal safety due to reduction in number of transportation-related accidents and fatalities. • Better access to low-cost and convenient mobility options. • Increased livability of communities.	• Increased use of shared transportation. • Reduction in fuel consumption, greenhouse gas emissions and air pollution from transportation.

Key Success Factors

A number of issues and challenges with regard to achieving the preferred future were raised, namely around governance, funding, harmonization, privacy, security, data ownership, risk and liability. Workshop participants identified key success factors that would support achieving their vision of the future.

The key success factors articulated below formed another important part of stakeholders' vision for the future of intelligent transportation systems in Canada.

Collaboration and Partnerships

- Strong federal leadership that establishes ITS as a national priority, with a national strategy and funding that supports long-term investments in the field.
- A collaborative ecosystem of government, ICT infrastructure providers and transportation stakeholders to contribute the necessary system components.
- Strong partnership and collaboration frameworks that allow for increased integration between all stakeholders.
- New forms of public-private partnership with different approaches to risk management.
- New business models for partnerships at the regional level.
- Regional technology clusters covering the entire supply chain.

Innovation, Funding and Support

- Platforms for R&D funding, collaboration and extension of innovation that foster communication and exchange between governments, universities, publicly-funded research institutions and companies.
- Regional labs and test sites for collaborative prototyping and interoperability testing.
- Facilities for large-scale mobility experiments in a real-life environment.
- Flexible, long-term funding that provides the private sector a sense of continuity and reassurance with regard to investments.
- Programs to take export-ready companies into international markets, and active promotion of Canadian ITS technologies abroad.
- Documented case studies, success stories and lessons learned to build on past experiences (from Canada and other jurisdictions).

Harmonization and Data-Sharing

- Standards of interoperability.
- Openness and availability of data.
- Multimodal data hubs.
- Seamless integration with ICT providers so information on the transformation system can be collected, processed, and disseminated for better decision-making.
- Deployment of connectivity/digital infrastructure to support industry.
- Secure technology designs that are enforced and audited.

Policies and Regulations

- Flexible procurement policies and practices that encourage and support the adoption of ITS technologies at all levels of government.[5]
- Support and messaging to help influence government decision-makers, "sell" them on ITS solutions, and spur interest and investment in future initiatives.
- New business models for local and municipal government that allow the monetization of the implementation of ITS technology.

[5] Will require a culture change around risk-taking.

Strategies and Approaches

In a second round of discussion, workshop participants identified strategies and approaches required to make their vision of the future a reality. A summary has been captured in the table below.

Strategy or Approach	Description and Details
Advancing ITS Research, Development and Deployment	Generating and commercializing innovations is fundamental to Canada's economic health. A strategy is needed to support the development of domestic ITS technologies, particularly in niche areas where Canada has a distinct national advantage. The first step is to map out the ITS ecosystem, identify gaps and select priority areas where the needs and potential benefits are greatest. Funding and support will then be needed for advancing research, development and deployment of technologies in those focus areas.
Developing More Flexible Procurement Policies and Strategies	There is a need for government policy-makers to rethink procurement policies and strategies in a way that will allow for increased flexibility in government contracts and stronger support for the adoption of ITS technologies.
ITS Advocacy and Promotion	Strong advocacy, promotion and marketing is needed to encourage the adoption and deployment of new ITS technologies. This includes marketing and communication efforts to increase awareness and understanding of the value of the new technologies, as well as the solicitation of early adopters.
Training of Highly Qualified Personnel	There is a need for training, education and professional development of current and future operators of ITS technologies to serve the needs of Canadian industry.
Promoting Canadian ITS Technologies Abroad	Mechanisms are needed to establish winning conditions for export-ready Canadian companies who have developed innovative or niche technology products to increase their chances of success at accessing international markets.
Positioning Canada as a Global Leader	Positioning Canada as a global leader starts with identifying priority technology areas or domains where focused investments can make the greatest impact, and then developing a strategy to position ourselves as a global leader for innovation excellence in these areas. In recognition that standards development influences the future market access of products and services, Canada's participation in the international standards community is an important opportunity to influence the marketplace, gain a competitive edge for Canadian companies and have an impact on global trade.
Developing New Business Models	New business models are needed for a collaborative, efficient, integrated ITS ecosystem where businesses are partners, not competitors. Legal frameworks will also be needed to support joint collaborative projects across the ecosystem.
Developing Architectures and Standards for Interoperability	There is a need for government and Canadian industry to work together to develop architectures and standards to ensure the efficient integration of systems and interoperability of ITS technologies in transportation applications.

Proposed Priorities for Action: The Path Forward

At the end of the day, 4 main areas for action emerged from the workshop discussions. For each of these areas, workshop participants discussed what needs to be done and identified one or two priorities that Canadian industry, government and other stakeholders need to focus on in the next 12 to 18 months in order to move forward. Outcomes of this work are summarized in the table below.

