GO RER INITIAL BUSINESS CASE SUMMARY | 2015

READY. SET. GO

METROLINX
An agency of the Government of Ontario

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1. Ready. Set. GO.

1.1 Building on success

Metrolinx is bringing faster, more frequent and more convenient service to one of the most respected regional transit systems on the continent–GO Transit. Through Regional Express Rail, GO would meet the needs of far more residents of the Greater Toronto and Hamilton Area, far more efficiently than ever.

The introduction of GO Transit's rail network in 1967 was a big step forward for public transit in the region. The system has evolved from a single GO train line along Lake Ontario's shoreline into an extensive rail network that accommodates nearly 54 million boardings a year. Complemented with GO bus service, the entire GO Transit network connects with 17 transit systems across a vast array of communities in the GTHA and beyond. It was the 2013 winner of the Outstanding Public Transportation System Achievement Award from the American Public Transportation Association and its on-time performance is consistently well above 90%.

Over the past 48 years, GO has provided a regional transit system that met people's needs–bringing commuters from the suburbs into downtown in the morning and home after work. But times have changed, and the nearly seven million people who call the GTHA home need more ways to move around. Today, the regional highway and road network is congested and the GO rail network has the potential to provide significant new travel options across the GTHA.

The Greater Toronto and Hamilton Area will join the ranks of great city-regions like Paris, London and Sydney in having a fast, frequent and convenient regional rail system that serves communities across the region.

1.2 Fixing the GTHA's transportation problem

Congestion is a leading concern of people in the GTHA. It was estimated to cost residents and the regional economy between $6 billion[1] and $11 billion[2] a year in 2006, making it clear that there is a need for updated transportation choices. There are significant economic benefits to solving the problem–and costs for failing too. Some U.S. cities have tried to meet growing travel demand by expanding their highway system. Houston, Los Angeles and Chicago, for example, have five to ten times more highway capacity through their cities and regions than we have here in the GTHA. But they have been unable to stop the growth in congestion.

Metrolinx was created in 2006 to improve the coordination and integration of all modes of transportation in the GTHA, including GO Transit, which merged with Metrolinx in 2009. Metrolinx's mission is to champion, develop and implement an integrated transportation system that enhances prosperity, sustainability and quality of life. One of the linchpins of these efforts is Metrolinx's Regional Transportation Plan (The Big Move), which contains specific strategies to help the GTHA reclaim its regional transportation advantage while bolstering its global competitiveness, protecting the environment and improving people's quality of life.

Metrolinx has steadily introduced more GO train trips over the years, with the goal of transforming the GO rail network from a largely rush-hour service into a comprehensive, all-day regional transit network.

In 2014, the Government of Ontario advanced this goal by committing to bring Regional Express Rail service (RER) to the GO rail network within 10 years as part of its Moving Ontario Forward plan. This document provides an overview of the Initial Business Case for RER service to transform the GO rail system over the next 10 years. While this is an initial business case, and there are details still to be worked out, there is strong evidence that the RER program would benefit the region.

- The program as a whole generates benefits over costs of over 3:1, meaning for every dollar the program would cost, it would generate three dollars in economic benefits.
- By 2029, it is forecast that ridership would grow to approximately 127 million customers, representing a 142% increase in ridership from 2014.
- New services would be provided throughout the weekday, evenings and weekends, leading to substantial increases in ridership in the off-peak periods, augmenting already significant ridership in the peak periods.

[1] http://www.metrolinx.com/en/regionalplanning/costsofcongestion/ISP_08-015_Cost_of_Congestion_report_1128081.pdf

[2] http://www.cdhowe.org/pdf/Commentary_385.pdf

These outcomes and others contained in the Initial Business Case provide the evidence and rationale to proceed with the RER program.

While GO RER service would have many unique characteristics, it bears similarities to regional express rail systems in other city regions, such as the Overground in London, the Réseau Express Régional in Paris, S-Bahn systems in Germany and Sydney Trains in Sydney. These systems typically have the following basic traits:

- frequent, all-day service
- electric trains
- predominantly surface rail lines
- good connections and integration with local transit

With an estimated 10-year capital investment of approximately $13.5 billion (2014$), RER would provide GTHA residents with faster and more convenient transit that would get them where they want to be, when they want to be there–with more comfort and less stress.

RER would improve the time it takes for commuters to complete their journeys in a host of ways. When the tracks and corridors are used more intensively, it becomes worthwhile to invest in track speed improvements, electric trains and equipment, grade separations, and other improvements.

Bringing RER to the GO rail network would use the GO rail corridors to a much more significant extent, enhancing connections between urban centres and providing relief to overcrowded highways, roads and local transit systems.

In addition to reducing journey times, RER would increase transit system capacity. Investing in capital improvements to existing GO rail corridors would mean that additional service and capacity could be provided cost effectively in a built-up urban environment while generating important economic, social and environmental benefits. With the GTHA poised to grow to nine million people by 2031, RER provides one of the most significant means to meet the region's transit needs.

GO RER service would also enhance and benefit from the growth of other transit systems in the region, feeding more riders to and from local buses, LRTs and subways as more people choose to combine them for more trips. The 19 GO stations within the City of Toronto, for example, could see significantly more use given increased service and better integration with local transit. This mutual growth would make projects that are currently underway as part of the Regional Transportation Plan even more useful for people, including the Eglinton Crosstown LRT, UP Express, York VIVA Bus Rapid Transit, the Mississauga Transitway and the planned Hurontario-Main LRT.

1.3 RER in the GTHA: What is being recommended?

The recommendation for RER service on the GO rail network proposes more than a doubling of peak-period service and a quadrupling of off-peak period service compared with today, reduced journey times for some cross-region transit trips by as much as 50%, and a wider range of options to GTHA residents to get around. It includes:

Two-way, all-day 15-minute service or better on weekdays, evenings and weekends:

- for the Lakeshore West line between Aldershot[3] and Union Station
- for the Lakeshore East line between Oshawa and Union Station
- for the Kitchener line between Bramalea and Union Station
- for the Barrie line between Aurora and Union Station and
- for the Stouffville line between Unionville and Union Station

Two-way 60-minute service or better on weekdays, evenings and weekends:

- for the Lakeshore West line between Hamilton GO Centre and Union Station
- for the Kitchener line between Mount Pleasant and Union Station (weekday midday periods only)
- for the Barrie line between Allandale-Waterfront and Union Station
- for the Stouffville line between Mount Joy and Union Station

[3] Service levels west of Burlington GO Station, including service levels at Aldershot, are dependent on infrastructure and service agreements with CN, which owns the rail corridor. Final plans may vary as the 10-year program evolves.

