Transportation and the Environment: Task Force Report Appendices

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APPENDICES: Task Force on Transportation and the Environment - Survey of Jurisdictions
Climate Change Mitigation

ALBERTA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
1A. Refer to the report "Clearing the Air" (March 2013). In this column, please list the climate change mitigation initiatives that are identified in this report. For each initiative, update the information reported (if necessary), and respond to a, b, c and d below (if this information is not already reported). a. Describe the initiative; b. Identify the objectives, including targets / indicators, and how this initiative may contribute to climate change mitigation; c. Identify the value / amount of funding provided for this initiative, if appropriate d. Feel free to provide a weblink or document to offer more information on this initiative (if desired). **1B.** Are there any additional climate change mitigation initiatives that are not indentified in "Clearing the Air"? If so, list them here, mark them as "NEW", and respond to a, b, c and d.	Identify the Ministry / Department with primary responsibility for delivering this initiative, including a contact person	Identify the theme, or type, of this climate change mitigation initiative *(check one)*: a. Legislation / Regulation (LR) b. Education / Training / Outreach (ETO) c. Incentive / Demonstration (ID) d. other (specify): *For your clarification, themes are defined on page 6 of the "Clearing the Air" report*	What is the status of this initiative *(check one)*? a. completed / concluded b. being planned c. in progress d. being amended e. other (specify)	***For completed / concluded initiatives:*** Has collaboration with other jurisdictions taken place in developing or delivering this initiative? If yes, please describe the collaboration (type, scope, parties involved, associated benefits and outcomes, etc). ***For current (all other) initiatives:*** Do you see this initiative benefitting from collaborative effort? If yes, please describe the opportunity for collaboration (i.e. type, scope, parties to be involved, etc) and identify the benefits you see accruing from collaborative effort.	***For completed / concluded initiatives:*** a. What was the outcome/result of this initiative, including costs and/or benefits? b. Identify the external factors that impacted the outcome, if any. c. Please describe the "lessons learned", if any. ***For current (all other) initiatives:*** Did this initiative uncover any early "lessons learned"? If so, please describe.
** If more space is needed, feel free to provide detailed answers to Q1, Q5 and/or Q6 in a separate document*					
1 Green Transit Incentives Program (GreenTRIP) The Green Transit Incentives Program (GreenTRIP) is providing $2 billion in capital funding for public transit projects throughout Alberta. The GreenTRIP program is part of the Alberta government's commitment to supporting communities as they plan for the future. It supports our Building Alberta Plan which includes creating good jobs and growing our economy, and building an even better quality of life.	***Alberta Transportation*** Contact: Ken Dmytrshyn	***C. Incentive /Demonstration (ID)***	***C. In progress***	Although GreenTRIP projects are municipal assets and primarily funded by provincial funding, the federal government can contribute to projects that receive GreenTRIP funding.	It was found to be very important that the applicant have a comprehensive methodology for reporting the benefits and GHG reduction identified in their submission and business case. Some municipalities that have completed projects have had difficulty reporting on the reduction to GHG as a result of their project.

ALBERTA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
This program is an invitation to encourage municipalities to be innovative about public transit, thereby working towards GHG reduction. Website: http://www.transportation.alberta.ca/4913.htm					So far, we have approved funding for transit projects in 15 municipalities under GreenTRIP, totaling more than $1 billion. A second round of applications for GreenTRIP funding will be called at the discretion of the Minister, as Alberta's budget allows.
2 GHG Emissions Reduction Framework Alberta Roadbuilders and Heavy Construction Association - Memorandum of Understanding (MOU) with Alberta Environment and Sustainable Resource Development and Alberta Transportation. The objective of this MOU is to develop a framework within which ESRD, TRAN and the ARHCA can work together to facilitate GHG emissions reductions that enable the industry to adjust to a carbon constrained future and help Alberta meet the targets set out in the 2008 Alberta Climate Change Strategy and the Provincial Energy Strategy. Web link to MOU, work plans, annual reports, and Guide to Energy Efficient Best Practices: http://www.transportation.alberta.ca/4058.htm	***Alberta Environment and Sustainable Resource Development (ESRD)*** Contact: Brian Waddell ***Alberta Transportation*** Contact: Peter Dzikowski	***B. Education / Training / Outreach (ETO)***	***C. In progress***		
3 Greening Government Strategy The Greening Government Strategy approved by Cabinet on April 28, 2010 commits the GoA to greening its business operations. The initiatives under the ARHCA MOU align with and help to deliver on this strategy. Website: https://external.sp.environment.gov.ab.ca/GreeningGov/Pages/default.aspx	***Alberta Environment and Sustainable Resource Development (ESRD)***	***E. Government Policy***	***C. In progress***	Cross-ministry effort working to include suppliers, contractors, and service providers	
4 "Trucks of Tomorrow" Program In June 2010 the Minister of Environment launched the Commercial Vehicle Incentive Program (also called Trucks of Tomorrow) as an initiative under the 2008 Provincial Climate Change Strategy funded by Environment, delivered by C3 (formerly called Climate Change Central). The primary goal of the program was to help Alberta transport companies reduce CO2 emissions through improved fuel efficiency. The budget was $2 million and the program ended December 31, 2011.	***Alberta Environment and Sustainable Resource Development (ESRD)*** Contact: Brian Waddell	***C. Incentive /Demonstration (ID)***	***A. Completed/ Concluded***		The successful pilot incentive program encouraged the installation of energy efficiency technologies and resulted in the installation of 3,063 fuel efficiency technologies on Alberta's freight fleet. As a result of these installations, emissions of greenhouse gases (GHG) will be reduced by 156,252 tonnes over the lifetime of the technologies. Upon the completion of the program,

ALBERTA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
Web link: http://c-3.ca/trucks-of-tomorrow/					20 trucking companies participated in fleet analysis and training workshops; these provided knowledge needed to make continued fuel efficiency improvements and GHG emissions reductions. A participant survey at the conclusion of the program recorded a high level of respondent satisfaction with the program. It indicated that the program was the influencing factor for the majority of companies that decided to make upgrades.
5 Green Sign Program The Alberta Transportation Green Sign Program to showcase environmental sustainability practices used by Alberta Transportation. The Government of Alberta is committed to environmental excellence. Technology is the key to ensuring Alberta remains at the forefront of innovative and effective environmental management. Where feasible, Alberta uses highway design strategies and rehabilitation methods that incorporate elements of environmental sustainability. These efforts include recycling paving materials, reducing emissions when producing asphalt, creating and restoring wetlands, and protecting fish habitats. Alberta Transportation will be placing information signs on highway construction projects incorporating green design features or construction activities. More info at: http://www.transportation.alberta.ca/5087.htm	***Alberta Transportation*** Contact: Chuck McMillan	***B. Education / Training / Outreach (ETO)***	***C. In progress***		
6 Alberta's Renewable Fuels Standard (RFS) Since the introduction of the Alberta RFS Regulation in April 2011, all transportation fuels sold in Alberta have been subject to blending requirements mandating a minimum of 5 percent renewable alcohol to be blended with conventional gasoline and two percent renewable diesel be blended with conventional diesel. Alberta was the first Canadian jurisdiction to require that all renewable fuels blended under the RFS demonstrate a lower GHG intensity than conventional fuels.	***Alberta Energy*** ***Alberta Environment and Sustainable Resource Development (ESRD)*** Contact: Robert Hendren	***A. Legislation / Regulation (LR)***	***C. In progress*** In effect since April 2011	Potential for harmonization of some aspects of RFS mandates across jurisdictions (harmonization options range from administrative to policy)	Over 400 million litres of ethanol and 140 million litres of biodiesel/renewable diesel were directly blended into transportation fuels in 2012. It is estimated that at least 1 megatonne of CO_2 emissions is reduced per year as a result of the Alberta Renewable Fuel Standard (RFS).

ALBERTA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
In order to be eligible for RFS compliance, the GHG intensity of the blended renewable fuels must be 25 percent lower than conventional fuels.					
7 Hybrid Taxi Project Program The purpose of the program was to determine whether replacing conventional taxi vehicles with gasoline-electric hybrid vehicles would provide an economic benefit to taxi drivers while simultaneously benefiting the environment through lower greenhouse gas emissions. Alberta Energy's $6.5 million consumer rebate program offered incentives for the purchase of new hybrid taxis between 2009 and 2012.	***Alberta Environment and Sustainable Resource Development (ESRD)*** Contact: Brian Waddell	***C. Incentive /Demonstration (ID)***	***A. Completed/ Concluded***	Incentive program was delivered by C3 (formally known as Climate Change Central)	C3 processed applications for incentives towards the purchase of 116 hybrid taxis, which will result in 2.5 kilotonnes of greenhouse gas emissions reduction and one million litres of gasoline saved over the lifetime of the taxis. For full program results, please visit: *http://c-3.ca/hail-a-hybrid-final-report/*
8 Alberta Biofuel Offset Protocol This protocol provides biofuel producers with a quantification methodology to generate offset credits for use as a compliance mechanism under the Specified Gas Emitters Regulation (SGER). The credits generated are based on the reduction in greenhouse gas intensity of produced biofuel as compared to conventional fuel.	***Alberta Environment and Sustainable Resource Development (ESRD)*** Contact: Rob Hamaliuk	***A. Legislation / Regulation (LR)***	***D. Being Amended***	Collaboration has occurred with Alberta Energy as they are implementing the Alberta Renewable Fuel Standard (RFS).	There have been two projects that have utilized the original biofuel offset protocol and have resulted in the creation of 106,952 tonnes of offset credits to date. Of this total, 52,123 have been submitted for compliance with the SGER. On April 1, 2011 the biofuel offset protocol was flagged with the implementation of the RFS which required a 25% reduction in GHG intensity from conventional fuels. The protocol has also undergone review by the Office of the Auditor General. This review identified key risk areas that needed to be addressed before any project can use the protocol.
9 Alberta Transportation Efficiency Protocol This protocol credits improved efficiencies in transportation (persons moved per kilometer, tonnes hauled per kilometer). The protocol has completed technical review, and is pending government review and 30 day public review. Government stakeholders have not been identified yet.	***Alberta Environment and Sustainable Resource Development (ESRD)*** Contact: Robyn Kuhn	***A. Legislation / Regulation (LR)***	***B. Being Planned*** Protocol is pending government review.		N/A
10 Fleet Fuel Switching Offset Protocol This protocol was approved in spring 2013. It credits the use of lower GHG fuels in vehicle fleets. A number of companies are looking at developing projects using	***Alberta Environment and Sustainable Resource Development (ESRD)***	***A. Legislation / Regulation (LR)***	***B. Being Planned*** Approved for use in the Alberta		N/A

ALBERTA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
this protocol.	Contact: Robyn Kuhn		Offset System.		
11 Climate Change Emissions Management Corporation (CCEMC) Facilities regulated under the SGER may pay into the Climate Change and Emissions Management Fund for compliance purposes. A portion of these funds are transferred to the CCEMC through a grant agreement. The CCEMC then invests this money into projects and technologies that will achieve GHG reductions in Alberta or enhance Alberta's ability to adapt to climate change. The CCEMC has invested in two biofuel operations. Please see www.ccemc.ca for further information.	***Alberta Environment and Sustainable Resource Development (ESRD)*** Contact: Rob Hamaliuk	***E. Government Policy***	***C. In progress*** Funds are issued by CCEMC on a performance basis.	Collaboration is with the CCEMC.	TBD. Projects are not complete. (1)Enerkem: CCEMC investment is $1.8m (2)Growing Power Hairy Hill: CCEMC investment is $5m
12 Bioenergy Funding Programs The Government of Alberta has provided significant support to Alberta's bioenergy industry through a number of channels, including significant investment in a series of Bioenergy Grant Programs since 2007. Alberta's Bioenergy Producer Credit Program provides incentives to producers of a wide variety of bioenergy products including biofuels, and electricity and heat from biomass. Though the final round of the Bioenergy Producer Credit Program has been closed to applications, the Government of Alberta will continue to honour existing commitments to the total of $440 million until the program's close in 2016. Previously the Government of Alberta also supported bioenergy feasibility studies, market development, infrastructure development, and production. Prior to 2011, over 70 bioenergy projects were provided with grants totalling over $180 million.	***Alberta Energy*** Contact: Susan Carlisle	***C. Incentive /Demonstration (ID)***	***C. In progress***		Biofuel annual production capacity has grown from 45 Million Litres in 2011 to over 400 million litres in 2014. The Northern Biodiesel LP plant in Lloydminster AB is the largest biodiesel facility in Canada, with a capacity of 265 million litres per year. Enerkem is constructing a 37 million litre ethanol plant in Alberta expected to be producing ethanol by 2015. It will be the first commercial facility to produce ethanol from municipal waste in North America.
13 Alternative and Renewable Energy Policy Framework Alberta Energy is developing an Alternative and Renewable Energy Policy Framework to provide overall direction for planning and development of future alternative and renewable energy related policy. The Framework will include electricity, heat and transportation end-uses.	***Alberta Energy*** Contact: Susan Carlisle	***E. Government Policy***	***B. Being Planned***		
14 Biofleet Website The Biofleet website is designed to provide information to trucking fleets and other end users of liquid fuels in Western Canada about renewable fuel blends with diesel and gasoline.	***Alberta Energy*** Contact: Susan Carlisle	***B. Education / Training / Outreach (ETO)***	***C. In progress***		

ALBERTA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
The current BioFleet site and content development were made possible by a financial contribution from Natural Resources Canada as well as Alberta Energy, Alberta Biodiesel Association, the Canola Council of Canada and the Canadian Renewable Fuels Association. Climate Change Central (C3) based in Calgary Alberta have managed website updates since 2011 with continuing support from Alberta Energy.					
15 Alberta Renewable Diesel Demonstration The Alberta Renewable Diesel Demonstration, led by Climate Change Central, was financial supported by the Government of Alberta, the Government of Canada, and Shell Canada. The ARDD was Canada's first demonstration to work with major petroleum producers and distributors to provide pilot-level experience of renewable diesel blending at full commercial scale, using in-line blending at a primary diesel terminal, or 'rack'. The ARDD was also Canada's first demonstration to adjust the finished fuels' cloud points using ultra low sulphur kerosene (ULSK) in order to fully meet the cold operability specifications in the CAN/CGSB 3.520 fuel standard.	***Alberta Energy*** Contact: Susan Carlisle	***C. Incentive /Demonstration (ID)***	***A. Completed/ Concluded***		The Alberta Renewable Diesel Demonstration (ARDD), Canada's largest cold-weather study of renewable diesel fuels, has successfully demonstrated the on-road use of low level renewable diesel blends in a range of Canadian climatic conditions. The final report was published in 2009.
Participation in National Initiatives Including: - **TAC Green Guide for Roads** – Ab on Sponsored Project Steering Committee and was on Green Guide for Roads Task Force - **TAC Climate Change Task Force** – Ab chairs this group - **TAC Sustainable Transportation Standing Committee** – Ab is member - **Transportation Working Group on Energy Efficiency** led by Natural Resources Canada – reporting to Council of Energy Ministers - Alberta contributed to developing the Guide for Purchasing Aerodynamics for Heavy Duty Tractors and Trailers in 2009.					

BRITISH COLUMBIA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
16 Clean Energy Vehicles for BC Point-of-Sale Incentive Program Incentives of up to $5,000 per eligible clean energy vehicle are available. Incentives are available for light duty vehicles that use natural gas, hydrogen or electricity as their primary fuel source. More information is available at http://www.cevforbc.ca/clean-energy-vehicle-program.	***Ministry of Environment***	***C. Incentive /Demonstration (ID)***	***C. In progress*** Program extended until March 31st, 2014.	Collaborated with New Car Dealers Association of B.C., which reimbursed individual dealers the approved incentive (following the sale or lease of an approved vehicle).	As of February 11, 2014, $2,227,500 has been disbursed ($72,500 remains).
17 Residential Rebates for Purchase of Qualifying Electric Vehicle Charging Equipment Rebates of up to $500 per eligible electric vehicle charging station are available to B.C. residents who own or lease a battery electric or plug in hybrid electric vehicle that is eligible for the Clean Energy Vehicle Program point-of-sale vehicle incentives. More information is available at http://www.livesmartbc.ca/incentives/transportation/.	***Ministry of Environment***	***C. Incentive /Demonstration (ID)***	***C. In progress*** Program extended to March 31, 2014	Not applicable	
18 Alternative Fuel Standards The Renewable and Low Carbon Fuel Requirements Regulation as outlined in the *Greenhouse Gas Reduction Act* reduces the carbon intensity of transportation fuels through two major requirements. The Renewable Fuel Requirement requires that gasoline have a 5% renewable content, and diesel have a 4% renewable content. The Low Carbon Fuel Requirement requires a 10% reduction in carbon intensity by 2020.	***Ministry of Energy and Mines***	***A. Legislation / Regulation (LR)***	***C. In progress***	Not applicable	In progress – reduction by 2020
19 Anti-Tamper Legislation The Motor Vehicle Act Regulations (Sect 29.03) under the Motor Vehicle Act makes the following anti-tampering provisions: 29.03 (1): A system or device installed on or incorporated in a motor vehicle or motor vehicle engine as required by section 29.02 shall, during the operation	***Ministry of Transportation and Infrastructure***	***A. Legislation / Regulation (LR)***	***C. In progress***	Not applicable	

BRITISH COLUMBIA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
of the motor vehicle or motor vehicle engine, operate or function in such manner as to comply at all times with the requirements of this Division. 29.03 (2a): A system or device shall not cause emission to the atmosphere of any air contaminant that would not be emitted to the atmosphere during the operation of the motor vehicle or motor vehicle engine if it were not equipped with the system or device.					
20 Awareness There are a number of programs that fall under this mitigation initiative: • Aircare acts as an educational/awareness program in the following ways: climate change information campaign, vehicle inspection report results and carbon dioxide calculator. • Ministry of Transportation and Infrastructure provides financial support to the BC Bike to Work society to put on encouragement campaigns in communities around the province. • The Ministry of Environment has published the BC Air Action Plan, which includes: the clean up of emissions from transit and school buses; promoting a province wide, anti-idling campaign; retrofitting older heavy duty vehicles and greening BC's vehicle fleet and embracing programs such as ScrapIT and Air Care on Road and supporting greener ports and marine vessels. • ICBC (Insurance Corporation of British Columbia) publishes a Learn to Drive handbook that contains a chapter on minimizing the environmental impact of driving; • ICBC supports the "Better Environmentally Sound Transportation" Commuter Challenge, which is an annual week-long event in which commuters record their sustainably-made trips; • The Ministry of Environment and Health collaborate on the provincial idle reduction initiative, which is a public awareness campaign; • LiveSmart BC (Ministry of Environment) website contains information regarding rebates and incentives, strategies to increase fuel efficiency, information on transportation alternatives; information on charging infrastructure; carbon	***Ministry of Transportation and Infrastructure*** Others (including Crown Corporations) – Ministry of Environment, Ministry of Health; Insurance Corporation of British Columbia (ICBC); TransLink BC Transit and Port Metro Vancouver.	***B. Education / Training / Outreach (ETO)***	***C. In progress*** Note: Aircare is currently scheduled to operate until December 31, 2014 (see http://www2.news.gov.bc.ca/news_releases_2009-2013/2012ENV0032-000734.htm).	For idle-reduction campaign: collaboration between Ministries of Environment and Health (collaboration within government).	

BRITISH COLUMBIA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
calculator and Bike to Work Week information. More information is available at http://www.livesmartbc.ca/. • Port Metro Vancouver's Truck Licensing System includes messaging around reducing emissions for trucks. • Translink, a public transit agency responsible for the Lower Mainland, has developed the travelsmart website that educates the public about transportation initiatives. More information is available at http://www.travelsmart.ca/. • BC Transit's (a provincial crown agency) has a Go Green initiative that has messaging on commuter options, ridesharing, no-idling policy and the BC Scrap-it program. Information is available at http://www.bctransit.com/gogreen/green.cfm					
21 Active Routes to School *Commuter* The Hub for Active School Travel (**HASTe**) is a hub for groups taking action on reducing school transportation emissions in BC. As a resource and networking center, HASTe assists groups can start or enhance initiatives to reduce the negative impacts of school-related transportation choices, and plan active and safe routes to school. More information is available at http://hastebc.org/.	***Ministry of Environment***	***B. Education / Training / Outreach (ETO)***	***A. Completed/ Concluded*** Currently on hiatus	Government (through the Ministry of Environment) previously provided some funding to HASTe. The organization has indicated that they currently examining different business models to ensure that they can sustain the work they are undertaking.	
22 Carpool Matching *Commuter* The Jack Bell Foundation operates a **ride-share website**, which matches carpoolers with each other. Provincial support for the program is through Translink and BC Transit, both of which provide administrative funding and support. Over 100,000 employees currently have access to the site through their employers. The website offers tips on how to approach ridesharing, information about location of HOV lanes. More information is available at https://online.ride-share.com/en/my/index.php.	***Translink*** ***BC Transit***	***B. Education / Training / Outreach (ETO)***	***C. In progress***	The support for this initiative is through Translink and BC Transit.	

BRITISH COLUMBIA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
23 Gateway Program – Dedicated Roadway Lanes *Commuter* The BC Ministry of Transportation is managing the **Gateway Program**, a series of multi-year regional transportation projects for Metro Vancouver: **The Port Mann / Highway 1 (PMH1) Project** includes ongoing construction of 30 kilometres of new HOV lanes onto the Lower Mainland's busiest and most congested highway. **Highway 1 ExpressBus Project** provides increased transit and HOV lanes, ramps, and a new park and ride to support frequent service, which commenced in December 2012. More information is available at http://www.pmh1project.com/transportation-choices/Pages/New-Transit-Options.aspx.	***Ministry of Transportation and Infrastructure***	***D. Other: Infrastructure Improvement***	***C. In progress***		
24 Gateway Program – Public Transit Improvement *Commuter* Several different transit improvement initiatives continue to operate in BC. The BC Ministry of Transportation is managing the **Gateway Program**, a series of multi-year regional transportation projects for Metro Vancouver. The **Port Mann /Highway 1 (PMH1) Project** includes ongoing construction of a new 10-lane Port Mann Bridge (the widest bridge in the world), 37 kilometres of highway widening from Vancouver to Langley, including 30 kilometres of new HOV lanes. These improvements also make transit service across the bridge possible for the first time in a generation. **Highway 1 ExpressBus Project** increases transit and HOV lanes, ramps, and a new park and ride to support frequent service, which commenced in December 2012. The construction of the **Evergreen Line**, an 11km elevated railway line that will connect Coquitlam to Vancouver via Port Moody and Burnaby will integrate with the existing SkyTrain system. Currently under construction, the line will be operational in 2016.	***Ministry of Transportation and Infrastructure***	***D. Other: Infrastructure Improvement***	***C. In progress***		

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Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
More information is available at http://www.translink.ca/en/Plans-and-Projects/Rapid-Transit-Projects/Evergreen-Line.aspx.					
25 Long Combination Vehicle (LCV) Program *Fuel Efficiency Programs* BC's Ministry of Transportation and Infrastructure also runs a **Long Combination Vehicle (LCV) Program**. By law, trucks are only permitted to pull one trailer 25m or less for safety. However, LCVs use less fuel to carry goods, so they reduce the greenhouse gas emissions associated with shipping goods by approximately one-third. BC LCVs consist of two full-length semi-trailers up to 40 metres overall length, but do not exceed the normal weight restrictions. LCVs have route and operating time restrictions. Drivers must meet strict requirements.	***Ministry of Transportation and Infrastructure***	***A. Legislation / Regulation (LR)***	***C. In progress***	Not applicable	
26 Heavy Duty Vehicle Retrofits The **B.C. Air Action Plan** of 2008 outlined a requirement for HDVs to be retrofitted with emissions reduction devices. All B.C.-registered commercial diesel vehicles of model years 1989-1993 with a licenced gross vehicle weight of more than 8,200 kg are required to install an approved emission reduction device. The most common device is a diesel oxidation catalyst (DOC) filter. It is anticipated that by 2015 there will be fewer than 1,000 of these vehicles remaining on the road, owing to attrition. The requirement does not apply to buses, off-road vehicles, emergency vehicles, and farm vehicles with LGVW under 17,300kg. Confirmation of the retrofit is checked at required vehicle inspections. Roadside Commercial Vehicle Safety and Enforcement (CVSE) officers may also check for compliance. More information is available at http://www.bcairsmart.ca/.	***Ministry of Environment*** ***Ministry of Transportation and Infrastructure***	***A. Legislation / Regulation (LR)***	***A. Completed/ Concluded*** On-hold	School districts	http://www.bcairquality.ca/topics/schoolbus/school-districts.html shows the progress of the retrofit of district-owned school buses.
27 Diesel School Bus Retrofit Program	***Ministry of Environment***	***C. Incentive /Demonstration (ID)***	***A. Completed/ Concluded***		

BRITISH COLUMBIA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
Heavy Duty Vehicle Retrofits – Incentives School buses are addressed through a parallel initiative, the **Diesel School Bus Retrofit Program**. Under this program, all eligible school-district-owned school buses were retrofitted with approved emission reduction device. Retrofits have been completed in 18 of 39 (46%) eligible school districts. The budget for completing the retrofit of all school-district-owned buses is $1.2 million over three fiscal years.					
28 BC Air Quality *Idle control – Idle Education* **BC Air Quality**, a joint program administered by the Ministry of Environment runs the **Provincial Idle Reduction Initiative**, a province-wide campaign aimed at decreasing engine idling. The initiative addresses issues of health and air quality, climate change, and economy and environmental concerns. The Initiative supports action in three areas: Public Awareness and Action through **Idle Free BC**; a partnership between the BC Ministry of Environment and other NGOs; **School Transportation Emission Reduction** through the Hub for Action on School Transportation Emissions (HASTE); **Government Leadership and Commitment** through idle-free sign distribution and guidelines for fleet operations.	***Ministry of Environment***	***B. Education / Training / Outreach (ETO***)	***C. In progress*** (except HASTe, which has been on hiatus since October 2013)	Not applicable	To be confirmed
29 Transit Anti-Idling Policy *Idle control – Idle Regulations* **BC Transit**, which is funded by the BC government has an anti-idling policy for transit operators. They also take part in a Smart Driving training program that refreshes drivers on why we all should drive in a fuel efficient and environmentally sound manner.	***BC Transit*** (Crown Agency) ***Ministry of Transportation and Infrastructure***	***B. Education / Training / Outreach (ETO***)	***C. In progress***	N/A	To be confirmed
30 Motor Vehicle Emissions Inspection and Maintenance Program (AirCare) – Emissions Testing	***Ministry of Transportation and Infrastructure***	***A. Legislation / Regulation (LR)***	***C. In progress*** AirCare Program to cease at end of	AirCare is an operating subsidiary of Translink. Ministry of Environment and MoTi work	In 2012, it was estimated that the repairs directly related to Aircare failures

BRITISH COLUMBIA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
In-shop Inspection and Maintenance In BC, the Motor Vehicle Emissions Inspection and Maintenance Program (**AirCare**) provides emissions testing in the Lower Mainland. AirCare tests vehicles for hydrocarbons (HCs), carbon monoxide (CO), nitrogen oxides (NOx), and diesel particulate. Vehicles are required to pass an AirCare inspection prior to re-licensing, if the vehicle's last AirCare inspection has expired. AirCare was developed in partnership with the BC Ministry of Environment and Metro Vancouver (formerly Greater Vancouver Regional District or GVRD) Air Quality. Under the ***SCBCTA Act***, the South Coast British Columbia Transportation Authority (TransLink), must develop and administer programs for certifying motor vehicle compliance regulations with respect to exhaust emission standards. Since 1992, 85% of all vehicles tested for emissions have passed.			2014 – details available at http://www.newsroom.gov.bc.ca/2012/05/aircare-to-end-after-2014-new-options-explored.html	together on the legislation for AirCAre.	reduced total light-duty vehicle generated emissions by 6.4%.
31 Motor Vehicle Emissions Inspection and Maintenance Program (AirCare)- Mobile Inspections *Inspection and Maintenance – On-Road Inspection* BC's Motor Vehicle Emissions Inspection and Maintenance Program (AirCare) has an on-road component, AirCare ON-ROAD (**ACOR**). Operated by the BC Ministry of Transportation, ACOR is a mobile inspection program that runs roadside tests of heavy-duty diesel vehicles, looking for excessive smoke emissions. ACOR inspectors identify vehicles for testing through a visual inspection. Vehicles with dark smoke are more likely to be tested, because dark smoke is a sign the vehicle may be operating outside allowable limits.	***Ministry of Transportation and Infrastructure***	***B. Education / Training / Outreach (ETO)***	***C. In progress***	MoTI works with Ministry of Environment on the legislation in regards to emission standards. MoTI administers and operates ACOR.	
32 LiveSmart BC *Monetary Incentives* LiveSmart BC, a program of the BC Ministry of the Environment runs the **Clean Energy Vehicles for BC Point-of-Sale Incentive Program**. Incentives of up to	***Ministry of Environment*** Various others	***C. Incentive /Demonstration (ID)***	***C. In progress*** Note: Clean Energy Vehicle Point-of-Sale Incentive Program has been extended to March 31, 2014 – see http://www.newsroom.gov.bc.ca/		As of February 11, 2014, $2,227,500 has been disbursed (as of February 11, 2014, $72,500 remains).

