Transport Canada Transports Canada

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Stakeholder Consultations on Transportation Innovation

Emerging Themes

Canada

Synopsis

Productivity in Canada overall has been decreasing over the past decade. The transportation sector, however, maintained a steady increase, largely through efficiency improvements, until 2009 when the recession triggered a decrease in productivity. It is commonly understood that the next generation of productivity gains in the sector will involve innovation, in the form of technology adoption, innovative products or innovative business practices.

Transport Canada (TC) has incorporated innovation into its forward-looking plan to identify measures to enhance transportation efficiency, environmental performance, safety, and security. Over the past year, Transport Canada has engaged in a national series of consultations with stakeholders representing the industry, academia and governments. Workshops and roundtables were held in Calgary, Vancouver, Halifax, St. John's, Toronto, Montreal and Ottawa. The objectives of these consultations were to increase knowledge and improve understanding of the issues facing the transportation sector, to identify the drivers and barriers to innovation, and the opportunities and challenges as they pertain to improving transportation performance.

A number of key issues and positions were raised by stakeholders during the workshops, and potential roles for Transport Canada to address those issues. Specifically, six, high-level themes emerged from the discussions:

- Policy and Leadership;
- Regulation;
- Partnerships and Collaboration;
- Research and Development;
- Skills Capacity and Workplace Innovation; and
- Data and Information Requirements.

This document provides a summary of the themes that emerged from the workshop discussions and reflects the positions expressed by stakeholders.

Introduction

Over the past year, Transport Canada has engaged in a national series of consultations with stakeholders representing the industry, academia and governments. Workshops and roundtables were held in Calgary, Vancouver, Halifax, St. John's, Toronto, Montreal and Ottawa. The objectives of these consultations were to increase knowledge and improve understanding of the issues facing the transportation sector, to identify the drivers and barriers to innovation, and the opportunities and challenges as they pertain to improving transportation performance. Transport Canada has identified its role as that of knowledge broker, catalyst and facilitator to address innovation barriers, identify key opportunities and support innovation in the sector.

The purpose of this report is to provide a summary of the key themes that emerged from the workshops. It reflects the positions expressed by stakeholder in response to the general questions that were posed at the workshops; the issues facing the industry, where the opportunities are for innovation to address those issues, any barriers to innovation and what possible roles Transport Canada might assume to foster innovation in the sector. It does not represent Transport Canada's response to the consultations, however, input received from stakeholders will be used to inform the development of a forward looking agenda that incorporates innovation.

Context

The transportation sector is facing ever increasing challenges in support of Canada's economic and social development, such as congestion, volatile energy costs, aging infrastructure, environmental concerns, climate change impacts, changing demographics and research capacity for the knowledge economy. The solutions to those challenges will increasingly depend on innovation. Investing in the right technologies, research and skills will enable the sector to continue to support trade, global competitiveness and prosperity.

Productivity in Canada overall has been decreasing over the past decade, although the transportation sector has made important progress in productivity gains having outperformed the rest of the economy largely through efficiency improvements. Productivity gains in transport impacts growth in other sectors, as it lowers the cost of doing business over distant location and enables greater access to markets. The future now lies in the adoption of innovative products and business practices to maintain a competitive edge.

Innovation enhancements in transportation yield significant economic and social benefits. New approaches to supply chain and fleet management have resulted in more efficient, reliable and lower-cost services. Network sharing arrangements have increased fluidity.

Systematic and proactive risk management practices, along with new monitoring, detection and scanning techniques, have increased safety and security margins in every mode.

Over the past few years, the Government of Canada has increased its focus and placed more emphasis on innovation as a key component to advance Canada's prosperity. The 2010 Budget identified innovation as key to harnessing Canada's competitive advantage and announced new spending for research, innovation clusters, commercialization of products and technology partnerships. The transportation sector has benefited from new bi-lateral air agreements, free trade agreements, and the gateways and corridors approach to pursuing long-term policy, planning and strategic investment in transportation systems to strengthen Canada's position in international commerce.

