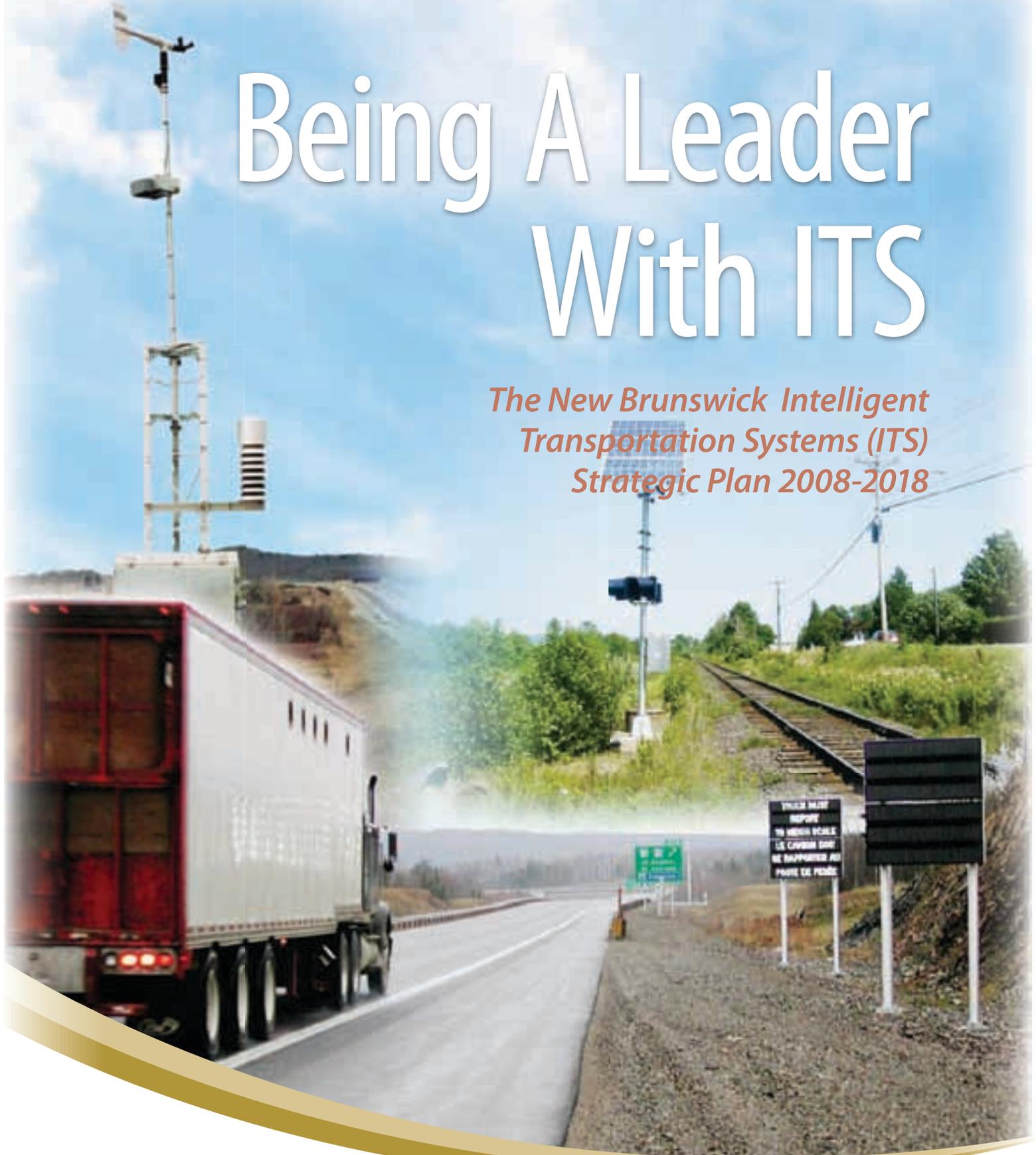


# Being A Leader With ITS

*The New Brunswick Intelligent  
Transportation Systems (ITS)  
Strategic Plan 2008-2018*





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**Being A Leader With ITS**

**New Brunswick's Intelligent Transportation Systems (ITS)  
Strategic Plan 2008-2018**

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# Executive Summary

*The New Brunswick Intelligent Transportation Systems (ITS) Strategic Plan – Being A Leader With ITS* is a 10-year strategy to guide the implementation of ITS in New Brunswick over the period 2008 – 2018. This strategy responds to the Government's *Charter for Change* commitment to "...aim to become a leader in Intelligent Transportation Systems – both to encourage smarter, safer travel at home and to market our technology abroad."

An efficient transportation network is an essential component of the plan to be self-sufficient by 2026. New Brunswick will use ITS technology to improve the efficiency of the transportation network in the province by developing and deploying ITS in a well planned and coordinated manner.

**The Vision is for New Brunswick to be a leader in and a champion of Intelligent Transportation Systems, applying technology to enhance the safety, sustainability and efficiency of the transportation system while supporting the economic, social and environmental goals of the Province.**

Intelligent Transportation Systems (ITS) use new and emerging technology (i.e. computers, sensors, communications technology, electronic devices, etc.) to improve the safety, efficiency, effectiveness, accessibility and sustainability of the transportation network without having to increase the capacity of the network itself. ITS applications can also help to reduce environmental impacts in all areas of transportation. Examples of ITS applications include vehicle actuated traffic signals, dynamic message signs, weigh-in-motion, road weather information systems, traveller information systems and on-board data recorders/GPS for managing vehicle fleets.

