
Office of the President and Chief Executive Officer

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Date: October 13, 2009

Memorandum to: Board of Directors

From: J. Robert S. Prichard
President and Chief Executive Officer

Re: **Electrification Study**

This matter will be dealt with in Public Session.

Attached is a memorandum from Gary McNeil and Leslie Woo recommending endorsement of the proposed scope of work for an Electrification Study. That memorandum in turn attaches the detailed scope of work.

We have developed this proposed scope of work with the assistance of the Community Advisory Committee (CAC) led by Dan Burns and Pamela Robinson. This has been an excellent process.

At the Board meeting, Gary and Leslie will introduce the matter and then invite Dan to speak to the CAC's work and recommendations. We then invite questions and discussion. At the end of the discussion, we seek the Board's endorsement of our proceeding with an RFP consistent with the recommended scope of work.

The proposed scope of work is being posted publicly simultaneously with distribution of this material to the Board. We will report at the Board meeting on any comments received following the public posting.

To: Board of Directors

From: Gary McNeil
Managing Director, GO Transit

Leslie Woo
Vice President, Policy and Planning

Date: October 20th 2009

Re: GO Rail System Electrification Study

RECOMMENDATION

RESOLVED

THAT the recommendations of the Community Advisory Committee (CAC) (see Appendix A) be part of the GO System Electrification Study Terms of Reference;

AND THAT a Request for Proposals be issued to retain a Consultant to undertake the GO System Electrification Study;

AND THAT the Metrolinx Board formally extend its appreciation to the CAC members for their important contribution to this work.

1.0 Background:

On May 26th 2009, Metrolinx announced that it would be undertaking a study on the feasibility of electrification of the GO rail system to be completed by December 2010.

On July 13th, 2009, the Metrolinx Board approved By-Law #3 establishing the Community Advisory Committee for developing the Terms of Reference for the GO Electrification Study and appointed the members of the CAC. The list of CAC members is found in Appendix B.

Metrolinx's 25 year long-term regional transportation plan, entitled The Big Move, sets out a fast, frequent and expanded regional rapid transit network as a principal element of the plan. The plan includes the establishment of Express Rail and Regional Rail service at speeds and frequencies that could be enhanced by system electrification. One of the goals of The Big Move is to increase transportation choices so as to increase the transit mode share in the GTHA.

GO Transit has been anticipating the advent of electrification in its rehabilitation and expansion investments almost since inception, through its protection of vertical clearances for an overhead catenary system. A series of prior studies have been undertaken to explore the possibility of electrification of aspects of the GO system, primarily focused on the Lakeshore corridor.

More recently, with the undertaking of the Environmental Assessment for the Union-Pearson Air Rail Link and the Georgetown South Corridor, the issue of the applicability and feasibility of electrification has received heightened public interest.

Given the order of magnitude that an investment in electrification would represent, it is prudent to ensure that a comprehensive, system-wide analysis that can facilitate rational evidence-based decision-making is

in place. In recognition of the significance of this Study to the future of the GO rail system, Metrolinx has assigned a dedicated Project Director for the duration of the study.

This Study is unique as it will examine the entire GO rail system and assess the impact of different technologies. The expectation is that the Study is to be significantly more comprehensive and detailed than a traditional cost benefit analysis. The Study shall consider the economic, social, environmental, health, and technological factors for the conventional and future diesel and electric technologies under study.

In addition to the study comprehensiveness, Metrolinx is setting a higher bar with respect to the inclusiveness of stakeholder and external expertise early on in the process and the timeliness of the study completion.

The Study is comprised of two stages:

Stage One: June 2009 to Oct 2009 Study Terms of Reference (ToR) development

Establish Community Advisory Committee

Complete Study ToR

Stage Two: Oct 2009 to Dec 2010 Study Period

Stage One

Stage One is now complete. The CAC that was created to assist with the preparation of the Study Terms of Reference (ToR) has completed its' work. Their advice is attached as Appendix A.

The CAC began meeting in July 2009 and they met every two weeks, concluding their deliberations on October 13th. The CAC was assisted throughout the process by Metrolinx staff and external consulting firm Deloitte. The members of the Committee are listed in Appendix B.

This approach of developing the Terms of Reference with the input from a diverse constituency is unique and the result is a much boarder and more comprehensive study scope.

In addition to the deliberations of the CAC, public consultation was conducted, through an online survey. The consultation provided input and affirmed central streams of study identified by the CAC. A stakeholder workshop was also held to provide further input from a range of interests including: community groups, academia, environmental groups and local electricity distribution companies. Metrolinx, assisted by Deloitte, provided the contextual information on the development of the Terms of Reference and attendees were given time to provide commentary and input on each area of study. This led to a number of suggestions that were provided to the CAC for their consideration. The final recommendations of the CAC received the unanimous support of all committee members.

Stage Two

Once the Study ToR has been approved by the Metrolinx Board, an RFP will be released to retain a consultant to undertake the study. The scope of work recommended by the CAC will compare diesel technology, electric technology and probable alternative technologies. The selected Consultant will work with Metrolinx to refine and further define the technologies to be analyzed and assessed in the Study. The Analytical Elements of the Study will include:

- Technologies, Capacities and Transit Service Impacts;
- Environmental and Health Impacts;

- Community and Land Use Impacts;
- Economic Impacts; and
- System Cost, Funding and Financing.

The Study will include a robust risk assessment related to each technology under study. The Consultant will also be required to complete three implementation scenarios to include the timing, cost, infrastructure requirements, required approvals, and additional studies that would need to be conducted.

The confirmation of a successful consulting team is targeted for November 2009 and the Study is targeted for a December 2010 completion. Upon completion of the Study, the findings will be presented to the Metrolinx Board for consideration.

Public / Stakeholder Consultations

An appropriate public and stakeholder communication and consultation plan for the Study is included in the recommended scope of work and it will be included as part of the Study ToR.

2.0 Recommendations

Metrolinx staff are in agreement with the CAC recommendations and support the integration of these recommendations with the full set of tender documents for the proposed Request for Proposals.

3.0 Financial Implications:

The costs of undertaking the study is included in the 2010/11 budget.

4.0 Interrelationships

Metrolinx has undertaken a Benefits Case Analysis (BCA) for one of the top 15 priority projects, the Express Rail on the Lakeshore line from Hamilton to Oshawa. This analysis will be an additional input to the Electrification Study.

GO is currently in the process of engaging a consultant to determine options to double Union Station's capacity over the next 10 years. A second related study is also being commissioned to address the need to quadruple capacity at Union Station by 2031 as identified in The Big Move.

Metrolinx continues to enhance its modeling and forecasting capabilities. This ongoing work will allow Metrolinx to provide more detailed ridership forecasts for the electrification study. It will build on ridership forecasts and assumptions from The Big Move.

5.0 Communications:

Pending Board approval of staff recommendations, a press release announcing the upcoming Request for Proposal will be posted on the Metrolinx Electrification Study micro-site and the GO Transit Tender site. Media availability of the CAC Chair and key Metrolinx staff will be organized for the day of the Board meeting.

CONCLUSIONS AND NEXT STEPS

The GO System Electrification Study is a critical next step in the implementation of the Metrolinx regional transportation plan. It is a timely and important step in advancing the expansion of the GTHA regional transit network. In the continuing Metrolinx tradition that values community and stakeholder input, the Community Advisory Committee enhanced and enriched the quality of the work.

Pending approval from the Board, the Metrolinx staff will incorporate the recommended Scope of Work into the Terms of Reference for the Electrification Study.

Staff will report back in December 2009 on the outcome of the Request for Proposals.

