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# REGIONAL EXPRESS RAIL (RER)

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September 5, 2014

| Metrolinx Board of Directors

Greg Percy, President GO Transit



**METROLINX**

An agency of the Government of Ontario

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# Purpose of Today's Presentation

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- Provide the Board of Directors with an update on the work that has been completed over the summer on planning for the delivery of the RER program
- Provide overview information on the implications for each of the seven rail corridors that offer GO Transit service
- Demonstrate how the program is being supported by existing investments and projects, as well as the work to develop a course of action that will need to be delivered over the coming 10 years, in full partnership with the Province, municipalities, stakeholders and communities

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# Provincial Commitment to RER

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“...our target will be two-way, all-day GO express rail on all lines. That’s what people from across the region have told me that they are looking for. Over ten years, we aim to phase in electric train service every fifteen minutes on all GO lines that we own. Doing that would mean moving the most people for the least cost. And it would help to unclog highways across the GTHA. We just know that that is a reality. And it would do for the region what subways did for Toronto back to the 1950s.”

Premier Kathleen Wynne  
Speech to the Toronto Region Board of Trade  
April 14, 2014

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# Ontario Budget

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- Recent Provincial Budget made a 10-year, \$29 billion commitment to transportation infrastructure, including \$15 billion dedicated to transit infrastructure in the GTHA
- Budget document:
  - Builds on the first wave of Big Move projects, such as the Eglinton Crosstown LRT
  - Continues expansion towards two-way, all-day GO Transit rail service, which is identified as a priority
  - Includes the proposal to electrify the GO rail system to deliver service at intervals as frequent as 15 minutes
  - States the Province will work with Metrolinx and municipalities on the prioritization of next wave projects, through the use of business case analysis
  - Sets out opportunity to work with the federal government to secure federal funding through the Building Canada Plan

# The Big Move sets the context for RER

- The Big Move's Priority Action #1 sets out fast, frequent, all-day, two-way express rail service
- Moving ahead with RER builds on the work that has been undertaken since 2008:
  - 30-minute all-day service on the Lakeshore East and West corridors
  - Georgetown South improvements nearing completion
  - New peak service launched to Acton, Guelph and Kitchener, with service levels to double in 2016
  - Additional peak service on all seven corridors
  - Expansion of the Willowbrook maintenance facility, and building new East Rail Maintenance Facility
  - Fleet size has grown by 163 coaches to 600 coaches, providing an additional 26,000 seats for our customers, increasing seat capacity to 96,000 seats
  - Parking inventory at rail stations has grown to 69,000 spaces, by adding 19,000 spaces
  - New James North station in Hamilton is under construction
- Investment has been well-received by customers, with rail ridership growing by 17% since 2008, including 30% growth in off-peak ridership on the Lakeshore lines
- Faster, more frequent trains, operating in both directions throughout the day, in the evenings and on weekends mean more transit options and less congestion for the GTHA, whether you travel by train, other transit systems or by car

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# RER is connected to other initiatives

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- RER will be delivered alongside a variety of other planned next wave projects set out in The Big Move that will collectively transform the region's transportation system
- Timing and staging of projects will be based on objective, evidence-based criteria to deliver the most benefits for the region
- There are also strong linkages to policy initiatives, such as the work underway on fare and service integration