Peak period, peak direction service on weekdays[4]:

- every 15 minutes on the Lakeshore West line between Hamilton GO Centre and Union Station
- every 30 minutes on the Lakeshore West line between West Harbour and Union Station
- every 15 minutes on the Milton line
- every 30 minutes on the Kitchener line between Kitchener and Union Station
- every 15 minutes on the Kitchener line between Mount Pleasant and Union Station
- every 30 minutes on the Barrie line between Allandale Waterfront and Union Station
- every 15 minutes on the Richmond Hill line
- every 20 minutes on the Stouffville line between Lincolnville and Union Station

Express service:

- In addition to the services outlined above, communities between Oakville and Hamilton on the Lakeshore West line, between Bramalea and Kitchener on the Kitchener line, and between Pickering and Oshawa on the Lakeshore East line would enjoy express services to/from Union Station.

[4] Some trips may run closer together than 15 minutes – average headways are presented.

Electrified service focused on the following Metrolinx-owned corridors with the highest service levels:

- the Lakeshore West line between Aldershot[5] and Union Station
- the Lakeshore East line between Oshawa and Union Station
- the Kitchener line between Bramalea and Union Station, including the Union Pearson Express service
- the Barrie line between Allandale Waterfront and Union Station
- the Stouffville line between Lincolnville and Union Station

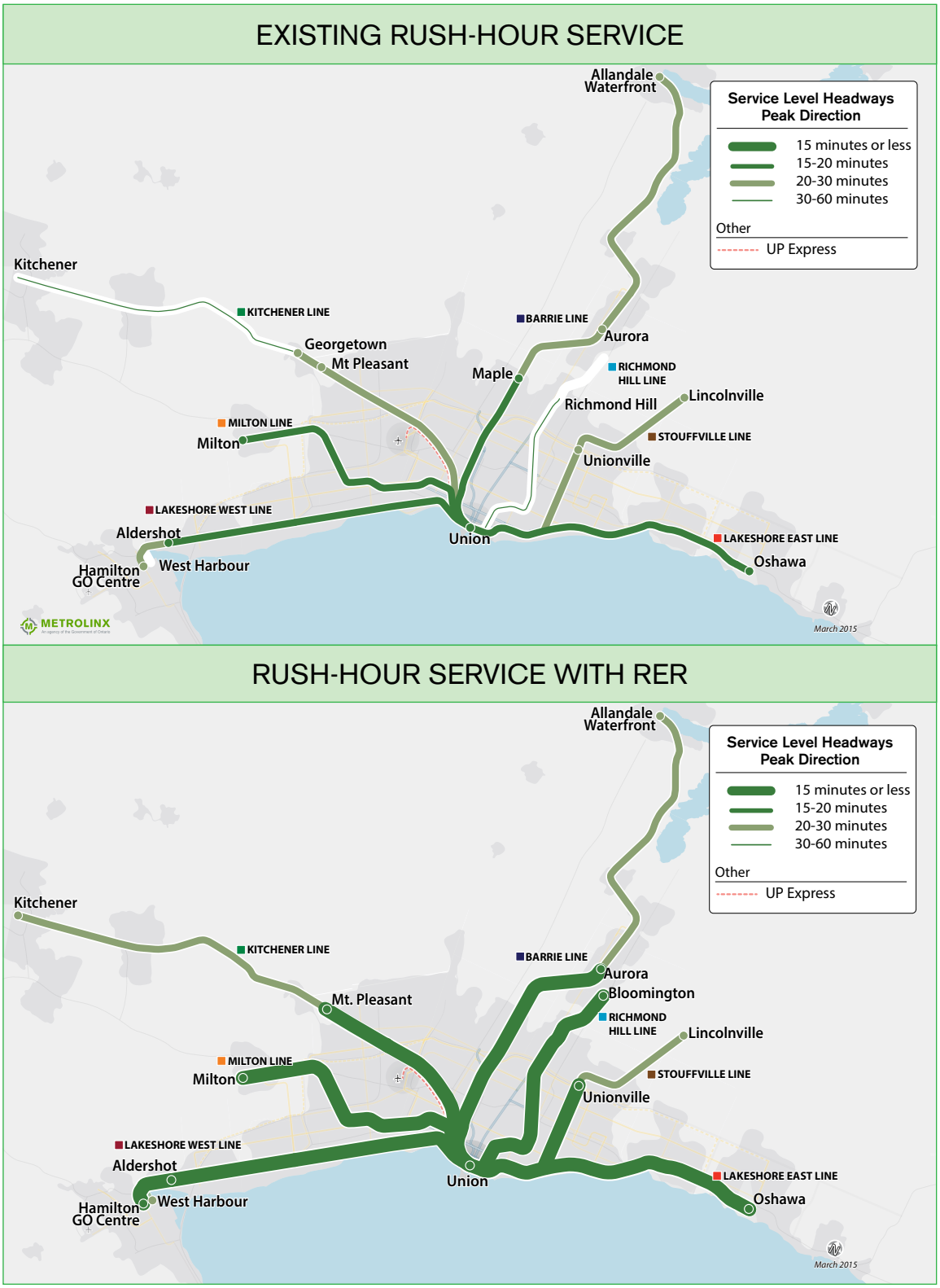
The services outlined above take into account the ownership of rail corridors between Metrolinx, Canadian National Railway (CN) and Canadian Pacific Railway (CPR). Discussions are ongoing with CN and CPR regarding how service could be increased on corridors the rail companies operate as main freight rail lines, including the CP-owned tracks where Milton GO service operates, the CN-owned tracks where Kitchener GO service operates through Brampton, and the CPR and CN-owned tracks where GO Lakeshore West service operates through Burlington and Hamilton. The final RER plan, including the extent of electrification, will be subject to these discussions with CN and CPR, as well as dialogue with VIA Rail Canada, which operates inter-city passenger rail services on these lines.