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APPENDIX A

Recommendations of the Community Advisory Committee for the GO System Electrification Terms of Reference

Recommendations of the Community Advisory Committee for the GO System Electrification Study Terms of Reference

October 14, 2009

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1 Study Overview

1.1 Purpose of the Study

The Greater Toronto and Hamilton Area (GTHA) is in the midst of a transportation transformation as a result of a renewed public commitment to invest and grow regional transit. The Big Move - a compelling integrated, multi-modal vision for regional transportation adopted by Metrolinx in 2008, will strengthen the economic, social and environmental sustainability of the Greater Toronto and Hamilton Area and profoundly change how people and goods are transported within the region¹. GO, a division of Metrolinx and the GTHA's principal inter-regional transit service, will play a decisive part in this transformation. The means by which GO's rail system grows and develops is therefore essential to realizing the ambitious vision of The Big Move and creating a GTHA that is shaped and supported by a world-leading regional transportation network.

Metrolinx (formerly the Greater Toronto Transportation Authority), the agency responsible for piloting this transformation, is commissioning this Study to examine how GO can best accomplish the goals of The Big Move over the next 25 years. The overriding purpose of the Study is to provide Metrolinx's Board of Directors with the information necessary to make an informed decision on whether to meet future service requirements by using conventional diesel powered trains or by utilizing trains powered by electricity, or alternate means. The Study will consider alternate technologies that may become viable in the short to medium term to inform the Board of Directors decision with regard to available technology options. The Study is to assess and identify an optimal technology, or combination of technologies, that would be able to attain the system performance goals identified in The Big Move and further enhance the quality, reliability and accessibility and environmental sustainability of commuter rail services in the GTHA.

The decision will have broad implications across the GTHA and presents a unique opportunity to take full advantage of the most advanced and state-of-the-art technologies and systems in addressing future requirements and provides an opportunity to be innovative and visionary in the development of alternative rail system concepts for GO. The Study is to be concluded by December, 2010.

1.2 Study Outputs

It should be noted that it is Metrolinx's expectation that the Study is to be significantly more comprehensive and detailed than a traditional cost-benefit analysis. The Study shall consider the economic, social, environmental, health, and technological factors for the conventional and future diesel and electric technologies under study. These economic, social, environmental, health and technological costs and benefits shall be those prescribed by Metrolinx in the Scope of Work and those identified and proposed by the Consultant based on their knowledge and experience with rail technologies. The Consultant will be expected to assemble a team capable of providing the required qualitative and quantitative analysis to produce the outputs listed above and to provide the analysis outlined in the Scope of Work.

This Study will be broader and more comprehensive in the range and diversity of its areas of study and inquiry than studies conducted in the past on GO's commuter rail system, which were focused primarily on the Lakeshore rail corridor. Metrolinx's decision to undertake a Study of the scale and scope contemplated in these Terms of Reference is based on the recognition that citizens want future transportation infrastructure decisions to achieve an optimal balance of economic, social, environmental, health and technological considerations.

¹ See Section 2.3.2 for more information on The Big Move

The outputs of the Study will be:

1. A comprehensive and detailed analysis of the net costs and benefits for each technology related to its:
 - a) Capacity and Service Impacts, including reliability of service;
 - b) Environmental and Health Impacts;
 - c) Community and Land Use Impacts;
 - d) Economic Impacts; and
 - e) System Costs, Funding, Financing and Delivery.
2. An overall cost-benefit analysis (including Union Station), on a system-wide and corridor-by-corridor basis;
3. An implementation strategy for the selected scenarios outlined by the Consultant;
4. A net cost benefit comparison of the major implementation scenarios;
5. A list of key findings and conclusions, including cost to benefit ratios for the technology and implementation options, within the context of The Big Move;
6. Summary of stakeholder engagement and consultations; and
7. A series of technical appendices, on a system-wide and corridor-by-corridor basis, for each technology related to its:
 - a) Capacity and Service Impacts, including service reliability;
 - b) Environmental and Health Impacts;
 - c) Community and Land Use Impacts;
 - d) Economic Impacts; and
 - e) System Costs, Funding, Financing and Delivery.

The output categories of the Study are to be developed for inclusion into Metrolinx's Benefits Case Analysis (BCA).

1.3 Relevant Previous Studies

The use of alternative technologies, particularly electric technologies, to power locomotives has been under consideration by GO for many years. The earliest studies date back to the 1970s. Since then numerous studies, primarily focused on the Lakeshore line, have been prepared for GO to better understand the state of technology and its potential application to the GO's commuter rail system. The most recent technical study was done to analyse the electrification of the Lakeshore line. This provided the technical input for the development of the Lakeshore Electrification Benefits Case². These studies, however, did not take into account the scope of this Study and did not provide for impacts on Union Station, joint use corridors, etc.

The technical studies were prepared as background information for GO and the recommendations and costs identified in the studies were established in the context of the economic climate, technology and public priorities relevant at the time the studies were commissioned.

1.4 Development of the Current Study and Principles

This Study is different from past studies commissioned by GO and Metrolinx in that its scope is system-wide. GO and Metrolinx have undertaken a number of electrification studies in the past; however, these studies did not encompass the full scope of this Study and did not assess impacts on a system wide basis. A Study on this scale has never been undertaken.

² This and all previous studies are available at http://www.metrolinx.com/electrification/past_studies.aspx

This Study will require an assessment of the net costs and benefits of the alternative technologies and will extend beyond the traditional cost-benefit analysis to include a comprehensive and detailed assessment of the economic, social, environmental, health and technological impacts of conventional and future diesel and electric technologies.

In setting the Terms of Reference for this Study, Metrolinx was assisted by a Community Advisory Committee (CAC) comprised of individuals with a diverse range of interests and backgrounds, committed to the future of regional transit³. It is Metrolinx's expectation that the inclusive and consultative approach used in the development of these Terms of Reference will continue into the development of the Study and that the Consultant will conduct the Study in a manner that is:

Objective: The Study will be conducted in a fair, independent, and objective manner. It will examine and report on all relevant issues without bias and will be reflective of the opportunities and constraints of the GO system.

Comprehensive: The Study will explore economic, social, environmental, health, and technological considerations relevant to assisting Metrolinx management and Board in making a recommendation to government on the optimal technology(ies) for GO commuter rail system.

Inclusive: The Study will be conducted in an inclusive manner, ensuring that a diverse and relevant cross section of subject matter and stakeholder input are considered in the development of the findings and conclusions of the Study.

Evidence Based: The findings and conclusions of the Study will be the result of the use of proven leading edge study approaches and methodologies that are supported by robust, realistic and defensible assumptions and data, and be predicated on the best available research.

About the Community Advisory Committee

On July 13, 2009, the Metrolinx Board of Directors established a Community Advisory Committee to work with Metrolinx to study the electrification of the entire GO rail system. The mandate of the CAC was to work with the Metrolinx Board to define the scope of the study and make recommendations on the terms of reference to the Board. After receiving the advice of the CAC, the Board of Metrolinx set the terms of reference for the Study. The 16-member Community Advisory Committee was comprised of GO system users and community members with expertise in transportation, environment, engineering, health, urban planning, policy analysis, alternative energy, community leadership, business, finance, and law.

1.5 Indicative Study Timelines

The timeline over which the Study is to be conducted is outlined below:

Table 1: Study timeline

Event	Anticipated completion date
Expected RFP Close	November 2009
Expected award	December 2009
Project completion	December 2010

1.6 Metrolinx's Project Management Structure for the Study

Metrolinx has provided a dedicated Project Director who will be the Consultant's principal point of contact to Metrolinx and the government. The Project Director will coordinate the relationship among Metrolinx, the Consultant, and other consultants that are currently/will be engaged by Metrolinx. GO is currently in the process of engaging a consultant to determine options available to double Union Station's capacity

³ A list of CAC members is available at <http://www.metrolinx.com/electrification/advisory.aspx#CAC>

over the next 10 years. A second related study is also being commissioned to address the need to quadruple capacity at Union Station by 2031 as identified in The Big Move.

The Project Director will also assist in the establishment of a Technical Working Group, who will also assist with the work being carried out in the Study.

Metrolinx will provide the Consultant with travel demand forecasts and ridership numbers - based on the Regional Transportation Plan developed by Metrolinx – to be used in the Study. The Consultant may refine these forecasts as necessary to incorporate the additional considerations of the Study.