Area for Action	Proposed Priorities	Additional Details
Supporting the development of ITS technologies that are used domestically and sold globally	1. Re-examination of government policies and processes to ensure they support and incentivize ITS innovation and solutions.[6] 2. Establishment of labs and test sites for prototyping and interoperability testing.	• There is a need to map out the current ITS landscape and develop a repertoire of Canadian industry capabilities. • Some important questions were raised around how to facilitate the commercialization of innovative technology through partnerships between government and industry. New policies and strategies are needed at all levels of government to encourage and support the adoption of ITS technologies. • In order to move towards large-scale implementation of ITS solutions, it is crucial that tests and trials are performed. Regional labs and test sites will be important for collaborative prototyping and interoperability testing. • Many questions remain around the financial impact and benefits of deploying ITS solutions to address societal issues (e.g. traffic congestion). Costs and benefits must be properly articulated in order to determine the true value of these solutions to society.
Developing the right networks, business models and models of engagement to encourage the implementation of ITS solutions	1. Analysis of the current state of ITS in Canada (including an inventory of ongoing projects and analysis of institutional barriers to use of ITS technology). 2. Development of new business models around the use of data.	Existing models, resources and good management practices can easily be shared and adapted. There is a need for: • A network for innovation and entrepreneurship for carrying R&D to commercialization. • Regional networks for operational deployment and transportation systems management. In addition, there is a lot of activity happening in other jurisdictions. It will be important to remain abreast of this work through national and international forums and ongoing information-sharing.
Developing highly	1. Upskilling of existing transportation	• The suggestion is to work with Canadian academic institutions to identify needs and develop academic

[6] Although this is aimed at all levels of government, it is particularly important at the municipal level.

Area for Action	Proposed Priorities	Additional Details
qualified personnel to serve the needs of Canadian industry and society	professionals (in both public and private spheres). 2. Establishment of Open Living Labs to foster collaboration between academic institutions, the public and private sectors.	programs that will build ITS professional capacity and develop the future ITS workforce. • There is a need for more student coop placements and graduate internships. • Specific courses targeted to existing professionals (in-class and online) will need to be developed. • There is a need for more civil service secondments to the private sector (and vice-versa).
Identifying niche technology areas where Canada has a clear competitive advantage	Niche areas are: 1. Data security (to ensure the authenticity, integrity, and confidentiality of transactions). 2. Sensors (merging and integration of sensors into roadside infrastructure).	• Concern is growing about the security of systems against hacking. Citizens are also concerned about the security of their data and possible violations of privacy. Data security and privacy should be an important area of focus for Canada. • Investments in sensor technology for application in the transportation system will help generate important intelligence on which to base decision-making.

Close

At the end of the day, Michel Dumoulin and Marie-Chantal Ross thanked participants for actively contributing to a lively and stimulating event. They noted a great buzz throughout the day's discussions and stated many good ideas were shared. They indicated that these discussions are a great example of what can be accomplished by bringing individual areas of expertise together to tackle common challenges and make a huge difference in the lives of Canadians.

In closing, Mr. Dumoulin and Ms. Ross noted the valuable insights and conclusions that were gathered would not have been possible without the participation and commitment of industry to engagement and collaboration.

In terms of next steps, the stakeholder insights and suggestions that emerged from these discussions will serve to inform the development of a robust program proposal for a national ITS program for Canada. More engagement with stakeholders is also planned.

Appendix A: Participant's List

Name	Company/Organization
Robert Wu	6Harmonics Inc.
Ken Brizel	ACAMP – Alberta Centre for Advanced MNT Products
Patrick Leclerc	CUTA
Helen Tang	DRDC
Pascal Lamoureux	Electromega
Alex Miller	ESRI Canada Limited
Brendon Hemily	Independent Consultant in Public Transportation
David Arbuthnot	Intelligent Mechatronic Systems
Randy Hanson	International Road Dynamics Inc.
Eric Labrie	is5 communications
Alec Nicholls	ISED
Randa Saryeddind	ISED
Janneke Van der Zee	ITSCAN
Stéphane Pipon	MDI Conseils et Technologies
Bob Arnold	NRC
Michel Dumoulin	NRC
Carlos Levy	NRC
Marie-Chantal Ross	NRC
Mark Stoochnoff	NRC
Stephane Tremblay	NRC
Mark Witzel	NRC
John Wood	NRC
Patrick Lauziere	Orange Traffic
Martin Nathanson	Paxgrid
Anthony Elton	Public Safety
Grant Courville	QNX (Blackberry)
Sharon Lewinson	RideShark Corporation
Uri Agam	Sensotech Inc.
Moira Bird for Amir Ghods	Smats Traffic Solutions Incorporated
Jacques Leonard	Stantec
Emmanuel Chabot	Transport Canada
Ken Moshi	Transport Canada
Barry Pekilis	Transport Canada
Howard Posluns	Transport Canada
Pino Porciello	TrustPoint Innovation Technologies
Brian Roberts	Wavefront

Appendix B: Workshop Agenda

Intelligent Transportation Systems

June 6, 2017 – 100 Sussex, Ottawa

AGENDA

08:30	Opening Remarks *Mot d'ouverture*	Michel Dumoulin
08:45	NRC's National ITS Program Overview *Vue d'ensemble du programme national STI du CNRC*	Marie-Chantal Ross
09:15	ITS Connekt – Becoming an international leader *ITS Connekt – Devenir un leader international*	Marije de Vreeze
10:00	Break / *Pause*	
10:30	Wavefront – Creating a high tech ecosystem *Wavefront – Création d'un écosystème de haute technologie*	Brian Roberts
11:00	Orangetraffic – from zero to success *Orangetraffic – de ses origines au succès*	Patrick Lauzière
11:30	ITS Canada – Canada's potential *STI Canada – le potentiel canadien*	Janneke van der Zee, Chris Philp
12:00	Lunch	
13:00	Narrowing in on national themes *Identification de thèmes pour la scène nationale*	Intersol – Roger Gaudet and Mélanie Valois
15:00	Break / *Pause*	
15:15	Unfolding the next three years *Plan d'attaque pour les trois prochaines années*	Intersol - Roger Gaudet and Mélanie Valois
16:45	Closing remarks Clôture	Marie-Chantal Ross Michel Dumoulin