APPENDIX 2
GO Regional Express Rail 10-Year Program: New Stations Analysis

Board of Directors Report
June 28, 2016

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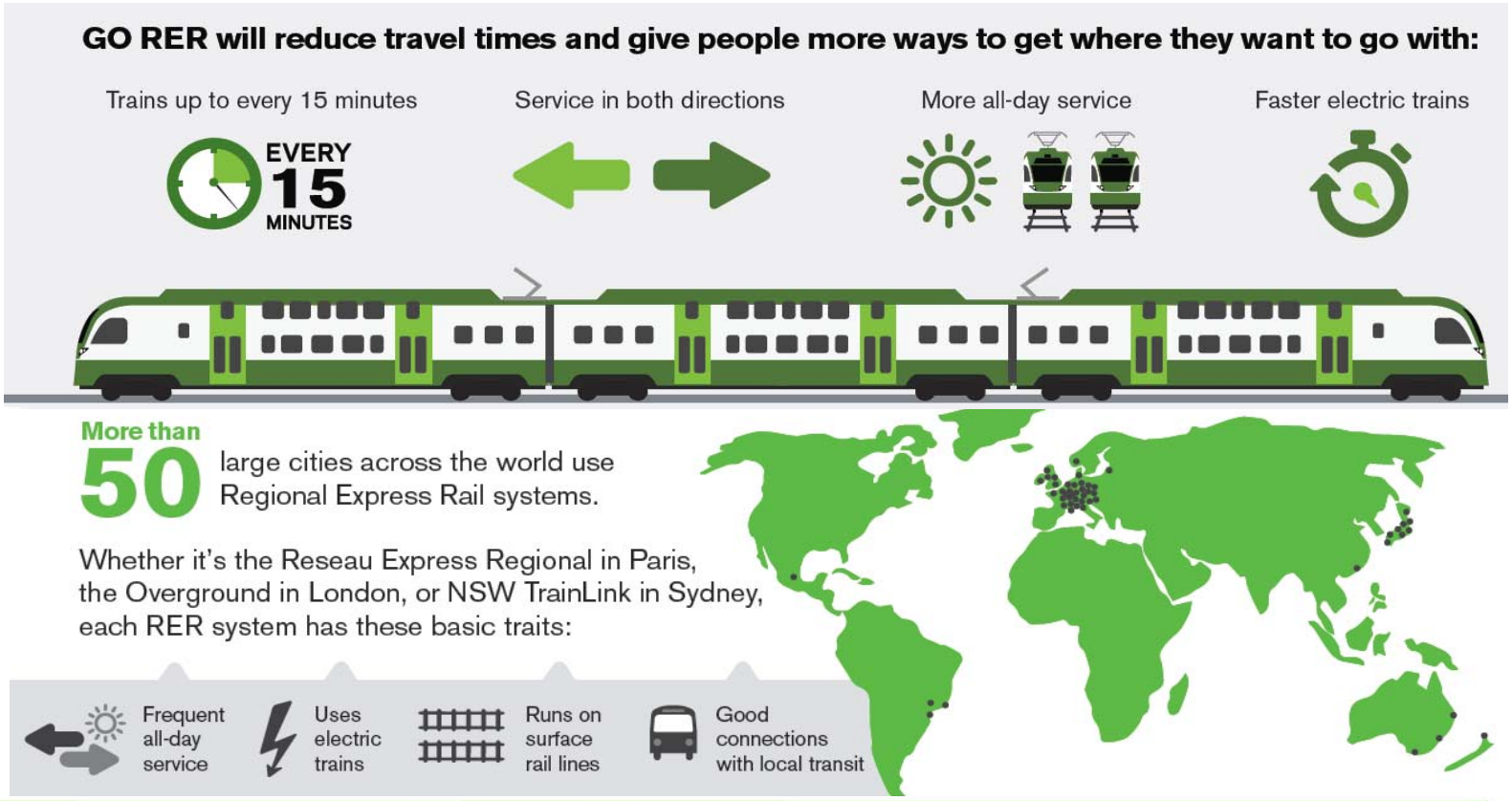
An agency of the Government of Ontario