2 Context and Background

As noted in the previous section, Metrolinx, through these Terms of Reference, is seeking the services of a highly qualified, experienced and accomplished multi-disciplinary, world-class Consultant (an individual firm or a consortium of firms/individuals) to conduct this comprehensive and detailed cost-benefit analysis with full consideration of the economic, social, environmental and health costs and benefits on the immediate, local and broader context of regional commuter transit in the GTHA. This section presents the context and relevant background related to the Study.

2.1 The Greater Toronto and Hamilton Area

The GTHA, located in the southern portion of the Province of Ontario, is Canada's largest urban region. It comprises two single-tier municipalities (Toronto and Hamilton) and four regional municipalities (Durham, Halton, Peel and York) and their 24 lower-tier municipalities.

The GTHA is one of the fastest growing urban regions in North America. The GTHA's population is expected to grow from 5.8 million to 8.6 million by 2031. The drivers for this growth are primarily international immigration in addition to the resettlement of people and businesses from other parts of Canada.

In terms of commuter rail transit service, the GTHA is currently served by a network of regional transportation corridors that were mostly developed several decades ago. Regional rapid transit is limited to the GO commuter rail system and the Toronto subway system (TTC), with a historical emphasis on controlled-access expressways for automobiles, including the Queen Elizabeth Way, the Gardiner Expressway, Highway 401, Highway 403 and Highway 407, with the Lakeshore GO rail corridor and Toronto's Bloor-Danforth subway being the only major east-west high-order transit options. Options for north-south travel include several rail corridors radiating outwards from downtown Toronto as well as a few controlled-access expressways. There are virtually no higher-order transit services that connect destinations outside of central Toronto to one another.

In order to address and plan for the rapid growth that is expected in the GTHA, the Province of Ontario, through the Ministry of Energy and Infrastructure, established a Growth Plan for the Greater Golden Horseshoe (the Growth Plan) through legislation. Metrolinx is playing a critical role in the realization of the goals and objectives of the Growth Plan.

2.2 Metrolinx

Metrolinx (formerly the Greater Toronto Transportation Authority) was created in 2006 to develop and implement an integrated multi-modal transportation plan for the GTHA in order to provide a comprehensive, long-term solution to the region's transportation challenges. In 2009, under the *Metrolinx Act*, Metrolinx was merged with GO in order to combine the organizations' strategy and planning expertise with implementation and operational know-how, creating an organization that is best positioned to build transit projects faster, better and to improve customer service for travelers in the GTHA. In addition to the *Metrolinx Act*, other relevant legislation and regulations that shape the agency's mandate include, but are not limited to:

- The Places to Grow Act;
- The Greenbelt Act;
- The Planning Act;
- The Highway Traffic Act;
- The Environmental Assessment Act;
- The Canada Transportation Act; and

- The Municipal Act.

Metrolinx's mandate⁴ is to:

1. Provide leadership in the coordination, planning, financing and development of an integrated, multi-modal transportation network;
2. Promote and facilitate coordinated decision-making and investment in regional transportation in order to resolve common issues in the region related to transportation⁵;
3. Act as the central procurement agency for the procurement of local transit system vehicles, equipment, technologies and facilities and related supplies and services on behalf of municipalities; and
4. Be responsible for the operation of the GO's commuter rail system and the provision of other transit services.

In addition to seeking input from various levels of government, Metrolinx is committed to ensuring that all relevant stakeholders are able to provide input into its decision making. Metrolinx has actively sought feedback from varying viewpoints, including: various levels of government; transit organizations, unions and the labour sector; users; private transportation operators and businesses; cycling and pedestrian organizations; environmental organizations; health organizations; youth organizations; tourism organizations; media; social service organizations; and the general public. Metrolinx carefully considers the perspectives of all its stakeholders in informing its decisions for strengthening multi-modal transportation in the GTHA.

A critical first step in Metrolinx's mandate to develop and implement an inter-modal transportation plan was the creation of The Big Move – a long term strategic plan that lays out Metrolinx's key values, priorities and objectives with respect to regional transportation in the GTHA. The Big Move is guiding Metrolinx's transportation planning for the GTHA, including setting future directions for strengthening GO's commuter rail service.

Metrolinx is aggressively pursuing the vision and objectives underlying The Big Move through planned short-term investments in commuter transit system expansions, and through longer-term initiatives and the development of a robust investment strategy to fund the major transportation projects contemplated in The Big Move. Another key initiative in Metrolinx's efforts to realize The Big Move is a comprehensive study of the optimal technologies for strengthening the service, reliability, accessibility and efficiency of GO's commuter rail system. These technologies are to be implemented in manner that is economically, socially, environmentally and technologically feasible; resulting in a GTHA that is shaped and supported by a world-leading regional transportation network.

2.3 The Public Policy Context

This Study will be conducted within a dynamic public policy environment and the Consultant will be expected to understand and factor this public policy environment into the development of the Study. The following highlights some of the more critical public policy elements influencing Metrolinx and regional transit in the GTHA.

2.3.1 Growth Plan for the Greater Golden Horseshoe

In order to address and plan for the rapid growth that is expected in the GTHA, the Province of Ontario, through the Ministry of Energy and Infrastructure, established the Growth Plan for the Greater Golden Horseshoe through legislation. The Growth Plan identified several key challenges for the region, some of which include:

- Increased numbers of automobiles travelling greater distances along limited transportation corridors, resulting in higher traffic congestion and longer delays;

⁴ Metrolinx 2007-08 annual report, accessible at http://www.metrolinx.com/annual_report/07_08/Metrolinx_AR08_English.pdf

⁵ Metrolinx Act, 2006, accessible at http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_06g16_e.htm#BK36

- Urban sprawl limiting the scope for the introduction of public transit and increasing the environmental impact of future development; and
- New infrastructure being built to service lower density areas while existing infrastructure in older parts of the region remain underutilized.

The Growth Plan prescribed forecasts of employment and population growth to which municipal Official Plans are legally required to conform. In doing so, the Growth Plan also identified a number of strategies to address these challenges and to accommodate future growth. In general, these strategies aimed to intensify land use by rationalizing settlement areas in the region and supporting the development of multi-modal transit alternatives.

The Growth Plan further specified that transportation system-planning and investment, along with land use planning, will be coordinated. Metrolinx, with a mandate to develop and implement an integrated multi-modal transportation plan for the GTHA, is the agency responsible for leading the implementation of a multi-modal transportation plan to better move people and goods within the GTHA.

2.3.2 The Big Move and GO2020

As part of the execution of its mandate, Metrolinx developed a transportation plan for the region called The Big Move. This document lays out Metrolinx's key values, priorities and objectives with respect to multi-modal transportation in the region.

The primary objective of this Study is to assess the technology(ies) for regional and express rail that will best position Metrolinx and the region to achieve the goals set out in The Big Move. The Big Move and GO2020 (a key delivery component of The Big Move) are therefore the primary goal setting documents for the Study. The following section outlines the vision, goals and objectives set out in The Big Move.

Vision, Goals and Objectives of The Big Move

The Big Move sets out a vision for the GTHA's transportation system over a 25-year time horizon. This vision states that the GTHA will have an integrated transportation system that supports:

- A high quality of life, by making the GTHA more livable, with a multi-modal transportation system that supports convenient, comfortable and safe mobility across the region;
- A thriving, healthy and protected environment, with a transportation system that conserves resources; and
- A strong, prosperous and competitive economy by easing the delivery of goods and services across the region.

In order to achieve this vision, Metrolinx has identified twelve key goals, each with its own objectives, that will guide future decision making. These goals are outlined below.

1. Increase transportation choices;
2. Increase comfort and convenience by placing stronger emphasis on the traveler;
3. Make walking and cycling attractive choices to promote active and healthy lifestyles;
4. Make transportation safer;
5. Reduce the transportation system's carbon footprint;
6. Improve the transportation system's resilience by reducing its dependence on non-renewable sources;
7. Lay the foundation of an attractive, well-planned region;
8. Respond equitably and efficiently to the needs of Ontario's economy;
9. Integrate the transportation system across multiple modes
10. Interconnectedness within the GTHA and to surrounding regions;
11. Increase efficiency and effectiveness; and

12. Achieve fiscal sustainability for transportation investments.

These goals are guiding Metrolinx's regional transportation planning activities and are expected to guide the Consultant in the development of this Study.