The New Brunswick ITS Strategy for 2008 – 2018 expands upon an earlier Atlantic effort and identifies **ITS Research and Development** and **ITS Deployment** as two priority areas for New Brunswick to focus on over the next 10 years.

**ITS Research and Development** involves the following activities:

- Continuation of the UNB National Rural ITS Research Centre
- Development of a New Brunswick ITS Architecture
- Marketing and Economic Competitiveness of New Brunswick ITS industries

**ITS Deployment** involves project work in the following areas:

- Traveller Information Systems
- Road Weather Information Systems
- Commercial Vehicle Operations
- Borders and Security
- Operations Management and Facilities Management
- Intermodal Applications

The Action Plan developed as a part of this strategy identifies a number of key actions that must be taken over the next 10 years in order for New Brunswick to meet this goal and to realize the maximum benefits of ITS applications. The Action Plan is divided into three key areas of focus: **1** General Actions, **2** Specific Projects, and **3** Ongoing Efforts. It will be a dynamic plan to be reviewed and updated on a regular basis to ensure it continues to reflect key changes in technology, policy directions and stakeholder input.

Projects implemented to date under the 2002 Atlantic Provinces ITS Strategic Planning Study saw strong support from the federal government through Transport Canada's ITS Directorate, the University of New Brunswick Transportation Group, several private sector participants and the provincial Department of Transportation. This ITS Strategic Plan calls on industry, academia and the federal government to continue to partner with the government of New Brunswick to meet the goal of becoming a leader in Intelligent Transportation Systems.

# Introduction

*The New Brunswick Intelligent Transportation Systems (ITS) Strategic Plan – Being A Leader With ITS* is a 10-year strategy to guide the implementation of ITS in New Brunswick over the period 2008 – 2018. Intelligent Transportation Systems (ITS) use new and emerging technology (i.e. computers, sensors, communications technology, electronic devices, etc.) to improve the safety, efficiency, effectiveness, accessibility and sustainability of the transportation network without having to increase the capacity of the network itself. ITS applications can also help to reduce environmental impacts in all areas of transportation.

This strategy responds to the Government's *Charter for Change* commitment to "...aim to become a leader in Intelligent Transportation Systems – both to encourage smarter, safer travel at home and to market our technology abroad." As well, the Government's 10-year multimodal transportation strategy, *New Brunswick at the Centre*, promotes the use of technology to provide effective solutions to infrastructure issues to avoid costly infrastructure expansion options.

New Brunswick's transportation system is an essential component of the goal to become self-sufficient by 2026. It connects individuals to: family, work, education, health, commercial, recreational and emergency services; and facilitates national and international trade for New Brunswick businesses. In addition, New Brunswick is a key link between the Atlantic Provinces and the rest of Canada and the United States. All internal and external stakeholders - individuals and industry - can benefit from an efficient and modern transportation network in the province.

Rapid growth in international trade opportunities for Canada is also creating significant new opportunities for shipping to and from Atlantic Canada. The development of an Atlantic Gateway will include identifying the strategic transportation infrastructure in New Brunswick that will be key to responding to these opportunities. ITS will have a role in maximizing the use of this infrastructure in support of the Atlantic Gateway development.

The New Brunswick ITS Strategy for 2008 – 2018 expands upon strategic actions and projects identified in the earlier *Atlantic Provinces ITS Strategic Planning Study*. It identifies ITS Research and Development and ITS Deployment as priority areas for New Brunswick to focus on over the next 10 years. The Strategy identifies a number of potential projects as well as the funding, policy, regulatory and operational considerations that need to be addressed over this period. It calls on the private sector to propose and partner with the Province regarding ITS projects.

The New Brunswick ITS Strategy recognizes the need for partnerships among the different levels of government, the private sector, and academia to ensure that the funding, policy and regulatory issues affecting the implementation of ITS projects and applications are addressed to meet the transportation needs of all stakeholders. Projects implemented to date under the 2002 *Atlantic Provinces ITS Strategic Planning Study* saw strong support from the federal government, through Transport Canada's ITS Directorate, the University of New Brunswick Transportation Group, several private sector participants and the provincial Department of Transportation.

This document first provides the background leading to the development of the 10 year ITS Strategic Plan for New Brunswick. Secondly, it addresses the Vision of the ITS Strategy and then discusses the following areas:

- ITS Research and Development
- ITS Deployment
- Common ITS Application Considerations

Finally, the document outlines an Action Plan that supports the Vision and establishes an agenda to facilitate the wide spread awareness, deployment, research and development of ITS.

The conclusion calls on industry and others to comment on this strategy as it is dynamic and will be updated as needed. It also calls on industry and others to continue to partner with the government of New Brunswick to make New Brunswick a leader in Intelligent Transportation Systems.

