

Urban Transportation Showcase Program: Results of integrated urban passenger greenhouse gas emission reduction demonstration projects

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Abstract

The Urban Transportation Showcase Program (UTSP) was created by Transport Canada in 2001 to test the greenhouse gas emission reduction potential of integrated urban passenger transportation projects.

Eight demonstration projects (in Whitehorse, Metropolitan Vancouver, Winnipeg, Region of Waterloo, Greater Toronto Area and Hamilton, Gatineau and Montreal, Quebec City, and Halifax Regional Municipality) testing about 35 distinct measures were implemented. Measures included bus rapid transit facilities, transit oriented development, Intelligent Transportation Systems, Active Transportation facilities, and transportation demand management measures. All of the projects implemented a suite of integrated measures in partnership with a range of governmental, private sector and non-profit partners. Each of the projects incorporated comprehensive results measurement regimes and they reported regularly to Transport Canada, each other and to the broader stakeholder community regarding their experience and the results of the demonstrations.

This paper describes some key results of the showcases and the program generally. The paper includes information on: the context for GHG reduction in the transportation sector; project emission reduction results; other project benefits; and, lessons learned from project officials and partners. The paper documents results reported to March 2009. A final program report that captures all project results will be published in 2010.

Introduction

The Urban Transportation Showcase Program operated between 2001 and 2009 as a Transport Canada initiative to assess integrated approaches for the reduction of greenhouse gas emissions (GHG) in the urban passenger sub-sector of the transportation system. The program co-funded eight Showcase demonstration projects that were located in Whitehorse, Metropolitan Vancouver, Winnipeg, Region of Waterloo, Greater Toronto Area and Hamilton, Gatineau and Montreal, Quebec City and Halifax Regional Municipality. These projects ranged in size from about \$3 million to over \$30 million. The showcases implemented measures aimed at increasing the use of more energy-efficient transportation options such as public transit, cycling, walking, and car-pools while also achieving economic and social co-benefits.

Throughout the program, the interim results and lessons-learned of these projects have been disseminated to Canadian transportation practitioners and decision-makers through conference presentations, publications and other outreach initiatives. A key objective of the program is to share “best practice” information as a means to encourage the replication of initiatives that can reduce GHG emissions. This paper is presented in support of this information-sharing objective and describes reported project results up to March 2009.

This paper is divided into four sections. The first section provides contextual information on the program, including GHG emission reduction in the transportation sector and program origins and objectives. The second section describes the results-to-date of the program and of the showcases according to the four program objectives. The final section concludes with general program results.

Program Background

Transportation Climate Change Table

Following the establishment of commitments under the Kyoto Protocol in 1997, the Government of Canada established multi-sectoral “tables” focused on the key emitting sectors. The Transportation Climate Change Table aimed to identify measures that would help Canada meet its targeted 6% reduction (from 1990 levels) by the Kyoto target date of 2012. Over 25% of Canadian emissions originate from the transportation sector, with 47% from light duty vehicles (generally for personal transportation), 23% from heavy duty vehicles (largely for goods movement), 4% from air, 3% from marine, 3% from rail and 20% from a range of sources such as off-road diesel vehicles and pipelines.

Given the multiple sources of emissions from the transportation sector and the variety of contexts within the transportation systems in Canada, the Transportation Table recommendations were wide-ranging. Many of the recommended GHG reduction measures were also qualified by the fact that there was little experience in their application in Canada.

To address the urban passenger sector (which corresponds with the 47% of emissions from light duty vehicles), the Transportation Table concluded that reductions were only possible through “...integrated strategies that combine reinforcing actions addressing public behaviour, demand, technology, infrastructure and land use across urban regions.” A review of practices in the 1990’s revealed that there was little Canadian experience in the planning, implementation and, particularly, impact measurement of such integrated projects.

The underlying goal of the UTSP was to determine the viability of integrated GHG reduction approaches that focused on behavior change. The UTSP was developed to help determine if integrated project successes (from international case studies) were more broadly replicable in the Canadian context. The program would identify the practices that are successful, what did not work, and would disseminate information to transportation-sector practitioners and decision-makers to help foster replication in the Canadian context.