Defining RER – The Vision



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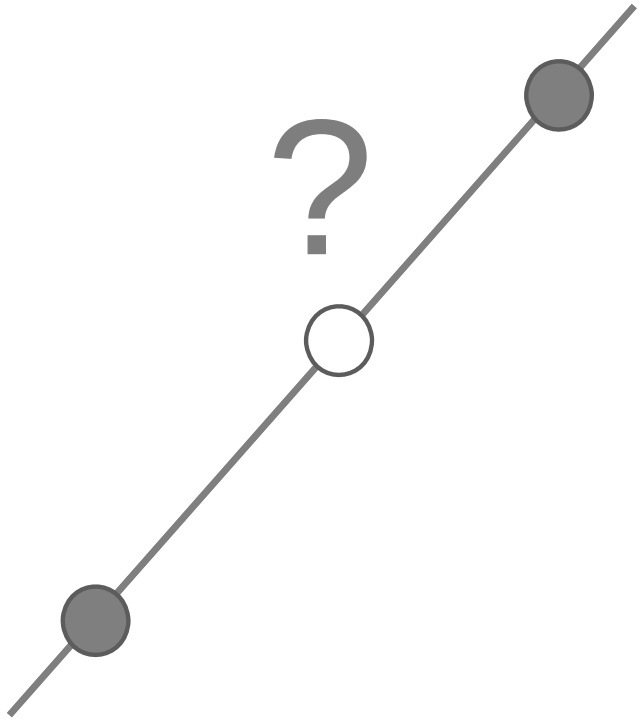
RER 10-Year Program and New Stations

Objectives of New Stations

- Improve service and add riders
- Minimize impact on trip time for existing customers
- Maintain appropriate station spacing for the vehicle technology
- Support existing regional and municipal plans
- Consider the different roles and needs of each location (e.g. adapt to urban and suburban context)



Think Regionally

- RER is part of a larger regional transit network in Regional Transportation Plan
- Scope of new stations work is GO system-wide
- Scope of impacts from any new station are corridor-wide
- Current focus is on new stations that should be included in the RER 10-Year Program.
- In the longer term it is expected that GO service increases will be commiserate with regional growth, prompting the ability to add more new stations.

