METROLINX GO RAIL ELECTRIFICATION

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Integrated Summary Report

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GO Rail Network Electrification TPAP Public Meetings Overview

Over 200 members of the public attended the third round of GO Rail Network Electrification Public Meetings between June 26th and July 5th, 2017 hosted by Metrolinx and Hydro One as co-proponents of the Transit Project Assessment Process (TPAP)* (Round 1 Public Meetings were held Feb/March 2016 and Round 2 Public Meetings were held November 2016). Four public meetings were held as part of the third round of public consultation on the Electrification TPAP. The four meetings were held in Mississauga, Toronto, Ajax, and Newmarket. Based on a show of hands and a review of the meeting sign in sheets, most of the meeting participants were attending an electrification project public meeting for the first time. Some participants had attended the Round 2 Metrolinx Regional Open House meetings in November 2016 (please see Attachment 8 for a recap of the November 2016 meetings).

The purpose of the meetings was to share information and seek feedback on the draft Electrification TPAP technical/environmental studies that have been completed to date prior to submitting the Environmental Project Report (EPR) for public review.

Each meeting began with a 30-minute open house, including a display of information boards and roll plans (i.e. maps of the entire network that illustrate where proposed noise and vibration mitigation measures are being considered) for review. Then, Metrolinx staff delivered a 30-minute overview presentation, followed by questions from the audience, facilitated by Swerhun Facilitation.

Participants provided feedback at the public meetings in person and in writing through feedback forms. Participants also had the opportunity to submit comments via email until July 14, 2017. In total, 26 paper feedback forms and 9 emails were received with comments specifically related to the electrification project (many other emails were received via electrification@metrolinx.com that were not related to the electrification project). Feedback from each of these sources is integrated into this summary.

Casey Craig and Nicole Swerhun, third party facilitators with Swerhun Facilitation, wrote this integrated summary, which reflects common themes and advice that emerged across all four public meetings.

Above: Examples of materials shared at each of the four Metrolinx Electrification TPAP Meetings
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Please see the Attachments for the meeting agenda and feedback form, the Electrification EA Update, the Hydrogen Feasibility Study handout, and meeting specific summaries of audience questions and Metrolinx staff responses. All materials, including this summary, are available online at www.gotransit.com/electrification. If you have any comments or questions about this summary, please contact electrification@metrolinx.com or 1-800-GET-ON-GO or 416-869-3200.

*The Transit Project Assessment Process (TPAP) process is the Environmental Assessment (EA) process for transit projects, as per Ontario Regulation 231/08.

2 Common Themes
The common themes identified in the summary report are not limited to electrification of the GO network; participants also provided feedback on a variety of topics including Regional Express Rail, track expansion projects, and general Metrolinx service planning. The list below identifies the themes that are relevant to the Electrification Transit Project Assessment Process (TPAP) in bold, and those that are outside the scope of the Electrification TPAP project in regular font. Metrolinx will be considering electrification related feedback as they refine the recommendations included in the Electrification TPAP project’s Environmental Project Report (EPR). Feedback related to other Metrolinx projects, such as Regional Express Rail, track expansion projects, and service planning, will be considered by Metrolinx more broadly. A summary of each theme is provided in the following pages of this report. Note that numbering is for ease of reference only and is not intended to reflect priorities.

1. **Find more equitable and accurate ways to measure and mitigate noise and vibration.**
2. Do more to reduce the noise from horns and whistles at level crossings.
3. Build noise barriers to a higher standard.
4. **Choose the technology with the least environmental, social, and financial impacts.**
5. Ensure there is enough parking to accommodate demand from existing and increased service users.
6. Develop and implement strategies to mitigate traffic congestion, particularly at at-grade crossings.
7. **Strengthen communications with the public, starting by providing timely public meeting notices.**
8. Explore a re-alignment of the rail corridor.
9. **Design and build electrification infrastructure in ways that reduce visual impacts.**
10. Other feedback (related to procurement, rolling stock, service planning, tree removal compensation, accessibility, and public consultation).

Newmarket meeting – July 5, 2017
Toronto meeting – June 29, 2017
3  Integrated Feedback Summary

The focus of each of the four Metrolinx Electrification TPAP Public Meetings was on participant questions and answers from Metrolinx staff. These meetings were held as part of the third round of public consultation, however, most meeting participants were hearing information about the electrification project for the first time. For a synopsis of the questions from the audience and answers from Metrolinx staff for each individual meeting, please see Attachments 1 – 4.

In addition to asking questions, raising concerns, and providing advice to Metrolinx about electrification and increased service (Regional Express Rail), many participants expressed support for the electrification project, noting that the project will benefit many people across the Province. Participants said they see the benefits of electrification to be improved air quality and important human health benefits; reduced greenhouse gas emissions (assuming electric power supply is clean); the ability to provide service at new stations along the route through faster acceleration; less ventilation required in tunnels; safer trains that do not carry diesel fuel; convenient links to the underground subway system; and important human health benefits.

Participants raised a number of concerns that reinforced what was heard through the previous round of consultation, including increased noise from trains, horns, and whistles as a result of increased service; the inequity of noise measurement and resultant mitigation efforts; the impact increased service will have on pedestrian movement and vehicular traffic crossing the rail corridor; the lack of parking space which will be in higher demand with increased service; and the idea that the use of an Overhead Contact System (OCS) to provide electrification of the rail corridor is an antiquated technology that should be traded with something more modern, like hydrogen.

Metrolinx indicated that much of this feedback is being addressed by ongoing projects and studies. For example, Metrolinx noted specifically that the Noise Action Planning Group is working on mitigating noise impacts along the corridor; there is an RER level crossings strategy that prioritizes grade separations; and there is updated GO Rail Station Access Plan identifying strategies that Metrolinx is proposing to use to address parking and access to stations. During the public meetings, Metrolinx referred the public to key documents, including:

- GO Regional Express Rail (RER) Initial Business Case Summary (2015)
- Go Rail Station Access Plan (updated December 2016)

The following summary organizes public feedback under the common themes that emerged over the course of the four public meetings. Metrolinx and Hydro One will take this feedback into consideration as they review and revise the Electrification Environmental Project Report (EPR). Meeting materials, including the presentation, the display boards, and the EA Update handout can be found online at [http://www.gotransit.com/electrification](http://www.gotransit.com/electrification).
3.1 Find more equitable and accurate ways to measure and mitigate noise and vibration.

