

THE TRANSPORTATION AND AIR QUALITY ACTION PLAN 2013-2020

37th Conference of the New England Governors
and Eastern Canadian Premiers

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**The Transportation and
Air Quality Committee**

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Preamble

In February 2007, the Conference of New England Governors and Eastern Canadian Premiers (NEG/ECP) convened a ministerial forum to address the key energy and environmental policy issues facing the region. The governors and premiers asked their chief policymakers to develop transportation policies to reduce greenhouse gas (GHG) emissions and achieve the states' and provinces' air quality goals while improving the effectiveness of the region's transportation system.

Recognizing that reducing GHG emissions from the transportation sector requires action in three broad areas – vehicle technology and efficiencies, vehicle fuels, and transportation system efficiencies including land use patterns that influence transportation demand – the forum recommended that a regional Transportation and Air Quality Steering Committee (TAQC) be established to oversee the implementation of the action items related to transportation. These action items include transportation planning, sustainable growth policies, low-carbon fuels, vehicle efficiency and low emission transportation options choices, and infrastructure funding.

The TAQC was tasked with developing a regional Transportation and Air Quality Action Plan to achieve air quality and other regional goals. The initial plan was adopted at the 32nd NEG/ECP in Bar Harbor, Maine on September 16, 2008. In order to stay abreast of changing technologies and federal, state, and provincial programs and policies, the NEG/ECP agreed in 2012 to task the TAQC to update the Transportation Air Quality Action Plan. This document encompasses these changes.

Executive Summary

The transportation network serving the New England states and Eastern Canadian provinces is vital to the economic and social well-being of the region's people and businesses. It moves people, creates and helps support jobs, and is vital to the region's economic competitiveness. The transportation system also has a physical and environmental footprint that, depending on its use, design, operations and maintenance, also has consequences for land use patterns, air quality and associated public health, noise, and water quality in the region.

Transportation accounts for almost 40 percent of overall greenhouse gas (GHG) emissions generated in the region. While the total GHG emissions from the transportation sector are declining, the rate of emissions reduction is greater in other sectors, such as residential, commercial, and industrial. Therefore, the transportation sector is and will continue to be the dominant source of the region's GHG emissions under a "business-as-usual" scenario.

Similar to the original Action Plan, this 2013 Update offers a variety of measures designed to reduce GHG emissions from the transportation sector, lessen the region's dependence on fossil fuels, and make its economy more competitive. The major air quality goal of this plan is to reduce transportation-related GHG emissions in sufficient magnitude to achieve the regional targets set by the NEG/ECP *Climate Change Action Plan 2001 (as updated 2013)*. Those targets are the reduction of total GHG emissions by:

- 10 percent below 1990 levels by 2020
- 75-80 percent below 1990 levels by 2050.

The reduction targets could be higher or lower for the transportation sector, depending on the contribution that other sectors make toward achieving the region's overall GHG reduction goals.

The manner in which individuals and businesses use the transportation system reflects economic conditions and activities, demographic factors, fuel prices, and the availability of transportation modes and vehicle technologies. Therefore, no one approach to reducing transportation-related emissions will, by itself, be sufficient. A combination of strategies and programs is needed.

The strategies developed in this action plan are designed to address factors that are best suited to a broad regional and international approach. The region as a whole supports the Plan's goals and principles, but not all actions apply equally to every jurisdiction. Working within the regional framework, each jurisdiction has agreed to implement the plan's actions consistent with its individual state/provincial programs, processes, and priorities while together achieving what is needed to move the region forward.

This report outlines a set of broad strategies, goals and actions that can move the region towards a more effective and fuel efficient transportation system that has the benefits of mobility while also contributing to significant reductions in GHG emissions and other air pollution reduction goals. The action items that states and provinces can take include the following:

- Reducing Vehicle Distance Traveled through a More Efficient, Integrated Transportation System,
- Sustainable Land Use Planning and the Growth of Local Economies,
- Low-Carbon Fuels,
- Vehicle Efficiency, and
- Freight Transportation Intermodality and Logistics.

THE TRANSPORTATION AND AIR QUALITY ACTION PLAN 2013-2020

This action plan offers specific regional goals and actions in each of the strategic areas that government can take to provide leadership for an accelerated, broader market transformation in the region's use of energy in the transportation sector. The magnitude of GHG emissions attributable to the transportation of people and goods is linked to the complexity of the sector. Therefore, concerted, continuous, and increased efforts by governments, private sector stakeholders, local communities and individuals are required to achieve the regional goals for GHG emissions reductions embraced by the governors and premiers in the years ahead.

Success in these efforts also has immediate financial implications for the traditional revenue sources for federal, state and provincial transportation departments and programs. As inefficient vehicle travel is reduced, highly efficient vehicles and clean energy sources are integrated into the fleet of total vehicles and the revenues generated by the traditional fee per unit of petroleum fuel will be reduced. A solution to this challenge is beyond the scope of this action plan, but the consequences of the changes to more efficient vehicles and clean fuels will have very real impacts on the NEG/ECP jurisdictions unless alternative options for sustainable, future transportation revenues are considered.

