

ELECTRIFICATION STUDY

Workshop Summary Report Stakeholder Workshop #3

September 22, 2010

Prepared for:
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This workshop summary report was prepared by Lura Consulting. Lura is providing third party facilitation services as part of the GO Transit Electrification Study. This summary report captures the key discussion points raised during Stakeholder Workshop #3. It is not intended as a verbatim transcript of comments received. If you have any questions or comments regarding the summary, please contact:

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1 About Stakeholder Workshop #3

1.1 GO Transit Electrification Study

Metrolinx has initiated a study of the electrification of the entire GO Transit rail system as a future alternative to diesel trains now in service, as well as the future Air Rail Link (ARL) between Union Station and Lester B. Pearson International Airport. The study is examining how GO and the ARL rail services will be powered in the future – using electricity, enhanced diesel technology or other means.

Over the past 20 years there have been many previous electrification studies but this is the first time that electrification of the entire GO rail system – all seven corridors – has ever been studied. The study is using an expanded and enhanced GO rail network from the network of today as the basis of comparison; this “reference case” network presumes that additional tracks and some of GO’s proposed line extensions (to St. Catharines, Kitchener, Barrie Waterfront, Bloomington Road, and Bowmanville) will be constructed in the coming years, resulting in increased train volumes.

1.2 Stakeholder Workshop #3

On Wednesday, September 22nd, 2010 the Electrification Study Team hosted the third stakeholder workshop for organizations across the Greater Toronto and Hamilton Area (GTHA). The workshop – the third in a series of four planned as part of the study – took place between 6:30 – 9:00 p.m. at Metro Central YMCA in downtown Toronto.

1.2.1 Purpose

The purpose of the workshop was to provide participants with an update on the Electrification Study progress and to obtain feedback on the high level evaluation used to identify a “short list” of six network options for the potential electrification of the GO network. Throughout the workshop, the Electrification Study Team obtained feedback from stakeholders on the work completed to date through a question and answer period and interactive breakout discussion sessions.

1.2.2 Attendance

In total, 20 representatives of non-governmental organizations registered for the workshop, with 18 attending the September 22th session. A list of organizations invited to participate in the workshop, as well as those who attended the meeting, is included in Appendix E.

1.2.3 Format

The workshop was facilitated by Mr. Jim Faught of Lura Consulting. At 6:30 p.m., Mr. Faught welcomed the participants to the workshop, described the session’s purpose, and introduced key representatives from Metrolinx and the Delcan+Arup JV Study Team.

The workshop began with opening remarks from Ms. Karen Pitre, Electrification Study Project Director, Metrolinx, who thanked participants for their interest and participation in the Electrification Study. Ms. Pitre provided a brief recap of the previous two stakeholder workshops and progress on the study to date.

Next, Mr. Roger Wood, Study Project Manager, Delcan+Arup JV Study Team, provided stakeholders with an overview of the reference case used in the Electrification Study and network options identified in the high level evaluation of potential network options. Mr. Wood then described the six network options resulting from the high level evaluation undertaken by the Study Team. Finally, Mr. Wood presented the proposed approach for the detailed assessment of the six “short listed” network options and walked stakeholders through a specific example of how the Study Team plans to conduct an analysis of land use and population density along the corridors in the GTHA, as part of the detailed assessment of options.

The presentation was supplemented with PowerPoint slides that can be found in Appendix A. After the presentation, meeting attendees were invited to ask questions and provide initial comments. A detailed account of the questions and comments following the presentation can be found in section two.

Following the question and answer period, workshop attendees engaged in facilitated breakout discussions about the network options and the proposed approach for the detailed assessment of the network options (see Appendix B for a sample worksheet). The breakout groups were encouraged to capture their ideas in writing so that they could be accurately recorded and included in this workshop report. The groups were given one hour for discussion and then were asked to share their feedback with the other workshop participants and the Electrification Study Team. Stakeholders were also encouraged to provide the Study Team with written comments by filling out and submitting individual comment forms following the workshop.

2 Workshop Presentation Discussion

Following the workshop presentation, attendees were given the opportunity to ask questions and provide initial comments (indicated by a ‘Q’ and ‘C’) to the Study Team. Answers, where provided, are indicated by an ‘A’.

Question 1: Does the 200 metre zone of influence you mentioned refer to the entire width of the area or does it refer to the distance from the centre to the outer line?

Answer: The 200 metres refers to the distance on either side of the centre line. In some instances the zone could be smaller or larger depending on the factors examined.

Question 2: Why did you include the ARL with Georgetown South operations if it will be running a different technology on its own corridor?

Answer: As you know, the decision for who is building and managing the ARL has changed over the course of this study. As outlined in the study's terms of reference, we will examine both diesel and electric operations for the ARL in order to understand the potential benefits and costs of electrifying the Georgetown line. The ARL is coupled with the Georgetown line in this study because it will not be operating on a dedicated track. Similar to GO operations in the area, the ARL will be required to share track with GO Transit, CN, and CP. As a result, if the Province decided to electrify the ARL all of the tracks running from Union Station through the corridor would need to be electrified.

Question 3: I have been told that there are technology constraints for the ARL relating to axle loading and redevelopment efforts currently underway at Pearson International Airport. Have you heard anything about this, and if so can you provide us with any details that you might have?

Answer: We are not aware of any ARL technology constraints related to axle loading.

Question 4: I was wondering if you could clarify what parameters you used to measure the cost of each technology options. Did you find the cost per train set, and if so, did you calculate the cost of the smaller train sets required if GO Transit were to run EMU cars? Similarly, if you were to conduct your analysis with the assumption that half of the cars in the consists were powered EMUs while the other half were the existing bi-level passenger coaches used by GO Transit, wouldn't the costs of operating EMUs be reduced significantly?

Answer: We assumed that EMUs would not be able to utilize the current passenger cars running on the GO system due to platform heights at station stops. In addition, although traditional EMUs can offer journey time benefits when compared to electric locomotives, capacity constraints at Union Station prevent GO Transit from realizing those benefits.

Question 4b: Have you considered the fact that locomotives are currently required to do break tests when they turn around at Union Station? If turnaround times could be increased at Union, I think EMUs could offer significant benefits over electric locomotives. In addition, in the early stages of the study, Karen mentioned that EMUs could be used on the existing network.

Answer: First, I did not confirm that EMUs could be used on the existing network early in the study, because I did not know at that time what technology and network options were suitable for GO Transit. Also, there are a number of constraints that are currently impacting Union Station capacity. Brake inspections are a minor issue compared to some of the other challenges that need to be overcome at Union Station. Lastly, I should note that using current GO bi-level passenger cars in combination with EMUs is not viable. The Study Team has had several conversations with GO Transit, Bombardier, and other manufacturers to see if we could retrofit the passenger cars to make them

suitable. Both parties confirmed that the cost of retrofitting the existing passenger cars is too high to make it a viable option.