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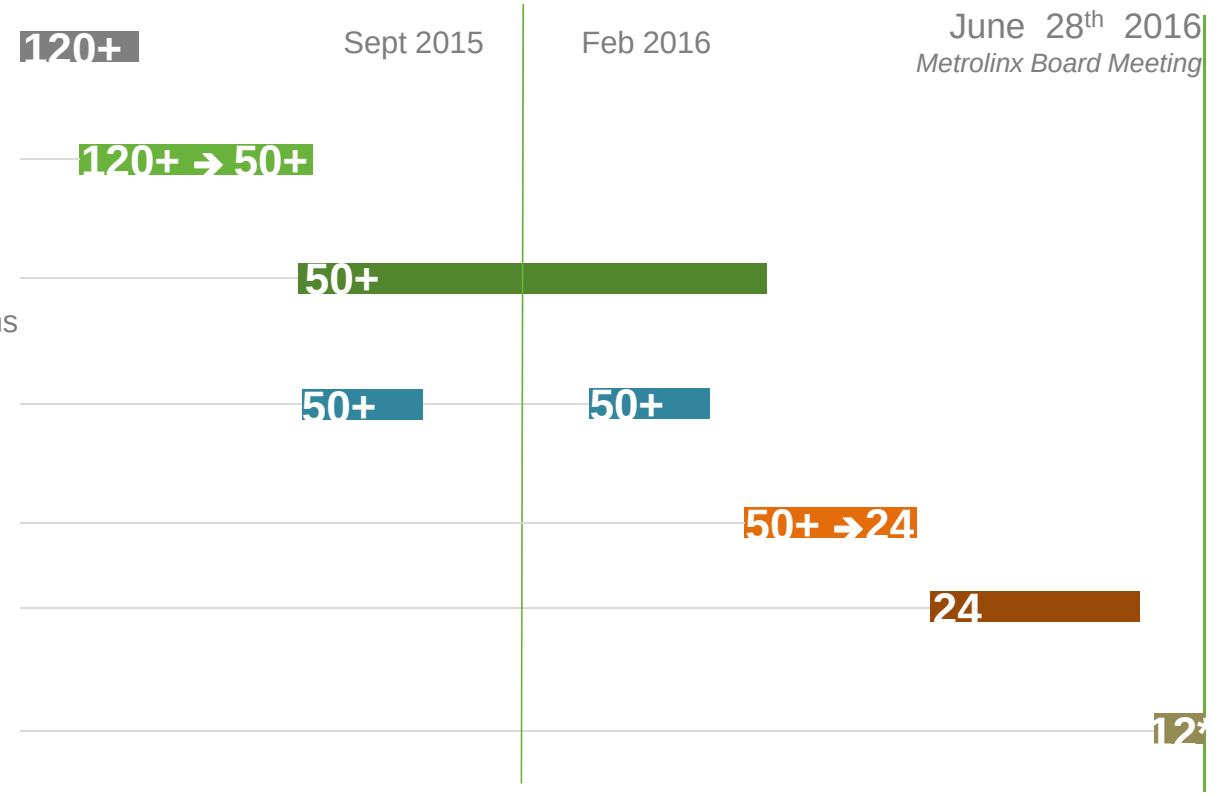
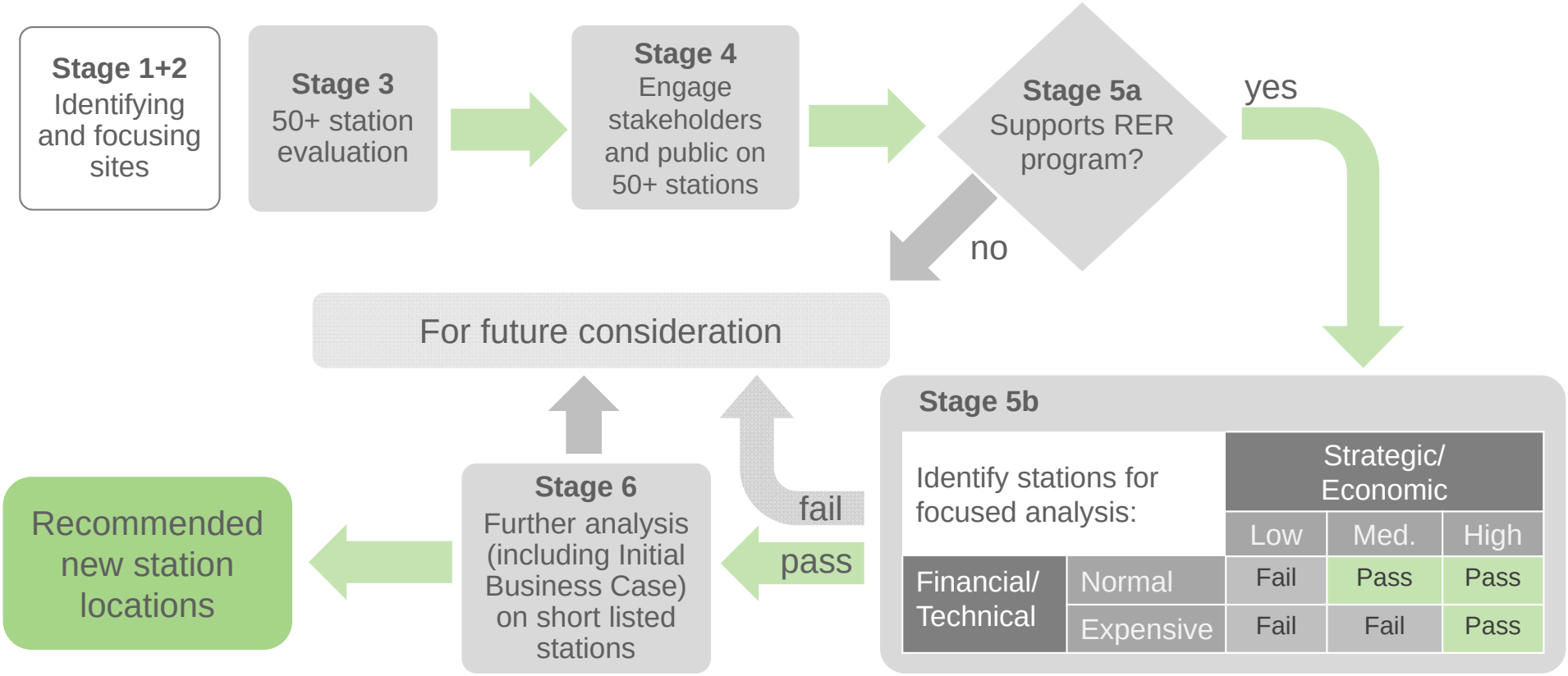
Process to Date