Basis for Action

Transportation in the New England-Eastern Canadian region has evolved significantly over the past century. Today, a safe, integrated, multi-modal transportation system that can effectively and efficiently move people and goods is recognized as being critical to economic competitiveness and vital to the environment and quality of life of people and communities. While access to reliable and affordable energy supplies is a must, energy efficiency and the environmental impacts of energy generation and use are increasingly important to transportation and air quality policymakers, land-use planners, business and industry interests, and the traveling public.

The region's transportation network supports social and economic opportunities for individuals, businesses and communities. Inefficiency in that network, whether in urban or rural areas, reduces competition and stifles the creation of new markets and jobs. Increases in the number of cars and trucks on the region's roadways contribute to congestion and pressure to expand transportation infrastructure. The expansion of the transportation network's physical and environmental footprint has significant consequences including GHG emissions, air pollution and associated health impacts, noise, transportation-related waste and stormwater runoff. These impacts have a measurable cost to local and regional economies that must be reduced now and in the future. Today's transportation policy making and investments are in part a response to prior development patterns, but they will also influence future patterns and travel options, thereby affecting both the region's economic potential as well as the potential for GHG emissions reductions.

GHG emissions from the transportation sector, including carbon dioxide (CO₂), methane (CH₄), nitrous oxide (NO₂), ozone precursors, particulate matter, and black carbon, factor into the changing climate. In New England and Eastern Canada, transportation accounted for 41 percent of overall GHG emissions in 2011 compared to 33 percent in 1990. Total GHG emissions from the region's transportation sector parallel similar changes in consumption of GHG-emitting transportation fuels in North America which increased steadily through 1990-2004 and has since fluctuated between 2005 and 2011, while remaining under the 2004 peak level. While total fuel use and associated emissions have declined in subsequent years, the share of emissions attributed to transportation as compared to other economic sectors increased as all the other sectors experienced greater rates of reduction in the same period¹. This trend is expected to continue through 2040, with the transportation sector becoming an even larger regional source of GHG emissions in a business-as usual scenario². Therefore, the principal goal of this plan is to identify actions that can be taken by state and provincial governments to further reduce GHG emissions from the transportation sector, lessen the region's dependence on fossil fuels, and make its economy more competitive.

Weather-related events associated with climate change also affect the region's transportation systems. More frequent and intense storm events, sea level rise, coastal and inland flooding and wind damage, and changing freeze/thaw cycles are but a few of the meteorological changes significantly challenging the region's transportation managers. These changes impacts both the operation of the transportation network and the physical infrastructure itself. As a result of these pressures, transportation planning, management and maintenance must adapt if infrastructure is to become more resilient to a changing climate. Strategies to reduce transportation-related GHG emissions can also be an important tool for transportation adaptation. Regional cooperation and sharing information on best practices for climate adaptation strategies will help build the knowledge base as the member jurisdictions addresses those challenges.

1 NEG/ECP Regional GHG inventory 1990-2011.

2 U.S. Energy Information Administration, *Annual Energy Outlook 2013*.

No one approach to reducing transportation-related emissions will, by itself, be sufficient. A combination of strategies and programs is needed. Transportation demand, fuel consumption and air emissions are influenced by a number of factors including:

- Economic activity profile,
- Demographic factors (e.g., population size, settlement patterns, and age cohorts),
- Fuel price and choices (e.g., cost and carbon content of fuels),
- Travel options and accessibility (e.g., miles or kilometers traveled),
- Vehicle technologies (including vehicle efficiency and operations), and
- Land use patterns.

While the need for travel is influenced by socio-economic factors, the decision on “how to travel” is also determined by available transportation options such as public transit, walking or biking, or intermodal freight options. The strategies developed in this action plan are designed to address factors that are best suited to a broad regional and international approach. Therefore, this plan does not include all potential or recommended actions that could be taken by states and provinces.

The following sections outline a set of recommended actions that will move the region toward a more effective and fuel efficient transportation system that can contribute to significant reductions in GHG emissions while advancing other air pollution reduction goals. The actions described in this report fall into the following categories:

- Reducing Vehicle Distance Traveled³ through a More Efficient, Integrated Transportation System,
- Sustainable Land Use Planning and the Growth of Local Economies,
- Low-Carbon Fuels,
- Vehicle Efficiency, and
- Freight Transportation Intermodality and Logistics.

Throughout the region, states, provinces and local governments are increasing the number and quality of sustainable transportation options available to the local and longer-distance traveler. Many of these initiatives are already underway such as walking and biking, support for Transit Oriented Development, enhanced public transit, commuter and intercity passenger rail services, improved intermodal connections for passenger and freight travel, and support for alternative fuel vehicles and related refueling facilities.

These initiatives do contribute to the reduction in GHG emissions that has occurred in the region. However, the sheer magnitude of GHG emissions attributable to the transportation of people and goods, which is linked to the complexity of the transportation sector, requires a concerted, continuous, and increased effort by governments, private sector stakeholders, local communities and individuals to achieve the regional goals level for GHG emissions reductions embraced by the governors and premiers in the year ahead.