Participants expressed that there are inequities in the way that Metrolinx measures noise and implements noise mitigation strategies. Participants said it is not acceptable that communities that already experience a high average noise level will not receive noise mitigation (some communities indicated their belief that existing high noise levels are already beyond the noise protocol’s established daytime and nighttime thresholds). Or, in some communities, the additional noise as a result of increased train service does not trigger a 5 dB increase. Sometimes it is both. In response to these concerns, participants would like to see Metrolinx:


b. **Consider the frequency of trains in noise measurement**. Current measurement practices dilute high noise levels experienced by passing trains by averaging them out of long periods of time.

c. **Consider noise walls for corridors with high existing noise levels (e.g. Lakeshore West), even where there is less than a 5 dB increase in noise**. Noise impacts will be exacerbated as a result of increased service.

d. **Collect data on-site to be used in noise and vibration modelling**. Do not base noise and vibration studies on modelling alone. Collect noise and vibration impact data from inside homes on first, second, and third floors. Use measured numbers and show how they compare to modelling numbers and demonstrate how mitigation will address the conditions.

3.2 Do more to reduce the noise from horns and whistles at level crossings.

Many participants expressed concern over horns and bells ringing at level crossings. With increased service, the noise from the bells and whistles will only be exacerbated and much harder to ignore. In particular, Newmarket participants raised concerns that trains retiring for the night at the Bradford Layover (train service centre) will have to pass through Newmarket, resulting in more horns and whistles at the 5 level crossings between Aurora and Bradford. Newmarket residents are concerned that they are receiving impacts of increased service without any of the benefits. Participants suggested that Metrolinx consider the following advice:

a. **Advocate for a revision to the Federal Train Horn Regulation**. Reduce train horn requirements within the regulation.

b. **Separate all level crossings** to reduce the need for many of the train bells and whistles.

c. **Implement additional security measures so the train operators don’t have to blow the whistle**. Do not put the burden on the municipality to take on the exemption process.

d. **Reimburse homeowners for property value losses due to the train horn noise**. There will be more train horns with increased service. Some property owners said they would like to see compensation for lost property value if the regulation is not updated.

e. **Do not sound horns and whistles for trains headed to the Bradford Layover**.

3.3 Build noise barriers to a higher standard.

Participants said that where noise walls have been installed on one side of the track but not the other, noise has increased as a result of sound bouncing off the barrier. With increased service, participants are concerned that they will be faced with significantly higher noise levels. Metrolinx has committed
to using absorptive materials for parallel noise walls, but there appears to be no such requirement for individual noise walls. Participants also noted that noise walls muffle sound for areas adjacent to track but send the sound higher, impacting those in high-rises and those further away from the sound barrier. Participants suggested that Metrolinx:

a. **Build parallel noise walls.** Sound is bouncing off noise walls where one side is built but not the other, making it noisier on the unprotected side of the track.

b. **Build noise walls higher than 5 m** to protect upper floors from noise.

### 3.4 Choose the technology with the least environmental, social, and financial impacts.

In the previous round of consultation, many participants urged Metrolinx to consider hydrogen technology to power the trains instead of an OCS system. Since then, Metrolinx and the Ministry of Transportation have begun studying the feasibility of using hydrogen to power vehicles on the GO rail network. There were participants at all four of the Metrolinx Electrification EA Public Meetings who reiterated support for hydrogen technology. Participants said hydrogen would result in less capital cost, a more affordable method of incorporating sustainability, and the elimination of many of the negative visual, tree removal, bridge barrier and replacement, and residential impacts of an OCS system. Feedback further suggested that the OCS technology is too old, and by implementing it in 2025, Metrolinx is taking a step into obsolescence. Participants also raised concerns about the OCS system costing more to operate because electricity is more expensive than fuel.

Some participants, however, suggested that early adoption of new and untested technologies should be avoided until the technology has been proven successful in other international transit systems. Participants raised concerns that a less environmentally focused government could more easily swap hydrogen trains for diesel trains in the future. Building more permanent infrastructure may compel future governments to continue to leverage that asset instead of potentially abandoning it. Participants suggested that Metrolinx:

a. **Determine whether hydrogen technology is feasible and preferred before implementing any of the OCS infrastructure.** Avoid duplicating efforts and cost.

b. **Use “clean” electric power** for less air pollution and less damage to heritage building and sites.

c. **Investigate Battery Electric Technology** as is being investigated in the U.K.

d. **Explore whether hydrogen trains could be used on the CN/CP owned corridors** (Milton, Kitchener, Richmond Hill). Participants suggested exploring hydrogen trains on CN/CP owned lines in addition to exploring hydrogen trains for Metrolinx owned corridors. Alternatively, participants suggested that instead of exploring the feasibility of hydrogen trains for Metrolinx owned corridors, they would prefer to see hydrogen options explored for the CN/CP owned corridors.

e. **Consider where and how the hydrogen will be generated, shipped, and stored for GO Train refueling.**

f. **Ensure electrification does not delay or impede the Province’s High Speed Rail study and plans.**

g. **Explore hydrogen buses** that could use the same fueling stations as the trains if hydrogen technology is determined feasible and preferred.
3.5 **Ensure there is enough parking to accommodate demand from existing and increased service users.**

Participants said that getting to the stations and finding parking will become significantly more difficult with increased service, noting there is not enough parking available to accommodate existing GO service users. Participants said that Metrolinx should make sure enough parking is provided to avoid undermining the intention of increased service to accommodate more users. Participant suggestions included:

a. **Purchase land around the East Gwillimbury GO Station to increase parking capacity.** East Gwillimbury’s geography makes it difficult to get to the GO Station by any means other than a car.