Question 4c: Currently GO Transit has a turnaround time of 5-10 minutes and the TTC subway turnaround time is 2 minutes. That is a huge difference. I realize that during rush hour it takes time to get people off the train, but if you can shave off a few minutes that makes quite a difference for riders.

Answer: Those details are currently being studied by AECOM as part of the Union Station capacity study. We haven't considered all of those details because of the other capacity constraints getting into Union Station. The capacity study is looking at all of the factors impacting Union Station capacity.

Question 5: The Big Move identified that some lines would be electrified in the near future because customer demand would drive for the case for electrification. Is this true? If so, should your reference case or benefits reflect that thinking rather than use a time frame of 2020?

Answer: The Big Move was an ambitious plan that outlined a number of potential projects across the GO network, including a commuter express rail. Included in the study was the need for more rail track in the GTHA to meet increased demand. Although previous electrification studies have been completed, no study has moved beyond the first step that identifies the fact that electrification can offer a number of benefits to existing operations. In order to ensure that this study produced meaningful findings and conclusions, we are looking at the characteristics of the corridor in the medium term (reference case). As a result, the current study will not address long term projects like the commuter express rail outlined in the Big Move.

Comment 6: It is not clear to my why the ARL is not being studied on its own and why electrifying it would require the entire Georgetown Line to be electrified. Montreal has a central station with one electrified line running to it.

Answer: I cannot answer whether only one track or more are electrified in Montreal. Across the GTHA, train operators currently share tracks and work together to coordinate their individual schedule. As a result, trains move from one track to another to accommodate the different needs and users currently operating on the network. If that is how the rail operators continue to operate, electrifying GO operations would require all tracks within a corridor to have overhead catenary.

Question 7: Other than converting to either one electric operation or another, did you study the option of making major changes to how GO Transit is currently operating? Take a look at the Réseau Express Régional (RER) in Paris where they have the trains running through their central station and ending at different locations. For me, I see that cost savings are only the tip of the iceberg for what GO Transit could accomplish. When will GO Transit look at this issue

holistically and examine the viability of changing the system from a commuter rail system to a regional rail service?

Answer: I hear your point. The Study Team is struggling with how to address Union Station and the needs of both CN, CP, and Via/Amtrak operations. We want to address these challenges and look at what might be available if Union Station capacity was not an issue. However, we are caught in a conundrum of how to produce findings and conclusions that are both realistic and address the challenges associated with Union Station capacity. If our approach was to look past Union Station to a period of time when the capacity limitations were addressed, then everyone would complain that we were loading the case against electrification.

Question 8: I have a question related to noise and vibration levels that you mentioned in your presentation. How do you know what a Tier 4 diesel locomotive will sound like if they haven't been built yet? We don't even know what a Tier 2 locomotive is supposed to sound like because in the Georgetown EA it mentioned that GO trains were currently operating at a level comparable to Tier 0 technology.

Answer: It is important to note that this study will produce findings and conclusions that will be presented to the Metrolinx Board to make recommendations to the Ministry of Transportation. The Study Team will assess the noise and vibration impacts of the various technology and network options. This assessment will provide a relative comparison of the options in order to understand their impact on communities surrounding the rail corridors. In order to understand the noise levels for Tier 4 technology, we have obtained estimates from a number of train experts and manufacturers.

3 Summary of Comments Received

The following section provides a summary of the comments received from workshop participants. A more detailed account of the question and answer period can be found in section two of this report. In addition, written comments compiled by the breakout groups and from individuals' worksheets submitted following the session can be found in Appendix C and D respectively.

3.1 Study Approach

- The Study Team has done an excellent job evaluating the available rolling stock and network options for electrification.
- The study's scope is limited and should have included an opportunity to examine the potential of transforming GO Transit operations from a commuter rail service to a true regional rail service.

- Tier 4 Diesel technology does not exist and thus should not be used as the reference case for electrification.
- A third-party assessment of the implementation timelines should be conducted following the completion of the Electrification Study.

3.2 Rolling Stock Technology Options

- Was reliability of rolling stock technology considered in the assessment of options?
- EMUs are a viable technology option if used in tandem with existing bi-level coaches.
- Stakeholders need more detailed information on impacts associated with operating Tier 4 diesel locomotives and dual-mode locomotives.

3.3 Network Options

- Stakeholders would like more information on how the six network options were selected.
- The Study Team should clarify what parameters were used to measure the cost of each network option.
- The Electrification Study should have explored the potential of also using EMUs to run smaller, more frequent consists with lengths that match off-peak service rather than continue to run locomotive hauled bi-level coaches.
- Where is the proposed Bolton line on the maps presented in the study reports and outputs?
- If electric locomotives are the preferred option for electrification, Metrolinx should begin to survey the used electric locomotive market.

3.4 Proposed Approach for Detailed Assessment of Options

3.4.1 Screening Approach

- The Study Team should use existing approaches to quantify GHG emissions already in use by the Province (e.g. OPA Feed-in Tariff program) to quantify GHG emissions as part of the Electrification Study.
- Why is the zone of influence 200 metres when greater distances have been used for other Metrolinx studies?
- The Study Team should address the impacts that air quality, noise, and vibration will have on clusters of vulnerable populations (i.e. hospitals, schools, retirement complexes).

3.4.2 Screening Criteria and Comparison

- The Study Team should examine the opportunity for energy saving through capitalizing on regenerative power.
- Will the impacts of GHG emissions be examined at a local level or regionally?

- Construction/implementation timing should be evaluated in the detailed assessment of the options (e.g. electrifying Lakeshore West would take longer than Georgetown South due to the number of bridges requiring improvement along the corridor).
- The costs of getting to the reference case should be included in the detailed assessment.
- Community impacts – such as human health, noise, and vibration – should be quantified so they can be fairly assessed against the capital costs of electrification.
- How will the Study Team accurately determine noise and vibration levels for Tier 4 diesel locomotives when prototypes do not currently exist?

3.5 Parallel Studies and Projects

3.5.1 Union Station

- Union Station is a major challenge for electrifying the GO network.
- The Electrification Study should inform the Union Station Capacity Study to ensure the potential benefits of operating an electrified service are included in the assessment of Union Station capacity.
- EMUs can reduce turnaround times at Union Station, leading to increased station capacity.
- The Study Team should examine the viability of Milton trains travelling across the top of the City to increase Union Station capacity.

3.5.2 ARL

- The ARL should be evaluated as a separate corridor, not part of Georgetown.
- The ARL evaluation should study offering both express and local service from Union Station to Pearson Airport.
- The Study Team needs to provide stakeholders with detailed information about the assessment of rolling stock technology options for the ARL.
- Study maps and figures need to be changed to illustrate that the ARL is included within the scope of the Electrification Study.
- The Study Team should examine the potential for future airport expansion as a result of electrifying the ARL.
- The ARL should be the first line that is electrified.