1. Identified an initial list - Identified an initial list 120+ sites using key site and network considerations.
2. Focusing analysis - Analyzed site factors, service considerations and historical requests, to scope list to 50+ sites.
3. Evaluating - Analyzed strategic, economic, technical/operational and cost/revenue considerations of 50+ sites.
4. Municipal & Public engagement - Consultation meetings and online, feedback and review of 50+ sites.
5. Refining the List - Following public engagement, scoped sites for further analysis.
6. Further analysis (IBCs) - A more detailed business case analysis on shortlisted sites to inform recommendations.
7. Recommended New Stations – for inclusion in the 10-Year RER Program*



*Subject to conditions identified in the GO Regional Express Rail Update Report to the Metrolinx Board of Directors, June 28, 2016

Decision Making Process



Stage 4: Municipal and Public Engagement

- The list of 50+ stations was presented to municipal staff for feedback over Fall 2015 and early Winter 2016
- Feedback was sought from the public through a series of consultations. Metrolinx hosted 19 regional Open Houses in total, with approximately 1872 members of the general public that attended.
- MetrolinxEngage.com saw 4249 visitors between February 16 and April 4th, 2016; over 200 public comments posted
- Municipal and public feedback was used to inform the preliminary evaluation and refinement of the locations moved forward for initial business case analysis, and the initial business cases themselves, for example:
  - Developer interest around station sites
  - City of Toronto's Feeling Congested Framework was considered when developing the strategic case criteria

Stage 5 – Evaluation Process Summary

- The initial results of Stage 3 (Evaluating) and Stage 4 (Municipal and Public Engagement) provided a preliminary evaluation of locations.
- Stations were analyzed based on 38 measures. However, nine key criteria were identified that significantly differentiate stations from each other and are better predictors of overall performance. More consideration of policy alignment and development potential in proximity to the potential station was included in the key criteria, based on stakeholder feedback.
- Assumptions about station configuration were based on the context of each location, with most urban locations assumed to provide no parking.

Stage 5 – Refining the List

Identifying locations for further analysis

- Best feasible sites identified so they can be considered in ongoing RER network service planning, infrastructure planning, design and engineering for the 10-year program
- Focus on the locations that will do best in current and future contexts in terms of connections to rapid transit and development potential
- Public and stakeholder consultation ensured the evaluation accurately reflects conditions and expectations.

Criteria	Action
Stations performing well and moderately	Proceed with initial business case
Locations not performing well	Remaining for future consideration

Stage 5 – Refining the List
Key criteria*

* As per February 10th, 2016 Metrolinx Board of Directors RER Stations Update Presentation

Category	Objective	Criteria	Measure/Metric
Strategic/ Economic Planning	Connectivity and Ridership Drivers	How many trips will start and end at this station?	Sum of boardings + alightings
		Does the station connect to other higher order transit modes and have potential to improve network and/or corridor service?	Distance to existing and planned routes
		Does the station connect to key destinations?	Number of nearby destinations and places of interest
	Travel Time Savings	What are the time savings associated with the new station?	Ratio for time penalty of existing riders to minutes saved for new station users
	Market Potential	How well situated is the station in relationship to future market demand?	High level assessment of market potential
	Development Potential	Can the station support future development and intensification? What is the likely timing?	Soft sites; number and scale of recent development proposals
	Policy Alignment	Does the station area align with Growth Plan policy?	Location relative to urban growth centre, built up area, or rural area
Financial/ Technical	Affordability	What is the cost to construct the station?	Relative expected cost
	Ease of construction	Can the required facilities be constructed?	Degree of site constraint

Stage 5 – Refining the List

Why Some Locations Did Not Perform as Well as Others

Locations that do not perform well share similar challenges and constraints, such as:

Prohibitive construction costs or challenges, such as corridor or track limitations:

- e.g. Adding a platform under major roads may impact substantial retaining walls and bridge columns, which may require grade separations to be rebuilt, or corridor widened through significant property acquisition

High time-cost impact, many passengers delayed, few save time through boarding or alighting here:

- e.g. In general, locations closer to Union can delay thousands of passengers already on a train. However, a location performs well if it saves many nearby passengers time by shortening their overall trip time from origin (e.g. home) to final destination (e.g. work), counterbalancing the effects of delays to passengers already on the train

Few nearby regional destinations:

- e.g. Some locations have very few regional destinations such as employment, schools, government services, or a confluence of unique retail

Stage 5 – Refining the List

Why Some Locations Did Not Perform Well as Others (cont'd)

Unsupported by Provincial growth policy, constrained by Greenbelt or area of limited growth:

- e.g. A station in or near designated Greenbelt lands would have constrained future development potential, and may be inefficient for local transit to access and serve

Unsupportive of current or planned land uses and/or low densities, such as warehouses, mature residential neighbourhoods:

- e.g. Light industrial and warehouse areas are often more car-dependent and do not facilitate transit ridership; the large properties and intersection spacing limit walk-up access surrounding single family homes limit potential ridership compared to areas where multi-unit dwellings are the norm; established neighbourhoods may be less supportive of introducing higher densities in future

No major new infrastructure to facilitate station construction within current RER program, such as the Richmond Hill Line, Milton Line

Stage 6 – IBCs Conducted on these Locations (24 sites)

Initial Business Cases Completed		
GO Corridor	**Location**	**Municipality**
BA	Spadina	Toronto
BA and KI	DOWNTOWN WEST: LIBERTY VILLAGE, DUFFERIN-QUEEN WEST, LANSDOWNE	Toronto
BA	Bloor-Davenport	Toronto
BA	St. Clair (Barrie Line)	Toronto
BA	HWY 7-CONCORD, YORK UNIVERSITY	York (Vaughan), Toronto
BA	Kirby	York (Vaughan)
BA	Mulock	York (Newmarket)
BA	Innisfil	Simcoe (Innisfil)
KI	St. Clair (Kitchener Line)	Toronto
KI	Breslau	Waterloo (Woolwich)
LSE and SV	DOWNTOWN EAST: DON YARD, UNILEVER, QUEEN-EASTERN	Toronto
LSE and SV	GERRARD: DUNDAS EAST-LOGAN, GERRARD	Toronto
LSE	Whites	Durham (Pickering)
LSW	PARK LAWN, MIMICO	Toronto
SV	Lawrence East	Toronto
SV	Ellesmere	Toronto
SV	Finch East	Toronto

- Initial Business Cases (IBC) were undertaken on the refined list of 17 locations (24 individual station sites, with some analyzed as part of a cluster).
- Sites analyzed through multiple lenses:
  - Strategic
  - Economic
  - Financial
  - Deliverability/operational considerations

LEGEND
CAPS = “clusters”: several locations in close proximity, only one to be recommended

Decision Making

Stage 6
17 IBC analyses (24 sites)

Step 1
Rank sites based on IBC performance

- High
- Medium
- Low
- Very Low

Step 2
Consider sites based on network fit and community support

+ −

Step 3
Categorize and recommend sites for inclusion in RER Program

- Included
- Not Included

Step 1 – Individual Station Performance

Initial Business Cases inform the relative ranking of stations based on the four cases and key sensitivities, including:

Strategic
- Policy alignment
- Natural environment
- Proximity to low-income community

Economic
- Net Present Value*
- Ridership, safety, GHG
- Travel time impacts
- Capital and operating costs recovery
- Development potential

Financial
- Capital and operating costs
- Ridership and new revenue

Deliverability/Operational
- Constructability
- Operating/service impacts

Magnitude of impact for sensitivities
- Alternate fare scenarios
- Alternate development scenarios

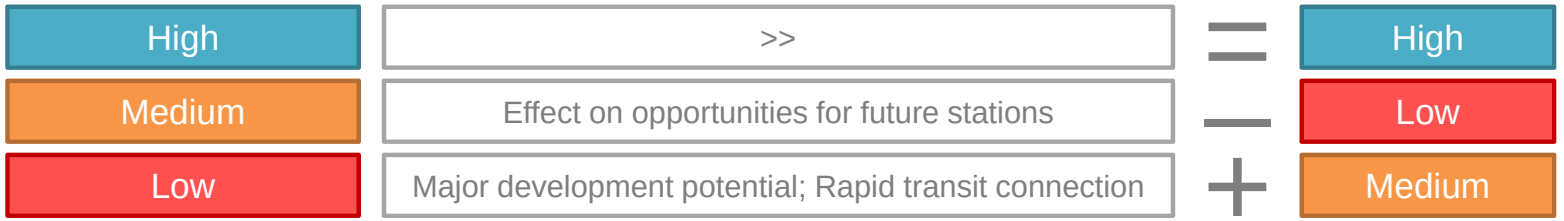
*See Appendix on Economic Analysis

High	all stations with **positive** economic performance: bring economic value to the region, meet key station objectives
Medium	sites with **marginal** economic performance but advantaged by strategic factors or sensitivities with **likely** positive impacts.
Low	sites with **marginal** economic performance but disadvantaged by strategic factors or sensitivities with **likely** negative impacts **OR** sites with **poor** economic performance but advantaged by strategic factors or sensitivities
Very Low	stations with **lowest** economic performance, which are not advantaged by strategic factors or likely sensitivities