3.6 **Develop and implement strategies to mitigate traffic congestion, particularly at at-grade crossings.**

Participants said they were pleased to see that 10 existing at-grade crossings have been prioritized for separation. With 15 minute service, trains will actually be passing every 6 minutes in either direction. This will make it very difficult for people and traffic to cross the at-grade tracks, and has the potential to significantly delay north and south bound vehicle traffic. Currently, there is major traffic congestion at at-grade crossings during morning and evening rush hour service with traffic backing up for a kilometer or more. Participant suggestions included:

a. **Separate as many at-grade crossings as possible, and ideally, separate all of them.** Participants said that several at-grade crossings on the Lakeshore West, Barrie, Stouffville, and Milton corridors are still in dire need of separation but have not yet been prioritized.

b. **Adjust traffic light and crossing signal syncing** to reduce traffic congestion at at-grade crossings.

3.7 **Strengthen communications with the public, starting by providing timely public meeting notices.**

Notwithstanding the newspaper advertisements that were placed in various publications across the Greater Toronto area, some of the feedback that Metrolinx received relayed public disappointment about the lack of advance notice of the four public meetings – specifically as it relates to the Notice of Commencement/Public Meetings that was delivered via Canada Post mail to residents in the vicinity of the project study area. Many participants said they received the notices the day before or the day of the public meeting in their area, or that the meeting dates had passed by the time they received the notice in the mail. Feedback also suggested the meetings were inconveniently scheduled prior to and after a long weekend, at the end of the school year, and the beginning of summer vacations. Given the magnitude of the project and the importance of the public meetings, participants said that “timeliness and convenience are the hallmarks of sincerity when it comes to involving the public in an open and transparent process”. Many participants sent emails that said the lack of advanced notice and poor timing of meetings suggests that Metrolinx is not interested in real consultation, and contributes to a poor reputation and the erosion of public trust and confidence. Participants suggested that Metrolinx consider the following:

a. **Schedule another round of public meetings with more advanced notice** so that all those who were not notified ahead of time may have the chance to attend.

b. **Issue future public meeting mailers with at least 2 weeks of notice** in advance of the first meeting, taking into account expected mail delivery time.
c. **Communicate construction impacts and timelines to residents as early as possible.** Participants said advanced notice, explanation of what to expect, and the efforts that Metrolinx is making to mitigate impacts is an important part of communications with the community.

d. **Send background information pamphlet door to door or publish them in the newspaper.**

e. **Provide door-to-door education** on electrification project by Metrolinx staff.

f. **Make information more clearly accessible on the website** well in advance of public meetings. Some participants said it is difficult to find the information on local impacts and mitigation strategies on the website.

g. **At all future meetings, ensure there is someone from the Metrolinx team available to answer questions on the business plan**, including financials on payback, costs, and revenue.

**3.8 Explore a re-alignment of the rail corridor.**

Some participants said they would like to see Metrolinx seriously consider a re-alignment of the rail corridor. These participants said that relocating rail corridor to a deep trench (like in the U.K.) would reduce noise and eliminate at-grade crossings. Given that each grade separation costs $25-85 million (depending on various factors), these participants would like to see a cost comparison of relocating the rail corridor. Participant suggestions included:

a. **Zone land along the new corridor as exclusively rail, energy, and agriculture** to prevent new development on the geographically preferred corridor.

b. **Provide the public with a serious estimate of both capital and operating expenditures** of relocating the rail line. Use the Barrie line from King City to Bradford as an example.

c. **Re-route the twin track from King City to above the road through Bradford, next to the ING building, above or under Bathurst.** There is enough fill in a cut above Green Lane to build an embankment wherever needed to provide grade separation all the way to Barrie.

**3.9 Design and build electrification infrastructure in ways that reduce visual impacts.**

Participants raised concerns that the electrification infrastructure will have negative visual impacts on residential communities and heritage bridges. Participants suggested the following:

a. **Place OCS poles right at the end of laneways**, not of at the end of streets, to avoid visual intrusion.

b. **Customize OCS poles** with sculptural elements or bright colours to make them look less industrial.

c. **Consider the heritage impacts and consult the community on bridge changes** for the Fort York, Queen, Dufferin, Wallace, Rouge River, Bellamy Eglinton, Highland Creek, and all other heritage bridges.

**3.10 Other feedback**

Participants provided the following additional feedback for Metrolinx’s consideration:

**Procurement and design feedback**

- Procure from Canadian companies for the electrification work.
- Choose a rolling stock (train) that allows for splitting up the cars and running a smaller train during off peak times.
- Hire an architect who will humanize the infrastructure or else you risk industrializing the corridor.
• Require diversity in design so not all stations look the same, especially if one contractor is selected to design all stations.

Service planning feedback
• Travel time savings achieved through electrification will not attract as many users as a difference in fare structure would.
• Run trains much later to encourage people to use them.

Tree removal compensation feedback
• Provide more detail on a Metrolinx’s tree and vegetation removal compensation strategy. Participants would like to know whether and how homeowners will be compensated for loss of property values.
• Provide wood chips and shred tree branches and trunks (if not wanted for firewood) at no charge to property owners.

Accessibility feedback
• Ensure Metrolinx meets and, where possible, exceeds Accessibility for Ontarians with Disabilities Act (AODA) requirements with respect to train cars, access to stations and platforms, access to regional partners, and communications.
• Provide an accessible train car or reserve parts of the train for those with accessibility needs.
• Accelerate accessibility improvements at Long Branch GO Station.

4 Next Steps
Metrolinx and Hydro One will use the feedback from the June/July 2017 Electrification TPAP Public Meetings to finalize the TPAP technical reports and GO Rail Network Electrification Environmental Project Report (EPR) (as required). There will be an additional opportunity to comment on the Electrification EPR during the 30 day public and stakeholder review period, which will commence after Metrolinx issues the TPAP Notice of Completion (anticipated timing is October 11, 2017). The full draft TPAP technical studies, as well as quick reference summaries of the studies, are available to review online at www.gotransit.com/electrification. Comments can be submitted via email to electrification@metrolinx.com or 1-800-GET-ON-GO or 416-869-3200

Following the 30 day public/stakeholder review, the Minister of Environment and Climate Change will have 35 days to review and issue notice to Metrolinx/Hydro One. The TPAP Statement of Completion is anticipated to occur mid-December, 2017, with plans to complete construction of electrification infrastructure by 2025. The Hydrogen Feasibility Study will be conducted concurrent to the Electrification TPAP.
5 Attachment 1: Questions of Clarification – MISSISSAUGA: June 26, 2017

Clarke Memorial Hall
161 Lakeshore Road West, Mississauga
June 26, 2017
6:30 pm – 8:30 pm

5.1 Overview

Approximately 62 members of the public attended the first of four Public Meetings at Clarke Memorial Hall in Mississauga. The meeting began with a 30-minute open house, including a display of information boards for review. James Hartley, Metrolinx’s Electrification TPAP lead, delivered a 30-minute overview presentation, and Nicole Swerhun (Swerhun Facilitation) facilitated questions from the audience for the remainder of the meeting.