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Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
$5,000 per eligible clean energy vehicle are available. Incentives are available for light duty vehicles that use natural gas, hydrogen or electricity as their primary fuel source. Incentives will be available until March 31st, 2013. LiveSmart BC also runs the **Residential Rebates for Purchase of Qualifying Electric Vehicle Charging Equipment Program**. Rebates of up to $500 per eligible electric vehicle charging station are available to B.C. residents who own or lease a battery electric or plug in hybrid electric vehicle that is eligible for the Clean Energy Vehicle Program point-of-sale vehicle incentives. The **BC SCRAP-IT** Program is a voluntary early retirement vehicle program that provides incentives to replace higher polluting vehicles with cleaner forms of transportation. The BC government and Translink have invested $17.5 million in the program, plus in-kind contributions (bus passes). Incentives include: cash payment; rebate towards the purchase of an eligible replacement vehicle or bicycle; transit passes; or credit with a car-sharing program. More information on this program is available at http://www.scrapit.ca/.			2013/03/clean-energy-vehicle-incentive-program-extended.html.		
33 Pollution Control Equipment Warranties In BC, ***Motor Vehicle Emissions Control Warranty Regulations*** (B.C. Reg. 116/96) under the ***Environmental Management Act*** includes the following provisions for warranted emissions control systems, starting with 1998 model year vehicles. The manufacturer must describe the coverage under the defects warranty, the performance warranty, and a description of all specified major emission control components used in the warranted vehicle. Also, the manufacturer must warrant that if the vehicle fails to conform to the applicable standards during the warranty period, the manufacturer will replace the necessary parts at no charge to the purchaser.	***Ministry of Environment***	***A. Legislation / Regulation (LR)***	***C. In progress***	N/A	To be confirmed
34 AirCare ON-ROAD (ACOR) *Public Report System*	***Ministry of Transportation and Infrastructure***	***B. Education / Training / Outreach (ETO)***	***C. In progress***	AirCare is an operating subsidiary of Translink. Ministry of Environment and MoTi work together on the	Awaiting response/to be confirmed

BRITISH COLUMBIA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
BC's Motor Vehicle Emissions Inspection and Maintenance Program (AirCare) has an on-road component, AirCare ON-ROAD (**ACOR**). Operated by the BC Ministry of Transportation, ACOR is a mobile inspection program that runs roadside tests of heavy-duty diesel vehicles, looking for excessive smoke emissions. ACOR provides a 1-800 number to report any truck that is smoking excessively. If the "smoking vehicle" is operated within the AirCare service area (Metro Vancouver or Fraser Valley Regional District) then a letter and request for inspection will be sent. If the vehicle is registered outside of the AirCare service area, then the owner is alerted to the issue and it is strongly recommended that they have their vehicle checked and repaired as necessary. More information is available on this program at http://www.th.gov.bc.ca/ACOR/.				legislation for AirCAre. MoTI administers and operates ACOR.	

CANADA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
35 Canadian Environmental Protection Act, 1999 (S.C. 1999, c. 33) Includes provisions to reduce the contribution of on-road and off-road vehicles and engines, along with fuels, to air pollution and greenhouse gases in Canada through the development and implementation of regulated emission performance standards. Website: http://laws-lois.justice.gc.ca/eng/acts/C-15.31/)	***Environment Canada***	***A. Legislation / Regulation (LR)***	***A. Completed/ Concluded***		
36 Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations (SOR/2010-201) Establishes mandatory GHG emission standards for new vehicles of the 2011 and later model years that are aligned with U.S. Standards. Website: http://laws-lois.justice.gc.ca/eng/regulations/SOR-2010-201/	***Environment Canada***	***A. Legislation / Regulation (LR)***	***A. Completed/ Concluded***		Please refer to the Regulatory Impact Analysis Statement (RIAS) for this regulation
37 Regulations Amending the Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations (Proposed Canada Gazette 1, December 2012) These regulations establish GHG emission standards for cars and light trucks of model years 2017-2025. Website: http://www.gazette.gc.ca/rp-pr/p1/2012/2012-12-08/html/reg1-eng.html	***Environment Canada***	***A. Legislation / Regulation (LR)***	***C. In progress***		Please refer to the Regulatory Impact Analysis Statement (RIAS) for this regulation
38 Heavy-duty Vehicle and Engine Greenhouse Gas Emission Regulations (SOR/2013-24) Establish GHG emission standards for new on-road heavy-duty vehicles and engines (e.g. buses, tractors and refuse trucks) of the 2014 and later model years. Website: http://laws-lois.justice.gc.ca/eng/regulations/SOR-2013-24/	***Environment Canada***	***A. Legislation / Regulation (LR)***	***A. Completed/ Concluded***		Please refer to the Regulatory Impact Analysis Statement (RIAS) for this regulation
39 Renewable Fuels Regulations (SOR/2010-189) These regulations aim to reduce GHG emissions by requiring an average 5% renewable fuel content in gasoline and 2% renewable content in diesel fuel. Website: http://laws.justice.gc.ca/eng/regulations/SOR-2010-189/	***Environment Canada***	***A. Legislation / Regulation (LR)***	***A. Completed/ Concluded***		Please refer to the Regulatory Impact Analysis Statement (RIAS) for this regulation
40 ecoENERGY for Alternative Fuels	***Natural Resources Canada***	***B. Education /***	***C. In progress***		

CANADA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
Natural Resources Canada's ecoENERGY for Alternative Fuels program (ecoEAF) represents the Federal Government's contribution to implementing recommendations from the Natural Gas Use in the Canadian Transportation Sector: Deployment Roadmap. The program reduces barriers to implementation and deployment of natural gas vehicles in transportation by supporting two main areas: the development and revision of much needed codes and standards, and the preparation and dissemination education and outreach tools and materials. These actions ensure alignment of technology across North-America, de-risks vehicle and infrastructure purchase, and provides accurate, unbiased and timely information to end-users, which assists in their decision to transition to natural gas vehicles. Website: http://www.nrcan.gc.ca/energy/alternative-fuels/fuel-facts/ecoenergy/3577		***Training / Outreach (ETO)***			
41 ecoENERGY for Biofuels The $1.5 billion, nine-year, ecoENERGY for Biofuels program provides an operating incentive to facilities that produce renewable alternatives to gasoline and diesel in Canada, based on volumes that are produced and sold, in support of the renewable fuels regulations (administered by Environment Canada). Website: http://www.nrcan.gc.ca/energy/alternative-fuels/programs/12358	***Natural Resources Canada***	***C. Incentive /Demonstration (ID)***	***A. Completed/ Concluded*** The program is no longer accepting applications.		The ecoENERGY for Biofuels program signed contribution agreements resulting in built production capacity of 1.881 billion litres per year of renewable alternatives to gasoline (ethanol) against a target of 2 billion litres, and 575 million litres per year of renewable alternatives to diesel (biodiesel) against a target of 500 million litres.
42 AUTO$MART Auto$mart provides on-line training materials for driving instructors to teach student drivers how to drive fuel efficiently, conserving fuel and saving money, while reducing their greenhouse gas emissions and environmental footprint. Website: http://www.nrcan.gc.ca/energy/efficiency/transportation/cars-light-trucks/driver-educators/7529	***Natural Resources Canada***	***B. Education / Training / Outreach (ETO)***	***C. In progress***		Over 2200 Canadian driving instructors are active in using Auto$mart content in driver education classes and over 500,000 novice drivers are exposed to Auto$mart annually.
43 FLEETSMART	***Natural Resources Canada***	***B. Education / Training /***	***C. In progress***		

CANADA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
This program includes training, tools and educational materials to introduce fleets to energy efficient practices. Fleetsmart targets owner/operators, fleet managers, and facilitators with a variety of tools such as: - A Guide for Purchasing Aerodynamics for Heavy-Duty Tractors and Trailers that provides tips on aerodynamic technology; - SmartDriver offers advice on vehicle maintenance, operations and driving techniques; and - Fuel Management 101 brings managers together to enhance their ability to measure and manage fuel efficiency. Website: http://fleetsmart.nrcan.gc.ca/index.cfm?fuseaction=fleetsmart.smartdriver		***Outreach (ETO)***			
44 ecoTECHNOLOGY for Vehicles Program (eTV) Transport Canada's **ecoTECHNOLOGY for Vehicles Program (eTV)** conducts in-depth safety, environmental and performance testing on a range of new and emerging advanced vehicle technologies for passenger cars and heavy-duty trucks. eTV proactively tests and evaluates a range of new advanced vehicle technologies. The program's Multi-Year Testing & Evaluation Work-Plan includes testing activities organized into seven high-level technology priorities, including: ▪ Electric Vehicles, including battery electric and plug-in hybrid vehicles; ▪ Natural Gas Technologies, including compressed natural gas and liquefied natural gas; ▪ Biofuel Technologies, including biodiesel and various ethanol blends; ▪ Hydrogen & Fuel Cell Technologies; ▪ Light-Duty Vehicle Power-train, Emissions and Aerodynamic Improvements; ▪ Heavy-Duty Vehicle Power-train, Emissions and Aerodynamic Improvements; and ▪ Connected Vehicle Systems. Program results inform the development of environmental and safety regulations to ensure that advanced vehicle technologies can be introduced in Canada in a safe and timely manner. Results also support Canadian efforts to align North American and global vehicle standards through various fora, including the Canada-U.S. Regulatory Cooperation Council and Global Technical Regulations Working parties, etc. Technical papers and presentations can be found on the eTV program website located at www.tc.gc.ca/eTV.	***Transport Canada*** Contact: Ryan Klomp Manager, ecoTECHNOLOGY for Vehicles Program ryan.klomp@tc.gc.ca	***C. Incentive /Demonstration (ID)***	***C. In progress***	The eTV program has been working with other federal government departments, and through various international standards development committees to support the development of international vehicle standards/regulations. For example, the program has been working closely with Environment Canada and US regulators – including the *United States National Highway Traffic Safety Authority* and the *Environmental Protection Agency* – to support the development of aligned/harmonized vehicle environmental and safety regulations. Collaboration through the eTV program helps underscore the fact that the Government of Canada is committed to addressing climate change and regulatory harmonization, particularly in the North American transportation	

CANADA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
				context, as emissions from the vehicle sector will be key to meeting international commitments.	
45 Shore Power Technology for Ports (SPTP) Shore power allows for properly equipped vessels to connect to a local electrical power source when docked. This connection powers the ship's load, enabling the vessel to turn off its diesel powered generators and auxiliary engines. The SPTP program contributes to Canadian ports and terminals efforts to increase its shore power capacity. The program contributes to Canadian ports and terminals efforts to increase its shore power capacity. The federal government will provide up to 50 per cent of the eligible costs – up to a maximum contribution of $5 million per project. Website: www.tc.gc.ca/sptp	***Transport Canada***	***C. Incentive /Demonstration (ID)***	***C. In progress***	Collaboration with Canadian port authorities, owner and/or operators of marine ports and terminal, is essential for the success of this initiative	Under the first funding round announced in May 2012, the Government of Canada contributed $5 million to the Port of Halifax to implement shore power for cruise ships, beginning with the 2014 cruise season. Also under the first funding round, Seaspan Ferries Corporation received approximately $88,000 to install shore power at the Swartz Bay Terminal on Vancouver Island. Additional projects under the first round of funding will be announced in the coming months.
46 Clean Rail Academic Grant Program Transport Canada is leading the Government of Canada's efforts to reduce rail sector emissions by supporting research of new and emerging technologies. Clean Rail Academic Grant Program provides federal funds to academic research programs currently developing technologies and practices which aim to reduce air emissions from the rail sector. The Program also supports the communication of findings from funded research to other academic institutions or the rail industry. For fiscal year 2012-2013, 10 grants were awarded. The amount of funding being allocated for research and development projects in this funding round is $250,000. Each application is eligible to receive **$25,000.** Website: ***http://www.tc.gc.ca/eng/innovation-571.htm***	***Transport Canada*** Contact: Lon Nadler, Clean Rail program, lon.nadler@tc.gc.ca	***D. Other (specify): Testing and Evaluation***	***C. In progress***		
47 Clean Transportation Research and Development The scope of this initiative is to initiate scientific research that will improve understanding of the technical aspects of reducing emissions within the aviation, marine and rail sectors.	***Transport Canada*** Contact: Lon Nadler,	***D. Other (specify): Testing and Evaluation***	***C. In progress***	Collaboration is done with industrial partners, other Canadian government departments and done in	

CANADA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
The research will also help to identify, demonstrate, and bring to market new emission reduction operational procedures and technologies. Transport Canada has solicited research proposals that meet our criteria. Only proposals that have technology readiness levels (TRLs) of 1 to 6 will be considered for contracts. Website: http://www.tc.gc.ca/eng/innovation-clean-transportation.htm	lon.nadler@tc.gc.ca			coordination with the US counterparts through the Regulatory Cooperation Council.	
48 Clean Transportation Initiative on Port-Related Trucking. Includes $7.5 million over 5 years of Federal contribution funding to support the deployment of technologies and practices to improve efficiency and emissions intensity of port-related trucking at Canada's major container ports. Website: https://www.tc.gc.ca/eng/innovation/trsp-menu-1533.htm	***Transport Canada*** Contact information: trsp-psrc@tc.gc.ca	***C. Incentive /Demonstration (ID)***	***C. In progress*** (Program ends March 31, 2016.)		
49 Canada's Aviation Action Plan to Reduce Greenhouse Gas Emissions from Aviation The Government of Canada and the Canadian aviation industry have released Canada's *Action Plan to Reduce Greenhouse Gas Emissions from Aviation*, which sets an ambitious goal to reduce greenhouse gas emissions from both domestic and international aviation, and identifies key measures that are expected to have the greatest environmental impact.	***Transport Canada*** Contact: Diane McLaughlin, Environmental Analysis and Evaluation, Environmental Policy, Ph: (613) 998-2661; diane.mclaughlin@tc.gc.ca	***D. Other (specify): Voluntary agreement***	***C. In progress***	The development of Canada's Action Plan was influenced by guidance from the International Civil Aviation Organization (ICAO). Developed in collaboration with all segments of the Canadian aviation industry, including: the National Airlines Council of Canada, the Air Transport Association of Canada, the Canadian Airports Council, the Canadian Business Aviation Association, NAV CANADA, and the Aerospace Industries Association of Canada.	Lessons learned: • Collaboration among key stakeholders was key in the development of the Action Plan, and will continue to be to ensure its success. • The federal government has a vital role to bringing stakeholders together, coordinating efforts, and addressing potential issues as they arise.
50 Canada-US Locomotive Emissions Initiative under the Regulatory Cooperation Council The Government of Canada is developing Locomotive Emissions Regulations that will help to reduce criteria air contaminant emissions from locomotives in Canada. The Government of Canada has also worked with the U.S. Environmental Protection Agency on the Canada-U.S. Regulatory Cooperation Council locomotive emissions initiative, in consultation with stakeholders. Website: *http://actionplan.gc.ca/en/page/rcc-ccr/about-regulatory-cooperation-council*	***Transport Canada*** Contact: Diane McLaughlin, Environmental Analysis and Evaluation, Environmental Policy, Ph: (613) 998-2661; diane.mclaughlin@tc.gc.ca	***D. Other (specify): Voluntary agreement***	***C. In progress***	This initiative requires close collaboration with the United States, particularly the U.S. Environmental Protection Agency, the Association of American Railroads, the Railway Association of Canada, Transport Canada, environmental non-governmental	Outcomes/Results: • September 2012 – Rail technology and infrastructure scan finalized; • October 2012 – Railroad workshop held; • April 2013 – Renewal of Canadian Memorandum of

CANADA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
				organizations, and other stakeholders of the rail sector supply chain and industry experts.	Understanding; • January 2014 – Steering Committee established to develop Canada-US voluntary action plan on locomotive emissions.
51 Renewal of Memorandum of Understanding between Transport Canada and the Railway Association of Canada for Reducing Locomotive Emissions Transport Canada worked closely with the Railway Association of Canada on the development of a renewed Memorandum of Understanding, for the 2011-2015 time period, to continue to address emissions from the Canadian rail sector. Website: *http://www.tc.gc.ca/eng/policy/acs-locomotive-emissions-menu-2155.htm*	***Transport Canada*** Contact: Diane McLaughlin, Environmental Analysis and Evaluation, Environmental Policy, Ph: (613) 998-2661; diane.mclaughlin@tc.gc.ca	***D. Other (specify): Voluntary agreement***	***C. In progress***	This renewed MOU encourages Railway Association of Canada member railway companies to continue to voluntarily reduce and report on criteria air contaminant and greenhouse gas emissions over the 2011 to 2015 period.	Outcomes/Results: • Implementation of the renewed Memorandum is underway, this is the third agreement between government and industry to continue to work together to reduce emissions from the Canadian rail sector. • The 2011 Locomotive Emissions Monitoring Program Report is expected to be completed in early 2014.
52 Energy Efficiency Requirements for Marine Vessels ***To reduce greenhouse gas emissions from international shipping*** Canada has enacted national regulations to implement new energy efficiency requirements negotiated under Annex VI of the International Maritime Organization's Convention for the Prevention of Pollution from Ships. The regulations require all vessels of 400 gross tonnage and above to have a Ship Energy Efficiency Management Plan on board stating how each vessel will increase energy efficiency and reduce greenhouse gas emissions. Additionally, under the regulations, new vessels of 400 gross tonnage and above must meet Energy Efficiency Design Index requirements that will increase energy efficiency by 30% by 2025. The Energy Efficiency Design Index requirements do not apply to domestic vessels voyaging only in Canadian waters as it was found that applying the international standards to these vessels, which are smaller and use shorter routes, would result in increased emissions.	***Transport Canada***	***A. Legislation / Regulation (LR)***	***A. Completed/ Concluded*** (June 2013)		
53 Energy Efficiency Requirements for Canadian Marine Vessels that Serve Domestic	***Transport Canada***	***A. Legislation /***	***B. Being***		

CANADA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
Trade ***To reduce greenhouse gas emissions from domestic shipping*** New Canadian ships that serve domestic trade within Canada are currently exempt from the Energy Efficiency Design Index requirements. A technical review found that when the international Energy Efficiency Design Index standard is applied to Canadian ships on domestic service, which are smaller and use shorter routes, the results would reduce the energy efficiency of these ships and increase their carbon dioxide emissions. The technical review recommended ways to apply the Energy Efficiency Design Index to yield the intended results; Transport Canada plans to implement adjusted domestic Energy Efficiency Design Index standards in the future.		***Regulation (LR)***	***planned***		
54 Carbon Dioxide Standards for Aviation ***To reduce greenhouse gas emissions from new airplanes*** Canada is participating in the development of a new international carbon dioxide standard for new airplanes at the International Civil Aviation Organization. Canada plans to adopt the standard once it has been finalized and approved by the International Civil Aviation Organization.	***Transport Canada***	***A. Legislation / Regulation (LR)***	***B. Being planned***		
55 ecoAgriculture Biofuels Capital Initiative (ecoABC) Through the ecoAgriculture Biofuels Capital Initiative (ecoABC), AAFC has committed $60.1 million to ten biofuels projects representing 729 million new litres per year of biofuel production and $54 million of investment by 597 farmers. Website: http://www.agr.gc.ca/eng/?id=1295549500949	***Agriculture and Agri-Food Canada***	***C. Incentive /Demonstration (ID)***	***A. Completed/ Concluded***	Industry	
56 SmartWay The SmartWay Transport Partnership is a collaboration designed to help businesses reduce fuel costs while transporting goods in the cleanest most efficient way possible. SmartWay works with freight carriers and shippers committed to benchmarking their operations, tracking their fuel consumption and improving their annual performance. Originally launched by the United States Environmental Protection Agency in 2004, SmartWay has been administered in Canada by Natural Resources Canada (NRCan) since 2012. Website: http://www.nrcan.gc.ca/energy/efficiency/transportation/commercial-vehicles/smartway/7615	***Natural Resources Canada*** Telephone: 1-855-322-1564 Email: smartway.canada@nrcan-rncan.gc.ca	***B. Education / Training / Outreach (ETO)***	***C. In progress***	Industry	
57 NEW - SD Natural Gas Fund The Government of Canada, Sustainable Development Technology Canada (SDTC) and the Canadian Gas Association created the SD Natural Gas Fund, which will support the	***Sustainable Development Technology Canada***	***C. Incentive /Demonstration (ID)***	***C. In progress***	Industry	

CANADA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
development and demonstration of new downstream natural gas technologies. Transportation (more efficient and lower emission natural gas engines, alternative natural gas engines, lower-cost solutions) is an eligible category. Website: http://www.sdtc.ca/index.php?page=sd-natural-gas-fund&hl=en_CA					

MANITOBA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5.Collaboration***	**Q6. Results***
58 NEW - GrEEEn Trucking Program The program provided incentives to Manitoba's commercial trucking industry to install emission-reduction and fuel reduction technologies. Key objectives of the program were to: - support job growth and contribute to a healthy provincial economy; - promote technology and innovation as a way to reduce greenhouse gas emissions (GHG) in the transportation industry; and - help the private sector implement GHG emission reduction technologies. The program launched in 2009 and ended in 2013, receiving total funding of $225,000. The program provided rebates of up to 25 per cent, to a maximum of $2,500 per tractor or trailer. Eligible upgrades included aerodynamics for tractor and trailer units such as side skirts and front fairings, low-rolling resistance tires, automatic tire-inflation devices and anti-idling technologies.	***Manitoba Infrastructure and Transportation (MIT)*** Contact: Rich Danis, Director, Transportation Policy, Ph: 204-945-0800	**C. Incentive /Demonstration (ID)**	***A. Completed/ Concluded***	MIT delivered this program in partnership with the Manitoba Trucking Association and the University of Manitoba Transport Institute.	Of the $225,000 in program funding, $174,000 was provided to 28 trucking companies for technology upgrades to 106 tractors and 24 trailers. This funding also leveraged about $13 million in upgrades by local transportation companies. It is estimated that this led to a reduction of 3.5 kilotonnes of GHG in 2012.
59 Manitoba's Biofuels Act In 2009, Manitoba became the first jurisdiction in Canada to implement a law requiring biodiesel in its diesel fuel. The purpose of the Act is to encourage and support the production and use of cleaner fuels, such as ethanol and other biofuels. The Act has the following provisions related to biofuels: - It mandates that 85% of gasoline sold in Manitoba must be formulated with 10 per cent ethanol as soon as local production grows to meet demand; - Fuel suppliers must replace at least 8.5% of their gasoline available for sale with ethanol; - A portion of gas tax revenue will be credited to an 8-year Ethanol Fund for the purpose of paying the ethanol production grant; - Ethanol producers currently receive 10 cents/litre of ethanol produced and sold in Manitoba to fuel suppliers, as part of a long term incentive program; - Ethanol grant makes available a production incentive to meet an estimated provincial demand of 130 million litres annually. The amount of this fund declines over the eight year period of the grant program as follows: 20 cents/litre for the first two years, 15 cents/litre for the next three years, and 10 cents/litre for the final three years of the program. This fund is fully subscribed. - A pool average of 2% biodiesel (which can include renewable diesel fuel) must be blended with diesel; - Manitoba has eliminated the 11.5 cent per litre road tax on pure biodiesel (B100) and all taxes on the biodiesel portion of blends with diesel fuel; and - Eligible biodiesel producers in Manitoba receive 14 cents/litre of biodiesel produced in Manitoba. Manitoba's Biodiesel Fund has committed up to $2.8 million annually in production incentives (based on 20 million litres annual demand). This fund is under-subscribed, with an actual distributed amount of	***Manitoba Municipal Government*** Contact: Jeff Cottes, Senior Legislative Analyst, Ph: 204-945-2695	***A. Legislation / Regulation (LR)***	***C. In progress***	There is no formal collaboration with other jurisdictions concerning the legislation, however, there may some opportunities for policy symmetries.	Recent inclusion of renewable diesel fuel suggests more work is required to verify its sustainability, especially in terms of GHG emissions reduction. Despite industry concern that ethanol and biodiesel blended fuels would cause vehicle performance problems, Manitoba has yet to receive a report on systemic technical failures caused by biofuels. This suggests that increasing biofuels content mandates is technically feasible.

MANITOBA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5.Collaboration***	**Q6. Results***
$793,000. The Ethanol and Biodiesel Funds are scheduled to conclude in 2015. This item addresses alternative fuel standards and monetary incentives, in the "Clearing the Air" report. Website: http://www.gov.mb.ca/iem/energy/biofuels/biodiesel/					
60 Manitoba Driver's Handbook The handbook is published by Manitoba Public Insurance and has a specific chapter that discusses the Environmental Consequences of Driving and Fuel Efficient Driving Techniques. This item addresses awareness programs, in the "Clearing the Air" report. Website: http://digitalcollection.gov.mb.ca/awweb/pdfopener?smd=1&did=19273&md=1..	***Manitoba Public Insurance***	***B. Education / Training / Outreach (ETO)***	***C. In progress***		
61 Manitoba's Clean Energy Strategy Manitoba's Clean Energy Strategy discusses the province's priority actions for biofuels, hybrid-electric vehicles, electric vehicles, alternative-powered buses and reducing the use of fossil fuels. This item addresses awareness programs, in the "Clearing the Air" report. Website: http://www.manitoba.ca/iem/energy/index.html	***Manitoba Municipal Government*** Contact: Jim Crone, Executive Director, Energy Division, Ph: 204-945-1874	***E. Government Policy***	***C. In progress***	Manitoba recognizes the important federal role regarding vehicle efficiency standards, and will work with federal counterparts to improve vehicle efficiency.	
62 The Climate Change and Emissions Reduction Act The Act acknowledges that reducing greenhouse gas emission is essential for the protection of human health and the environment, that actions taken by Manitobans can both reduce greenhouse gas emissions and promote sustainable economic development and energy security and this will require cooperative, complementary and compatible activities across all sectors of the Manitoba economy. Provisions in the Act include: - Prescribing a fuel efficiency standard for new private vehicles acquired for use by the Government of Manitoba; - Finding the most cost-effective efficiency improvements and emission reductions that are feasible for new private vehicles in each year from 2010 o 2016 inclusive; and - Finding feasible and cost-effective efficiency improvements and emissions reductions for new private vehicles in 2017 and afterwards. This item addresses vehicle emission standards, in the "Clearing the Air" report. Website: http://web2.gov.mb.ca/laws/statutes/ccsm/c135e.php	***Manitoba Conservation and Water Stewardship*** Contact: Neil Cunningham, Director, Ph: 204-232-0950	***A. Legislation / Regulation (LR)***	***C. In progress***	The Vehicle Standards Advisory Board report provides examples of programs and policies from other jurisdictions that could be implemented in Manitoba.	Manitoba represents a very small segment of the North American automobile market. As such, developing emissions standards provincially is not practical.

MANITOBA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5.Collaboration***	**Q6. Results***
63 Climate Change Connection Climate Change Connection is a non-government organization that hosts an anti-idling educational awareness program that lists idling facts, provides solutions, hosts modules for public school programming and offers Idle Free Zone signs in French and English. Manitoba's funding is approximately $100,000, provided through an annual grant from the Climate Change Branch of Manitoba Conservation and Water Stewardship. This item addresses idle control education programs, in the "Clearing the Air" report. Website: http://www.climatechangeconnection.org/Solutions/Idling.htm	***Manitoba Conservation and Water Stewardship*** Contact: Neil Cunningham, Director, Ph: 204-232-0950	***B. Education / Training / Outreach (ETO)***	***C. In progress***	Climate Change Connection works with other jurisdictions in the delivery of national programs such as the annual Commuter Challenge.	
64 Light Vehicle Inspection Light Vehicle Inspection Methods and Standards Handbook The "Light Vehicle Inspection Methods and Standards Handbook" outlines the inspection procedures and criteria for determining vehicle compliance with the standards of safety and repair maintained by the Registrar of Motor Vehicles. The book is published by Manitoba Public Insurance, a crown corporation, in accordance with Manitoba Regulation75/94, the Vehicle Safety Inspection Regulation under Manitoba's *Highway Traffic Act*. The handbook mandates a yearly inspection of the catalytic converter and any other emission control equipment on motor vehicles manufactured on or after January 1, 1995. The inspection is classified as a fail if the vehicle is missing a catalytic converter or any other emission equipment. Website: http://www.mpi.mb.ca/en/PDFs/VSIHandbook.pdf Vehicle Safety and Inspection Program Manitoba Public Insurance, Vehicle Standards and Inspections, is responsible for Manitoba's vehicle inspection standards and oversees administration of the vehicle inspection programs that are currently in place. In particular, the Vehicle Safety and Inspection Program helps ensure vehicles meet the equipment requirements set out in Manitoba's *Highway Traffic Act*. Vehicles are required by law to meet minimum standards at a certified inspection facility, evidenced by a certificate of inspection when ownership is transferred or a vehicle becomes resident in Manitoba. Roadside inspections are also used to ensure vehicles are properly maintained and meet minimum standards. This item addresses inspection and maintenance programs, in the "Clearing the Air" report. Website: http://www.mpi.mb.ca/en/Reg-and-Ins/Registration/VSI/pages/reg-safetyandinspection.aspx	***Manitoba Public Insurance***	***A. Legislation / Regulation (LR)***	***C. In progress***	Vehicle emissions testing programs elsewhere were looked at to determine if these could be implemented in Manitoba.	See ***Results below.