Step 2 – Network Fit Considerations

- Apply a broader network lens that prioritizes individual stations *within* their corridor (versus across corridors) depending on:
  - connections to rapid transit
  - support from the wider community
  - effect on opportunities for future stations
  - spacing in relation to other existing or new stations on the line to ensure that impact on travel times is minimized

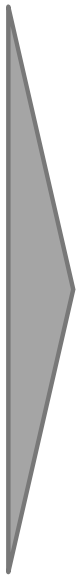
Examples:



Step 3 – Station Recommendations

Rank potential stations along each corridor to account for distribution and optimize corridor performance:

- Identify **two stations** per line to preserve the trip time savings gained through electrification
- Provide for **one additional station** if it is located toward the end of the line, which would impose less travel time delay
- Consider up to **one additional station with network fit advantages** on the condition of more detailed assessment of network capacity and service plan impacts



Included in GO RER 10-Year Program

Stations based on individual performance and/or with Network Fit, subject to further detailed analysis and conditions required to address contextual issues and/or determine network capacity

Not Included in GO RER 10-Year Program

1) Stations in **clusters** that are relegated based on superior performance of alternate location (i.e. may not be inherently poor performers but only one in cluster can proceed)
2) **Very Low** stations and **Low** without Network Fit factors. These are locations that will not be pursued within 10-year RER program

Recommendations: Barrie corridor

Corridor	Station	Category	Conditions
Barrie	Spadina	Included	Subject to review of long-term (beyond 10-year RER program) train storage needs
	Bloor-Davenport	Included	Subject to further analysis of corridor service implications and commitment by the City of Toronto to provide accessible, weather-protected, pedestrian connection to Lansdowne Subway Station
	St. Clair West	Not Included	
	Highway 7-Concord	Not Included	
	Kirby	Included	Subject to corridor service planning and further analysis of service implications
	Mulock	Included`	A grade separation at the location as well as further Metrolinx analysis are required
	Innisfil	Included	Subject to existing financial agreements between City of Barrie and Town of Innisfil, confirmation of specific station location by the Town of Innisfil / County of Simcoe, and potential EA amendment or new EA.

LEGEND
Included = Included in the GO RER 10-Year Program
Not Included = Not Included in the GO RER 10-Year Program

Recommendations: Kitchener and Lakeshore corridors

Corridor	Station	Category	Conditions
Kitchener	Liberty Village	Included	Subject to further development of corridor service plan and track configuration
	St. Clair West	Included	Subject to corridor service planning and further analysis of service implications
	Breslau	Included	Subject to confirmation of specific station location by Township of Woolwich / Region of Waterloo
Lakeshore East	Don Yard/Unilever	Included	See Stouffville Corridor for Conditions (serves both corridors)
	Gerrard	Included	See Stouffville Corridor for Conditions (serves both corridors)
	Whites	Not Included	
Lakeshore West	Park Lawn	Not Included	

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Included = Included in the GO RER 10-Year Program
Not Included = Not Included in the GO RER 10-Year Program

Recommendations: Stouffville Corridor

Stouffville	Don Yard/Unilever	Included	Specific location subject to further technical analysis, corridor service plan, and discussion with public and private landowners
	Gerrard	Included	Subject to detailed consideration of specific station location with the City of Toronto
	Lawrence East	Included	Subject to corridor service planning and further analysis of service implications
	Finch	Included	Subject to corridor service planning and further analysis of service implications
	Ellesmere	Not Included	