Innovation is a key component of Transport Canada's forward-looking plan to identify measures to enhance transportation efficiency, environmental performance, safety, and security. Innovation has implications for trade facilitation, supply chain management, security and competitiveness and is strongly linked to environmental sustainability, climate change and greenhouse gas emissions.

TC defines innovation in its broadest sense and refers not only to new and emerging technologies, but also to new or better ways of using existing technologies. Equally important to innovation are: research and development, business practices, policies and regulatory approaches, skills development, and capacity building. Transport Canada can play a leadership role in fostering R&D, technology and skills capacities to improve the innovation performance of the transportation sector.

Emerging Themes

Over the course of the consultation workshops, six high level themes emerged from the discussions:

- Policy and Leadership;
- Regulation;
- Partnership and Collaboration;
- Research and Development;
- Skills Capacity and Workplace Innovation; and
- Data and Information Requirements.

The following is a summary of the issues and positions raised by stakeholders and potential roles for Transport Canada to address those issues.

1. Policy and Leadership

Stakeholder Positions:

The transportation industry lacks a coherent, multi-modal transportation strategy, that includes innovation, and that will guide longer-term development. Leadership is required to see beyond jurisdictional disputes and develop a vision for the sector based on the importance of transportation to economic development. The vision should further identify the need for cost-competitive, reliable and secure service as a means to improving competitiveness by facilitating trade and increasing prosperity. Finally, it should position Canada as a world leader in areas where there is unique expertise, such as cold climates.

Leadership is required at two levels; a high strategic level to set out the broad framework that positions the transportation sector as a fundamental enabler of the Canadian economy; and at a more pragmatic level to set priorities and drive action. The strategy must also include clear goals and performance measures to enable progress to be measured and course adjustments made when required.

While government has a clear role to play to create the environment and develop the framework to drive innovation, industry leadership is essential to articulating priorities and driving a shift in thinking to take a longer term view of investment in new technologies and innovative processes. Academia also needs to develop a better understanding of the industry so as to better support the technology and skills development to drive innovation.

Participants cautioned against creating new mechanisms to bring partners to the table. A more appropriate approach would be to use existing networks and institutions more effectively to identify mutual objectives and priorities.

Innovation is most often incremental and involves continuous improvement to performance and productivity, rather than being sudden and transformative. The creation of innovation roadmaps to support value-added technologies and processes, will assist the industry in identifying and investing in innovation. Roadmaps should be accompanied by realistic action plans that focus on the strategic priorities identified in the vision, encourage partnerships and build research capacity.

Industry requires the right tools and policy frameworks to encourage, rather than hinder or stifle, innovation. A portfolio of support mechanisms is required that includes sustained and predictable funding for research and development, marketing and commercialization support, capital investment, and demonstration and showcasing of technologies.

To ensure that research and development is responsive to strategic goals, and that stakeholders are routinely consulted on matters of priority to the sector, consideration should be given to a permanent consultative body to advise the department. One model that was suggested was the Office of the Chief Scientific Advisor (CSA) to the UK Department for Transport (DfT). Other options include advisory boards or committees comprised of representatives of industry and academia.

> The CSA's role is to ensure that the Department's scientific activities are well directed and that policy development is soundly based on good science. This is achieved by challenging the scientific content and quality of the Department's policies at a strategic level and working with heads of profession and research programme managers to ensure high quality and fitness for purpose of the science and research funded by DfT including its agencies.

Potential Roles for Transport Canada:

Transport Canada should act as an advocate for the sector with other government departments, provincial governments and internationally with other governments. The department should represent the interests of the sector by being the single window at the federal level through which industry interacts with other departments. Furthermore, Transport Canada should take the lead in developing a higher and more compelling profile for the transportation sector and its role in the Canadian economy, especially through building a wider understanding of its importance in the daily lives of Canadians and its existing and potential contribution to international trade and competitiveness.

Transport Canada has a role to play in ensuring a sustained dialogue with all stakeholders on issues of strategic importance to the sector.