In addition to the Growth Plan and The Big Move, the Ontario Minister of Transportation, under the *Metrolinx Act*, is currently preparing a Provincial Transportation Policy Statement to which municipal Official Plans and Transportation Master Plans will be required to comply.

2.3.3 GO (formerly GO Transit): a division of Metrolinx

GO is the inter-regional public transportation service provider for the GTHA, primarily servicing commuters traveling from 20 to 60 kilometers outside of downtown Toronto. Since its inception in 1967, GO has developed a network of train and bus services that bridge the boundaries between regions and municipalities, attracting customers with safe, fast, reliable and comfortable service to key central business districts across the region. GO's service area currently extends from downtown Toronto to Hamilton, Milton, and Guelph in the west; Orangeville, Barrie, and Beaverton to the north; Stouffville, Uxbridge, Port Perry, and Peterborough in the northeast; Oshawa and Newcastle in the east; and Niagara in the Southwest.

GO serves a population of six million in an 8,000 square kilometre area, operating 185 train trips through nearly 60 stations on seven rail corridors. The commuter train system carries more than 200,000 passengers each weekday and has the fifth highest ridership in North America, following the three New York transit services and Chicago's METRA regional rail system.

Table 2: Key Statistics

Lines	7	Locomotives	45
Stations	59	Bi-level passenger railcars	470
Route kilometres	390km	Average trip length	33.5km
Weekday train trips	185	Rail car seating capacity	162 passengers each car (10-12 cars per train set)
Fleet size	41 train sets	Ridership	55 million

GO aspires to be 'the preferred choice for interregional travel' in the GTHA, and it intends to achieve this vision by pursuing best practices in the transit industry, championing public transit, setting an example for environmentally sustainable operations and enhancing the quality of life for residents of the region.

With respect to its business model, GO recovers 82% or more of its costs from fare and sundry revenues. As a Crown Agency of the Province of Ontario, the Ontario government funds the investments required for infrastructure expansion, rehabilitation and replacement, and subsidizes operating costs. Federal and municipal contributions towards growth and expansion of the GO system have complemented provincial funding.

GO's Strategic Plan, GO2020⁶ was issued in the fall of 2008 and is one of delivery components of The Big Move. It outlines GO's commuter service expansion plans over the next ten years.

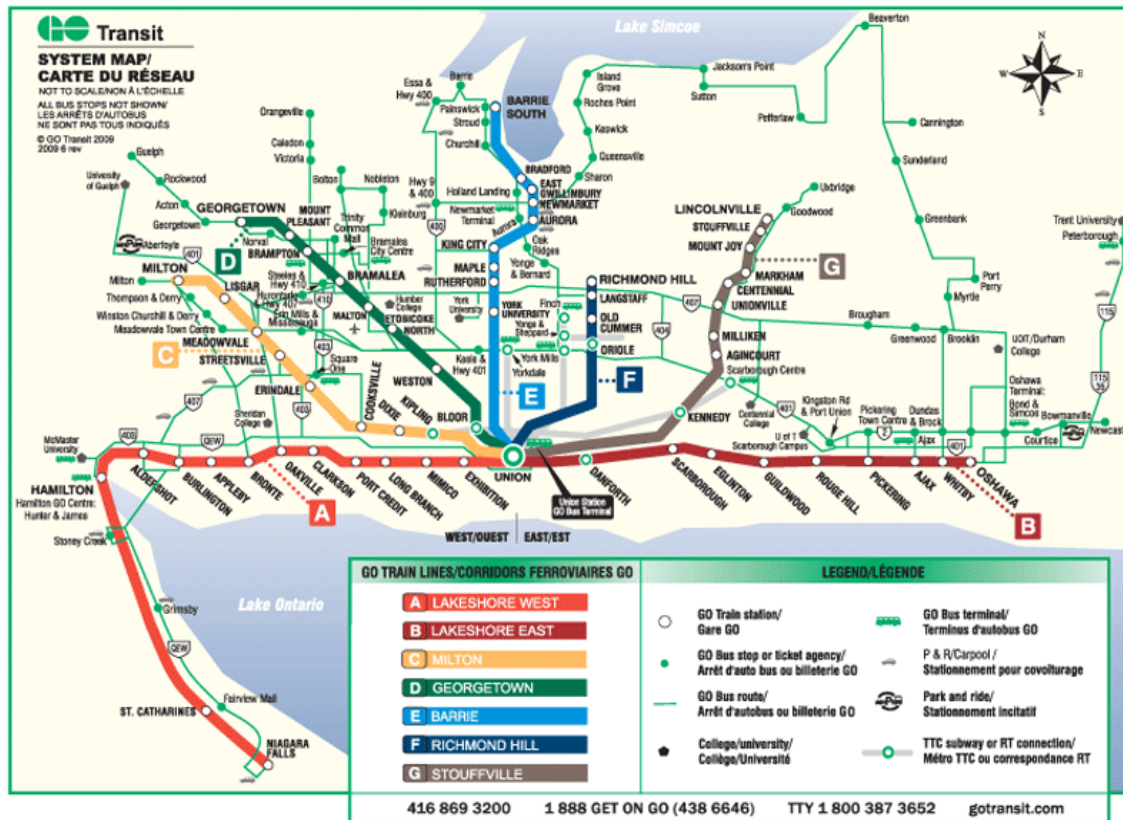
⁶ GO2020 is available at http://www.gotransit.com/public/en/publications/GoTransitStrategicPlanGo2020_lowres.pdf

2.4 Overview of GO's Commuter Rail System

Rail System Information

The GO rail system currently extends from downtown Toronto to Hamilton, Milton, and Georgetown in the west; Barrie to the north; Stouffville, Uxbridge, and Oshawa in the east. The GO commuter rail system consists of seven train lines: Lakeshore West, Milton, Georgetown, Barrie, Richmond Hill, Stouffville, and Lakeshore East.

Figure 1: GO system map



Train service is available at all stations during peak rush-hour periods. During weekday off-peak hours train service is available on the Lakeshore line between Oshawa in the east and Aldershot in the west, and on the Georgetown line between Union Station in the east and Bramalea in the northwest. On weekends, trains run between Oshawa in the east and Aldershot in the west. Service is provided through a combination of direct and contracted operations. GO operates all stations and terminals, while trains are controlled, operated and maintained through contracted third-parties.

Located in downtown Toronto, Union Station is the hub of GO's commuter rail system and is also a primary hub for VIA Rail. The two organizations share facilities at Union Station. Union Station is also used by other inter and intra-city operators such as Ontario Northland and the TTC subway system. All rail lines and 96% of train ridership is either to or from Union Station. The varying and unique operating and service demands of these users, combined with rapid demand growth and the historic nature of Union Station, have constrained GO's ability to expand rail, bus and customer service capacity at Union Station. Work is currently underway to revitalize Union Station, including improvements to the train shed roof, stair and elevator access; and track and signal improvements. GO and the City of Toronto are the primary sponsors undertaking the major improvement work on the concourse levels.

Service Information

Service levels of all corridors will need to be expanded in order to accommodate the 10 and 25 year expansion plans. An Appendix will be included in the RFP with a chart outlining the current and anticipated service levels per corridor as various service expansion milestones are achieved.

Fleet Information

GO currently utilizes two types of locomotives and one type of bi-level passenger rail car in its commuter rail fleet. An overview of the specifications for all commuter rail technologies currently in use will be attached as an Appendix to the RFP. The specifics of the current and future fleet requirements to meet the expansion plans for GO2020 and the Big Move will be attached as an Appendix in the RFP.

