



ASSOCIATION OF CONSULTING
ENGINEERING COMPANIES | CANADA
ASSOCIATION DES FIRMES
D'INGÉNIEURS-CONSEILS | CANADA

GO TRIP

GO Transit Rail Improvement Program

SIMCOE
COUNTY

Canadian Consulting Engineering Awards 2011

YORK
REGION

May 2011

PEEL
REGION



AGM
Program Managers

Hatch Mott
MacDonald

I
BI
GROUP

MMM GROUP



Project Highlights

The GO Transit Rail Improvement Program (GO TRIP) was launched in 2003 by GO Transit, the Province of Ontario's interregional public transportation service for the Greater Toronto and Hamilton areas of southern Ontario. The \$700-million seven-year initiative, funded by three levels of government through the Canada Strategic Infrastructure Fund (CSIF), was designed to enhance rail service throughout the Greater Toronto Area (GTA) service area where the system carries nearly 55 million passengers a year.

GO TRIP focused on increasing the capacity and reliability of GO Transit's commuter rail network while improving passenger safety and system security. Reduction of the interface between GO trains and growing volumes of CP and CN freight traffic through overpass development was critical to the system's reliability. Extension of GO Train service to population centres such as Barrie expanded the system's overall service area while improvements to the northwest rail corridor were designed to support the Air Rail Link between Toronto Pearson International Airport and Union Station in downtown Toronto (scheduled to commence service prior to the 2015 Pan Am Games).

Overall, GO TRIP was comprised of eleven major projects, including development of 100 km of new track, three grade separations, sixteen new bridges, two layover facilities, seventeen station expansions to accommodate new track and longer trains, and two feasibility studies for new rail lines.

In 2003, GO Transit selected AGM Program Managers, a consortium of Hatch Mott MacDonald, IBI Group and MMM Group, to implement this major initiative by providing overall management of engineering and construction services. AGM's specific responsibilities involved management of environmental assessments, public consultations, government agency and stakeholder coordination, procurement, technical reviews, environmental compliance, operational analysis, and oversight of over 80 design and construction contracts.

In implementing GO TRIP, the overarching goal of AGM Program Managers was minimization of impacts on day to day operations of GO Transit, a considerable challenge given the size of the Program and the numerous component projects. Physical constraints along rail corridors created a difficult environment for construction. Intricate planning and programming was required for staging of the individual components of the program, involving development of detailed project implementation and construction staging schedules. The Program included requirements for eight major environmental assessments while stringent permitting and approval processes were regulated by provincial and federal governments as well as local conservations authorities.

The seven-year span of the Program involved over 80 design and construction contracts with consultant and contractor groups, requiring careful consideration of contracting strategies and meticulous contract management. Widely diverse and often conflicting stakeholder concerns, including those of residents along the rail corridors, GO Transit customers, rail companies, and four levels of government, had to be considered and reconciled over the life of the Program.

AGM Program Managers successfully addressed these numerous logistical and technical challenges and met GO TRIP's goals during the delivery of this complex Program. The critical task of maintaining uninterrupted GO Transit and rail system operations while expansion took place was achieved and, overall, GO TRIP was implemented with **minimal impact to the GO Transit ridership, residents along the rail corridors, and railway companies.**

The Program's application of an integrated design and project management approach involving GO Transit, CN and CP Rail, consulting engineers, contractors and key stakeholders ensured a high-level of technical excellence, all of which contributed to the overall success of GO TRIP. Rigid control over Program expenditures, through utilization of processes such as value engineering and application of innovative and leading edge technologies, resulted in on-time and within budget completion of the Program.

AGM Program Managers introduced alternative procurement processes, including design-build contracts, to GO Transit procurement system, increasing the likelihood of on-time completion of projects within authorized cost and to the required quality standards.

The Program witnessed the first major application of mechanically stabilized earth (MSE) walls for rail embankment support, as well as the first significant use of the Giken press-in piling method in Canada, allowing for vibration-free installation of pipe piles within a congested rail corridor.