# Background

In 2002, New Brunswick joined with the other Atlantic Provinces, Transport Canada, and the Atlantic Canada Opportunities Agency to create the *Atlantic Provinces Intelligent Transportation Systems (ITS) Strategic Planning Study*. The result was a comprehensive body of material reflecting the needs of transportation stakeholders in the Atlantic Region, opportunities for systems applications, recommended strategic actions, and strategic project initiatives. The plan was intended to be the start of an on-going process to take a co-ordinated approach in applying technology to transportation and realize the associated benefits in the Atlantic Region.

The 2002 Study identified fifteen critical needs, the following of which had significance for New Brunswick:

- Expedited border-crossing inspection and clearance for commercial vehicles.
- Reduced rural road collisions through early detection of adverse conditions.
- Reduced incidence, severity and cost to the community of road collisions.
- Improved safety in road work zones.
- Enhanced management of winter maintenance operations.
- Expedited weight, credential and safety checks for commercial vehicles.
- Road emergency notification and information system for rural areas.
- Travel incentives and traveller information to promote tourism in Atlantic Canada.
- Enhanced safety and security for travellers and for transportation operators and facilities.
- Enhanced ability to detect, verify and respond to incidents on major roadways.
- Enhanced tracking and real-time management of containers and other goods at intermodal terminals.
- Real-time transit service monitoring and public needs.
- Improved management of fleet transportation services.

Over the last five years, the Department of Transportation has taken action to address many of the needs identified above, including implementation of the road weather information systems (RWIS) network, weigh-in-motion installations, national participation with a 511 consortium (related to traveller information), asset management, operations management, establishment of a national rural ITS research centre at the University of New Brunswick and the completion of various research studies and pilot projects. A significant part of these accomplishments has been the development of strategic partnerships with Transport Canada's ITS Directorate, the University of New Brunswick Transportation Group and the private sector.

In 2007, NBDOT embarked upon a process to gather and update stakeholder input from both public and private sector sources within the province. Internal and external stakeholder workshops were held to define the needs that could benefit from ITS applications, further strategic actions and potential deployments in a collaborative setting. New Brunswick will continue this collaborative process, reviewing the Plan and soliciting further stakeholder input on a regular basis. The first task of the stakeholder group was to develop a Vision statement.

# The Vision

New Brunswick's transportation network serves the social and economic development needs of individuals, business and industry within the province and within Atlantic Canada, allowing access to local, regional, national and international services and markets. Intelligent Transportation Systems will help the transportation network be more efficient, safe, sustainable, and have less of an environmental impact through the use of technology to meet the following goals:

- Travellers, commercial vehicle operators, tourists, emergency service providers – anyone who utilizes the province's transportation system - will have access to accurate and timely highway condition information, and be able to make more informed decisions about travel, thereby enhancing the safety and efficiency of their trip.
- Highway and road maintainers will have access to timely and accurate road weather information and other relevant information to enhance the efficiency of their maintenance activities.
- Highway policy analysts and commercial vehicle enforcement agencies will have access to comprehensive, accurate and timely commercial vehicle information to ensure public safety, enhance commercial vehicle operations, and protect public investment in transportation infrastructure.
- Various agencies will share timely, relevant, accurate information that they will use to enhance the efficiency of their operations e.g. road conditions, route closures, commercial vehicle credentials, etc.
- Commercial Vehicle operators will be able to travel through the province without having to stop at every stationary scale facility for validation of weight, dimension and credential information provided they are compliant with the provincial laws and regulations.
- Environmental impacts will be reduced, through reduced idling, reduced delays and traffic congestion, more efficient travel routes, etc.
- The National Rural ITS Research Centre at the University of New Brunswick will use this technology as a platform for research, development, innovation, and training of highly qualified personnel.
- New Brunswick industry will benefit from streamlined processes related to the movement of passengers and freight provincially, regionally, nationally, and internationally.
- New Brunswick companies will be able to develop and market their technologies and business expertise both nationally and abroad.

Common priorities identified from the stakeholder sessions for moving forward with ITS include continued ITS Research and Development, and ongoing ITS Deployment. A coordinated approach to these two priority areas is required so that the goals of the Plan can be met, supporting New Brunswick's goal of self-sufficiency by 2026.

**The Vision is for New Brunswick to be a leader in and a champion of Intelligent Transportation Systems, applying technology to enhance the safety, sustainability and efficiency of the transportation system while supporting the economic, social and environmental goals of the Province.**

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# ITS Research and Development

## UNB National Rural ITS Research Centre

In 2004, NBDOT partnered with Transport Canada and the University of New Brunswick (UNB) to establish a

National Rural ITS Research Centre. The UNB Centre is one of three centres established at Canadian Universities - including University of Toronto and University of British Columbia - but the only centre in eastern Canada, and uniquely focused on rural ITS. Research activities to date include two traveller information studies, two rail safety studies, an analysis of work zone portable variable message signs, a spring weight restrictions study, a review of heavy vehicle emissions sensing technology, a test of wireless technology to collect winter road condition information, the creation of the Geo3D spatially encoded video inventory tool – a sophisticated video recorder with GPS capability used to collect accurate location and measurement information of highway assets such as the roadway, signs and guiderail, and an in-vehicle test of hand-held technology for the collection of road condition information.

