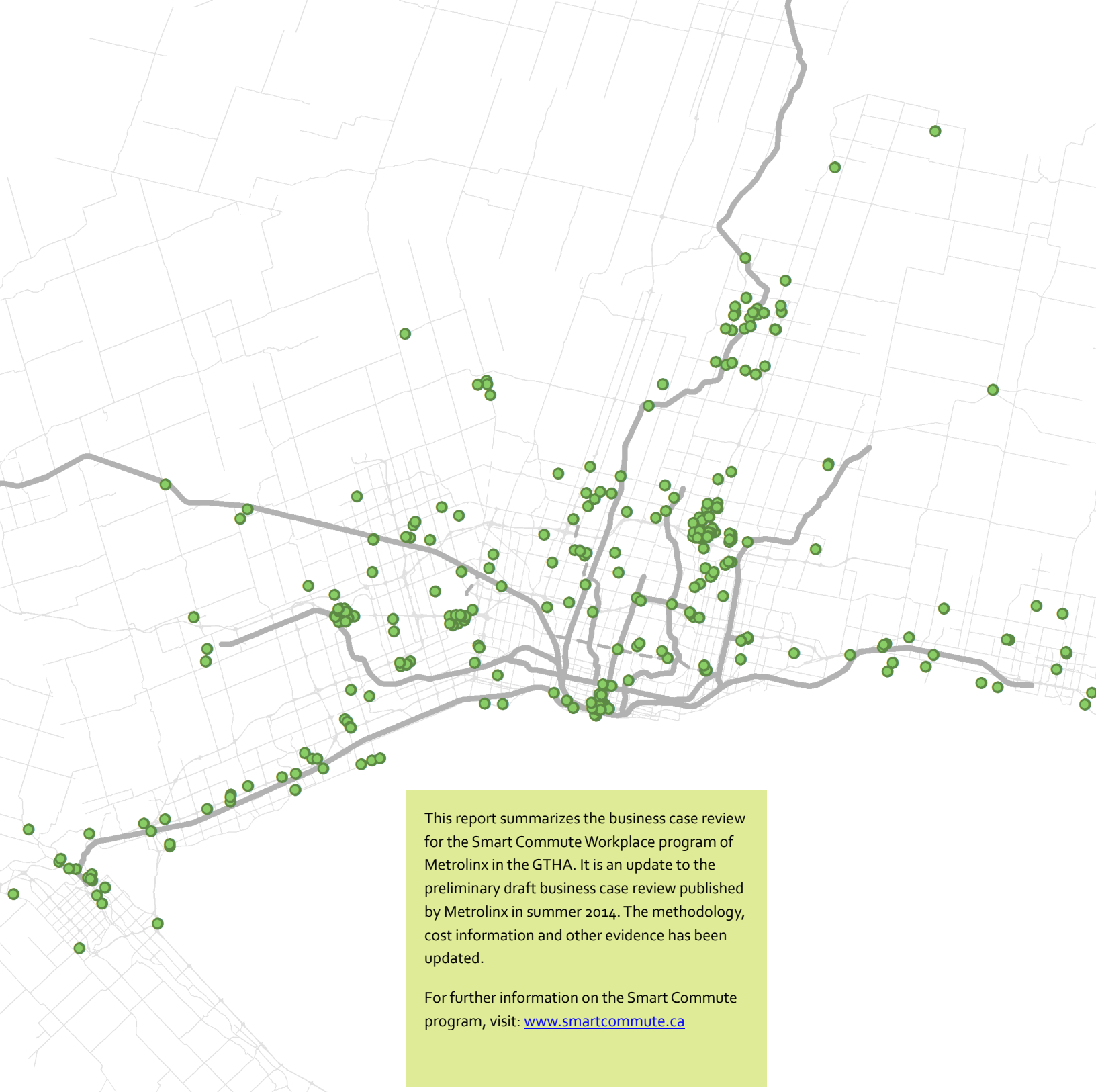
METROLINX

SMART COMMUTE WORKPLACE PROGRAM

BUSINESS CASE REVIEW

MARCH 2015



This report summarizes the business case review for the Smart Commute Workplace program of Metrolinx in the GTHA. It is an update to the preliminary draft business case review published by Metrolinx in summer 2014. The methodology, cost information and other evidence has been updated.

For further information on the Smart Commute program, visit: www.smartcommute.ca

Smart Commute

A Program of METROLINX

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Table of Acronyms

BCR	Benefit cost ratio
GDP	Gross Domestic Product
MAE	Multiple Account Evaluation
NPV	Net Present Value
PV	Present Value
RTP	Regional Transportation Plan, *The Big Move, 2008*
SC	Smart Commute
SOV	Single Occupant Vehicle
TDM	Transportation Demand Management
TMA	Transportation Management Association or Smart Commute offices in the region working with employers to develop tailored employee travel programs
TTS	Transportation Tomorrow Survey
VKT	Vehicle Kilometres Travelled

Glossary of Terms

Appraisal	Analysis of a program, investment or intervention that has not yet been implemented and focuses on estimated or forecasted evidence.
Benefits Case Analyses (BCA)	Reports produced by Metrolinx between 2008 and 2012 focusing on select economic impacts and financial costs of major proposed Metrolinx transit projects. BCAs have subsequently been replaced by the new Business Case framework.
Business Case	A collection of a suite of evidence on the potential strategic, economic, financial, deliverability and operational impacts of a proposed program, intervention or investment to inform decision-making throughout the project lifecycle. Metrolinx Business Cases are an enhancement and replacement of Metrolinx's former Benefits Case Analyses reports.
Business Case Review	A post-implementation review of a transportation program, intervention or investment.
Cost Benefit Analysis	A form of evaluation that focuses on comparing certain economic impacts (generally benefits) to the cost of an investment. Cost Benefit Analysis is used in the Economic section of Metrolinx's Business Case framework and was also used to inform previous Benefits Case Analyses.
Delivery and Operations Case	One component of a Metrolinx Business Case that examines the impacts of proposed investments or interventions on operations, the delivery of the proposal, potential risks, procurement and related commercial or management issues.
Economic Case	One component of the Metrolinx Business Case that examines or reviews the impacts of proposed investments or interventions. Economic impacts include transportation user benefits (journey time impacts, road decongestion impacts, safety/accident reductions, etc.), environmental impacts (changes in emissions levels, vibration, etc.), social and community impacts (the distribution of benefits among populations, severance/isolation impacts, etc.), wider economic benefits (agglomeration/productivity impacts, etc.) and public funding impacts (property tax revenues, etc.). The Economic Case generally includes a benefit-cost ratio. Economics is a branch of science that studies the production, distribution and consumption of goods and services.
Evaluation	Analysis of a program, investment or intervention that has been implemented and focuses on revealed evidence from previous performance.
Ex ante	Analysis based on forecasted or estimated evidence of future performance.
Ex post	Analysis based on evidence of past performance.
Financial Case	One component of the Metrolinx Business Case that examines the lifecycle costs and revenues of proposed investments or interventions.
Smart Commute Gold Workplace Designation	A Gold designation is granted to outstanding Smart Commute workplaces that demonstrate innovation, focus on measuring their success and achieve significant positive outcomes and demonstrated success in convincing their employees to choose other ways to get to work than driving alone.
Smart Commute Silver Workplace Designation	A Silver designation granted to workplaces that take the Smart Commute program beyond the basics, providing enhanced commuter options for their employees. Smart Commute Silver Workplaces want to make a significant positive impact – on their employees' commutes, congestion, and/or the environment – and are willing to invest effort and resources to implement relevant programs.
Smart Commute Workplace Designation Program	The Workplace Designation program rewards efforts that a) grow over time by implementing new initiatives that help more commuters choose alternatives to driving alone, and b) continue to engage commuters at their workplace on a regular basis.
Strategic Case	One component of a Metrolinx business case that examines the alignment of proposed programs, investments or interventions with Metrolinx strategic plans and goals. Involves the presentation of transportation planning information, including traffic forecasts, related travel patterns, drivers and interdependencies.

EXECUTIVE SUMMARY

Smart Commute is a program of Metrolinx and the municipalities of the Greater Toronto Hamilton Area (GTHA). The program mandate is to encourage those living and working in the GTHA to choose efficient transportation choices that reduce congestion and help to improve quality of life in the region. Through workplace, school and community programming, and with the support of services and tools, Smart Commute encourages those who live and work in the GTHA to try travelling at a different time of day, choose a different mode (e.g. carpooling, transit, walking or cycling), or reduce their trips through teleworking.

The Smart Commute workplace program helps inform employers and commuters about their commute choice, and encourages them to try more efficient options. In 2014, Smart Commute worked with 340 workplaces in the region, employing more than 730,000 commuters.

As the Smart Commute workplace program progresses and future development options are considered, a review was undertaken of the program outcomes to date. This Business Case Review provides an ex post evaluation of the value delivered by the Smart Commute workplace program. It outlines how the program is delivered, how it supports Metrolinx's strategic goals, the financial costs and economic impacts, by giving an indication of the value delivered for the money invested.