On the Richmond Hill line, plans need to be developed for addressing flooding issues in the Don River Valley, as well as discussions with CN for the part of the line that operates on tracks owned by CN.

Figure 1 below compares existing rush hour and non-rush hour service levels with service levels planned under RER. As shown, rush hour and non-rush-hour service will be significantly improved with the implementation of the RER plan.

[5] Service levels west of Burlington GO Station, including service levels at Aldershot, are dependent on infrastructure and service agreements with CN, which owns the rail corridor. Final plans may vary as the 10-year program evolves.

Figure 1: Comparisons of rush hour and non-rush hour service levels with levels planned under RER

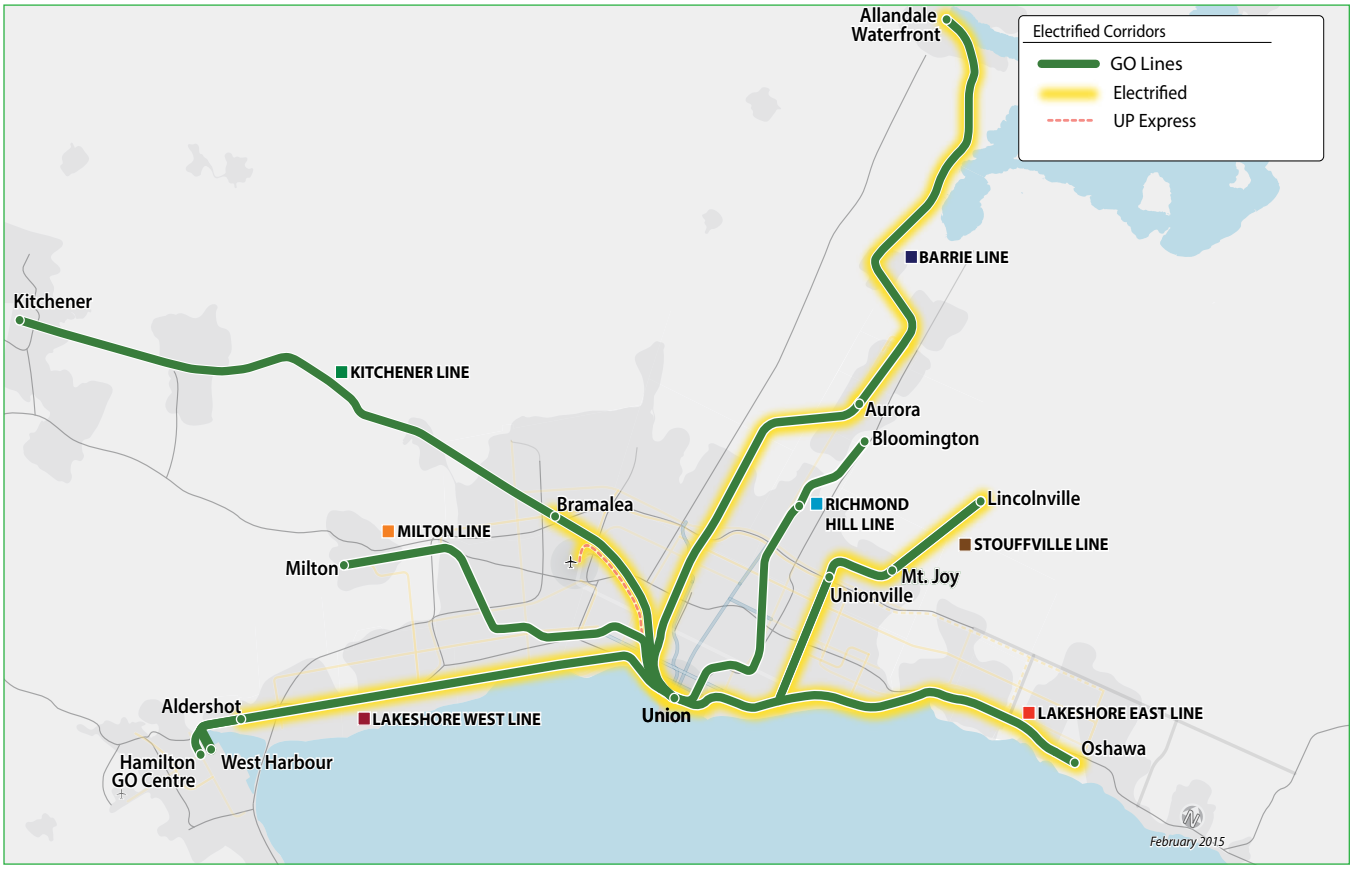


EXISTING SERVICE OUTSIDE RUSH HOURS

NON-RUSH-HOUR SERVICE IN 2025

Figure 2 illustrates the five corridors that would be electrified and how much of each corridor would be electrified.

Figure 2: Illustrating planned electrified corridors on the GO rail system



Connecting with other transit

RER would integrate with the expanding network of transit in the region, connecting with bus, LRT and subway routes operated by different transit providers. Integrating schedules and fares with all transit providers across the region would contribute to the success of RER.

RER would also incorporate elements of the City of Toronto's SmartTrack proposal by providing electrified, frequent, two-way service on GO Transit's Stouffville, Lakeshore East, Union Station and Kitchener corridors. Work with the City of Toronto is underway to help define the SmartTrack additions to Regional Express Rail, including potential additional stations, service levels, fare policies and the proposal to provide a new rail service along Eglinton Avenue West from Mount Dennis to the Airport Corporate Centre. A report to Toronto City Council is scheduled for the fall of 2015.

1.4 Future improvements

The RER program outlined here sets out the plans for the next 10 years. It is subject to change and refinement as discussions proceed with CN and CPR, the City of Toronto and other municipalities in the region. Additional planning, design and engineering work will lead to adjustments to this Initial Business Case and the program. It also lays a foundation for the continued expansion of the GO RER network into the future.

1.5 How a recommendation was reached

Using a framework that is consistent with highly respected, standardized transportation analysis methods, Metrolinx conducted a business case analysis that examined:

- the strategic case–how well the plans align with strategic, regional transportation objectives
- the financial case–how much the project would cost
- the economic case–how the benefits of the project measure up against the costs
- the delivery and operations case–how the project would be procured, delivered and operated

The recommendations emerged after applying this analysis to a range of options–from roughly the status quo all the way to electrified, two-way all-day service every 15 minutes on each rail corridor–and testing different options for each line. The recommended plan would maximize the return on the public investment on all GO rail corridors, and would be affordable within the context of available funds while minimizing risks and allowing for future improvements.