MANITOBA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5.Collaboration***	**Q6. Results***
*** Results Emissions testing in Ontario and British Columbia were put in place due to air quality issues rather than to achieve climate change objectives. Rationalizing a similar program in Manitoba could not be done on the basis of climate change. Manitoba does not have the same air quality issues encountered in other jurisdictions, so a mandatory emissions testing program was not viewed as cost effective in Manitoba. Dealing with emissions from older vehicles requires caution. The air quality benefits associated with newer technology are real and can be quantified. GHG benefits are more difficult to determine as they can be impacted by driving habits, vehicle maintenance habits, and other behaviours. When considering programs to remove older vehicles from roads, or inspections that may prohibit the use of vehicles that don`t achieve inspection standards, issues related to access to work may emerge (i.e inspection programs may be seen to be penalizing low-wage earners if they are prohibited from using their vehicles due to non-compliance with inspection criteria).					
65 NEW - All-Electric Bus Development and Demonstration An all-electric transit bus was completed in 2011 at a total cost of $3 million and involved five partners: Government of Manitoba; Mitsubishi Heavy Industries (MHI), Manitoba Hydro, New Flyer and Red River College. The success of this project resulted in the production of four additional battery-powered buses by New Flyer in 2012 supported in part with funding of $3.4 million from Sustainable Development Technology Canada (SDTC). The City of Winnipeg also became a partner in the expanded project, with buses intended to be operated on an actual in-service route for four years. Demonstration activities with all of the buses will be moving forward during 2014, and continuing in subsequent years. The overall purpose of the project, as originally outlined has been: - To develop a prototype, advanced battery-electric bus, combining battery technologies from MHI with bus technologies from New Flyer; - To demonstrate the advanced battery-electric bus and associated advanced-charging technologies; - To validate operational capabilities for use under Manitoba's highly variable climate conditions; and - Importantly, to use the demonstration as a showcase for other potential markets within North America. The value of the initial prototype bus project was $3 million. This value was rolled into the larger expanded bus project, which has a total value of approximately $10.3 million. This is a new item that addresses alternative fuels. Weblinks: Initial prototype bus project announcement: http://news.gov.mb.ca/news/index.html?archive=2011-4-01&item=11342 Unveiling of completed prototype bus announcement: http://news.gov.mb.ca/news/index.html?archive=2012-6-01&item=14422 Federal announcement of funding for expanded electric bus project: https://www.nrcan.gc.ca/media-room/backgrounders/2012/3305	***Manitoba Municipal Government*** Contact: Jim Crone, Executive Director, Energy Division, Ph: 204-945-1874	***C. Incentive / Demonstration(ID)***	***C. In progress***	Project already has involved extensive collaboration with companies and agencies from outside Manitoba. MHI, based in Japan, has been a key project partner since the beginning. By 2012, the project was expanded involving Federal funding from SDTC.	This project is still underway, not scheduled for final completion until 2018. By June of 2012 the initial prototype all-electric bus was unveiled and has been operated since then to gain experience. Preliminary analysis suggests that the replacement of a conventional diesel bus with an all-electric transit bus in a jurisdiction with highly renewable electricity (like Manitoba) yields an annual reduction of approximately 160 tonnes of GHG per bus per year.
66 NEW - Active Transportation (AT) As part of TomorrowNOW – Manitoba's Green Plan, the Province is moving forward with a three-year, four point Action Plan to support active transportation (AT), focusing on improved provincial	***Manitoba Municipal Government***	***C. Incentive / Demonstration(ID)***	***C. In progress***	Manitoba provides funding to municipalities for AT projects.	

MANITOBA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5.Collaboration***	**Q6. Results***
coordination in the following areas: - Single Window Coordinated Policy Services; - Strategic Investments in AT; - Improved AT Policy; and - Expanded AT Resources. Since 2011, Manitoba has invested more than $17 million in support of AT. This includes investments in cycling and walking facilities in education and awareness initiatives on road safety and the Small Communities Active Transportation Fund, which provides a total of $1 million in cost-shared funding in 2012/13 and 2013/14 to Manitoba communities with populations less than 50,000. Eligible projects for active transportation infrastructure include: - Bicycle security (e.g. racks, storage lockers, enclosures); - Bicycle facilities (e.g. bike lanes, paths, roadway configuration on or off road); - Sidewalks/pathways for pedestrian use, curb cut-outs, or ramps to enhance accessibility; - Lighting and signage on sidewalks, trails and bike paths; and - Active transportation design (e.g. pathway design plans, update of a Transportation Plan to include an AT plan). Website: http://www.gov.mb.ca/ia/at/index.html	Contact: Vicky Reaney, Provincial Active Transportation Coordinator, Ph: 204-945-8794			Manitoba also works closely with Manitoba Public insurance on road safety and driver education initiatives.	
67 NEW – Light-Duty Electric Vehicles Roadmap Manitoba's Electric Vehicle Road Map outlined three directions: (i) facilitating partnerships to undertake testing and demonstration of selected electric vehicles within Manitoba; (ii) creation of an Electric Vehicle Advisory Committee (EVAC) to provide recommendations to government on how to accelerate the adoption of electric vehicles; and (iii) creation of the Electric Vehicle Technology & Education Centre (EVTEC) at Red River College to facilitate the dissemination of practical knowledge about electric vehicles and provide hands-on experience. The overall purpose of the project, as originally outlined has been: - To accelerate adoption of electric vehicles within Manitoba; - To demonstrate operational capabilities of electric vehicles, particularly under Manitoba's highly variable climate conditions; and - Enhance capacity within Manitoba to address electric vehicles and their associated requirements. Expenditures on this initiative total $805,000. This is a new item that addresses alternative fuels. Weblinks: Manitoba's Electric Vehicle Road Map (2011): http://www.manitoba.ca/iem/energy/transportation/images/elec_vehicle_road_map.pdf Associated announcement:	***Manitoba Municipal Government*** Contact: Jim Crone, Executive Director, Energy Division, Ph: 204-945-1874	***E. Government Policy***	***C. In progress***	Electric vehicle activities have involved extensive collaboration, both between agencies within Manitoba and a variety of corporations, including MOUs signed with several electric vehicle manufacturers.	

MANITOBA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5.Collaboration***	**Q6. Results***
http://news.gov.mb.ca/news/index.html?archive=2011-4-01&item=11325 Report of the Electric Vehicle Advisory Committee (EVAC) (2012): http://www.gov.mb.ca/iem/energy/transportation/images/ev_advisory_committee_final_report.pdf Associated announcement: http://news.gov.mb.ca/news/?item=14421 Creation of the EVTEC at Red River College, announcement: http://news.gov.mb.ca/news/index.html?archive=2011-4-01&item=11342 Red River College Factsheet on EVTEC: http://www.rrc.mb.ca/files/file/appliedresearch/Evtecfactsheet.pdf					

NEW BRUNSWICK					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
68 The New Brunswick Climate Change Action Plan 2007–2012	***Environment and Local Government (ELG)*** However, several DTI initiatives were included in the Action Plan Contact: Climate Change Secretariat	***B. Education / Training / Outreach (ETO)***	***A. Completed/ Concluded***		*2011-2012 Progress Report*
69 Long Combination Vehicle (LCVs) special permits More information	***Department of Transportation and Infrastructure (DTI)*** Contact: PSD , Planning and Strategic Development (PSD)	***B. Education / Training / Outreach (ETO)***	***C. In progress***	Continued work on the harmonization of conditions for the movement of LCVs between New Brunswick, Nova Scotia, Quebec and Ontario.	
70 Anti-idling Policy	***Department of Transportation and Infrastructure (DTI)*** Contact: VMA, Vehicle Management Agency (VMA)	***A. Legislation / Regulation (LR)***	***C. In progress***		
71 New - New Brunswick Climate Change Action Plan 2014–2020 The Department of Environment and Local Government (ELG), through the Climate Change Secretariat, is nearing the completion of renewing New Brunswick's Climate Change Action Plan (2014-2020).	***Environment and Local Government (ELG)*** However, DTI was consulted and several Department initiatives are included in the Action Plan Contact: Climate Change Secretariat	***B. Education / Training / Outreach (ETO)***	***C. In progress***		
72 NEW - Transportation and Air Quality Committee (TAQC) The 37th Annual Conference of the New England Governors and Eastern Canadian Premiers (NEG/ECP) in September 2013 resulted in 2 resolutions: **Resolution 37-1** was passed concerning transportation including: • providing transportation choices that will facilitate a more sustainable transportation future, including the use of advanced technology and alternative fuel vehicles;	***Department of Transportation and Infrastructure (DTI)*** Contact: PSD	***B. Education / Training / Outreach (ETO)***	***C. In progress***	Collaboration is occurring through the New England Governors and Eastern Canadian Premiers (NEG/ECP) - Transportation and Air Quality Committee (TAQC). TAQC consists of representatives of the state and provincial environmental agency air bureaus and transportation departments, as appointed by the Governors and Premiers. New Brunswick representation includes DTI (Canadian co-chair) and ELG.	

NEW BRUNSWICK					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
• achieving a regional five percent fleet market share penetration of alternative fuel vehicles by 2020 and facilitate the availability of refuelling stations to support those vehicles; • providing to governors and premiers at the 2014 NEG/ECP Annual Conference a proposed regional target for enhanced public transportation, biking and walking options for a sustainable transportation system; • maintaining a regional network of expertise on sustainable transportation, greenhouse gas emission mitigation, and air quality; and • developing a regional profile of the fleet fuel efficiency and greenhouse gas emission of light duty vehicles as well as the number of Plug-in Hybrid Electric Vehicles, Battery Electric Vehicles and Natural Gas Vehicles in the states and provinces. More Information **Resolution 37-2** was also passed concerning regional initiatives to encourage greater use of alternative fuel vehicles. More Information					

NEWFOUNDLAND AND LABRADOR					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
73 Turn Back the Tide Website The Office of Climate Change and Energy Efficiency offers *Turn Back the Tide*, an online clearinghouse for emissions reduction resources. These include a carbon calculator; tools for selecting an efficient vehicle; tips for fuel efficient driving behaviour, as well as fleet management. Website: http://www.turnbackthetide.ca/	***Office of Climate Change and Energy Efficiency, Executive Council***	***B. Education / Training / Outreach (ETO)***	***C. In progress***		
74 Anti-Idling Programs An anti-idling campaign was introduced as a commitment in the 2005 Climate Change Plan. The Government of Newfoundland and Labrador provided funding to the Newfoundland and Labrador Lung Association for an anti-idling project. Through this initiative dedicated signage was developed and partnerships were established with local School Boards. Although the project ended in 2010, signage is still present throughout the province. The Department of Environment and Conservation has also implemented anti-idling zones around public buildings, which help reduce fuel costs as well as local air pollutants. Other initiatives: Newfoundland and Labrador has also delivered a number of other programs including Tire Pressure Information Clinics (Awareness) and a Retire Your Ride program aimed at reducing the number of older, high-emitting vehicles on provincial roads (Scrappage).	***Department of Environment and Conservation***	***B. Education / Training / Outreach (ETO)***	***A. Completed/ Concluded***		
75 NEW - Metrobus Mini-Hybrid Project Through the Green Fund, the Government of Newfoundland and Labrador provided $85,000 in funding for the Metrobus mini-hybrid project. The public transit demonstration/pilot project allowed the St. John's Transportation Commission to install mini hybrid devices on six buses to help reduce the environmental impact. Website: http://www.env.gov.nl.ca/env/nlgf/projects/gf57.html	***Department of Environment and Conservation*** Contact: Mike Carroll	**C. Incentive /Demonstration (ID)**	***C. In progress***		Along with a reduction in fuel consumption, the system will also help remove debris from the engines' radiators, resulting in more efficiently operating engines.
76 NEW - Climate Change Action Plan The 2011 Climate Change Action Plan committed that 35 per cent of all new car and SUV purchases would be energy efficient or hybrid. This applies to use by government departments, agencies, boards and commissions.	***Department of Transportation and Works***	***E. Government Policy***	***C. In progress***		Ongoing, but NL is currently exceeding the target of 35%.
77 NEW - Driver Training Material Review new driver training material and examinations for opportunities to strengthen driver knowledge on fuel-saving opportunities. Energy efficient tips have been added to the driving guide.	***Service NL***	***B. Education / Training / Outreach (ETO)***	***C. In progress***		

NORTHWEST TERRITORIES					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
78 NEW - Deh Cho Bridge The opening of the Deh Cho Bridge across the Mackenzie River has eliminated the operation of the Merv Hardie ferry and the seasonal construction of the Mackenzie ice bridge.	***Department of Transportation***	***D. Other (specify): Department Practice***	***A. Completed/ Concluded***	No collaboration with other jurisdictions took place during the completion of this initiative.	With the opening of the Deh Cho Bridge the department has achieved a reduction in the consumption of 440,000 litres of diesel per year with the elimination of the Merv Hardie Ferry. An estimated 50,000 vehicles per year that would have been left idling for an average of fifteen minutes will now be able to continue on their ways, consuming less gas. Yearly fuel consumption from the construction of the ice bridge normally maintained during the winter over the Mackenzie crossing has also been eliminated.
79 Anti-Tempering Legislation Although not explicit, article 75 of the Motor Vehicle Regulations (SI-013-92) under the Northwest Territories Motor Vehicles Act appears to imply anti-tampering of the emissions control system: 75: (1) No person shall operate a vehicle unless it is equipped with an exhaust system designed according to the manufacturer's specifications.	***Department of Transportation***	***A. Legislation / Regulation (LR)***	***A. Completed/ Concluded***	No collaboration with other jurisdictions took place during the completion of this initiative.	This legislation has discouraged operators of motor vehicles from modifying their vehicle exhaust systems in ways that will reduce efficiency and cause increased effects upon air quality and the environment. It encourages drivers to keep their vehicles maintained to the basic environmental standards.
80 Professional Operators License Information Pamphlet The Department of Transportation's Professional Operators License information pamphlet includes a chapter on "Keeping Your Fleet Green". The chapter outlines the fuel efficiency achievements made possible by driving behaviours and maintenance regimes.	***Department of Transportation***	***B. Education / Training / Outreach (ETO)***	***A. Completed/ Concluded***	No collaboration with other jurisdictions took place during the completion of this initiative.	On-road vehicles are a significant contributor to greenhouse gases in the transportation section. This initiative has helped the department to foster a culture of driver behaviour that reflects green initiatives and encourages proper maintenance as a way of insuring top vehicle efficiency.
81 NEW - Green Light Green Light is the Department of Transportation's environmental strategy which highlights the department's existing environmental practices and sets a goal of fostering a corporate culture of environmental excellence.	***Department of Transportation***	***E. Government Policy***	***A. Completed/ Concluded***	No collaboration with other jurisdictions took place during the completion of this initiative.	Green Light has resulted in an organized approach for the department in moving forward on its environmental initiatives. The Action Plan sets priority actions for both the short term and medium term. Already, the department has completed a Climate Change Adaptation Strategy, formed the basis of a Greenhouse Gas Reduction Plan and created a department Green Team based on this strategy.
82 NEW – Greenhouse Gas Reduction Plan The department is drafting a Greenhouse Gas Reduction Plan that will assess the department's energy usage by identifying practices that contribute to emissions in the Northwest Territories.	***Department of Transportation***	***E. Government Policy***	***C. In progress***	Potential collaboration with the public, industry, and federal government could result in going forward with the plan.	The plan will outline current practices for reducing the department's contribution, adopt methods used in other jurisdictions to reduce energy consumption, and emphasize the need for partnerships in order to achieve an industry-wide reduction in transportation-related greenhouse gas emissions across the North while taking the GNWT one step closer to its reduction goals.
83 NEW - Energy Efficient Vehicles	***Department of***	***C. Incentive***	***A.***	No collaboration with	Analysis after two years of use revealed that the vehicles were

NORTHWEST TERRITORIES					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
The Department of Transportation acquired a hybrid pickup truck and Smart car as part of a pilot project undertaken to demonstrate and assess the use of energy efficient vehicles.	***Transportation***	***/Demonstration (ID)***	***Completed/ Concluded***	other jurisdictions took place during the completion of this initiative.	consuming 25 - 30% less fuel compared to standard fuel vehicles. These results are present in documents like the draft Greenhouse Gas Reduction Plan, informing the public of the benefits of alternative energy vehicles.
84 NEW – Extended Ferry Operating Season In support of the supply of LNG to Inuvik, the Department of Transportation extended the ferry operating season of the Abraham Francis and Louis Cardinal ferries along the Dempster highway. The ferries continued to operate in a channel until the ice bridges used in the winter season reached their full carrying capacity.	***Department of Transportation***	***E. Government Policy***	***A. Completed/ Concluded***	No collaboration with other jurisdictions took place during the completion of this initiative.	This initiative allowed for the uninterrupted resupply of LNG, propane, and other commodities during freeze-up, lowering the cost of living in the region. Although the ferry service at the Arctic Red River could not be extended as long as originally planned, small vehicles and commercial carriers experienced significantly increased efficiency during their travels. On the Mackenzie River, commercial vehicles weighing up to 40,000 kg were able to cross the ice bridge 5 days after the ferry had stopped for the season. The department is currently conducting a review of the past season to identify issues, challenges, possible mitigating measures and the costs to provide the service.
85 NEW - Commercial Vehicle Configurations The Department of Transportation is currently considering several changes to commercial vehicle regulations that would simultaneously increase efficiency and reduce emissions. This includes increased weights on fuels trucks and other commercial vehicles, a two-year trial period for 'tri-dem' vehicles on northern roadways, and the use of streamlining technologies for vehicles.	***Department of Transportation***	***A. Legislation / Regulation (LR)***	***C. In progress***	Collaboration with Industry	DOT has established a two-year trial period expiring June 31, 2015 allowing the commercial trucking industry to drive vehicles in the tridem drive tractor, tridem semitrailer (7 axles), configuration on NWT highways. The department has also granted special permits to the mining industry allowing tridem drive tractors to pull super B-train loads (9 axles) for a two-year trial period expiring November 31, 2015 from Hay River to the diamond mines north of Yellowknife. While this is likely to increase vehicle efficiency while reducing emissions, the department will be monitoring the effects increased loads have on roads.
86 NEW - Carbon Footprint of the Inuvik to Tuktoyaktuk Highway (ITH) The purpose of this report is to present initial findings regarding greenhouse gas emissions associated with the proposed Inuvik to Tuktoyaktuk highway project.	***Department of Transportation***	***E. Government Policy***	***A. Completed/ Concluded***	No collaboration with other jurisdictions took place during the completion of this initiative.	The department has developed two scenarios based on traffic volume for projecting future greenhouse gas emissions after the construction of the highway. In the low traffic scenario, the estimated reduction in GHG emissions over time would offset the estimated emissions during construction. More modest reductions of GHG emission associated with the high traffic scenario would not offset the estimated emissions during construction. DOT is investigating opportunities to reduce fuel consumption during the construction phase of the highway.

NORTHWEST TERRITORIES					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
87 NEW - Equipment Modernization and Infrastructure Improvements The Department of Transportation has made an effort to improve the fuel efficiency of its ferry and heavy equipment fleet. Recent ferry upgrades have focused on installing more efficient engines and reducing idling time. DOT has an ongoing program replacing aging equipment with more fuel efficient equipment and is considering ways to test Hybrid Heavy Equipment. Improving infrastructure though better surface conditions, shortened distances via highway straightening, improved roadway geometrics and enhanced levels of service also contribute to efficiency.	***Department of Transportation***	***D. Other (specify): Department Practice***	***A. Completed/ Concluded***	No collaboration with other jurisdictions took place during the completion of this initiative.	The Louis Cardinal ferry has received the most recent efficiency upgrades and was modified before the 2013 ferry season to support an extended operating period. The department works continuously on improvements to highway surface conditions. Most recently, the Highway 4 realignment was opened to traffic, marking an improved route that directs drivers away from the poor road conditions around the Giant Mine site.

NOVA SCOTIA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5.Collaboration***	**Q6. Results***
88 Active and Safe Routes to School Department of Health and Wellness provides funding to the Ecology Action Centre, a non-government organization, to run this program the active and safe routes to school program. Website: http://www.saferoutesns.ca/	***Department of Health and Wellness***	***B. Education / Training / Outreach (ETO)***	***C. In progress*** This program has run for many years and continues to do so.		
89 Transit Improvement Service Nova Scotia and Municipal Relations currently administers the 3 programs. The Community Transit Assistance program (CTAP), and Accessible Transit Assistance Program (ATAP) and the Nova Scotia Transit Research incentive program (NSTRIP), each of which provide funding to community transit service providers in various capacities. Website: http://www.novascotia.ca/snsmr/municipal/funding/community-grants-and-programs.asp	***Service Nova Scotia and Municipal Relations*** Contact within NS TIR: Bernie Swan, Policy Advisor, swanb@gov.ns.ca	***C. Incentive /Demonstration (ID)***	***C. In progress*** This program has run for many years and continues to do so.		
90 Long Combination Vehicle (LCV) program Website: http://novascotia.ca/tran/trucking/LCVGuidelines.pdf	***Nova Scotia Transportation and Infrastructure Renewal (NS TIR)*** Contact: Michael Balsom, Manager, Fleet Services, balsommg@gov.ns.ca	***A. Legislation / Regulation (LR)***	***C. In progress*** Began as pilot project in 2008. Currently 10 carriers permitted to run LCVs in the Province (57 permits) -2013.		The LCV pilot program has finished its 'pilot' stage and is now a full program under the auspices of 'special move' permits.
91 SmartDriver for Highway Trucking Workshop In the SmartDriver for Highway Trucking workshop (NRCAN), all equipment operators trained in this module: http://fleetsmart.nrcan.gc.ca/index.cfm?fuseaction=smartdriver.highway	***Nova Scotia Transportation and Infrastructure Renewal (NS TIR)***	***B. Education / Training / Outreach (ETO)***	***C. In progress***		
92 Vehicle Policy in Manual 300 Only those vehicles that meet or exceed the air quality and environmental impact requirements of the current edition of the Province of Nova Scotia Government Vehicle Specification will be selected. This specification will be updated as needed to reflect best available technology in the local market for fuel efficiency, air quality and environmental impacts.	***Nova Scotia Transportation and Infrastructure Renewal (NS TIR)***	***B. Education / Training / Outreach (ETO)***	***C. In progress***		
93 Anti-Idling Policy	***Nova Scotia***	***B. Education /***	***C. In progress***		

NOVA SCOTIA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5.Collaboration***	**Q6. Results***
According to the policy, vehicles should not remain running while in a parked position for no longer than a minute. Vehicles should also not be allowed to idle at all if they are within 30 meters of a ventilation system intake, open window of a workplace or entrance of a workplace.	***Transportation and Infrastructure Renewal (NS TIR)***	***Training / Outreach (ETO)***			
94 Roundabout Implementation Program Not an official TIR program but Highway Planning and Design staff have been very systematic and organized in the implementation of roundabouts to intersections in the province and the education of practitioners and the general public in the design and operation of roundabouts. The safety and operational advantages and the reduction in greenhouse gas emissions related to roundabout use has been highly documented from around the world for years.	***Nova Scotia Transportation and Infrastructure Renewal (NS TIR)*** Contact: Keith Boddy, Highway Design Engineer, boddyke@gov.ns.ca	***C. Incentive /Demonstration (ID)***	***C. In progress***	Nova Scotia has taken the lead in Canada for our comprehensive approach to the implementation of roundabouts and have staff currently involved with Transportation Association of Canada (TAC) in developing guidelines and training.	Started in 2002 with the first roundabout opening in 2006 at Avonport. MVA updated in 2004 to reflect a "yield on entry" rule, necessary for proper roundabout operation. There are 18 roundabouts constructed and in operation or nearing completion as of 2011. There are 16 roundabouts in the planning/design/tender stage.
95 Greener Paving Methods Cold In-Place Recycling • The province first started using recycling methods for the rehabilitation of roadways as early as 1997. • There are three types of cold in-place recycling processes that are performed in the province; partial depth reclamation with foamed asphalt stabilization or asphalt emulsion stabilization, full depth reclamation with foamed asphalt stabilization, and full depth reclamation with Portland cement stabilization. • The processes aforementioned stabilize the existing aged pavement through the addition of asphalt or cement. The benefits of using these processes is that the existing pavement materials are fully used, minimizing the importation and use of new materials which in turn reduces overall energy consumption and its effect on the environment. Additional benefits include a more stable pavement layer, reduction in distresses due the subgrade, a shorter construction period and cost effectiveness. Warm Asphalt Mix • The use of Warm Mix Asphalt (WMA) additives and technologies provides benefits that aid the environment and asphalt paving industry. Through the use of these additives and technologies, the production temperatures of asphalt concrete can be reduced significantly and still achieve the same or better results on the road. • In 2009, the province conducted its first trial with WMA, followed by three more trial projects in 2010. Approximately 29,000-tonne of WMA was placed for the	***Nova Scotia Transportation and Infrastructure Renewal (NS TIR)***	***C. Incentive /Demonstration (ID)***	***C. In progress***		Cold In-Place Recycling Since 1997 the use of cold in-place asphalt recycling processes has made up approximately 15% of the capitalized asphalt repaving program. In 2011, the province used these processes on approximately 80-km of roadway throughout the province. Warm Asphalt Mix The benefit of reduced production temperatures is associated with Greenhouse Gas emissions from the asphalt production facility. For the paving

NOVA SCOTIA					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5.Collaboration***	**Q6. Results***
four trial projects in 2009 and 2010. In 2011, the province was open to requests from contractors who wished to use WMA on their projects. Those contractors that wished to use a WMA additive or technology, did so at their own cost. Approximately 7,650-tonne of WMA was mandated for use in 2011 for late season paving.					industry, WMA additives and technologies provide numerous benefits that include lower production costs associated with fuel and electrical power, longer haul distances, improved compaction of the mix in the field, and placement in colder outside temperatures associated with the early spring and late fall.

ONTARIO					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
96 EV Incentive Program Ontario consumers are eligible under the EV Incentive Program for an incentive ranging from $5,000 to $8,500 towards the purchase or lease of a new plug-in hybrid electric or battery electric vehicle. Incentives are available to persons, businesses, municipalities, non-government organizations and non-profit groups. The maximum number of incentives received per calendar year is 25. On January 2, 2013, an incentive of up to $1,000 is for the purchase and installation of a charging station for home or business use was launched. The purpose of this program is to support the adoption of EVs in Ontario. Indicators include the number of incentives provided and the number of EVs on the road in Ontario. Contribution to climate change mitigation by replacing gasoline-fuelled vehicles with fully or partially electric vehicles. The amount of funding for this initiative is not for public information. Website: www.ontario.ca/electricvehicles	***Ontario Ministry of Transportation (MTO)*** Contact: Rob Dolezel, robert.dolezel@ontario.ca	***B. Education / Training / Outreach (ETO)***	***C. In progress***	Yes, consistent education and promotion of electric vehicles and their benefits across the country would be beneficial and would help increase uptake of electric vehicles by building awareness. Partners could include utilities, different levels of government along with the private sector. Collaboration is already occurring between ministries (Staff-level Working Group and ADM Steering Committee). MTO is also working with a few NGOs to conduct research and perform public education.	Market availability of new technologies and general awareness has a big impact on new technology uptake.
97 Green Licence Plate Program Under Ontario's green license plate program, certain plug-in hybrid and battery electric vehicles are eligible to use the HOV lanes without a second occupant. To date, Ontario has constructed 83 kilometres of HOV lanes on the provincial highway network in the Greater Toronto Area and Ottawa. HOV lanes are currently on Highways 403, 404, 417 and the Queen Elizabeth Way. The purpose of this program is to support the adoption of EVs in Ontario. Indicators include the number of incentives provided and the number of EVs on the road in Ontario. Contribution to climate change mitigation by replacing gasoline-fuelled vehicles with fully or partially electric vehicles. The amount of funding for this initiative is not for public information. Website: www.ontario.ca/electricvehicles	***Ontario Ministry of Transportation (MTO)*** Contact: Rob Dolezel, robert.dolezel@ontario.ca	***B. Education / Training / Outreach (ETO)***	***C. In progress***	Yes, consistent education and promotion of electric vehicles and their benefits across the country would be beneficial and would help increase uptake of electric vehicles by building awareness. Partners could include utilities, different levels of government along with the private sector. Collaboration is already occurring between ministries (Staff-level Working Group and ADM Steering Committee). MTO is also working with a few NGOs to conduct research and perform public education.	Market availability of new technologies and general awareness has a big impact on new technology uptake.
98 NEW – Green Commercial Vehicle Program	***Ontario Ministry of***	***C. Incentive***	***A. Completed/***	Stakeholder consultations	See *** Results below.

ONTARIO					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
Grants were provided to qualified Ontario companies that supported one-third of the eligible cost of anti-idling devices and alternative fuel vehicles up to a specified cap. The objective of the initiative was to support the purchase of green vehicles and add-on technologies by the private sector to improve their economic competitiveness and reduce greenhouse gas emissions. A total of $4.7 million was flowed to 169 companies for 1,635 vehicles. A weblink with additional information is being established.	***Transportation (MTO)*** Contact: Julius Gorys, Julius.gorys@ontario.ca	***/Demonstration (ID)***	***Concluded***	were undertaken to help develop and deliver the initiative. Collaboration was with environmental groups, alternative technology and fuel producers, trucking industry and associations and other government ministries. Consultation was essential for finalizing and revising program design and implementation elements to ensure eligibility criteria, the application process, and data collection and grant funding structure was reasonable and effective.	
*** Results The program had a number of accomplishments including significant leveraging of private sector investments in green vehicles and technologies: $24 million versus $4.7 million in grants; lifecycle fuel savings of approximately 18 million litres and 72,000 lifecycle tonnes of GHG avoided. Program demand was lower than anticipated because of buying cycles, the economic downturn, and the purchase of less expensive technologies than originally projected. Programs such as these reduce the payback period for firms enabling more vehicles or devices to be purchased and encouraged broader market change; showcasing these vehicles and devices resulted in the acquisition of more of the same even without government grants.					
99 NEW – Vehicles Powered by Alternative Fuels Program People who purchase or lease new or used vehicles licensed under the Highway Traffic Act (e.g., automobiles, buses, trucks, and vans) may qualify for a rebate of retail sales tax (RST) if the vehicles operate or are converted to operate on an alternative fuel. The objective of this program was to promote the adoption of alternatively fuelled vehicles in Ontario. Indicators included the number of incentives provided and the number of alternatively fuelled vehicles on the road in Ontario. Contribution to climate change mitigation by replacing gasoline-fuelled vehicles with alternatively fuelled vehicles. A rebate of the 8% RST paid on vehicles powered by alternative fuels, including RST paid on any conversion costs, is limited to: • $750 for propane vehicles • $1,000 for vehicles powered by any other alternative fuel	***Ontario Ministry of Finance***	***C. Incentive /Demonstration (ID)***	***A. Completed/ Concluded***	Contact Ontario Ministry of Finance for details	Contact Ontario Ministry of Finance for details

ONTARIO					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
• $1,000 for HEVs delivered to purchasers after May 9, 2001 and before March 24, 2006 • $2,000 for HEVs delivered to purchasers after March 23, 2006 and before April 1, 2012. Website: http://www.fin.gov.on.ca/en/refund/vpaf/					
100 NEW – Sustainability InSight Sustainability InSight was created to guide the Ministry of Transportation's (MTO) activities in managing the province's transportation system in a more sustainable way. It sets out to both: ingrain sustainability into the internal business practices and behaviour of the ministry; and to influence the ministry's policies and programs that affect the external provincial transportation system. The strategy's goals are to be reached over time by completing specific actions articulated in three-year Sustainability Implementation Plans (SIPs). Sustainability InSight is guided by seven strategic goals. Implementing the strategy will help MTO achieve its vision of being a world leader in moving people and goods safely, efficiently and sustainably, and to support a globally competitive economy and a high quality of life. Climate change is one of many pressures on the transportation system; moving toward a more sustainable system includes taking and encouraging actions to reduce greenhouse gas emissions from transportation. The strategy is incorporated and implemented through regular business planning and capital investment. Website: http://www.mto.gov.on.ca/english/sustainability/strategy/	***Ontario Ministry of Transportation (MTO)*** Contact: Bram Westfall, Bram.westfall@ontario.ca	***E. Government Policy***	***C. In progress***	MTO working across all divisions to implement.	See *** Results below.
*** Results In 2012, the first Sustainability Implementation Plan (SIP) was publicly released, outlining specific commitments the MTO will take over the course of three years (2011-13) to work toward the strategy's seven goals. The plan contains a description of projects in varying stages of implementation, 2011 achievements and 2012 and 2013 milestones. The SIP indicates that MTO will provide a comprehensive update on all commitments in the current plan when it releases its next SIP at the end of the 3 year period.					
101 NEW - #CycleON : Ontario's Cycling Strategy Released on August 30, 2013, the Strategy establishes a 20-year vision, goals and strategic directions to increase cycling as a viable transportation choice. The Strategy will be implemented through a series of action plans. The Cycling Strategy's vision is that by 2033 cycling in Ontario is recognized, respected and valued as a core mode of transportation that provides individuals and communities with health, economic, social and other benefits. Increasing the transportation mode	***Ontario Ministry of Transportation (MTO)*** Contact: Bram Westfall, Bram.westfall@ontario.ca	***E. Government Policy***	***C. In progress*** First Action Plan under development.	The Cycling Strategy is a multi-ministry initiative, led by MTO with involvement of 11 partner ministries. The Strategy is also being implemented through the actions of external partners, including municipalities.	MTO will develop indicators to measure progress towards achieving Cycling Strategy's goals.