Any discussions regarding the reduction of GHG emissions from the transportation sector must recognize the effect some actions may have on traditional revenue sources for federal, state and provincial transportation departments and programs. As inefficient vehicle travel is reduced and highly efficient vehicles and clean energy sources are integrated into the fleet of total vehicles, the revenues generated by the traditional fee per unit of petroleum fuel will be reduced. A solution to this challenge is beyond the scope of this action plan, but

3 “Distance traveled” is used in lieu of Vehicle Miles Traveled (VMT) or Vehicle Kilometers Traveled (VKT).

Policies that incent employers to promote programs that reduce the number of single occupant vehicle commute trips enhance overall transportation efficiency. Commute time congestion is reduced in areas where vehicle occupancy rates are increased through the incentive of high occupancy vehicle (HOV) or flexible tolling lanes, and where ridesharing, vanpooling, walking, biking and transit options are promoted. In addition, car sharing and station cars reduce distance traveled and can be used to promote market penetration of advanced vehicle technologies. Incentives for employees can range from stipends for transit costs to elimination of free parking at the work place.

Finally, expansion of transportation alternatives can be complemented by pricing mechanisms aimed at encouraging acceptance of more energy efficient alternatives. Appropriate pricing of fuels, road access, and parking can be used to influence consumer behavior and increase the viability and effectiveness of the efficiency measures discussed above.

Sustainable Land Use Planning and the Growth of Local Economies

The availability of affordable vehicle technology, reasonably priced and readily available fuel, an extensive and publicly funded highway and road network, and the desire for mobility independence have resulted in an overwhelming increase in the use of light-duty vehicles (LDV) on the region's roadways. The reliance on single-occupancy vehicles and an expanded road network has resulted in dispersed land use patterns which then reinforce the need for more vehicles, roads, and parking systems to provide the desired mobility to reach economic centers, schools and services. The result can be an ongoing quest for significant local, state, and provincial transportation investments to maintain and add capacity. Many cities and towns are now car-dependent and lack the density, mixed-use or pedestrian and bike-safe characteristics to allow for the viability of alternative modes. Walking and bicycling are difficult and public transit service is inefficient in areas of dispersed land use. These modes are more viable in compact, mixed-use areas where jobs and residences, businesses and services are in close proximity.

Changes to this car-centric travel and development pattern are occurring in the region. Regardless of the scale, many of the region's urban centers, small cities and towns and even village areas have the existing density to be conducive to walking and biking and to support transit services. Interest in and implementation of transit-oriented development is occurring in large cities and smaller communities, and some of it is connected to the expansion of commuter and intercity passenger rail services. Regional intercity bus services as well as smaller public transit systems also offer viable alternatives to the single-occupancy car. Public and private sector investments to improve rail infrastructure are benefiting intercity passenger rail, freight rail, and intermodal service in the Northeast states and Eastern Canadian provinces.

Freight also moves in and around the region via ports. New England and Eastern Canadian ports handled over 319.2 million tons of cargo in 2011⁵. The area is home to busy deep water ports in the majority of states and provinces. In addition to commercial fishing, principal commodities comprise a diverse market including petroleum products and coal, containers, bulk and break-bulk cargo, and forest products⁶. All of these ports support the local economy with employment and investment opportunities. Most of these ports are supported by rail facilities and all have highway access that enables efficient distribution. Recent investments at these facilities illustrate their importance in the global economy.

5 "Tonnage for Selected U.S. Ports in 2011". U.S. Army Corps of Engineers Navigation Data Center, Revised 4/25/2013, <www.navigationdatacenter.us> and Shipping in Canada 2011, Statistics Canada. <http://www.statcan.gc.ca/pub/54-205-x/54-205-x2011000-eng.htm>

6 "2011 State to State Public Domain Database by Commodity". U.S. Army Corps of Engineers Navigation Data Center, <http://www.navigationdatacenter.us/wcsc/pdf/pdrgcm11.pdf> and Shipping in Canada 2011, Statistics Canada.

Low-Carbon Fuels

The transportation sector contributed 123 million metric tons of CO₂ emitted in the Northeast/Eastern Canada region in 2010, or approximately 40 percent of total GHG emissions. Petroleum continues to be the overwhelmingly dominant transportation fuel in the region, accounting for 98.4 percent of the energy used in the sector, followed by natural gas (1.5 percent) and biofuels or electricity (0.2 percent). The heavy reliance on petroleum fuel for transportation subjects the region to economic disruptions from volatile global petroleum prices. It also presents an economic and environmental scenario that will not allow the region to meet established climate change goals or thrive economically⁷.