2. Regulation

Stakeholder Positions:

The transportation sector is among the most heavily regulated industries. Government policies and regulations are known to influence the development and uptake of new technologies, private sector investment in research and development, and innovative business practices. Regulatory control has the potential to facilitate modal shifts to achieve other public policy objectives. In some situations, a conflict of interest exists where government is both regulator and provider of services or otherwise has oversight responsibilities. An effective regulatory framework that takes into account all of the department’s strategic outcomes (safety, security, efficiency, sustainability) is needed to ensure an efficient multi-modal system that can compete in a global market.

Industry requires flexible, performance-based regulations that will encourage, rather than hinder, innovative solutions to regulatory objectives. Performance based safety regulations in particular should be based on industry best practices, and a risk management approach built on a solid foundation for SMS. Regulation should be revolutionary, to keep pace with evolution in the industry, by being adaptive and evidence-based.

> A safety management system is defined by TC as "a documented process for managing risks that integrates operations and technical systems with the management of financial and human resources to ensure safety of [transportation systems] or the safety of the public."

Regulations must also be responsive to changing environments and anticipate emerging, rather than existing or current, technologies and business practices. Performance based regulations will allow the industry to adapt quickly to changes in market conditions. Regulatory certainty will build business confidence and encourage investment in R&D and new technologies.

Technology, and the process innovations it enables, should be recognized as an effective tool for achieving safety objectives and should be made part of any regulatory change. Regulations should be designed to promote the use of new technologies and, where more efficient, accurate and safe technologies can be used, they may even replace existing regulatory controls.

Industry is often subject to many levels of regulation (federal, provincial and local) each of which has differing objectives and priorities or in some cases may duplicate or "layer" regulations. Other jurisdictions may lack adequate knowledge of the sector, inadvertently creating barriers to innovation.

> Regulations driving ship technology (International Maritime Organization, US-Environmental Protection Agency for ballast-water treatment and emissions control e.g. sulphur, CO2, NOX) are not practical for small fresh-water fleets operating on the Great Lakes. In some contexts there is *no existing technology* to meet regulatory requirements.

The regulatory environment should support Canada's global competitiveness in transportation by streamlining regulations pertaining to movement of goods and people across borders (especially the US) in order to promote international trade. Regulations should consider the impact on the entire supply chain, and not just one category of player.

To facilitate both inter-provincial and international trade, regulations, particularly those pertaining to truck traffic should be harmonized and, where practical, international

standards adopted for use in Canada. . Canada needs to be more proactive in promoting innovative solutions and finding areas where the alignment of standards and regulations is mutually beneficial.

Potential Roles for Transport Canada:

Transport Canada's role is to design a regulatory framework that anticipates changing industry needs, with innovation as a key pillar. The department should continue the introduction of SMS as an important regulatory instrument that provides the flexibility for businesses to adopt innovative solutions to regulatory requirements and benefit from industry best practices.

There is an opportunity for Transport Canada to act as an advocate to intervene with other federal departments on the sector's behalf and to work with provinces influence the harmonization of regulations. Furthermore, government has a role to play in the process of setting international regulations and standards, especially with respect to maritime transport. Although Transport Canada is present at high-level discussions, it is not always involved in the working process, deferring instead to industry players who lack authority.

In areas where technology adoption is advancing rapidly, Transport Canada can facilitate industry investment in new technologies by providing the necessary regulatory certainty, through performance-based standards, to build business confidence.

Government must also be cognizant of the costs of meeting regulatory requirements, such as obligatory service fees and taxes, which may adversely affect innovation.

The testing of new technologies for safety certification, such as crash testing of real equipment, involves considerable cost that could be alleviated through the of alternative means such as computer-based simulation. Transport Canada could consider the use of non-traditional compliance testing methods based on sound principles.

3. Partnerships and Collaboration

Stakeholder Positions:

Innovation cannot be conducted in silos; it requires visionaries, research partners, entrepreneurs, competitors, community leaders and policy makers. To successfully promote innovation, a three-pronged approach of government, industry and academia is needed to create prioritized lists of goals and objectives. For example, Europe is leading in innovation in rail because industry, government and researchers came together to develop a 20- year plan, which is now being implemented. Stakeholder engagement at all levels is necessary to drive innovation in the sector.