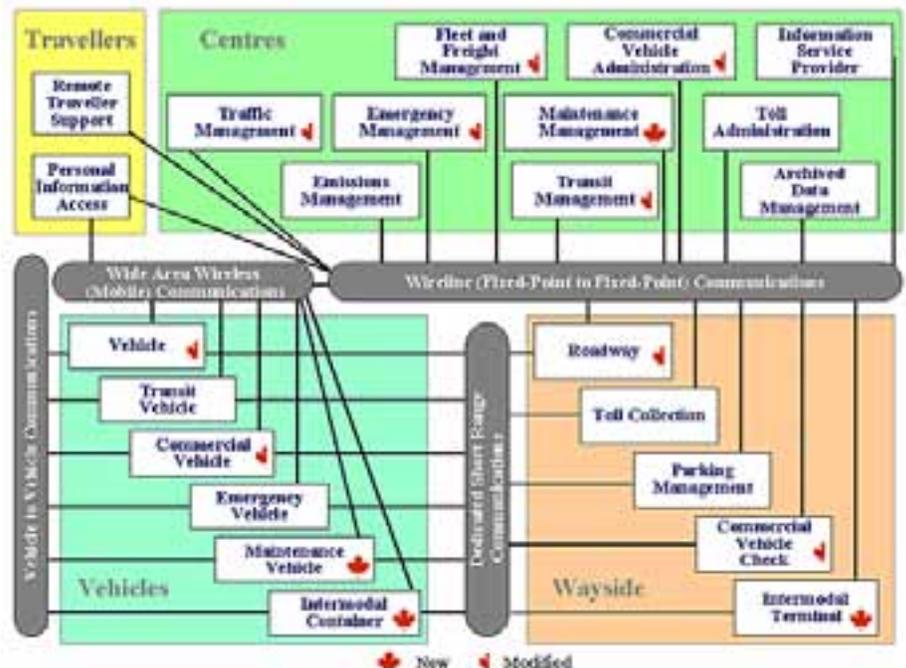
New Brunswick stakeholders have identified the importance of the continued operation of the National Rural ITS Research Centre at UNB. The Centre will focus specifically on ITS as they relate to rural transportation applications that promote safety, mobility, sustainability, accessibility, and efficiency in all modes and for all users of the transportation system. Continued operation of this Centre will provide opportunity for industry, academia, and the province to continue the development of ITS expertise.

In order for the Centre to operate successfully, there must be continued collaboration among Transport Canada, the Province and UNB, as well as with the private sector

– particularly in terms of funding and investment. Collaboration in terms of research and product development will bring forth a wide range of expertise and perspective, creating opportunities for product marketing, revenue generation, and resource expansion. Private sector involvement will provide insight into where market opportunities may lie, assistance in establishing the business case for development, and the path to help bring efforts beyond the proof of concept or pilot project stage into successful widespread product application.

## New Brunswick ITS Architecture Development

As New Brunswick continues to advance with the deployment of ITS, it becomes increasingly important to take a coordinated, well planned approach to ensure existing and new technology can interact effectively. Systems are becoming more sophisticated all the time, and there is a wide range of interested stakeholders involved – general public, policy makers, industry, enforcement agencies, regulatory groups, transportation operators and maintainers, etc. Interdependencies among various systems result, both within an organization and among peer agencies on a local, regional, national and international scale. These interdependencies are not always recognized, and things do not operate as efficiently as they could. Clearly identified interdependencies and the related communication requirements among systems are



necessary to ensure maximum benefits are achieved. Development of a New Brunswick ITS Architecture is a critical step to ensure the compatibility / interoperability between new and existing ITS operated by various transportation stakeholders throughout the province.

Transport Canada established the ITS Architecture for Canada to provide a common framework for planning, defining, and integrating ITS. The Architecture defines the functions that are required for various ITS applications, the physical locations where these functions reside, and the information flows that connect these functions and locations together into an integrated system. The physical architecture diagram provides an at-a-glance inventory of all the functions identified within the Architecture, grouped according to four physical locations: travellers, centres, vehicles, and wayside.

New Brunswick can customize the ITS Architecture for Canada to meet the needs of the province's stakeholders, identifying only the functions applicable to New Brunswick. Stakeholders will be asked to participate in the development of the Architecture template.

## Marketing and Economic Competiveness

A range of New Brunswick companies and academic institutions offering products and services relevant to the ITS industry were identified in the 2002 ITS Strategic Planning Study. New Brunswick companies have specific niche areas of expertise including, but not limited to, road weather information, infrastructure management, freight tracking/ administration, software development, Geographic Information Systems, precision manufacturing, and aerospace component parts.

Industrial development can be achieved through the transfer of relevant enabling technologies to the ITS industry, or the development of new technologies targeting ITS applications. Participation in the Rural ITS Research Centre, involvement in showcase deployment activities such as the Asset Management Business Framework initiative, and participation in joint marketing and trade mission activities through ITS Canada will provide business opportunities for local companies.

In order for New Brunswick businesses to succeed in these areas, they must be aware of the opportunities available. Provincial government departments must work together to identify the opportunities that arise

through the research and development projects, and ensure that this information is made available to the New Brunswick business community.