Higher petroleum prices have spurred the market for alternative fuels, many of which are domestic, renewable, and have a lower carbon content compared to petroleum. Often referred to as “low-carbon”, these fuels are a non-petroleum alternative with environmental and economic benefits. The carbon content of a given fuel is determined by a life-cycle analysis that allows a comparison of unlike fuels. For example, a petroleum fuel life-cycle analysis would include GHG emissions from all of the energy used to bring the fuel to market and propel a vehicle (i.e., all the energy used in fuel exploration, recovery, and refining; transportation of the final fuel product to the retail station; and the emissions from burning the fuel in the vehicle). Similarly, a biofuels life-cycle analysis would include energy use associated with clearing land to plant a crop; fuels and fertilizers used in growing and harvesting the crop; and refining, transportation, and burning of the fuel in the vehicle. Depending on their specific sources and the processes used to develop them, low-carbon fuels can include electricity, natural gas, biogas and biofuels, among others.

Low-carbon fuels can be renewable, such as hydropower, wind and solar generated electricity, ethanol or biodiesel. They can also be non-renewable such as natural gas and propane. Electricity from the grid and hydrogen are secondary forms of energy and their GHG impact is determined by the energy resource used for power generation – whether it is a low-carbon renewable or non-renewable energy or a higher carbon energy resource such as coal or oil. The use of some low-carbon fuels, such as clean electricity and natural gas, requires specific vehicle technologies as well as an alternative refueling infrastructure.

The NEG/ECP states and provinces have an opportunity to lead a market transformation favoring low-carbon fuels. For any proposed fuel, a comprehensive life-cycle analysis should be conducted for GHG reductions and the sustainability of a given fuel pathway for its land, air and water impacts should be reviewed. These analyses will provide needed information to help ensure that decisions can result in environmentally-sound fuel supplies for generations. Policies to help develop the market for low-carbon fuels and alternative fuel vehicles (AFVs) are a NEG/ECP priority and are discussed further in Action Items 3 and 5.

Vehicle Efficiency

It is often cheaper to invest in efficiency over time than it is to purchase increasing quantities of fuel. Thus making energy efficiency the least cost energy. As new technologies continue to improve the fuel efficiency of vehicles, the region’s dependence on imported petroleum fuels and associated GHG emissions can be reduced.

Significant GHG emission reductions can also be achieved via efficiency improvements in light-duty vehicles through the application of currently available technologies. The implementation of the North American GHG standard for light-duty vehicles is expected to reduce GHG emissions from model year (MY) 2016-2020 light-

7 NEG/ECP Regional GHG inventory 1990-2011.

duty vehicles by 21 percent.⁸ Additional GHG standards finalized in 2012 applied to MY 2017-2025 will result in an overall 50 percent reduction in GHG emissions from light-duty vehicles compared to MY 2010.⁹ Some of the improvements in fuel economy will be met through advanced vehicle technologies including hybrid electric drives and battery electric vehicles. These standards will provide significant savings for consumers at the pump. Higher costs for new vehicle technology are projected to add, on average, about \$1,800 for consumers who buy a new vehicle in MY 2025. Those consumers who drive a MY 2025 vehicle for its entire lifetime will save, on average, \$5,700 to \$7,400 in fuel costs (seven and three percent discount rates, respectively) for a net lifetime savings of \$3,400 to \$5,000 (when compared to a vehicle meeting the MY 2016 standards). For those consumers who purchase a new MY 2025 vehicle outright, the discounted fuel savings will offset the higher vehicle cost in less than 3.5 years, and fuel savings will continue for as long as the consumer owns the vehicle.¹⁰

Similarly, large reductions in vehicle GHG emissions from improved efficiency should be achieved from U.S. Environmental Protection Agency (EPA) regulations for MY 2014-2018 medium- and heavy-duty vehicles such as long-haul trucks, heavy-duty pickup trucks and vans and vocational vehicles following the implementation of the first North American GHG standard. Both existing and emerging technologies will be used to meet the new standard. The EPA estimates that the standards will reduce CO₂ emissions by about 270 million metric tons over the life of model year 2014 to 2018 vehicles. In addition to vehicle technology changes, significant improvement in fuel economy can be achieved through changes in driving behavior, use of idle-reduction technology, and improved logistics as discussed in the section on Freight Transportation.

Freight Transportation Intermodality and Logistics

Trucks carry most of the freight in the NEG/ECP region due to a growing need of just-in-time production and delivery schemes of the economy, prior policies, and public and private investment decisions. As a result, trucks are the second largest user of energy in the transportation sector behind passenger vehicles. Opportunities may exist in the region to increase the availability of freight intermodal options involving trucks, rail, and maritime modes. Improved integration of these modes and systems of transporting goods could result in better fuel efficiency and lower GHG emissions, reduced traffic congestion, and less roadway wear and tear.

The majority of the freight moved in the NEG/ECP region is short-haul break bulk and containerized cargo intended for immediate use by private industry in the wholesale and retail distribution systems. A smaller share of freight, generally heavier commodities such as petroleum products, is carried port-to-port and then broken down for distribution at large-scale transfer facilities.

Policies and programs that help improve intermodal freight movement to rail and waterways will decrease the amount of energy consumed to move goods, as illustrated in Figure 2. While rail and marine are the more energy efficient or lowest emitting modes on point-to-point long-distance links, these types of routes represent only a small portion of the total transportation flow in the NEG/ECP region. Distribution issues at the rail or port end points must also be taken into consideration as well as the nature of the cargo, route circuitry, service speed or frequency, and shipment loss/damage. These commercial considerations reinforce the need to develop appropriate intermodal facilities in support of a more energy efficient transportation system.