Rail Infrastructure

GO currently has a number of expansion and renovation projects underway that are designed to better meet the transportation demand of the region's commuter population.

To be included in the Appendix of the RFP will be the current rail infrastructure; outlined in corridor and track miles with specific track diagrams; the infrastructure as it will look in 5 years; and anticipated additions to the rail infrastructure and Union Station to accommodate the expansion scenarios in the Big Move and GO2020.

Union Station

Union Station is the hub of regional transit in the GTHA and is where most rail and bus service for the GTHA converge. The planned regional transit network for the next 25 years, as outlined in the Big Move and the GO2020 strategic plan, will require that Union Station's capacity be almost quadrupled from current levels. Consideration of the impacts that the various technology choices will have on Union Station will be a key factor into this Study. GO is currently in the process of engaging a consultant to determine options to double Union Station's capacity over the next 10 years. A second related study is also being commissioned to address the need to quadruple capacity at Union Station by 2031 as identified in The Big Move.

GO and the City of Toronto are also currently developing plans for revitalization at Union Station. It is anticipated that these plans will be completed by 2015.

3 Scope of Work

3.1 Structure of the Study

Through the development of these Terms of Reference, Metrolinx, in consultation with the Community Advisory Committee, has established the broad parameters for the structure of the Study. The Consultant will be expected to build on the broad study parameters set out in these Terms of Reference and make proposals to strengthen the structure and define specific methodologies and approaches for successfully executing the Study. It is the expectation of Metrolinx that the analysis, assessment, findings and conclusions of the Study will be based on the forecasts identified in Appendix X of this RFP. With respect to the analytical elements of the Study for technologies, the Consultant will conduct a comprehensive and detailed cost-benefit analysis that assesses the possible, realistic and viable forms of the technologies over the full forecasting horizon, i.e., the analysis of the future states of the various technologies should be on a “future to future” basis, reflecting the expected progress and improvements of the technologies over time.

The Consultant will provide a general commentary on key micro and macro economic, social, health, environmental and technological drivers that will impact the range of technologies beyond the forecasting horizon of this Study. The Consultant will also identify any major risks or opportunities that arise as a result of this commentary.

3.2 Analytical Elements of the Study

3.2.1 Technologies, Capacities and Transit Service Impacts

Technologies

At a high-level, the Study is to compare diesel to electric and viable and probable alternate technologies. The table below presents the technologies contemplated by Metrolinx for the Study. The Consultant will be expected to work with Metrolinx to refine and further define the technologies to be analyzed and assessed in the Study.

Table 3: Technologies to be Studied

Technology	Description
Diesel Technologies	Conventional diesel and available future ⁷ diesel technologies.
Electric Technologies	Electric technologies to be studied shall be current and future ⁷ catenary based electric technologies such as electric locomotives, Electric Multiple Unit's (EMU's), and dual-mode locomotives.
Alternate technologies	The alternate technology(ies) shall be a technology that will be commercially viable and available within the short to medium ⁸ term. The Consultant is to propose up to two (2) viable alternate technology(ies) to be studied based on a preliminary analysis conducted in consultation with Metrolinx.

For the purposes of comparison, the Consultant shall analyze the technologies to be implemented both on a system-wide and a corridor-by-corridor basis, including the future development of the Union-Pearson Air Rail Link. The purpose of this analysis is to identify a technology, or combination of technologies, for implementation based on a comparison of the feasibility and net costs/benefits on a system-wide and corridor-by-corridor basis. The Consultant, in consultation with Metrolinx, will determine whether an alternate technology is feasible and warrants further analysis.

⁷ Future technology is defined as a technology where research and development work is complete, prototypes developed and testing advanced to the point where the technology is being commercially marketed and will be ready for production within 5 years.

⁸ For the purposes of this Study, the short to medium term is to be 5-10 years.

For the purposes of analysis, the Consultant shall compare each of the diesel, electrification and alternate technologies against each of the following elements/characteristics:

- a) Traction power;
- b) Communication systems;
- c) Power systems;
- d) Acceleration and braking;
- e) Signal systems;
- f) Power to weight ratios;
- g) Potential for technology alternatives to increase automation and reduce costs;
- h) Infrastructure requirements, particularly with respect to Union Station;
- i) Crossing warning systems;
- j) Train scheduling;
- k) System reliability; and
- l) Any other elements/characteristics proposed by the Consultant.

Each of the above elements/characteristics and their relationship with diesel technology, electrification technology and alternate technologies shall be evaluated in the context of:

- a) Operating and capital costs;
- b) Energy consumption, using a common measure of usage (e.g., energy used/common unit) to determine potential emissions;
- c) Reliability, including impact on travel times across various GO lines;
- d) Feasibility;
- e) Capacity for staged implementation; and
- f) Other elements as identified by the Consultant in consultation with Metrolinx.

For each of the above criterion, the Consultant will be expected to propose an evaluative framework with relevant metrics to compare the technologies.

In addition, the Consultant will also assess the feasibility and staging of each technology using both FRA compliant and non-compliant vehicles. In assessing the feasibility and staging the Consultant must also consider the use of dedicated tracks and or dedicated Rights of Way (RoW) and their impacts on the technologies under study.

Capacities

The Consultant will be expected to take a broad perspective to the identification, analysis and assessment of system capacities, including, but not limited to:

- a) Station capacities, with a particular focus on Union Station, working in conjunction the consultants engaged to study capacity at Union Station;
- b) Power supply and distribution capacities, based on an overall power demand simulation for each technology; and
- c) Other relevant capacities as identified by the Consultant in consultation with Metrolinx.

The Consultant will identify all potential bottlenecks and infrastructure capacity constraints for each viable technology and each viable implementation option on a system-wide and corridor-by-corridor basis. The Consultant is also asked to consider of the impact of dedicated tracks and/or Rights of Way and prospective operating rule changes on the system capacities under study.

Transit Service Impacts

For the purposes of analysis, the Consultant shall examine and quantify the impact of conventional and future diesel technology, electric technology and alternate technologies on, at minimum, each of the following considerations:

- a) Overall cost of operating GO's commuter rail system;
- b) In-cabin and external noise and vibration;
- c) Frequency and scheduling of GO service (including frequency of stops and station locations);
- d) Speed of service and journey time;
- e) Ability to integrate various modes of transportation;
- f) Reliability of service;
- g) EMI impact on existing communications and control systems;
- h) Impact on existing CN / CP / VIA operations;
- i) Ability to manage supply / demand within identified capacity constraints in a cost effective manner;
- j) Ability to integrate GO's commuter rail system with municipal transit systems;
- k) Impact on station spacing; and
- l) The Consultant will be expected to propose other service elements to be examined and assessed for consideration and approval by Metrolinx.

3.2.2 Environmental and Health Impacts

The aim of this section of the Study is to identify, in specific and quantifiable terms, the principal environmental and human health impacts of the technology(ies) over a 30 year period. For the purposes of analysis, the Consultant shall examine and, where possible, quantify the impact of diesel technology, electrification technology and alternate technologies on, at minimum, each of the following considerations:

Environmental Impacts

- This analysis and assessment will examine the lifecycle, system wide impacts of the technology(ies). This will include all aspects, from material inputs used during production, waste management and land remediation impacts during construction and operation, and emissions impacts during operations.
- The Consultant shall present potential mitigation strategies for each negative environmental impact as part of the overall evaluation, based on precedent experiences in other jurisdictions.
- For each technology, the Study will address any opportunities available during the construction period to ameliorate existing social or environmental concerns, such as an assessment of whether electrification of the GO System could create the opportunity to address long-standing concerns related to bike paths or other local community benefits along the rail corridor.

The Consultant shall consider the implications of the Net Gain principle when assessing all relevant environmental impacts and will identify potential strategies for achieving environmental Net Gain.