As New Brunswick continues to advance deployment of ITS within the province, New Brunswick businesses will also benefit from improved efficiency of goods movement with resulting improvements in the economic sustainability and competitiveness of the region.



# ITS Deployment

## Traveller Information Systems

Traveller information systems provide travellers – defined as those who utilize the transportation system - with information to assist in making travel decisions, mode choices and route decisions. Information is gathered from various sources including traffic, maintenance, construction, weather, tourism, and other relevant data. The information is consolidated and disseminated using a variety of media to facilitate pre-trip and en-route travel decisions.

The New Brunswick Department of Transportation (NBDOT) currently operates a 1-800 telephone information system. Members of the public can call the number and receive winter road condition information. Road condition and other information are also available through the NBDOT website. The NBDOT participated with the national 511 consortium, which was successful in its bid to have the Canadian Radio and Telecommunications Commission (CRTC) assign the 511 telephone number for weather and traveller information in Canada.

Local highway advisory radio, provided by a private company, operates in various locations in the province including the Confederation Bridge, the St. Stephen border crossing, and the cities of Moncton and Fredericton. The NB Department of Tourism and Parks provides tourism information via the internet and through a provincial communication centre, accessible through a 1-800 number. The Centre receives over 300,000 calls annually.

New Brunswick stakeholders have identified a need for a simple, readily accessible, single point of access for accurate and reliable traveller information. Currently, initiatives are ongoing among various provinces and territories to deploy 511 services for traveller information. To date, the number has been put in service by the Province of Nova Scotia and the Government of the Yukon. 511 services are already in operation or under



development in the majority of states in the United States. 511 services provide en route information access via telephone, and are typically accompanied by a 511 web presence for pre-trip planning and information access on personal digital devices. A multimodal traveller information system could include real-time information on traffic congestion and incidents, location and duration of planned maintenance/construction or special events, road/bridge closures, flood information, ferry information, border crossing information, weather, transit information, and tourism information.

Over the timeframe of this strategy, New Brunswick will take steps to implement a multimodal traveller information system. Initially, the existing system will be enhanced by converting the current 1-800 number to the internationally recognized 511 telephone number, and providing more real time road information. A public awareness campaign will be implemented, complete with associated road signage identifying the switch to 511.

Acquisition of a system that employs Interactive Voice Response technology and has the ability to send messages out to subscribers' personal digital devices, similar to the applications recently deployed in Nova Scotia and the Yukon, will be examined as well. Consolidation of the data of interest to travellers and other transportation network users into a central data management centre will provide the opportunity for further system enhancements such as including an interface with ferry operations, airports, public transit schedules, railway schedules,



the existing tourism communication centre operation, etc.

The infrastructure required to collect and consolidate traffic event information must have a province-wide event reporting feature with data standards to ensure that the information can be shared, accessed and used without difficulty. The New Brunswick ITS Architecture will help to identify these communication interfaces and any upgrade requirements necessary to make existing data systems compatible. System integration with MRDC Operations Corporation and Brun-Way Highway Operations Inc. information systems is essential to ensure availability of complete roadway data through a single point of contact.

### Road Weather Information Systems



Road Weather Information Systems (RWIS) provide detailed roadside weather conditions and road surface temperature data through the use of in-road and roadside sensors. A complete RWIS combines the roadside data readings with standard meteorological data to provide precise road weather forecast and pavement condition predictions for up to 12 hours. This information is used by road maintenance providers as a tool to plan winter maintenance activities.

In 2004 New Brunswick partnered with Prince Edward Island and Nova Scotia to implement the Maritime Provinces RWIS Network. This included the installation of 29 environmental sensing stations (ESS) by NBDOT, through a funding partnership with Transport Canada. Private highway operators MRDC and Brun-Way have installed 11 ESS on the portions of Route 2 that they operate. This yields a total of 40 ESS installed on the National Highway System in New Brunswick to date. Highway cameras installed at the ESS sites in New Brunswick provide images of the highway at the site. These images have recently been made available to the general public through the NBDOT website, allowing them to view current

highway conditions and make more informed decisions about their travel plans.

The existing RWIS network is located solely on the National Highway System (NHS) in New Brunswick. There remains a significant portion of roadway in the province (88%) that is not a part of the NHS. The varied weather conditions found throughout the province require the strategic location of additional ESS sites in order to provide more accurate information regarding roadway conditions in these specific areas.

New Brunswick will take steps to provide for the installation of 15 additional ESS sites over the next 5 year period. These stations will be strategically located to provide roadway maintainers with the road condition and weather information they need to be able to make informed decisions regarding their winter maintenance activities in all areas of the province as well as providing travellers and the general public with more current information.

### Commercial Vehicle Operations

Commercial vehicle operations (CVO) play a vital role in the economy of New Brunswick, as well as the entire Atlantic Region. In 2006, New Brunswick's international exports were valued at \$11.8 billion – 90% of which is currently with the United States. Recent estimates indicate that trucks move 90% of consumer goods within the Atlantic Region. Commercial vehicle traffic volumes in the primary New Brunswick trade corridors are expected to grow at rates of 2% to 4% per year for the foreseeable future. The effective administration, regulation and enforcement of CVO are important to ensure



a strong economy as well as a safe and efficient transportation network.