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- 8 U.S.EPA, *EPA and NHTSA Finalize Historic National Program to Reduce Greenhouse Gases and Improve Fuel Economy for Cars and Trucks*, EPA-420-F-10-014, April 2010. Environment Canada, Greenhouse Gas Emission Regulations, <http://www.ec.gc.ca/cc/default.asp?lang=En&n=E97B8AC8-1#X-201105241638261>
- 9 U.S.EPA, *EPA and NHTSA Set Standards to Reduce Greenhouse Gases and Improve Fuel Economy for Model Years 2017-2025 Cars and Light Trucks*, EPA-420-F-12-015, August 2012.
- 10 U.S.EPA, *EPA and NHTSA Set Standards to Reduce Greenhouse Gases and Improve Fuel Economy for Model Years 2017-2025 Cars and Light Trucks* – Fact Sheet: <http://www.epa.gov/otaq/climate/documents/420f12051.pdf>

Figure 2

U.S. Freight Transportation 2010

Transportation Mode	Fuel Intensity	
	BTU per short ton mile	kJ per tonne kilometer
Class 1 Railroads	289	209
Domestic Waterborne	217	160
Heavy Trucks	4,074 ^a	14,073 ^a

^a Most recent truck data is 2006.
Information is drawn from the following sources: U.S. Department of Energy, *Transportation Energy Data Book: Edition 31-2012*.
Truck data is derived from the *Transportation Energy Data Book, 2008*.

Private industry controls most of the region’s rail networks and port facilities. Their decisions on modal choice are based on cost, reliability and timing. Therefore any new development of intermodal transfer facilities must be coordinated with the private sector in order to ensure that short-haul, light-load traffic in the vicinity of the facilities does not increase.

Government must work with these partners to enhance freight infrastructure and better understand the long-term interconnectivity of freight networks and facilities. This can reduce emissions and lower costs associated with the shipment of goods. Public and private sector collaboration is also needed to maintain and expand the availability of railroad and port right-of-ways to maximize the options for developing the most efficient transportation options. This will also address concerns of competitiveness, security, and continued economic development.

Guiding Principles

The New England governors and Eastern Canadian premiers recognize the following principles as guidelines for action on transportation policies and programs in the region, as they affect GHG emissions:

1. Canada and the United States are signatories to the United Nations Framework Convention on Climate Change that requires a reduction in anthropogenic GHG emissions to levels that no longer pose a dangerous threat to the climate.
2. The effects of GHG emissions and climate change are a global concern requiring action at many levels. Harmonizing programs and policies among states, provinces and other jurisdictions could increase their effectiveness.
3. Individually and as a region, transportation system decisions either move towards GHG reduction goals or make them more difficult to achieve.

4. The jurisdictions within the region have collectively agreed to GHG emission reduction goals and will continue to develop and implement measures to reduce transportation-related GHG emissions, collectively and individually with the respective states and provinces.
5. The region should implement actions that support and develop state and provincial economies by engaging in comprehensive and balanced transportation system planning that address the need for:
 - a. heightened public safety and a secure, resilient transportation system;
 - b. an integrated system that provides enhanced mobility, improved modal choices, connectivity, accessibility for all users, and support for a sustainable economy;
 - c. energy reliability and security in the region;
 - d. sufficient resources to maintain and improve the current transportation infrastructure;
 - e. a resilient economy and communities that can sustain and prosper in the face of climate change;
 - f. collaborative engagement with local and national governments and the private sector;
 - g. minimized regulatory impediments to the movement of people and goods.

Regional Goals

The principal goal of the Transportation Air Quality Action Plan is to provide a menu of options for the states and provinces to implement that will result in a reduction of GHG from the transportation sector in sufficient magnitude to allow the region to achieve the broader regional targets set by the NEG/ECP *Climate Change Action Plan 2001 (as updated 2013)*. The updated Climate Change Action Plan sets regional carbon emission reduction targets for 2020 and 2050.

The original near-term target of reducing regional GHG emissions to 1990 levels by 2010 was surpassed with an effective three percent reduction in 2010.

Therefore, the overall regional goals are established as follows:

Short-term Goal: Reduce regional GHG emissions by 10 percent below 1990 emissions by 2020.

Long-term Goal: Reduce regional GHG emissions by 75-85 percent below 2001 levels by 2050.

These reduction targets could be higher or lower for the transportation sector, depending on the contribution that other sectors (e.g., energy) make toward achieving the region's overall GHG reduction goals. The targets will be regularly monitored with results published every year. The targets will also be reviewed in 2020 in light of new knowledge and considerations such as cost-effectiveness and technological availability and deployment. This will allow the Plan to evolve in response to the performance of the transportation network, policies and programs review, markets opportunity, technological advances and scientific knowledge in the NEG/ECP region.