Below are the questions of clarification asked by meeting participants with answers provided by Metrolinx staff noted in italics. Questions are organized by topic area and are not in chronological order.

5.2 Questions of Clarification

5.2.1 Noise levels

1. I live in Mimico. I understand that the noise and vibration protocol is based on residential homes being a certain distance from the tracks themselves. How does the noise and vibration assessment work? The consultant team identifies sensitive receptors like residential homes that are within 1.5 m of the tracks, measuring from rear windows. If noise increases by 5 dB, it triggers the need to investigate noise mitigation.

2. You said that noise is not a concern for Metrolinx where power stations are in industrial zones. How can you guarantee these areas will not be residential in the future? Many of these substations are adjacent to Hydro One substations, which would not warrant mitigation. If there is an existing facility and a new residential neighbourhood is proposed, the developer would usually be required to implement noise mitigation.

3. The RER 15 minute service will mean a train passes every 6 minutes in either direction. You’re talking to us about general noise levels, but what we are really interested in is the noise impact as a result of increased train frequency. Metrolinx should be considering the frequency of noise in its noise mitigation. The protocol Metrolinx follows looks at two windows: the average noise during the daytime from 7:00 am to 11:00 pm and the average noise during the nighttime from 11:00 pm to 7:00 am. If the average noise increases by more than 5 dB, then Metrolinx investigates noise mitigation measures. Increased frequency is taken into consideration in this average. Doubling trains results in a 2 to 3 dB increase in noise, which is not significant, according to the protocol.

4. When GO increased service from hourly to every 30 minutes, there was no public consultation. These meetings are about electrification, but now we are now objecting to the noise because this is just too much. Who at the province should we be writing to about updating the noise protocol? The Minister of Environment and Climate Change is responsible for the Ontario Government’s provincial protocol, which is called the MOEE / GO Transit Protocol for Noise and Vibration Assessment (see Attachment 9 for the Protocol).
5. I live on Queen West near the tracks and I hear the trains non-stop. The noise is ridiculous – our walls, dishes, and doors rattle. Currently only a chain link fence separates my house from the corridor. There are no noise barriers, and it looks like there are no plans to build any noise barriers either. Is this going to change? Metrolinx follows a specific protocol to determine if noise mitigation is needed. Where noise does not increase by 5 dB or more, no explorations of noise barriers.

5.2.2 Train horns and whistles

6. I live two or three blocks from the tracks. There is a ‘ding’ sound at the nearby level crossing that will increase with increased train service. Has anyone thought of making changes to this noise source? For example, you could make the bells quieter or place them only at track crossings. There is a Federal Train Horn Rule that Metrolinx must abide by for train bells and whistles at or near grade level crossings. Metrolinx has a Noise Action Planning group that is currently exploring alternatives or improvements to these bells and whistles where new technology could replace the old. There are exceptions to the train horn rule. Metrolinx can help municipalities access these exceptions.

7. I live in Etobicoke near Long Branch GO Station. Around 11:00 pm, bells go off as the train leaves the station over Etobicoke Creek (westbound). Why is this? Metrolinx would have to look into why this is happening. Please leave us your name and phone number and we’ll find out and get back to you.

[Metrolinx provided the following answer after the meeting: Metrolinx has made an effort to reduce the number and duration of bells, and improve the consistency of their use. The mandatory use of train whistles and bells on rail corridors is outlined in Transport Canada Canadian Rail Operating Rules (CROR). In accordance with the CROR, there are two different circumstances where Metrolinx is required to use train bells or whistles — at stations and to notify work crews of an approaching train. CROR Rule 13 states: “The engine bell must be rung... (3) when approaching, passing or moving about station facilities or shop track areas.” This requires that Metrolinx use bells on approach to a station and as a train leaves the station. CROR Rule 14 states: “(1) Succession of short sounds; Alarm for persons or animals on or near the track.” You can review the CROR online at https://www.tc.gc.ca/media/documents/railsafety/CANADIAN_RAIL_OPERATING_RULES_2016.pdf

Also, we’ve been working with municipal and federal stakeholders on this issue for some time now to identify best practices and possible solutions to the use of train bells and whistles for trains entering and exiting passenger rail stations.]

5.2.3 Noise barriers

8. Are there any studies on noise bounce back in places where noise walls are on both sides versus on one side of the corridor? We are finding that having a noise wall on one side of the corridor creates more noise for us on the opposite side of the corridor than not having one at all. If there are sensitive receptors on both sides of the track that will experience a 5 dB increase in noise, then both sides would get the noise wall. There is the potential for noise bounce back if noise walls are not made with absorptive materials.

9. Does Metrolinx plan to use the baffled/egg carton / honeycomb design for the noise walls? Are these designs more expensive? The type of noise walls have not yet been determined, and whether they are more expensive is unknown. However, the design of noise walls can often be based on community input. On Lakeshore West, there are no planned noise walls. The investigation of noise mitigation is required when noise is expected to increase by 5 dB or more. On Lakeshore West, the
existing noise compared to the future noise results in less than a 5 dB increase, no noise mitigation is required.

5.2.4 Electrification infrastructure

10. **How close are the OCS poles to each other?** The OCS poles would be approximately every 50-65 m on a straight piece of track. Where there are curves or switches in the track, OCS poles could be closer together. The OCS poles will be approximately 2.9 metres from the track.

11. **Will you be installing the OCS along existing GO Train tracks or are you adding more tracks?** For 15 minute service, Metrolinx needs extra tracks on certain corridors (e.g. Barrie). Electrification infrastructure will go over top. Lakeshore West already has enough track for increased service, so there is no need to add more.