The New Brunswick Department of Transportation has installed high-speed weigh-in-motion (WIM) technology at three of the permanent scale locations on the National Highway System – Longs Creek, Deerwood, and Salisbury westbound on Route 2. WIM sensors collect vehicle weight and dimension information as the vehicles travel at highway speeds and the system identifies vehicles required to report to the permanent scale facility for further inspection, allowing the majority of compliant vehicles to proceed on their journey.

The use of WIM represents a significant cost savings to the industry, estimated at \$600,000 per year at one site alone, and allows commercial vehicle enforcement (CVE) staff more time to perform more detailed inspections. The objective is to commence the installation of 5 more sites strategically located throughout the province – at Waweig on Route 1, Salisbury east and St. Jacques on Route 2, near the border on Route 95, and in the Campbellton area on Route 11.

In July 2006, a Commercial Vehicle Operations (CVO) ITS study was completed, identifying three priority areas for improvement of CVO in New Brunswick:

- 1 improve field access to various safety/credential databases,
- 2 improve the special permit process, and
- 3 improve traveller information services.

At present, CVE officers are not able to access safety data for all carriers, and the data they can access is not always complete and current. These issues are not unique to New Brunswick – it is a national issue. The province intends to work with other jurisdictions, nationally and internationally, to enhance motor carrier profile systems so that CVE officers will have access to complete and current safety related data for all carriers that travel in New Brunswick. In order to facilitate these improvements, steps will be taken to move toward the automation of field data collection by CVE staff. In the long-term, safety and credential information will be used as pre-screening criterion in addition to weight and dimension data.

New Brunswick's special permit office issues in the order of 17,000 special permits a year. Expanding New Brunswick's current electronic permit system to include secure access, the issuance of permits and transmission of an electronic copy to the carrier

will allow 24/7 access to permits, providing more convenience to carriers.

New Brunswick will continue to participate with the other Atlantic Provinces on the Harmonized Trucking Strategy, which includes a regional agreement to harmonize the movement of over-dimensional loads in the region and the development of a regional permit system. The New Brunswick ITS Architecture will be particularly important to ensure compatibility and interoperability with existing permit systems in other jurisdictions, including the other Atlantic Provinces, the New England States, and Quebec.



The commercial carrier industry has indicated that real-time information services are crucial to the efficiency of their operations. Information about traffic flow conditions, traffic incidents, road/bridge closures, ferry schedules, and construction information will allow operators to make informed decisions, both pre-trip and en-route, to reduce delays. Implementation of a 511 Traveller Information Service will help to meet these needs. The strategic location of variable message signs and/or the operation of highway advisory radio in advance of key links in the network will also be investigated.

While there is good coverage on the National Highway System for the enforcement of regulations pertaining to commercial vehicles, ensuring the safety of these and other highway users, there remains a significant area in the province that is accessed by other roads which are not covered by permanent scale facilities. The initiation of a Virtual WIM pilot project – an un-manned WIM station that allows CVE officers to monitor commercial vehicles in high-traffic remote areas – will be investigated.



## Borders and Security

New Brunswick's St. Stephen and Woodstock border crossings provide key access points for the movement of goods between Atlantic Canada and the north-eastern United States. The implementation of ITS technologies at borders will provide for enhanced border crossing security and efficiency, reducing vehicle delays, idling time, and emissions.



The efficient and safe flow of goods at the borders is important for the Atlantic Gateway initiative to establish



an integrated, competitive transportation system for international trade. The provision for seamless, safe and secure movement of people and goods across New Brunswick's borders is important for the economy of the province and the plan to be self-sufficient by 2026.

At land border crossings, NB stakeholders have identified a need for the application of a queue end warning system to help identify border wait times in advance of the border crossing, providing the opportunity for all travellers to choose to wait, use an alternative route, or to travel later. Suitable locations and options for such systems should be identified.

The construction of a new border crossing at Calais/St. Stephen, scheduled for completion in 2009, is expected to significantly decrease border wait times at this location. New Brunswick will continue to work with the border crossing project team, including the Canadian Border Services Agency (CBSA), to identify opportunities for the implementation of ITS applications at the borders. The development of the ITS Regional Architecture will identify required

communication links and protocol, data sharing, compatibility issues, etc.

NB stakeholders have also identified the importance of frequent traveller pre-clearance programs such as NEXUS, and preferred carrier programs for commercial vehicles such as the Free and Secure Trade (FAST) program at the borders. At present, NEXUS is only available on a limited basis at the Woodstock crossing, and the FAST program is available at both crossings but there is no dedicated lane for FAST approved commercial vehicles.

With regard to the security of rail cars at international border crossings, VACIS scanning of railroad cars is to be implemented by US CBP at the Vanceboro, Maine border with installation/construction scheduled for December 2008.

At airports, efficient customs clearance of scheduled commercial and charter flights is important to ensure these activities continue to operate in the province. The application of an advanced security screening technology or electronic declaration at departure and arrival points could improve efficiency without the need for costly increases to the number of resources available. New Brunswick will work with airport authorities and the Federal Government to ensure international travel services can be attracted to and retained in the province.