3.6 General Comments

3.6.1 Operations and Planning

- Metrolinx should begin negotiations with both federal and provincial agencies to ensure that potential electrification projects can go through an accelerated EA process.

4 Next Steps

The next steps for the study, as presented by Mr. Roger Wood of the Delcan+Arup JV Study Team, include:

- Further refining of the approach used to conduct a detailed assessment of the network options;
- Conduct a multi-category evaluation of the six shortlisted network options;
- Conduct a comprehensive risk assessment on the issues which may affect the case for electrification;
- Additional consultation with stakeholders at the fourth stakeholder workshop;
- Obtain feedback from the broader public through e-consultation.

Mr. Faught thanked participants for their participation and feedback at the workshop. He also noted the opportunity for additional comments to be submitted to the Electrification Study Team via the study email address or online on the Electrification Study Website.

APPENDIX A:

Workshop PowerPoint Presentation



METROLINX

**Electrification of the GO Transit
Rail Network
Stakeholder Workshop -
High Level Evaluation**

September 22, 2010



1

Metrolinx is an agency of the Government of Ontario

AGENDA

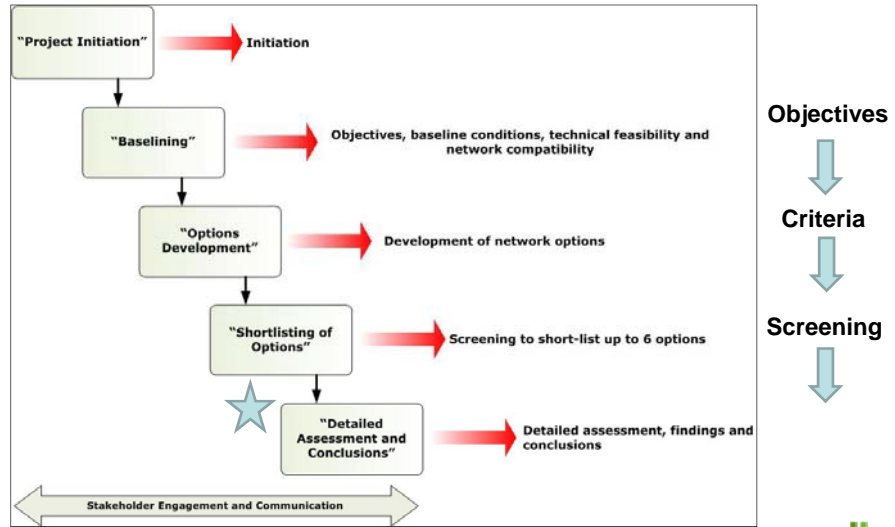
- Study Overview & Where We Are
- Re-cap:
 - Reference Case
 - Rolling Stock Technology Assessment
 - Power Supply
 - Option Progression
- High Level Evaluation
 - Technology Evaluation
 - Corridor Prioritization
- Next Steps
 - Detailed Assessment Overview
 - Land Use and Population Analysis
 - Multiple Category Evaluation (MCE)



2



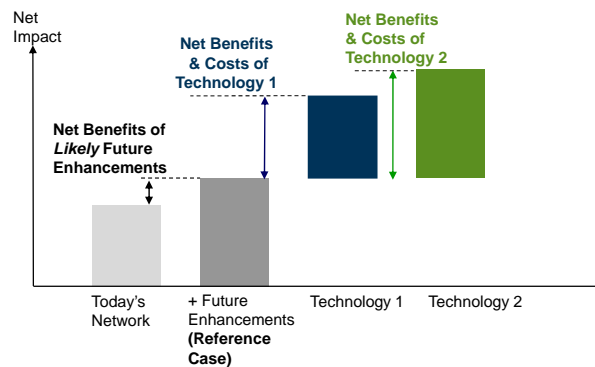
Study Overview & Where We Are



3

Reference Case

- Basis for comparison of options
- Evaluate the incremental impacts of each technology



4

Rolling Stock Technology Alternatives Shortlist

Diesel Loco



Electric Loco



Dual Mode Loco



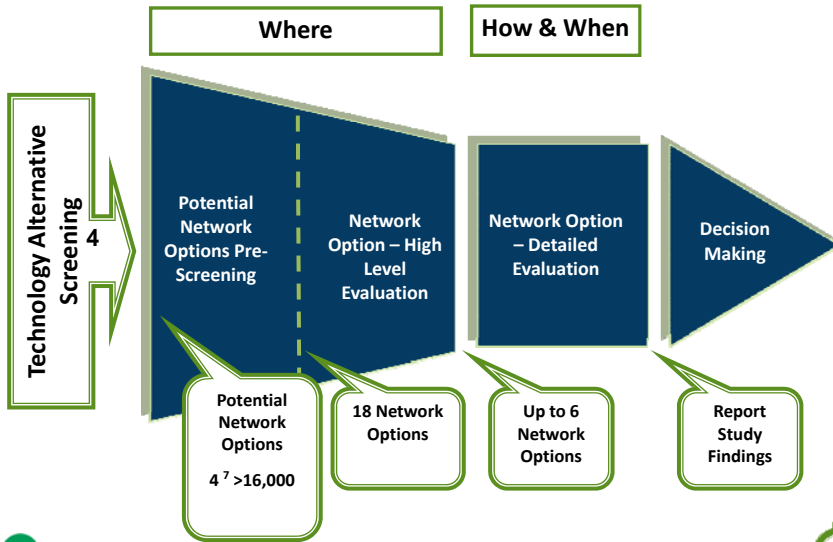
Electric Multiple Unit



Power Supply - 2 x 25 KV OCS



Option Progression



7

Applying Pre-Screening Criteria

| Pre-Screening Criteria | Options Remaining |
|------------------------------------------------------------------------------------|----------------------------|
| No pre-screening | 16,384 (4^7) |
| 1. Consider three technologies as a single family of electric trains at this stage | 128 (2^7) |
| 2. Lakeshore East and West to operate on the same technology | 64 (2^6) |
| 3. Prioritizing highest service/demand corridors | 18 + Reference Case |