12. I understand that there are routes that will not be electrified because Metrolinx does not own them. However, could electrification be extended to the Kitchener line if the freight bypass to Bramalea is approved? Metrolinx is looking into this possibility. The challenge is that CN uses the same Kitchener corridor, limiting the ability to expand because CN does not want to jeopardize their freight service. Metrolinx is looking into potential solutions to address CN concerns, with one option being a new freight corridor.

13. **Is the pedestrian and bike path design parallel to bridge feasible?** Yes, it is feasible. There shouldn’t be any conflict as there will be a 7 m high fence separating the rail from the paths, eliminating the potential for contact with wires.

5.2.5 Rolling stock (trains)

14. **What type of trains will you be running on the electrified line, and will the double decker trains still fit under the OCS?** Metrolinx has not selected the type of trains yet. Metrolinx invested millions of dollars into the double decker coaches. Metrolinx may choose EMUs in the future where each passenger coach has an electric engine in it.

15. **Will electrification increase train speed?** Electric trains can accelerate from the GO Stations more quickly than diesel trains.

5.2.6 Traffic impacts and at-grade crossings

16. **Will electrification increase ridership?** Yes.

[Metrolinx provided the following answer after the meeting: The Business Case for RER (including electrification) forecasts 127 million customers by 2029, representing a 142% increase in ridership from 2014. You can view the business case at the website below.]


17. I am generally supportive of the project. Has Metrolinx studied the impact that increased east/west rail traffic is sure to have on north/south traffic patterns at level crossings? There is a Traffic Plans for Stations study underway, and another study that would address grade separations. Areas of increased traffic may be a higher priority for grade separation.
18. **How will you mitigate traffic impacts with at-grade crossings when there is 15 minute service?**

   Metrolinx is prioritizing the separation of at-grade crossings and traffic impacts are one criteria that will be used to prioritize.

19. **Will the travel time from Oakville to Union Station be quicker?** This depends on the type of rolling stock (trains) that is selected – this decision has not yet been made. It is possible to see speeds increase by up to 8%, depending on the rolling stock.

### 5.2.7 Parking and station access

20. **How will you make it easier to get to the stations for increased service?** Metrolinx will need more parking. Parking is at a premium. Metrolinx is exploring partnerships with local transit services to improve access to the stations.

21. **Is Metrolinx looking at both increased parking needs as well as mitigating increased traffic impacts?** Yes, traffic will increase. Metrolinx is challenged with coming up with innovative ways to address this.

22. **Will you expropriate land to accommodate increased parking spaces at Long Branch?** I suggest you consider this. Each station would have a unique solution. Metrolinx does not intend to expropriate for parking.

23. **What is the required distance between GO Stations?** Mimico to Humber Bay Shores needs more stations. We were told that with electrification, more stations would come. There will be 12 new GO Stations. Electric trains can get to top speed faster than diesel trains, allowing Metrolinx to service these 12 new stations and still get to Union Station in the same amount of time. There is no minimum or maximum distance between stations, but adding stations along the corridor means longer commutes for those further down the line.

### 5.2.8 Hydrogen and alternative technologies

24. **Isn’t it true that you will not need the Traction Power Stations and the Overhead Contact System if hydrogen technology proves to be feasible and you choose this technology instead?** Will you begin building this infrastructure before making a decision on hydrogen? Metrolinx is looking at the feasibility of hydrogen powered trains at the same time as seeking approval for electrification. Right now there isn’t a hydrogen powered train model for high volume commuter rail. Construction for the electrification infrastructure is scheduled to begin next year. Metrolinx will have to decide on hydrogen before then.

25. **Visual effects and tree and vegetation impacts were a heavy focus of the presentation. Have you considered alternatives to the OCS?** In Germany they have High Speed Trains with no overhead wires, like a subway power source. Metrolinx has 250 km of rail corridor to cover and over 150 at-grade crossings, making it impossible to provide the enclosed environment required for a third rail system (like a subway). Furthermore, while freight trains do not use these tracks often, they still have running rights. CN and CPR’s diesel trains still have to be accommodated on these tracks, which would impede the ability to implement High Speed Rail.

26. **In Germany there were no level crossings. If Metrolinx separated these level crossings would High Speed Rail be possible?** Metrolinx would love to separate all at-grade crossings but they cost approximately $50-75 million each. The rail corridor would also have to be 100% secured.
[Metrolinx added the following clarification after the meeting: Each grade separation costs $25-85 million, depending on various factors.]

27. Are there any other alternatives to the OCS? Can you bury the trains underground, like a subway? In 2010, Metrolinx undertook a study to look at ways to supply power to trains. The study concluded that electrification was the best option.

28. Can you turn third rail systems, like TTC, on and off electronically? TTC runs on a low voltage third rail. Europe uses an OCS system to support long term travel – long distances. The distance that Metrolinx serves is much further than the TTC serves. If Metrolinx implemented a third rail system, there would need to be significantly more traction power substations and power distribution facilities built along the corridors. The TTC uses 600 volts of power while the electrified Metrolinx system will use 25,000 volts, so there would also be significant safety issues to mitigate.

5.2.9 Trees and vegetation removal

29. Will Metrolinx compensate for property value loss as a result of tree and vegetation removal? For trees on private property, Metrolinx’s realty group would speak directly with property owners and work with them to come to a solution.

30. How much tree and vegetation clearance will there be? The vegetation clearance zone is about 2.5 metres from the edge of the OCS. There is a maximum of 7 metres clearance zone from the innermost track.

5.2.10 Electro Magnetic Interference (EMI) / Electro Magnetic Field (EMF)

31. I have safety and wellbeing concerns with respect to EMI/EMF issues. There are very few EMI/EMF emissions as a result of electrification.

5.2.11 Project cost and timing

32. What is the budget for this project, given the $50 billion transportation improvements approved across the GTA? I suggest you use some of the budget to create more parking. The budget for electrification is $2.6 billion.

33. What we haven’t seen so far is the actual costs associated with the project. Who will pay for this? Will our income tax, property tax, or gas tax increase? Is this a Provincial project or are the Feds kicking in, too? Both the Provincial and the Federal governments are contributing funding to electrification.