Recommended Regional Actions

The Transportation and Air Quality Committee (TAQC) includes members from the state and provincial environmental and transportation agencies. The TAQC works closely with the Climate Change Steering Committee and other state, provincial and regional initiatives to oversee the development, updating and implementation of the NEG/ECP Transportation and Air Quality Action Plan. While each state and province determines the most appropriate mix of policies and specific actions to reduce transportation-related GHG emissions in its jurisdiction, the TAQC plays an important role in this regional initiative. As directed by the governors and premiers, the TAQC is a forum for the states and provinces to share information regarding GHG reduction strategies and plan implementation. TAQC meetings, conference calls and regional forums are the vehicle through which data on energy use, GHG emissions, and changing transportation patterns in each state and province are compiled and analyzed in order to create a regional emissions profile for the NEG/ECP region. The resulting insights and data allow the TAQC to regularly report to the governors and premiers on progress in implementing and realizing the regional goals of the Action Plan.

As part of its ongoing work, the TAQC has identified the following action items as the core of the 2013 Update of the Regional Transportation and Air Quality Action Plan.

Action Item 1 : Transportation Planning

Basis for Action

State, provincial, and local transportation officials must balance multiple objectives when planning projects and transportation systems: public safety, adequate mobility, minimizing bottlenecks and congestion, preserving the environment, and providing a foundation for economic growth. This planning often influences transportation emissions. Highway design, efficient operations management, intelligent transportation technology, transit programs, passenger rail facilities, or streets that allow for safe biking and pedestrians enable lower emissions transportation choices and influence how communities will grow. Targeted investments in infrastructure and a more effective management of existing transportation systems and services may be the optimal approach to improving the performance of the transportation system and reducing emissions.

Climate change, operations and emergency response considerations should be incorporated into every step of the transportation planning and design processes. The lifespan of most transportation infrastructure is measured in decades, with some, such as bridges and tunnels lasting 60 to 80 years or longer. Changing climatic conditions need to be factored into the planning, design and operations of new and rebuilt infrastructure. Climate experts agree that major climate impacts are already being experienced and will become more and more significant if GHG emissions are not reduced in a short timeframe. Actions to improve emergency response, establish risk vulnerability, and enhance long-term infrastructure resilience are needed. Assessments of how the location, design and maintenance of infrastructure can help make it more resilient may reduce the impact of future extreme weather events.

Transportation is fundamentally about people's ability to access the goods and services they need in a safe, timely, reliable and affordable manner. Improved access is often about:

- Situating people and the things they need in a more compact land use pattern in order to reduce trip lengths and make travel options, including non-motorized modes, more feasible; and

- Improving routes and sustainable options for both motorized and non-motorized travel to allow for choices of alternative modes and making them safer and less congested.

By increasing the availability and attractiveness of alternatives to the single-occupancy automobile, overall distance traveled and emissions per vehicle are reduced even as convenient and equitable mobility across the region is maintained or enhanced. For example, high-quality passenger rail and public transit systems can provide a level of service that equals or exceeds that of automobiles, with far lower GHG emissions per passenger mile. Planning the transportation system of the future will depend on numerous partners: local and regional planners, business, economic development and housing interests, and the public-at-large will all need to contribute.

Regional Goals

- By 2020, enhance the service of public transportation and other non-single occupancy transportation options.
- Achieve a reduction in emissions per distance traveled and total distance traveled in the region through the development and improvement of a more efficient integrated transportation system.

Recommendations

1. Maintain and improve existing transportation systems infrastructure to facilitate high-occupancy vehicle lanes, rapid transit bus lanes, and biking and walking facilities.
2. Enhance passenger rail and public transit infrastructure and inter-modal connections at the local, state/provincial, and regional levels to optimize existing services and boost ridership.
3. Foster inter-agency cooperation during transportation planning processes.
4. Support programs to manage transportation demand and support congestion reduction including commuter services, park-and-rides, ridesharing and vanpooling.
5. Support the further development of inter-connected regional, state, provincial, and local greenway and bicycle/pedestrian pathway systems.
6. Include GHG analyses and considerations as part of the transportation planning efforts.
7. Incorporate climate resiliency measures into all planned infrastructure improvements and new construction.
8. Work cooperatively with other entities to identify and assess planning and implementation of adaptation strategies, and share best practices among jurisdictions to address the impact of climate change on transportation activities and infrastructure.
9. Improve the efficiency of the existing transportation network operations using Transportation System Management principles including Intelligent Transportation Systems (ITS).

Action Item 2: Land Use

Basis for Action

Most decisions that affect land use occur at the municipal level. States and provinces influence settlement patterns through infrastructure investment, state-level regulatory decisions, and economic development and housing programs. States and provinces also help municipalities by providing planning-related technical assistance and in some cases, funding for local planning programs.

Traditional settlement patterns in the region include a long history of compact and mixed-use cities, towns, and village areas surrounded by rural countryside. These centers provide a template by which the region can sustainably grow in the future. When economic activity occurs on “Main Street” rather than on the urban fringe, historic neighborhoods are renewed, brownfields¹¹ are reused and new development occurs as infill or compact mixed-use centers. These development patterns can enhance more transportation choices that help reduce emissions.