2. The Strategic Case: Who Benefits and How

2.1 Making the regional GO system work for more GTHA residents

GO rail services do an excellent job of carrying commuters to downtown Toronto and back during peak travel periods in the morning and afternoon, which most service is geared toward. While the Lakeshore corridors already offer service in both directions throughout the day, the GO rail network has the potential to provide GTHA residents with far more frequent service, including service in off-peak periods. With RER, many cross-regional trips would become viable by transit for the first time, such as Oakville to Markham and Pickering to Brampton. Peak service on these trips would be increased to meet growing demands, off-peak service would be substantially enhanced, and some journey times cut by as much as 50% during peak periods. On many routes during peak periods, the RER journey time would be faster than the journey time by car. Even when roads are not congested, RER transit times would be attractive, taking into account reduced stress, the ability to make more productive use of time, and increased reliability and predictability.

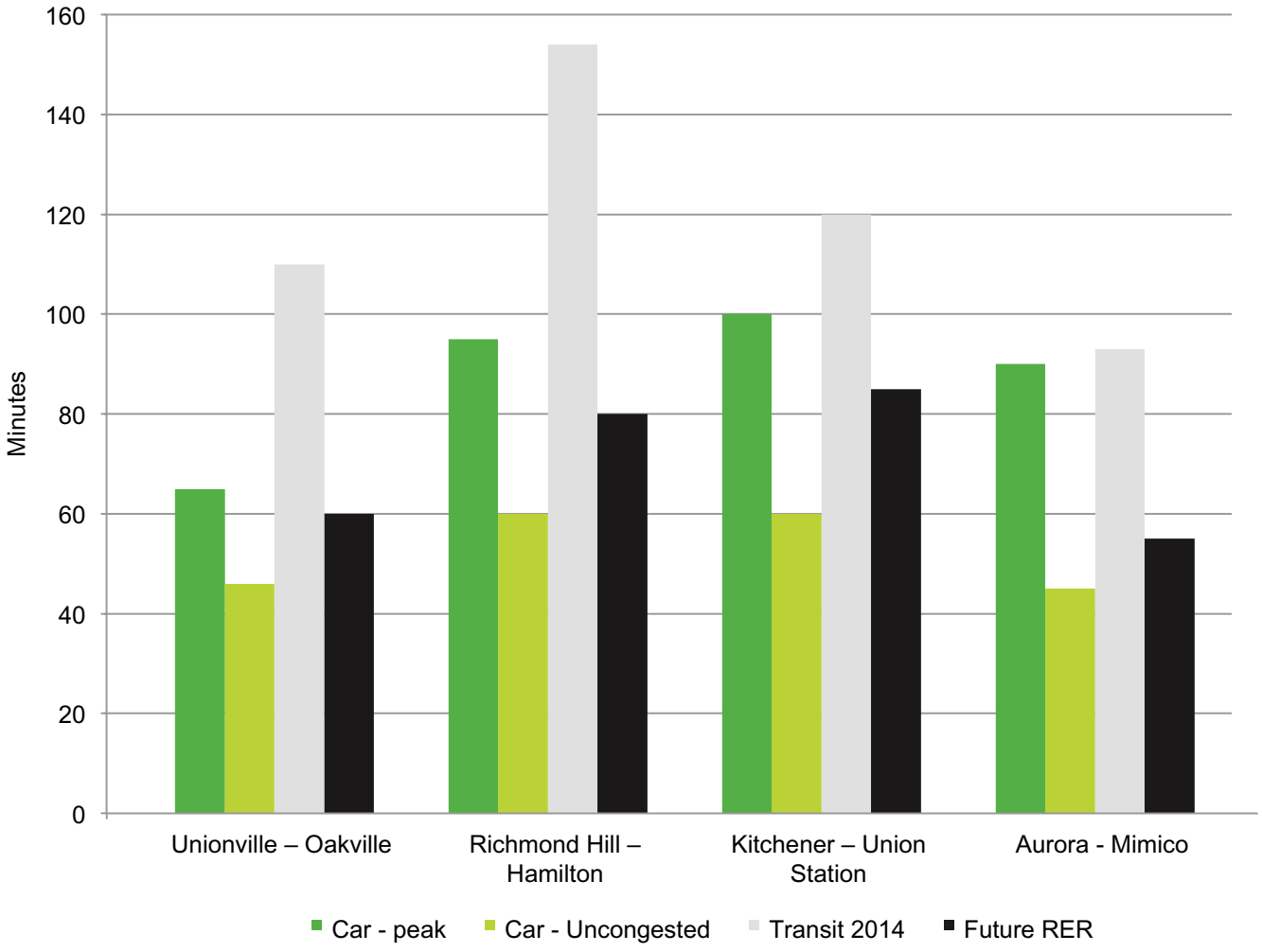
Everyone in the Greater Toronto and Hamilton Area would benefit from RER, but in different ways and for different reasons.

GO Transit and transit customers would benefit through:

- more transit options throughout the region
- improved access to jobs, schools and other crucial destinations
- time savings, through shortened wait times and faster trains
- reduced journey times for longer trips, with electric trains and associated improvements to tracks, stations, control systems and operating practices

The effect would be even more substantial for journeys involving transfers between two or more lines. On many routes, the trip time would be faster than the trip time by car during peak periods. While driving would still be faster for many journeys when roads are not congested, transit times would still be attractive. Figure 3 provides some comparative journey times between selected start points and destinations.

Figure 3: Estimated comparative journey times by car and transit, in 2014 and with RER



Customers who switch from automobile to train would benefit from:

- cost savings, because car operation is typically more expensive than train fares
- time savings in rush hour, when trains run at high speeds–while traffic slows down
- higher productivity, because the time spent on a train can be used to carry out other tasks
- lower stress levels, which can also improve productivity

Road users, including emergency responders and commercial vehicle drivers, would benefit from:

- Congestion relief. Experience indicates that development of an RER system would slow the growth of road traffic and congestion, particularly during off-peak hours, with a larger share of longer-distance regional trips being shifted off the roads.