New and **innovative technology** was utilized for installation of a pre-assembled bridge section for the rail bridge over the Credit River. The overnight installation process provided a safer and more cost-effective alternative to the more common practice of assembling the bridge over the river, allowing for installation without any interruption to commuter service.

GO TRIP made significant contributions to the economic, social and environmental quality of life in the Southern Ontario region. Level of service to GO Transit customers was improved considerably as a result of the Program, with **reduced travel time for commuters, an increase in system capacity, enhanced on-time train performance, and improved step-free accessibility for GO customers.**

Improvements in GO Transit service as a result of GO TRIP facilitated a **reduction in vehicular traffic and related road congestion in the region**, where average commuting times are among the highest of major North American cities. Based on the increase in service, GO Transit estimated that the Program resulted in the elimination of one million kilometres of daily car travel in the region, with a commensurate **reduction in the region's greenhouse gas emissions and carbon footprint.**

AGM facilitated a **unique collaboration** with the Royal Botanical Gardens in the Hamilton area where embankment restoration developed into protection programs for an environmentally sensitive area and restoration projects directed towards native animal and vegetation species.

GO TRIP resulted in **over 4,000 person years of work** over the life of the Program, mainly in the consulting and construction industries, as well as enhanced economic opportunity in communities that were added to the GO Transit commuter system.

AGM Program Managers' application of an integrated design and project management approach resulted in successful delivery of a highly complex and challenging \$700 million program, the largest commuter rail project in Canada's history. With its alternative procurement processes, precedent-setting technical innovations and collaboration with Program stakeholders, GO TRIP exemplifies solution-driven engineering excellence in response to demanding project management challenges.



Full Project Details

Full Project Details

GO TRIP focused on increasing the capacity and reliability of GO Transit's commuter rail network while improving passenger safety and system security. Reduction of the interface between GO trains and growing volumes of CP and CN freight traffic through overpass development was critical to the system's reliability. Extension of GO Train service to population centres such as Barrie expanded the system's overall service area while improvements to the northwest rail corridor were designed to support the Air Rail Link between Toronto Pearson International Airport and Union Station in downtown Toronto (scheduled to commence service prior to the 2015 Pan Am Games).

AGM Program Managers, a consortium of Hatch Mott MacDonald, IBI Group and MMM Group, was selected by GO Transit in 2003 to implement the GO TRIP initiative by providing overall management of engineering and construction services. AGM's specific responsibilities included:

- Management of eight environmental assessments
- Public consultations, government agency and stakeholder coordination
- Procurement and management of 80 consultant and construction contracts
- Technical reviews
- Environmental compliance
- Operational analysis

Project Components

Overall, GO TRIP included development of:

- 100 km of new track
- Three grade separations
- Sixteen new bridges
- Two layover facilities
- Seventeen station expansions to accommodate new track and longer trains
- Two feasibility studies for new rail lines

GO TRIP consisted of eleven major projects in the following three distinct areas: rail expansions; layover facilities and platform expansions; and grade separations. Additional information for the following projects can be found on page 6.

Rail Expansions

- Lakeshore Corridor West (West Section) Expansion
- Lakeshore Corridor West (East Section) Expansion
- Lakeshore East Rail Expansion
- Georgetown North Expansion
- Bradford to Barrie Rail Expansion

Layover Facilities and Platform Expansions

- Milton Layover Facility
- Barrie Layover & Storage Yard
- Milton 12-Car Platform Extensions

Grade Separations

- Hagerman Rail-to-Rail Grade Separation
- Bradford-Snider Rail-to-Rail Grade Separation
- Georgetown South Expansion

Meeting the Award Objectives

Innovative Engineering Solutions to Complex Project Management Challenges

Of key importance in the implementation of GO TRIP was the minimization of impacts on day to day operations of GO Transit, a considerable challenge given the size of the Program and the numerous component projects. Intricate planning and programming was required for staging of the individual components of the program, involving development of detailed project implementation and construction staging schedules. Physical constraints along rail corridors created a difficult environment for construction while stringent permitting and approval processes required by provincial, federal, and local conservation authorities further contributed to the complexity of the Program.