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Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
share of cycling will help to reduce greenhouse gas emissions. The province currently invests in cycling through capital expenditure, program delivery, and transfers to partners. For example, from 2010-13, about $4 million was spent by MTO on cycling related provincial infrastructure, including two pilot projects to pave highway shoulders on Manitoulin Island and Bruce Peninsula. Website: http://www.mto.gov.on.ca/english/pubs/cycling/					
102 Long Combination Vehicle (LCV) Program Permit program to allow the operation of LCVs in Ontario. LCVs are up to 40-metres long and consist of a tractor pulling two full-length semi-trailers. Each LCV replaces two 23-metre tractor-trailers. LCVs reduce fuel consumption and related greenhouse gas (GHG) emissions by approximately one-third by pulling two semi-trailers with on tractor. Due to program restrictions, they also push traffic from peak to non-peak periods, further reducing the amount of time these vehicles spend idling in congested traffic. The LCV Program did not receive new funding, and is managed through existing resources. Industry has been an important partner, and covered many of the initial start-up costs and continuing costs associated with engineering assessments of routing for these large vehicles. Website: http://www.mto.gov.on.ca/english/trucks/lcv/program-conditions/index.shtml	***Ontario Ministry of Transportation (MTO)*** Contact: Joe Lynch, A/Manager, Policy and Planning Division, Transportation Policy Branch, Goods Movement Office	***A. Legislation / Regulation (LR)***	***C. In progress***	Neighbouring provinces and states have different regulations concerning this type of vehicle. MTO has been working with Quebec and the Atlantic provinces to better harmonize requirements. Further collaboration with neighbouring states may be of benefit in the future. Greater collaboration would allow these types of vehicles to travel seamlessly through Canada and the US.	The LCV Program has grown since it was introduced in 2009. Continued growth will further create reductions in fuel consumption and GHG emissions.
103 NEW – Environmental Guide on Air Quality and Greenhouse Gas Emissions The environmental guide lays out MTO policy and methodology to assess the GHG emission implications of future MTO highway projects. The principal objective of the guide is to standardize MTO's assessment of the air quality and GHG emission impacts of its future projects. There is no funding assigned to the development of the guide. However the application of the guide in individual projects will be funded through MTO's environmental assessment project. The environmental guide is available at: http://www.mto.gov.on.ca/english/environmental-assessment-and-protection/MTO-Air-Quality-Guide-en-26-01-2012.pdf	***Ontario Ministry of the Environment*** Contact: Ms. Dawn Irish, Branch Manager, Environmental Policy Office, Transportation Planning	***E. Government Policy*** (endorsed by the Ministry of the Environment)	***C. In progress***	Prepared in collaboration with provincial and federal regulatory agencies.	Potential for GHG emissions are now part of the evaluation criteria for selecting transportation options and related aspects of new projects.
104 NEW – Metrolinx Smart Commute Workplace Program	***Metrolinx*** (agency of MTO)	***C. Incentive /Demonstration***	***C. In progress***	Yes – this program benefits from the collaborative effort	This program works to serve over 300

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Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
Smart Commute is a program of Metrolinx and the municipalities in the Greater Toronto and Hamilton Area. The Smart Commute Workplace program is delivered through a network of 13 Transportation Management Associations partly funded and supported by Metrolinx and is designed to help workplaces and commuters explore different commute choices like transit, carpooling, cycling, walking and alternative work arrangements. The goals of the current Smart Commute Workplace program is to ease gridlock, improve air quality and reduce greenhouse gas emissions while making commutes less expensive and more enjoyable. While this has been the goal of the current Smart Commute Workplace program, Metrolinx is undergoing a new Smart Commute strategy, and it will look to encompass the program with workplace, schools and active and sustainable communities. Website: http://www.smartcommute.ca/en/home	Contact: Becky Upfold, Ph: 416-202-5590	***(ID)***	With the intention of being updated with the refresh of the new Smart Commute strategy.	of Metrolinx, GTHA municipalities, Transportation Management Associations (TMAs) and private sector workplaces. All of these parties work together to deliver workplace programs that also meet the actions outlined under Strategy 4 of The Big Move. The benefits include increased awareness and changes in commuting behaviour.	workplaces and 700,000 commuters through the network of Smart Commute TMAs. The program results are recorded through surveys, ridematching, tracking, and other events and campaigns.
105 Metrolinx Smart Commute Carpool Zone Carpool Zone is an online ridematching tool, available to all commuters in Ontario, but is specifically promoted to commuters and workplaces within the GTHA. Carpool Zone is an integral part of the Smart Commute program and has the ability to customize elements of the service to fit the needs of participating Smart Commute workplaces. The objectives of Carpool Zone include the facilitation of ridematching throughout the region, with the goal of reducing Single Occupancy Vehicle travel by encouraging carpooling among commuters in the GTHA. The service costs are up to $100,000/annum to operate. Website: https://www.carpoolzone.smartcommute.ca/en/my/	***Metrolinx*** (agency of MTO) Contact: Krista Eichenbaum, Ph : 416-202-5747	***D. Other (specify): Providing supportive tools*** To incent and facilitate behaviour change, specifically, carpooling	***C. In progress*** On-going service delivery	Yes – collaborating with other GTHA municipalities in promoting and using the tool throughout the region is beneficial.	Regional promotion and use increases the number of users and in turn increases the number of potential carpool matches. This then contributes to increased behaviour change and the related savings of Single Occupancy Vehicle reduction including emissions avoided, reduced VKT and money spent on commuting.
106 NEW – Metrolinx Smart Commute Emergency Ride Home The Emergency Ride Home (ERH) Program provides Smart Commute workplace commuters with easy access to transportation alternatives in the event of a personal emergency. The ERH program is designed as a form of 'commuter insurance' and provides transportation reimbursement for those who have used a sustainable mode to commute to work and need to arrange a different way of getting home via taxi, public transit, or a rental car. The ERH program covers reimbursements up to a maximum of $75.00 per ride. The program is only offered by 12 of the 13 TMAs and is only available to commuters who work at a Smart Commute workplace. The goal of this service is to provide an option to those commuters using sustainable modes of commuting, in supporting Goal A of The Big Move in providing Transportation	***Metrolinx*** (agency of MTO) Contact: Krista Eichenbaum, Ph : 416-202-5747	***C. Incentive /Demonstration (ID)*** For behaviour change	***C. In progress*** On-going service delivery	Yes - collaboration with other funders (including other municipalities) and Transportation Management Associations has taken place to determine the maximum reimbursement cost and outline the protocols of the program.	

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Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
Choices. The reimbursement is received and reviewed by Metrolinx prior to sending the claim to the appropriate TMA to process the claim. The maximum cost reimbursement is $75.00 per ride. Website: http://www.smartcommute.ca/en/more-options/emergency-ride-home-cms					
107 Metrolinx Stepping it Up As part of Metrolinx *The Big Move*, Strategies 2 (create an ambitious transportation demand management program) and 7 (build walkable and cyclable communities), the Stepping It Up pilot project implemented Canadian School Travel Planning Mode and Smart Commute workplace program at 30 elementary schools in Hamilton and Peel, to promote active and sustainable modes of school travel for students, families and staff. The project aimed to shift school travel behaviour from driving to walking, cycling/other active and sustainable transportation modes using a variety of education, encouragement, enforcement, engineering, and evaluation initiatives as determined in each school's School Travel Plan. Objectives included to: work with 30 schools, collect 30 sets of school travel data, create 20 school travel plans and implement 34 school travel initiatives from school travel plans. Targets included to reduce automobile mode share by 3 to 5% (replace auto trips with walking or cycling trips or other sustainable modes) and this was chiefly measured through five-day tallies of how students travelled to school daily (other measurement tools such as traffic counts, staff surveys, and family surveys were also tested). By reducing automobile trips, the project prevented greenhouse gas emissions and promoted more resilient and sustainable travel behaviour such as walking and cycling in school communities. Total funding of $1.2 million from April 2009 to December 2011 includes approximately $300,000 from Metrolinx; $400,000 from Transport Canada; and $500,000 in-kind contributions from other government partners (i.e. Region of Peel, City of Hamilton). Website: www.metrolinx.com/en/projectsandprograms/schooltravel/SteppingItUpReportENG.pdf	***Metrolinx*** (agency of MTO) Contact: Jennifer Lay, Ph: 416-202-5951	***C. Incentive /Demonstration (ID)***	***A. Completed/ Concluded*** (April 2009-December 2011)	Yes – key collaborators included: Metrolinx (overall project coordination and reporting), the City of Hamilton (project delivery in Hamilton), Region of Peel (project delivery in Mississauga and Brampton), University of Toronto (data compilation and analysis) and Green Communities Canada (school travel planning expertise and support), and Transport Canada (federal matching funding). At the community level the project (i.e. school travel planning) was implemented in partnership with a variety of collaborators including: school boards, schools, public health units, municipal divisions (e.g. police services, transportation services, recreational services), and community associations/ NGOs. These collaborations enabled the project to be completed on time, budget and meet or exceed objectives and targets.	See *** Results below.
*** Results					

ONTARIO					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
The outcome: through baseline and follow up surveys in school classrooms, project partners measured: an overall average decrease in school car trips of 7% in the morning period and 3% in the afternoon period, with an equivalent increase in pedestrian trips; this in turn prevented (annually) 101,635 vehicle kilometres, 22 tonnes of greenhouse gas emissions (CO_2e) and 884 kg of air pollutants annually. Costs and benefits of individual school projects were subsequently evaluated along with other Ontario projects and, for example, one Stepping It Up school had a BCR of 17 (full results are detailed in Costs and Benefits report available from Metrolinx) The most important external factor that impacted the outcome was the collaboration and delivery of the project by partners as listed in Q5 (including ongoing funding and in-kind resources, especially human resources, to the project). Another significant external factor was the health climate (e.g. the project was delayed due to the H1N1 epidemic in 2009/10). Key Lessons: 1) with key collaborators on board, School Travel Planning is a relatively low cost intervention that can be effective in shifting travel behaviour at elementary schools to reduce motor vehicle use and promote active travel, thereby preventing greenhouse gas emissions and producing other measurable benefits; 2) for these efforts to be sustainable, active travel modes (walking, cycling) need to be formally recognized as part of school transportation and appropriate resources and partnerships must be formed for longer term promotion; 3) a provincial champion and strategy is needed to create a supportive context for active travel modes at the school board and municipal levels.					
108 Metrolinx Next Steps in Active and Sustainable School Travel Program School travel is estimated to account for 22% of morning peak period travel in the GTHA; The Big Move envisions that by 2031, 60% of all school travel will be by active transportation modes. As part of Metrolinx's *The Big Move*, Strategies 2 (create an ambitious transportation demand management program) and 7 (build walkable and cyclable communities), and following from the 2009 to 2011 Stepping It Up project, the Active and Sustainable School Travel (ASST) program is a conglomeration of initiatives over 2012 to 2014, to continue to advance the movement on this issue in the GTHA and Ontario. To date the program has included the completion of a number of studies on ASST policy, barriers and enablers, Ontario School Travel Planning case studies, costs and benefits of School Travel Planning in Ontario report, and the development of a strategic roadmap for provincial coordination on ASST. The objectives of the program are to: establish common goals and directions amongst the various collaborators and build the case for ASST provincially; secure champions to lead and fund in their area; and establish a formal mandate and collaborative framework for the longer term. The targets are to undertake research and consultations to create a strategic plan for provincial coordination on ASST and an implementation plan by June 2014 – the indicators of success are formal stakeholder collaboration in, commitment to and completion of the strategy and plan. By improving provincial collaboration on this file, we may (in both short and longer term) contribute to climate change mitigation by foster policies to create more walkable and cyclable communities, shifting behaviour to reduce automobile use and move toward more active and sustainable travel, and build healthier and more resilient communities in Ontario. The approximate amount of funding to Metrolinx's ASST initiative is one FTE plus an operating budget, totalling: $150,000 each fiscal year; stakeholders have additionally contributed significant in-kind staff time for meetings, workshops, and other pieces of the program.	***Metrolinx*** (agency of MTO) Contact: Jennifer Lay, Ph: 416-202-5951	***E. Government Policy*** Creating a mandate, strategy and action plan for provincial coordination/collaboration	***C. In progress*** Strategy report development completed Nov. 2013 and action plan development underway (completion anticipated May 2014)	Yes – to develop the strategic roadmap and implementation plan, we are collaborating with eight provincial ministries (MTO, EDU, MOHLTC, MMAH, MOE, MOI, MCYS, MTCS), and other stakeholders including school boards, municipalities and NGOs. Each stakeholder participated in interviews and workshops and is providing further input and in-kind support (i.e. staff time) as the initiative unfolds.	Early lessons: active and sustainable school travel is a shared issue and thus requires a multi-sectoral, multi-disciplinary mandate, as well as formal collaboration from a number of key provincial ministries (provincially) as well as school boards, municipalities and NGOs (regionally/locally); in order to realize shared goals and objectives, the shared mandate must be sufficiently resourced and delivery agents must have the supports they need to implement ASST initiatives that are aligned with local needs and realities.

ONTARIO					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
Weblinks: www.metrolinx.com/en/projectsandprograms/schooltravel/school_travel.aspx www.metrolinx.com/en/projectsandprograms/schooltravel/school_travel_resources.aspx					
109 NEW – Metrolinx The Big Move Metrolinx released *The Big Move*, its regional transportation plan (RTP) for the GTHA, in November 2008. *The Big Move* is a 25-year plan, which includes new transit lines, Union Station revitalization and PRESTO fare card rollout. The objectives of the RTP are to improve quality of life, maintain economic competitiveness and protect the environment. It contributes to climate change mitigation by aiming to increase transit ridership and reduce the number of personal vehicles on GTHA roads and by extension, the amount of GHG emissions they produce. Original estimated capital cost of $50 billion. Currently, $16 billion of *Big Move* projects are underway. Website: http://www.metrolinx.com/thebigmove/Docs/big_move/TheBigMove_020109.pdf	***Ontario Ministry of Transportation (MTO)*** Contact: Christopher Langford, Ph: 416-585-7352	***C. Incentive /Demonstration (ID)*** Creating public incentives for behaviour change	***C. In progress*** Plan is required by legislation. To be reviewed by 2016.	Yes – Metrolinx consulted with GTHA municipalities and appropriate local transit agencies to develop the RTP. Each party provided their perspective on priority projects. Members of the public and stakeholders were also consulted which contributed to the development of an informed and comprehensive RTP for the benefit of the region.	The RTP provides a framework for the development of a regional transit/transportation network. Several projects outlined in the RTP are currently underway. Impacts on GHG reduction and climate change are not quantifiable at this time.
110 Gas Tax Program The Ministry provides Gas Tax funding to eligible Ontario municipalities. Municipalities are responsible for their transit operations, including capital and operating expenditures that support ridership growth, and must comply with the program guidelines and requirements. The Gas Tax program provides sustainable funding to Ontario municipalities to improve and expand their transit services. Since 2004, the Province has committed more than $2.7 billion in gas tax funding, including $163.4 million for the 2013-14 interim six month program.	***Ontario Ministry of Transportation (MTO)*** Contact: Andrew Miller, Ph: 416-585-7488	***C. Incentive /Demonstration (ID)*** The Gas Tax program provides sustainable funding to Ontario municipalities to improve and expand their transit services.	***C. In progress*** The Gas Tax program is an on-going annual funding program.	The Ministry provides Gas Tax funding to eligible Ontario municipalities. Municipalities are responsible for their transit operations, including capital and operating expenditures that support ridership growth, and must comply with the program guidelines and requirements.	For 2013-14, 96 municipal transit systems in 133 communities across the province will receive funding. In 2012, there was an increase of more than 193 million passenger trips compared to 2003. This increase means that there were approximately 161 million fewer car trips on our roads. In getting more people out of their cars and onto public transit, we are helping to ease traffic congestion while keeping our air clean.

ONTARIO					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
111 NEW – Metrolinx Energy Management Program Initiated in early 2013, Metrolinx has introduced a comprehensive energy management program that engages the 4 GO Transit operating teams which together consume more than 99% of energy directly paid for by the organization. The program includes: • establishing a baseline of energy use for all energy sources (2012 baseline now complete) • establishing Energy Management Teams which have each identified priority action areas based on their types of energy expenditure and which have developed team-specific action plans and team-relevant Key Performance Indicators o Action plans include programs, operating practices, and capital investment projects • creating a Corporate Energy Management Plan with Key Performance Indicators suitable for the organization level, and identifying corporate-wide initiatives required to ensure the success of the energy management teams • establishing a data collection protocol to ensure on-going energy consumption data is recorded systematically and provided to the energy teams to inform decision making/priority setting • creating an Energy Management Award to annually recognize individuals and teams who have made significant contributions to improving energy efficiency	***Metrolinx*** (agency of MTO)	***C. Incentive /Demonstration (ID)***	***C. In progress***		
112 NEW – Metrolinx Energy-Efficient Design Requirements • working to integrate energy efficiency requirements within procurement documents (exact strategy depends on type of procurement – i.e. RQQ very different from DBFM) • requiring LEED silver as minimum standard for all new facilities (GO Transit) • completion of numerous LEED Gold and LEED Silver certified buildings • on-going program of retrofits to install energy efficient equipment such as HVAC units, LED lighting, programmable lighting and building controls, etc.	***Metrolinx*** (agency of MTO)	***D. Other (specify): Design requirements***	***C. In progress***		
113 NEW – Metrolinx Investment in Renewable Energy • Solar panels on Ajax, Oakville and Erindale Parking structures as well as new Oshawa Bus Maintenance Facility (each approximately 250 kW) • Two additional locations are planned (Clarkson=125kW and Burlington=60kW) • Further installation opportunities are being explored	***Metrolinx*** (agency of MTO)	***D. Other (specify): Operations***	***C. In progress***		Future analysis following sufficient period of data collection will enable verification of the amount of power generated over time, and the related GHG emissions benefits.
114 NEW – Smart Driver Pilot Project with GO Transit Bus Operations	***Metrolinx***	***B. Education /***	***C. In progress***	Executive Champion support	These initiatives have

ONTARIO					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
Smart Driver (SD) is a bus driver training program designed to achieve fuel efficiency. The program is multi-faceted, but focuses ultimately on driving techniques that will improve fuel usage. The GO Transit pilot scope was designed with the following parameters: • Based out of Halton Hills Bus Garage • Employee base limited to 40 operators • Pilot length 52 weeks (June 12, 2013 – June 2014) The pilot encompasses the following elements: • Train the Trainer session for five Safety & Training Staff • Training delivery to Halton Hills drivers by Training Staff • Training delivery to Bus Operations Supervisors by Training Staff • Training delivery to vehicle service personnel by Training Staff • 8' wall chart tracking sheet posted in driver's lunch room at Halton Hills Garage, filled out weekly • Poster campaign to create awareness • On-site information days approximately every 6 weeks • Individualized performance tracking letters delivered to drivers every 4 weeks • Executive Champion support through Town Hall meetings (P. Finnerty, M. Holland and R. Siddall) • Two support coaching sessions - November session provided by CUTA master trainers & March session provided by Training staff.	(agency of MTO)	***Training / Outreach (ETO)***		through Town Hall meetings.	combined to engage employees, raise awareness and support positive results from the program. Data on driver performance (among drivers participating in the pilot) has been rigorously collected on a daily and weekly basis to measure the effectiveness of the program and provide customized feedback to drivers involved.
115 NEW – GO Transit Displacement of Car Trips In the past 5 years, GO Transit has undertaken an aggressive program of expanding service levels to better accommodate travel demand in the GTHA and attract new riders. Improvements have included: • 30 minute all-day service on Lakeshore East and West (introduced in June 2013) • targeted peak-period increases on all corridors where there is space in the schedule to relieve crowding and increase travel time choices • extension of most peak-period trains from 10 to 12 cars (increasing capacity of each train by approx. 300 people) • construction of new stations and new parking facilities to make the GO Transit service accessible to a broader range and larger number of users • increase of bus service on multiple routes and acquisition of double-decker buses to accommodate more riders per trip	***GO Transit***	***D. Other (specify): Public transit improvement***	***C. In progress***		Metrolinx is in the process of measuring and quantifying the GHG benefits of riders choosing transit over driving. Results will be available later in 2014.
116 NEW – MTO GreenPave Rating System	***Ontario Ministry of***	***C. Incentive***	***C. In progress***	Concepts could be adopted	GreenPave rating is

ONTARIO					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
A simple, points-based rating system designed for use on MTO projects to assess the "greenness" of pavements. It can be used to provide an assessment of the sustainability of pavement designs and construction for the purpose of promoting greener pavements. GreenPave also supports greater awareness and use of sustainable technologies and processes, including recycling of materials.	***Transportation (MTO)*** Contact: Becca Lane, Manager, PHM, Highway Standards Branch, MERO	***/Demonstration (ID)***		by others, however, point system reflects Ontario initiatives - promoting processes that reduce construction vehicle emissions and haul distances and increase material reuse and recycling.	applied to pavement design and construction and is an awareness tool intended to highlight options that reduce environmental impacts
117 NEW – Roundabout Resource Guide Several roundabouts on provincial highways have been constructed and opened to traffic; several more are under construction and in detail design. Continuous traffic flow reduces idling time, CO_2 emissions and improves fuel efficiency.	***Ontario Ministry of Transportation (MTO)*** Contact: Ms. Sheri Graham, Manager, PHM, Highway Standards Branch, Traffic Office	***D. Other (specify): Planning and Design Guidance***	***C. In progress***		Continuous traffic flow reduces idling time, CO_2 emissions and improves fuel efficiency.
118 HOV Lanes High Occupancy Vehicle (HOV) Lanes in Ontario have been effective. Though results vary from place to place, nearly every area with highway HOV lanes reports that ridesharing and highway capacity have increased, and that travel times have improved since the lanes opened.	***Ontario Ministry of Transportation (MTO)*** Contact: Kelly Brown, Manager, Provincial Planning Office, Policy and Planning Division	***C. Incentive /Demonstration (ID)***	***C. In progress***	Collaboration has taken place internally within MTO. However, thorough research and continued jurisdictional scan has been an important element of the HOV program as we continue to monitor, evaluate, and improve the program.	See *** Results below.
*** Results MTO will continue to monitor the effectiveness of the lanes and look for areas for improvement. One such example was the three-year pilot, effective July 1, 2012, which allows taxicabs and airport limousines with just the driver to use provincial HOV lanes. Prior to this pilot, taxicabs and airport limousines were allowed to use the HOV lanes if there were two or more people in the vehicle. Taxicabs and airport limousines that use HOV lanes will be able return to duty faster after dropping off a fare or arrive sooner to pick up a fare, thereby moving more people to their destinations in fewer vehicles. This pilot is also intended to improve accessibility for people who cannot or choose not to drive.					
119 Drive Clean Drive Clean is Ontario's mandatory vehicle emissions inspection and maintenance program. Operated by the Ministry of Environment, Drive Clean requires LDVs and medium-sized trucks of model year 1988 or newer in southern Ontario to get a test pass every two years to renew the stickers on their licence plates, beginning at seven years of model age. A conditional pass is granted if a vehicle fails its retest and repair cost requirements are met. All HDVs registered in the province are required to undergo emissions testing every year, beginning at seven years of model age. Since 1999, 88% of all LDVs and 96% of all Diesel HDVs have passed the Drive Clean emissions test.	***Ontario Ministry of the Environment*** Contact: Garth Napier, Director, Drive Clean Office, 40 St Clair Ave W, 4th Floor Toronto, Ontario M4V 1M2	***A. Legislation / Regulation (LR)***	***C. In progress***		Drive Clean began in 1999 and continues to operate. The program is committed to continuous improvement.

ONTARIO					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
The program identifies vehicles that are not being maintained and ensures that this newer vehicle technology is working properly over time and owners continue to repair malfunctioning vehicles. Drive Clean reduces emissions of smog-causing pollutants such as hydrocarbons (HC), NOx and particulate matter. The cost of delivering the Drive Clean program is fully offset through the collection of test fees shared between the government and the privately-owned Drive Clean facilities (DCFs) that provide testing services. Website: www.ontario.ca/driveclean					
120 New - Fleet Tools The Fleet Management Centre (FMC) has made tremendous achievements in the greening of the Ontario Public Service (OPS) Fleet. These achievements have contributed to a more efficient and sustainable government fleet that support the OPS Green Fleet strategy and its fuel and GHG emission reduction targets by considering vehicle and fuel specification, fleet management, and travel demand management. The FMC utilizes a Fleet Management Information System (FMIS) that stores all relative information regarding vehicle usage. GHG and Fuel Reduction: The target for 2012/13 year end was set in the strategy to be a cumulative reduction of 16%. The target for 2014/15 calls for an additional reduction of 2.6M litres of fuel. Total Cost of Ownership (TCO): The FMC uses a TCO life-cycle approach to asset management of the fleet program that supports its cost-effective and efficient delivery. Taking into consideration the full life-cycle and benefits of various alternatives, the total cost and environmental impact to the province of owning vehicles are evaluated prior to acquisition. Apply a continuous improvement approach to enhancing the TCO process in order to ensure that the OPS is provided with only those vehicles that provide the best overall return on investment. OPS Motor Pool Strategy: FMC employs a balanced approach to fleet, weighing the number of vehicles sufficient to effectively deliver the operational needs of each client with the need to minimize the government's carbon footprint. In the case of road travel the FMC has implemented fleet pools strategically located throughout the province increasing access for OPS employees who must travel on business. These pools are primarily stocked with hybrid, plug-in hybrid and other fuel efficient vehicles. Continued review of vehicle and client utilization in order to determine the optimum location and size of future pools. The review will determine the required number of additional pools and the quantity of vehicles that would be required to support them.	***Ontario Ministry of Transportation (MTO)*** Fleet Management Centre	***E. Government Policy*** The FMC strategies are multi-pronged and reach out into many areas.	***C. In progress*** FMC has adopted a "continuous improvement" approach which calls for an attitude of perseverance in order to improve performance year-over-year as opposed to meeting an established performance bar and then maintaining that performance year to year.	The FMC shares its successes and direction with multiple jurisdictions including inter-ministerial, inter-provincially, and through various fleet related organizations of which it participates.	A key lesson learned for the FMC was to adopt an attitude of perseverance as there are no overnight or single solutions. GHG and Fuel Reduction: The target for 2012/13 year end was set in the strategy to be a cumulative reduction of 16%, which the OPS (including the OPP) met. Total Cost of Ownership (TCO): TCO allows the creation of a green vehicle selector that point's client to use the vehicles that meet their needs while providing the best overall return on investment both environmentally and financially for the province. Through life-cycle techniques, the total costs and environmental impacts to the province of owning vehicles are evaluated prior to

ONTARIO					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
<u>Adoption of Alternative Technologies:</u> The FMC has implemented a strategic approach to increasing the number of hybrid vehicles in the fleet. These vehicles are subjected to the TCO modelling prior to acquisition. Vehicle replenishment planning tools have been implemented allowing the FMC to project vehicle replacement requirements over the next three years.					acquisition. <u>OPS Motor Pool Strategy:</u> The FMC has implemented 29 pools throughout the province resulting in a person reimbursement decrease of over 29% and a reduction of daily rental activity of approximately 26%. <u>Adoption of Alternative Technologies:</u> As of March 31, 2014 the OPS fleet will have 1,403 hybrid passenger vehicles, 15 battery electric vehicles (BEV), and 67 plug-in hybrid electric vehicles (PHEV) in its fleet. This represents over 40% of the passenger vehicles are alternative technology.
<u>121 Green Fleet Strategy</u> The Fleet Management Centre of Ontario's MTO provides fleet management and fleet guideline services for the Ontario Public Sector fleet of over 10,000 vehicles. The Ontario Government uses a range of measures under its Green Fleet Strategy to reduce fuel consumption for its fleet including: <u>Research and Development – Engine Idle-Management (EIM):</u> Exploration of leading edge technologies has led to an initial pilot led by the FMC for anti-idling technology. Initial results indicated that there is the potential for significant reductions in fuel consumption and GHG emissions. This is beyond "start/stop" technology and focuses on the EIM of stationary work vehicles.	***Ontario Ministry of Transportation (MTO)*** Fleet Management Centre	***E. Government Policy*** The FMC strategies are multi-pronged and reach out into many areas.	***C. In progress*** FMC has adopted a "continuous improvement" approach which calls for an attitude of perseverance in order to improve performance	The FMC shares its successes and direction with multiple jurisdictions including inter-ministerial, inter-provincially, and through various fleet related organizations of which it participates.	<u>Research and Development – Engine Idle-Management (EIM):</u> In the initial pilot for EIM the results for the MTO enforcement vehicles reflected a 57% reduction in engine idling. As a result and through the pilot, MTO has up-fitted 50 new MTO enforcement vehicles and 8 MOF

ONTARIO					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
Education and Awareness: Entrenched in the FMC, is education and the promotion of its belief that the environment is an integral part of its activities, including the operation of the vehicles that it supplies to the OPS for business use. The FMC is raising awareness of its partners, both internally and externally, regarding environmental issues that are an important component of environmental protection.			year-over-year as opposed to meeting an established performance bar and then maintaining that performance year to year.		vehicles with this technology and is continuing to monitor these vehicles. Education and Awareness: The FMC is preparing to launch the on-line tool throughout the OPS fleet community that contains modules dedicated to environmentally friendly driving and the need to reduce fuel consumption.