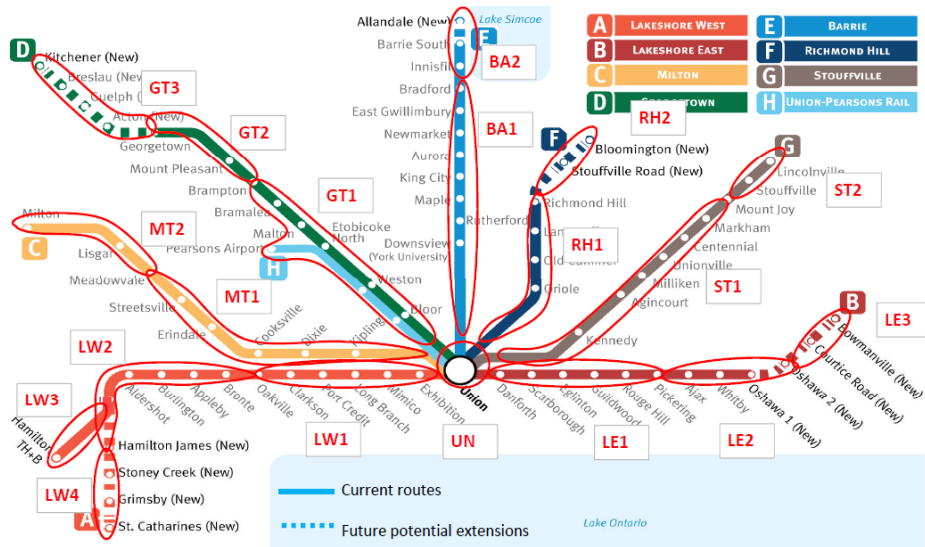
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High Level Evaluation Principles

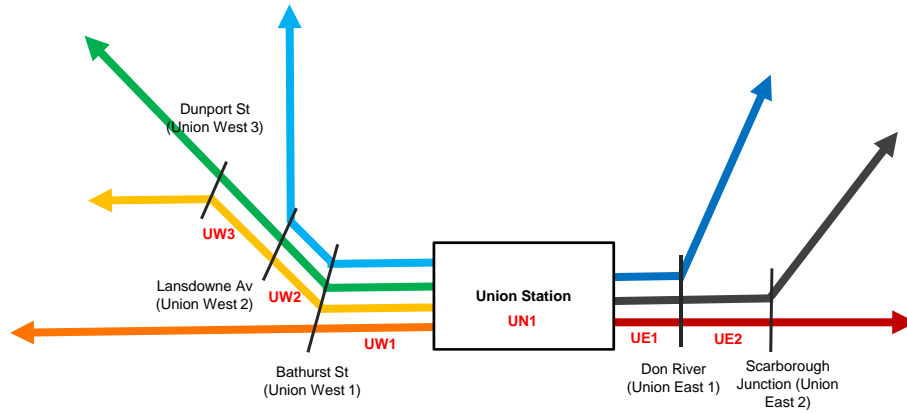
- Comparative assessment
- Assumes operationally feasible
- 19 service sections



Corridor Sections



Downtown Toronto Detailed Sections



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Service Sections Electrified

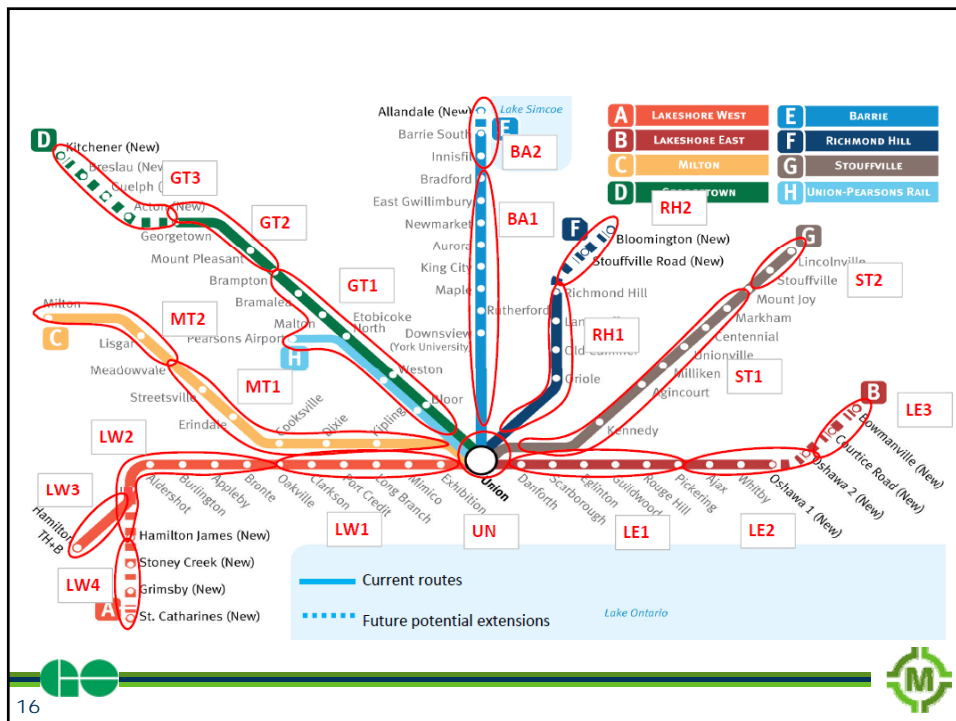
➤ Cumulative from Union outwards

| Corridor | Service Section | Corridor Section(s) | Service Description |
|----------------|-----------------|-----------------------------|-------------------------------------------|
| Lakeshore East | LE-a | UN1+UE1+UE2+LE1 | Union to Pickering |
| | LE-b | UN1+UE1+UE2+LE1+LE2 | Union to Oshawa |
| | LE-c | UN1+UE1+UE2+LE1+LE2+LE3 | Union to Bowmanville |
| Lakeshore West | LW-a | UN1+UW1+LW1 | Union to Oakville |
| | LW-b | UN1+UW1+LW1+LW2 | Union to Hamilton James |
| | LW-c | UN1+UW1+LW1+LW2+LW3 | Union to Hamilton James and Hamilton TH+B |
| | LW-d | UN1+UW1+LW1+LW2+LW4 | Union to St Catharines |
| | LW-e | UN1+UW1+LW1+LW2+LW3+LW4 | Union to Hamilton TH+B & St Catharines |
| Milton | MI-a | UN1+UW1+UW2+UW3+MI1 | Union to Meadowvale |
| | MI-b | UN1+UW1+UW2+UW3+MI1+MI2 | Union to Milton |
| Georgetown | GT-a | UN1+UW1+UW2+UW3+GT1 | Union to Brampton |
| | GT-b | UN1+UW1+UW2+UW3+GT1+GT2 | Union to Georgetown |
| | GT-c | UN1+UW1+UW2+UW3+GT1+GT2+GT3 | Union to Kitchener |
| Barrie | BA-a | UN1+UW1+UW2+BA1 | Union to Bradford |
| | BA-b | UN1+UW1+UW2+BA1+BA2 | Union to Allandale |
| Richmond Hill | RH-a | UN1+UE1+RH1 | Union to Richmond Hill |
| | RH-b | UN1+UE1+RH1+RH2 | Union to Bloomington |
| Stouffville | ST-a | UN1+UE1+UE2+ST1 | Union to Mount Joy |
| | ST-b | UN1+UE1+UE2+ST1+ST2 | Union to Lincolnville |