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# The Vision

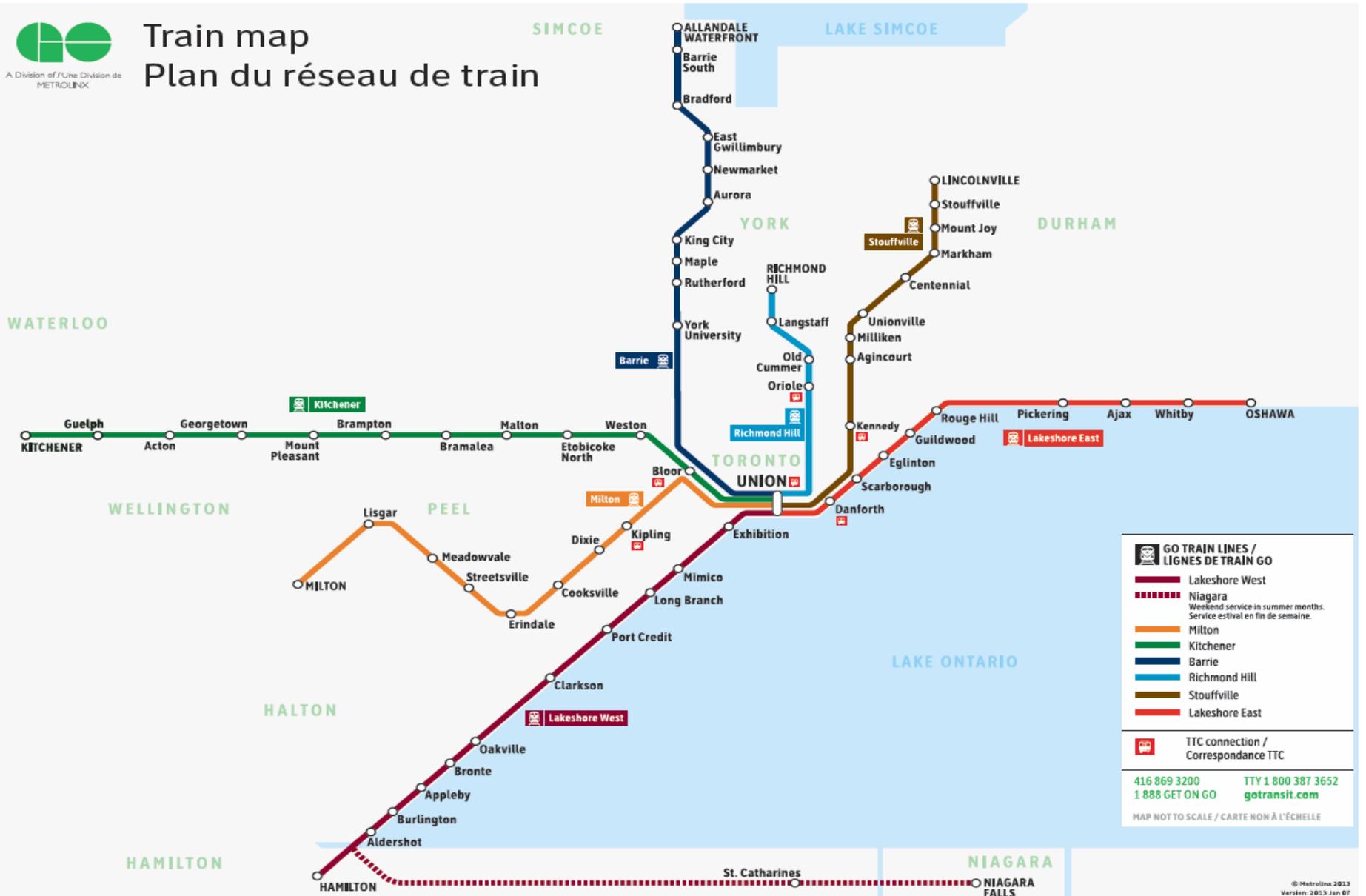
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- RER will transform the regional transportation system by providing significant new travel choices across the GTHA. It will provide:
  - An electrified service with 15-minute frequencies in core areas
  - Service in both directions, throughout weekdays, in evenings and on weekends
  - All-stop and limited stop service, to meet demand and reduce travel times
- Vision will be refined based on analysis, municipal, stakeholder and community input and discussions with key partners like CN and CP
- Phasing of delivery will consider business case analysis, ridership growth, appropriate sequencing of infrastructure projects and other evidence-based factors
- RER will deliver positive outcomes across the GTHA, not only when complete, but in each and every year so that the public and customers will see measurable progress and benefits



# Train map Plan du réseau de train

A Division of /Une Division de  
METROLINX



**GO TRAIN LINES / LIGNES DE TRAIN GO**

- Lakeshore West
- Niagara  
Weekend service in summer months.  
Service estival en fin de semaine.
- Milton
- Kitchener
- Barrie
- Richmond Hill
- Stouffville
- Lakeshore East

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**TTC connection / Correspondance TTC**

416 869 3200      TTY 1 800 387 3652  
1 888 GET ON GO      [gotransit.com](http://gotransit.com)

MAP NOT TO SCALE / CARTE NON À L'ÉCHELLE

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Version: 2013 Jan 07

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# The Work Plan

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In conjunction with the Province, Metrolinx staff have been working to prepare the RER work plan, which will be comprised of four key elements:

1. **Service Concept**, in order to provide the foundation to determine infrastructure needs and develop a phasing plan
2. **Infrastructure Needs**, in order to be clear on the infrastructure and equipment that will be needed to deliver on the Service Concept
3. **Phasing Plan**, to identify the optimal sequencing of infrastructure and service, considering factors like ridership growth, congestion benefits and effective infrastructure delivery
4. **Engagement Plan**, to identify the work necessary to engage stakeholders that include the public, municipalities, and elected officials.