Demonstrating and Assessing Innovative and Integrated Approaches

The UTSP was created as part of the Government of Canada's Action Plan 2000 on Climate Change in 2001 and was later extended to 2009 under the Interim Strategy on Existing Climate Change Programs. The objectives of the program were to:

- support the development and integration of strategies, transportation planning tools and best practices so as to reduce GHG emissions;
- demonstrate, measure and monitor the effectiveness of a range of integrated urban GHG reduction strategies;
- evaluate the effects of these strategies for other important policy objectives to build strong cities (smog reduction, congestion relief, improved public transit infrastructure); and,
- establish a comprehensive and pro-active national Information Network for the dissemination of information on successful GHG reduction strategies for sustainable urban transportation.

The following presentation of program result highlights are organized according to these objectives.

Given that urban transportation is not a direct federal area of jurisdiction, the approach behind the UTSP was to provide a funding incentive (a maximum of 33% of total costs) to foster the implementation of GHG reduction demonstration projects. Eligible recipients were municipalities and local transportation authorities. Provinces/Territories could choose to participate or not, and could render a project ineligible by objecting to a federal transfer to a municipality or authority within its jurisdiction. Provincial governments were co-funders of six of the eight projects.

Program Results

This paper is based upon showcase progress and final reports and other program records to March 31, 2009, the sunset date of the program. It does not include final GHG impact assessments from five showcases and does not reflect the results of a planned review of reported GHG reduction results. A separate publication will compile final results, which includes these sources.

The results summarized below are based on three final demonstration project reports, extensive progress report records from all showcases, and internal program records. As a condition of participation, proponents agreed to a comprehensive GHG impact measurement strategy and to ongoing progress reporting to Transport Canada.

Objective One: To support the development and integration of strategies, transportation planning tools and best practices so as to reduce GHG emissions

This objective relates to the program's selection process and efforts to stimulate the development of innovative and integrated proposals.

To meet this objective, the program implemented a competitive, application-based selection process. The program design and selection process were developed following a national consultation with key transportation sector stakeholders. This consultation was followed by outreach and marketing that stimulated the submission of 48 expressions of interest in the first stage of the selection process.

An independent Selection Committee consisting of transportation and municipal experts evaluated the expressions of interest against program criteria and advised Transport Canada on the choice of 15 projects to retain for the second stage of the process. Project selection criteria emphasized integrated approaches, innovation, GHG reduction potential, relevance to local policy priorities, commitment to GHG impact measurement, and sound financial and administration commitments.

The second stage of the selection process saw the development of 15 detailed project proposals. Transport Canada contributed \$30,000 to each of the finalists to support the development of these proposals. As a result, 15 integrated strategies were developed (incorporating about 40 distinct transportation measures). Strategies were customized to meet the needs of the jurisdiction as reflected in existing transportation plans or more general municipal development plans.

The Selection Committee evaluated all of the 15 detailed proposals against the same criteria and made a recommendation to Transport Canada on which projects to fund. The eight projects that were funded are described below.

The proponents of the seven showcase proposals not selected for funding have reported that participating in the selection process was a significant boost to local efforts to foster sustainable transportation. At least five of these seven applicants were able to implement at least some components of their strategies and all reported that the process provided a unique opportunity to foster innovation within their communities.

Objective Two: To demonstrate, measure and monitor the effectiveness of a range of integrated urban GHG reduction strategies;

This objective relates primarily to the implementation and assessment of the eight showcases selected for funding under the UTSP.

More detailed information on each of the showcases is available on the UTSP web site and in annual program reports. A short summary of each project, along with some specific results, is presented below.

Integrated Travel Management in Old Quebec City: This showcase aimed to reduce vehicular traffic within a special transportation management zone in, and adjacent to the Old City of Quebec. A free, twenty passenger electric bus is at the heart of the project.

These buses, which cost between \$3 and \$4 to fuel each day, operate on a route connected to parking lots outside the Old City and to key attractions, services and accommodations within the Old City. This bus service is complemented by measures such as access controls within the management zone for tour buses and freight delivery vehicles, improved facilities for cyclists and pedestrians, customer information, and parking management. Combined, these measures contribute to the overall objective of reducing the need for vehicular traffic.

Final GHG reduction figures were not available for this project at the deadline for this paper. Interim project reports document the popularity of the new *écolobus* service, which has exceeded ridership projections, and the success in implementing the complementary measures.