PRINCE EDWARD ISLAND					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
122 Vehicle Inspection Regulations PEI's *Motor Vehicle Inspection Regulations* of the *Highway Traffic Act* requires an annual safety inspection that includes an exhaust system inspection as well as mandating catalytic converters on all models 1990 and newer. This ensures all Motor Vehicles in the Province are equipped with properly functioning exhaust systems that include catalytic converters. Properly functioning exhaust systems and catalytic converters reduce exhaust emissions and mitigate their overall contribution towards climate change. This legislation can be found within the *PEI Motor Vehicle Inspection Regulations* of the *Highway Traffic Act*	***Department of Transportation and Infrastructure Renewal*** Contact: John MacDonald, Director of Highway Safety Contact: Doug MacEwen, Safety Coordinator, Highway Safety	***A. Legislation / Regulation (LR)***	***C. In progress***	This initiative was developed provincially but mirrors similar legislation found in other Canadian provinces. No direct collaboration took place in the development of this regulation.	While this initiative does improve fuel consumption and decrease air emissions, it also improves highway safety. Over 100,000 motor vehicles are inspected on PEI annually. The cost is paid by the owner or leaser of the vehicle.
123 Driver Awareness The opening chapter to PEI's *Driver's Handbook* published by the Department of Transportation and Infrastructure Renewal, Highway Safety, discusses "Help Protect the Environment" and discusses vehicle maintenance, idling practices, and specific tips for winter driving. This informs residents on how to reduce emissions through fuel efficient driving and proper maintenance tactics. These tactics are designed to curb motor vehicle exhaust emissions and mitigate their overall contribution towards climate change. More information can be found in *Prince Edward Island Driver's Handbook*, Chapter 1. Pages 39-43.	***Department of Transportation and Infrastructure Renewal*** Contact: John MacDonald, Director of Highway Safety Contact: Doug MacEwen, Safety Coordinator, Highway Safety	***B. Education / Training / Outreach (ETO)***	***C. In progress***	This initiative was developed provincially but mirrors similar language contained in the Driver Handbooks found in other Canadian provinces.	Residents who wish to obtain a Drivers Licence in the Province are required to read the provincial Drivers Handbook. However those who took their drivers test prior to 2002 would not have seen this information. Outreach in other forms to reach this audience may be required.
124 Safety Inspection and Maintenance In PEI, an annual motor vehicle safety inspection is required on all motor vehicles and trailers (with gross mass over 450 kilograms) registered in the Province and operating on the highway. All commercial vehicles over 4,500 kg must also have a valid inspection. All buses must be inspected at least once every six months.	***Department of Transportation and Infrastructure Renewal*** Contact: John MacDonald, Director of Highway Safety	***A. Legislation / Regulation (LR)***	***C. In progress***	This initiative was developed provincially but mirrors similar legislation found in other Canadian provinces. No direct collaboration took place in the development of this regulation.	While this initiative does improve fuel consumption and decrease air emissions, it also improves highway safety.

PRINCE EDWARD ISLAND					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
Poorly maintained vehicles can increase fuel consumption by up to 50 percent, increasing the emission of smog-causing chemicals, greenhouse gases and other pollutants that damage our health and our environment.	Contact: Doug MacEwen, Safety Coordinator, Highway Safety				
125 Commercial Vehicle Inspections Commercial Vehicle Enforcement Officers conduct roadside inspections on commercial vehicles at several locations throughout the province as well as the scale facilities. The Department of Transportation and Infrastructure Renewal employs officers that are certified to conduct Commercial Vehicle Safety Alliance inspections, ensuring that drivers and vehicles are in compliance with all mandatory provincial requirements. This includes inspections of exhaust system components.	***Department of Transportation and Infrastructure Renewal*** Contact: John MacDonald, Director of Highway Safety Contact: Doug MacEwen, Safety Coordinator, Highway Safety	***D. Other (specify): Enforcement***	***C. In progress***	This initiative was developed provincially but mirrors similar legislation found in other Canadian provinces.	While this initiative does improve fuel consumption and decrease air emissions, it also improves highway safety.
126 Hybrid Vehicle Tax Incentive A provincial sales tax rebate on the purchase or lease of hybrid vehicles through the *Hybrid Vehicle Tax Incentive*. To provide an incentive that would encourage Islanders to purchase climate friendly hybrid vehicles. The Province provided a maximum of $3,000 per vehicle.	***Department of Finance*** Contact: Kathy Toole, Tax Administration Supervisor, Taxation and Property Records	**C. Incentive /Demonstration (ID)**	***A. Completed/ Concluded***	This program could be matched with the Federal ecoAUTO program which also provided a tax rebate on hybrid vehicles up to a maximum of $2,000. The program mirrored similar initiatives in several other Canadian provinces such as Quebec, Ontario and Manitoba, but PEI's program was touted as the most generous in the country.	Introduced in 2007, the program ran until April 1, 2013. There were a total of 750 refunds issued between 2007 and 2013 for the purchase or lease of hybrid vehicles. Total hybrid purchases were 524. The remainder would be monthly, quarterly, semi-annual or annual refunds of PST paid on lease payments for hybrid vehicles. The total value for the 750 refund applications was $1,447,037.94. The Federal ecoAUTO program provided further incentive for many people and added to the overall success of this initiative. Also a contributing factor was the market. At a North American level there was significant marketing of the hybrid car by all major automakers as well as a price drop turn the economic downturn of 2008-09 that made the hybrid car more affordable for many.

QUEBEC					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
127 Transportation Electrification **The electrification of the transportation sector is a governmental priority.** Specific initiatives are as follows:	***Ministère des Transports (MTQ)*** (coordination)	***E. Government Policy***	***C. In progress***		
128 NEW - Transportation Electrification – Drive Electric Program • **(UPDATED)** The **Drive Electric Program** offers a purchase/lease rebate for individuals, businesses, nonprofit organizations, and Québec municipalities that want to acquire an electric vehicle, or charging station. • In 2014, the program rebate amount ranged from $4,000 to $8,000 for all-electric vehicles and plug-in hybrids. A $500 rebate is available for non-plug-in hybrid and a $1,000 for lowspeed electric vehicles. The rebates offered in 2013 were supposed to be reduced until the end of the program in 2015. In 2013, the program was improved and extended until December 31, 2016. A maximum rebate of $8,000 will be offered on the purchase of an electric vehicle for the next three years. A $1,000 Subsidy for the acquisition and installation for residential charging station is also available. o Target: 10,200 additional new electric vehicles by 2017 o Budget: $65 million for the improvement of the program	***Ministère de l'Énergie et des Ressources naturelles (MERN)***	***C. Incentive /Demonstration (ID)***	***C. In progress***		December 2013 : 2500 electric vehicles were registered in Quebec March 2013 : 1000 rebates were granted
129 NEW - Transportation Electrification–Electric Bus Subsidy • **(NEW)** Subsidy for a demonstration project in Montreal of three urban fully electric buses. The buses' autonomy will be increased thanks to a conductive quick-charge system (two charging stations at route end points). o Budget: $11.9 million	***Ministère des Transports (MTQ)*** ***Société des tranports de Montréal***	***C. Incentive /Demonstration (ID)***	***C. In progress***		
130 NEW - Transportation Electrification –Charging Stations Plan • **(NEW)** A deployment plan will be developed for 5,000 charging stations across Québec. 500 for the Electric circuit[1], 3,500 for business location and 1,000 near government buildings. o Budget: $15 million	***Ministère de l'Énergie et des Ressources naturelles (MERN)*** ***Hydro-Québec (H-Q)***	***C. Incentive /Demonstration (ID)***	***B. Being Planned***	Collaboration possible with neighbouring provinces	325 charging stations in January 2014
131 NEW - Transportation Electrification –Montreal-Burlington Charging	***Ministère de l'Énergie***	***D. Other:***	***A. Completed/***		

[1] http://www.lecircuitelectrique.com/index.en.html

QUEBEC					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
Corridor • **(NEW)** Charging corridor Montreal – Burlington (240 v charging stations)	***et des Ressources naturelles (MERN)*** ***Ministère des Transports (MTQ)*** ***Hydro-Québec (H-Q)***	***Infrastructure Projects***	***Concluded***		
132 NEW - Transportation Electrification –Montreal-Quebec City Charging Corridor • **(NEW)** Fast charging stations corridor Montreal-Quebec (pilot project)	***Ministère de l'Énergie et des Ressources naturelles (MERN)*** ***Ministère des Transports (MTQ)*** ***Hydro-Québec (H-Q)***	***D. Other: Infrastructure Projects***	***C. In progress***		Implementation: summer 2014
133 NEW - Transportation Electrification –Charging Stations Decree • **(NEW)** Municipalities are now authorized to provide charging services, since the adoption of a government decree in July 2013	***Ministère des Affaires municipales et de l'Occupation du territoire (MAMOT)***	***A. Legislation / Regulation (LR)***	***A. Completed/ Concluded***		Montreal and other cities are now members of the Electric circuit
134 NEW - Transportation Electrification–Shore Power Subsidy • **(NEW)** Subsidy for shore-power equipments for cruise ship (port of Montreal and Quebec) o Budget: $7.7 million	***Ministère des Transports (MTQ)***	***C. Incentive /Demonstration (ID)***	***B. Being Planned***		
Other transportation electrification initiatives					
137 Hydro Quebec's Transportation Electrification Program **Hydro Quebec's Transportation Electrification** program is designed to have electricity play an increasingly important role in personal and public transportation. The program follows Hydro Quebec's Electric Action Plan. The website offers information on electric personal and private transport, along with details of Hydro Quebec's four transportation initiatives: Public Transit (development of electrification of public transit); Development and marketing of advanced technologies; Test-driving and experimenting with integration into the power grid; and Infrastructure for vehicle charging (including the deployment in 2012 of Canada's first public charging network).	***Hydro-Québec (H-Q)***	***B. Education / Training / Outreach (ETO***)	***C. In progress***		
138 Low-Floor, Biodiesel-Electric Hybrid Drive Buses With provincial government financial assistance, AVT (Société de gestion et d'acquisition de véhicules et systèmes de transport) has contracted for 509	***Société de gestion et d'acquisition de véhicules et systèmes de transport (AVT)***	***C. Incentive /Demonstration (ID)***	***C. In progress***		The contract states that the delivery of the buses should be on a four years period starting in 2014.

QUEBEC					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
regular size, low-floor, biodiesel-electric hybrid drive buses. The awarding of the contract follows a collective purchase with the other transit authorities in Québec. Total value: $471.3 million					
139 2006-2012 Climate Change Action Plan (CCAP) Website: http://www.mddelcc.gouv.qc.ca/changementsclimatiques/pacc2020-en.htm Target: reducing GHG emissions by 14.6 megatons by 2012* The 2006–2012 CCAP had an initial budget of $1.58 billion, the lion's share of which ($1.2 billion) came from the fossil fuel duty collected by the Régie de l'énergie from fossil fuel distributors. The duty was introduced in November 2007 by the *Regulation respecting the annual duty payable to the Green Fund* (http://www.mddefp.gouv.qc.ca/ministere/fonds-vert/index-en.htm) *and was the first initiative of its kind in North America.* Another $350 million was added in 2007 from a federal fund—the Clean Air and Climate Change Trust Fund—which led to a revision of the CCAP in 2008. * Evaluations of potential reduction and avoidance identified for each action are presented only as indications and should be taken as forecasts. Specific initiatives include:	***Ministère du Développement durable, de l'Environnement de la Lutte contre les changements climatiques (MDDELCC)*** (coordination)	***E. Government Policy***	***A. Completed/ Concluded*** (December 31st 2012)		As of March 31st 2012: 1 968 kilotonnes of GHG emission reduced (that can be measured) A final report is forthcoming
140 2006-2012 Climate Change Action Plan – Emission Standards for Light Duty Vehicles • Action 3 of the 2006-2012 CCAP aimed to utilize the necessary mechanisms to require manufacturers of light-duty vehicles sold in Québec to meet a GHG emissions standard starting in 2010. In December 2009 the government of Québec passed Automobile GHG Emission Standards for LDVs. The Regulation is designed to reduce emissions from cars and light trucks of model years 2010 to 2016 that are sold, leased or marketed in Quebec. The regulation includes a compliance mechanism that allows companies to comply with the federal regulations for the year model 2012 to 2016. ▪ Budget: $0 million ▪ Reduction / avoidance potential: 1,700 kilotonnes of GHG emission reduced for 2012	***Ministère du Développement durable, de l'Environnement de la Lutte contre les changements climatiques (MDDELCC)***	***A. Legislation / Regulation (LR)***	***C. In progress***		No results regarding the GHG reduction have been published so far.
141 2006-2012 Climate Change Action Plan –Alternative Fuel • Action 4 of the 2006-2012 CCAP aimed to have gasoline distributors	***Ministère de l'Énergie et des Ressources naturelles (MERN)***	***C. Incentive /Demonstration (ID)***	***A. Completed/ Concluded***		In order to achieve his reduction / avoidance potential, Quebec decided to implement measures to increase

QUEBEC					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
include a minimum of 5% ethanol in their total fuel sales by 2012 ▪ Budget: $30.0 million ▪ Reduction / avoidance potential: 780 kilotonnes of GHG emission reduced for 2012					biofuels offer rather than implement a regulation. For instance, a subsidy of $18 million was granted to Éthanol cellulosique Varennes s.e.c for the construction of the first factory in Quebec of second generation ethanol.
142 2006-2012 Climate Change Action Plan – Municipality Financial Support • **(UPDATE)** Action 5 of the 2006-2012 CCAP provided support to municipalities taking GHG emission inventories and action on climate change and in adopting regulations to offset the effects of idling motors. Two programs were implemented. The first one, Municipalities Climate program, gave financial aid to municipalities for the elaboration of GHG emissions inventories and climate change action plans. The second one, Turn Off Your Motor, was a financial and technical support program to assist municipalities wishing to adopt idle control regulations. ▪ Budget: $16.2 million ▪ Reduction / avoidance potential: 460 kilotonnes of GHG emission reduced for 2012	***Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques(MDDELCC)***	***C. Incentive /Demonstration (ID)***	***A. Completed/ Concluded***		No GHG reduction were quantified since the first program did not cover the implementation of the action plans and it is mostly a tool to raise awareness and the second program implied high incertitude linked the quantification itself. As of March 31st 2012, 244 municipal organisations participated in the Municipalities Climate program. They represent a third of all municipalities in Quebec and have 79% of its population. 112 inventories and 41 action plans were made.

QUEBEC					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
143 2006-2012 Climate Change Action Plan – Public Transit Subsidy • Action 6 of the 2006-2012 CCAP was financing government assistance programs that were part of the Québec Policy Respecting Public Transit (QPRPT) (http://www.mtq.gouv.qc.ca/portal/page/portal/entreprises_en/transport_collectif/politique_quebecoise_transport_collectif) to encourage the use of public transit and alternative modes of transportation programs. *1.* Governmental subsidy program for improving public transit services. Subsidy program offered to public transit authorities in order to increase the supply of public transit services (increase in frequency for example) ▪ Budget: $633.3 million ▪ Target: increase mass transit ridership by 8% (The government was aiming for a 16% increase in the supply of public transit services. This expansion is necessary to attain the targeted 8% growth in ridership). ▪ Reduction / avoidance potential : 100 kilotonnes of GHG emission reduced for 2012 ▪ The program was renewed in 2013.	***Ministère des Transports (MTQ)***	***C. Incentive /Demonstration (ID)***	***A. Completed/ Concluded***		Québec public transit services have increased by 28 percent and ridership by 14 percent from 2006 to 2012 with the support of the incentive programs to increase urban transit services through the Québec Policy Respecting Public Transit 2006-2012. Funding for these programs has been extended through December 31, 2014. Rural transit service availability has been improved from 47 regional county municipalities (RCM) in 2006 to 71 in 2011. Of the eligible RCMs, 86 percent now have transit service while rural public transportation ridership increased by 120 percent between 2006 and 2011.
144 2006-2012 Climate Change Action Plan – Public Transit Energy Efficiency Subsidy *2.* Governmental subsidy program for improving energy efficiency in the road transport of passenger. Subsidy program offered to public transit authorities to improve among other things energy efficiency, acquiring electric or hybrid buses. Subsidies were also available for the acquisition of electric or hybrid cars used as taxis. ▪ Budget: $23.5 million ▪ Reduction / avoidance potential : linked to the previous reduction / avoidance potential	***Ministère des Transports (MTQ)***	***C. Incentive /Demonstration (ID)***	***A. Completed/ Concluded***		The program provided subsidy among other things for the modification of 749 regular buses city buses to improve their energy efficiency and thus provide a total annual reduction of GHG of 14 kilotonnes.
145 2006-2012 Climate Change Action Plan –Public Transit in Rural Areas *3.* Governmental subsidy program to support initiatives for public transit in rural areas and intraregional transportation by buses. ▪ Budget: $36.4 million ▪ Reduction / avoidance : linked to the previous Reduction / avoidance potential ▪ The program was renewed in 2013	***Ministère des Transports (MTQ)***	***C. Incentive /Demonstration (ID)***	***A. Completed/ Concluded***		GHG emission cannot be measured. As of March 31st 2012, 75 municipal organisations received a subsidy for new services of public transit.
146 New - 2006-2012 Climate Change Action Plan – Driving Alternatives	***Ministère des***	***B. Education /***	***A. Completed/***		GHG emission cannot be measured.

QUEBEC					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
Subsidy • **(NEW)** Action 7 of the 2006-2012 CCAP was financing the Governmental subsidy program to alternatives to driving (financial support for enterprises and institutions interested in providing forms of transportation other than individually driven cars, funding to foster or promote walking and cycling for examples) ▪ Budget: $46.8 million ▪ Reduction / avoidance : 30 kilotonnes of GHG emission reduced for 2012	***Transports (MTQ)***	***Training / Outreach (ETO)***	***Concluded***		As of March 31st 2012, 64 organisations implemented employer programs. The program also provided subsidy to 31 promotional campaigns or tools.
147 New - 2006-2012 Climate Change Action Plan – Intermodal Rail and Marine Transport Assistance • **(NEW)** Action 8 of the 2006-2012 CCAP was financing the Assistance Program Aiming to Reduce or Avoid Greenhouse Gas Emissions through the Implementation of Intermodal Rail and Marine Transport Projects (Summary of the projects funded under the PAREGES program) ▪ Budget: $60 million ▪ Reduction / avoidance : 60 kilotonnes of GHG emission reduced for 2012	***Ministère des Transports (MTQ)***	***C. Incentive /Demonstration (ID)***	***A. Completed/ Concluded***		40 projects were accepted. For 2012-2013, those projects contributed to the reduction or avoidance of 57 kilotonnes of GHG emission. If all accepted projects are implemented, the GHG reduction / avoidance potential should be surpassed.
148 2006-2012 Climate Change Action Plan – Heavy Duty Vehicle Assistance • Action 9 of the 2006-2012 CCAP was financing the Governmental subsidy program Improving Energy Efficiency in Road, Rail and Marine Transportation (PEET). The heavy vehicle section promotes the use of equipment and technologies aiming at reducing emissions in the freight transportation and heavy vehicle sectors. Financial assistance is received after the acquisition, installation, alteration or replacement of equipment. The rail and marine section aimed to support rail and marine transportation companies and organizations in their efforts to improve energy efficiency. ▪ Budget: $46.4 million ▪ Reduction / avoidance : 1,050 kilotonnes of GHG emission reduced for 2012 (The reduction / avoidance potential was estimated for the 2006-2012 period and not for the year 2012 only. Thus, it cannot be compared to the result).	***Ministère des Transports (MTQ)*** ***Ministère de l'Énergie et des Ressources naturelles (MERN)***	***C. Incentive /Demonstration (ID)***	***A. Completed/ Concluded***		Reduction or avoidance of 121 kilotonnes of GHG emission. Heavy vehicle section: 2,055 requests for subsidy were accepted. Rail and marine section: 23 projects were accepted.
149 2006-2012 Climate Change Action Plan –Speed Limiting Devices	***Ministère des Transports (MTQ)***	***A. Legislation / Regulation (LR)***	***A. Completed/ Concluded***		The regulation is in effect since January 1st 2009. Reduction or

QUEBEC					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
• Action 10 of the 2006-2012 CCAP aimed for the adoption of a regulation requiring mandatory use of speed limiting devices on all trucks and setting the maximum speed for these vehicles at 105 Km/hr ▪ Budget: $0 million ▪ Reduction / avoidance potential: 330 kilotonnes of GHG emission reduced for 2012 (The Reduction / avoidance potential was estimated with a different methodology than the result. The latter considers the GHG reduction in Quebec).					avoidance of 130 kilotonnes of GHG emission.
150 New -2006-2012 Climate Change Action Plan –Government Fuel Savings • **(NEW)** Action 16 of the 2006-2012 CCAP aimed to reduce by 2010 fuel consumption of government departments and public organizations by 20% (between 2003-2003 and 2009-2010) ▪ Budget: $0.3 million ▪ Reduction / avoidance potential: 150 kt of GHG emission reduced	***Ministère de l'Énergie et des ressources naturelles (MERN)***	***E. Government Policy***	***A. Completed/ Concluded***		The target of 20% was not reached. Fuel consumption increased by 5%, the number of vehicles increased by 17% and the total distance by 12%. This can be explain by the fact that some ministries increased their activities providing services to the public.
151 2006-2012 Climate Change Action Plan –Government Employee Commuting • Action 17 of the 2006-2012 CCAP: Require each government department to develop a program to reduce GHG emissions generated by employees commuting to work ▪ Budget: $9 million ▪ Reduction / avoidance potential: 20 kilotonnes of GHG emission reduced for 2012	***Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques (MDDELCC)***	***E. Government Policy***	***A. Completed/ Concluded***		As of March 31st 2012, 6 ministries had their program approved. The reduction / avoidance of GHG emission of this action was not quantified due to the difficulty of isolating the benefits of this action from all other actions.
152 NEW - 2013–2020 Climate Change Action Plan (2020 CCAP) (launched in June 2012) Website:http://www.mddep.gouv.qc.ca/changementsclimatiques/pacc2020-en.htm) ▪ Budget: $2,955 million from the Green fund which is financed by the fossil fuel duty until December 31 2014 and the Québec Cap and Trade System for Greenhouse Gas Emissions Allowances The 2020 CCAP, a continuation of the 2006–2012 CCAP, is intended to support measures to fight climate change in 2013 and beyond.	***Ministère du Développement durable, de l'Environnement et de la lutte contre les changements climatiques (MDDELCC)*** (coordination)	***E. Government Policy***	***C. In progress***		

QUEBEC					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
The government has two objectives: reduce Québec's GHG emissions to 25% below 1990 levels by 2020, and strengthen Québec's resilience to climate change impacts. The 2020 CCAP establishes measures for every GHG-emitting sector in Québec, specifically transportation, industry, and construction—sectors that emit the most greenhouse gases. Several measures will also be put in place in support of the 2013-2020 governmental climate change strategy. A number of initiatives will also be launched in relation to land use management, research and innovation, public awareness, and governmental exemplarity given the short-, medium-, and long-term impacts these sectors could have on our production methods, consumption habits, and the setup of our communities. Some programs were implemented by the ministère des Transport so far and are in progress: • The Programme d'aide à l'amélioration de l'efficacité du transport maritime, aérien et ferroviaire en matière de réduction des émissions de gaz à effet de serre ($20 million until March 31st 2017) (http://www.mtq.gouv.qc.ca/portal/page/portal/entreprises/transport_maritime/programmes_aide/prog_aide_amelioration_efficacite), an assistance program that aims to avoid or reduce greenhouse gas emissions by encouraging the improvement of energy efficiency in organizations and businesses that offer marine, air and rail transportation services, through, for example, the use of more energy-efficient transportation material and equipment, or the use of energy producing less greenhouse gas. • The program Véloce II ($3 million for 2013-2014 for this section of the program) provides subsidies to municipalities for cycling infrastructures on their territories among other things. • The Governmental subsidy program for improving public transit services ($132 million) and the Governmental subsidy program to support initiatives for public transit in rural areas and intraregional transportation by buses ($8 million) were renewed for 2013.					
153 NEW - 2013–2020 Government Strategy for Climate Change Adaptation (launched in June 2012) Website:http://www.mddep.gouv.qc.ca/changementsclimatiques/strategie-adaptation-en.htm The strategy outlines the overall plan for governmental measures in this area. These measures will help Québec minimize the direct and indirect impacts of climate change and the damage they cause to the health and safety of people and communities, to economic activities, and to the natural and built environment. The strategy also aims to build awareness of these issues in Québec	***Ministère du Développement durable, de l'Environnement et de la lutte aux changements climatiques (MDDELCC)*** (coordination)	***E. Government Policy***	***C. In progress***		

QUEBEC					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
and help local and regional organizations implement and take ownership of climate change adaptation solutions. At the heart of the 2013–2020 Government Strategy for Climate Change Adaptation lies the development of knowledge and know-how on adaptation, awareness and training, land-use management, and the integration of adaptation measures into the public service.					
154 NEW - Québec Cap and Trade System for Greenhouse Gas Emissions Allowances (C&T) Website:http://www.mddep.gouv.qc.ca/changements/carbone/index-en.htm) The C&T system constitutes the Government of Québec's primary strategic tool for fighting climate change, and it is funding the 2013–2020 Climate Change Action Plan. Two-thirds of the revenue will fund measures that reduce GHG emissions in the transportation sector, including those that target mass transit and alternative transportation. Québec's cap-and-trade system for greenhouse gas emission allowances initially foresees three compliance periods. The first compliance period began on January 1, 2013, following a transition phase of several months in 2012 during which emitters and participants were able to register for the system and familiarize themselves with the way it works without, however, being required to meet a GHG emission target ceiling. During first compliance period, around 80 establishments, mainly in the industrial and electricity generation, with annual GHG emission equal to or greater than the annual threshold of 25,000 metric tons of equivalent CO_2 equivalent, are subject to the system. This initial period will end on December 31, 2014. Exceptionally, this first period will last two years, whereas the other two periods will each extend over three years. During the second compliance period, which begins January 1, 2015, business operators in Québec that distribute fuel (e.g., gasoline, diesel fuel, propane, natural gas and fuel oil, with some exceptions) or import it for their own consumption and whose annual GHG emissions attributed to the use of fuel distributed and consumed in Québec equal or exceed an annual threshold of 25,000 metric tons of CO_2 equivalent will also be subject to the system. This second period will end on December 31, 2017. The third compliance period, whose procedures will be identical to the second, will begin on January 1, 2018 and end on December 31, 2020.	***Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques (MDDELCC)***	***E. Government Policy***	***C. In progress***		The first auction was held on December 3rd 2013. [2]
Other measures					
155 Road Safety Education Program	***Société de l'assurance***	***B. Education /***	***C. In progress***		

[2] For details: http://www.mddep.gouv.qc.ca/changements/carbone/resultats-vente20131203-en.pdf

QUEBEC					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
• The Road Safety Education Program (http://www.saaq.gouv.qc.ca/en/documents/pdf/prevention/safety_program.php) is the handbook for obtaining a driver's licence in Quebec. It includes a section on Eco-driving. Competencies that must be exhibited in the driver's test include understanding of the principles and advantages of ecological, economical, and safe driving. This applies to both an LDV and HDV licence.	***automobile du Québec***	***Training / Outreach (ETO)***			
156 Ecomobile Program • The Ecomobile program is found at http://ecomobile.gouv.qc.ca/en/ecodrivers_ed/index.php. The ecodriving training courses proposed were designed to help drivers who would like to reduce their fuel bills by adopting more sustainable ways of driving. Instructional material includes presentations and videos shot by a driving simulator. There is also the possibility of using a driving simulator: o Training for experienced drivers. A one-hour course that acquaints drivers with ecodriving principles. Offered by certified organizations only (Ecomobile pilot project); o Training for new drivers. A module that raises awareness about ecodriving principles and provides training to new drivers. This module has been part of the SAAQ mandatory driving course for new drivers since January 2010; o Training for instructors. Offers training to the instructors of driving schools and other driver training organizations and provides them with a larger range of skills to teach ecodriving principles. o Certification - Ecomobile pilot project. Within the scope of its Ecomobile pilot project, the Ministry created a certification process for driving schools and other driver training organizations wishing to add the one-hour course in ecodriving to their curriculum and offer it to experienced drivers.	***Ministère de l'Énergie et des ressources naturelles (MERN)***	***B. Education / Training / Outreach (ETO)***	***C. In progress***		
157 Public Transit Pass Tax Deduction • **(UPDATE)** Additional deduction of 100% in the calculation of an employer's income. An employer may deduct, in calculating his income from a business, an additional amount equal to 100% of the amount that is otherwise deductible in calculating his income and that	***Revenu Québec (RQ)***	***E. Government Policy***	***C. In progress***		Cost of tax expenditures (projections): 2011 and 2012 (under $2 million per year). Non-taxation of benefits granted to employees: 2011 and 2012 ($7 million per year).