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Technology scenarios per corridor

- Reference Case
 - Tier 4 Diesel
- Full Electrification
 - Electric Locomotive
 - EMU
- Partial Electrification
 - Electric Locomotive + T4 Diesel
 - Electric Locomotive + Dual Mode
 - EMU + T4 Diesel
 - EMU + Dual Mode



Getting to the 6 Network Options

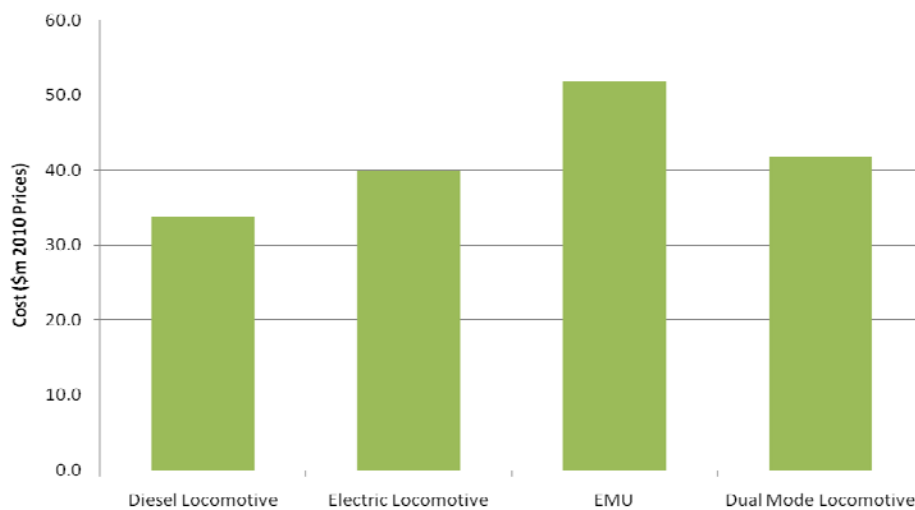
➤ Compilation of data for **comparative** analysis to rank sections

- Technology characteristics
 - Rolling stock capital and O&M costs
 - Journey time benefits
 - Environmental (CAC, GHG, noise, vibration)
- Corridor section characteristics
 - Infrastructure and OCS capital and O&M costs
 - Population within 200m zone of influence

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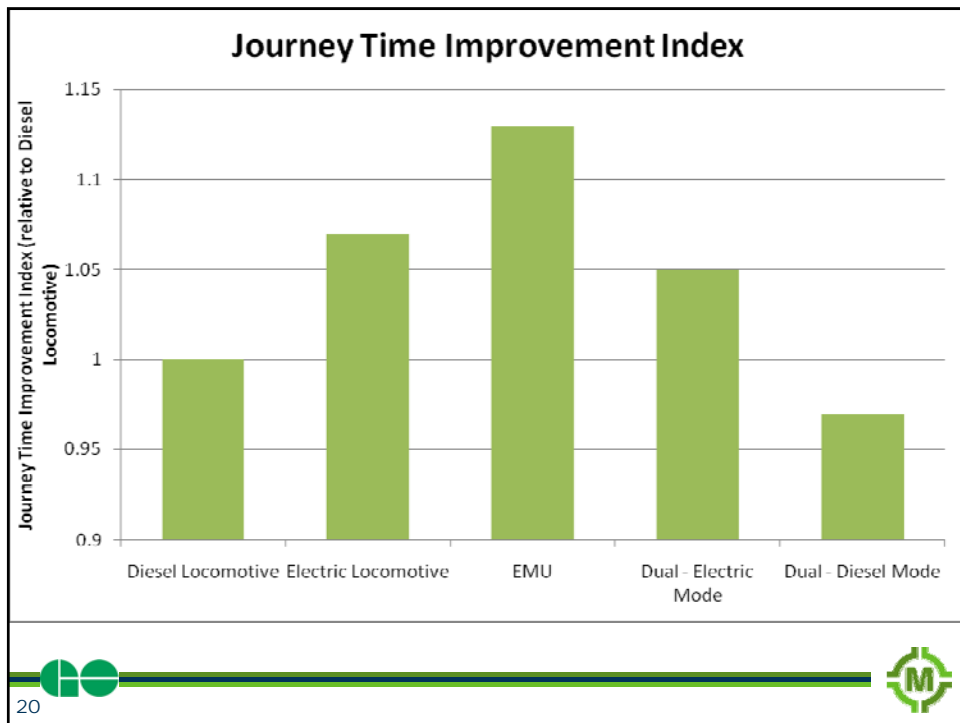
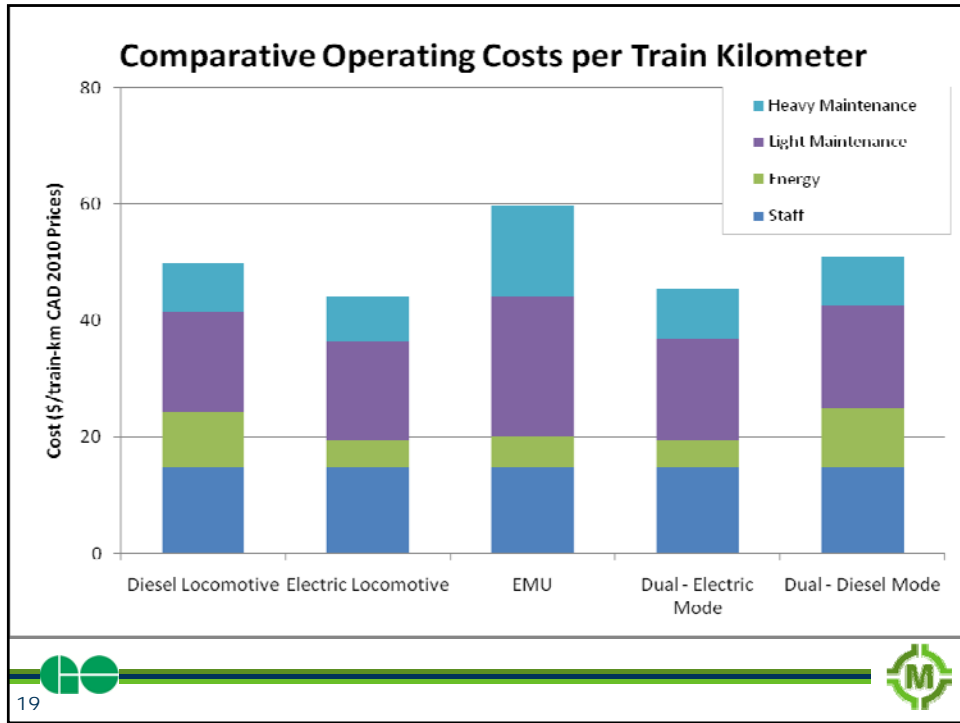
Capital Cost per Trainset