Less polluting modes of transportation such as walking, biking, transit, and light rail can be viable options to reduce travel distances when work, home, shopping, school, and other services are located within close proximity. Places that integrate a variety of uses within a compact, pedestrian-oriented area have greater transportation efficiency than areas characterized by sprawling disconnected land use patterns. Some studies¹² have calculated that a doubling of residential density can provide a potential 10 percent reduction in GHGs during the 2030–2050 period.

Regional Goals

- Work in partnership with municipalities and other planning entities to put state, provincial, and municipal plans, policies, and programs in place to encourage higher density, compact, and mixed-use development.

Recommendations

10. Improve coordination between agencies, departments, ministries, and municipalities regarding land use planning and GHG reductions.
11. Provide provincial/state incentives, such as infrastructure funding or regulatory relief for developers or municipalities that pursue higher-density, mixed-use development including transit-oriented design.
12. Promote regulatory review for energy and GHG emission impacts of development projects and infrastructure spending, including modeling of CO₂ impacts.
13. Actively provide municipal planning outreach to promote compact and mixed-use development, transit and pedestrian-oriented land use and design, and other planning techniques.

11 Abandoned or under-used industrial or commercial properties where expansion or redevelopment is complicated by real or perceived environmental contaminants.

12 Todd Litman, Win-Win Emission Reduction Strategies, Victoria Transport Policy Institute; Smarth Growth Reform, 2 July 2010: <http://www.vtpi.org/wwclimate.pdf>
José A. Gomez-Ibanez et N. Humphrey, *Driving and the Built environment, the Effects of Compact Development on Motorized Travel, Energy Use and CO₂ Emissions*, TRB Report Special Report, # 268 – May-June 2010.

Action Item 3: Low-Carbon Fuels

Basis for Action

Sustainably produced low-carbon and alternative fuels have the potential to offer air quality benefits and reduce GHG emissions. There are many different types of low-carbon fuels including but not limited to natural gas, propane, biofuels, waste-derived gaseous and liquid fuels, hydrogen, and electricity from renewable and/or lower-carbon sources. Using such fuels lessens the dependence on traditional petroleum transportation fuels and can stimulate economic activity. The availability of low-carbon fuels differs throughout the NEG/ECP region. Therefore, it will be useful to assess the feasibility of using the various types of low-carbon fuels in each jurisdiction and to understand the life cycle GHG impacts associated with the use of each of them. Due to the mix of fuels and renewable resources used to generate electricity in this region, electricity for use in electric vehicles and transit modes is one of the lowest carbon options available.

Regional Goals

- Promote and foster opportunities to increase production, generation, and use of transportation fuels and vehicles in a manner that delivers net GHG reductions.

Recommendations

14. Use government vehicle purchases, fuel choices and policies to demonstrate the viability and increase public awareness and acceptance of low-carbon alternative fuels, and alternative fuel vehicles (AFV) such as electric and natural gas vehicles.
15. Coordinate the development and facilitate the establishment, by the private sector and public utilities, of regional alternative fuel networks that include electric, natural gas, propane and other alternative fueling infrastructure in order to increase consumer awareness and enable greater use of low-carbon fuels.
16. Review, identify and address barriers to the broader use and acceptance of AFVs.
17. Collect and update data necessary to analyze policies, including comprehensive life-cycle analyses of all fuels to determine their relative GHG impact.
18. Encourage research and development of biofuels and other low-carbon fuels that reduce GHGs and other air emissions, particularly fuels that use renewable resources from the NEG/ECP region.
19. Continue demonstration projects of low-carbon fuels and AFVs in the region.

Action Item 4: Pricing and Incentive Mechanisms

Basis for Action

Pricing and incentive mechanisms can have a profound impact on consumer behavior relative to transportation fuel, mode, and technology choices. The challenge of accurately pricing the cost of a given transportation mode reflects the difficulty of identifying and assessing the full cost of transportation including health and environmental impacts, quality of life, loss of time, etc., associated with each mode. The integration of such

externalities provides individuals with a clearer picture of the impacts that their transportation choices may have on all aspects of their environment. Establishing an economy-wide price on carbon can send a progressive price signal to the market and the consumers, and may be an effective means to alter consumer behavior and achieve both effective regional GHG emission reductions and a more sustainable mobility network.

Market-based mechanisms should be expanded to more fully address the transportation sector. High market entry cost for new technologies creates barriers to the introduction and uptake of new cleaner vehicle technologies. Public procurement and support for research, development, and demonstration programs allow for innovation and deployment of more efficient technology to become viable in a competitive market much sooner.

Regional Goal

- Promote lower-carbon fuel choices and encourage clean technologies in all modes of transportation through incentives, pricing and procurement mechanisms.