34. This is an enormous, ambitious project. How will you meet the 2025 target? Metrolinx is organizing to be able to deliver the infrastructure by 2025. There have been consultations with suppliers for infrastructure. Completing the TPAP is a necessary step in this process.

35. Is 2025 still the completion target for Kitchener? Yes, Metrolinx would be able to meet this deadline.

36. Willowbrook Yard was rezoned by the City of Toronto, and potential residential properties adjacent to the rail corridor could jeopardize electrification. What will happen if the Metrolinx’s OMB appeal is denied? Metrolinx does not think the appeal will be denied. Metrolinx’s position is that putting residential adjacent to the yard could result in noise issues.
6 Attachment 2: Questions of Clarification – AJAX: June 28, 2017

Ajax Community Centre
75 Centennial Road, Ajax
June 28, 2017
6:30 pm – 8:30 pm

6.1 Overview

Approximately 23 members of the public attended the second of four Public Meetings at Ajax Community Centre in Ajax. The meeting began with a 30-minute open house, including a display of information boards for review. Karen Pitre (Metrolinx) delivered a 30-minute overview presentation, and Yulia Pak (Swerhun Facilitation) facilitated questions from the audience for the remainder of the meeting.

Below are the questions of clarification asked by meeting participants with answers provided by Metrolinx staff noted in italics. Questions are organized by topic area and are not in chronological order.

6.2 Questions of Clarification

6.2.1 Electrification infrastructure

1. This is my first meeting. Could you please explain why you are making changes to the current system? Why are you electrifying? There are several benefits of electrification. These include lower emissions, improved air quality, quicker travel times and train acceleration, and reduced train maintenance requirements. The OCS would still require maintenance but the trains would require less maintenance than the diesel trains.

2. I am pleased to see that Metrolinx is considering electrification. Right now, Toronto to Whitby takes 15 minutes. How much faster will the train be? As part of the RER business case, work was done to determine the decreased travel time. You can view the business case by visiting: [link]

3. Are there any safety procedures in place for passengers in the event of a power outage? The system is designed to be able to power trains between areas of power outages. Each station has two transformers so if one goes out, the other will be available for power. If you lose one main power station, you can rely on other substations to operate.

4. What is the distance from the track to the OCS pole and the pole to private property (Wales Avenue on the Stouffville line)? It looks like the OCS or noise walls will need to be on my property. What happens in this case? In terms of tight areas on the corridor, site specific solutions will need to be achieved. Typically, the OCS pole would be 2.9 metres from the centre line of the track (between the two rails) to the face of the pole. Depending on the OCS structure (because of the possible difference in number of rail lines it needs to cross), poles are about 1 foot (30 cm) wide. 3 metres from the wire is required. So, either a technical solution will be investigated like bringing the wire inside the corridor or look at gaining some land. The distance is 7 metres, ideally, which is easy in an open field, but more difficult in Stouffville. Typically noise walls are about 5 metres high from the top of the rail (as it must block the path of sound to be effective). For private property, Metrolinx will look at the potential impacts and examine how or whether these impacts can be mitigated. If
mitigation is not feasible, Metrolinx then determines what is required in order to mitigate the impact and will deal directly with the property owner.

5. Currently CP, CN and VIA rail lines run through the LSE area. Would Electrification or High Speed Rail impact trains like VIA which run express to Montreal? VIA runs in the same corridors as GO. The timetable of VIA and new increased service would have to be worked out. VIA will run under the wires but details are being worked out with these stakeholders. This kind of agreement with electrification is common in other countries.

6.2.2 Rolling stock (trains)

6. Who is building the trains/ where are the trains being built? This decision has not yet been made. Metrolinx will include trains as part of the RFP package. Different strategies are being discussed. There are electric locomotive trains, Electric Mobile Units (EMU) trains, and electric locomotive engines replacing diesel – these would be phased in.

7. Will Metrolinx resell the old trains to salvage some of the funds from them? It would be costly to turn them into garbage. There is a resale market for trains, and this will be part of Metrolinx’s rolling stock strategy.

8. Does Metrolinx have plans to include train cars that can accommodate bikes? GO Train cars have bike trains and large volume capacity. It would be nice if something like 4 out of the 14 train cars allowed bikes on board. Metrolinx will determine how many bikes need to be accommodated.

6.2.3 Project timing and communication

9. When will construction start on new or upgraded noise walls, and when and how will residents be notified about it? I live right next to a noise wall just north of the 401. The noise wall north of the 401 would be associated with the highway, not the tracks. However, for noise walls, there would be an AFP (Alternative Financing and Procurement) contract. It will still be a few years before Metrolinx will know the details on when certain noise walls will be built. A location schedule will for noise wall construction will be made once the RFP has been issued and a contract has been procured. Notification to residents will happen well in advance.

6.2.4 Hydrogen and alternative technologies

10. Will you be issuing the RFP before the Hydrogen Feasibility Study is complete? If not, it appears that the timeline for completion in 2025 is flawed. 2025 was a hard date promised by the Minister. The RFP will only be issued after the Hydrogen Feasibility Study is complete and a decision has been made on the technology. The plan is still to complete the work by 2025.

11. Two of the benefits of electrification include increased acceleration leading to faster service, and regenerative braking. Would hyrdail still have these benefits? Metrolinx will have to look at this.

12. Can Metrolinx speak to the High Speed Rail (HSR) Study the province is doing? Electrification infrastructure is already accounted for. The GO corridor ends in Kitchener and the HSR goes beyond Kitchener to London. It would be costly and take a lot of coordination to integrate GO, UP Express, and the freight services with High Speed Rail beyond Kitchener.

13. The most expensive infrastructure for the High Speed Rail would be east of Kitchener. So, High Speed Rail would be more possible once this is installed. My advice is don’t delay or impede the High Speed Rail plans by the province.
6.2.5 Contracts and procurement

14. I assume an electrification RFP will go for bid with 50% design and build. What is the timeline between issuing the RFP to completing construction to being able to use the infrastructure? Metrolinx is considering an AFP model (not Design/Build). Metrolinx is planning for 2025 revenue service system to be phased in by corridor, as it is not feasible to do all corridors at once. The RFP will go out some time in 2018. The AFP process takes more time to make the design decisions and get to the constructions phase.