The Net Gain principle requires that proposed changes in land or water use consider the impact on the ecological assets of an area in terms of the ecological services or functions and functional capacities that may be affected⁹. Net Gain implies that aggregate changes in ecological assets (e.g., emissions of greenhouse gases; air toxics and contaminants; water quality and quantity; arable land, biodiversity) will be positive on the whole, even though the individual elements under consideration could have negative consequences for air, land and water assets. The methodology applied will need to consider appropriate

⁹ Pollution Probe; Exploring Applications of the Net Gain Principle; February 2004. Available at <http://www.pollutionprobe.org/Reports/netgain.pdf>

sustainability indicators, identify data monitoring requirements, and generate modelling outputs that can effectively inform a Net Gain assessment.

Health Impacts

- The human health impacts of exposure to air contaminants, electromagnetic fields, noise, vibration, and other exposures, as identified by the Consultant. In addition to hazards related to exposure, other hazards impacting human health such as accidents should also be identified.
- The analysis should consider the magnitude of the human health impacts and exposure levels as a function of proximity to a corridor or corridors, including the social and economic impacts (such as the cost impact to Ontario's health care system), on system workers, riders, local and regional residents and governments. The Consultant is to identify any groups that are particularly susceptible to these exposures and assess the order of magnitude of the impact of the technology(ies) on these groups.
- The Consultant shall present evidence based mitigation strategies for each negative health impact as part of the overall evaluation. Mitigation strategies shall be developed based on precedent experiences in other jurisdictions.

3.2.3 Community and Land Use Impacts

For the purposes of analysis, the Consultant shall, on a system-wide and corridor-by-corridor basis, examine and quantify the impact of diesel technology, electrification technology and alternate technologies on, at minimum, each of the following considerations:

Community Impacts

- An analysis and assessment of the micro and macro impact of the technologies under study on local and regional communities, including, but not limited to, aesthetic impacts, the social impacts of continuing with diesel and conversely, the social impacts of moving to new technologies; and
- An analysis and assessment of what the social behavioural impacts have been of well established systems in other jurisdictions, including, but not limited to, the correlation between the use of technology alternatives and traveler behaviour with respect to commuter rail or other forms of public transit.

Land Use Planning

- An analysis and assessment of differences in the types of land use required or stimulated between and among the technologies under study. This analysis and assessment is to consider the experience of other jurisdictions;
- An analysis and assessment of the impact of the technologies under study to facilitate provincial land use planning objectives and policies for the GTHA, including any requirements for planning in heritage conservation districts; and
- An estimate or projection of the amount of land that will have to be allocated or acquired to accommodate any ancillary infrastructure associated with each technology.

3.2.4 Economic Impacts

For this component of the Study, the Consultant will be expected to have capabilities, and undertake comprehensive and detailed economic modeling.

For the purposes of analysis, the Consultant shall examine and, where possible, quantify the impact of diesel technology, electrification technology and alternate technologies on, at minimum, each of the following considerations:

- The direct and indirect macro and micro economic impact of implementing the various technologies, including, but not limited to job creation, tax revenue impacts, and land value appreciation/depreciation; and

- The potential economic development impacts associated with each technology alternative with respect to net new job creation, stimulating domestic manufacturing capacity, land values, land development, and other considerations as identified by the Consultant in consultation with Metrolinx.

3.2.5 System Cost, Funding, and Financing

For this component of the Study, the Consultant will be expected to have capabilities, and undertake comprehensive and detailed transportation and economic modeling, building on the transportation and economic models that have been completed in support of The Big Move.

For the purposes of analysis, the Consultant shall examine and, where possible, quantify the impact of diesel technology, electrification technology and alternate technologies on, at minimum, each of the following considerations:

System Costs

The development of a comprehensive and defensible methodology for the assessment of all hard and soft system capital costs, operating costs, and lifecycle maintenance costs for each technology under study, including an approach for assessing the impact of dedicated RoW on the total cost analysis;

- Capital costs

Develop robust cost estimates for each technology under study. Considerations will include, but are not limited to:

 - a) Vehicle System (rolling stock);
 - b) Power Distribution System;
 - c) Communication and Signal Systems;
 - d) Track System;
 - e) Additional Civil Works; and
 - f) Other Capital Costs as identified by the Consultant (e.g., property acquisition, financing costs associated with implementation staging, mitigation costs etc.) in consultation Metrolinx.
- Operating and maintenance costs

Develop robust life-cycle operating and maintenance cost estimates for each technology under study. Considerations will include, but are not limited to:

 - a) Energy costs, including an assessment of how sensitive operating costs are to each technology;
 - b) Maintenance costs;
 - c) Labour/staffing costs, including training;
 - d) The cost of operating required ancillary infrastructure; and
 - e) Other costs identified by the Consultant in consultation Metrolinx.

Funding and Financing

- An analysis and assessment of the funding challenge associated with the technologies under study, including a presentation on how funding challenges have been addressed in other jurisdictions and what, if any, alternative funding or financing approaches have been used to implement the technologies under study.
- An assessment of the difference among the technologies with respect to:
 - a) Any carbon/sustainability tax/tariff programs/incentives and their impact on the cost of each technology;
 - b) Any applicable local improvement taxes;

- c) The feasibility of receiving support from/partnering with energy suppliers/distributors;
 - d) Unique partnership opportunities such as co-generation, integration with district energy concepts, distributed energy, etc.; and
 - e) Other areas of investigation identified by the Consultant in consultation with Metrolinx.
- An identification and assessment of the business models used by railways to operate power distribution networks, where applicable and relevant to the technologies under study.

3.2.6 Risk Analysis

- The Study is to include a robust risk assessment related to each technology under study. This risk analysis will include identifying and addressing:
 - a) Existing federal, provincial, or municipal regulatory barriers or imperatives;
 - b) Pending or emerging policy and/or legislative initiatives at the provincial, federal and North American levels that could impact the choice of technology(ies). Such initiatives include carbon trade-off or monetization regimes, Green Energy Act, etc; and
 - c) Key risks around the timing of the implementation of the various technologies, particularly in the context of a phased implementation.
 - d) Key risks associated with the safety, during the construction and operation periods, of each technology. The Consultant must specifically address the ability and risks of maintaining existing services/operations while transitioning to a new technology(ies);
 - e) Each technology's dependence, susceptibility and adaptability, from a longer-term perspective, to each of the following:
 - Climate change;
 - Peak oil;
 - Availability of electricity;
 - Population growth; and
 - Any other factors proposed by the Consultant.
- The Consultant, in consultation with Metrolinx, will be expected to develop a comprehensive list of risks to be analyzed and assessed in the Study.

3.3 Assessment of Net Impacts

- The Study will consider diesel technology, electrification technology and alternate technologies from each perspective outlined above. This will be done on a corridor by corridor basis and system-wide basis. Based on the analysis of the above, the Consultant is to present an integrated analysis of net costs and benefits for each of the viable technology(ies), or combination of technologies. The Consultant will therefore be expected to analyze and present:
 - Net technology, capacities and transit service impacts;
 - Net environmental and health benefits;
 - Net community and land use benefits;
 - Net economic benefits; and
 - Net system cost.

3.4 Implementation Scenarios for Viable Technology(ies)

- The Consultant will identify viable technologies, or combinations of technologies (i.e. transition between/across technologies over time), based on a comparison of the feasibility and net impacts of the technologies on a system-wide and corridor-by-corridor basis. For these technology(ies), the Consultant will model, assess and present findings on, at a minimum, the following three implementation scenarios:

Scenario	Description
Partial system implementation	This scenario contemplates a situation where a limited number of lines are selected for implementation. This scenario does not contemplate full implementation for the entire GO rail system.
Phased, multi-year implementation of a select technology	This scenario contemplates the full for the entire GO rail system over a longer-term timeframe, (e.g. 10-20 years).
Phased, multi-year implementation of a combination of technologies	This scenario contemplates the full implementation of a combination of technologies across the system over a longer-term timeframe, (e.g. 10-20 years).

- The Consultant will also be expected to propose other implementation scenarios for consideration and approval by Metrolinx. For all implementation scenarios, the Consultant will be expected to examine or identify, at minimum, the timing, cost, infrastructure requirements, required approvals, and additional studies that need to be conducted.