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# Service Concept

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- Service Concept will define the outcome for each of the seven rail corridors over the course of the 10-year program
- It will apply the Vision on each of the corridors and include detailed information on:
  - Frequency of service on each corridor and part of the corridor
  - The mix of all-stop and limited-stop service
  - Length of trains
  - Expansion of existing stations and the introduction of infill stations
  - Priority areas for electrification
  - Consideration of future service extensions

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# Developing the Service Concept

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In developing the Service Concept, the following key considerations are important:

- Infrastructure needed to deliver RER service levels
- Corridor ownership, and working with CN, CP and VIA
- Environmental assessments and other approvals
- Union Station capacity
- Sequencing level of service increases with electrification and other infrastructure
- Linkage to other initiatives, such as work on the Yonge Relief Network Study and fare and service integration
- Community impacts along corridors

# Infrastructure Planning

Service Concept will require the following types of infrastructure:

- New track and signal enhancements, including positive train control
- Grade separations and pedestrian crossings
- Bridge expansions
- Station platform, tunnel and parking expansions
- Property acquisition and utility relocation
- Electrification infrastructure, including supplying power to the corridors

Renovations  
at more than  
**60** rail  
stations

Up to **6** rail-  
rail grade  
separations

Around  
**130**  
Expanded  
Bridges

Around  
**340** New  
Track miles

**500** km  
overhead  
catenary

Up to **40**  
rail-road  
grade  
separations

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# Environmental Assessments

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Comprehensive and coordinated approach to Environmental Assessments (EA) will be developed

- Scope of current EA's can be amended to include RER
- Remaining EA requirements will be bundled by corridor
- System-wide EA for electrification to be completed separately with strong link to corridor planning

# Lakeshore West Corridor



## Current Facts

60,000  
Total Ridership  
per weekday

90  
Total Trips per  
weekday

177 km  
Total Track

## Service Considerations

- CN owns the corridor west of Burlington and operates it as a main freight line, and CP owns the corridor into the Hamilton GO Centre; this will drive infrastructure requirements and the timing of electrification
- Additional work needed to determine the roles of the Hamilton GO Centre and the new James North station
- Anticipate all-stop service between Hamilton and Oakville, and then non-stop service to Union Station to reduce travel times and congestion; Oakville to Union Station could operate as a separate all-stop service, with Oakville becoming a significant hub
- Consideration of future service extensions

## Infrastructure Needs

- Possible rail/rail grade separation at Hamilton Junction
- One new track required along much of the corridor
- Various road/rail grade separations

# Milton Corridor



## Current Facts

30,000  
Total Ridership  
per weekday

16  
Total Trips per  
weekday

106 km  
Total Track

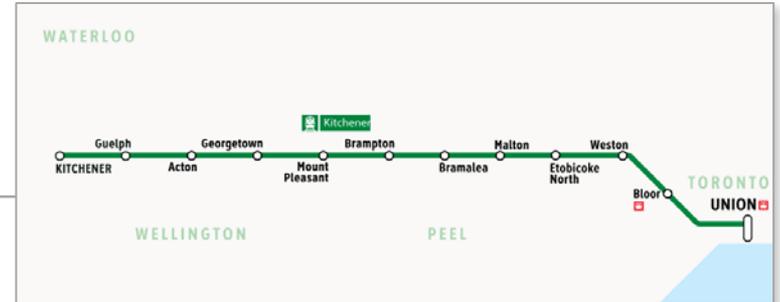
## Service Considerations

- CP owns majority of corridor and operates it as a main freight line; this will drive infrastructure requirements and timing of electrification

## Infrastructure Needs

- Corridor through Streetsville is constrained and community engagement will be required
- Possible rail/rail grade separation at Humber River
- Two new tracks assumed along the majority of the corridor
- Various road/rail grade separations

# Kitchener Corridor



## Current Facts

18,000  
Total Ridership  
per weekday

16  
Total Trips per  
weekday

166 km  
Total Track

## Service Considerations

- CN owns the corridor through Brampton and operates it as a main freight line; this will drive infrastructure requirements and the timing of electrification
- In peak periods, anticipate all-stop service between Kitchener and Mt. Pleasant, and then non-stop service to Union Station to reduce travel times and congestion; Mt. Pleasant to Union Station could operate as a separate all-stop service
- Need to integrate with provincial planning for high speed rail