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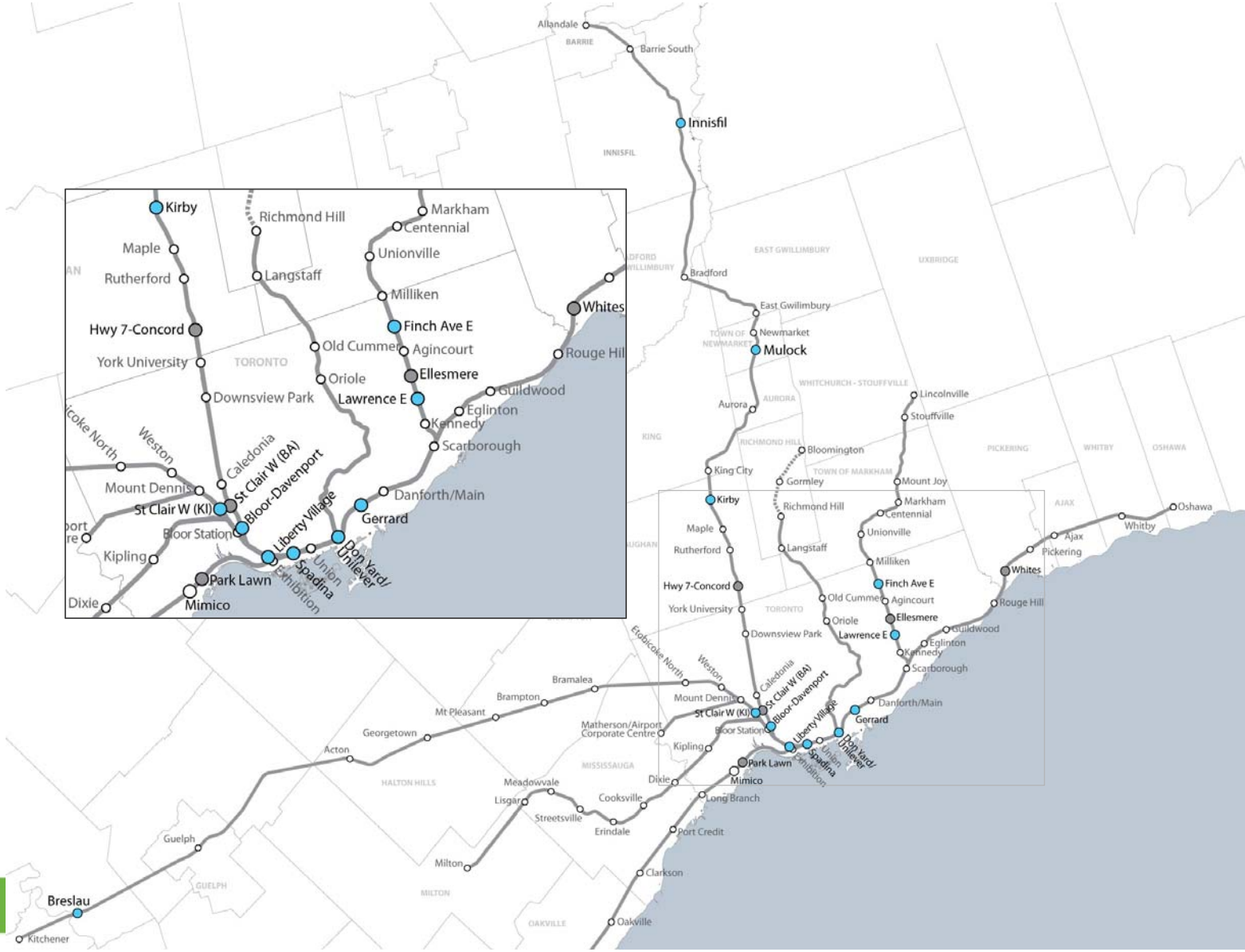
GO Network

LEGEND

- Included in the GO RER 10-Year Program
- Not Included in the GO RER 10-Year Program
- Existing/Committed



Next Steps

1. Proceed with recommended New Stations

as set out in staff report of June 28th 2016 subject to:

- Formal confirmation by of funding and any conditions identified in the June 28th Metrolinx staff report
- Detailed technical analysis of corridor service plans

2. Detailed station planning and procurement

(2016+)

- Business case updates on recommended sites as required
- Begin TPAP/EAs
- Preliminary and detailed design

3. Construction (2018+)

- Construction (staged within RER program)

Next Steps (continued)

The following stations are not being included in the GO RER 10 year program at this time. However, this does not mean that the stations will not be considered for inclusion in the GO rail network in the future. Metrolinx will continue to work with municipalities to improve the strategic, economic, financial, and operations cases for these locations and bring them forward for consideration. Additional factors for consideration will include land use in the area that supports transit-oriented development and optimizes provincial transit infrastructure investments:

- Barrie Corridor: Highway 7–Concord
- Lakeshore West Corridor: Park Lawn, Walkers Line-Cumberland
- Kitchener Corridor: Woodbine-Highway 27

The remaining 24 stations that did not undergo initial business case analysis are identified for future consideration in the context of longer term regional transportation planning.