The analysis was based on a statistically significant sample of data from the Smart Commute workplace survey. The sample includes 37 Smart Commute workplaces that have completed baseline and follow-up employee surveys and met the minimum required response rate. Mode shift, change in annual trips and annual vehicle kilometres travelled were calculated from the sample size, were found to be representative of the Smart Commute Gold and Silver designated workplaces, and then extrapolated to the 360,000 employees employed at all Gold and Silver designated workplaces across the Smart Commute Network.

STRATEGIC CASE: The Smart Commute workplace program aligns with strategies set out in the Regional Transportation Plan (The Big Move, 2008) as well as Provincial policies on land use and growth to encourage sustainable travel behaviour and transportation demand management (TDM) programs. The program increases the efficiency of the road network and encourages active transportation. By working directly with employers, the program also expands Metrolinx's reach to non-transit markets where road congestion is concentrated. The program is also is a platform for collecting valuable commuting data and information that can be used by Metrolinx to support the development of other transportation projects and programs.

FINANCIAL CASE: As highlighted in Table 1, Transportation Management Association (TMA) program costs for 2013-14 were $3.1 million, with approximately 39% of funding from municipalities, 44% from Metrolinx and 18% from other sources including fees paid by employers. Added to this is the Metrolinx central budget of staff time and programming to support workplace program delivery, for a combined annual total of $4 million.

ECONOMIC CASE: The Smart Commute workplace program was found to reduce single occupancy vehicle (SOV) travel by approximately 40 million Vehicle Kilometres Travelled (VKT), and increase active transportation use by approximately 9 million Kilometres Travelled per annum. As Table 1 highlights, the program generates an estimated $34 million in auto VKT reduction benefits, and an estimated $21 million in active transportation health benefits, calculated to an annual economic benefit of over $55 million.

The Smart Commute workplace program has an estimated benefit cost ratio (BCR) between 2:1 and 11:1, with the most likely scenario demonstrating a 6:1 BCR. The BCR has been calculated over a 5.5-year evaluation period. This is the average interval between Smart Commute surveys (4.5 years) plus one additional year. The full cost of the program over 5.5 years is counted. In the absence of detailed data to describe how the mode shift builds up over that time period, several 'ramp up' scenarios have been tested, with the most conservative scenario assuming no mode shift occurs until immediately before the follow up survey, which is then held constant for a full year. Sensitivity tests of the 'ramp-up period' are presented in Figure 3 of the main report.

The economic valuation of the program is considered conservative as some key benefits of the program have only been assessed in qualitative/descriptive terms (i.e., have not been monetized). Additionally, if mode shift is realized shortly after program launch, the estimated BCR ranges up to 11:1; however, using more conservative assumptions (mode shift is realized the day before the follow-up survey occurs), the BCR reaches 2:1.

The most likely scenario demonstrates an approximate 6:1 benefit cost ratio for the Smart Commute workplace program, where workplace mode shift is realized gradually in the years ahead of the 4.5-year average completion of a follow-up survey. Going forward, additional analysis of the adoption rate of travel behaviour change following introduction of Smart Commute programming at workplaces, as well as other impacts (including business benefits associated with labour or realty costs), may add quantified benefit.

Note that some Smart Commute workplace program benefits which have not been monetized in the BCR include:

- Operational efficiencies (e.g., elimination of parking shortages, reduced maintenance fees, increased visitor parking);
- Employee benefits (e.g., increased work-life balance, travel options, staff satisfaction, contribution to recruitment & retention);
- Business results (e.g., idea generation resulting from cross -department agglomeration of staff in carpools or shuttles);
- Potential real estate savings for employers (e.g., avoided construction of new parking, reduced land requirements for parking);
- Lower government capital and maintenance costs for roadways over time;
- Fewer air pollutants and greenhouse gas emissions;
- Value of employer-level commuting data that supports development of other transportation projects and programs; and,
- Increased economic productivity stemming from reductions in regional congestion.

Inclusion of such impacts will be investigated as part of future updates to the Business Case Review.

DELIVERY AND OPERATIONS CASE: The Smart Commute workplace program is overseen by Metrolinx's Smart Commute team, as part of the Planning and Policy business unit, and delivered by 13 TMAs operating out of 9 physical offices across the GTHA. The TMAs have varied beginnings and are uniquely owned and operated (Appendix C provides more information). A key element that unites TMAs is the financial and program support from the Smart Commute team at Metrolinx. As part of funding agreements, the TMAs are required to deliver services in accordance with Metrolinx-established performance metrics.

Table 1 Summary of Economic and Financial Evidence

Economic Benefits – Annual		Financial Costs	
Road congestion reduction	$6.3 M	Annual costs	$4 M
Safety benefits	$3.1 M	5.5 years of costs*	$22.2 M
Vehicle operating cost savings	$24.6 M	Estimated Benefit Cost Ratio	6:1
Active Transportation health benefits	$21.5 M	Net Present Value	$123.4M
TOTAL	$55.5 M		

*Average elapsed time between baseline & follow-up surveys + one year of cost while benefit occurs

1 BACKGROUND AND CONTEXT

Characteristics of Smart Commute Workplace Program

1.1 Smart Commute is a program of Metrolinx and the municipalities of the Greater Toronto Hamilton Area (GTHA). The program mandate is to encourage those living and working in the GTHA to choose efficient transportation choices that reduce congestion and help to improve quality of life in the region. Through workplace, school and community programming, Smart Commute encourages those who live and work in the GTHA to try travelling at a different time of day, choose a different mode (e.g., carpooling, transit, walking or cycling), or reduce their trips through teleworking.

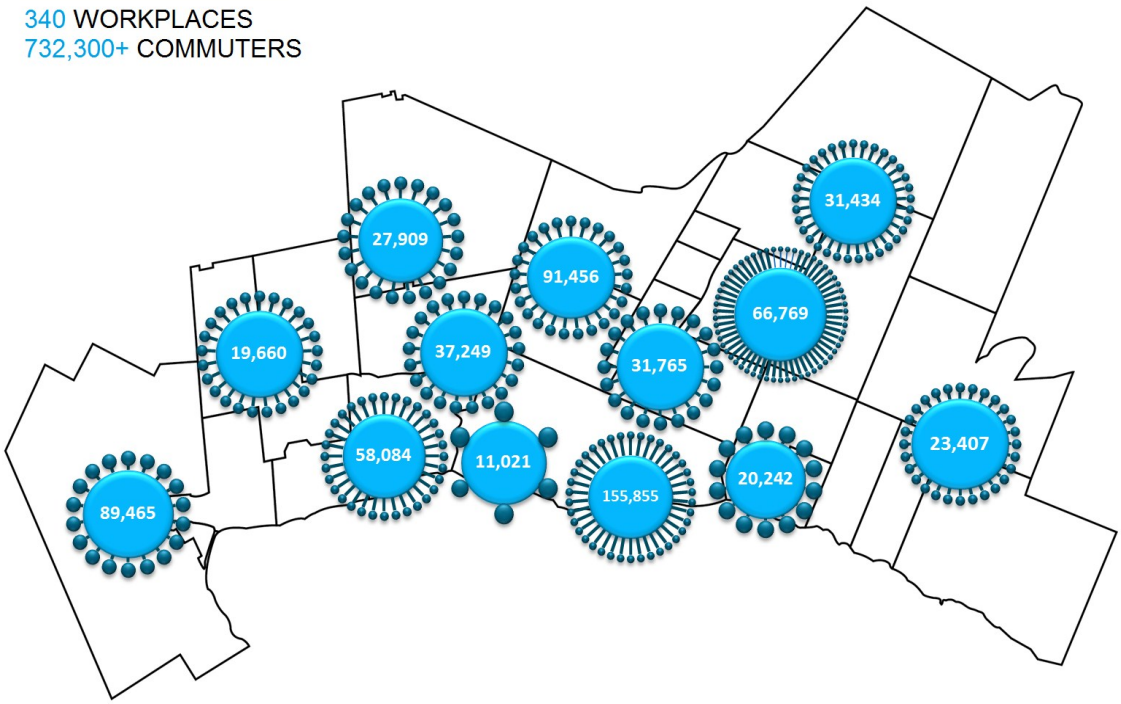
1.2 The Smart Commute workplace program informs employers and commuters about their travel choices, encouraging them to try more efficient options that reduce congestion and help to improve quality of life in the region, while lowering commuting costs.

1.3 The program was formed in 2004 as a partnership of the municipalities and regions of the GTHA, using funding from Transport Canada and private sector partners. Smart Commute became a program of Metrolinx on January 1, 2008. It is funded by the Government of Ontario through Metrolinx, municipalities and the private sector.

1.4 As of September 30th, 2014 there were 13 Smart Commute offices (Transportation Management Associations or TMA) in the region working with employers to develop tailored employee travel programs. TMAs offer a range of commute services to support carpooling, shuttles, alternative work arrangements (telework, compressed work week, flex hours etc.), walking, cycling programs and transit use.