## Infrastructure Needs

- Corridor through downtown Brampton is constrained and community engagement will be required
- Possible rail/rail grade separation in the Georgetown area
- One new track is required along much of the corridor
- Various road/rail grade separations

# Barrie Corridor

## Current Facts

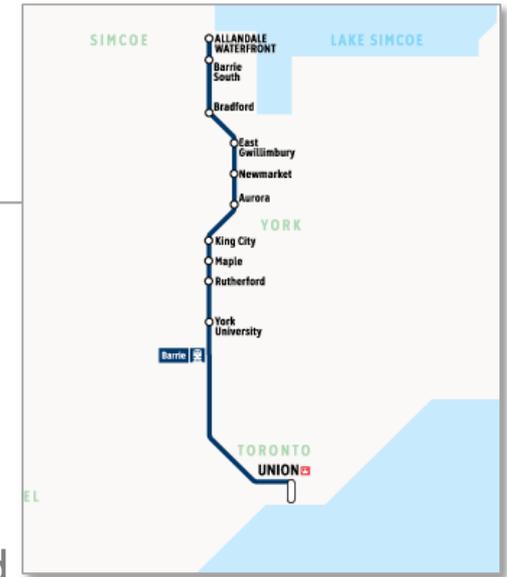
17,000  
Total Ridership  
per weekday

14  
Total Trips per  
weekday

103 km  
Total Track

## Infrastructure Needs

- Rail/rail grade separation is required at Davenport
- One new track required along much of the corridor
- Various road/rail grade separations



# Richmond Hill Corridor

## Current Facts

10,000  
Total Ridership  
per weekday

11  
Total Trips per  
weekday

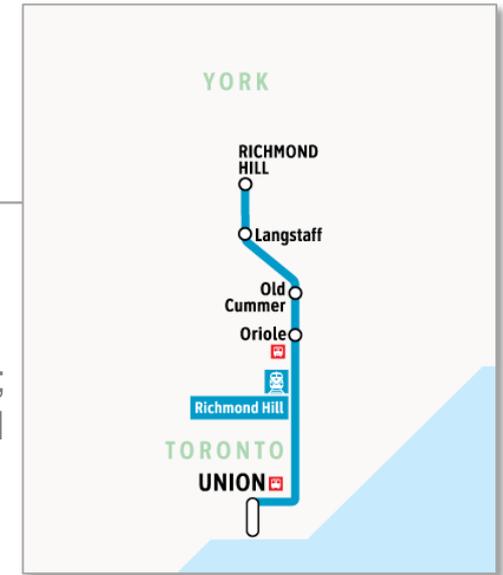
47 km  
Total Track

## Service Considerations

- CN owns the northern section of the corridor; this will drive infrastructure requirements and the timing of electrification
- Need to consider corridor in conjunction with Yonge Relief Network Study

## Infrastructure Needs

- Flooding issues in the Don Valley will need to be addressed
- Rail/rail grade separation required at Doncaster
- One new track required along much of the corridor
- Various road/rail grade separations



# Stouffville Corridor

## Current Facts

15,000  
Total Ridership  
per weekday

15  
Total Trips per  
weekday

37 km  
Total Track

## Service Considerations

- Need to consider corridor in conjunction with Yonge Relief Network Study

## Infrastructure Needs

- Possible rail/rail grade separation at Scarborough Junction
- One new track required along much of the corridor
- Various road/rail grade separations



# Lakeshore East Corridor



## Current Facts

52,000  
Total Ridership  
per weekday

88  
Total Trips per  
weekday

115  
Total Track KM

## Service Considerations

- Anticipate all-stop service between Oshawa and Pickering, and then non-stop service to Union Station to reduce travel times and congestion; Pickering to Union Station could operate as a separate all-stop service, with Pickering becoming a significant hub
- Consideration of future service extensions

## Infrastructure Needs

- Possible rail/rail grade separation at Scarborough Junction
- One or two new tracks required along much of the corridor
- Various road/rail grade separations

# Union Station Rail Corridor (USRC)

- USRC includes Union Station and the approaches to the station from the east and the west
- As Canada's largest passenger facility, it plays a critical role in the region's transportation system
- USRC is in the midst of a major transformation process, involving:
  - Train shed roof replacement and refurbishment
  - New passenger concourses which will triple the size of the existing GO concourse
  - New stairs and elevators to platforms
  - Second subway platform
  - Improved pedestrian access to Union Station through existing and new PATH entrances
  - Replacement of the legacy signal systems to increase reliability
- These improvements position Union Station to meet needs over the short and medium term