Gatineau and Montreal Public Transit: This showcase aimed to reduce emissions through improved transit service and through the deployment and assessment of hybrid diesel-electric buses. In Gatineau, this project includes a range of mutually supportive public transit measures, including a higher-order transit corridor featuring transit-signal and lane priority measures, real-time next-bus arrival information, park-and-ride facilities, as well as a special route branding and marketing campaign. In Montreal the project tested a variety of different route types, with a significant focus on technology testing and operator and maintenance training for the hybrid buses.

Final project results were not available in time for this paper, but will be reported in the final program report. One indication of success is interim reports of up to 37% reduced fuel consumption for the hybrid buses when employed in particular contexts and using more effective operating processes.

Region of Waterloo, iXpress Bus Project: This showcase aimed to attract travelers to a limited-stop express bus service that connects the regional centres of Cambridge, Kitchener and Waterloo with frequent, faster higher-order transit services. Transit signal priority helps to improve travel times and reliability. Features such as real-time next-bus arrival information, an on-line trip planning tool, and other branding and marketing components help to make the service attractive and convenient for new users. Links to cycling and walking facilities promote multi-modal travel. A unifying component for the entire project was the development and implementation of one of Canada's first community-based social marketing (CBSM) pilot projects.

While final project information was not available in time for this paper, there is interim evidence of project success. For example, 20% of iXpress passengers previously made the same trip by car. The CBSM project saw overall trips made by walking, cycling and transit increase by 12.5% and auto-based trips decrease by 2.5% among participants.

City of Winnipeg, WinSmart: This showcase incorporated a wide range of measures designed to increase the use of cycling and transit on the Pembina Corridor which runs south from the city centre to the University of Manitoba. Park and ride, automatic transit vehicle location, a new active transportation trail, and another community-based social

marketing pilot project are the key measures employed to attract residents to more sustainable modes. This multi-faceted project is also piloting the use of biofuel in the municipal fleet, pedestrian way-finding facilities in the downtown, and measures to make freight movements in the urban area more efficient.

Project results will be published in the UTSP final report. Preliminary results from the social marketing project mirror similar successful modal shift trends as the Region of Waterloo and Metro Vancouver pilot projects with increases in cycling, walking and carpooling and a 3.4% reduction in vehicle kilometres traveled.

Metropolitan Vancouver, Sustainable Region Showcase: This was the largest showcase project with six sub-projects and aimed to reduce GHG emissions using technology, new facilities and by fostering integration. The projects are: a hybrid diesel-electric bus pilot; a study on how to make urban goods movement more energy efficient; the planning and development of demonstration “transit villages” at the Broadway-Commercial and Surrey Central Skytrain stations; TravelSmart, a community-based social marketing project implemented in six distinct neighbourhoods; the Main Street transit and pedestrian priority project; and the development of the Central Valley Greenway, a 24 km dedicated corridor for bicycles and other Active Transportation modes.

The final GHG impact of this project is still being calculated, but interim results are very encouraging. The TravelSmart program resulted in a 9% increase in walking, 33% increase in cycling, 14% increase in transit use and an 8% decrease in single occupancy vehicle use across urban and suburban areas in the Region. The hybrid diesel-electric buses demonstrated a 20% reduction in fuel consumption. The goods movement efficiency study has evolved into a second phase and is part of regional efforts to make their freight gateway more efficient. The transit village project is being expanded (including a feature project at the Main Street station that is supporting a major neighbourhood redevelopment effort) and the bus bulges and transit priority measures from Main Street are being replicated on other corridors.

City of Whitehorse, Whitehorse Moves: This is the smallest showcase in size and the smallest community in which a UTSP project was implemented. The main objective of the project was to reduce the barriers to increased walking, cycling and transit. The project’s central capital element is a connected Active Transportation network of trails, bike lanes, bridges and stairs. The project also saw the development of a round-about to calm motor vehicle traffic before it entered the downtown, a public education and outreach campaign, and transportation demand management projects to promote increased car-pooling, transit, walking and cycling.

Final project results include an estimated GHG reduction of 90 tonnes from elements of the project that were measurable, replication of project elements in forthcoming developments, changes to development and planning standards in the City to foster sustainable transportation, and an effective network of partners to work with in current and future projects. Whitehorse’s cycling mode share increased from 1.8% in 2001 to 2.7% in 2006 in census “trip to work” figures.

Greater Toronto and Hamilton Area, Smart Commute Initiative: This project aimed to establish ten Transportation Management Associations (TMAs) throughout the region to provide opportunities for employees to reduce single-occupant commuting trips. These TMAs engaged with local employers to help establish programs to increase the number of employees using transit, vanpools, carpools, walking and cycling to travel to work. These activities were supported by the establishment of the Carpool Zone ridematching service and the development of implementation professional project implementation guidelines to support the work of the TMAs.