## Operations Management and Facilities Management

ITS applications in the area of operations and facilities management enhance the efficiency and effectiveness of road infrastructure management and result in improved, more cost effective service delivery. ITS applications are currently in use in the province to improve the inventory, storage and retrieval of asset information (e.g. fleet management system, automated onboard spreader control, Geo3D data inventory) and to optimize maintenance and construction operations management.

The recently implemented award winning Asset Management System (AMS) identifies asset deterioration over time and the optimum time to rehabilitate highway infrastructure in order to avoid costly reconstruction. The system supports management of the province's highway network at an overall least cost, enhancing performance and safety for all users.

New Brunswick began implementation of an Operations Management System (OMS) on July 21st, 2008. The OMS will optimize the management of human resources, equipment and materials used in activities such as summer, winter, bridge and ferry maintenance and capital projects. It will also provide historical and trend information required for the AMS.

Integration of these systems with a wide range of on-board equipment and field data collection devices in the future will further enhance their capabilities. For example: the use of Automatic Vehicle Location (AVL) can facilitate dispatch and route optimization for winter maintenance and incident response; interfaces with spreader control and other on-board sensors provide direct data collection; and hand-held equipment for direct communication of inspection reports can improve the efficiency of operations.

The Traffic Studies and Highway Safety divisions of NBDOT are responsible for the management and analysis of collision statistics and perform field investigations related to highway safety. NBDOT is currently investigating applying digital mapping to record accident locations. The use of GPS and other in-vehicle or hand-held devices by agencies involved in accident response for recording and sharing accident data would enhance the accuracy of the information provided. This technology can also be used to enhance operational safety and efficiency, providing specific location information for dispatch and tracking of responding personnel.

The Radio Communications section of NBDOT is responsible for the provision of wireless communications and technical support to all government departments and agencies as well as the RCMP. New Brunswick has recently embarked on a program to deploy a new fully digital province-wide radio system. This new system, which will be available for service in 2011, will support voice and data over Internet Protocol (IP) networks, and increase the capacity and efficiency of existing operations.

A variety of ITS applications have already been tested and proven in other jurisdictions, and their benefits for implementation in New Brunswick will be examined. Applications such as automated bridge de-icing, work zone traffic management and automated enforcement using variable message signs, and the use of simulators for training equipment operators will be studied.

## Intermodal Applications

Intermodal ITS applications focus on improving the safety and efficiency of the movement of goods and people at inter- and intra-modal facilities including airports, seaports, and rail terminals. They permit different agencies and modes of transportation to communicate and share information/data electronically, thereby increasing facility efficiency and economic competitiveness. The implementation of intermodal ITS applications supports the Atlantic Gateway initiative to establish an integrated competitive transportation network for international trade.

At airport facilities in urban centres such as Fredericton, Moncton and Saint John, the use of fleet management systems could provide for: efficient management of taxis serving the airports; efficient management of traffic at the terminal curb; dissemination of flight arrival, departure and delay information to drivers; and efficient movement of people between airports and city centres. The participation of airport authorities and private industry is key. This could also be applied as it relates to passenger traffic from cruise ships using Saint John as a port of call, disseminating cruise arrival/ departure updates to on shore service providers to ensure the efficient movement of passengers to and from the ship.



Security and safety of cargo and facilities is a critical matter at seaport facilities. Electronic type tags or transponders are in use at various ports for cargo tracking and to increase security. As well, commercial vehicle and driver authentication systems have been deployed at ports to ensure that only authorized personnel enter seaport facilities and restricted areas. The application of similar ITS applications at New Brunswick's ports will be considered in conjunction with the Port Authorities as a means of enhancing security and providing for more efficient operations.



# Common ITS Application Considerations

There are a number of items to be taken into consideration when planning the development and deployment of ITS applications:

## Data Management

ITS applications are data intensive. During the system definition phase for a given ITS project, it will be important to establish a set of goals and priorities for the system data collection, analysis, dissemination, security and performance reporting. The system design must consider the level of readiness for a given agency to exchange data over a network, as well as the network infrastructure available/required to facilitate the data collection and dissemination.

## Standards

The design and implementation of any ITS application must consider the relevant industry standards which are in place or under development. The New Brunswick ITS Architecture will provide links to the applicable standards for the system interfaces identified.

## Privacy Issues

Users of the transportation network may have perceptions of privacy infringement associated with some ITS deployments. It is very important that the operating agency of the specific system understand the privacy protection measures that exist within the system and provide awareness programs to enable users to understand the purpose and benefits associated with the application, as well as allowing the opportunity to provide input to the system development process.

## User Acceptance/Technology Adaptation

As with the implementation of any new processes or procedures that result in a change to the norm, the implementation of ITS technology will require training and information campaigns to help achieve user acceptance and adaptation. Technology education and training must be provided to in-house operating staff, with public education campaigns for systems involving interaction with the travelling public.

## Funding

In the past, New Brunswick has benefited from successful collaboration agreements with Transport Canada providing significant funding and support for the implementation of ITS applications as well as for research and development related to ITS. Partnerships with the University of New Brunswick and private industry have also been a key component in the success of ITS research and development projects.