The seven year span of the Program involved 80 design and construction contracts with consultant and contractor groups, requiring careful consideration of contracting strategies and detailed contract management. Widely diverse and conflicting stakeholder concerns, including those of residents along the rail corridors, GO Transit customers, rail companies, and four levels of government, had to be considered and reconciled over the life of the Program.

AGM Program Managers successfully addressed those logistical and technical challenges and met GO TRIP's goals in the delivery of this highly complex Program. The critical task of maintaining uninterrupted GO Transit and rail system operations while the expansion took place was achieved and, overall, GO TRIP was implemented with minimal impact to the GO Transit ridership, residents along the rail corridors, and the rail companies.

The Program's application of an integrated design and project management approach involving GO Transit, CN and CP Rail, consulting engineers, contractors and key stakeholders ensured a high-level of technical excellence, all of which contributed to the overall success of GO TRIP.

Rigid control over Program expenditures, through utilization of processes such as value engineering and application of innovative and leading edge construction technologies, resulted in on-time and within budget completion of the Program.

Innovations introduced by AGM Program Managers which were instrumental in the successful execution of the Program included the following:

- Introduction of alternative procurement processes to the GO Transit procurement system, increasing the likelihood of on-time completion of projects within authorized cost and to the required quality standards. Use of the design build project delivery system, for example, was used to minimize the project risks for GO Transit while reducing the delivery schedule by overlapping the design and construction phases of projects.
- First major application of mechanically stabilized earth (MSE) walls for rail embankment support.
- First significant use of the Giken press-in piling method in Canada, which allowed for vibration-free installation of sheet piles along congested rail corridors.
- New and innovative technologies for installation of a pre-assembled bridge section for the rail bridge over the Credit River. The installation process provided a safer and more cost-effective alternative to the more common practice of assembling the expansion over the bridge, allowing for installation without any interruption to commuter service.

Contributions to Economic, Social and Environmental Quality of Life

GO TRIP made significant contributions to the economic, social and environmental quality of life in the Southern Ontario region.

Level of service to GO Transit customers was improved considerably as a result of the Program, with reduced travel time for commuters, an increase in system capacity, enhanced on-time train performance, and improved step-free accessibility for GO customers.

Improvements in GO Transit service as a result of GO TRIP facilitated a reduction in vehicular traffic and related road congestion in the region, where average commuting times are among the highest of major North American cities. Based on the increase in service, GO Transit estimated that the Program resulted in the elimination of one million kilometres of daily car travel in the region, with a commensurate reduction in the region's greenhouse gas emissions and carbon footprint.

GO TRIP rail track improvements facilitated a unique collaboration involving the Royal Botanical Gardens in the Hamilton area where embankment restoration developed into protection programs for an environmentally sensitive area and restoration projects directed towards native animal and vegetation species.

GO TRIP resulted in over 4,000 person years of work over the life of the Program, mainly in the consulting and construction industries, as well as enhanced economic opportunity in communities that were added to the GO Transit commuter system.

AGM Program Managers' application of an integrated design and project management approach resulted in successful delivery of a highly complex and challenging \$700 million program, the largest commuter rail project in Canada's history. With its alternative procurement processes, precedent-setting technical innovations and collaboration with Program stakeholders, GO TRIP exemplifies solution-driven engineering excellence in response to demanding project management challenges.

AGM's program management role on GO TRIP ,the largest commuter rail project in Canada's history, included overseeing:

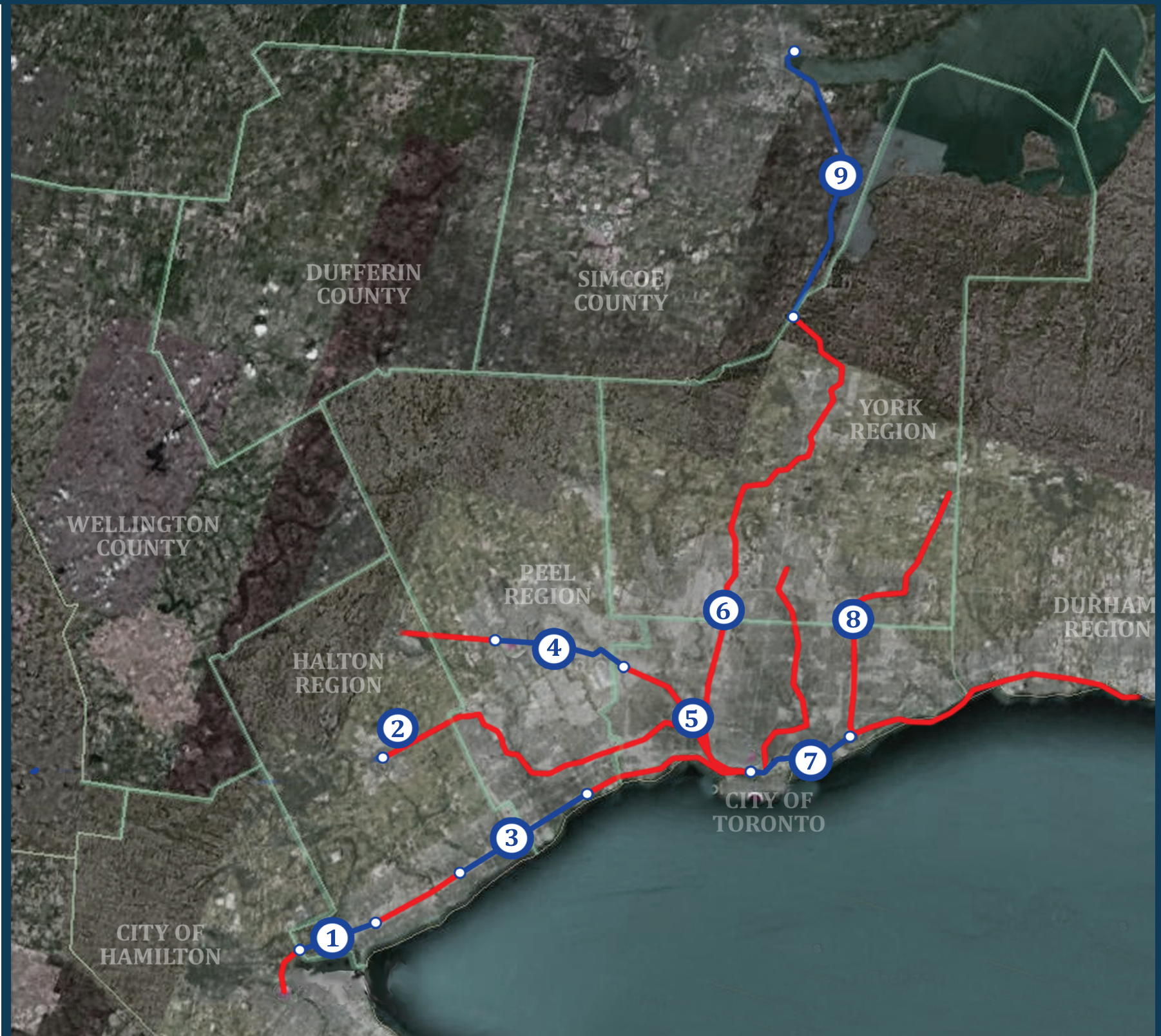
- 8 environmental assessments
- 40 consultant assignments
- 40 construction contracts

The \$700M Program resulted in:

- 100 km of new track on the GO network – to respond to the demand for track time in the GTA and to remove conflicts with other train traffic
- 3 new rail/rail grade separations to eliminate train service conflicts
- 17 station expansions to accommodate new tracks and longer trains
- 1 new station to serve the Barrie area
- 2 new layover facilities to reduce non-revenue train movements
- 16 new bridges to carry additional GO tracks

The Program benefits include:

- Improved GO train service, safety and security
- 21% increase in passenger traffic over past 5 years
- Elimination of one million vehicle kilometers of car travel every day
- Better on-time train performance
- Improved step-free accessibility for GO customers



1 Lakeshore West (West) Expansion (New Track)



2 Milton Layover Facility



3 Lakeshore West (East) Expansion (New Track)



4 Georgetown North Expansion (New Track)



5 West Toronto Diamond Grade Separation



6 Snider Diamond Grade Separation



7 Lakeshore East Expansion (New Track)



8 Hagerman Grade Separation



9 Bradford to Barrie Extension

Individual Project Details

Individual project details for the eleven key projects are provided in the following pages.