The complexity and scope of the industry – domination in some modes by a few large companies and predominance of SME's in others – will require different partnership models. In this respect, industry associations can play a role, especially in engaging SME's who often find the costs of conferences and workshops to be prohibitive. Cost-sharing formulas, especially on R&D activities, not only serve to leverage resources, but ensure that the right partnerships are in place to ensure success.

Stakeholders have identified a general lack of awareness, much less collaboration, between industry, academia and governments. Consequently, research is not always responsive to industry needs as there are few mechanisms in place where universities and industry can interact. Academia is not always aware of the challenges facing the industry and the opportunities it presents in terms of innovation and employment. Conversely, industry is often unaware of the availability of new products or opportunities to adapt technologies to other modes of transport.

Existing technologies are often sourced outside of Canada due to a lack of knowledge of Canadian expertise and availability of products. The industry requires better access to information and better sharing of best practices both domestically and internationally. Suppliers of transportation equipment and vehicles often drive the innovation by conducting research and dictating the technologies that are being introduced. Collaboration with suppliers will provide operators with the knowledge they require to make sound investments and some influence over the introduction of new products.

> The US Research and Innovative Technology Administration (RITA) model requires researchers to obtain matching funding from industry – all partners must be prepared to bring resources to the table. The Rail Research Advisory Board (RRAB) is another example of partnership for collaboration on research and innovation.

Collaboration among all partners on specific gateways and corridors is required to create a seamless supply chain to support and expand trade. To be competitive and to ensure an increasing share of global markets, the sector needs to see itself as part of a global supply chain focussed on gateways and multi-modal systems. Enhancing the supply chain requires multi-stakeholder participation and cross-enterprise collaboration to improve the process and efficiency of the entire system and rather than achieving improvements to individual components or productivity.

Especially in large urban areas, the alignment of land use planning is needed to permit future corridor growth, including increased demands on transportation infrastructure, requiring collaboration among municipal, provincial and federal governments. Equally important in an urban context is the management of the interface between passenger and freight movements, and the connections between public transport, traffic congestion, urban freight, roadway and rail capacity, traffic control, traffic management and driver information systems.

Potential Roles for Transport Canada:

Transport Canada has a key role to bring players to the table to develop the vision and objectives of an innovation strategy and thereby ensure buy-in by all participants. To further promote and encourage innovation in the sector, Transport Canada should encourage the creation of centres of excellence in transportation that would bring industry, universities and governments together to collaborate on innovation and facilitate the sharing of global best practices.

To help drive collaborative efforts, partnerships and cost-sharing (leveraging resources) could be made a requirement for funding for R&D initiatives.

The adoption of information technologies is key to ensuring collaboration and improvement of the supply chain. Transport Canada, through the gateways and corridors initiative, encourages cross enterprise collaboration by acting as a knowledge broker and providing technology information.

To facilitate freight movement within critical corridors, Transport Canada can encourage the further development of traffic management strategies by providing opportunities for all levels of government involved to share information and collaborate on technology solutions.

4. Research and Development

Stakeholder Positions:

Corporate research has all but disappeared because it is unaffordable; there is greater specialization in the industry with a concentration in corporate ownership. The linkages between industry and research that enabled innovation to happen more quickly in the past are missing. The challenge is how to get into the hands of industry the potential and opportunities that are available.

Research is a fundamental component of innovation. It is important to find an effective model to drive research and development so as to increase the take-up of new technologies and processes. The model must be able to accommodate a diverse sector, much of which has few linkages with academia and does not have the internal capacity to manage complex application processes. Forging relationships with colleges, universities and research institutes is critical to advance R&D, identify priorities, identify niche markets, and to enable academia to better understand the complex challenges faced by the sector.

Canada has one of the most generous tax incentive programs, the Scientific Research and Experimental Development (SR&ED) program, to encourage private sector investment in R&D, but the program has not produced the desired results for most of the sector. Generally speaking, small and medium sized companies (SME's) that are struggling for survival cannot afford to do research and are not participating.

An additional disincentive is that most R&D tax incentive programs have too narrow a definition of innovation and fail to take into account investments in processes, including business processes. Private industry requires incentives, other than tax relief, to adopt new technologies.