Residents of communities along heavily travelled transportation corridors would benefit from:

- congestion relief on main roads
- air quality benefits

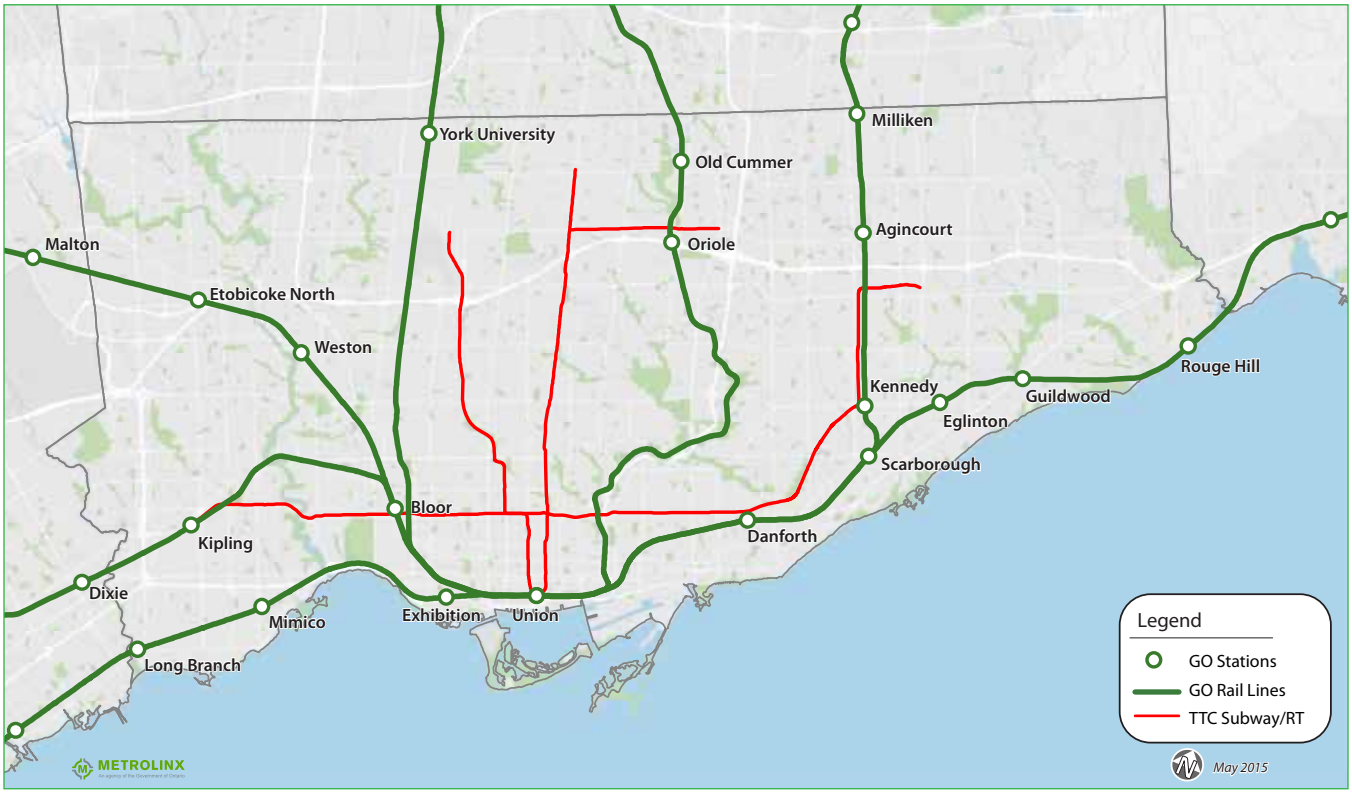
Those who cannot, or do not, drive would benefit from:

- Better transportation options, particularly for those who live at a considerable distance from their workplaces, young people, members of lower-income households, and those who cannot drive because of age or disability
- Access to affordable transit that covers the region, particularly for trips in the mid-day, evenings, and weekends where current service levels are lower.

Residents of Toronto would benefit from:

- New transit options for those living in areas not conveniently served by the subway system at present, but that have GO stations nearby. Figure 4 indicates the potential for the 19 GO stations in Toronto to become important transportation connections, especially in Etobicoke, North York and Scarborough.

Figure 4: GO stations in Toronto



Ontario residents in general

The effects of RER would be felt beyond the immediate region because of the central importance of the GTHA to the provincial and national economy. The subways spurred development around high-volume stations and boosted economic growth. RER would support the Province's efforts to focus new development – both new residential development and employment – in locations well served by transit.

RER would also reduce costs. Electrification of a significant portion of the rail network would reduce the need for diesel fuel and electric multiple unit trains can be run less expensively than heavy diesel locomotives, which would help make the system self-sustaining in the long term. Moreover, RER's ability to connect local transit systems would make the most of previous and future investments in local transit, from vehicles and busways to transit hubs and stations.

Employers/workers

Equally important, RER would provide major economic benefits. Workers would have access to a wider range of jobs, and employers would be able to draw employees from a wider pool as connections across the region make it more convenient for workers to live in one region and work in another. Better matching workers and jobs means more productivity and more competitive businesses. Moreover, by relieving traffic congestion, RER would reduce costs for businesses. A 2006 Metrolinx study concluded that the cost of congestion to the GTHA economy was $3.3 billion per year, due to increased vehicle costs, lost productivity, increased chance of collisions, environmental pollution and other factors, which works out to more than $1,600 per household in 2006 dollars[6]. (This is aside from another $2.7 billion in lost output due to congestion causing higher costs of business activity which the Metrolinx study also identified.) More recent research by the C.D. Howe Institute indicates that the cost of congestion may be higher–instead of $6 billion[7] it may be $7.5 billion to $11 billion[8] a year, which would work out to a per household cost of between $3,600 and $5,000[9]. These higher figures include the costs of reduced interaction among firms and people–the synergies that are a major reason people and firms locate in large cities. The entire province would also benefit from the environmental impact, which would include reduced CO_2 emissions and criteria air contaminants. RER would be powered with electricity, which can be generated from more sustainable, non-polluting sources. RER trains could be equipped with regenerative braking so that power is returned to the system as trains stop.