Locomotive = 10 passenger cars + 1 loco; EMU = 12 passenger cars

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Environmental Considerations

➤ Criteria Air Contaminant (CAC) Emissions

- Electric trains reduce local CAC emissions compared to Diesel loco
- Impact depends on population density adjacent to corridor

➤ Greenhouse Gas Emissions

- EMU and Electric loco both reduce GHG compared to Diesel loco
- EMU's higher energy demand results in more GHG emissions compared Electric loco

➤ Noise and Vibration

- All electric technologies deliver a reduction in noise and vibration compared to Diesel loco

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High Level Evaluation Measures

1. Transportation Efficiency

- Incremental Costs and Benefits
 - Capital costs – rolling stock, OCS, power supply, structures
 - O&M costs
 - User Benefits – journey time savings for users
 - Ridership x time savings + estimated benefits from demand uplift

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High Level Evaluation Measures

1. Transportation Efficiency (con't)

- High level Transportation Efficiency Index (TEI) using comparative data [User Benefits/(Capital + O&M Cost)]
- Higher TEI equates to greater return in user benefits per \$ invested
- TEI does not include all impacts & should not be compared to Metrolinx BCA's



High Level Evaluation Measures

2. Environmental Efficiency

- Cost per % GO's GHG/CAC/noise/vibration impact reduced
 - Lower cost per % impact reduced, greater return in environmental benefits per \$ invested
- % Change in GO Transit's contributions to:
 - Regional GHG
 - Local CAC, noise, vibration (weighted by population)



High Level Evaluation Findings (1)

- Electric Loco taken forward to detailed evaluation
 - Elec Loco better transportation efficiency
 - EMU – 2.9x journey time savings but Life cycle cost 4.7x more
 - EMU – 4.7x more expensive so lower environmental efficiency
 - EMU - Higher technology risk, implementation and affordability considerations
 - Additional EMU transportation efficiencies could be realized with future modifications to the system.



High Level Evaluation Findings (2)

- With Electric Locomotives it is more cost effective to electrify the entire corridor
 - Elec Loco cost less than Dual Mode Loco
 - Elec Loco give O&M savings
 - Transportation and environmental benefits maximized
- Except:
 - Lakeshore West to Hamilton Th+B
 - Lakeshore West to St. Catharines



High Level Evaluation Findings (3)

- Diesel Loco trains for Hamilton TH+B and St. Catharines.



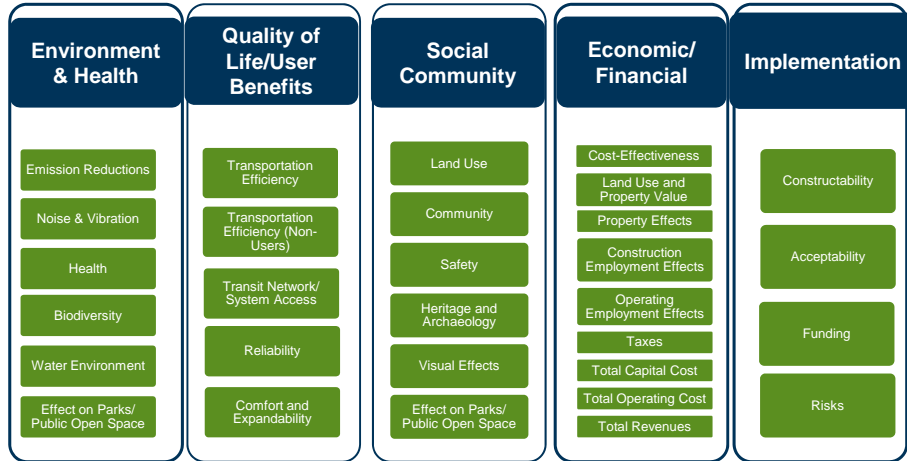
➤ Dual Modes

- Not worthwhile if only a small fleet required
- May be considered under implementation/ phasing strategy