1.5 As of September 30, 2014, 340 workplaces with approximately 732,300 commuters were part of the Smart Commute network.

Figure 1 Transportation Management Association Commuter Populations (Q2 2014-2015)



2 STRATEGIC CASE

Business Strategy

2.1 Smart Commute takes its essential mandate from The Regional Transportation Plan (RTP), *The Big Move,* 2008. The Smart Commute workplace program delivers on three of the nine 'Big Moves' included in the RTP:

'*Big Moves*' included in the RTP, *The Big Move*, 2008

#4 – Create an ambitious transportation demand management program

> Strategy 4.1: "Develop a Transportation Demand Management (TDM) policy and strategy for provincial ministries and agencies such as school boards, hospitals and universities that include actions, timelines and targets."
>
> Strategy 4.3: "Encourage private sector employers to implement TDM programs."

#2 – Enhance and expand active transportation;

> Strategy 2.1: "Plan and implement complete, integrated walking and cycling networks for the GTHA, including Toronto's PATH system, that address key barriers such as bridges over 400-series highways, rail corridors and major rivers, and missing sidewalks on major roads. The cycling networks will bring every GTHA urban resident to within a maximum of one kilometre of a dedicated bicycling facility. This will be supported by a provincial funding commitment increased over time to at least $20 million per year for municipalities to complete the walking and cycling networks."

#3 – Improve the efficiency of the road network

> Strategy 3.5: "Continue to support the Smart Commute Carpool Zone online ride-matching service, and identify and eliminate legal and liability barriers to ride-sharing.
>
> Strategy 3.6: "Amend the Ontario Public Vehicles Act to allow third-parties such as non-governmental organizations to provide vanpools to service major trip generators such as employers, post-secondary institutions and tourism destinations and to augment public transit service in low density or dispersed employment areas."

Problem Identification

2.2 Work-related trips in the GTHA account for more than 40 % of AM peak-period travel.[1] Studies have shown that congestion in the GTHA costs the region over $6 billion in 2008.[2] These costs include higher shipping prices, higher wage salaries required to attract and retain talented employees, increased vehicle operating and maintenance costs, environmental emissions impacts and lost productivity.

2.3 Businesses not in close proximity to higher order transit are more likely to bear the brunt of the economic costs of congestion, as it may restrict access to the region's labour pool and increase goods movement costs. Businesses in these areas are also likely to contribute to region-wide transportation congestion, as they are major peak-period vehicle trip generators, noted in Figure 2.

Impacts of not investing

2.4 By changing whether, when, where and how individuals travel, the transportation system can be more efficiently used. Without investing in improving alternative and more efficient travel options for employees commuting to work, firm attractiveness and productivity could decline, particularly in those areas away from higher order transit.

2.5 Studies have shown that many areas with the greatest capacity to accommodate office growth are not currently in proximity to higher order transit.[3] These locations are mostly found in suburban municipalities outside of the City of Toronto, adjacent to 400 series highways, where road congestion is acute and travel times are increasing.[4]

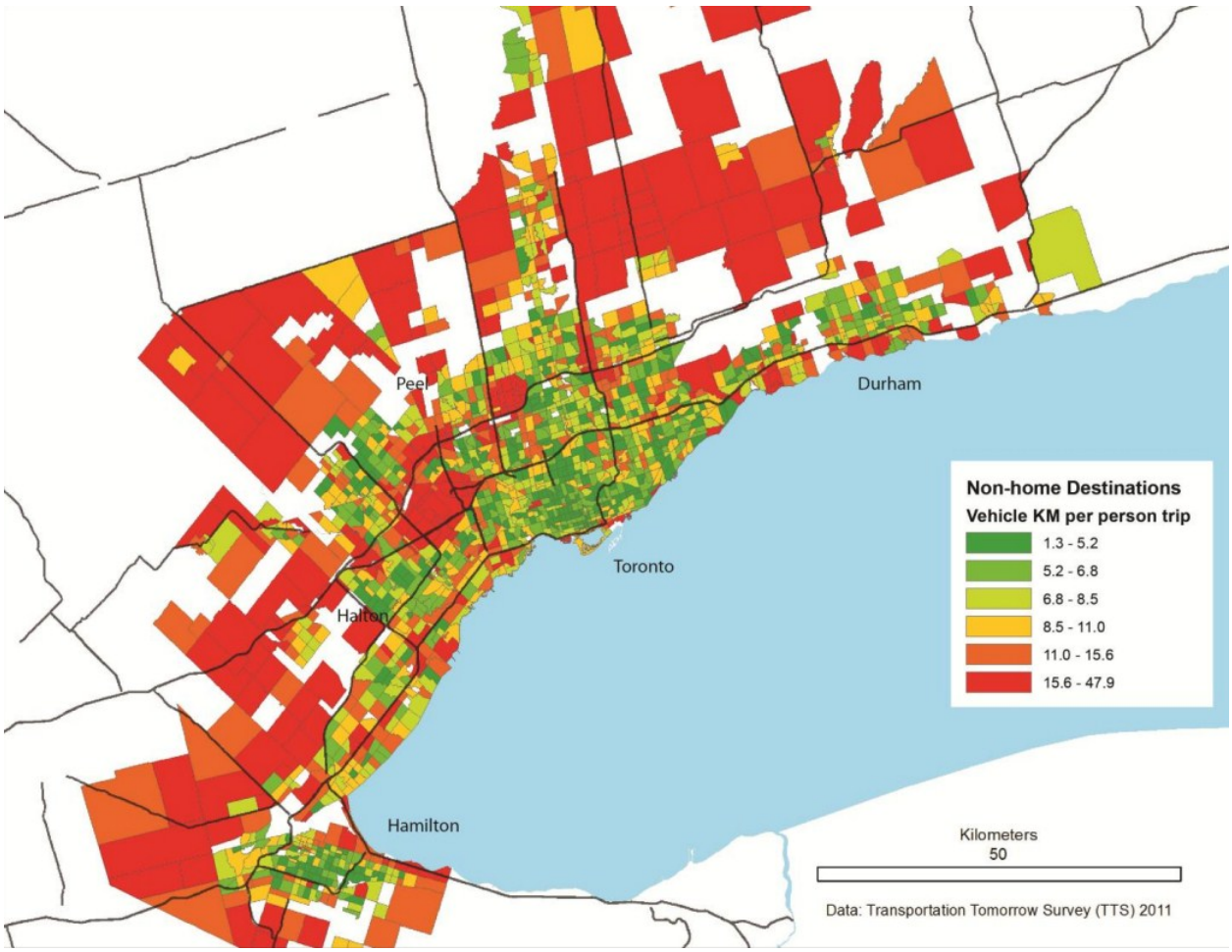
[1] University of Toronto, "Transportation Tomorrow Survey," 2011

[2] HDR Corporation, "Costs of Road Congestion in the Greater Toronto and Hamilton Area: Impact and Cost Benefit Analysis of the Metrolinx Draft Regional Transportation Plan," December 2008. < http://www.metrolinx.com/en/regionalplanning/costsofcongestion/ISP_08-015_Cost_of_Congestion_report_1128081.pdf>
Conference Board of Canada, "Cars, Congestion and Costs: A New Approach to Evaluating Government Infrastructure Investment," July 2013. <http://www.cdhowe.org/pdf/Commentary_385.pdf >

[3] Strategic Regional Research, "A Region in Transition," 2013 <http://www.canurb.com/cui-news/new-report-by-strategic-regional-research-a-region-in-transition.html>

[4] Ministry of Transportation of Ontario, "Travel Time Study", 2012 and 2008 ,<http://www.mto.gov.on.ca/>

Figure 2 Average Vehicle Kilometres Travel added per trip to a non-residential destination[5]



Internal drivers for change

2.6 Without continuing to improve access to employment sites in the GTHA, employment growth could decline and business costs could rise, potentially impacting productivity and reducing business activity.

2.7 Continuing trends showing suburban office growth, increased highway congestion and improved mobile technologies support further investment in TDM workplace programs in the GTHA. Smart Commute, as the most extensive and well-established TDM workplace program in the region, is well-positioned to take advantage of new mobile technologies, a younger workforce less inclined to commute by car, and increased travel options (car sharing, bike sharing, increased suburban transit services, teleworking, etc.).

2.8 As Metrolinx looks to improve station access to GO train stations that either currently or will have two-way all-day frequent GO train service, Smart Commute workplace programs may provide new solutions to the 'first-mile, last-mile' element of transit growth, particularly in suburban environments in outer City of Toronto and other GTHA municipalities.

External drivers for change

2.9 Across the GTHA, external drivers include increased congestion, fluctuating fuel prices and a new generation of residents less dependent on the car.

2.10 Section 1.6.7 of the Ontario Provincial Policy Statement and Section 3.2.2 of the Growth Plan for the Greater Golden Horseshoe encourage efficient, integrated multi-modal transportation systems and the implementation of TDM strategies.