QUEBEC					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
represents: o either an amount paid to an employee paid after March 23, 2006 for the purchase of an eligible public transit pass consisting of a subscription for a minimum of one month and that is valid for a period after March 31, 2006; o or an amount paid to an employee for the purchase of an eligible adapted transit pass that is valid for a period after March 23, 2006 (or March 31, 2006, in the case of a transit pass consisting of a subscription for a minimum of one month); o or the cost to him of an eligible public transit pass or an eligible adapted transit pass supplied to an employee after March 23, 2006. To give rise to this additional deduction, the transit passes must have been acquired by the employee or supplied by the employer for the transportation of the employee between his ordinary place of residence and his place of work. • (NEW) An individual is not required to include, in calculating his income from an office or employment, the value of the benefit received because or on the occasion of his office or employment, if such benefit arises either from the reimbursement, after March 23, 2006, of the cost of an eligible public transit pass consisting of a subscription for a minimum of one month and that is valid for a period after March 31, 2006, or the reimbursement, after March 23, 2006, of the cost of an eligible adapted transit pass that is valid for a period after March 23, 2006 (or March 31, 2006, in the case of a transit pass consisting of a subscription for a minimum of one month), or the supply, after March 23, 2006, of an eligible public transit pass or an eligible adapted transit pass. To give rise to this tax treatment, the transit passes must have been acquired by the employee or supplied by the employer for the transportation of the employee between his ordinary place of residence and his place of work.					
158 Tax Deduction for Use of Alternative Fuels with Heavy Vehicles • Additional deduction of 85% for certain trucks and tractors fuelled with liquefied natural gas. To foster the development in Québec of technology allowing liquefied natural gas to be used to fuel heavy vehicles used to transport merchandise by road, an additional deduction of 85% of the amount the taxpayer deducted in calculating	***Revenu Québec (RQ)***	***E. Government Policy***	***C. In progress***		Cost of tax expenditures (projections): 2011 ($3 million), 2012 ($5 million)

QUEBEC					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
his income for the year on account of capital cost allowance (CCA) is granted for certain trucks and tractors. The trucks and tractors covered by this additional deduction are those that otherwise benefit from the 60% CCA rate, i.e. trucks or tractors designed for hauling freight and used mainly for that purpose in a business that includes hauling freight, that are new at the time of acquisition and whose gross vehicle weight rating exceeds 11 788 kilograms. In addition, such trucks or tractors must be acquired after March 30, 2010 but before January 1, 2016 and be fuelled by liquefied natural gas.					
159 Faites de l'air! (Clear the Air!) • Faites de l'air! (Clear the Air!) http://www.cleartheairprogram.org/) is a program for recycling older, highly-polluting vehicles. Funded by the government of Quebec and administered by the Association québécoise de lutte contre la pollution atmosphérique (AQLPA). All participants receive the incentive rewards in the form of tax receipts, rebates for a car-share service; one year free subscription service to carpooling service; tax credit towards the purchase or lease of a vehicle with low fuel consumption, plus several other rewards.	***Association québécoise de lutte contre la pollution atmosphérique (AQLPA)***	***C. Incentive /Demonstration (ID)***	***C. In progress***		According to the Association's website, 41 523 cars were recycled since the beginning of the program

SASKATCHEWAN					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
160 Renewable Diesel Program Saskatchewan introduced a mandate for inclusion of 2% renewable content in the average annual diesel fuel pool for fuel distributors beginning July 1, 2012 (the first compliance period ends December 31, 2014).	***Ministry of the Economy***	***A. Legislation / Regulation (LR)***	***C. In progress***		
161 Liquefied Natural Gas Developing policy in coordination with New West Partnership to encourage trucks to migrate to Liquefied Natural Gas.	***Ministry of Highways and Infrastructure***	***C. Incentive /Demonstration (ID)***	***B. Being Planned***	Collaborating with New West Partnership members (British Columbia, Alberta, Saskatchewan)	
162 Drivers Handbook Used as a vehicle for fuel-efficient driving messaging. An introduction to the Handbook discusses driving and maintenance practices that keep emissions to a minimum. Topics include fuel efficient driving practices, maintenance tips, and idling sensitivity.	***Saskatchewan Government Insurance (SGI)***	***B. Education / Training / Outreach (ETO)***	***C. In progress***		
163 Climate Change Saskatchewan An education and outreach organization funded by the Province of Saskatchewan, hosts a website with a section on transportation and climate change. The site gives the emissions context, provides tips to reduce vehicle emissions, right-sizing for fleets and personal use, transportation alternatives, and links to resources on other websites.	***Ministry of Environment and Government Services***	***B. Education / Training / Outreach (ETO)***	***C. In progress***		
164 Go Green The program is dedicated to reducing Saskatchewan's government and public environmental footprint through programs and education. A specific page on transportation sets the context, provides links to resources such as car-shares, carpools, transit, and other governmental and NGO websites. Another page describes the government's own anti-idling policy.	***Ministry of Environment and Government Services***	***B. Education / Training / Outreach (ETO)***	***C. In progress***		
165 Fleet Management Framework The document informs transportation choices with a framework for current and future initiatives, including: right-sizing the vehicle fleet, optimizing vehicle mix, enhanced driver awareness and training, and improved vehicle maintenance tracking and operations reporting.	***Ministry of Environment and Government Services***	***B. Education / Training / Outreach (ETO)***	***C. In progress***		
166 LCV program The province ran a pilot project on a single run between Regina and Saskatoon, five days a week, with the operation hours and conditions controlled, and a maximum speed of 90 km/h.	***Ministry of Highways and Infrastructure***	***C. Incentive /Demonstration (ID)***	***A. Completed/ Concluded***		This pilot is completed and is in the evaluation phase.
167 Idle Control	***Ministry of Highways***	***B. Education / Training /***	***C. In progress***		

SASKATCHEWAN					
Q1. Mitigation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
Identified in other broader initiatives.	***and Infrastructure***	***Outreach (ETO)***			
168 School Idle Free Zone Program Provides free anti-idling signage to any interested school in the province.	***Ministry of Environment and Government Services***	***B. Education / Training / Outreach (ETO)***	***C. In progress***		
169 Community Idle Free Zone Program Provides free anti-idling signage to any interested health facility, recreation or community center, or municipal offices in the province.	***Ministry of Environment and Government Services***	***B. Education / Training / Outreach (ETO)***	***C. In progress***		
170 Anti-Idling Policy Government of Saskatchewan has an Anti-Idling Policy for all Central Vehicle Agency (CVA) and government-owned vehicles (over 5,000 vehicles), and government-owned facilities. Idle-free zone signs have been installed at government offices and many other government buildings to remind all employees and visitors not to idle - even when driving personal vehicles.	***Central Services***	***B. Education / Training / Outreach (ETO)***	***C. In progress***		
171 Inspection and Maintenance Government of Saskatchewan's CVA issued a new policy requiring regular vehicle inspections by qualified vendors every six months for its vehicle fleet.	***Central Services***	***B. Education / Training / Outreach (ETO)***	***C. In progress***		
172 Saskatchewan Renewable Diesel Program Incentive Developed to support production of renewable diesel. Provides 13 cents per litre of eligible renewable diesel to qualifying producers in Saskatchewan for use in all diesel fuel applications. The incentive program terminates March 31, 2016.	***Ministry of the Economy***	***C. Incentive /Demonstration (ID)***	***C. In progress***		
173 Ethanol Fuel Grant Program The ethanol program provides a 15 cent per litre grant to eligible distributors who blend Saskatchewan produced ethanol within Saskatchewan. The program is intended to encourage smaller ethanol production facilities and complimentary industries; addressing production cost differentials associated with blending ethanol with gasoline; and, promote the retail usage of ethanol-blended fuels.	***Ministry of the Economy***	***C. Incentive /Demonstration (ID)***	***C. In progress***		
174 Ethanol Grant Program Ended in 2012.	***Ministry of Finance***	***C. Incentive /Demonstration (ID)***	***A. Completed/ Concluded***		

YUKON TERRITORY

Q1. Mitigation Initiative*	Q2. Ministry	Q3. Theme	Q4. Status	Q5. Collaboration*	Q6. Results*
175 Anti-tampering Legislation In-kind support	***Environment***	***A. Legislation / Regulation (LR)***	***A. Completed/ Concluded***	None	Legislation in place
176 Awareness Website, fuel efficiency info in Driver handbooks In-kind support	***Environment***	***B. Education / Training / Outreach (ETO)***	***A. Completed/ Concluded*** Ongoing maintenance	None	Website created and regularly maintained - Information in commercial and basic handbooks
177 NEW - Transportation Emissions Analysis This initiative provides an analysis of Yukon's transportation GHG emissions. The objective is to determine the major sources of GHGs and explore possible actions to address. This is expected to help contribute to the Yukon target "Reduce GHG emissions from the transportation sector by 10% by 2015" (2012 base year).	***Environment***	***B. Education / Training / Outreach (ETO)*** Information/ background research	***A. Completed/ Concluded***	None	The report was completed. Identified that the Environment Canada NRI (National Inventory Report) does not accurately report Yukon's transportation emissions and may be under reporting Yukon's transportation emissions by 100%.
178 NEW – Secondary Students Transit Pilot Project This initiative is a pilot project to transport secondary students through the city transit system with a subsidised bus pass instead of traditional school bus. The goal is to reduce the use of school buses (# and KM). The cost of this project is $40,000 per year.	***Education***	***C. Incentive /Demonstration (ID)*** Commuting students	***C. In progress*** Pilot in progress	Collaboration between Department of Education and the City of Whitehorse transit	There have been positive results so far.
179 NEW – Optimise school bus routes This initiative reviews school bus routes to optimise the number of buses and the total kilometres travelled. The objective is to reduce kilometres travelled, fuel used and cost. The costs of this project are absorbed internally.	***Education***	***C. Incentive /Demonstration (ID)*** Commuting students	***C. In progress***	None	None

APPENDIX B: INVENTORY OF CLIMATE CHANGE ADAPTATION INITIATIVES
TABLE OF CONTENTS

	Description	Jurisdiction
1	Climate Change Risk Assessment and Adaptation Report	Alberta
2	Flood Mitigation Program	Alberta
3	Coquihalla –Adaptation Pilot Project	British Columbia
4	Yellowhead Highway Climate Change – Adaptation Pilot Project	British Columbia
5	Development of Best Management Practices to Address Extreme Precipitation Events that Affect Coastal Regions of Canada	British Columbia
6	Climate Change Adaptation Plan	Canada
7	Northern Transportation Adaptation Initiative (NTAI)	Canada
8	Engineering Protocol for Climate Change Infrastructure Vulnerability Assessment	Canada
9	Assessment of Climate Change Impacts and Adaptation for the Canadian Transportation Sector	Canada
10	Winter Road System	Manitoba
11	Spring Road Restrictions Program Policy Revisions	Manitoba
12	Winter Weight Premium Policy	Manitoba
13	Road Flood Proofing	Manitoba
14	Permafrost Degradation on Infrastructure	Manitoba
15	Materials Properties	Manitoba
16	Road Weather Information System (RWIS)	Manitoba
17	Water Control Structures	Manitoba
18	Hudson Bay Railway Rehabilitation	Manitoba
19	Port of Churchill Capital Investment	Manitoba
20	Transport Canada Network of Expertise on Transportation in Arctic Waters (NEXTAW)	Manitoba
21	Provincial Flood Risk Reduction Strategy	New Brunswick
22	Climate Change Projections for Newfoundland and Labrador	Newfoundland and Labrador
23	Culvert Size	Newfoundland and Labrador
24	Access Road from Aklavik to Willow River Gravel Source – Planning Study	Northwest Territories
25	Highway 3 Vulnerability Assessment	Northwest Territories
26	DOT Climate Change Adaptation Risk Assessment Workshop	Northwest Territories
27	Climate Change Adaptation Plan	Northwest Territories
28	Runway Vulnerability Protocol	Northwest Territories
29	Inuvik Airport Geophysics Summit	Northwest Territories
30	Monitoring of Permafrost Terrain – Dempster & Inuvik to Tuktoyaktuk Highways	Northwest Territories
31	IceMap GPR Software and Training	Northwest Territories
32	Hay River Airport – Monitoring and Evaluation	Northwest Territories
33	Behaviour of Ice Covers Under Moving Loads	Northwest Territories
34	Updating the State of Practice for Ice Road Design: 2014 Winter Program	Northwest Territories
35	Construction of Permanent Bridges Along the Mackenzie Valley Winter Road	Northwest Territories
36	Ice Spray Technology	Northwest Territories
37	Ice Profiling to Measure Ice Thickness on Winter Road Alignments	Northwest Territories
38	Yellowknife Highway Test Sections	Northwest Territories
39	Climate Change Vulnerability Assessment and Mitigation Dempster Highway	Northwest Territories
40	Transport Canada Permafrost Network	Northwest Territories

41	Transport Canada Network of Expertise on Transportation in Arctic Waters	Northwest Territories
42	An Evaluation of Flood Risk to Infrastructure Across the Chignecto Isthmus	Nova Scotia
43	Regional Adaptation Collaborative	Nova Scotia
44	Incorporating Hydraullic Studies	Nova Scotia
45	Elevating Roads and Structures	Nova Scotia
46	Flood Mitigation/Prevention - Transit	Ontario
47	Flood Emergency Response Plans - Transit	Ontario
48	Extreme Weather Plan (winter storm)- Transit	Ontario
49	Development of IT Disaster Recovery	Ontario
50	Formal Introduction of Extreme Weather into Enterprise Risk Management (ERM)	Ontario
51	Emergency Electricity Back-up - Transit	Ontario
52	Assess Impact of Climate Change on Maintenance	Ontario
53	Enhanced Rainfall Intensity-Duration-Frequency (IDF) Curves	Ontario
54	Shore Line Protection	Prince Edward Island
55	Raising Bridges	Prince Edward Island
56	Preserving Permafrost Conditions for Airports	Quebec
57	Adaptation Research into Northern Quebec Airport Infrastructure	Quebec
58	Decision-making Tools for Practioners in Permafrost Regions	Quebec
59	Evaluating the Impact of Climate Change on Maritime Infrastructure in Northern Quebec	Quebec
60	Impact of Climate Change in the Gulf of St. Lawrence Region	Quebec
61	Impact of Climate Change on Infrastructure in the Îles-de-la –Madeleine Region	Quebec
62	Vulnerability of Highway Infrastructure to Climate Change	Quebec
63	Research Chair for Coastal and Fluvial Engineering	Quebec
64	Climate Change Research on Coastal Vulnerability	Quebec
65	Adapting Culvert Standards To Severe Storms	Quebec
66	Adapting Infrastructure Standards To Storm Floods	Quebec
67	Culvert Policy	Saskatchewan
68	Vulnerability of the North Alaska Highway to Climate Change	Yukon
69	Yukon Flood Plain Risk Mapping	Yukon
70	Sensitivity of Yukon Hydrological Response to Climate Warming: A Case Study for Sectoral Climate Change Adaptation	Yukon
71	Pan-Territorial Permafrost Workshop	Yukon
72	Economic Implications of Climate Change Adaptations for Mine Access Roads in Northern Canada	Yukon
73	Processing and Interpretation of Geophysical Data along Transportation Infrastructure in Permafrost Regions	Yukon
74	Establishment of Baseline Data Collection Sites and Assessment of Permafrost Response to Climate Warming for Transportation Infrastructure in the Yukon and NWT	Yukon
75	Sensitivity of Dempster Highway Hydrological Response to Climate Warming	Yukon

Task Force on Transportation and the Environment - Survey of Jurisdictions
Climate Change Adaptation

ALBERTA					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
Please identify the climate change adaptation initiatives of your jurisdiction in this column. For each initiative, respond to a, b, c and d below. a. Describe the initiative; b. Identify the objectives, including targets / indicators, and how this initiative may contribute to climate change adaptation; c. Identify the value / amount of funding provided for this initiative, if appropriate d. Feel free to provide a weblink or document to offer more information on this initiative (if desired).	Identify the Ministry / Department with primary responsibility for delivering this initiative, including a contact person	Identify the theme, or type, of this climate change adaptation initiative *(check one)*: a. A Dept / Gov Practice (P) b. Legislation / Regulation (LR) c. Education / Training / Outreach (ETO) d. Incentive / Demonstration (ID) e. other (specify):	What is the status of this initiative *(check one)*? a. completed / concluded b. being planned c. in progress d. being amended e. other (specify)	***For completed / concluded initiatives:*** Has collaboration with other jurisdictions taken place in developing or delivering this initiative? If yes, please describe the collaboration (type, scope, parties involved, associated benefits, etc). ***For current (all other) initiatives:*** Do you see this initiative benefitting from collaborative effort? If yes, please describe the opportunity for collaboration (i.e. type, scope, parties to be involved, etc) and identify the benefits you see accruing from collaborative effort.	***For completed / concluded initiatives:*** a. What was the outcome/result of this initiative, including costs and/or benefits? b. Identify the external factors that impacted the outcome, if any. c. Please describe the "lessons learned", if any. ***For current (all other) initiatives:*** Did this initiative uncover any early "lessons learned"? If so, please describe.
** If more space is needed, feel free to provide detailed answers to Q1, Q5 and/or Q6 in a separate document*					
1 Climate Change Risk Assessment and Adaptation Report This report presents (i) a high-level climate change risk assessment focused on the mandate of Alberta Transportation, and (ii) a set of adaptation measures intended to reduce the most significant risks. The report is available on the Alberta Transportation web site under Publications and can be found at the link below: http://www.transportation.alberta.ca/601.htm	***Alberta Transportation*** Contact: Peter Dzikowski	***F. Research / Assessment***	***A. Completed/ Concluded***	Similar work was done by 6 other Alberta Ministries for their areas of responsibility. This complemented work already done by two other departments.	The risk assessment was completed. The result was used in our enterprise risk management process that considered the climate change risks along with all other risks to guide our business plan development. The climate change risk assessment is expected to be updated at an interval yet to be determined. Given the long term nature of these risks (40 to 50 years out), the risk assessment may be updated every several years as newer climate change (scenario) data becomes available.

ALBERTA					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
2 Flood Mitigation Program The Redford government is fortifying key transportation infrastructure across the province against future flooding. As part of the recovery commitment, $110 million has been earmarked over the next three years to do expanded mitigation work on transportation infrastructure damaged by the June flooding and to protect other roads and bridges identified as at high-risk from future floods. Full press release at the link below: http://alberta.ca/release.cfm?xID=35441D7B4B5CB-CC92-86D4-DF91A48CA0C5B1FC Weblinks: Flood Mitigation: http://www.alberta.ca/Flood-Mitigation.cfm Flood Mitigation Framework: http://www.alberta.ca/AlbertaCode/images/Mitigation-Framework.pdf	***Alberta Transportation*** Contact: Ranjit Tharmalingam There may be other initiatives and other departments may be involved in non-transportation initiatives.	***A. Departmental / Government Practice (P)***	***C. In progress*** Implementing risk reduction through building resilience.	The flood mitigation program collaborates with Alberta municipalities to build resilience.	

BRITISH COLUMBIA					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
3 Coquihalla –Adaptation Pilot Project The costs associated with this project came to a total of $131,000. The final report is available at http://www.pievc.ca/e/doc_project_single.cfm?dsid=3&projid=10. The Coquihalla Highway was chosen as the first pilot initiative to formally study climate change and infrastructure vulnerability and adaptation by the Ministry of Transportation and Infrastructure.	***Ministry of Transportation and Infrastructure***	***F. Research / Assessment***	***A. Completed/ Concluded***	Collaborated with organizations in workshops and other forums, including: internal to government – Ministry of Environment, Ministry of Forests, Lands and Natural Resource Operations, Emergency Management BC as well as external organizations: BC Hydro, various municipalities, the Pacific Climate Impacts Consortium (PCIC), and Environment Canada.	
4 Yellowhead Highway Climate Change – Adaptation Pilot Project The total cost for this project was $170,000. The final report is available at http://www.pievc.ca/e/doc_project_single.cfm?dsid=3&projid=18. This is similar to the Coquihalla Highway Project with respect to being a formal study on climate change and infrastructure vulnerability and adaptation.	***Ministry of Transportation and Infrastructure***	***F. Research / Assessment***	***A. Completed/ Concluded***	Collaborated with organizations in workshops and other forums, including: internal to government – Ministry of Environment, Ministry of Forests, Lands and Natural Resource Operations, Emergency Management BC as well as external organizations: BC Hydro, various municipalities, the Pacific Climate Impacts Consortium (PCIC), and Environment Canada.	
5 Development of Best Management Practices to Address Extreme Precipitation Events that Affect Coastal Regions of Canada This is a Natural Resources Canada Project regarding highway climate and adaptation. Note: Report is currently at draft stage, and will post in the future. There will also be a technical circular to guide staff and consultants to include climate change issues in transportation design work for the ministry. The total cost for the project to date is $260,000.	***Ministry of Transportation and Infrastructure***	***F. Research / Assessment***	***C. In progress***	Collaborating with Natural Resources Canada, Engineers Canada, Pacific Climate Impacts Consortium and Ministry of Environment (Climate Action Secretariat).	The preliminary best practices identified are: • Establish monitoring Programs; • Keep Meteorological and Climate Data up to date; • Identify sources for robust climate change information; • Work with regional climate change and meteorological professionals; • Ensure projections are based on ensembles of climate change model outputs; • Consider combinations and sequences of events; • Strive for balance between computational methods and professional judgement; • Consider the impact of the

BRITISH COLUMBIA					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
					high intensity precipitation events; • Use risk management to address uncertainties; • Provide tools and ensure staff are trained in their use; • Identify key staff responsible for monitoring and managing climate change issues; • Establish multidisciplinary climate change review teams; • Monitor codes and standards; • Incorporate climate change adaptation measures into planning cycles and • Mandate consideration of climate change in day to day activities.

CANADA					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
6 Climate Change Adaptation Plan The departmental Plan consists of a series of departmental actions aimed to strengthen climate change adaptation knowledge & capacity, and improve how TC integrates climate change adaptation into decision-making. The Plan has four objectives: 1. Strengthen science-based knowledge of climate change risks, costs and adaptation practices for transportation infrastructure and operations (e.g. marine, aviation, surface, strategic gateways and corridors). 2. Strengthen Transport Canada's engagement[3] with other departments and stakeholders on climate change adaptation issues. 3. Integrate climate change adaptation into corporate planning and decision-making tools 4. Integrate climate change risks and opportunities into relevant regulatory activities, programs, plans, and strategies Costs are internal. The Plan is not available on TC's website.	***Transport Canada*** Contacts: Jenna Craig jenna.craig@tc.gc.ca and Kathy Palko kathy.palko@tc.gc.ca	***A. Departmental / Government Practice (P)*** Departmental Plan (internal)	***C. In progress*** A 3 year plan. 2013/14-2015/16	No external collaboration due to internal nature of initiative.	*Climate Change Adaptation Plan (2013/14-2015/16)*
7 Northern Transportation Adaptation Initiative (NTAI) **Action is included in Adaptation Plan* This Initiative supports science-based research to help better understand climate impacts in Northern Canada and facilitate better and more integrated transportation planning and adaptation measures. This program falls under the Government of Canada's federal adaptation programming, which allocated $148.8 million to federal adaptation programming in Budget 2011 for the purpose of improving Canada's resilience to a changing climate. Key objectives of the NTAI: • Increase capacity of Northerners to adapt transportation infrastructure to climate change; • Support R&D and new innovative technologies; and • Test new technologies and/or technologies used in the South in the North The initiative is a five-year $11 million program.	***Transport Canada*** Contact: Janice Festa janice.festa@tc.gc.ca	***F. Research/ Assessment***	***C. In progress*** 5 year Program (2011/12-2015/16)	Yes, two networks of expertise were created with representatives from northern jurisdictions and academia. One network is dedicated to permafrost related issues (the Permafrost Network) and one on arctic waters issues (Network of Expertise on Transportation in Arctic Waters or NEXTAW). Each Network meets twice a year.	Collaboration has played an important role in ensuring the success of the NTAI to date. TC has formed strong partnerships with other governments, academia and the private sector to ensure that the objectives are achieved. TC also recognizes the importance of providing an institutional structure, through its networks, that promotes lasting collaborative partnerships among these various sectors (i.e., beyond TC). The challenges facing the northern transportation system are complex and therefore require an interdisciplinary approach

[3] Includes headquarters and Regions

CANADA					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
Website: http://www.tc.gc.ca/eng/innovation/ntai-menu-1560.htm					that brings together experts from many different fields.
8 Engineering Protocol for Climate Change Infrastructure Vulnerability Assessment This initiative will conduct pilots of the Public Infrastructure Engineering Vulnerability Committee (PIEVC)'s Engineering Protocol for Climate Change Infrastructure Vulnerability Assessment on four northern airports. The PIEVC Engineering Protocol is a structured, formalized and documented process for engineers, planners and decision-makers to recommend measures to address the vulnerabilities and risks to changes in climate design parameters and other environmental factors from extreme climatic events. Costs to be confirmed. PIEVC website: http://www.pievc.ca/e/index .cfm	***Transport Canada*** Contact: Jenna Craig jenna.craig@tc.gc.ca	***F. Research/ Assessment***	***B. Being planned*** Specific airports currently being confirmed.	Collaborating with territorial governments and airport operators.	No results yet.
9 Assessment of Climate Change Impacts and Adaptation for the Canadian Transportation Sector *Included in Adaptation Plan The project will assess the current state of knowledge on climate change risks and opportunities, and adaptation measures for the Canadian transportation sector. Proposed objectives are: 1. To assess the current state of scientific knowledge of climate change impacts and adaptation relevant to the Canadian transportation sector. 2. To identify the emerging climate change risks, vulnerabilities, and opportunities for the Canadian transportation sector. 3. To enhance the Canadian transportations sector's ability to adapt to a changing climate through science-based knowledge and information on climate change impacts and adaptation practices. Project cost is estimated at $300,000 plus salary. A summary of a stakeholder scoping meeting for the project (held November 2012) is available from TC.	***Transport Canada*** & ***Natural Resources Canada*** Contact: Kathy Palko kathy.palko@tc.gc.ca	***F. Research/ Assessment***	***B. Being planned*** Next steps include creation of advisory committee.	Stakeholder scoping meeting was held in November 2012. Opportunities for further engagement include the creation of an advisory committee, stakeholder input into process and content, and product review.	No results yet.

MANITOBA					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
10 Winter Road System The program provides for the construction and maintenance of winter roads to communities in northern Manitoba. The program has been in effect since the 1970s. The program operates normally over an eight week period from mid-January to mid-March. Climate change adaptation strategies being undertaken include: - relocate existing winter roads to more land based roads; - construct new roads; - construct new bridges; - upgrade existing winter and forestry roads; and - explore enhanced rail and ferry services. Program spending is approximately $250,000 each year, mainly to ensure roads are safe and reliable for users. Website: http://www.gov.mb.ca/mit/winter/index.html	***Manitoba Infrastructure and Transportation (MIT)*** Contact: Larry Halayko, Director, Ph: 204-945-7035	***A. Departmental / Government Practice (P)***	***C. In progress***	MIT manages the winter road network in Manitoba with construction and maintenance work delivered by local communities. The federal government and MIT jointly fund the program with most funding coming from the Province.	Changes in temperature and precipitation can affect construction, opening dates and the duration the road is open. In general, MIT has not seen a trend towards shorter seasons, though this has not been measured. The length of the winter road season may be longer in some years and shorter in others.
11 Spring Road Restrictions Program Policy Revisions MIT has revised its Spring Road Restrictions (SRR) policy to be more responsive to variable weather conditions. Previously, there were fixed starting and ending dates, regardless of prevailing conditions. The policy was revised to enable flexible start/end dates that can change from year to year depending on prevailing weather conditions. Spending on the SRR is nominal with program costs covering staff time and a small amount of newspaper advertising. Website: http://www.gov.mb.ca/mit/srr/	***Manitoba Infrastructure and Transportation (MIT)*** Contact: Stan Hilderman, Senior Pavements and Geotechnical Engineer, Ph: 204-781-6901	***A. Departmental / Government Practice (P)***	***C. In progress***	Manitoba collaborated with industry, consultants and the University of Manitoba during the formulation of this program.	The previous spring restriction program did not reflect weather conditions. The new policy is more responsive to variable weather conditions from year to year. Previously, SRR timeframes lasted 70 days. Now the flexible start/end dates results in SRR timeframes that last an average of 56 days. The change now more effectively protects roads while benefiting industry.
12 Winter Weight Premium Policy MIT has revised its Winter Weight Premium (WWP) Policy to be more responsive to variable weather conditions from year to year, changing its previous policy of fixed starting and ending dates to a new policy that is based on actual weather conditions. This change will allow motor carriers to carry heavier loads as soon as roads are frozen which is expected to assist rural economic growth. Costs to deliver this policy are nominal, primarily providing for staff and administration.	***Manitoba Infrastructure and Transportation (MIT)*** Contact: Stan Hilderman, Senior Pavements and Geotechnical Engineer, Ph: 204-781-6901	***A. Departmental / Government Practice (P)***	***C. In progress***	Manitoba collaborated with industry, consultants and the University of Manitoba during the formulation of this policy.	The new policy reflects variable weather conditions from year to year, benefiting industry.