Final project results include a reported 17,500 tonne reduction in GHG emissions and a strong regional partnership of organizations, businesses, governments and others dedicated to making commuting more sustainable. There are now over 100 employers who participate in commuter options programs through their local TMAs. When UTSP project funding ended, Metrolinx, the Greater Toronto Transportation Authority, added the project into its ongoing operations.

Halifax Regional Municipality, MetroLink Bus Rapid Transit: This project aimed to attract new customers to public transit through improved services. Two higher-order bus rapid transit facilities were implemented to link residential areas of Halifax to key services, transportation hubs and employment destinations. Along with improved-comfort vehicles, the service installed transit signal priority and queue-jump lanes to improve speed and reliability. The service promoted multi-modal access by combining the MetroLink service with bike facilities and trail connections, as well as park and ride lots. The project also featured an award-winning outreach and marketing effort to make residents aware of the new service.

Final results of the project are a 30% modal shift from cars to the new transit service that will provide a 2 kilotonne per year reduction in GHG emissions. There was also a 17% - 55% improvement in travel times (depending on the route and the direction of travel). The project is slated for replication within the municipality with new MetroLink routes slated to launch in 2012.

Objective Three: To evaluate the effects of these strategies for other important policy objectives to build strong cities (smog reduction, congestion relief, improved public transit infrastructure)

A final research project to quantify at least some co-benefits is taking place in 2009-10. The co-benefits described below have been reported by almost all of the showcases.

1) Improved capacity to implement inter-sectoral and cross-jurisdictional projects. Due to the necessity to implement integrated projects, all of the showcases needed to work with new partners in new ways. Almost all of the projects had to develop special project offices and project steering and coordination committees to guide implementation.

In the Greater Toronto Area and Hamilton this involved eleven local and regional governments working in partnership with each other, business associations, and employers to solve regional transportation challenges. In Metro Vancouver it meant strengthened ties and working relationships between TransLink (the regional transportation authority) and municipalities as most of the projects combined elements with multiple jurisdictional responsibilities. In Quebec City, the project led to the development of a special mobility management office. The Region of Waterloo forged a unique partnership with the University of Waterloo for the measurement component of their project.

Provincial governments were key partners in seven of the eight showcases. Their contributions included funding, project governance, regulatory changes and as leaders in ensuring the replication of UTSP-supported projects.

In most cities non-profit community groups and the business community were essential partners. These new relationships and new institutions were established to plan and implement the showcases, and will continue to be models for collaboration and will provide a strong base for initiatives going forward.

2) New professional standards and practices in support of sustainable transportation.

Examples of this include the establishment of new regulations for transit signal priority in Nova Scotia, new land use development standards and practices in Whitehorse, and new standards for mixed pedestrian and cycling facilities at intersections in Metropolitan Vancouver. In Montreal and Gatineau new guidelines for the operation and maintenance of hybrid diesel-electric buses will inform all subsequent users of this technology on the best practices for maximizing their energy efficiency.

The program also partnered on the development of professional guidelines by the Canadian Urban Transit Association, the Federation of Canadian Municipalities and the Transportation Association of Canada.

3) Health and lifestyle benefits due to increased opportunities for physical activity. A total of 30% of the users of the Halifax MetroLink service access the service by walking. In Whitehorse, there was a 10% increase in households where at least one member walked or cycled downtown in 2006, after new facilities were built. Winnipeg and Vancouver now have central, connected Active Transportation corridors that are making it easier for residents of all ages and abilities to cycle, walk, and roll.

4) More energy-efficient use of existing infrastructure. Higher-order transit projects such as the iXpress bus service in the Region of Waterloo and the Ligne verte in Gatineau demonstrate how low cost interventions such as intelligent transportation system technologies and queue-jump lanes can increase the speed and reliability of transit with little or no impact on other road users. The car-pool zone service in the Greater Toronto and Hamilton Area registered over 500 new carpools at the end of the project, meaning fewer cars are required to move the same number of people. The road diet project in

Whitehorse, which saw a four lane street converted to two through lanes, one left turn lane and two new bike lanes, had no impact on motor vehicle service levels and increased cyclist travel times. Community-based social marketing projects in Vancouver, Winnipeg and the Region of Waterloo all successfully increased the use of sustainable modes without increasing or modifying existing services and infrastructure.