6.2.6 Accessibility

15. This project is scheduled to be complete in 2025. AODA compliance rules should be in place by then as well. What impact will electrification have on accessibility with respect to cars, platforms, stations, and access? Metrolinx has committed to fully accessible cars and stations.
Attachment 3: Questions of Clarification – TORONTO: June 29, 2017

Metro Hall
55 John Street, Toronto
June 29, 2017
6:30 pm – 8:30 pm

7.1 Overview

Approximately 54 members of the public attended the third of four Public Meetings at Metro Hall in Toronto. The meeting began with a 30-minute open house, including a display of information boards for review. James Hartley, Metrolinx’s Electrification TPAP lead, delivered a 30-minute overview presentation, and Nicole Swerhun (Swerhun Facilitation) facilitated questions from the audience for the remainder of the meeting.

Below are the questions of clarification asked by meeting participants with answers provided by Metrolinx staff noted in italics. Questions are organized by topic area and are not in chronological order.

7.2 Questions of Clarification

7.2.1 Electrification infrastructure

1. **Why is Metrolinx not electrifying the full length of the rail lines?** Metrolinx can only electrify the lines that Metrolinx owns. Trains will still continue to run beyond the electrified sections of track. Riders would get on a diesel train at Union that would continue beyond the termination point of the electrification infrastructure.

2. **If Metrolinx is only electrifying the rail lines that they own, will CP and CN electrify on their own?** CN and CP run their trains much longer distances across the country than GO does. CN and CP would both have to electrify all of their rail lines across Canada which is not currently feasible.

3. **Is electrification in use anywhere else?** Yes, there are successful examples throughout Europe, as well as New Jersey, Montreal, and California’s Caltrain.

4. **Does the height clearance under the OCS allow for double stacked train cars?** Yes, there will be extra clearance. CN and CP have running rights on Metrolinx-owned corridors. Some of the CN and CP trains are double stacked and taller than Metrolinx passenger trains. The OCS wires will be installed high enough to allow their trains underneath.

5. **It sounds like there is a less than 20% reduction in travel time. This doesn’t seem like a convincing reason to electrify. So, why are we electrifying?** In 2010 Metrolinx conducted a feasibility study on electrification. The report concluded that electrification would reduce commute times, reduce maintenance costs because of fewer moving parts on electric trains, and provide environmental benefits like improved air quality and reduced emissions.

6. **Are there data to support these statistics, such as the cost reductions associated with electrification?** The 2010 study on electrification has these details. You can read the study by visiting:
7.2.2 Electricity use

7. How much electricity is involved in the system and where is it coming from? With Ontario’s over supply and under sale of electricity, how will supply and demand impact electrification? Metrolinx and Hydro One are co-proponents for the electrification project. Traction Power Substations are strategically located so Metrolinx can tap into Hydro One resources. Electric trains will run on 25,000 volts. You can visit the Independent Electricity System Operator (IESO) website for more information: http://www.ieso.ca/

8. Will residential electricity rates go up if Metrolinx is powering trains using electricity from the same grid as residential areas? If it is rush hour and dinner hour and there is high demand on the hydro system due to increases electrified service, will this impact electricity prices for residents? Metrolinx is considered a large consumer client with a direct deal with Hydro One. Hydro One is aware of the power requirements for electrification. The system is currently oversupplied at certain times, and there is no expectation of rate increases. Hydro One does not expect impact to residential services. ‘Time of Use Pricing’ will also continue.

9. Has Metrolinx considered making electrification infrastructure available to other grid users in general, including TTC, electric buses, etc.? No, this has not been considered for the following reasons: TTC streetcars and the subway use 750 DC power from Toronto Hydro. These trains are travelling short distances. The GO train travels much further and uses 25k AC voltage. They are different power classes.

7.2.3 Hydrogen and alternative technologies

10. How does the hydrogen feasibility study fit into the Electrification EA? The Hydrogen Feasibility Study is not part of the Electrification EA. The Feasibility Study will help Metrolinx determine which technology to use to electrify the network.

11. How is the Hydrogen Feasibility Study being done? The Hydrogen Feasibility Study was just announced. Metrolinx and the Ministry of Transportation will work on the study together. There will be a symposium in the fall at the University of Toronto, bringing together industry leaders and experts to explore whether these types of trains can be procured, whether they meet Metrolinx specifications, and whether the technology can power a 12-car GO Train with the maximum capacity of passengers.

12. Will you be doing the Hydrogen Feasibility Study at the same time as you complete the Electrification EA? Shouldn’t you complete the Hydrogen Feasibility Study first? Metrolinx is working on both concurrently. Metrolinx is not required to begin implementing plans as soon as the Electrification EA is complete. Metrolinx will decide on hydrogen before building any of the OCS infrastructure.

13. How long will the Hydrogen Feasibility Study take? I assume construction would be shorter for hydrogen. Electrification does require a lot of infrastructure and impacts to evaluate. Part of the Feasibility Study is to examine the environmental impacts of the infrastructure required for hydrogen. We do not yet know these impacts so it is unclear if the process for hydrogen would take longer, shorter, or the same amount of time as electrification.

14. It is an excellent idea to study hydrogen fuel cells. Using hydrogen could eliminate almost all infrastructure issues you have identified with electrification. In the U.K., Battery Electric “BV” for trains appears to have the same benefits of fuel cells. Battery Electric and hydrogen fuel cells were
rulled out in the 2010 electrification study. The difference is, there have been major advancements in hydrogen so the Province has committed to re-examining this technology.

7.2.4 Bridge replacements and bridge barriers

15. The Dufferin Street Bridge over the Lakeshore West corridor and the expressway are slated for replacement in 2018. Is this being taken into consideration during the planning for electrification bridge work? The Dufferin Street Bridge is a gable bridge. Metrolinx is aware of the plans to upgrade this bridge. Dufferin, Dunn, and Dowling bridges will all require creative solutions to accommodate electrification infrastructure. Some options to consider include new elevated bridges or lowering the tracks in these areas.