MANITOBA					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
Website: http://www.manitoba.ca/mit/mcd/mcpd/wwa.html					
13 Road Flood Proofing Priority for flood proofing Manitoba's road network has focused on key trade routes, such as Highway 75 to the United States as well routes to Western Canada. The Province is also looking to flood proof smaller roads that have lower traffic volumes as they provide important links to rural communities. To ensure that roads stay open during severe floods, which tend to occur during the snowmelt in the spring , adaptation strategies being used include: - elevating roads; - increasing culvert capacity; - redirecting water flow; and - asphalting roads to reduce risk of washout of soil based and gravel roads. Multi-year funding of $215 million is being provided to flood proof roads in Manitoba. Website: none.	***Manitoba Infrastructure and Transportation (MIT)*** Contact: Ron Weatherburn, Executive Director, Ph: 204-945-3775	***A. Departmental / Government Practice (P)***	***C. In progress***	Collaboration with others occurs primarily through construction and maintenance committee meetings organized by the Transportation Association of Canada (TAC). Best practices and other information is regularly shared between MIT and provincial counterparts in other jurisdictions. MIT is always looking for cost-sharing opportunities with the federal government.	Flood proofing reduces the risk of road closure which impacts the economic viability and social well-being of communities. In Manitoba, there is a need to undertake more flood proofing.
14 Permafrost Degradation on Infrastructure There are areas in northern Manitoba that have discontinuous permafrost. Changes in weather patterns or the construction of roads have led to the melting of permafrost. This has resulted in ongoing maintenance of roadways and increased costs. Manitoba is working with other jurisdictions to investigate and study this issue. Detailed information on costs is not readily available at this time. Website: none.	***Manitoba Infrastructure and Transportation (MIT)*** Contact: Stan Hilderman, Senior Pavements and Geotechnical Engineer, Ph: 204-781-6901	***A. Departmental / Government Practice (P)***	***C. In progress***	Manitoba is collaborating with other jurisdictions on the permafrost issue. Collaboration is also occurring with consultants and universities.	MIT is participating in ongoing studies to address the degradation of permafrost. There are no measurable findings at this time.
15 Materials Properties Manitoba is looking to gain a better understanding of how high and low temperatures are affecting certain aspects of material properties. Currently, the major initiative deals with the selection of asphalt cement, which can crack at low temperatures and rut at high temperatures. Combating the effects of extreme weather effects on asphalt is important for enhancing the life of the asset and keeping maintenance and operating costs down.	***Manitoba Infrastructure and Transportation (MIT)*** Contact: Stan Hilderman, Senior Pavements and Geotechnical Engineer, Ph: 204-781-6901	***D. Incentive/ Demonstration (ID)***	***C. In progress***	MIT consults with other Canadian provinces in the setting of specifications and the sharing of results and experiences.	As MIT is currently involved in the construction of test sites for monitoring, there are no findings at this time.

MANITOBA					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
Detailed information on costs is not readily available at this time. Website: none					
16 Road Weather Information System (RWIS) As a new project, RWIS provides year-round information on road conditions in Manitoba. It mainly focuses on high traffic level routes that experience major issues such as snow storms, flooding and construction delays. It also addresses roads with lower traffic volumes and winter roads. RWIS helps with adaptation by providing real-time information that helps MIT in its planning and decision-making. For instance, road sensors and cameras are used by the maintenance staff to inspect road conditions without having to physically be there. For a snow covered road, this helps determine the best time for ploughing, which saves time and costs. There are presently 5 RWIS sites in operation in Manitoba with another 7 to come on board by spring 2014, for a total of 12 sites. Sensors and cameras are located on road segments that are spaced 50 kilometres apart. Website: http://www.gov.mb.ca/mit/roadinfo/	***Manitoba Infrastructure and Transportation (MIT)*** Contact: Mike Knight, Director, Ph: 204-795-8069	***A. Departmental / Government Practice (P)***	***C. In progress***	MIT has discussed the RWIS project with Saskatchewan and Ontario. Collaboration also occurs with members of the Transportation Association of Canada (TAC) that sit on the travellers, salt management and snow plough lighting committees.	As an information tool, RWIS provides data to aid operational planning and decision-making that is expected to contribute to time savings and improved cost control.
17 Water Control Structures Severe rain events are greater than in the past and have contributed to the disruption and loss of water control structures including drains, bridges, culverts and pumping stations. To ensure water control structures remain operational after an extreme rainfall, adaptation strategies being used include: - larger drains and culverts to increase water flow capacity; - larger bridges capable of withstanding intense rainfall; - erosion control such as use of rock riprap and dikes; and - set design standards to the highest recorded rain event. To adapt to extreme rain, MIT spends an average of $2 million each year on bridges and large culverts. Website: http://www.gov.mb.ca/mit/wcs/index.html	***Manitoba Infrastructure and Transportation (MIT)*** Contact: Ron Richardson, Director, Ph: 204-479-1990	***A. Departmental / Government Practice (P)***	***C. In progress***	Considering severe rainfalls are often isolated and the topography of the province is unique, collaboration with other provincial counterparts is not always possible as approaches for dealing with major rain events are unique to each province. When collaboration is doable, it is done with the Transportation Association of Canada (TAC) and the universities.	Huge rainfalls are more frequent than they were 50 years ago, affecting both highway crossings and water control crossings. Agricultural drains haven been mainly impacted as they are often too small to handle major rain events. There is a need to re-evaluate how well existing pumping stations can handle more extreme and frequent rain events. Unlike flooding from a spring snowmelt, it is difficult to predict when and where a flash flood will occur. As a result, MIT will make decisions quickly using its best judgement.

MANITOBA					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
18 Hudson Bay Railway Rehabilitation Freight and passenger rail services are provided on more than 800 miles of railway lines in northern Manitoba, which includes the 545 miles of railway from The Pas to Churchill, known as the "Bay Line" and operated by the Hudson Bay Railway (HBR). Six remote, rail-only northern communities rely on the rail service as the only surface transportation option for freight and personal mobility. Passenger rail services are provided by Via Rail. Service along the Bay Line had been declining for many years due to the north's challenging operating environment, exacerbated by climate change, and the need for significant annual investments in infrastructure maintenance. In response, Manitoba, Canada and OmniTRAX embarked on a 10 year, $60 million public-private partnership to rehabilitate the Bay Line. Canada and Manitoba contributed $20 million each over 5 years and OmniTRAX will contribute $20 million over ten years to the project. Website: none.	***Manitoba Infrastructure and Transportation (MIT)*** Contact: Erica Vido, Manager, Transportation Policy, Ph: 204-945-2631, Erica.Vido@gov.mb.ca	***D. Incentive/ Demonstration (ID)***	***C. In progress***	OmniTRAX developed and implemented the workplan. Transport Canada co-funded and administered the project. No other opportunity for collaboration is known	To date, about $50 million has been spent on Bay Line rehabilitation. The project began in 2008 and 2012 was the final year of government contributions to the project, after which the project continues, but at a slower pace and reduced scope. Operating performance has improved significantly since 2008. The speed of trains has increased by 40% for passenger trains and 28% for freight trains. Total transit time between Churchill and The Pas for freight trains (grain) has decreased by 22% There has been less success than would be desirable in addressing sub-grade issues like sinkholes and unstable areas. This is due to inherent unstable land foundation caused by underlying discontinuous permafrost and muskeg.
19 Port of Churchill Capital Investment Located in northern Manitoba on the shore of Hudson Bay, the Port of Churchill is Canada's only deep-sea, international Arctic port. The current shipping season into the Port of Churchill is typically about 14 weeks, with navigation permitted by Canadian regulations between mid-July and early November for non-ice-classed vessels. However, the effects of climate change may result in an extended shipping season for the port. Climate change is extending the navigable shipping season and opening up the Arctic for development – an emerging marketplace for which the Port of Churchill is positioned to serve. To capture these opportunities, the governments of Manitoba and Canada are investing $8 million in traffic-diversifying capital improvements to the Port of Churchill. Website: none.	***Manitoba Infrastructure and Transportation (MIT)*** Contact: Erica Vido, Manager, Transportation Policy, Ph: 204-945-2631, Erica.Vido@gov.mb.ca	***D. Incentive/ Demonstration (ID)***	***C. In progress***	OmniTRAX, together with the Churchill Gateway Development Corporation, are developing and implementing a workplan. Western Economic Diversification Canada co-funds and co-administers the project.	n/a

MANITOBA					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
20 Transport Canada Network of Expertise on Transportation in Arctic Waters (NEXTAW) Manitoba Infrastructure and Transportation is involved in Transport Canada's Network of Expertise on Transportation in Arctic Waters. The department has accessed NEXTAW funding to undertake research on sea ice changes and their impacts on transportation infrastructure and operation in Hudson Bay, with particular emphasis on the Churchill Gateway System. The total project budget is $2.5 million, including $600,000 provided via NEXTAW. Website: none.	***Manitoba Infrastructure and Transportation (MIT)*** Contact: Erica Vido, Manager, Transportation Policy, Ph: 204-945-2631, Erica.Vido@gov.mb.ca	***F. Research/ Assessment***	***C. In progress***	Manitoba is collaborating with the Centre for Earth Observation Science at the University of Manitoba. Further collaboration with the Government of Nunavut will be undertaken to ensure outcomes are applicable across the Hudson Bay region. It is anticipated that workshops and meetings will be held in northern communities to obtain feedback on risks and opportunities.	

NEW BRUNSWICK					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
21 Provincial Flood Risk Reduction Strategy Development of a Provincial Flood Risk Reduction Strategy to address both inland and coastal flooding. Goals of Strategy: •Increased public safety and avoidance of personal hardships, •Reduced flood damage to properties, infrastructure and the environment, •Increased community resilience, •Cost savings for taxpayers and property owners, and •Less uncertainty about flood risk, leading to better decisions. No funding at this stage of strategy development.	***Department of Environment and Local Government*** Contact: Jeff Hoyt	***A. Departmental / Government Practice (P)***	***C. In progress***	We do not see this benefitting from collaborative effort outside of the Province. We have been in discussion with other jurisdictions, to help inform our work to date.	As we are still in the development phase there are no lessons learned to report on at this stage.

NEWFOUNDLAND AND LABRADOR					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
22 Climate Change Projections for Newfoundland and Labrador The Office of Climate Change and Energy Efficiency worked with researchers at Memorial University to study how the province's climate is expected to change by mid-century. These projections are important because changes to our climate will affect all regions and all sectors of our province, including transportation. The availability of better information leads to better planning; better planning leads to better decision making; and better decisions will increase our resilience to the impacts of climate change. The findings of this study will provide local industries, businesses, municipal governments and other organizations with the information they need to improve their planning for the future. Information regarding the report may be accessed at http://www.exec.gov.nl.ca/exec/cceeet/publications/index.html.	***Office of Climate Change and Energy Efficiency, Executive Council***	***C. Education / Training / Outreach (ETO)***	***C. In progress***		Results of the study are being incorporated into decisions. An analysis of the costs and benefits of such decisions cannot be undertaken at this time.
23 Culvert Size The Government of Newfoundland and Labrador uses the most recent Environment Canada data available to develop intensity duration and frequency curves to inform the design and build of culverts. Culverts are often oversized to allow for fish passage which will also accommodate larger storms.	***Department of Transportation and Works***	***A. Departmental / Government Practice (P)***	***C. In progress***		

NORTHWEST TERRITORIES					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
24 Access Road from Aklavik to Willow River Gravel Source – Planning Study A planning study for a proposed 27 km all-weather road from the community of Aklavik to the nearby Willow River gravel source was completed. This road would replace the existing winter road from the community, which will become less reliable as climate change continues. The completion of the planning study ensures the Department of Transportation is prepared for future consequences of climate change. Total Cost: $98,966.00	***Department of Transportation***	***A. Departmental / Government Practice (P)***	***A. Completed/ Concluded***	The department completed this initiative in partnership with the Hamlet of Aklavik. Funded under the Research and Development component of the Building Canada Plan – Infrastructure Canada	Over time, the reliability of winter roads will become less certain due to the impacts of climate change. Given the long planning horizon of an all-weather road, DOT deemed it prudent to initiate this planning study well in advance of future need.
25 Highway 3 Vulnerability Assessment In partnership with Engineers Canada, the Department of Transportation selected the section of Northwest Territories Highway 3 located between km 240 and km 333 as a case study for a climate change vulnerability assessment using the protocol developed by the PIEVC. This segment of the highway traverses highly variable terrain in the Canadian Shield, ranging from bedrock outcrops to silty clays. The discontinuous permafrost is warm and ice-rich. Total Cost: $113,445.00	***Department of Transportation***	***F. Research / Assessment***	***A. Completed/ Concluded***	Funded under the Research and Development component of the Building Canada Plan – Infrastructure Canada. Partnering with Engineers Canada to study segments of Highway 3 using the protocol developed by PIEVC.	The assessment demonstrated that those sections built on ice-rich permafrost are at greatest risk, based on the low capacity to withstand the anticipated climate-related loads. The report concluded that climate change will likely increase maintenance and repair efforts required to maintain safe driving conditions.
26 DOT Climate Change Adaptation Risk Assessment Workshop A consultant was retained by the Department of Transportation to lead workshop participants through a preliminary climate change risk analysis of NWT transportation infrastructure. Total Cost: $24,122.00	***Department of Transportation***	***C. Education / Training / Outreach (ETO)***	***A. Completed/ Concluded***	Funded under the Research and Development component of the Building Canada Plan – Infrastructure Canada	The resulting workshop report was a first stage in the development of the DOT Climate Change Adaptation Plan.
27 Climate Change Adaptation Plan The Climate Change Adaptation Plan identifies how the department will manage the key short and long-term risks resulting from climate change, and how to take advantage of the associated opportunities. Funding: $260,000	***Department of Transportation***	***A. Departmental / Government Practice (P)***	***C. In progress***	Funded under the Research and Development component of the Building Canada Plan – Infrastructure Canada	

NORTHWEST TERRITORIES					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
28 Runway Vulnerability Protocol In February 2011, the department, in partnership with Carleton University, conducted a scoping workshop to develop a vulnerability assessment protocol to determine which runways built on permafrost are most at risk to the impact of climate change. Total Cost: $15,000.00	***Department of Transportation***	***F. Research / Assessment***	***A. Completed/ Concluded***	Partnered with Carleton University.	This is an effective tool to assist in the development of a strategy for managing the risks associated with vulnerable airport infrastructure. The guidelines have been developed for identifying potential climate-related hazards across 27 airport facilities in the NWT. Once risks have been characterized it may be possible to move toward ranking the installations according to their relative susceptibility.
29 Inuvik Airport Geophysics Summit This involved an assessment of the state of knowledge about geophysics in permafrost terrain, and assessed some experimental techniques for evaluating ground ice conditions on runways and road infrastructure. These techniques could be useful in assessing the vulnerability of embankments built on permafrost to the impacts of climate change. The site work at the Inuvik airport was carried out from June 5 – 13, 2011. A report was presented in the fall of 2011. Total Cost: $35,625.00	***Department of Transportation***	***F. Research / Assessment***	***A. Completed/ Concluded***	Funded under the Research and Development component of the Building Canada Plan – Infrastructure Canada	The geophysical surveys provide an integrated view of subsurface conditions and an assessment of possible hazards related to warming ground conditions. The data provide a key baseline for future investigations.
30 Monitoring of Permafrost Terrain – Dempster & Inuvik to Tuktoyaktuk Highways The department conducted LiDAR surveys on the Dempster Highway and the proposed alignment of the Inuvik to Tuktoyaktuk Highway to produce high resolution digital elevation maps.	***Department of Transportation***	***A. Departmental / Government Practice (P)***	***A. Completed/ Concluded***	Funded under the Research and Development component of the Building Canada Plan – Infrastructure Canada	The surveys provide topographic baselines with which to monitor future change and assess the vulnerability of the Dempster highway to the impacts of climate change.
31 IceMap GPR Software and Training The Department of Transportation purchased the updated version of IceMap ground penetrating radar software system and provided training to staff constructing ice roads.	***Department of Transportation***	***C. Education / Training / Outreach (ETO)***	***A. Completed/ Concluded***	Funded under the Research and Development component of the Building Canada Plan – Infrastructure Canada	Given the impacts of climate change and climate variability on ice roads, this is a valuable tool that provides more reliable and timely measurement of ice thickness to ensure the safety of operational staff and the travelling public.
32 Hay River Airport – Monitoring and Evaluation A consultant has been engaged to conduct a geotechnical and geophysical investigation and engineering review of the primary runway at the Hay River Airport. Ongoing issues with stability of the runway are at least partially attributed to impacts of climate change associated with increasing air	***Department of Transportation***	***F. Research / Assessment***	***C. In progress***	Funded under the Research and Development component of the Building Canada Plan – Infrastructure Canada	

NORTHWEST TERRITORIES					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
temperatures and annual precipitation. The investigation and options analysis will identify an approach to stabilization of the runway and to support the development of a funding application in support of future rehabilitation and construction.					
33 Behaviour of Ice Covers Under Moving Loads In 2012, DOT contributed to a field testing program to determine the physical processes that are at play when a loaded vehicle travels over an ice cover. Further field work will be carried out in 2014 to assess the effectiveness of measures that have been identified to lower the cost and improve the safety of transportation on ice covers. Funding: $50,000.00	***Department of Transportation***	***F. Research / Assessment***	***C. In progress***	Funded under the Research and Development component of the Building Canada Plan – Infrastructure Canada.	
34 Updating the State of Practice for Ice Road Design: 2014 Winter Program DOT is contributing to a field testing program to improve the understanding of the impact that the variability in natural ice thickness has on ice deflection in order to more confidently assess risk for loading. This risk management framework will enable industry and public users to better identify potential risks and apply appropriate control measures in a cost effective and efficient manner. It will also enable them to consider the effects of climate change on ice growth and ice road operating window. Funding: $25,000.00	***Department of Transportation***	***A. Departmental / Government Practice (P)***	***C. In progress***	Funded under the Research and Development component of the Building Canada Plan – Infrastructure Canada	
35 Construction of Permanent Bridges Along the Mackenzie Valley Winter Road The completion of bridges along the Mackenzie Valley Winter Road increases the reliability of the route where warmer temperatures are causing sections of winter roads to become unstable. These bridges mark the beginning of a larger transition to a completed all-weather highway up the Mackenzie Valley intended for the future of the territory.	***Department of Transportation***	***A. Departmental / Government Practice (P)***	***C. In progress***	Funded under three federal plans: SHIP, CSIF and BCP	
36 Ice Spray Technology The Department of Transportation has made use of ice-spray technology to improve ice-making capacity at the Tsiigehtchic	***Department of Transportation***	***A. Departmental / Government Practice (P)***	***C. In progress***		

NORTHWEST TERRITORIES					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
and the Peel River ice crossing near For McPherson. The trend in warmer weather has caused ice to form slower than usual, causing delays in providing access through ice crossings. Ice-spray technology helps ice to form despite climate change.					
37 Ice Profiling to Measure Ice Thickness on Winter Road Alignments The Department of Transportation carefully monitors ice thickness on winter roads before allowing personnel or traffic to enter the ice surface. Profiling also helps the Department to establish patterns in ice thickness over time, recording the increase or decrease in effects of climate change.	***Department of Transportation***	***A. Departmental / Government Practice (P)***	***C. In progress***	Funded under the Research and Development component of the Building Canada Plan – Infrastructure Canada	
38 Yellowknife Highway Test Sections Four test sections were constructed along Highway 3, north of Yellowknife to test new rehabilitation techniques for roads constructed on warm, ice-rich permafrost. Thermistor strings were installed during embankment reconstruction to monitor temperatures at various locations within the road embankment. All installed thermistor strings were connected to data loggers for automated temperature measurements.	***Department of Transportation***	***F. Research / Assessment***	***C. In progress***	Funded under the Research and Development component of the Building Canada Plan – Infrastructure Canada	A consultant is monitoring, assessing, and documenting the performance of the constructed test sections over a three-year period. Annual monitoring reports will be prepared for the years 2013, 2014, and 2015 and would be submitted approximately during the month of November of each year. It is planned to submit the final assessment report in December of 2015.
39 Climate Change Vulnerability Assessment and Mitigation Dempster Highway The Dempster Highway connects the Klondike Highway in the Yukon to Inuvik, Northwest Territories on the Mackenzie River delta, and when the Inuvik-Tuktoyaktuk Highway is built, it will link southern Canada with the Arctic Ocean. The Dempster Highway relies on permafrost to provide a stable foundation to support the road embankment. With climate change, there is a higher risk of permafrost degradation that will lead to embankment instability and possibly failure. The primary purpose of this project is to determine if there is sufficient information to conduct a vulnerability assessment of the Dempster Highway, to ascertain the gaps in the available information for this purpose, and to establish if it is feasible to correct any identified deficiencies.	***Department of Transportation***	***F. Research / Assessment***	***C. In progress***	Yukon Department of Public Works and Highways and GNWT Department of Transportation are co-managers of the project with funding from Transport Canada under their Northern Transportation Adaptation Initiative	

NORTHWEST TERRITORIES					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
40 Transport Canada Permafrost Network The Department of Transportation is involved in Transport Canada's Permafrost Network intended to foster northern expertise and conduct research to provide Canada and the Territories with the capacity to manage transportation infrastructure in the context of changing climate. The Permafrost Network, sponsored by Transport Canada under their Northern Transportation Adaptation Initiative, is supporting the development of a signature program focused on the Dempster/Inuvik to Tuktoyatuk Highway Corridor. This program will focus on the impacts of climate change on permafrost as it relates to transportation infrastructure along the Dempster/ITH Corridor from the Klondike Highway in the Yukon to Tuktoyaktuk in the NWT. Four Research and Development projects have been proposed for the ITH as follows: • Evaluate Various Techniques for Mapping and Characterization of Ice Wedges along Highway Alignments in Continuous Permafrost • The Influence of Snow on Permafrost Stability Beneath Highway Embankments • Case Studies on Transportation Infrastructure Construction Issues in Permafrost Regions • Development of Improved Maintenance Procedures for Highways in Permafrost	***Department of Transportation***	***C. Education / Training / Outreach (ETO)***	***C. In progress***	Collaborating with Transport Canada, other provinces and academia.	
41 Transport Canada Network of Expertise on Transportation in Arctic Waters The Department of Transportation is involved in Transport Canada's Network of Expertise on Transportation in Arctic Waters. • Potential impacts of climate change on the future stream flow and water levels of the Mackenzie River (project approved by TC) • Multimodal transportation systems analysis and planning in Northern Canada under the effects of climate change	***Department of Transportation***	***C. Education / Training / Outreach (ETO)***	***C. In progress***	Collaborating with Transport Canada, other provinces and academia.	

NOVA SCOTIA					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
42 An Evaluation of Flood Risk to Infrastructure Across the Chignecto Isthmus NSTIR set out to investigate the short and long-term risks of flooding of the Isthmus and initiate an adaptation program to respond to climate change. **Need for the Project:** Nova Scotia's road and rail gateways to Canada are situated within the Chignecto Isthmus – a low-lying area that is vulnerable to rising sea levels and storm surges from both the Bay of Fundy and the Northumberland Strait. Currently, a system of agricultural dykes, the Canadian National Railway (CNR) and the Trans-Canada Highway (Hwy 104) protect this area (2,200 ha),its vital transportation links, and more than $70 million of public and private assets. However, the area has historically flooded during large storm events and climate change will increase flooding frequency, duration and intensity. The NS Department of Transportation and Infrastructure Renewal (NSTIR) and CNR will continue to maintain their systems in face of environmental hazards but practical adaptation options must also be developed as part of integrated provincial and corporate approaches to climate change. **Project Objectives**: The work involves eight key tasks: acquire and process additional lidar (Light detection and ranging) data in a narrow band near Route 366 to Tidnish Head and Baie Verte, and integrate this information with the newly-completed Lidar coverage in the Amherst, NS, and Sackville, NB areas; gather the necessary existing information to conduct flood risk modeling and mapping across the rest of the NS frontier (to the Tidnish-Baie Verte area); conduct additional field surveys to ground-truth the digital elevation model(DEM) and the flood modeling predictions;prepare an integrated set of flood risk maps of the Isthmus area;identify areas and transportation infrastructure at risk on the Isthmus;identify potential alternative routes for sustainable transportation; present summaries of the research project at the ACAS conference in March 2012(http://atlanticadaptation.ca/ACAS-Conference); and prepare a Final Report for NSTIR and ACASA.	***Nova Scotia Transportation and Infrastructure Renewal (NS TIR)*** Contact: Dr. Bob Pett, (902) 424 4082, pettrj@gov.ns.ca Dr. Pett is on extended leave until May 2014	***F. Research / Assessment*** Research/Policy	***C. In progress***	Nova Scotia specific issue, but certainly sharing our information might help others in similar situations. March 2012 ACAS Conference http://atlanticadaptation.ca/ACAS-Conference Dr. Pett's Presentation: http://atlanticadaptation.ca/sites/discoveryspace.upei.ca.acasa/files/E%20Bob%20PettSECURED.pdf In partnership with the Natural Resources Canada (NRCAN), Nova Scotia's Climate Change Directorate and other ACASA members.	
43 Regional Adaptation Collaborative The Regional Adaptation Collaborative (RAC) Program is part of this investment. It is a three-year, $30 million, program delivered in cooperation with all provinces and territories. The Atlantic Regional Adaptation Collaborative, administered	***Nova Scotia Transportation and Infrastructure Renewal (NS TIR)***	***C. Education / Training / Outreach (ETO)*** Research	***A. Completed/ Concluded***	The Governments of New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland and Labrador partnered to deliver the Atlantic portion of this program.	March 2012 conference: "Climate Change: Getting Ready" http://atlanticadaptation.ca/sites/discoveryspace.upei.ca.acasa/files/Conference%20Program%20FINAL_0.pdf

NOVA SCOTIA					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
through the Atlantic Climate Adaptation Solutions Association (ACASA), worked to develop tools and resources that can help decision makers address: coastal erosion, coastal and inland flooding, infrastructure design, and groundwater management. From 2009 to 2012, Natural Resources Canada provided $3.5 Million to the region. The Atlantic Provinces contributed an additional $4.6 Million. Weblinks: http://atlanticadaptation.ca/program http://www.nrcan.gc.ca/environment/impacts-adaptation/regional-initiatives/10631					Follow up document: http://atlanticadaptation.ca/sites/discoveryspace.upei.ca.acasa/files/Evaluation%20-%20Online.pdf
44 Incorporating Hydraullic Studies The purpose of this initiative is to conduct hydraulic studies in design stages of water crossing structures and factor in climate change flow values. The target is to incorporate this into all new and replacement water crossing designs but it is presently not done 100% of the time.	***Nova Scotia Transportation and Infrastructure Renewal (NS TIR)***	***A. Departmental / Government Practice (P)***	***C. In progress***		The immediate benefit is the reduced likelihood that we will have to rebuild or complete significant repairs to the structure after a significant storm event.
45 Elevating Roads and Structures On a project by project basis, during the planning stages of road repairs we evaluate elevations of roads and structures to see if project specific adaptations are necessary to accommodate the potential for flood waters (e.g., raise the height of road beds). This is not always practical but it is considered.	***Nova Scotia Transportation and Infrastructure Renewal (NS TIR)***	***A. Departmental / Government Practice (P)***	***C. In progress***		

ONTARIO					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***

46 Flood Mitigation/Prevention - Transit
 	
Don Valley (GO Transit Richmond Hill Corridor) has been identified as the location most vulnerable to flooding within the GO Transit network but there are hundreds of bridges and culverts in the system.
 	
GO is working with the Toronto and Region Conservation Authority, CN Rail and others to identify mitigation strategies with improvements to infrastructure, operating procedures and communications/collaboration between stakeholders. This includes:
• assessment of high risk areas with mitigation work being implemented (i.e. culvert replacement or upgrade; track bed hardening; on-going culvert maintenance program for debris and sediment removal
• pilot installation of embankment failure (washout) detectors and track ballast integrity sensors
• review of high water detector locations and enhanced use of this technology for notification of how quickly water levels are rising
  o Flood sensors now alarm to GO Transit Control Centre and CN Rail Traffic Control
• Procurement of AccuWeather Advanced Skyguard (or equivalent) software is presently underway
  o This software will predict incoming extreme weather and potential threats to our infrastructure. This will allow us to detour trains around known flood-prone areas as well as respond proactively to incoming extreme weather events
• Flood warning messaging now goes directly from TRCA to GO Operations staff (direct phone calls)
• study of lower Bala rail subdivision (Don River) flooding
• discussions with the TRCA on utilizing Don River flood monitoring system
• other high temperature, high wind, fire hazard and snow/ice mitigation efforts underway or planned
• Full review is being conducted on the July 8 2013 failure of Automatic Train Location System (ATLS) and related train tracking software tools to identify ways to avoid future failure
 	
GO Transit maintenance contractors monitor the weather and provide special track patrols during and after storm events to provide visual track bed inspection services.
 	
Targets and indicators have not yet been set.
 	