Finally, RER is part of a much wider effort to change how the region around Toronto functions. The Province has already put in place a Greenbelt to protect natural resources and environmentally sensitive areas, and a Growth Plan to encourage growth in areas that have good transportation links and other services. RER fits with these initiatives. It would improve connections within the region and stimulate further development around stations.

[6] Metrolinx Investment Strategy, May 2013. http://www.metrolinx.com/en/regionalplanning/funding/IS_Full_Report_EN.pdf

[7] http://www.metrolinx.com/en/regionalplanning/costsofcongestion/ISP_08-015_Cost_of_Congestion_report_1128081.pdf

[8] http://www.cdhowe.org/pdf/Commentary_385.pdf

[9] Dachis, Benjamin. Cars, Congestion and Costs: A New Approach to Evaluating Government Infrastructure Investment. CD Howe Institute. July 2013. http://www.cdhowe.org/pdf/Commentary_385.pdf

2.2 Electrification: Faster service, lower operating costs, greener environment

Currently, GO operates most rail services with 10- or 12-car trains powered by diesel locomotives. This is an efficient way to move large numbers of commuters during rush hour, but diesel locomotives are not able to accelerate as quickly as electric alternatives, limiting their ability to travel at top speeds for longer periods.

GO RER service would use a mixed fleet that would include electric multiple unit trains (EMUs). EMUs accelerate faster and can be split into smaller train sets depending on demand, yielding significant cost savings compared to diesel alternatives. Journey times can be reduced significantly with electric traction, depending on route, stopping pattern and equipment, as well as technology and equipment improvements that RER will facilitate.

A shift toward more electrified service will lead to a reduction in greenhouse gas emissions, from the conversion of the trains themselves; the resulting higher ridership and reduced car use in the region; and the benefits resulting from the urban region growing in a way that is aligned with the significantly improved rail system.

Refer to Figure 2 in section 1.3 to see which rail corridors would be electrified and to what extent.

2.3 SmartTrack coordination

The recommended electrified GO RER service on the Stouffville, Lakeshore East, Union Station, and Kitchener corridors supports the City of Toronto's SmartTrack proposal.

To examine ways to integrate SmartTrack with RER, Metrolinx is working with the City of Toronto, the TTC and the Ministry of Transportation. Toronto City Council approved funding for a SmartTrack work plan on February 10, 2015, and the City will prepare a comprehensive SmartTrack report to its Executive Committee for fall of 2015.

Further work on the new stations, service levels and integrated fares included in the SmartTrack proposal, along with public outreach and engagement, will continue to refine the coordination of SmartTrack within the RER program.

3. The Financial Case: How Much Will it Cost?

3.1 A comprehensive cost analysis

In analyzing the options for RER, Metrolinx added up all of the costs and revenues of each option, converted these costs into constant (2014) dollars, and compared all of the costs and revenues with a Base Plan used to evaluate all other scenarios on an incremental basis. The Base Plan would entail investment of approximately $5 billion—mostly on trains, car parking, and other improvements—to expand GO system peak capacity to keep pace with growing demand, without expanding all-day services.

A significant level of analysis was conducted. It involved: examining several service level scenarios defined by the technology used (diesel or electric) and by the timing (peak-period service only, all-day hourly service, or all-day service every 15 minutes); estimating capital investments; estimating operating costs; and estimating revenues from forecast ridership.

3.2 Forecasting ridership

Since RER is a new service concept with a different profile of expected users, traditional ridership forecasting models used in the region need to be adjusted accordingly. Forecasts for many new user groups—such as drivers in off-peak periods—would be refined once advances in forecasting tools and techniques currently under development are available.

Metrolinx has leveraged its extensive experience with GO Transit ridership patterns to develop Initial Business Case forecasts. Ridership during rush hours has been growing by approximately 3% per year, and there are many reasons to expect this growth to continue.

The first step in the analysis involved forecasting future ridership (from the present to 2030) and determining the ratio of trips made during peak periods to those made outside peak periods. Estimates of demand on each route determined the train and track capacity needed to accommodate passengers during peak periods. Estimates have been broken down by station to begin to determine what passenger facilities are needed at each station.

GO RER forecasting takes into account the effects of offering more and faster train services.

When more and faster service is introduced, more people use it, over and above any increase in population and employment. For example, when GO improved hourly off-peak service on its Lakeshore route to half-hourly service, ridership at the affected times increased by 29%. This is consistent with what has been seen in other regions.

Forecasting for non-peak period service takes into account trips that people make for purposes other than work–trips that would become more attractive (or in some cases possible) once the system makes it easy, convenient and affordable to visit friends, go shopping, or keep appointments in places not previously (or readily) accessible by public transit. Experience from other jurisdictions demonstrates that when a regional express rail system is put in place, people start using it in new ways, taking trips they would otherwise have avoided making because they were too inconvenient, time-consuming or expensive. This includes counter-peak ridership such as City of Toronto residents seeking work in the 905 part of the region. The City of Toronto is analysing the potential impact of substantially improved rail service and its potential to realize job clusters outside the downtown by making them more accessible by transit including growth regions in the 905 such as Mississauga and Markham.

Figure 5 provides the estimated growth in ridership, based on the recommended increases in service levels, and anticipated growth in population and jobs.

Figure 5: Forecast increase in peak and off-peak ridership (millions)[10]

GO RAIL LINE	2014 PEAK RIDERSHIP	2014 OFF-PEAK RIDERSHIP	2014 TOTAL RIDERSHIP	2029 PEAK RIDERSHIP	2029 OFF-PEAK RIDERSHIP	2029 TOTAL RIDERSHIP	RIDERSHIP INCREASE 2014-2029
Lakeshore West	10	7	17	16	17	33	93%
Milton	6	-	6	8	-	8	27%
Kitchener	5	-	5	10	5	15	223%
UP Express	-	-	-	-	-	3	-
Barrie	4	-	4	11	11	22	442%
Richmond Hill	3	-	3	3	-	3	18%[11]
Stouffville	4	-	4	7	5	12	217%
Lakeshore East	10	5	14	20	12	32	121%
GO Rail	42	12	54	76	52	127	142%

[10] Totals may not add up correctly due to rounding.

[11] Ridership on Richmond Hill will grow by 18% because 2014 ridership will grow from 2.7 million to 3.3 million in 2029.