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APPENDIX A

Locations For Future Consideration – Would Require IBC Analysis

Stage 5 – Locations For Future Consideration – Would Require IBC Analysis

GO Corridor	Location	Municipality
BA	Bathurst/Side Road 15	York (King)
KI	Woodbine-Highway 27	Toronto
KI	Islington	Toronto
KI	Heritage	Peel (Brampton)
LSE and SV	Parliament-Cherry	Toronto
LSE and SV	Jones	Toronto
LSE and SV	Greenwood	Toronto
LSE and SV	Coxwell	Toronto
LSE	Lakeridge	Durham (Ajax/Whitby)
LSW	Roncesvalles	Toronto
LSW	Kipling	Toronto
LSW	Winston Churchill	Peel (Mississauga) / Halton (Oakville)
LSW	Maple Grove	Halton (Oakville)
LSW	Dorval	Halton (Oakville)
LSW	Walkers Line/Cumberland	Halton (Burlington)

(continued next page…)

LEGEND
CAPS = “clusters”: several locations in close proximity, only one to be recommended

* per the Decision Making Framework, locations on corridors that are not significantly impacted by the GO RER program (i.e. electrification and major track infrastructure improvements) were not considered at this time.

Stage 5 – Locations For Future Consideration – Would Require IBC Analysis (continued)

GO Corridor	Location	Municipality
MI	EAST MALL/WEST MALL*	Toronto
MI	Cawthra Rd/Dundas W*	Peel (Mississauga)
MI	Trafalgar*	Halton (Milton)
RH	WEST DON: Queen, Dundas, Gerrard*	Toronto
RH	Millwood [CN Leaside]*	Toronto
RH	Eglinton [CN Leaside]*	Toronto
RH	Don Mills-Bond*	Toronto
RH	York Mills*	Toronto
RH	John St-Green Ln*	York (Markham)
RH	16th Avenue*	York (Richmond Hill)
SV	14th Avenue	York (Markham)

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* per the Decision Making Framework, locations on corridors that are not significantly impacted by the GO RER program (i.e. electrification and major track infrastructure improvements) were not considered at this time.

APPENDIX B

Economic Analysis

Economic Analysis vs Financial Analysis

Economic Analysis plays an important role in Business Cases assessment as it measures *value of things that matter to people* and society, broadly taking account of all the ways a project affects people, irrespective of whether those effects are registered in conventional financial accounts. All costs and benefits to society are translated into dolllar values for purpose of analysis. These include valuation of

- Travel Time Savings
- Vehicle Kilometres Traveled (VKT)
- Vehicle Operating Cost Savings
- Decongestion
- Safety
- Greenhouse Gas

Financial Analysis deals only with *money spent or received*. The analysis includes:

- Fare Revenue
- Additional Station Operating Costs
- Additional Train Operating Costs
- Capital Costs

Net Present Value (NPV) is an analytical tool that shows the total present value of all future benefits minus the present value of all future costs expressed in monetary terms (dollars). The NPV of the economic benefits and economic costs is a key measure used for this analysis.

NPV and BCR Two Sides of the Same Coin

NPV and BCR are both measures of the same respective things in economic and financial evaluations, but they illustrate them differently.

Net Present Value (NPV)	Benefit Cost Ratio (BCR)
The total present value of all future benefits minus the total present value of all future costs	The indicator of value for money for an option/project It is calculated by dividing the present value of total benefits by the present value of total costs
Net Present Value = Present Value* Benefits - Present Value* Costs	Benefit Cost Ratio = Present Value * Benefits / Present Value * Costs
Value to the economy lost or gained over the period of analysis (in present $)	Ratio indicating the value of every dollar invested in the project. <1 = losing money for every $ spent
Shows the $ value of benefit or loss	Shows the scale of benefit or loss

* **Present value** is the current worth of a future sum of money or stream of cash flows at a specified rate of return