A number of Canadian companies are subsidiaries of parent firms that conduct all of their research offshore. As a result, most of the effort for the Canadian subsidiaries is focussed on product development and internal processes rather than innovative technologies.

To encourage innovation, companies need to understand the delays between investment and returns and be able to explain and defend the longer-term benefits to shareholders who are concerned with the bottom line and require short-term gains. One way to demonstrate the value of investment is to support pilot projects to encourage early adopters.

> The United States offers a good example of how to promote the [marine] industry. For example, the Great Lakes Restoration Project provides support to scientists to tackle environmental technologies that work in fresh water.

Analysis of Canada's record in R&D reveals that while Canadians are good at initiating new ideas, those ideas are seldom brought to the marketplace. There is less support, through appropriate funding and promotion, for applied research that leads to the development of products for commercial use. Academic success is measured by R&D activity but does not always make the connection to the application and marketing (commercialization) of an innovation. Access to financing to support market innovations is seriously lacking in Canada, further discouraging investment in innovation.

Financial support needs to cover not only research but also the uptake and commercialization of ideas and may take the form of seed funding, access to private equity and venture capital.

Potential Roles for Transport Canada:

Government invests in basic research through National Science and Engineering Research Council (NSERC) grants and other programs, however, transportation is not a priority of granting institutions; the exceptions are automobiles and aerospace. Transport

Canada can assist the industry by revitalizing the government's R&D capacity in transportation, which has been declining since the 1980's.

Transportation and logistics research is often not considered inter-disciplinary or inter-jurisdictional which, in many cases, are conditions to qualify for funding. Researchers have a difficult time accessing funding and are often not aware of the availability of funding programs. Transport Canada has a role to play to provide single window access for R&D funding, by helping to reduce and simplify the paperwork associated with many of the application processes.

> Small and medium-sized firms can benefit from a variety of services offered by the National Research Council (NRC) Industrial Research Assistance Program (IRAP) that includes the provision of technical and business advisory services and financial assistance to develop and commercialize new technologies.

Government has a role to play in supporting Canadian innovation by showcasing successes, by encouraging niche opportunities where Canadians excel, by identifying and promoting emerging technologies, conducting marketplace monitoring or collecting marketplace intelligence and by being an early adopter of new products and practices. Industry and academia need to work together to promote research that leads to innovation. Transport Canada could facilitate that collaboration by establishing a forum(s) for researchers and industry to connect.

Government has a leadership role to play to improve competitiveness through profiling, branding and positioning of Canada and Canadian products and services, prototype testing, and for supporting sustainability in transportation.

5. Skills Capacity and Workplace Innovation

Stakeholder Positions:

The transportation sector is facing the same demographic challenges as other sectors; the prospects of losing a significant proportion of the existing workforce and associated expertise, through retirement. It is difficult to innovate when large numbers of workers approaching retirement lose their focus on building organizational success and tremendous knowledge is lost when employees retire.

In addition, there are increasing problems with attraction and retention of employees to an industry that has lost its appeal as an employer of choice. The younger generation places more emphasis on work/life balance and is no longer willing to make the kind of commitments required for some of the traditional transportation jobs. Companies are

struggling with succession planning and mentoring of new employees. The sector needs to find ways to change its image and to market transportation to young people and educational institutions as an innovative sector which provides opportunities for a multitude of interesting jobs. One approach would be for companies to partner with individual schools, colleges and universities as a way of providing career information and work experience.

> The Rail industry is addressing the need to attract, train and retain skilled workers. Rail employs 35,000 and with suppliers the total is 60,000 people: 11,000 will be retiring over the next 5 years.

Some firms see the expected shortages of labour as a unique opportunity to focus on innovation that will achieve productivity improvements. The principal challenge is to overcome what are sometimes adversarial relationships and bring all sides together in a cooperative environment around shared objectives and with a collective sense of urgency. The role of labour will need to be changed so it becomes a partner in adopting innovative solutions.

Potential employees are having difficulty finding appropriate training especially where certification and competency standards are lacking. The industry sees opportunities to make better use of apprenticeship programs and simulation training but government policies and regulations can create obstacles to their use.