[5] 5 Metrolinx, "Metrolinx Review of Development Charges," informed by data from the 2011 Transportation Tomorrow Survey. <http://www.metrolinx.com/en/regionalplanning/funding/Metrolinx_Review_of_Development_Charges_EN.pdf>

2014 Ontario Provincial Policy Statement

1.6.7.1 *Transportation systems* should be provided which are safe, energy efficient, facilitate the movement of people and goods, and are appropriate to address projected needs.

1.6.7.2 Efficient use shall be made of existing and planned *infrastructure*, including through the use of *transportation demand management* strategies, where feasible.

Growth Plan for the Greater Golden Horseshoe, 2006

Section 3.2.2.1.b: "Offer a balance of transportation choices that reduces the reliance upon any single mode and promotes transit, cycling and walking."

Section 3.2.2.1.d: "Offer multi-modal access to jobs, housing, schools, cultural and recreational opportunities, and goods and services."

Section 3.2.2.3.b: "Support opportunities for multi-modal use where feasible, in particular prioritizing transit and goods movement needs over those of single occupant automobiles."

Section 3.2.3.f: "Increasing the modal share of transit."

Objectives

2.12 Smart Commute's mission is to achieve measurable travel behaviour change through high quality, cost effective transportation demand management solutions.

Measures of Success

2.13 Smart Commute Workplace program performance metrics focus on program reach (size, market penetration, engagement), satisfaction, delivery of infrastructure and services, behaviour change impact and overall cost-effectiveness. Success metrics are measurable, communicable and accountable to other stakeholders through an annual program update.

Scope

2.14 This Business Case Review uses existing data from TMAs around the GTHA to evaluate the economic impacts of the Smart Commute workplace program.

2.15 This Business Case Review focuses on an estimate of financial impacts and an evaluation of the economic benefits of the program. Monetized benefits include vehicle kilometres reduced, auto operating savings, accident reduction benefits, travel time saved network -wide and active transportation health benefits per km. Some program benefits were not monetized in this report, including environmental benefits (emissions reductions, etc.), social and community benefits (accessibility, social inclusion, etc.), business benefits (operational efficiencies, employee benefits, potential real estate savings for employers) and economic development benefits (those benefits experienced by the wider regional economy, including productivity, GDP, income, etc.). Inclusion of these impacts will be investigated as part of future updates to this Business Case Review.

Constraints

2.16 Identified program constraints include inadequate data management applications, limited program awareness beyond the reach of member workplaces and directly related municipal staff, and inconsistent service delivery models between TMA offices. The previous program performance metrics focused on workplace recruitment. These metrics have now been redirected via a new strategy to transition to deeper workplace engagement and improved data acquisition techniques.

Interdependencies

2.17 Smart Commute relies on the engagement of participating employers and employees, 13 TMAs and the support of Metrolinx and the GTHA municipalities.

Stakeholders

2.18 Smart Commute stakeholders include participating employers, employees, municipalities, TMAs, Metrolinx and members of the public.

Options

2.19 The purpose of this Business Case Review is to conduct an ex post evaluation of the value of the existing Smart Commute workplace program.

3 FINANCIAL CASE

Financial Impacts

3.1 Workplace Program Costs: Transportation Management Association (TMA) program costs for 2013-14 were $3.1 million, with approximately 39% of funding from municipalities, 44% from Metrolinx and 18% from other sources including fees paid by employers. Added to this is the Metrolinx central budget of staff time and programming to support workplace program delivery, for a combined annual total of approximately $4 million from all investment sources.

3.2 Sources of Investment: As Table 2 shows, the costs of the Smart Commute workplace program in 2013 totalled $4 million. This cost was born by different parties: municipalities, members (firms), Metrolinx and other funders.

3.3 Scope of investment evaluated: In terms of the financial impact on Metrolinx alone, the annual cost of the Smart Commute workplace program in 2013-14 was $2,298,000. Over a 5.5 elapsed time period, Smart Commute workplace investment contribution from all sources totalled $21,843,000, approximately 50% of which was leveraged from other investment sources. This Business Case Review evaluates the benefits of the Smart Commute workplace program accounting for all joint private and public investment.

Table 2 **Smart Commute program funding (annual, 2013-14 fiscal cycle budget)**

Municipal Funding	Members Fees	Other	Metrolinx (includes operating budget)	Total
$1,224,000	$492,000	$31,000	$2,298,000	$4,045,000

4 ECONOMIC CASE

Economic Impacts

4.1 The economic value of the Smart Commute workplace program stems from the associated benefits from more efficiently moving commuters to and from their workplaces. This value is primarily calculated through a reduction in single occupancy vehicle (SOV) use. Reduction in demand for limited road space that results from lower SOV use improves the functioning of the region's road network, freeing up additional capacity to accommodate regional growth in population and economic activity.

4.2 There are additional economic benefits that result from different aspects of the Smart Commute workplace program. Increases in active transportation (primarily walking or cycling) provide health benefits to commuters, reducing public health care costs and supporting a more productive regional work force. There is strong evidence linking use of active modes with reduced workplace absenteeism.[6]

4.3 Reductions in SOV use also reduce the demand for parking, enabling employers and land owners to make more productive use of their properties. A lower demand for parking can save employers rent and real estate costs. Less parking can also make available additional land for new development, thereby increasing the supply and affordability of work space.

4.4 For some employees, there can be significant cost savings through the use of different modes, potentially providing them with greater disposable income to spend on other goods. In some cases, this may be limited to a slight reduction in marginal travel costs (splitting gas costs with a carpool partner); in other cases, this may facilitate eliminating a household vehicle, saving gas as well as ownership costs like insurance, financing and long-term maintenance/ depreciation costs. The Canadian Automobile Association (CAA) estimated the average annual ownership costs in 2013 to be between $6,500 and $8,900.[7]

4.5 The economic benefits of reduced road congestion, auto vehicle operating cost reductions, safety benefits, and health benefits from increased active transportation use have been calculated and are listed along with their monetization factors in Table 3. Every peak period reduction in 1km of SOV kilometres travelled is estimated to generate 0.01 hours of time savings network-wide.[8] These time savings are monetized using the average value of time of a GTHA resident on a per hour basis.

[6] Government of Western Australia, "TravelSmart Workplace Fact Sheet: Employee Health and Active Travel", October 2014. <http://www.transport.wa.gov.au/mediaFiles/active-transport/AT_TS_FS_EmployeeHealth.pdf>

[7] Canadian Automotive Association, "Driving Costs Beyond the Price Tag: Understanding your Vehicle Expenses 2013 Edition", <http://www.caa.ca/wp-content/uploads/2012/06/CAA_Driving_Cost_English_2013_web.pdf>.

[8] Metrolinx, Economic Analysis and Investment Strategy, approximation based on results from previous Benefits Case Analyses modelling. These reports can be found here http://metrolinx.com/en/regionalplanning/projectevaluation/benefitscases/benefits_case_analyses.aspx

4.6 Note that some of the program benefits have not been monetized in the BCR, including:

a) Operational efficiencies (e.g., elimination of parking shortages, reduced maintenance fees, increased visitor parking);

b) Employee benefits (e.g., increased work-life balance, travel options, staff satisfaction, contribution to recruitment & retention);

c) Business results (e.g., idea generation resulting from cross-department agglomeration of staff in carpools or shuttles);

d) Potential real estate savings for employers (e.g., avoided construction of new parking, reduced land requirements for parking);

e) Lower government capital and maintenance costs for roadways over time;

f) Fewer air pollutants and greenhouse gas emissions;

g) Value of employer-level commuting data that supports development of other transportation projects and programs; and,

h) Increased economic productivity stemming from reductions in regional congestion.

Inclusion of these impacts will be investigated as part of future updates to the Business Case Review.

Table 3 **Summary of Economic Benefits**

Economic Benefits (Annual, 2013-2014)		Monetization Factors (2013$)		Source of Factor
Road congestion reduction	$6.3M	$15.54	per hour saved	Greater Golden Horseshoe Model
Safety benefits	$3.1M	$0.08	per km reduced	Canadian Motor Vehicle Collision Statistics
Vehicle operating cost savings	$24.6M	$0.61	per km reduced	CAA
Active Transportation health benefits	$21.5M	$2.31	per km added	New Zealand Transportation Agency Guidance
TOTAL	$55.5M			

Summary of Findings

4.7 To calculate the effect of the Smart Commute workplace program, the mode split is compared before and after implementation of Smart Commute initiatives at each workplace in the sample. The methodology, including data sources, sample size, sample distribution, sensitivity tests, average trip distance, and mode shift ramp up scenarios used to evaluate the economic impacts is cited in Appendix A.

4.8 The benefits of the Smart Commute program were found to significantly outweigh the costs of the program, even when using conservative assumptions.

4.9 Based on TMA feedback, anecdotal evidence and program observations, the Table 4 mode shift ramp up of scenario 2 or 3 is most likely to occur at a workplace. These scenarios show an approximate 6:1 benefit to cost ratio for the Smart Commute workplace program.