3.5 Consultation Requirements

- The Consultant is expected to deploy a highly qualified, experienced and accomplished multi-disciplinary team capable of undertaking stakeholder engagement to facilitate the Study. It is expected that the Study will consider, document and consolidate feedback provided by impacted GO stakeholders. Consultations will likely include:
 - Local communities and the general public;
 - Consumer groups – the Study is to include the perspective from all types of riders;
 - Municipalities and institutions;
 - Engaged third parties (e.g., Chambers of commerce, CAA, Railway Association of Canada);
 - Relevant federal and provincial government entities such as Transport Canada, the Ministry of the Environment, Ministry of Municipal Affairs and Housing, Ministry of Energy and Infrastructure, the Ministry of Research and Innovation, and the Ministry of Transportation; and
 - Other stakeholders to be identified by Metrolinx and the Consultant.
- To facilitate stakeholder engagement and consultation in the development of the Study, the Consultant will be expected to:
 - Develop, in consultation with Metrolinx, a proactive stakeholder engagement and communication plan that includes a comprehensive list of impacted stakeholders to be engaged and consulted, engagement and communications approaches and tactics, and strategies to overcome consultation barriers along with the identification of other elements deemed critical to high quality stakeholder interaction;
 - Work with any community and/or technical working groups that may be struck by Metrolinx in relation to this Study;
 - Work with other consultants engaged by Metrolinx in order to engage stakeholders impacted by these developments;
 - Lead or execute stakeholder consultation sessions, including one-on-one interviews, workshops and open public forums. For the purposes of pricing responses to this RFP, Proponents should assume that the Study will require
 - one-on-one meetings,
 - stakeholder consultation workshops and
 - public forums;
 - Record and consolidate stakeholder input and feedback, and integrate this feedback where appropriate in the Study.

- f) Provide an ongoing and final record and report of the stakeholder engagement process, feedback and findings obtained through the course of conducting the Study.

3.6 Project and Schedule Management

- The Consultant will provide project and schedule management for the Scope of Work described in this section and all of its components, including:
 - A dedicated Project Manager for the Study;
 - Required planning, progress and other meetings for the purpose of project management and status updates;
 - Quality Assurance/Quality Control;
 - Document control relative to the subject Scope of Work;
 - Work plan and schedule, including regularly scheduled status reporting; and
 - Other requirements as determined by Metrolinx.
- The Consultant shall provide an updated detailed work plan to Metrolinx within one (1) week of written notification of award of the contract. The work plan shall include the proposed Study process, the review and approvals process, meetings with stakeholders, and a discussion of the quality plan that will be implemented by the Consultant for the deliverables related to the scope of work.

APPENDIX B

COMMUNITY ADVISORY COMMITTEE

MEMBERS

- Chair, Daniel Burns, former Ontario Deputy Minister of Health and Long Term Care
- Vice Chair, Pamela Robinson Ph.D., MCIP RPP, Assistant Professor, School of Urban & Regional Planning, Ryerson University and Member, Metrolinx Advisory Committee on the The Big Move
- Frank Giannone, President, FRAM
- Dina Graser, Chair People Plan Toronto
- Dr. Linn Holness, Director Division of Occupational Medicine, U of T and Director, Centre for Research Expertise in Occupational Disease, St. Michael's Hospital
- Gerry Johnston, former Assistant Deputy Minister, Ontario Ministry of Transportation
- Ed Levy, Senior Consultant and former President, BA Consulting Group
- Eva Ligeti, Executive Director, Clean Air Partnership
- Eli Malinsky, Member, Clean Train Coalition
- Brian E. McCarry, Professor, Stephen A. Jarislowsky Chair in Environment and Health, McMaster University
- Danny Nikitopoulos, Member, GO Customer Service Advisory Committee; CA, MBA, Specialist, Valuation Services, KPMG LLP
- Bob Oliver, Executive Director, Pollution Probe
- Murray Skinner, former CEO Metroland publications
- Jim Tovey, President, Lakeview Residents Association
- Michael Warren, Chair, The Warren Group, former General Manager Toronto Transit Commission
- Alan Wells, Chair, Rouge Park Alliance; former Provincial Development Facilitator and former CAO York Region

COMMUNITY ADVISORY COMMITTEE

MEMBER BIOS

CHAIR, Daniel Burns

Daniel Burns, a long time senior public servant, retired from the position of Deputy Minister at the Ontario Ministry of Health and Long-Term Care at the end of January 2002. He is a chair of the board of trustees of the Centre for Addiction and Mental health and a trustee of the Maytree Foundation, teaches and consults in public policy and public administration. In addition to his position at the Ministry of Health and Long-Term Care, Mr. Burns was a Deputy Minister in numerous Ontario Government Ministries, including Economic Development and Trade (1999 to 2000), Economic Development Trade and Tourism (1998 to 1999), and Municipal Affairs and Housing (1995 to 1998).

Mr. Burns has been a member of the Board of Directors of the Canadian Institute for Health Information and of the Board of Directors of Canada Health Infoway Inc. He is a member of the Board of Trustees of Queen's University and is the chair of the board's standing committee on campus planning and development. He is also a member of the Canadian Institute of Planners. He has also served on the Boards of the Institute of Public Administration of Canada, the United Way of Greater Toronto and the Metro Toronto Community Foundation. Born in Ottawa, he received his B.A. in Geography and Economics from Queen's University, and his M.Sc. in Urban and Regional Planning from the London School of Economics.

VICE CHAIR, Pamela Robinson

Dr. Pamela Robinson, MCIP RPP is an assistant professor in the School of Urban and Regional Planning. Prior to joining the faculty at Ryerson, she was a lecturer in the Urban and Environmental Studies programs at Innis College, University of Toronto. She is the recipient of the Canada Mortgage and Housing Corporation Award for Teaching Excellence and the OPPI Award for Planning Excellence. She is a partner in Robinson & Gore: Policy and Planning, a Toronto-based consultancy. She is the Secretary of the Board of Directors of the Friends of the Greenbelt Foundation and sits on Advisory Committees for Metrolinx and UN-Habitat.

Frank Giannone

Frank Giannone is the president of Fram Building Group. A graduate of the Civil Engineering program at the University of Toronto, Frank entered the family business in 1981 as the fourth generation in the home building business. Fram is a builder/developer of fine residential and mixed-use communities in the Greater Toronto Area, Collingwood, as well as in Dallas, Texas,

and Detroit, Michigan.

Frank is a past-president of the Toronto Home Builders' Association, and is the President of the Ontario Home Builders' Association. The Ontario Home Builders' Association is a key strategic partner in the development of healthy sustainable communities representing 4,200 member companies organized into 29 local associations across the province. The residential construction industry is the engine that drives the provincial economy, contributing \$36 billion towards the provincial GDP and employing more than 325,000 people.

Dina Graser

Dina Graser is an associate at Goodmans LLP, where she practices broadcasting and telecommunications law. Prior to becoming a lawyer, she ran her own company through which she produced and programmed festivals, live shows, conferences, special events and community projects for a wide range of organizations in Toronto. Dina is a member of the Board of Directors of Artscape Inc. She also chairs People Plan Toronto (PPT), a group of active, engaged citizens committed to improving Toronto's planning process, with whom she is working to start a new Community Planning Resource Centre.

Dr. Linn Holness

Professor and Director of the Gage Occupational and Environmental Health Unit and the Centre for Research Expertise in Occupational Disease, both collaborative programs of the Dalla Lana School of Public Health and Department of Medicine at the University of Toronto and the Department of Occupational and Environmental Health at St Michael's Hospital. Dr. Linn Holness' clinical specialty is occupational medicine, with specific research interests in occupational disease, occupational contact dermatitis, occupational lung disease, and occupational health services. She is affiliated with the Keenan Research Centre of the Li Ka Shing Knowledge Institute of St. Michael's Hospital. In addition, Linn is the Chair of the Board of Examiners for Occupational Medicine at the Royal College of Physicians and Surgeons of Canada, and an associate editor of *Dermatitis*.