5) Measures to manage congestion developed. All of the projects that resulted in a modal shift away from single occupancy vehicles and toward more energy and space efficient modes provided examples of how to better manage congestion. Projects that implemented measures that decreased space for vehicles (by, for example, adding bus bulges and shortened pedestrian crossings in Vancouver or the road diet in Whitehorse) measured no notable decrease in vehicle service levels on those corridors. The SmartCommute Project in the GTA/Hamilton continues to work with employers to increase the use of modes that reduce congestion pressures in the region.

6) Increased professional capacity to plan, implement and measure the effectiveness of integrated sustainable transportation projects. The UTSP helped to allow for innovative components and concepts of transportation plans to be implemented. This provided project officials with opportunities to learn first hand and develop new skills in planning, implementation, operations and ongoing management. One notable area of professional development was in the area of measuring the environmental impact of the projects.

7) Land use changes that encourage the use of sustainable transportation options. Almost all of the projects are supporting local efforts to develop denser and more diverse land uses along key transportation corridors and nodes. This includes major real estate developments near SkyTrain stations in MetroVancouver, retail developments adjoining MetroLink terminals in Halifax, and plans to make new and existing neighbourhoods in Whitehorse more connected to transit and active transportation facilities.

Objective Four: To establish a comprehensive and pro-active national Information Network for the dissemination of information on successful GHG reduction strategies for sustainable urban transportation.

An important objective of the program is to foster the longer-term replication of GHG reduction measures in the transportation sector by communicating the results and “lessons-learned” of the showcase projects and other notable case studies to transportation professionals and decision-makers. Since 2003 the program has implemented the following initiatives:

1. The program supported or organized over 85 workshops and conference sessions across Canada in collaboration with federal departments, sector associations, and non-profit groups. There were over 5,000 attendees and over 400 case study presentations at these events.

2. A total of 62 Canadian GHG reduction Case Studies and Issue Papers were developed and published on the UTSP web site. These case studies received a total of 180,000 online “visits” between 2004 and 2007.
3. Recognition of innovative urban GHG reduction projects was accomplished by supporting sustainable urban transportation awards provided by the Federation of Canadian Municipalities and the Transportation Association of Canada. A total of 12 awards were presented over the past six years. It should also be noted that many of the Showcases were themselves recognized in national and local awards processes.
4. The program web site received over 400,000 visits to resources such as showcase profiles and results, TDM Resource Centre, and a database of transportation project results.
5. Various marketing and outreach activities included articles and advertisements in trade publications; publication of annual program reviews, brochures and presentations by Transport Canada and Showcase implementers at professional conferences.
6. Finally, a number of capacity building projects were implemented including the development of sustainable transportation planning guidelines, transit priority guidelines and the Urban Transportation Emissions Calculator.

In sum, there is a considerably broader base of information and expertise within the target group to plan, implement and measure integrated sustainable urban transportation initiatives.

Conclusion

The UTSP provided a unique opportunity to test the effectiveness of an integrated approach to planning and implementing municipal passenger transportation projects. Through this program, a federal government initiative was able to stimulate local and provincial efforts to reduce emissions through projects that focused on travel behaviour change and the deployment of emission-reducing technologies.

Interim and final project results demonstrate that Canadians are willing to reduce their use of single occupancy vehicles if convenient and reliable alternatives are in place and they know how to use them. Results demonstrate that Canadian transportation practitioners and governments are capable of delivering multi-faceted projects that respond to latent demand for a wider array of sustainable transportation options. Program experience also demonstrates the relevance and validity of a wide-range of strategies and illustrates that progress can be made in both large and small communities, and in urban and suburban contexts. Finally, showcase communities are realizing co-benefits that are helping to manage congestion, foster land-use changes and improve the health and overall quality of life for residents.

The ongoing replication of Showcase strategies and of the program's underlying focus on integrated approaches will be the ultimate measure of UTSP program success. The fact that almost all of the strategies implemented in the Showcases are being replicated within the project communities is encouraging. Current pressures to reduce GHG emissions, manage congestion and foster a healthier quality of life are likely to continue well into the future. As jurisdictions work to address these pressures, the UTSP offers a legacy of practical and inspirational examples that demonstrate the benefits of balanced, sustainable transportation systems.

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