Table 4 **Multiple Account Evaluation (MAE) Summary Table**

Criteria	Business Case
Financial Costs (over 5.5 years)	
Incremental Operating and Maintenance Costs (PV)	$22.5M
Economic Impacts (Annual)	
Road Congestion Reduction Benefits (PV)	$6.3M
Auto User Benefits (PV)	$24.6M
Auto Safety Benefits (PV)	$3.1M
Health Care Cost Savings (Increasing Walking and Cycling)	$21.5M
Net Economic Benefit (over 5.5 years)	
Scenario 1 BCR	2.1:1
Scenario 1 Net Benefits (PV)	$43.3M
Scenario 2 BCR	6.5:1
Scenario 2 Net Benefits (PV)	$123.4M
Scenario 3 BCR	6.6:1
Scenario 3 Net Benefits (PV)	$124.6M
Scenario 4 BCR	11:1
Scenario 4 Net Benefits (PV)	$228.3M

5 DELIVERABILITY AND MANAGEMENT CASE

5.1 The deliverability case provides evidence on the commercial viability of an investment, existing operating mechanisms and the procurement strategy that is used to engage the market. An outline of existing deliverability and management evidence has been provided in this Business Case Review.

Output Based Specification

5.2 The Smart Commute workplace program is currently overseen by Metrolinx's Smart Commute team in the Planning and Policy business unit. Services are delivered by 13 TMA offices throughout the GTHA, as shown in Appendix C The common element that ties the TMA offices together is the financial and program support from the Smart Commute team at Metrolinx. As part of individual funding agreements with Metrolinx, the TMAs are required to perform in accordance with Metrolinx-established performance indicators.

5.3 All 13 TMAs are located within the 6 GTHA regional municipality boundaries of Hamilton, Halton, Peel, York, Durham and Toronto. Within the regional municipalities, TMA service boundaries have been delineated as shown in Appendix C.

5.4 TMA operational models vary within the Smart Commute network. As of 2014, the different types of operation models include Not-for-Profit TMAs (38%), Board of Trade/ Chamber of Commerce TMAs (15%), Non-Fee Municipal TMAs (23%) and For-Fee Municipal TMAs (15%). Six of the TMAs are municipally operated and the remaining seven TMAs are privately operated.

5.5 Similar to TMA operations, there are variations in TMA governance among the Smart Commute network. As of 2014, 38% of TMAs are governed by Boards of Directors, 15% by Boards of Trade/Chambers of Commerce and 38% are governed by municipal governments.

5.6 Eight of 13 TMAs recovered a portion of program delivery costs through private investment in 2014.

Procurement Strategy

5.6 Services are delivered directly through the 13 TMAs located throughout the GTHA. As of 2014, six (46%) of TMAs provide employer Smart Commute services through procured delivery agents. Of the six municipally operated TMA services four deliver the Smart Commute workplace program using in-house staff resources.

6 CONCLUSIONS AND NEXT STEPS

Conclusions

6.1 The Business Case Review demonstrates that the Smart Commute workplace program provides a high benefit to cost ratio through its impact on reducing road congestion, saving personal transportation costs and encouraging active travel in the GTHA. The Smart Commute workplace program was found to reduce SOV travel by approximately 40 million VKT, and increase active transportation use by approximately 9 million Kilometres Travelled per annum. The program generates an estimated $34 million in auto VKT reduction benefits, and an estimated $21 million in active transportation health benefits, calculated to a net economic benefit of over $55 million over the evaluation time period of 5.5 years.

The most likely scenario for mode shift realization demonstrates an approximate 6:1 benefit to cost ratio for the Smart Commute workplace program.

Next Steps

6.2 The Smart Commute workplace program will continue to build on its success by pursuing strategic opportunities including:

a) **Quality data:** Continue to collect quality commuter data with high employee response rates;

b) **Flex Work Programming:** Rollout pilots with member businesses to expand flexible and remote work employer programming across the GTHA;

c) **New Ride-match Markets:** Reach new carpool ride-matching markets with Smart Commute's online tool;

d) **Leverage Change Opportunities:** Support workplaces in preparations for business continuity during the TORONTO 2015 Pan Am/Parapan Am Games and beyond;

e) **Tailored Evaluation:** Evaluate the impacts of specific transportation interventions (carpool programs, teleworking, etc.) and the value of specific TDM interventions that encourage more efficient and sustainable travel patterns;

f) **Segmentation:** Coordinate research for the region to segment and identify workplaces and individuals with greater potential for behaviour change; and

g) **Implement Performance Metrics:** Smart Commute Workplace program performance metrics will focus on program reach (size, market penetration, engagement), satisfaction, delivery of infrastructure and services, behaviour change impact and overall cost-effectiveness.

7 APPENDIX A: ECONOMIC IMPACTS METHODOLOGY

7.1 Data Sources: In order to estimate the economic impact of the Smart Commute workplace program, three data sources were used:

a) The Smart Commute Q2 activity reports for July 1, 2014 to September 30, 2014, submitted by TMAs, and administered by Metrolinx Smart Commute. This dataset houses information on participating employers, including the number of employees, number of employees who responded to baseline and follow-up surveys, and mode splits of employee commutes during both surveys.

b) Data on average distances travelled to work by mode in the GTHA from the 2011 Transportation Tomorrow Survey administered by the University of Toronto.

c) The Smart Commute workplace program budget for 2013-14.

7.2 Method: To calculate the effect of the Smart Commute workplace program, the mode split of employers before and after implementation of Smart Commute initiatives is compared as shown in Table 9.

7.3 Sample Size: In 2014 there were a total of 339 employers actively participating in the Smart Commute program (not including Ontario Public Services offices), with a total of 664,182 employees. Of these, 107 employers completed follow-up surveys, 37 of which completed baseline and follow-up surveys meeting the minimum response rate to establish statistical significance (at a 95% confidence interval and 5% margin of error). Minimum required response rates for Smart Commute's surveys are noted in Appendix B. As noted in Table 5, the 37 employers representing 72,844 employees provided surveys with mode splits both before and after implementation of the program.

7.4 Of the companies that completed both a baseline and a follow-up survey and met minimum response rates, the average employee response rates in the surveys were 25% and 22% for the baseline and follow-up Smart Commute surveys, respectively.

Table 5 **Smart Commute Workplace Survey Data**

	Total Active Employers	Total Active Commuters	Employers w/ Completed Surveys	Employers w/ Completed Surveys (meeting min. RR)	Employee Survey Respondents	Active Commuters at Employers w/ Completed Surveys (meeting min. RR)
Baseline Survey	339	664,182	339	37	18,101	72,844
Follow-up Survey	339	664,182	107		16,056	

7.5 Sample Distribution: Employers used in the sample were selected on the basis of having completed both a baseline survey and a follow up survey, and both surveys meeting the minimum response rate, irrespective of the time either survey was completed. As a result, there was a risk that these employers may not be geographically or proportionately representative of all active employers participating in the Smart Commute workplace program. To explore this risk, employers along with information regarding their firm size were mapped across the GTHA. This mapping exercise demonstrated that sampled employers are well distributed across the region and represent a range of firm sizes and industry sectors.

7.6 Time between surveys: All baseline surveys occurred before employers began actively participating in the Smart Commute workplace program. Follow-up surveys were conducted on average 4.5 years after baseline surveys, with a minimum of 20 months between the baseline and most recent survey, and a maximum of nearly 9 years. A sensitivity test suggests there is no correlation between the time elapsed between initial and follow-up survey completion and the resulting mode shift.

7.7 Average trip distance by destination: To calculate the change in kilometres travelled, data from the 2011 Transportation Tomorrow Survey was used to assign average commute trip distances by mode for each upper/single-tier municipality to the respective TMAs, and their employer survey results. (See Table 6).

7.8 Average trip distance by mode: From the data in Table 6, a calculation can be made to determine the change in the number of kilometres travelled on each mode after the implementation of the Smart Commute workplace program. To estimate total changes in vehicle kilometres driven, changes in car-based modes (e.g. drive and carpool) have been summed (see Table 7).

Change in kilometres travelled after Smart Commute Implementation, by mode, is shown in Table 10.

7.9 Network Representation: Mode shift, change in annual trips and annual vehicle kilometres travelled were calculated from the sample size, were found to be representative of the Smart Commute Gold and Silver designated workplaces, and then extrapolated to the 360,000 employees employed at all Gold and Silver designated workplaces across the Smart Commute Network.