Gerry Johnston

In 1992, following twenty-nine years of service with the Ontario Government, G. Johnston retired from his position as Assistant Deputy Minister, Policy and Planning, Ministry of Transportation and established G.H.J. Transportation Consultants where he still serves as President. During his period with MTO, he was responsible for policy, planning and research for all modes of transportation and worked closely with GO Transit in the development of

legislation, business plans and implementation strategies. Since leaving government in 1992, G Johnston has been involved in a number of domestic and international assignments dealing with the planning, financing, governance and implementation of major transportation works in Canada, Malaysia, Middle East and Trinidad

He graduated from Queens University with a B.Sc. in civil engineering in 1956 and a M.Sc. in Transportation in 1960. He is married to Peggy and lives in Whitby. They have two children and six grandchildren.

Ed Levy

Ed Levy has worked as a transportation planner and advisor since graduating from the University of Toronto in 1957. He co-founded Barton-Aschman Canada Limited in 1973 which then became BA Consulting Group Limited. He served as President and then Chairman of the Board of Directors for more than 15 years. In 1989, Ed was retained as an advisor to the Royal Commission on the Future of the Toronto Waterfront, and in 1991 he was appointed by the Commission as Co-Director of a major study of options for the Gardiner Expressway-Lake Shore Boulevard waterfront transportation corridor..

Ed has since formally retired from BA Group, but continues to work with the firm as Senior Consultant. He also continues to participate actively on several Toronto Board of Trade committees and is a member of the Board of Directors of a new Railway Museum and Railway Heritage Centre. Ed has been a valued member of the Metrolinx Advisory Committee to the Board on the regional transportation plan.

Eva Ligeti

Ligeti is Executive Director of the Clean Air Partnership, Chair of the GTA Clean Air Council, and a member of the Province of Ontario's expert panel on climate change adaptation. She was chosen as Ontario's first Environmental Commissioner of Ontario by an all-party committee of the legislature in 1994. She remained Commissioner until 1999, reviewing the government's compliance with the Environmental Bill of Rights and reporting to an all-party committee of the Ontario legislature.

She is a past principal at Seneca College of Applied Arts and Technology and former chair of its School of Legal and Public Administration. A lawyer, Ligeti focused on civil litigation and administration law in her practice with Iler, Campbell and Associates. She has served as legal counsel to the Canadian Environmental Law Association.

Eli Malinsky

Eli Malinsky has been working to spur collaboration and entrepreneurship within Toronto's social mission sector over the past seven years. He has worked at Imagine Canada, the country's pre-eminent research institute on the nonprofit and voluntary sector. In 2005, Eli joined the Centre for Social Innovation to help fulfill the organization's strategic and programming vision. He is also a member of the Clean Train Coalition, formed in response to the Georgetown South Service Expansion and the Union-Pearson Rail Link (GSSE/UPRL). Eli has a Master's degree in Communication and Cultural Studies, and is passionate about social enterprise, social innovation, and creating spaces for social change.

Brian E. McCarry

Dr. Brian E. McCarry is a Professor of Chemistry and Chemical Biology at McMaster University with expertise in environmental toxicology and organic analytical chemistry; he holds the Stephen A. Jarislowsky Chair in Environment & Health. In addition, he has served on many major university committees, including as chair of the Budget Committee. McCarry is the chair of Clean Air Hamilton (CAH), a multi-stakeholder group which has provided informed direction on air quality issues and health impacts due to air pollution; he also chairs the Hamilton Air Monitoring Network. A well-known figure in the City of Hamilton's clean-air movement, he has documented the health risks resulting from transportation sources, industrial sources and major fires such as the Plastimet Fire and Hagersville Tire Fire.

Dr. McCarry holds a B.Sc. degree from the University of British Columbia and a Ph.D. from Stanford University. He is a Fellow of the Chemical Institute of Canada. In 2005 he was named Hamilton Environmentalist of the Year and he received the Canadian Environmental Awards Silver Award in the Climate Change category. In 2000 Clean Air Hamilton was one of ten groups from 770 applicants world-wide to be awarded a Dubai International Award for Best Practices by the Municipality of Dubai.

Danny Nikitopoulos

Danny Nikitopoulos works in as a Specialist in Valuation Services at KPMG LLP. He is a Chartered Accountant and completed his Masters of Business Administration at the Schulich School of Business at York University. An avid public transit user, Danny is a member of the GO Customer Service Advisory Committee.

Bob Oliver

Bob Oliver is the Executive Director at Pollution Probe in Toronto. He holds a Bachelor of Mechanical Engineering from Carleton University, and brings fifteen years experience managing industrial projects and developing strategies for energy efficiency and greenhouse gas emissions reductions.

Bob was most recently the Director of Pollution Probe's Transportation Programme. In that position he worked effectively to support the development of policies and programs to reduce greenhouse gas emissions from transportation activity in Canada. Bob researched and wrote *Greenhouse Gas Emissions and Vehicle Fuel Efficiency Standards for Canada*, a major report supporting the development of policy options to reduce emissions through improvements in automobile technology and fleet composition. Bob also focused on the potential for alternative fuels and transportation infrastructure to contribute to reducing emissions of air pollutants and greenhouse gases.

Murray Skinner

Murray Skinner was named president of Metroland Media Group Ltd. in September 2000 and had been a part of the company for 33 years serving as vice-president of marketing for 19 years. He previously worked in advertising and management positions at Thomson Newspapers. Mr. Skinner is a director of Black Press, and a former member of Canadian Community Newspapers Association's Distribution Committee, the Retail Advertising Club of Toronto, Advertising & Marketing Club of Toronto, Canadian advisory board for Canadian Circulation Audit Board, and a founding member of the Flyer Distribution Standards Association. Murray is a recipient of an Honorary Life Membership with the Canadian Community Newspapers Association (CCNA) in recognition of his contribution and support of community journalism in Canada.

Jim Tovey

Jim Tovey is a long time resident of Lakeview and is a tireless community advocate on issues of culture, planning, environment and health. He has been a strong voice in calling for the protection and revitalization of our waterfront. He is the Vice Chair of the City of Mississauga Heritage Advisory Committee, as well as President and founder of the Lakeview Ratepayers Association, the largest residents association in Mississauga. Jim was a central figure in stopping the use of the Lakeview Generating Station grounds as a location for power generation, and spearheaded the first citizen created Master Plan for waterfront reclamation and community revitalization in North America.

In 2009, Jim was honoured with the Gordon G. Shipp Citizen of the Year award for his contributions and achievements in Mississauga.

R. Michael Warren

Michael Warren has been the Chairman and CEO of The Warren Group Inc since 1985, a consulting group that provides strategic advice to governments and corporations. He served as the Chair of the Board of Trustees of Sunrise Senior Living REIT from 2004 to 2007. He was the first President and CEO of Canada Post Corporation (1981-1985) and the first Chief General Manager of the Toronto Transit Commission (1975-1981). Through 1980 he was also acted as the Interim General Manager of the Canadian National Exhibition. From 1962 until 1975 Mr. Warren was a Deputy Minister in several Ontario Government departments including the Solicitor General, Municipal Affairs and Housing, and Citizenship.

Mr. Warren holds a Bachelor of Commerce degree from Concordia University and is a member of their Sports Hall of Fame. His columns and opinion pieces are frequently published in the Globe and Mail and other major Canadian newspapers.

Alan Wells

Alan Wells was appointed by the Ontario government as Chair of the Rouge Park Alliance in February 2008. Prior to joining the Rouge Park Alliance, Alan worked with the Province as the Development Facilitator helping groups resolve issues concerning growth management, infrastructure planning and environmental protection. He has over 25 years experience working with York Region, serving as CAO for 7 years. Alan has served as a volunteer with the Uxbridge Watershed Advisory Committee and Toronto Region Conservation Authority's Duffins and Carruthers Creeks Watershed Resource Technical Advisory Committee. In his spare time, he enjoys fly fishing, and making maple syrup from home.