Lakeshore Corridor West (West Section) Expansion

The existing two-track section of the Lakeshore Rail Corridor (West Section) between Burlington Junction and Bayview Junction was heavily used by CN freight traffic. Development of a new third mainline track improved the reliability of the existing service to GO Aldershot and Hamilton Stations, and permitted increased peak hour service to these stations. The new mainline track required new structures and station modifications to provide access to the new tracks, to accommodate 12-car trains and to provide for handicapped access.



Lakeshore Corridor West (East Section) Expansion

As part of GO Transit’s service improvements along its western Lakeshore Corridor, a third mainline was added to CN’s right-of-way to reduce conflicts between GO trains, freight trains and other passenger services operating along that corridor. This new third mainline was constructed in several phases in several locations as the new service expanded. This 14.4 km section of track on CN’s Oakville Subdivision began at the Port Credit GO Station near Stavebank Road in Mississauga and ended on the west side of the Oakville GO Station near Kerr Street.



Lakeshore East Rail Expansion

Studies carried out by GO Transit concluded that the growing demand for commuter rail service from the eastern half of the Greater Toronto Area, required additional mainline trackage from suburban Toronto into the downtown. The project comprised of a new third mainline track 12 km in length and reconstruction of existing south side platforms at two stations to convert them into island platforms. Adding to the complexity of this project was the challenging work environment, i.e., highly urbanized, consisting of residential neighbourhoods, industrial areas, urban parkland and numerous major road crossings.



Georgetown North Expansion

Improved level of commuter rail service and reliability at the new GO stations at Mount Pleasant, Brampton and Malton involved addition of elevators, platform de-icing system and handicapped access. The project extended from just east of Malton Station to Winston Churchill Boulevard and the scope of work covered track capacity improvements on the GO Weston Subdivision and CN Halton Subdivision, including improvements to some rail structures crossing roadway and waterway. These included bridges over Fletchers Creek, Etobicoke Creek, Kennedy Road, McLaughlin Road and Dixie Road. A layover facility was constructed at Mount Pleasant GO Station so that the current peak period service could be extended. Modifications were made to all stations to accommodate the 12-car trains and to provide accessibility.



Bradford to Barrie Rail Expansion

The City of Barrie is continually growing rapidly with increasing travel demand between Barrie and the GTA. This project involved the replacement of track and upgrading of signals at crossings. In conjunction with the track upgrades, two other projects were included as part of this work: the new Layover Facility, the new Barrie South GO Station with parking capacity for 450 vehicles, and the new platform at Bradford Station.



Milton Layover Facility

Studies identified the need for a new 8-train, 12-car layover facility to be located near the Milton GO Station along CPR's Galt Subdivision. Upon completion of an environmental assessment, AGM Program Managers continued with the detailed design and construction supervision. This was the first layover facility designed and constructed to support GO Transit's expanded fleet of 12-car consists including the new locomotives.

Milton Layover was also the first facility designed and constructed with GO Transits new wayside power cabinets. Some of the major components included were the design and construction of track and service roads, high voltage substation and associated power distribution, train crew and maintenance building, wayside equipment Motor Control Centres (MCC), Direct Current (DC) systems, Closed Circuit TV (CCTV) communications and associated electrical works.