Table 6 **Average 1-Way Commute Distance by TMA and Mode**

Average Commute Distance (Manhattan*) (All trips < 50km)							
		Km by primary mode					
Regional Municipality of Employment	TMA	Transit	Cycle	Drive	Walk	Dropped Off	Other
Durham Region	SCD	11.8	4.7	14.9	1.3	11.3	1.5
Halton Region	SCHAL	13.2	5.0	17.5	1.2	12.9	35.0
City of Hamilton	SCHAM	7.6	4.0	13.2	1.3	9.3	25.0
Peel Region	SCBC	13.5	7.3	17.3	1.2	12.6	6.4
Peel Region	SCM	13.5	7.3	17.3	1.2	12.6	6.4
Peel Region	SCPAA	13.5	7.3	17.3	1.2	12.6	6.4
City of Toronto	SCES	16.8	5.4	17.0	1.4	13.1	11.7
City of Toronto	SCNET	16.8	5.4	17.0	1.4	13.1	11.7
City of Toronto	SCS	16.8	5.4	17.0	1.4	13.1	11.7
City Toronto	SCTC	16.8	5.4	17.0	1.4	13.1	11.7
York Region	SCCY	14.5	5.8	17.0	1.2	12.5	12.1
York Region	SCMRH	14.5	5.8	17.0	1.2	12.5	12.1
York Region	SCNTV	14.5	5.8	17.0	1.2	12.5	12.1

* Manhattan vs Euclidean – Euclidean distance is considered the hypotenuse in a triangle; Manhattan counts distance as if on a grid. Refer to University of Toronto Data Management Group, Transportation Tomorrow Survey data definitions.

7.10 Monetized congestion reduction factor: Mode shift changes were monetized using standard economic factors (see Table 7). To calculate congestion reduction benefits as a result of reduction in vehicle kilometres travelled, a factor of 0.01 hours reduced per vehicle km travelled reduction is used. This figure is derived from previous benefit case analysis work conducted by Metrolinx's Economic Analysis & Investment Strategy team over several major transit infrastructure proposals.

7.11 Monetized health impact factor: Health impacts were calculated based on changes in physical activity as a result of increases in active transportation use (see Table 8). Note that health impacts of changes in vehicle emissions as a result of changes in motor vehicle travel were not calculated for this business case review.

7.12 Length of benefit and cost: Due to the variation in time elapsed between completion of the baseline and follow up survey, the financial cost required to generate 1 year of benefits from the resulting mode share is unknown. This Business Case Review tested 4 possible 'ramp up' assumptions for mode shift, noted in Figure 3. For the purpose of this analysis, the average elapsed time of 5.5 years was used to calculate the cost required to achieve a minimum of 1 year of benefits of the mode shift. This is considered conservative as it is likely that some mode shift happens shortly following the introduction of Smart Commute programming. However, as mode shift uptake rates following the introduction of Smart Commute are not known at this time and are likely to vary. The conservative 5.5 years of costs were used to calculate the benefit cost ratio.

Table 7 **Change in Single Occupancy vehicle kilometres driven**

Mode	Change in Vehicle Kilometres Driven		
Drive Alone			(59,499,000)
Dropped Off			414,000
Carpool / 2 people per car			18,604,000
Total Change in VKT			**(40,480,000)**
Road Decongestion Benefits	0.01	Hours saved/km reduced	4,048,000
Monetization Factors:	**Factor***	**Unit**	**Value**
Value of Time Savings due to Road Decongestion	$15.54	$/hour	$6,290,000
Value of Accident Reduction Benefits	$0.08	$/km reduced	$3,129,000
Value of Auto Operating Cost Savings	$0.61	$/km reduced	$24,626,000
Total Value			**$34,045,000**

Table 8 **Health Benefits resulting from increases in physical activity**

	Change in active transportation
Changing in walking share	0.8%
Annual change in km walked (n=360,000)	1,846,000
Change in cycling share	0.8%
Annual change in km cycled (n=360,000)	7,457,000
AT health benefits per km (2013)	$2.31
Annual health benefits	$21,490,000

* Table 3 notes factor source.

7.13 Estimated realization of mode shift: An example of the uncertainty of the number of years of costs used to calculate the BCR is visualized in Figure 3. A range of benefits is presented in this BCR because the uptake rate in Smart Commute programming and rate at which mode shift occurs at participating employers is currently unknown. If it was to occur largely at the onset of Smart Commute programming, benefits would be greater over time as more people would have shifted modes for a larger portion of the 5.5 years. Alternatively, the evaluation time period could be reduced, thereby reducing the program costs associated with achieving the same amount of benefit. Alternatively, if little mode shift occurs at the introduction of Smart Commute services, a longer time period and therefore greater associated costs is more appropriate for inclusion in the BCR .

This Business Case Review tested 4 possible 'ramp up' assumptions for mode shift:

a) Scenario Assumption 1: Benefits realized during final year of the evaluation time period. This assumes it takes a significant amount of time for Smart Commute programming to take effect, and can be considered the most conservative ramp up assumption. To be conservative, this BCR assumes no mode shift or associated benefits occurs until immediately before the follow-up survey. Subsequently, that mode shift is held constant for the final year.

This scenario is highly unlikely as sensitivity tests suggest there is no correlation between the time elapsed between initial and follow-up survey completion and the resulting mode shift.

b) Scenario Assumption 2: Following an S-Curve, where the ramp up is initially slow with little mode shift early on; half way through the period, the majority of the final mode shift has occurred; in the final year, nearly all mode shift has already occurred. All mode shift has occurred at 4.5 years, and is held constant for 1 year.

An example of this scenario could occur in a workplace where the program attracts early adopters who can more easily make commute changes. As more employees become aware, the majority of employees who are able to shift modes do so. Finally, as the Smart Commute culture becomes embedded in the workplace, a few more employees shift their travel modes.

c) Scenario Assumption 2: Following a linear curve, where the ramp up grows at a constant rate over 4.5 years and then is held constant for 1 year.

An example of this scenario could occur in a workplace where program adoption grows over time, as more employees become aware of the travel options and the Smart Commute culture matures at a steady pace in the workplace.

d) Scenario Assumption 4: Following the launch of a program at workplace, all mode shift occurs immediately and is held constant for the following 5.5 years.

An example of this scenario could occur in a workplace where a specific change opportunity exists, such as the workplace is moving to a new location or a parking lot is closing. In this scenario, all employees switch modes immediately.

Figure 3 **'Ramp up' Assumptions for Workplace Mode Shift**

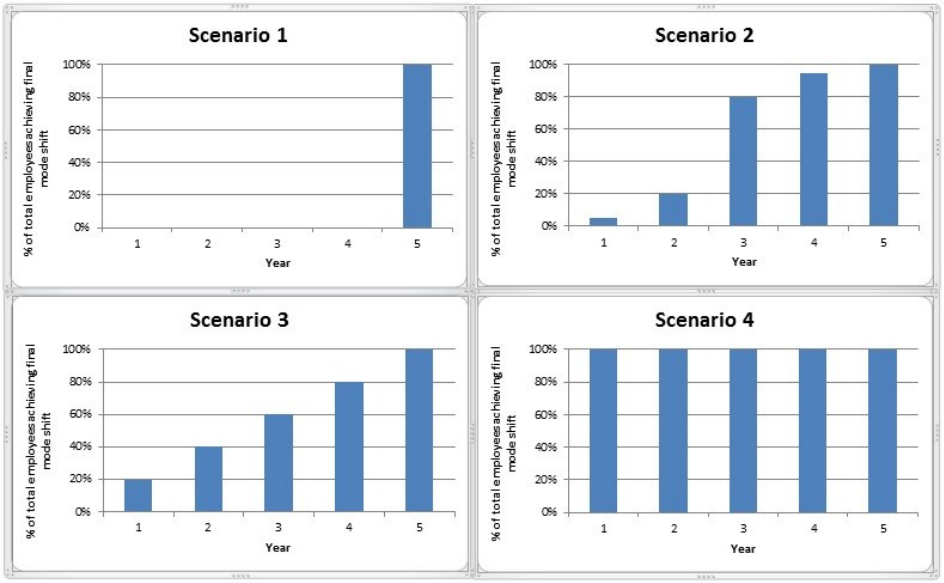


Table 9 **Mode Splits for Active Smart Commute Employers (Source: Smart Commute Workplace Surveys, 2014)**

	Walk	Bike	Transit	Carpool	Dropped off	Telework	Other	Drive Alone
Baseline Survey	3.5%	2.6%	19.0%	6.3%	2.6%	0.4%	3.0%	62.6%
Follow-up Survey	4.3%	3.5%	No change	7.6%	No change	No change	1.7%	60.9%
Change in Mode Share	0.8%	0.8%	No Change	1.3%	No Change	No Change	-1.3%	-1.7%

Table 10 **Change in kilometres travelled after Smart Commute Implementation, by Mode**

	Walk	Bike	Transit	Carpool	Dropped off	Telework	Other	Drive Alone
Change in Mode Share	0.8%	0.8%	No Change	1.3%	No Change	No Change	-1.3%	-1.7%
Annual One-Way Trip Change (annual *500)	284,000	300,000,	-	448,000	-	-	-469,000	-717,000
Annual Kilometres Travelled Changed	373,000	1,508,000	-	3,762,000	-	-	-6,171,000	-12,030,000
Annual Kilometres Travelled Changed (Scaled to Total)	**1,846,000**	**7,457,000**	**-**	**18,604,000**	**-**	**-**	**-30,519,000**	**-59,499,000**

Note: 'Other' was not calculated as there was no way of monetizing benefits associated with an increase or reduction of this category.