Recommendations

20. Develop programs to encourage the purchase of lower GHG-emitting vehicles. Such programs can be revenue-neutral or revenue-producing. Options include either incentives or disincentives on vehicle sales taxes and annual vehicle fees relative to the carbon emissions performance of the vehicle. Additional approaches might include programs based on distance travel.
21. Promote fuel efficiency in all modes of transportation through incentives for new and emerging technologies, partnerships with the private sector, and public awareness programs.
22. Seek a partnership with our federal governments to develop a market-based policy to send uniform GHG emission price signals to the transportation sector as soon as possible.

Action Item 5: Low Emission Vehicles

Basis for Action

Use of advanced low emissions vehicle technologies can significantly reduce the GHG emissions from the transportation sector. Technologies include mechanisms that make conventional vehicles more efficient such as idle control devices, as well as advanced hybrid technology that combines conventional and alternative power sources, or advanced controls that reduce particulate and ozone forming emissions. The NEC/ECP region, along with other U.S. states that have adopted the California Low Emission Vehicle (CAL LEV) standards and zero emission vehicle (ZEV) requirements, accounts for 30 percent of total vehicles sold in North America. A significant opportunity to improve the overall efficiency of the region’s fleet exists with the harmonization of the CAL LEV and North American GHG light-duty vehicle standards for MY 2010-2016 vehicles, and proposed harmonized standards for MY 2017-2025 vehicles. Together these standards are projected to generate a 25 percent reduction in GHG emissions and a significant reduction of conventional air pollutants from the transportation sector. In most CAL LEV states there are further requirements for zero emission technologies, mostly electric drive. These programs will drive the market for cleaner and more efficient light-duty vehicles for the benefit of consumers and the environment. Actions by governments in the NEG/ECP region can increase the rate of adoption of these cleaner, more efficient vehicles and thus achieve maximum benefits.

Regional Goal

- Continued harmonization of low-emission and fuel economy standards throughout the entire region and the rapid adoption of these vehicles by consumers in the region.

Recommendations

23. Explore joint government procurement strategies to demonstrate effectiveness, create demand for low emission and advanced technology vehicles, and lower costs.
24. Expand the coverage of “no-idling” programs.
25. Support efforts to increase public awareness of the GHG emissions reduction and fuel economy benefits of efficient driver behavior, including such actions as avoiding rapid acceleration and deceleration, reducing vehicle weight when possible, maintaining proper tire pressure, conducting routine vehicle engine maintenance, planning ahead to combine trips and other behaviors that help improve the fuel efficiency of a vehicle.
26. Identify, review and remove barriers to broader use of low emission vehicles and technologies.
27. Demonstrate to car manufacturers that the region is ready to increase the number of ZEVs by engaging and supporting others stakeholders in the creation of electric vehicle charging infrastructure networks and regional corridors.
28. Explore the use of policies to support rapid adoption of cleaner fuels and vehicles including:
 - a. preferential parking or highway access,
 - b. consumer incentive programs, and
 - c. government fleet purchase and contract specifications.

Action Item 6: Freight Policy

Basis for Action

The freight sector is a major contributor to the economy and the second largest contributor to GHG transportation emissions in the Northeast. The percentage of freight moved by trucks surpasses 75 percent in many jurisdictions and contributes to increased congestion and maintenance issues for the region’s roads and highways. Current volumes are expected to double over the next 20 years. Truck traffic also has a significant negative impact on the road conditions due to its weight.

The dual issues of the rising fuel costs and emissions reduction objectives necessitate the creation of inter-modal opportunities for private sector carriers to operate more efficiently. Freight carriers and shippers will have to consider practices that result in less fuel consumption to remain competitive. Such practices can help slow the rate of growth of distance traveled and reduce total GHG emissions and air pollution from the transportation sector.

Regional Goals

- Increase the efficiency of all modes of freight transportation through vehicle technology and greater capacity usage.
- Increase the intermodal road/rail or marine transportation share by 2020.
- Improve the fuel efficiency of road freight transportation by 10 percent by 2020.
- Slow the growth of vehicle distance traveled in the road freight sector.

Recommendations

29. Working with other interested parties, organize regional discussions of freight issues that engage private sector railroads, shippers, trucking and marine interests to identify obstacles, opportunities, and strategies aimed at achieving reduction of the consumption of carbon fuels in the transportation of goods and freight.
30. Focus on rail, road, and maritime corridors of regional significance and coordinate efforts with state, provincial, regional, and corridor planning studies to identify modal implications of improved freight transportation infrastructure.
31. Identify and report on opportunities for increased efficiency in freight and passenger flows by:
 - a. addressing physical and regulatory obstacles to the more efficient movement of goods within the region (e.g., truck weight restrictions, border wait times, local congestion);
 - b. assisting in development of new strategic intermodal facilities;
 - c. lowering the GHG emissions per distance traveled of freight through a combination of technology and infrastructure improvements;
 - d. supporting development of cooperative planning mechanisms and infrastructure investment opportunities for transportation corridors of regional importance (e.g., Halifax/Saint John to Boston/Montreal); and
 - e. developing regional policies and funding strategies to support transportation sector goals.
32. Support efforts to improve logistics planning, particularly in the movement of goods and materials, to improve the efficiency of the freight transportation sector.
33. Support an enhanced regional focus on freight idling reduction programs.