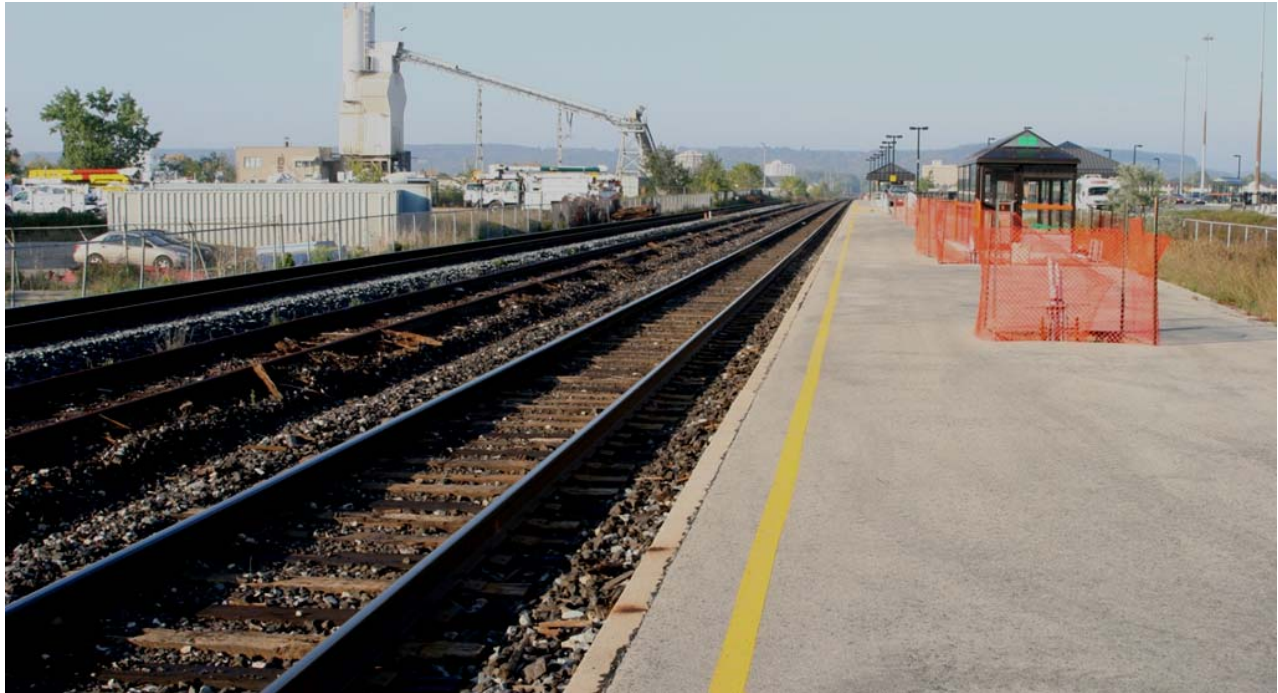
Barrie Layover & Storage Yard

This project included the construction of a GO train layover yard with capacity for existing peak service trains, as well as future capacity for six trains. The construction also included a new crew building, mechanical building and wayside power for trains to plug into overnight.



Milton 12-Car Platform Extensions

The GO Stations along the Milton Line were upgraded to accommodate longer 12-car trains and to provide improved access. The work included Milton Station platform extension; Meadowvale Station platform extension including snow-melt system, new pedestrian tunnel and elevators; Erindale Station platform extension and elevators; Dixie Station platform extension; and Kipling Station platform extension.



Hagerman Rail-to-Rail Grade Separation

The Hagerman Rail-to-Rail Grade Separation was constructed to eliminate the conflict between GO Commuter service in the North/South Uxbridge Subdivision and the CN freight service in the East/West York Subdivision. The project also involved the grade separation of 14th Avenue and the Uxbridge line. Major relocation of existing telecommunications and the municipal utilities occurred. The project was required to allow GO Transit to increase the frequency of train service during peak and off peak hours.



Bradford-Snider Rail-to-Rail Grade Separation

The Snider Rail-to-Rail Grade Separation was constructed to increase the service level in the corridor by removing the operational restriction between the East/West CN York Subdivision freight traffic and the North/South Bradford Corridor commuter service and allow for peak period GO train service to operate across the CN freight corridor.