Note: 'No Change' denotes no statistically significant change in mode share

8 APPENDIX B: SMART COMMUTE WORKPLACE SURVEY REQUIRED RESPONSE RATES

Employer Size	Minimum Sample Size	Minimum Response Rate
40	16	40%
50	20	40%
55	22	40%
60	24	40%
65	26	40%
70	28	40%
75	30	40%
90	36	40%
94	38	40%
97	39	40%
97	39	40%
100	40	40%
115	46	40%
120	48	40%
125	50	40%
139	56	40%
140	56	40%
150	60	40%
165	66	40%
175	70	40%
180	72	40%
200	80	40%
208	83	40%
218	87	40%
220	88	40%
220	88	40%
220	88	40%
225	90	40%
227	91	40%
229	92	40%
230	92	40%
231	92	40%
235	94	40%
240	96	40%
250	100	40%
250	100	40%
250	100	40%
250	100	40%
250	100	40%
255	102	40%
260	104	40%
260	104	40%
270	108	40%
280	112	40%
290	116	40%
300	120	40%
312	125	40%
316	126	40%
316	126	40%
319	128	40%
320	128	40%
325	130	40%
335	134	40%
340	136	40%
345	138	40%
350	140	40%
350	140	40%
370	148	40%
375	150	40%
400	160	40%
411	164	40%
445	178	40%
450	180	40%
459	184	40%
480	192	40%
500	200	40%
519	221	43%
529	223	42%
600	234	39%
621	237	38%
641	240	37%
657	242	37%
669	244	36%
686	246	36%
700	248	35%
740	253	34%
753	254	34%
797	259	33%
800	260	32%
807	260	32%
856	265	31%
862	266	31%
880	267	30%
890	268	30%
900	269	30%
940	273	29%
1000	278	28%
1034	280	27%
1050	281	27%
1071	283	26%
1100	285	26%
1100	285	26%
1119	286	26%
1122	286	26%
1135	287	25%
1150	288	25%
1180	290	25%
1200	291	24%
1212	292	24%
1216	292	24%
1246	294	24%
1300	297	23%
1313	297	23%
1372	300	22%
1400	301	22%
1500	306	20%
1532	307	20%
1600	310	19%
1600	310	19%
1627	311	19%
1640	311	19%
1752	315	18%
1774	316	18%
1800	317	18%
2000	322	16%
2100	325	15%
2134	326	15%
2291	329	14%
2400	331	14%
2461	332	14%
2462	332	13%
2500	333	13%
2700	336	12%
2783	338	12%
2849	339	12%
2900	339	12%
2920	339	12%
3000	341	11%
3050	341	11%
3070	341	11%
3100	342	11%
3560	347	10%
3765	349	9%
3800	349	9%
4000	350	9%
4200	352	8%
4500	354	8%
5000	357	7%
5192	358	7%
5500	359	7%
6000	361	6%
6328	362	6%
7000	364	5%
7400	365	5%
7742	366	5%
8476	424	5%
8500	425	5%
10000	500	5%
11000	550	5%
11200	560	5%
11500	575	5%
23600	1180	5%
26900	1345	5%
31720	1586	5%
60000	3000	5%

9 APPENDIX C: TMA DELIVERY AND OPERATIONS AS OF 2014

Figure 4 **Transportation Management Associations (TMA) Governance – 6 GTHA regions**