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# Preparing USRC for the Long Term

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- Further mid-term initiatives include:
  - Extending track 1 to accommodate 12-car trains
  - Rationalizing track use between GO and VIA Rail
  - Additional storage tracks on the eastern approaches to Union Station
  - Operational strategies to manage an increased volume of trains through the station in peak periods
  - Alterations required to accommodate electrification
  - Potential off-loading of demand to satellite stations
- Additional work required to determine the long term capacity plan

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# Electrification Overview

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- Benefits of electrification are significant, particularly with the level of service built into the RER plan:
  - Faster acceleration and deceleration
  - Lower operating costs
- Metrolinx's Electrification Study (2010) included the design for the electrification of the entire network including the traction power facilities
- EA for UP Express electrification completed June 2014; environmental approvals for power supply have not yet been received
- Electrification Performance Specifications for UP Express have been developed, including information on the location and sizing of catenary poles to support the wires, grounding, bonding and other elements
- Provisions for electrification are being incorporated into existing projects
- Opportunity to integrate environmental approvals for transit and electrification infrastructure

# Electrified Rail Systems

## Canada

- AMT Deux Montagne commuter line in Montreal

## United States

- Amtrak – Northend Electrification System SEPTA – Philadelphia commuter lines
- Caltrain (design) – San Francisco to San Jose

## Europe

- French National Railways – France
- Deutsche Bhan – Germany
- HSL-Zuid - Holland



# Fleet

- GO Transit has one of the most modern fleets in North America, including 77 locomotives, a planned growth to 750 bi-level coaches and, imminently, 18 diesel multiple units
- Book value of these assets is in the order of \$900M, and will have to be effectively managed during the course of a transition to an electrified service
- In moving to an electrified service, alternatives include:
  - Electric locomotives, pulling bi-level coaches
  - Dual mode locomotives (diesel and electric powered), pulling bi-level coaches
  - Self-propelled electric multiple units
- Some combination of these technologies is possible for the future



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# Importance of a Business Case Approach

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- RER program, and the other projects being assessed, represent a significant public investment
- Need to apply objective, evidence-based criteria to determine prioritization of the next wave program
- Work needs to progress in conjunction with the Province and input from municipalities
- Effective approach includes the following:
  - Close inter-relationship between business case analysis, planning and operations
  - Testing of options to optimize outcomes
  - Openness and transparency in the sharing of the methodology and outcomes to build support
  - Review and update of the analysis over the lifecycle of a project
  - Use of international best practices
  - Use common information to allow relative comparison of outcomes between projects, including a base case
  - Address not just build phase of projects, but a lifecycle approach

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# Costing and Funding

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- Due diligence is continuing on costing, applying evidence-based rationale and other factors
- Costing is determined by the Service Concept, Infrastructure Plan and Phasing Plan
- Opportunity for the federal government to come to the table as a full partner in the expansion of the region's transportation system
- Other potential partners in the delivery of the program, including municipalities, which will need to align local services to stations and work in partnership on grade separations and utility crossings

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# Program Delivery

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- Working with Infrastructure Ontario on the range of delivery models that could be used to deliver the RER program
- Delivery models could include:
  - Design-Bid-Build
  - Design-Build
  - Design-Build-Finance
  - Design-Build-Finance-Maintain
  - Design-Build-Finance-Maintain-Operate

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# Effective Engagement is Critical

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- Effective engagement with municipalities, stakeholders, communities and the public will be key
  - Program involves extensive construction and ongoing service expansions that impact communities and neighborhoods
  - Local transit services will need to be adjusted to provide effective access to stations
  - Close partnership with CN, CP and VIA required in order to advance service expansion and electrification, particularly on corridors owned by CN and CP
- Tools and approaches will need to be developed to engage communities, stakeholders, the public and elected officials throughout the planning and delivery of the program

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# Next Steps

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- Work continues to deliver existing projects that will build the foundation for RER
- In partnership with the Province, refine the Service Concept, infrastructure needs, costing, environmental and other approval requirements
- Work closely with Infrastructure Ontario on developing delivery options
- Develop phasing strategies based on ridership forecasting, benefit cost ratios, deliverability considerations and other factors
- Work will also continue on needs in the Union Station rail corridor, electrification, fleet and operational planning
- Need to determine timing of engagement with federal government, CN and CP on key issues
- Metrolinx staff will return to the Board of Directors at the December 11th meeting with further updates