While many ITS applications offer a net savings in operations and maintenance costs, significant funding is often required for their implementation. It will be important to maintain existing and to establish new working relationships and funding partnerships with other levels of government, academia and private industry in order to move this plan forward. It is also necessary to establish ongoing funding to support continued operation of the ITS applications.

# Action Plan

An efficient, safe and sustainable transportation network is an essential component of the plan to be self-sufficient by 2026. New Brunswick will use ITS technology to assist in achieving this objective. In order for New Brunswick to meet the commitment identified in the *Charter for Change* to "... become a leader in Intelligent Transportation Systems – both to encourage smarter, safer travel at home and to market our technology abroad.", ITS applications must be developed and deployed in a well planned and coordinated manner.

The following Action Plan identifies a number of key actions that must be taken over the next 10 years in order for New Brunswick to become a leader in ITS, and to realize the maximum benefits of ITS applications. The Action Plan is divided into three key areas of focus: **1** General Actions, **2** Specific Projects, and **3** Ongoing Efforts. The Action Plan will be reviewed and updated on a regular basis to ensure it continues to reflect key changes in technology, policy directions and stakeholder input.

## General Actions

In order to become a leader in ITS, New Brunswick must:

**Be Coordinated** - Establish an ITS working group within the provincial government, chaired by NBDOT, to lead and coordinate all research, development, and deployment activities related to ITS. This group will also coordinate with external stakeholders, develop partnerships and funding agreements, participate in joint marketing and trade missions, and keep current with the latest technology developments through participation on national committees and associations.

**Be Knowledgeable** – Increase the knowledge and awareness of ITS and the benefits it can achieve within the government, as well as within municipalities and the private sector, through the provision of educational/awareness sessions, seminars, and ITS technology demonstrations.

**Be a Participant** - Continue to participate and cooperate with Transport Canada and other jurisdictions in updating the Canadian ITS Architecture and other matters of national and/or regional focus for ITS. The Province must also strive to ensure the architecture is applied to ITS projects to ensure the interoperability and successful integration of ITS technologies.

**Be Inclusive** - Ensure that ITS applications are included/considered early in the planning and design of infrastructure development and improvements. Allowances for future installations can be more easily made in the planning process than after construction is completed. Coordinating ITS installation with construction and maintenance activities also minimizes cost and traffic disruptions.

**Be a Partner** - Provide funding for the application of ITS initiatives in the budget process, and actively pursue opportunities for cost-sharing through partnerships with the federal government, other provincial/territorial/municipal governments, and the private sector.

## Specific Projects

The following specific projects will be initiated within the first five years of the Strategic Plan timeframe.

- Continued support of the operation of the National Rural ITS Research Centre at UNB.
- Development of the New Brunswick (Regional) ITS Architecture.
- Conversion of the 1-800 traveller information number to 511, accompanied by a public awareness program.
- Further development and operation of a 511 traveller information system.
- Installation of 5 additional WIM systems and the related infrastructure at strategic locations.
- Implementation of a virtual WIM pilot project.
- Development of 24/7 on-line special permitting for oversize/overweight loads travelling on NB highways.
- Development of a motor carrier profile system to optimize the safety and credential checking process.
- Implementation of 15 additional Environmental Sensing Stations (ESS) at strategic locations.
- Procurement and deployment of dynamic message signs that can be used in portable work zone traffic management, queue end warning systems, Amber Alerts and other ITS applications.



## Ongoing Efforts

The following items will also be further developed:

- Continue to support the operation and development of the Asset Management and Operations Management Systems, looking toward future enhancements.
- Continue to participate with the other Atlantic Provinces toward the further harmonization of trucking issues involving ITS, including a regional permit system and harmonization of the movement of over-dimensional loads.
- Investigate and identify suitable locations and options for queue end warning systems and other ITS applications at international border crossings.
- Work with airport authorities and the Federal government to ensure international travel services can be attracted to and retained in the province, particularly with regard to the efficient customs clearance of scheduled as well as charter/private flights.
- Encourage private industry, airport authorities and port authorities to investigate ITS applications such as Fleet Management to improve the flow of people and goods to/from airports and ports, electronic tags/transponders for tracking cargo, and vehicle/driver authentication systems to enhance security.
- Support the deployment of a fully digital province-wide radio system, considering the potential of the system to facilitate collection/dissemination of traveller information data.

# Conclusion

The Intelligent Transportation Systems Strategic Plan *Being A Leader With ITS* presents a Vision for a safe, sustainable and efficient transportation system, enhanced by the coordinated application of ITS, that will meet the needs of all users and support the Province's self-sufficiency objective. The document identifies the steps taken to date, and outlines the ITS needs that have been identified by stakeholders that should be pursued over the next 10 years. The Action Plan identifies specific projects to be initiated over the initial 5-year period. The ITS Strategic Plan is directed at the Government's goal of becoming a leader in ITS – encouraging smarter, safer travel and marketing New Brunswick based technology abroad. It is recognized that the Action Plan must remain dynamic and be updated on a regular basis to reflect changes in technology, policy directions as well as ongoing input from stakeholders.

Industry and others are requested to review this strategy and Action Plan and comment on it as needed.

Industry and others are most importantly called on to partner with New Brunswick to make the province a leader in Intelligent Transportation Systems.