As new technologies and processes are introduced, employers will have the added challenge of investing in a workforce with the requisite skills, especially as it pertains to the new generation of information and communication technologies. Companies will increasingly be faced with decisions respecting the upgrading of skills of existing employees and attracting and investing in the training of new employees. Expertise in supply chain management, which includes understanding how global markets work and the use of increasingly complex technical systems, has emerged as a new skill requirement.

Colleges and universities have to compete to attract students in all fields and there are very few support programs for students in transportation. Dedicated scholarships and apprenticeship programs are needed, for example the Railway Association of Canada (RAC) has a railway training and employment project with the Assembly of First Nations (AFN), funded by Human Resources and Skills Development Canada (HRSDC), for career opportunities in Canada's rail industry. Efforts are required to strengthen the linkages between industry and academia to ensure that training and research are being directed to areas of greatest need. The overall challenge for the industry is to find ways to attract the best and the brightest by making transportation a desirable career.

Potential Roles for Transport Canada:

While HRSDC has overall responsibility for skills and employment, TC has a role to play as advocate for the industry to ensure the human resources needs of the transportation sector are appropriately addressed, and to ensure that other federal departments have a better understanding of the challenges and opportunities that the sector presents. It is also important that skills requirements form an essential component of any long term vision for the sector. Working with federal and industry partners, TC can also play a role in changing the image of the transportation sector and marketing it as a career choice to young people, starting at the public school level.

To encourage the growth of research capacity in an increasingly knowledge-based sector, the department can look to the successful Railway Research Advisory Board (RRAB) as an example of collaboration between industry, academia and government to identify and support priority research. Among the many initiatives are opportunities for graduate students to get exposure to leading edge researchers and facilities, to raise awareness of the sector and promote skills development.

6. Data and Information Requirements

Stakeholder Positions:

A general lack of industry knowledge and supporting data creates an impediment to innovation. Reliable traffic data, especially data on container availability, truck and rail traffic in corridors, and commodity flows, is critical to support planning, generate development options, inform public policy, and to find innovation solutions to ease congestion in urban centres. Access to better data enables the modeling of systems/networks for infrastructure management, optimization and investment analysis.

There is a need for improved forecasting, sharing and integrating intelligence on a long-term basis. Essential information, such as where excess capacity exists, is required to enable shippers to balance their use of infrastructure. Improved data collections systems and methods to share data across supply chains will enhance reliability and efficiency and increase international market share. There is a need to support and encourage the use of EDI (electronic data interchange) technologies that are currently used by larger carriers and shippers to gain competitive advantage, while smaller companies often still use manual documentation.

Data will provide a basis for informed discussion; the challenge is to motivate collaboration and bring it together systematically in one place, to enable the industry to see the value of sharing non-proprietary information. Confidentiality of commercially sensitive information, especially where there are only a few large players, is still seen as

the key barrier to making information available. Participants noted proven approaches to the issue, such as aggregating data to ensure the confidentiality of individual companies, such as the model used in the US. There is a particular urgency to generate aggregated urban passenger and freight movement data for analysis to support planning, the development of options, and informed public policy discussion.

Another issue is the general unwillingness to share existing data and this is where government has a role to demonstrate the value of public-private data partnerships in building trust among stakeholders to address the information gaps. In the absence of Canadian data, some stakeholders use US information for benchmarking purposes.

Although there are some examples of models that represent progress, such as the Transportation for Tomorrow Surveys (TTS) covering passenger traffic, a huge critical gap is the absence of urban freight data and analysis. Initiatives are required to improve sharing of industry data, which is expensive to gather and is often not accessible. An example of a successful partnership is the McMaster Institute for Transportation and Logistics (MITL), in which the private sector plays an important role and which includes researchers from other universities. However, there are still situations where government needs to regulate the provision of data, as is the case in Europe and the US.

> MITL was born from a pressing need and a desire for change by business leaders, by civic leaders at all levels of government, and by academics that specialize in the study of transportation and logistics. The objective of MITL is to connect with government, industry partners and academia in addressing critical transportation and logistics issues.