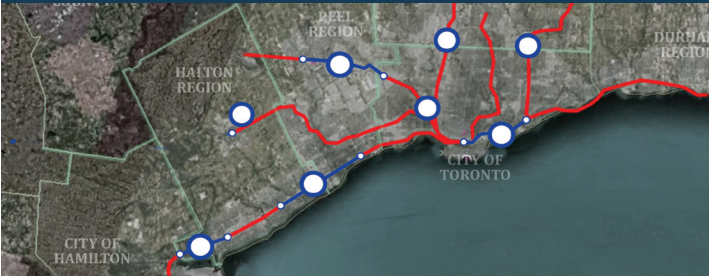


Georgetown South Expansion

The Georgetown South Expansion provided a grade separation between the CP Freight line and the GO commuter rail service in the West Toronto Diamond area. In addition, the project provided support for a new Air Rail Link from Union Station to Pearson International Airport, and future expanded service to Milton, Barrie and Georgetown.



GO TRIP HIGHLIGHTS



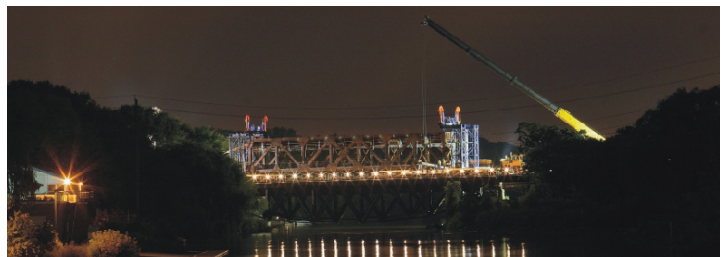
Successful management and delivery of a highly complex and challenging \$700 million Program, the largest commuter rail project in Canada's history



Meeting the commuter demand from expanding regions around Toronto reducing travel time and improving reliability



Significant "value add" through unique partnership with the Royal Botanical Gardens



Application of leading edge technology: MSE walls, tunnel jacking and bridge span hoisting



Introduction of new procurement processes to GO Transit



Creation of 4000 person years of work



Protective environmental measures during construction



Reduction of congestion on the roads in the GTA by elimination of one million kilometres of car travel per day

Phone: (416) 869-3600 ext. 5501
Fax: (416) 869-1755
Email: gary.mcneil@gotransit.com

April 28, 2011

Ms Bronwen Parsons
Canadian Consulting Engineer Magazine
12 Concorde Place, Suite 800
Toronto, ON M3C 4J2

Dear Ms Parsons:

Re: GO Transit Rail Improvement Program

Metrolinx is pleased to provide permission for AGM Program Managers (AGM) to submit their project for Program Management Services for the GO Transit Rail Improvement Program (GO TRIP) for the Canadian Consulting Engineering Awards 2011, project management category. AGM was the consortium of Acres (now Hatch Mott MacDonald), Giffels (now IBI Group) and MMM Group selected by GO Transit to undertake management of the Program.

With the goal of meeting current and future demand for commuter rail service from the GTA communities along its rail corridors, in 2003 GO Transit launched an ambitious program of expansions and infrastructure improvements to its network. The Program funded by three levels of government through the Canada Strategic Infrastructure Fund (CSIF) has had the majority of the projects completed.

To manage the execution and delivery of this \$700 million, seven-year Program, GO Transit solicited proposals from qualified consulting firms from across North America and subsequently selected AGM. AGM staff were located in the GO Transit's headquarter building in Toronto and worked hand-in-hand with GO staff to deliver the Program.

As a result of AGM's efforts, GO was able to deliver the Program efficiently and cost-effectively. AGM provided overall program management and administration of over 80 consulting and construction contracts. In addition to developing and monitoring the implementation plan and the program policies, procedures and standards, AGM was responsible for communications; reporting; document control; estimating; budgeting/cost control; scheduling; design and construction oversight; procurement; value engineering; quality management; CN, CP Rail and stakeholder coordination; and for overall compliance with environmental requirements and railway industry codes and standards.

Innovations introduced by the team included the adoption of design-build contracts into GO Transit's procurement process and the first major application of mechanically stabilized earth (MSE) walls for supporting a rail embankment.

Successful execution of GO TRIP can be attributed, to a large extent, to the professionalism and dedication of the AGM team assigned to the Program. The team members' attention to quality and rigid monitoring of costs and schedule were critical to the successful delivery of the Program. The AGM consulting team demonstrated excellent project management practices, to substantially deliver on the promised projects.

Sincerely,



Gary McNeil
President, GO Transit