3.3 Estimating fare revenues

Fare revenue in 2014 was approximately $330 million. Under the Base Plan, it would grow to approximately $460 million in 2029. However, under the recommended RER program, the number of riders using the network is expected to increase by approximately two and half times, from the 2014 annual rail ridership of 54 million to 127 million in 2029. In the recommended RER program, annual revenue from fares would grow to almost $770 million in 2029. In present value terms over the 60-year period analysed[12], fare revenue would grow from approximately $14 billion in the Base Plan to approximately $20 billion as a result of implementing the recommended RER plan. The increased ridership under the recommended RER plan reflects a business principle: Improvements spur additional demand; additional demand generates additional revenue; additional revenue would, in the case of the RER program, recover operating costs and help to pay down the capital investment over a 60-year period.

Revenues depend on the growth in ridership and the fares paid by existing and new riders, estimated in Figure 5 above for peak periods (rush hour) and off-peak (all other times).

3.4 Service levels: Technology and timing

Metrolinx examined several service-level scenarios defined by the technology used (diesel or electric) and by the timing (peak period service only, all-day hourly service, or all-day service every 15 minutes). It looked at maintaining the existing system with increases in service over time to keep up with increasing commuter traffic in peak periods to a fully electrified RER network with four EMU trains per hour from Union Station on each line.

For each scenario, Metrolinx considered:

- revenue from fares and fees, based on ridership forecasts
- property purchases
- infrastructure costs (such as laying track or adding overpasses)
- electrification costs
- cost of purchasing new trains
- operating costs
- parking requirements
- government subsidy (if needed to bridge the gap between costs and revenues)

[12] Figures presented are present values, calculated over 60 years from 2014-2074, discounted at 3.5%.

3.5 Estimating capital costs

The capital investment estimates draw on GO Transit's long-standing experience with laying track, construction of stations, bridges and other infrastructure, installing and upgrading signalling, purchasing diesel locomotives and unpowered bi-level cars, and acquiring property. Metrolinx also drew on information from systems around the world with comparable RER service to prepare cost estimates for the new elements of the system: electrification, purchase of electric trains, and purchase and installation of advanced train control systems.

Capital construction costs are considered for the purposes of generating the business case (in 2014 dollars) for the full 60-year period. For consistency, certain items go beyond the 10-year build program. For example, approximately $2 billion for rolling stock after 2025 is included in all scenarios to accommodate the need for larger and more trains that would be needed over time as ridership in the peak period continues to grow.

Based on the Initial Business Case analysis, the estimated capital investment to deliver the recommended RER program by 2024 is $13.5 billion (2014$). This compares to an estimated capital investment of approximately $5 billion (2014$) under the Base Plan, briefly described in sub-section 3.1.

3.6 Estimated operating costs

Based on the Initial Business Case analysis, the estimated GO rail operating costs to deliver the recommended RER program over 60 years, discounted to present value, is $12.9 billion (2014$). This compares to operating costs of $10.6 billion over 60 years, discounted to present value, required under the Base Plan.[13]

3.7 Overall cost and revenue comparison

Based on the Initial Business Case analysis, the estimated capital investment and operating costs over 60 years discounted to present value, to deliver the recommended RER program is $25.9 billion. This compares to the Base Plan's estimated capital investment, and operating costs over 60 years discounted to present value, of $15.1 billion–a difference of $10.8 billion in additional capital investment and operating costs under the recommended RER program.

However, as described in section 3.3, estimated GO rail fare revenue under the Initial Business Case analysis would be approximately $6 billion more under the recommended RER program, compared with the Base Plan, in present value terms over the 60-year period analysed[14]. This means the net cost to government under the recommended RER program (compared with the Base Plan) is approximately $5 billion.

[13] Figures presented are net present values, calculated over 60 years from 2014-2074, discounted at 3.5%.

[14] Figures presented are net present values, calculated over 60 years from 2014-2074, discounted at 3.5%.

4. The Economic Case: How Much Would it Benefit the GTHA?

4.1 The benefits of mobility for over seven million people

The main advantage of RER comes down to mobility–for individuals and society. How much time do people have to spend on the road or on transit to get where they want and need to go?

Much of the region's transportation infrastructure was built 50 years ago–and designed to meet expected traffic growth for 50 years. When Highway 401 was widened to 12 lanes in the 1960s, it was expected to meet the region's needs for 50 years. It is now congested throughout the day. In the past half-century, commute times on transit and highways have grown. Many people now spend more than two hours each day driving to and from work, school and other activities.

4.2 Benefits

Benefits of transit and transportation projects include:

- time savings for existing and new transit users
- auto cost savings for drivers who switch to transit
- quality of life benefits, such as improved comfort, convenience and reliability for transit users
- safety benefits, primarily through reductions in road accidents
- benefits to transit users through relief from crowding
- cost and time savings to road users due to congestion relief

Benefits were assigned a dollar value based on standard economic valuation parameters used in the GTHA, combined with evidence from RER projects implemented elsewhere. Figure 6 indicates the net benefits after taking the costs of the recommended scenario into consideration.

Figure 6 also shows preliminary calculations for wider economic benefits, i.e. the benefits of additional business productivity resulting from better matching and connectivity between jobs and workers, and valuation of greenhouse gas reductions.

Figure 6: Net benefits of recommended plan[15]

BENEFIT	2014 $ BILLION (NET PRESENT VALUE)
TOTAL TRANSPORTATION BENEFITS	
Value of time savings for existing transit users	7.7
Value of time savings for new transit users	6.9
Value of time savings for road users in rush hour	2.1
Value of time savings for road users outside rush hour	0.7
Reduction in automobile operating costs	14.7
Safety benefits (reduction in road accidents)	1.6
Total transportation benefits	33.8
TOTAL ADDITIONAL BENEFITS	
Wider economic benefits	1.2
Greenhouse gas reductions	0.7
TOTAL ADDITIONAL BENEFITS	1.9
TOTAL BENEFITS OF RER	35.6

4.3 Calculating net benefits

For the purpose of calculating net benefits, Metrolinx has calculated the total benefits and total costs of building the system. Benefits minus costs represent the net benefits of the RER program.