Sharing data and providing access to data is important to improve service delivery and enhance competitiveness. Innovative use of technologies, such as the use of GPS to track rail cars, would increase visibility, and demonstrate reliability and efficiency by providing accurate and up-to-date information.

Potential Roles for Transport Canada:

Where private industry is either unwilling or unable to generate and share traffic data to support infrastructure investment decisions, maximize capacity and improve efficiency government has a role to play to ensure the provision of data. Transport Canada can assist by demonstrating the value of sharing industry data and providing incentives to encourage the creation of public-private partnerships. Regulation of data collection is a last resort.

Innovation Drives Competitiveness:

Throughout the workshop discussions, the role that innovation plays in driving competitiveness emerged as an overarching theme. Innovation is seen as the key to making the Canadian transportation sector more efficient and, therefore, competitive. Given the significant role that transportation plays in the national economy, a more competitive transportation system will also help Canada improve its relative standing internationally. Competitive advantage flows to companies that are innovative in their approaches to performance and productivity and that deploy the latest technologies to improve efficiency.

Stakeholders felt that the industry was lagging behind in global competitiveness due to the lack of a seamless supply chain. The focus, they believe, needs to be on creating an efficient, reliable, and secure system by tackling such issues as, labour shortages, inconsistent or non-existent technology standards, and inconsistent regulations. Opportunities exist to better integrate the supply chain by improving the flow of information, streamlining logistics processes, adopting green initiatives and sharing best practices and technology adoption. Governments and industry need to work together to improve the efficiency and reliability of the supply chain to improve Canada's competitive position.

To encourage innovation, the sector requires a suite of incentives and support mechanisms to address economic barriers. Firms that are struggling financially are finding it difficult to invest in innovation. Canadian tax structures and user fees, as well as a general lack of federal financial support, are cited as obstacles that are hampering competitiveness for the entire sector. Canada's business tax environment is more favourable than in the past but the ease of doing business can be improved. Some of the obstacles include tariffs on manufactured goods and cumbersome foreign trade zone rules.

The transportation sector requires a level playing field globally; the off loading of fees and carriage requirements affects competitiveness. On-going advances are needed to keep distribution costs low and ensure timely delivery of products and inputs. Major capital investments in systems, processes and equipment must be continually made to sustain competitiveness. The return-on-investment of these transportation-related investments, often extending over lengthy payback periods, must be demonstrable and attractive.

Conclusions:

Through the focus group sessions, stakeholders challenged government to ensure the approach to innovation is strategic, by considering the following priorities:

- there is a value in having a long term vision and clear objectives, but there is also a need to demonstrate concrete progress through short-term action;
- policy and leadership and partnerships and collaboration are strategies that should be used tactically to set specific priorities and drive action;
- the most urgent areas for action appeared to be: regulatory change and harmonization; filling critical information gaps; and, addressing workplace issues (ranging from the need to attract new talent to upgrade existing skills to changing the labour relations environment);
- there is a need for specific action to encourage more R&D activity (e.g., building industry-academia partnerships, offering incentives specifically for SMEs, encouraging graduate students to choose transportation research); and
- the uptake of new technologies and processes is equally dependent on creating the right framework for innovation through action in related areas (e.g., regulatory reform, skills development, changing the labour relations environment).

To move this agenda forward, stakeholders identified specific priorities related to Transport Canada's role:

- leadership in terms of bringing the partners together to facilitate the development of a broad multi-modal strategy and action plans to ensure progress;
- acting as an advocate for the sector with other federal departments and other levels of government on issues ranging from the harmonization of regulations to changing the image of the sector to helping to develop R&D models which are more appropriate to the sector; and
- taking action, in collaboration with industry partners, to address the significant knowledge and information gap which exists in the sector.

There is a clear sense that progress can be made if all partners demonstrate leadership, if clear goals and objectives are set, and if specific areas for concrete action are identified. Innovation in transportation is absolutely critical to both the competitiveness of the sector and Canada's economy as a whole.

Participants List:

The job titles of participants are provided in the language in which they were given.

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