6 Options for Detailed Evaluation

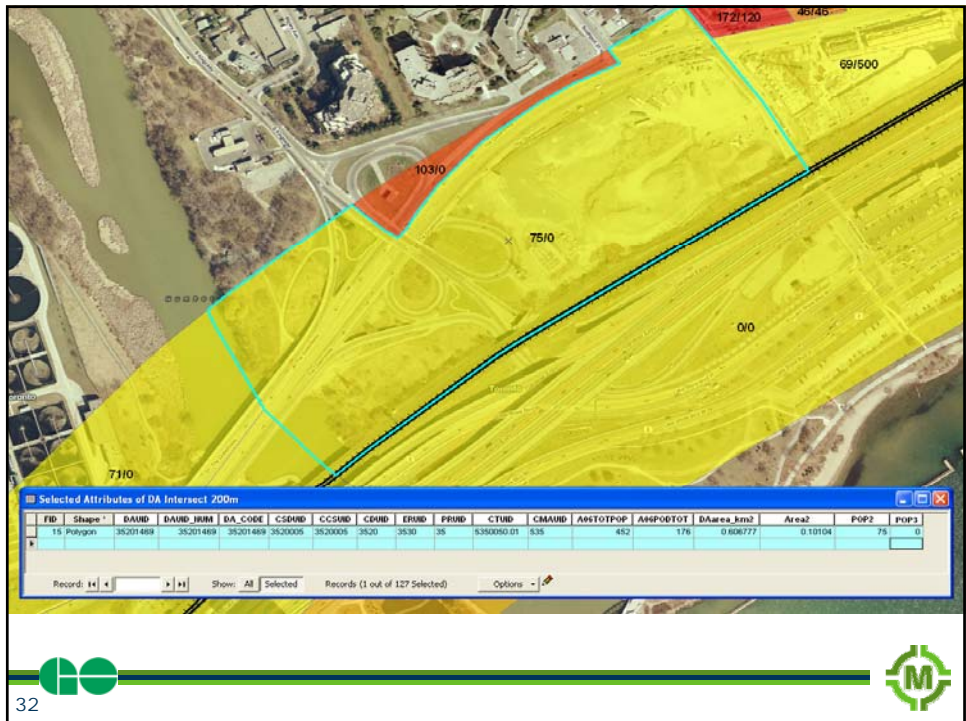


Multiple Category Evaluation

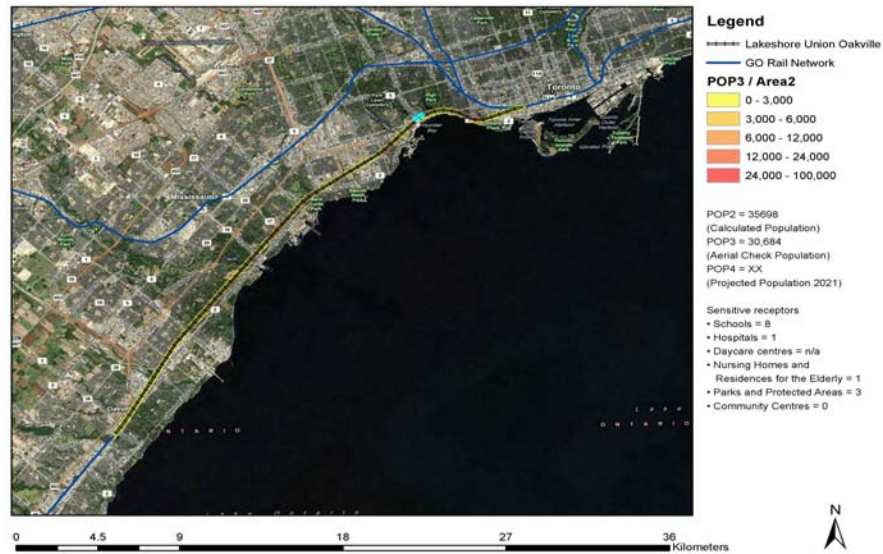


Land Use & Population Analysis





Union Station to Oakville - 200 Meter Buffer



Next Step - Detailed Evaluation

- ▶ Undertake the detailed MCE on the six shortlisted network options, including sensitivity and scenario testing (compare with the Reference Case)
- ▶ Undertake a detailed risk assessment on issues which may affect the case for electrification
- ▶ Consider wider constraints and opportunities and implications of other Metrolinx studies
- ▶ Determine key phasing and implementation considerations
- ▶ Continue to consult with the public and stakeholders and receive feedback

Questions and Comments



APPENDIX B:

Sample Worksheet



**GO Transit Electrification Study
Stakeholder Workshop #3**

WORKSHEET

Please Print

Name (optional)

Email (optional)

Phone Number (optional)

1. What feedback do you have on the key study background reports completed to date?

2. What feedback do you have on the proposed network options?

APPENDIX C:

Submitted Group Worksheets

Group 2 - Breakout Discussion Worksheet

1. What feedback do you have on the key study background reports completed to date?

- Consultants were not given enough leeway (i.e. scope was limited and did not look at other opportunities to transform the system. Did we consider Service Levels?
- Look beyond network paring and look at running GO in a different way

2. What feedback do you have on the proposed network options?

- A little more clarification on how the six options were selected
- Look at running smaller trains (reduce length of consists)
- Good strategy to single out the best options
- Electric loco is a good option, if approach is incremental steps / changes are going to be made to the system
- Where is the Bolton line on your maps?

3. What feedback do you have on the proposed approach for the detailed assessment of the network options?

- What are the construction time savings?
- How is the study team going to assess GHG emissions? Only local or including regional impacts?
- Ensure that monetary values are attached to social benefits so they can be fairly assessed against the costs/impacts
- Quantify CAC impacts to ensure they are adequately and fairly compared to capital costs
- Operating costs → Were losses due to transmissions considered?
- Review government programs and subsidies and incorporate them into the cost estimates for electric locomotives
- Include the cost of getting to the reference case in the detailed assessment

4. Do you have any additional comments or questions regarding the GO Transit Electrification Study?

- Include the ARL in the assessment report – it is currently not included in the report figures
- Review or Look at a greater visions with respect to trip time and the impact to overall performance

Group 3 - Breakout Discussion Worksheet

1. What feedback do you have on the key study background reports completed to date?

- Air toxins are not included in air quality assessment
- How do you tailor train sizes to demand at different times of day with loco-hauled train?
- Why is heavy maintenance so high for EMU?
- What about quantified benefits for transfers between electric locomotives and diesel locomotives?
- There needs to be more risk assessments done
- Not even Tier 3 is developed yet, how can Tier 4, which doesn't even have a prototype be used as the reference case? Should be Tier 2 which is in operation now.
- 200 metres is too short, past studies used 300 metres (air pollution only)

2. What feedback do you have on the proposed network options?

- How would existing locomotives be used if both Lakeshore and Georgetown are electrified, giving GO more locomotives than they can use?
- Why would we do the ARL twice?
- When does GO change from a commuter options to regional rail operation?
- How do you get the operating dollars?

3. What feedback do you have on the proposed approach for the detailed assessment of the network options?

- Cost of going the whole line at once possible cost prohibitive?
- UPRL should be its own corridor, not as part of any line project
- The Team should study impacts of electrification on capacity at Union Station (Instead of the reverse)
- More detail on equipment assumptions and breakdown (esp. For EMUs) and risk of Tier 4 and Dual-Mode

4. Do you have any additional comments or questions regarding the GO Transit Electrification Study?

- If Tier 4 doesn't materialize, now what?
- Union Station capacity should be assessed in the Electrification Study
- Union Station Capacity Study should have been done earlier or as a direct component of this study (Not a parallel study)

Group 4 - Breakout Discussion Worksheet

1. *What feedback do you have on the key study background reports completed to date?*

-Accept at face value

2. *What feedback do you have on the proposed network options?*

-How did the study team evaluate the network options?

-Was the ARL evaluated – why was it not separated

-The ARL should operate both express and local service

-Milton trains could travel across the top of the city to increase Union Station capacity

-Niagara falls was not included

3. *What feedback do you have on the proposed approach for the detailed assessment of the network options?*

-Air quality – how was the 200 metre zone defined

-Residential – is 200 metres enough?

-Hospitals and schools not as much of them so how do they fit in factoring the impact of air, noise, and vibrations impacts on the community

-EMU's – should be examined in more detail

-Reliability and break down factors to ensure stakeholders can understand the impacts of the options on their community

-Metrolinx should use the quickest EA process to get this implemented

4. *Do you have any additional comments or questions regarding the GO Transit Electrification Study?*

-Examine the opportunity to use regenerative power – set up a power station to make use of braking and regenerative power

APPENDIX D:

Submitted Individual Worksheets

****Notes:**

- **Personal information submitted on worksheets was removed**
- **Where questions are missing no response was given**

Individual Worksheet 1

2. What feedback do you have on the proposed network options?

- construction priorities
- measured impact on CN/CP/VIA → transferability of your findings to investigate electrification of freight in the future
- option for shorter (fewer cars) trains at off-peak hours would greatly improve the capacity and efficiency factor of the GO system

3. What feedback do you have on the proposed approach for the detailed assessment of the network options?

- has the conversion efficiency and transmission losses been included in the energy costs of the electrified options?
- corridor width of 200 metres: perhaps this width should be widened in proximity of stations due to idling
- evaluation of local air quality impacts should be expanded to look at regional impacts of electricity generation emissions. Trains running at peak hours will be incrementally powered by natural gas which has NOx and SOx emissions.