Contribution to Climate Adaptation:
• Reduced likelihood of stranded passengers, or bodily harm to passengers or employees.
• Improved ability to maintain service during and/or recover quickly following major storm events.
	GO Transit
	
	Contact: Grant Bailie, GO Transit Director, Rail Corridors , Ph: 416-354-7003
	
	GO Transit Control Centre
	
	Contact: Barry Stannard, Manager, GTCC Operations, Ph: 416-869-3600 Ext: 4211
		A. Departmental / Government Practice (P)	***C. In progress***	Collaboration with City of Toronto; Toronto and Region Conservation Authority; CN and CP Rail.	Results are:
					• improved ability to anticipate flooding and its impacts in key areas
					• improved communications to inform passengers and stakeholders of conditions and alternative options

ONTARIO					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
47 Flood Emergency Response Plans - Transit A comprehensive set of emergency response measures have been developed following the July 2013 Don River Flood to address customer and safety needs during an event, and to assist in recovery following the incident. Measures include: • Preparation of an emergency response van which will house and transport bottles of water, weather protection tent, blankets, first aid kits, a generator and extra batteries and cell phone/radio charging unit. • Technological radio updates are underway (March 2014 delivery date) including frequency inter-operability so that individuals from different internal groups can communicate • Technical review is underway to improve customer information systems and staffing levels to enhance customer information (in response to failure of electronic customer information signage during major storm) • A full review was conducted of media communications during the July 2013 event and a new "crisis" protocol was established o In future, a professional media relations representative will be on scene so that site response personnel are not faced with media relations requests o real time updates to social media will be provided	***GO Transit Control Centre*** Contact: Barry Stannard, Manager, GTCC Operations, Ph: 416-869-3600 Ext: 4211	***A. Departmental / Government Practice (P)***	***C. In progress***		
48 Extreme Weather Plan (winter storm)- Transit This is a detailed operational plan developed and refined over many years in response to extreme winter weather events. The plan is designed to be implemented on short notice, strategically communicate to our customers and provide GO and its service partners with the ability to return to normal operations as quickly as possible after a winter storm event. Strategies include advanced information to operators and customers; modified train schedule focusing on sustainable service delivery while removing triggers of typical serious delays; minimize required train movements (i.e. crossovers, trains passing trains; reduced need for switches).	***GO Transit Control Centre*** Contact: Barry Stannard, Manager, GTCC Operations, Ph: 416-869-3600 Ext: 4211	***A. Departmental / Government Practice (P)***	***C. In progress*** Updated annually based on lessons learned and changes to standard schedule		Improved track record of delivering on-time service during major winter storm events.
49 Development of IT Disaster Recovery Capability to enable operating critical production services from two data centre locations. Contribution to Climate Adaptation: Improved ability to maintain service during and/or recover quickly following major storm events.	***Metrolinx Chief Information Office*** Contact: Alaisdar Graham, Ph: 416-367-5755	***A. Departmental / Government Practice (P)***	***B. Being planned***		

ONTARIO					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
50 Formal Introduction of Extreme Weather into Enterprise Risk Management (ERM) The purpose is to recognize Extreme Weather/Climate Adaptation as a significant potential risk to infrastructure, safety and quality of service; to raise the profile of this issue at Executive level to ensure its inclusion in relevant decision making. Contribution to Climate Adaptation: Improved ability to incorporate climate-related risk assessment in all decision making and to ensure progress is being appropriately tracked.	***Metrolinx*** Contact: Derek Tang, Manager, Risk & Insurance, Ph: 416-202-5548	***A. Departmental / Government Practice (P)***	***B. Being planned***		Will increase awareness of the need to consider extreme weather impacts in planning and decision-making. Will ensure regular check-in to assess the breadth and quality of planning for such events.
51 Emergency Electricity Back-up - Transit Emergency power capacity is installed and maintained at all key maintenance locations: • Natural gas based co-generation provides on-site power generating capacity at the two largest bus maintenance facilities • Diesel-based generator back up at other bus maintenance locations can draw from bus refuelling tanks providing extended capacity when necessary (up to 50,000L of fuel) • Diesel locomotives can be used as on-site generators as needed at all rail maintenance facilities; also have capability to draw on train refuelling tanks where available Objectives are to ensure safety and business continuity despite major storm events or other causes of power disruption.	***Metrolinx*** (GO Transit) Contact: John Womersley, Chief Bus Fleet & Facilities, Ph: 905-286-4922 Ext: 6011 Contact: Remi Landry, Director, Rail Services, Ph: 416-354-7002	***A. Departmental / Government Practice (P)***	***A. Completed/ Concluded***		Electricity availability (and therefore business continuity) in case of distribution grid failure is assured.
52 Assess Impact of Climate Change on Maintenance Review snowfall intensity and freeze thaw cycles to determine changes and assess impacts to current and future winter maintenance operations. Acquire an understanding of winter weather / storm changes impacting maintenance operations and if standards / equipment complements need to be updated to maintain appropriate level of service to the public.	***Ontario Ministry of Transportation (MTO)*** Contact: Phil Hutton, Manager, PHM, Highway Standards Branch, Design and Contract Standards Office	***F. Research / Assessment***	***C. In progress***	Research collaboration with University of Waterloo, TAC, AURORA organizations. Future collaboration beneficial with other road authorities.	Ability to ensure appropriate level of service provided to road users.
53 Enhanced Rainfall Intensity-Duration-Frequency (IDF) Curves Updated data and increased number of rainfall stations plus ability to update with additional source information. Online tool to generate IDF curves for any location or area in Ontario. Website: http://www.mto.gov.on.ca/IDF_Curves/terms.shtml	***Ontario Ministry of Transportation (MTO)*** Contact: Phil Hutton, Manager, PHM, Highway Standards Branch, Design and Contract Standards Office	***C. Education / Training / Outreach (ETO)*** Tool available to transportation designers and any other interested user.	***C. In progress*** Two phases complete, phase three commencing.	Developed by the University of Waterloo. Advice from Environment Canada, Ministry of Natural Resources, Conservation Authorities and Municipalities. Opportunity and available for use by any interested user.	Ability to ensure adequate and cost effective design for infrastructure.

PRINCE EDWARD ISLAND					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
54 Shore Line Protection Placing armoured stone along shoreline in areas where the road is exposed to major water ways to protect against storm surges. This ensures the road is not damaged or washed away in the event of a heavy storm.	***Department of Transportation and Infrastructure Renewal*** Contact: Stephen Yeo, Director Capital Projects	***A. Departmental / Government Practice (P)***	***C. In progress***	This initiative was developed provincially but mirrors similar practices followed by many jurisdictions around the World where roadways are exposed to major waterways.	
55 Raising Bridges When replacing or repairing bridges in the Province, when conditions allow, the plan now includes a vertical extension or raising the bridge by 0.75 metres This protects the bridge against storm surges and flooding.	***Department of Transportation and Infrastructure Renewal*** Contact: Stephen Yeo, Director Capital Projects	***A. Departmental / Government Practice (P)***	***C. In progress***	This initiative was developed provincially but mirrors similar practices followed by many jurisdictions around the World where roadways are exposed to major waterways.	Sometimes, the ground or sand conditions do not allow for this practice. The footings needed to support the raised bridge will not hold. This problem has yet to be resolved.

QUEBEC					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
56 Preserving Permafrost Conditions for Airports Research and pilot projects for the implementation and the monitoring of performance of the adaptation techniques aimed at preserving permafrost conditions at the airport infrastructure sites at Tasiujaq, Puvirnituq and Salluit in Nunavik. These projects made it possible to document and define effective Adaptation techniques, in order to address degradation issues observed in infrastructures due to the melting of permafrost. The long-term monitoring of these projects has allowed for a more specific definition of the criteria in developing these techniques.	***Ministère des Transports du Québec (MTQ)*** Contact: M. Pascal Couillard, pascal.couillard@mtq.gouv.qc.ca	***F. Research / Assessment*** R&D	***A. Completed/ Concluded*** (Tasiujaq and Puvirnituq, but will be subject to additional monitoring starting in summer 2014 until 2017. In progress (Salluit - 2017)	These projects were undertaken in collaboration with Guy Doré from the pavement engineering research group (Groupe de recherche en ingénierie des chaussées) at the Université Laval. Mr. Doré has also contributed to similar projects with Yukon Highways and Public Works. In the framework of the Engineering and Research Support Committee - Northern Transportation Infrastructure in the Presence of Climate Change Subcommittee, which is under the authority of the Council of Ministers Responsible for Transportation and Highway Safety, the results of these projects are shared with the member jurisdictions in order to maximize adaptation interventions on a Canada-wide scale. Transport Canada contributed to the research project concerning adaptation techniques in Tasiujaq.	The general principles related to the performance of these adaptation techniques aimed at reducing the melting of permafrost at the base of and under road embankments are: -Low-sloping embankments (used for low embankments, from 1 m to 5 m, and for embankments with a slope ratio between 1V: 5H and 1V: 8H). This is effective for keeping water from the base of the embankment and reducing the natural accumulation of snow on the slope and the foot of the embankment. This helps freezing to penetrate the earth and the embankment during winter and avoids adding extra heat. - Air convection embankments and heat drain techniques (used on embankments with a minimum height of about 2 m or more in order to allow for convection) are used to remove heat from the embankment during winter. All of the tested techniques showed improvements to the permafrost thermal regime under or at the base of the embankment. At the Tasiujaq experimental site, the section of the embankment equipped with a heat drain and the section with low slopes showed a 3 m rise of the permafrost table. In some cases, a combination of adaptation techniques is required to stabilise, thermally or mechanically, the infrastructure on permafrost that is sensitive to the thawing. However, the choice of increasing the maintenance or implementing one or more of the adaptation techniques is based on a cost/benefit analysis.

QUEBEC					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
57 Adaptation Research into Northern Quebec Airport Infrastructure Research project aimed at developing an adaptation strategy for MTQ airport infrastructure in Nunavik that are vulnerable to the melting of permafrost. This project made it possible to develop an adaptation plan for all MTQ infrastructures that are vulnerable to the thawing of permafrost in the context of climate change. It has also contributed to developing an approach to geothermal modelling in order to quantify the degree of anticipated degradation, and to define the factors such as the type of infrastructure, vulnerable locations in the infrastructure, anticipating the evolution of damage, etc. This would allow the evaluation of the level of risk for Northern infrastructures in the context of climate change. These factors would systematically nourish the cost/benefits analysis that guides the adaptation efforts (increasing maintenance and/or use of adaptation techniques) in the course of the project.	***Ministère des Transports du Québec (MTQ)*** Contact: M. Pascal Couillard, pascal.couillard@mtq.gouv.qc.ca	***F. Research / Assessment*** R&D	***A. Completed/ Concluded***	This project was carried out in collaboration with Michel Allard from the Centre d'études nordiques and Guy Doré from the Groupe de recherche en ingénierie des chaussées at the Université Laval. No collaboration with other jurisdictions was planned because the project was specifically intended for MTQ airport infrastructures in Nunavik. However, since this research project is also aimed at developing a strategy for evaluating vulnerabilities in MTQ infrastructures in permafrost regions taking climate change into consideration, the new knowledge was shared with other jurisdiction members of the Northern Transportation Infrastructure in the Presence of Climate Change Subcommittee. The strategy developed in Québec was applied to the Iqaluit airport in Nunavut.	
58 Decision-making Tools for Practioners in Permafrost Regions The objective of this project is to develop a decision-making instrument that will help teams of technical specialists who work on transportation infrastructure projects in permafrost regions. It will allow them to ensure that the new aspects and technical knowledge concerning climate change will be taken into consideration at every stage of the projects.	***Ministère des Transports du Québec (MTQ)*** Contact: M. Pascal Couillard, pascal.couillard@mtq.gouv.qc.ca	***A. Departmental / Government Practice (P)***	***C. In progress*** (February 2014)	This project is being carried out in collaboration with Yukon Highways and Public Works and the Department of transportation of the Government of Northwest Territories.	This resulted in the development of an instrument to facilitate decision making, entitled *Decision process: Maintenance, rehabilitation and monitoring of infrastructure built in permafrost regions*.
59 Evaluating the Impact of Climate Change on Maritime Infrastructure in Northern Quebec Research project aimed at evaluating the impact of climate change on maritime infrastructures in Nunavik, and identifying adaptation solutions.	***Ministère des Transports du Québec (MTQ)*** Contact: M. Pascal Couillard, pascal.couillard@mtq.gouv.qc.ca	***F. Research / Assessment*** R&D	***C. In progress*** (April 2014)	Because this project covers Nunavik's coastal infrastructures, no opportunities for collaboration with other jurisdictions were foreseeable while planning this research project.	

QUEBEC					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
This project also aims to develop an evaluation strategy for Northern maritime infrastructure vulnerabilities that take into consideration changes to climate and to oceans brought about by climate change. It will also propose parameters to study, data required for the studies, analyses to do, modelling instruments and the methodologies to adopt, as well as the limits to consider in order to evaluate the vulnerabilities of Northern maritime infrastructures. And finally, databases concerning water levels, climate, ice conditions, etc., and some sectorial studies that were developed in the course of this project could be used in planning infrastructure development and rehabilitation, or for future research projects in the Canadian North.				Also, there was an absence of information concerning the elaboration of a strategy for evaluating the vulnerabilities of coastal infrastructures on Northern coasts that takes into consideration factors linked to climate change (projected ice conditions, storms, extreme water levels, waves, etc.) as well as the availability of data and analyses (characteristics of future storms) needed to anticipate the impacts of climate change. This project is thus the first of its kind in Canada. The following federal ministries contributed expertise and/or financial support for some of the research activities: Indian Affairs and Northern Development, Transport Canada, Environment Canada, Natural Resources Canada.	
60 Impact of Climate Change in the Gulf of St. Lawrence Region Research projects aimed at developing knowledge (characterization and modelling) concerning the wave regime, coastal and sea ice, water levels, and storm surges in the St. Lawrence Gulf and Estuary in the context of climate change. This includes: ▪ Modelling of the wave regime in the St. Lawrence Gulf and Estuary for adaptation of coastal infrastructures in the context of climate change. ▪ Anticipating water levels in the St. Lawrence Gulf and Estuary, and the Labrador Sea, in the context of climate change. ▪ Modelling coastal and sea ice in the St. Lawrence Gulf and Estuary in the context of climate change. The acquisition of knowledge concerning coastal dynamics, and modelling of the wave regime, water levels, storm surges, coastal and sea ice in the St.	***Ministère des Transports du Québec (MTQ)*** Contact: M. Pascal Couillard, pascal.couillard@mtq.gouv.qc.ca	***F. Research / Assessment*** R&D	***C. In progress***	These projects were carried out in collaboration with several partners, including: the research consortium Ouranos, the Université du Québec à Rimouski (UQAR), the Institut des sciences de la mer de Rimouski (ISMER), and Environment Canada. In the framework of these research projects, climate simulations made by par Ouranos were used to model future climate conditions. No collaboration with other jurisdictions was planned, since the region studied was specifically the St. Lawrence Gulf and Estuary in Québec.	The results of these projects will also serve as input for future projects with the engineering research chair for coastal and fluvial waterways at the INRS and the research chair for coastal geosciences at the UQAR. In the case of the wave-modelling project, the results show that an increase in extreme wave height is probable in the second half of the 21st century, even though nothing is certain and current conditions might continue. This increase is directly linked to the reduction in sea-ice cover, and changes in wind regimes (sometimes decisive in changes to wave climate). The attenuation of waves by sea ice will generally become negligible by the end of the 21st century, and could well be ignored for simplified studies.

QUEBEC					
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Lawrence Gulf and Estuary will guide decision making and help with the design of future coastal protection projects in order to ensure the longevity of transportation infrastructures. The databases (previsions concerning waves, water levels, storm surges, ice, etc.) and the analyses that were developed in the framework of these projects could be used in the planning of infrastructure construction or rehabilitation projects.					The results of the project concerning ice, climate simulations for 1981 to 2070 reveal an average 35-day reduction for which the concentration of sea ice is more than 10% of the maximum annual value, and a 67% reduction of the maximum annual sea-ice concentration.
61 Impact of Climate Change on Infrastructure in the Îles-de-la –Madeleine Region Research projects for Îles-de-la -Madeleine to characterise the coastal zone and support solution analysis for the protection of two vulnerable highway sections.	***Ministère des Transports du Québec (MTQ)*** Contact: M. Pascal Couillard, pascal.couillard@mtq.gouv.qc.ca	***F. Research / Assessment*** R&D	***A. Completed/ Concluded***	These projects were carried out in collaboration with the CIDCO and the ISMER. No collaboration with other jurisdictions was planned, as the project was specifically concerned with infrastructures in the Îles-de-la -Madeleine.	These projects allowed for the creation of various inventories, field studies and analyses, including a high-resolution bathymetric survey in order to document, characterise and map the coastal region in two vulnerable sections of the national highway 199. Stations for observing maritime conditions were also created in the sectors studied. These projects give support to solution analysis for sustainable adaptation solutions for the protection of route 199.
62 Vulnerability of Highway Infrastructure to Climate Change Research projects aiming to document the vulnerability of highway infrastructures in the context of climate change. ▪ Study concerning the vulnerability of highway infrastructures in the East of Québec due to erosion and coastal submersion in the context of climate change. ▪ Study of the morphosedimentological dynamics of the shore bordering route 138 in the Côte-Nord in the context of climate change. The objectives of the research project concerning the vulnerability of highway infrastructures in the Eastern regions of Québec due to erosion and submersion are listed below: 1) Update the mapping of coastlines in the Eastern regions of Québec (Côte-Nord, Bas St-Laurent, Gaspésie, Îles de la Madeleine) and determine	***Ministère des Transports du Québec (MTQ)*** Contact: M. Pascal Couillard, pascal.couillard@mtq.gouv.qc.ca	***F. Research / Assessment*** R&D	***C. In progress***	These projects were carried out in collaboration with the Université du Québec à Rimouski (UQAR). No collaboration with other jurisdictions was planned, as the project was specifically concerned with infrastructures in the Eastern regions of Québec.	The first two objectives have been completed and the mapping of sections of the national-highway network subject to erosion and submersion according to a 2050 horizon are now receiving final validation. The main highways under the authority of the ministère des Transports du Québec (routes 20, 132, 138 and 199, and other coastal highways under the authority of the MTQ) have been analysed and a database with spatial reference has been produced. This represents a total of 2,017.9 km, including 887 km along the Côte-Nord, 621 km in Gaspésie, 402 km in the Bas St-Laurent and 108 km on Îles-de-la -Madeleine. The research project concerning shore dynamics along the North Shore aims at defining the projections for the evolution of the low sandy shores in the context of climate change in order to establish risk-

QUEBEC					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
the distance that separates the coastline from the national highway network; 2) Improve and apply a system of shore management based on hydrosedimentary units and cells in the sectors where coastal hazards are prone to present risks to the coastal highway infrastructure in the Eastern regions of Québec; 3) Develop an approach and a vulnerability index for coastal infrastructures subject to erosion and coastal submersion in the context of climate change; 4) Carry out an analysis and resume of strategies used in Europe for the protection of coastal highway infrastructures from natural risks, and to formulate recommendations for adaptation strategies, measures and potential adaptation solutions for coastal regions in Eastern Québec.					prevention management strategies to counter erosion along Highway 138, and to develop the basic necessary scientific knowledge in order to identify the best adaptation solutions concerning risks to coastal areas. Two sectors where the Highway 138 follows low sandy shores for the greatest distance Tadoussac and the Natashquan River are being studied as reference zones.
63 Research Chair for Coastal and Fluvial Engineering Creation of a research chair in engineering for coastal and fluvial waterways at the Institut national de la recherche scientifique (INRS). The chair will allow the development and sharing of the necessary expertise, and to supply the decision-makers and project designers with reliable information in the fields of coastal and fluvial engineering. The MTQ has a project under way to model the impact of waves on a vertical wall. The project should end in March 2016, and the results will allow the MTQ to develop the design parameters for walls protecting highways near the sea in the context of climate change, notably for a protection wall along Highway 132, on the northern edge of the Gaspé Peninsula.	***Ministère des Transports du Québec (MTQ)*** Contact: M. Pascal Couillard, pascal.couillard@mtq.gouv.qc.ca	***F. Research / Assessment*** R&D	***A. Completed/ Concluded***	The creation of a research chair in engineering for coastal and fluvial waterways by the INRS in the fall of 2012 was the result of a concerted effort by the MTQ and the ministère de la Sécurité publique du Québec (MSP) in order to respond to shared needs for expertise in infrastructure protection in the context of climate change. Because the aim of this chair is to characterise the parameters for the design of projects for infrastructure protection through use of simulations in an exterior hydraulic canal (120 m long, 5 m wide and 4 m deep) that reproduces diverse hydrodynamic coastal conditions, it could be useful to other highway administrations to use equipment of this scale.	

QUEBEC					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
64 Climate Change Research on Coastal Vulnerability Partnership with the research chair in coastal geosciences at the Université du Québec à Rimouski (UQAR). The research program of this chair is focused on the analysis of coastal vulnerability in Québec and the risks associated with erosion and submersion in the context of climate change, coastal risk management, and the application of sustainable adaptation solutions. The chair has access to infrastructures that are unique to Québec: a dynamics and integrated-management laboratory for Québec's coastal maritime zones and a network of stations for the environmental monitoring of Québec's maritime coasts. The chair's scientific research program in coastal geosciences is based on the following five research axes: 1) Quantifying the influence of marine weather conditions on recent erosion and establishing projections concerning future rates of erosion; 2) Identifying and analysing the key factors in coastal erosion and submersion; 3) Modelling the phenomenon of submersion in the context of environmental change; 4) Developing an approach for mapping submersion risk; 5) Developing an approach for quantifying the vulnerability of coastal submersion and erosion.	***Ministère des Transports du Québec (MTQ)*** Contact: M. Pascal Couillard, pascal.couillard@mtq.gouv.qc.ca	***F. Research / Assessment*** R&D	***C. In progress*** (April 2017)	The MTQ is working in partnership with the research chair in coastal geosciences at the UQAR, and participates in planning the research projects and work of the chair. With the ministère de la Sécurité publique du Québec (MSP), the MTQ participates in planning research projects and activities that are proposed in the annual program of the research chair.	So far, progress has mostly been achieved in the first three axes of research.
65 Adapting Culvert Standards To Severe Storms Standards were established for the design of transportation infrastructures (roads, bridges and culverts), and manuals and design requirements are continuously revised in order to take into consideration the possibility of more severe and frequent storms in coming years. These measures allow a preventive approach in order to avoid having undersized culverts, for they would be more susceptible to be washed away by flooding.	***Ministère des Transports du Québec (MTQ)*** Contact: M. Pascal Couillard, pascal.couillard@mtq.gouv.qc.ca	***B. Legislation/ Regulation (LR)***	***A. Completed/ Concluded***	There was no collaboration with other jurisdictions in carrying out this initiative.	In its *Manuel de conception des ponceaux*, the MTQ recommends increasing the flow for basins measuring 25 km² and less by 10% (factor of 1.1) in order to take climate change into consideration.

QUEBEC					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
Priority would also be given to systematic maintenance in order to avoid emergency repairs, which are more costly. The MTQ will also update its culvert design manual in the coming months in order to improve this initiative. IDF curves (intensity-duration-frequency) will be added, as well as recommendations in regards to increases to consider, taking climate change into consideration, for the different regions in Québec, considering IDF projections for 2040-2070 and 2070-2100 horizons.					
66 Adapting Infrastructure Standards To Storm Floods Standards were established for the design of transportation infrastructures (roads, bridges and culverts). Manuals and design requirements are continuously revised in order to take into consideration the possibility of more severe and frequent storms in coming years. These measures allow a preventive approach in order to avoid having bridges and culverts washed away by severe flooding.	***Ministère des Transports du Québec (MTQ)*** Contact: M. Pascal Couillard, pascal.couillard@mtq.gouv.qc.ca	***B. Legislation/ Regulation (LR)***	***A. Completed/ Concluded***	There was no collaboration with other jurisdictions in carrying out this initiative.	MTQ standards require a free height of 1 m over floodwater levels or 300 mm over the 100-year flood levels for bridges and for culverts with an opening measuring 4.5 m or more.

SASKATCHEWAN					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
67 Culvert Policy Developing standard change, changing the design return period from 1:25 to 1:50 years on the National Highway System roadways and from 1:50 to 1:100 years on culverts where communities may be impacted.	***Ministry of Highways and Infrastructure***	***A. Departmental / Government Practice (P)***	***B. Being planned***	No. The response to extreme events will be specific to Saskatchewan's situation. We can also learn from how other jurisdictions (eg. Alberta) approach similar adaptation initiatives.	No. Initiative is under development.

YUKON TERRITORY					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
68 Vulnerability of the North Alaska Highway to Climate Change Description: Highways and Public Works will work with Northern Climate ExChange researchers to identify and characterize sensitive permafrost areas underlying the 200km stretch of the North Alaska Highway near Beaver Creek. Objectives: establish potential future climate scenarios for the study region; estimate potential impacts of the identified climate scenarios where the highway is underlain by thaw-sensitive permafrost; help develop targeted, efficient and effective policies, engineering designs and maintenance plans to encourage transportation security in the region. Total project funding: $395,727 from AANDC.	***Yukon Department of Highways and Public Works*** Contact: Muhammad Idrees Email: Muhammad.Idrees@gov.yk.ca	***F. Research / Assessment*** research	***C. In progress***	This project is already being completed in collaboration with Yukon College's Northern Climate ExChange.	Early lessons learned: project has no results yet.
69 Yukon Flood Plain Risk Mapping Yukon does not have sufficiently accurate elevation data needed to support water level modeling for communities bordered by rivers and lakes. Detailed modelling can assist in determining current and future vulnerable areas in and around communities thereby assisting in future flood preparedness planning; land use planning; and flood mitigation investments. *Objectives:* This project will conduct a LIDAR (Light Detection and Ranging) survey for thirteen Yukon community areas to acquire digital elevation data that will support accurate flood plain mapping to determine vulnerable areas. Total project funding: $299,400 from AANDC.	***Yukon Department of Community Services*** Contact: Michael Templeton, Emergency Measures Organization, michael.templeton@gov.yk.ca	***A. Departmental / Government Practice (P)***	***C. In progress*** just started	Do you see this initiative benefitting from collaborative effort? Yes. In that we can learn from experiences in other jurisdictions to design the most efficient system possible.	Early lessons learned: project has no results yet.
70 Sensitivity of Yukon Hydrological Response to Climate Warming: A Case Study for Sectoral Climate Change Adaptation Description: Environment Yukon-Water Resources Branch researchers will conduct a sensitivity assessment of hydrological response to climate warming and associated permafrost thawing using the Cold Regions Hydrological Model (CRHM) at the Wolf Creek Research Basin (WC). Objectives: Researchers will apply the CRHM model to other Yukon regions and communities to provide the necessary climate warming sensitivity information to support development of adaptation strategies. Total project funding: $208,130 from AANDC.	***Yukon Department of Environment*** Contact: Richard.Janowicz, Water Resources Branch, Richard.Janowicz@gov.yk.ca	***F. Research / Assessment*** research	***C. In progress***		Early lessons learned: project has no results yet.

YUKON TERRITORY					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
71 Pan-Territorial Permafrost Workshop Description: The workshop provided opportunity to discuss ways to adapt to the effects of changing permafrost on Northern infrastructure. Three key streams of infrastructure discussed: buildings, roads and other straight stuctures such as pipelines. Objectives: The workshop connected people who make decisions about permafrost impacts on infrastructure with those that hold knowledge about permafrost and adaptation. Participants are able to make better informed and more coordinated decisions about adaptation to permafrost across the North. Total project funding: $74,000 (to Yukon only. The other two territories also received substantial funds)	***Yukon Department of Environment*** Contact: Johanna Smith, Climate Change Secretariat Johanna.Smith@gov.yk.ca	***C. Education / Training / Outreach (ETO)***	***A. Completed/ Concluded***	Collaboration between the Governments of Yukon, NWT and Nunavut. Project Funded by AANDC. CanNor provided additional funds to NWT for portions managed by them.	Results are currently being analysed and are not yet available.
72 Economic Implications of Climate Change Adaptations for Mine Access Roads in Northern Canada Description: This project will work with northern mining and transportation experts, including sector representatives, academics, and government officials, to develop cost-benefit analyses for a range of adaptation options and pathways (sets of options concurrently or sequentially applied). We will identify these options through a case study of a major northern mine access road. Objectives: The results of the project will help inform how adaptation cost-benefit analyses might be usefully conducted in other mining regions and on other types of mining infrastructure across northern Canada. Total project funding: $292,000. Project led by the Yukon College's Northern Climate ExChange. Contact: Lacia Kinnear lkinnear@yukoncollege.yk.ca	***Yukon Department of Highways and Public Works***	***F. Research / Assessment*** research	***B. Being planned***	The Pan-Territorial Adaptation Partnership (Governments of Yukon, the Northwest Territories, and Nunavut) is participating in an advisory capacity. Funding provided by Natural Resources Canada, the Northwest Territories and the Federal Department of Transport.	
73 Processing and Interpretation of Geophysical Data along Transportation Infrastructure in Permafrost Regions Description: The work proposed herein intends to assess the use of geophysical techniques to map permafrost, develop guidelines for the application of geophysics in permafrost terrain, and develop increased capacity for their use. Objectives: Geophysics have the potential for increased application in permafrost areas in northern Canada, especially in difficult to access terrain, if reliable	***Yukon Department of Highways and Public Works*** Contact: Muhammad Idrees Email: Muhammad.Idrees@gov.yk.ca	***A. Departmental / Government Practice (P)***	***C. In progress*** Started late 2013		

YUKON TERRITORY					
Q1. Adaptation Initiative*	**Q2. Ministry**	**Q3. Theme**	**Q4. Status**	**Q5. Collaboration***	**Q6. Results***
information on subsurface conditions can be obtained. With increased reliability, practitioners would consider geophysics to be a cost effective method to obtain information on subsurface conditions for planning purposes. Total project funding: $159,750 from Transport Canada.					
74 Establishment of Baseline Data Collection Sites and Assessment of Permafrost Response to Climate Warming for Transportation Infrastructure in the Yukon and NWT Description: a research program is required to supply baseline data on permafrost conditions (temperatures) adjacent to and beneath transportation infrastructure on the Dempster Highway, and to estimate the vulnerability of permafrost at these sites to climate warming. Objectives: (1) Determine the thermal regime in permafrost at strategic sites along the transportation network of central and northern YT and adjacent NWT; (2) Model the sensitivity of permafrost to climate warming at a selected site, possibly the Peel Plateau site; and (3) Determine the time frame for permafrost degradation that may have potentially significant effects on highway embankments. Total project funding: $426,900.	***Yukon Department of Highways and Public Works*** Contact: Muhammad Idrees Email: Muhammad.Idrees@gov.yk.ca	***F. Research / Assessment***	***C. In progress*** Started late 2013		
75 Sensitivity of Dempster Highway Hydrological Response to Climate Warming Description: The project includes a detailed sensitivity assessment of hydrological response to climate warming and associated permafrost thawing using the Cold Regions Hydrological Model (CRHM) along the Dempster Highway corridor. Objectives: Projected changes to hydrological response (extreme and drought events, annual and seasonal flows) will be summarized and flood frequency curves based on annual peak flows will be developed for Dempster Highway stream crossings. These products will allow for the development of adaptation strategies and options which may include infrastructure design modification. Total project funding: $90,400.	***Yukon Department of Highways and Public Works*** Contact: Sandra Orban Sandra.Orban@gov.yk.ca	***F. Research / Assessment*** research	***C. In progress***		