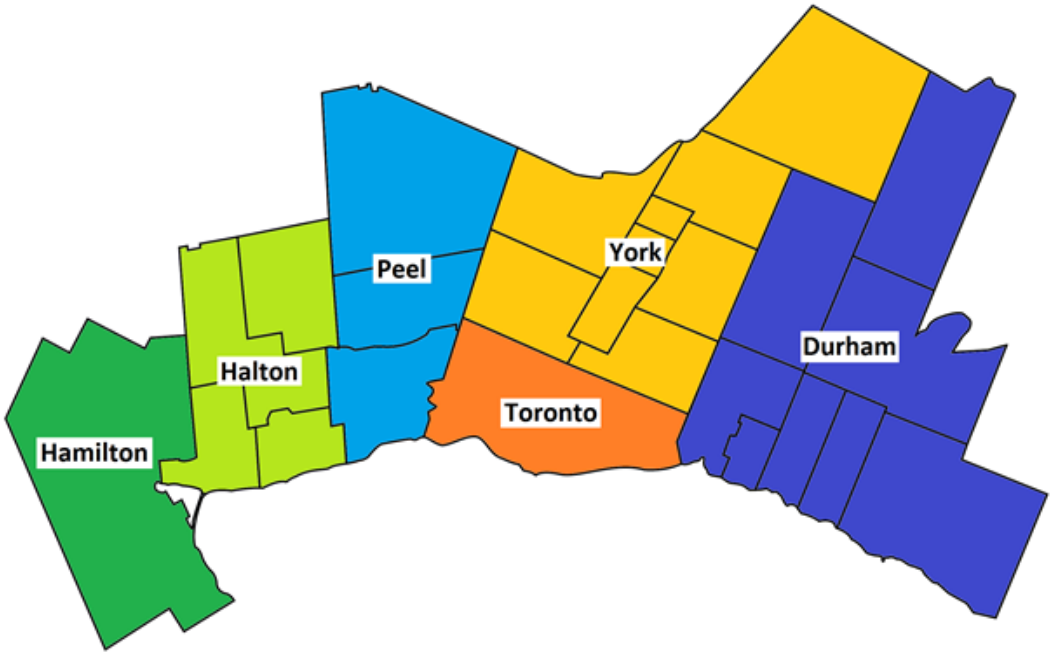


Figure 5 **Boundaries of 13 TMAs**

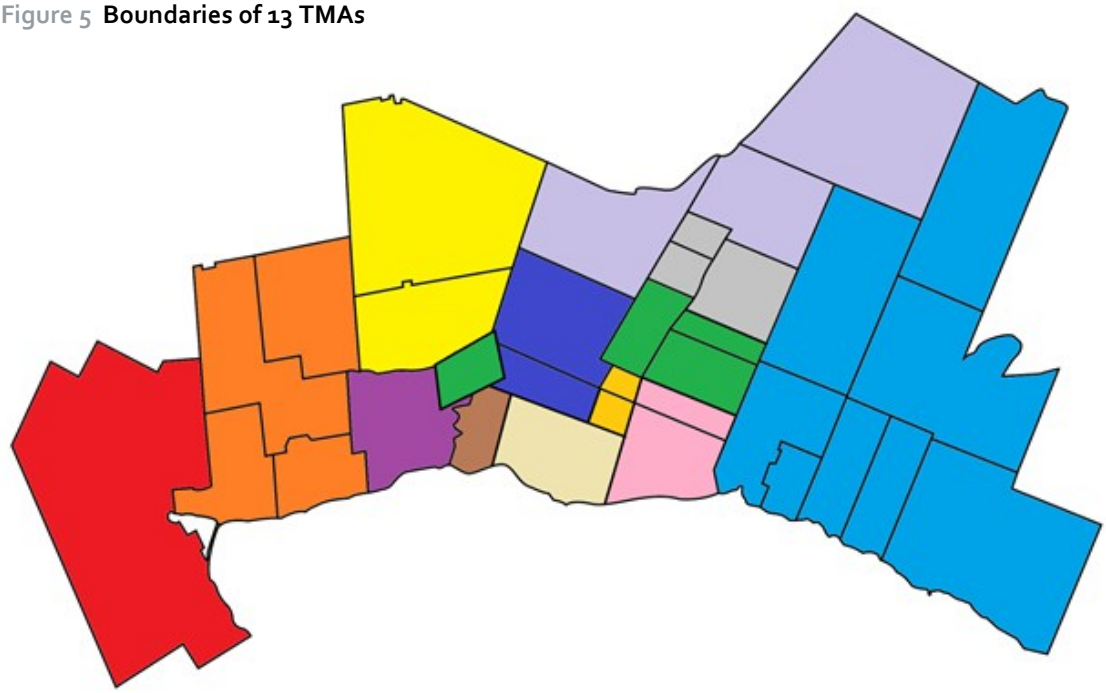


Figure 6 **Smart Commute's 13 TMA Names**

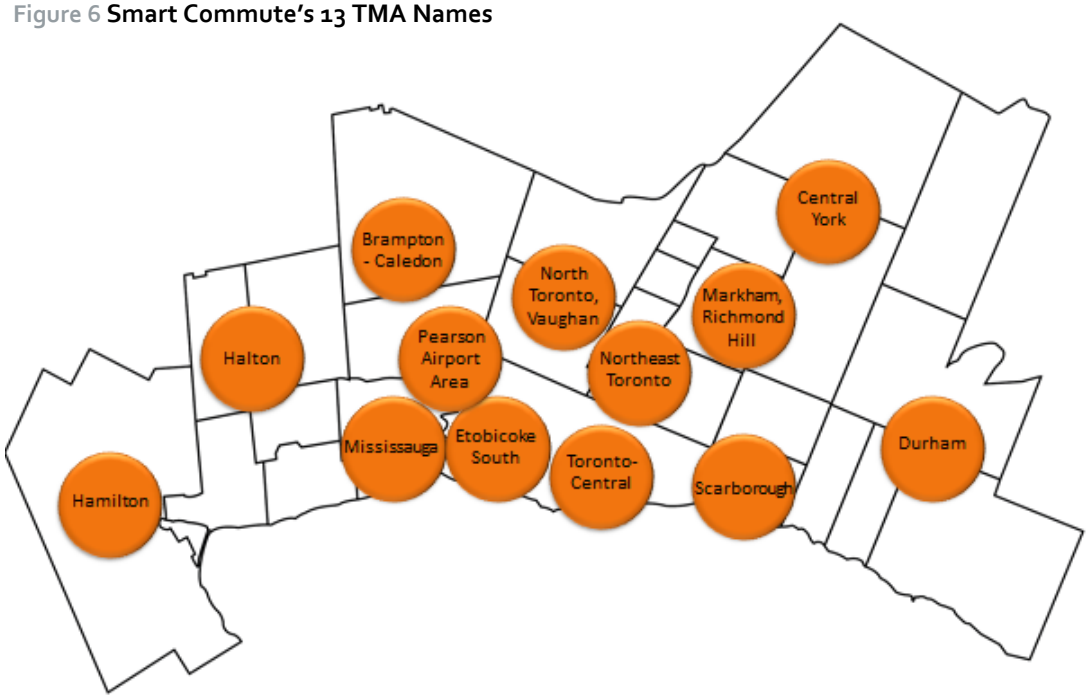


Figure 7 **TMA Relationship & Governance**

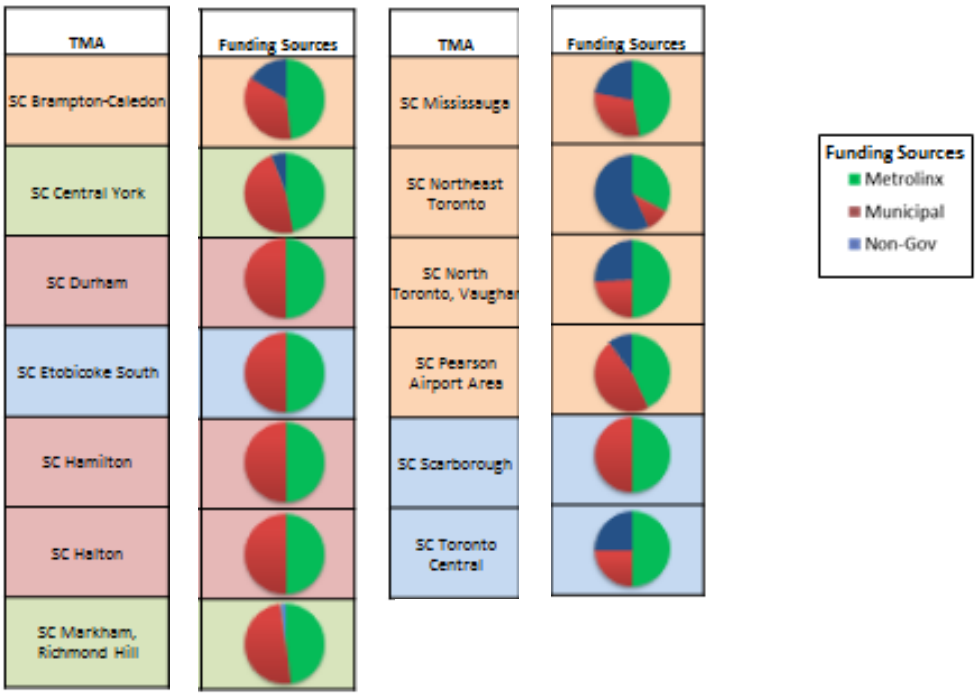
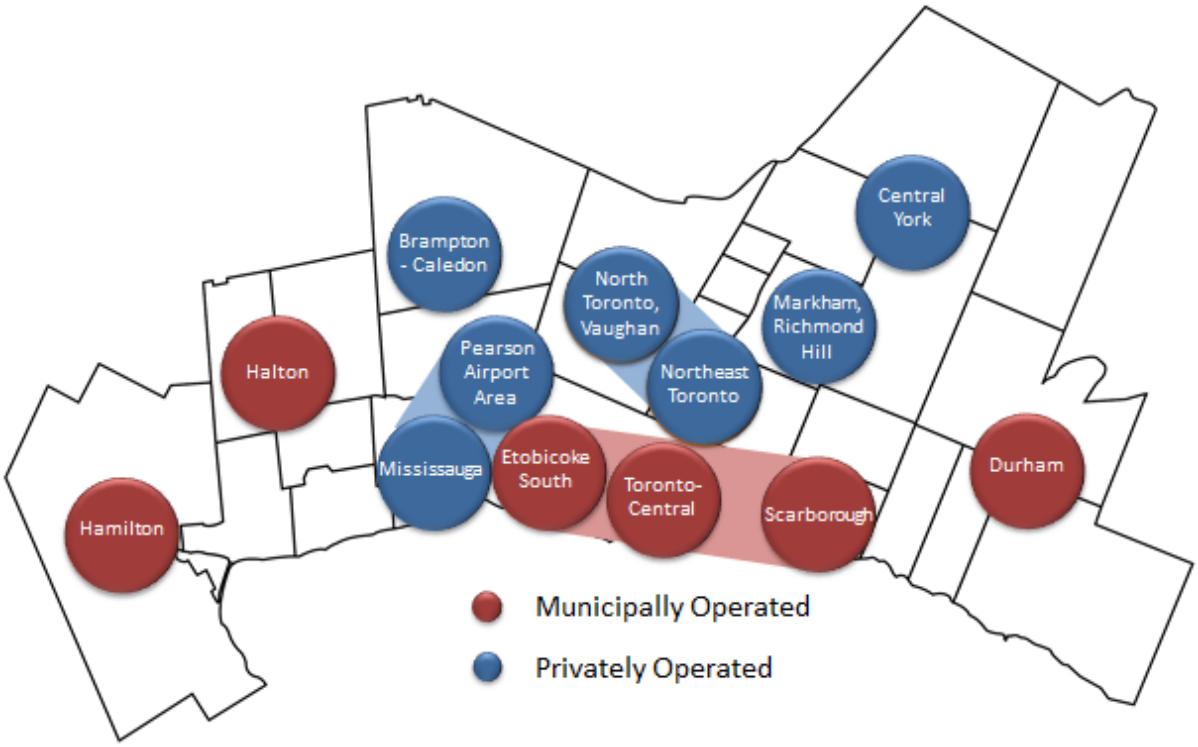


Figure 8 **6 TMAs Municipally Operated, 7 TMAs Privately Operated**



10 APPENDIX D: THE METROLINX BUSINESS CASE FRAMEWORK

10.1 A business case is a generic term for a collection of evidence that, when assembled in a logical and coherent way, explains the contribution of an investment to organisational objectives. In this case, the value of an existing program is under review, and therefore this work is described as a "Business Case Review". The key difference between a "Business Case" and a "Business Case Review" is that of options analysis. The "Business Case" process involves assessing, selecting and optimizing preferred options, while the "Business Case Review" simply reviews the performance of a single chosen/ implemented option.

10.2 Business Cases and Business Case Reviews include both quantitative and qualitative information that collectively indicates the (expected) performance of an investment.

10.3 Metrolinx Business Cases and Business Case Reviews are structured to assess the following areas of interest to decision makers:

a) is the investment supported by a robust explanation of how it fits with wider public policy, planning and strategic objectives?;

b) is the investment or program financially affordable?; and

c) does the investment demonstrate value for money measured in economic terms?; and

d) can the investment or program be delivered and operated successfully?

10.4 A Business Case (or Business Case Review) puts an investment decision into a strategic context and provides the information necessary to either:

a) For a Business Case: make an informed decision about whether to proceed with the investment and in what form.

b) For a Business Case Review: understand the basis against which continued or accelerated funding of the project or program will be justified, compared and evaluated.

10.5 This Smart Commute Business Case Review is an ex post evaluation of the impacts of the existing Smart Commute workplace Program. Separately, a benefit-cost analysis was conducted by the Metrolinx Smart Commute team, in collaboration with community and government partners, to evaluate the School Travel Planning process in Ontario. This was published in 2013, and demonstrated a 2:1 return on investment.[9]

10.6 This document has been organized using the Metrolinx Business Case structure and headings.

10.7 The purpose of this report is to:

a) assemble the existing evidence into the Metrolinx Business Case 'Three Case Structure'

b) identify initial cost, revenue and benefit estimates

c) identify gaps in the data and knowledge base to be refined in future iterations of the Business Case Review in order to help to contribute to ongoing investment decision-making.

[9] Metrolinx, Green Communities Canada, and the University of Toronto, "The Costs and Benefits of School Travel Planning Projects in Ontario, Canada", January 2014. <http://metrolinx.com/en/projectsandprograms/schooltravel/Costs_and_Benefits_of_School_Travel_Planning_Projects_EN.pdf>

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