Individual Worksheet 2

2. What feedback do you have on the proposed network options?

- the diagrams of the 18 options (pages 22-31) of the Sept 22 paper don't show the ARL even though I understand it is being studied

3. What feedback do you have on the proposed approach for the detailed assessment of the network options?

- no monetary value to the environmental benefits of electrification in terms of how the health care costs/life expectancy/GHG reduction will reduce the impact of the conclusions.

Individual Worksheet 3

1. What feedback do you have on the key study background reports completed to date?

- the 2 LTK reports are excellent
- process is now moving in the right direction

2. What feedback do you have on the proposed network options?

- seems to present a reasonable basis for further evaluation
- feeling that Union Station rail corridor is a major issues that needs to be assessed separately
- need greater explanation of requirement for electrification of the entire TTR/UPRL
- Impact of potential air rights development due to electrification

3. What feedback do you have on the proposed approach for the detailed assessment of the network options?

- Need more info on equipment-related options and risks associated with Tier 4 and Dual-Mode
- Need more info on physical constraints of ARL and impact on equipment choices

4. Do you have any additional comments or questions regarding the GO Transit Electrification Study?

- If Electric Loco and Bi-level option is emerging as the frontrunner, then the Study Team needs to survey used loco market (Amtrak, NJT, SEPTA, etc.)
- Construction/implementation time savings from loco and bi-level option? Cost savings?
- Need an outside assessment of implementation timelines, specially RE: PANAM Games deadline for ARL

Individual Worksheet 4

1. What feedback do you have on the key study background reports completed to date?

- electrification hook up at Willowbrook yards can be used for Union to Pearson and Georgetown as stage 1. To be followed by completion of Lakeshore as stage 2.
- It will take 5 years to do Georgetown, 10 years plus to do Lakeshore due to length and complexity. Do the fastest route first
- Electrification of UPRL – Please advise us further on the convertible D2EMU proposed for ARL. UPRL can be electrified starting next year not constrained by PANAM

2. What feedback do you have on the proposed network options?

- Accelerate UPRL electrification by doing a technical amendment to the existing EA to specify details of the technology being used. MOE order allows for alternative technologies that meet Tier 4 standards. Give MOE the detail on what the alternative is rather than going through a separate TPEA process for the entire route.

3. What feedback do you have on the proposed approach for the detailed assessment of the network options?

- Electrify UPRL by 2015. Fast track the EA by technical amendment, start implementation planning today!
- Convertibles will give the cushion in case it cannot be operational as electric for 2 weeks of PANAM
- EMUs are cheaper than D2EMUs; Build it right, built it electric!

4. Do you have any additional comments or questions regarding the GO Transit Electrification Study?

- Concerns about November prioritization framework; Electrification “envelope” needs to be established
- Base Case must look at cost to convert to electric as transferring existing diesel resource plus whatever incremental add-on. Please do not add the cost of electrification on top of expanding services using diesel.

APPENDIX E:

Workshop Invitation and Attendance List

**GO Transit Electrification Study
Stakeholder Workshop #3 Invitation and Attendance List
Wednesday, September 22, 2010**

* Bolded Organizations Attended Stakeholder Workshop #3

Environment & Health

Pollution Probe

Air and Waste Management Association

Toronto Board of Health

CommunityAIR

Ontario Agency for Health Protection and Promotion

Clinton Climate Initiative

Environmental Health Association

ESEI Solar Foundation

Clean Air Partnership

Rouge Park Alliance

Ontario Healthy Communities Coalition

Ontario Clean Air Alliance

Wellesley Institute

Pembina Institute

Ontario Lung Association

Evergreen

Green Communities Canada

Canadian Association of Physicians for the Environment

Conservation Council of Ontario

Friends of the Greenbelt Association

Ontario Public Health Association

Protect Our Water and Environmental Resources

Community

Toronto City Summit Alliance

Weston Village Residents' Association

Weston Community Coalition

Mount Dennis Community Association

Canadian Federation of Students (Ontario)

Unionville Ratepayers Association

Lakeview Ratepayers Association

Metroland Media Group

Member of GO Transit Community Advisory Committee

Centre for Social Innovation

Active Living Alliance for Canadians with a Disability

Center for Information and Community Services of Ontario

Community Living Ontario

Housing Action Now

Ontario Community Support Association

Ontario Council of Agencies Serving Immigrants

Safe Kids Canada

Ontario Heritage

Metrolinx Seniors Advisory Committee

Ontario Undergraduate Student Alliance

Land Use and Social Planning

People Plan Toronto

Sustainable Urban Development Association

Canadian Urban Institute

Ontario Smart Growth Network

Ontario Professional Planners' Institute

pAlliance

Ontario Association of Landscape Architects

Urban Land Institute

Building Industry and Land Development Association

Canadian Policy Research Networks

Ontario Association of Architects

Ontario Federation of Agriculture

Ontario Professional Engineers Association

Neptis Foundation

Transportation Advocacy and Commuter Groups

BA Group

Clean Train Coalition

Regional Transit Advocate

Transit Riders Advocacy Coalition (GTHA)

GO Transit Customer Service Advisory Committee

Healthy Transport Consulting

Canadian Automobile Association (CAA)

Ontario Public Transit Association

Canadian Urban Transit Association

Transport Action Ontario

Smart Commute

Centre for Sustainable Transportation

Ontario Good Roads Association

Disabled and Aged Regional Transit

Canadian Institute of Transportation Engineers

Business and Economic Development

Greater Toronto Airports Authority (GTAA)

FRAM Building Group

The Warren Group

Green Tourism Association

Ontario Agri Business Association

Ontario BIA Association

Ontario Environmental Industry Association

Ontario Restaurant, Hotel, Motel Association

Ontario Tourism & Ontario Tourism Marketing Partnership

Retail Council of Canada

C.D. Howe Institute

The Institute for Competitiveness & Prosperity

BOMA Canada

Ontario Chamber of Commerce

Small Business Association - Canada

Canadian Youth Business Foundation (CYBF)

Toronto Board of Trade

Toronto Association of BIAs

Canadian Federation of Independent Business

Ontario Home Builders Association

Ontario Real Estate Association

Canada Green Building Council, Greater Toronto Chapter

Academic

University of Toronto (2)

McMaster University

Humber College (School of Applied Technology)

Mohawk College of Applied Arts and Technology

Sheridan College Institute of Technology and Advanced Learning

Ryerson University, School of Urban & Regional Planning

Gage Occupational and Environmental Health Unit – University of Toronto

Ontario College of Art & Design

Seneca College of Applied Arts and Technology

University of Ontario Institute of Technology

University of Toronto at Scarborough

York University