As described in section 3.7, to calculate the total economic costs of building and operating the system, Metrolinx took the present value of capital investments in the system ($13.1 billion), and added the present value of the operating cost of the system ($12.9 billion)–leading to the total present value cost of the system ($26.0 billion). However in the Base Plan, the GO rail system would have cost present value $4.5 billion in capital investments and another $10.6 billion for gross operating costs for a total cost of $15.1 billion. Therefore, the incremental present value cost to build and operate the recommended RER system–above what would have been required in the Base Plan–is $10.9 billion ($26.0 billion – $15.1 billion).

[15] Numbers may not add perfectly due to rounding.

Therefore, as shown in Figure 7 transportation benefits, plus additional benefits, minus costs, lead to net transportation benefits of $22.9 billion and net benefits of $24.7 billion. This indicates that there is a substantial amount of net benefit and the RER program is worth the investment.

Figure 7: Net benefits[16]

4.4 Benefit:cost ratio

BENEFIT	2014 $ BILLION (PRESENT VALUES)
TOTAL TRANSPORTATION BENEFITS	**33.8**
TOTAL ADDITIONAL BENEFITS	**1.9**
Total benefits	**35.6**
Minus incremental costs to build RER, above Base Plan	**(10.9)**
Net transportation benefits	**22.9**
Net benefits (including Additional Benefits)	**24.7**

Figure 8 compares the estimated benefits and estimated costs of the recommended option to arrive at a ratio of the benefits to the costs. RER would deliver strong value for money because it has a positive ratio of benefits to costs, indicating that even if the costs are somewhat higher than expected, or the benefits are slightly lower, the project would still make economic sense, because benefits would still be higher than costs.

The transport benefit:cost ratio includes traditional transportation benefits. For full transparency, a full benefit:cost ratio including the additional benefits of wider economic benefits and greenhouse gas reductions is shown.

[16] Numbers may not add up perfectly due to rounding.

Figure 8: Benefit:cost ratio of recommended plan

BENEFIT	2014 $ BILLION (PRESENT VALUES)
Total transportation benefits	33.8
Additional costs required to upgrade GO to RER	10.9
TRANSPORT BENEFIT: COST RATIO	**3.1**
Total of all benefits (including GHG reductions and wider economic benefits)	35.6
Additional costs required to upgrade GO to RER	10.9
FULL BENEFIT:COST RATIO	**3.3**

The analysis presented in the Initial Business Case indicates that, on all corridors, significant net benefits are likely to be obtained with the investment in GO to deliver RER service at the level recommended here. The capital investment in electrification and other improvements are justified by benefits outweighing costs by a ratio of more than three to one.

5. Developing RER

5.1 Immediate tasks ahead

Business cases are not static documents. At each stage in the preparation and delivery of a major transportation project, as more information becomes available, each part of the analysis must be reviewed, and, if necessary, updated. The analysis, as well as public consultation, continues throughout the phases of planning, design, construction and operations, with a different emphasis at each stage. The Initial Business Case analysis that is summarized in this document helped specify the recommended RER program described. Further refinements and decisions about the program as it is advanced will be supported by additional analysis. The analysis will then be presented in updated business case information.

In the coming months, Metrolinx will continue to refine its RER plans in consultation with municipalities and their local transit agencies as well as other users of the rail lines: VIA, Canadian National and Canadian Pacific.

As of early 2015, Metrolinx is working with the Province to move ahead with the following tasks:

- developing a project schedule for RER to ensure delivery within 10 years while minimizing disruption to existing transportation systems
- developing detailed design specifications and technical standards for the system of electrification and the electric trains to be used
- seeking federal and municipal support
- identifying and preparing to purchase additional property where necessary

5.2 Cooperation with municipalities

Cooperation with municipalities will make a very good program even better. To bolster RER, Metrolinx will coordinate with the City of Toronto on SmartTrack and with the transit systems in other municipalities. Metrolinx will pursue integration with local transit in terms of routes and fares; access to local transit stations and hubs; development of the Union Station Rail Corridor to meet the demand for additional train and passenger movements; and the encouragement of transit-oriented development that will result in more riders on GO Trains and fewer trips on the regional road network than otherwise would have been the case.

5.3 Engaging stakeholders

Engaging the public and stakeholders is vital to building a transit network that gets GTHA residents where they need to go. In addition to working with municipalities and elected officials, initiatives will seek the views of the public. Together with Ministry of Transportation (MTO), a comprehensive strategy is being developed to explain RER in more detail and to keep the public engaged and informed throughout the program.

The engagement plan will lay out how the RER project team will engage stakeholders, including the establishment of multi-stakeholder committees for each of the seven corridors. Environmental assessments will be conducted where needed. A citizen panel is also being established to reflect community views regarding the proposed Davenport Diamond grade separation, where a new elevated GO corridor is proposed above the CPR corridor, which will be needed if increased levels of service are to be provided on the Barrie corridor.

6. Conclusion: Putting the Regional System in Place

The GTHA is a centre of economic and cultural dynamism, and strong communities. The region is a preferred place to live for newcomers to Canada, a beacon to young people seeking to launch their careers, and a safe, stable, enjoyable place for parents to raise their children.

In the past, the region's transit and transportation infrastructure has made a major contribution to the quality of life that attracts and keeps people and jobs here. But changing needs and new demands require new ways for people to travel across the GTHA. Buses, LRT and subways all have roles to play in meeting the transit and transportation challenges of a large region like the GTHA. But Regional Express Rail would strengthen the GO rail network as the backbone of regional transit by providing a faster, high-capacity system. RER would make transit far more attractive for longer, cross-region and off-peak trips. It would help to ensure that everyone could get the most out of the GTHA's transit and transportation system. In many ways, by providing improved, comprehensive and more flexible mobility, RER would transform not just the service that is offered by GO, but in time, the region around it, and how and where people live and work.

RER would support the region and its growing travel demands by providing needed transportation system capacity and attractive travel options in terms of speed, convenience, comfort and reliability.

It is a financially affordable investment and would create a financially sustainable backbone for the regional transit system far into the future.

It would create tremendous net value as the benefits to citizens and businesses would exceed its costs by a ratio of three to one.

It can be built and delivered in 10 years.

Bringing RER to the GO rail network would mean more frequent, flexible and dependable transit options. It would mean a simpler, hassle-free travel experience to get to work, home, and everywhere in between. It would transform a 20th-century rail system into one for the 21st-century.

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