16. I am with the Friends of Fort York. We would like some assurance that Fort York is included in your list of potentially impacted heritage properties and that it will get bespoke treatment. Also, what is the status of the Bathurst Bridge? This is a heritage designated bridge. The heritage value and impacts on both the Fort York and the Bathurst Bridge should be considered. The Bathurst Bridge is a provincially significant heritage bridge that will require a custom solution that accounts for the scenic views and is in line with the City’s plans for the bridge.

17. Who is Metrolinx speaking with at the City about the Dowling/Jameson bridges? Metrolinx has connected with Senior Level Management in Planning, Public Works, Transportation Services, Major Capital Infrastructure, Bridges and Structures, among others.

18. I am from Options for Davenport. I do not see any indication of how you will be treating the Wallace Avenue Bridge. Our community considers this a heritage bridge. Will you be engaging further with the community about plans for the Wallace Avenue Bridge? Metrolinx also considers the Wallace Avenue Bridge a heritage structure, and there is a process in place to protect the heritage attributes. Metrolinx is still early in the preliminary design phase, so engagement has not happened yet. The Wallace Avenue Bridge will need to be altered for electrification. The treatment of this bridge was addressed through the UP Express EA, which is why it is not part of the current network Electrification EA discussion. The bridge is not structurally sound. The floorboards and railings would need to be replaced and there are weight bearing issues.

7.2.5 Project cost and timing

19. At what stage of the EA process are costs factored in? Costs are considered throughout the life of the project. The 2010 Electrification study has the economics of the electrification project and why it makes financial sense. You can read this study by visiting: http://www.gotransit.com/electrification/en/project_history/docs/ElectricificationStudy_FinalReport.pdf

7.2.6 Traffic impacts and at-grade crossings

20. How many grade separations will there be? Metrolinx would like to separate all 150-180 level crossings, but each one costs $50-70 million. Not all level crossings can be separated at once. Grade separations in the City of Toronto are more costly than those in rural areas. There is a strategy underway to prioritize grade separations.

[Metrolinx added the following clarification after the meeting: Each grade separation costs $25-85 million, depending on various factors.]
21. Have you ever closed a road completely because of traffic impacts at level crossings? Yes, particularly where there are comparable under-used or better routes to accommodate the traffic.

7.2.7 Electro Magnetic Interference (EMI) / Electro Magnetic Field (EMF)

22. Are there EMI/EMF safety issues with the trains? Electricity goes through the OCS wire and emits electro-magnetic fields in opposite directions that cancel each other out. There are very low EMI/EMF impacts from electrification.

7.2.8 Noise and vibration modelling

23. I am disappointed to see that the 5 dB increase criteria for investigating noise mitigation is based on modelling. It sounds like nobody has gone out and done baseline studies across corridors through on-site monitoring. Models are often pie in the sky, and subject to many assumptions. Is there an intention to on-site monitoring for noise? The noise protocol is based on a 5 dB average noise increase. A baseline was established and modelling was done from there. If we take an exact measurement of the sound, it is hard to isolate the impact of the train for a direct comparison. The way it is measured would not influence the type of mitigation.

24. Are winter conditions included in the vibration modeling? Yes. Winter conditions were factored in.

7.2.9 Noise levels and noise walls

25. The noise from an accelerating diesel train is enormous. Electric trains should improve the noise levels. Yes, there will be a dramatic noise reduction, particularly as trains pull out of stations. When trains are running at top speed, there is little to no difference between the noise of electric trains and diesel trains.

7.2.10 Train speeds

26. I am a strong supporter of electrification. Will electrification mean faster trains? I heard that the trains can move up to 120 km/h. Are there speed restrictions? It sounds like Metrolinx could be designing a Porsche for the autobahn but we can’t drive it on the autobahn. The advantage isn’t the top speed the train can achieve, but how quickly the train accelerates. Electric trains are better at reaching top speed and staying there longer before having to slow down, compared to diesel trains.

27. Is Metrolinx doing anything to address the areas that are impacting the ability to achieve top speed (e.g. bends in track, accommodating other trains, switch and signal issues, etc.)? Metrolinx would not be able to do High Speed Rail because other users (CN, CP, VIA Rail) need to be able to use the track as well. Metrolinx strives for Class 5 track, which allows for speeds up to 120 km/h, but a dedicated rail line would be required for High Speed Rail.

28. Shouldn’t Metrolinx take this opportunity to straighten out the track to increase speed where it is possible to do so? Metrolinx looks at every opportunity to improve the speed of service, and many upgrades have been made to the signal system to allow increased speeds wherever possible. The LSE and LSW corridors are fairly straight, but others have more curves. Metrolinx does not own all of the property that would be required to straighten out the track. A lot of land would have to be expropriated to do this, especially in the City which would impact many residential homes near the track.

Prepared By: Swerhun Facilitation 08-14-2017
29. **Why do the trains slow down sometimes?** Speed limits on the corridor are based on the tracks. For example, trains will move slower when there are bends in the track or construction nearby, and signal systems may tell trains to stop or slow down as required.

30. **Is the rate of the GO Train acceleration dependent on horsepower and the wheels on the tracks or slippage (wheels spinning on the tracks)?** The locomotives are designed to compensate for slippage, like traction control.

### 7.2.11 Ridership

31. **There was a University of Toronto study which showed that narrowing the schedule would increase ridership.** Yes, electricity is a component helping drive increased ridership and service. This goes hand in hand with electrification.

32. **There are no express TTC buses, Travel time from where I live to Union Station takes 1.5 hours by TTC versus 30 minutes by GO Train. I choose to take the TTC because GO Train service is inconvenient and more expensive. The travel time savings achieved through electric trains will not attract as many users as a difference in fare structure would.** Consult Durham and York Regions, who have established a $0.50 local transit trip to connect to the GO Train. Metrolinx is working on a Fare Integration Plan. The goal is a seamless network connecting to 10 public transit agencies regionally.

33. **Does electrification increase capacity? If the objective is to allow more frequent service, why isn’t increased capacity identified as a benefit?** Electric trains can reach top speeds faster, but other factors limit the top speed, including curves in the track, the signalling system, and the fact that GO trains share running rights with freight.

34. **LSE and LSW service went from every hour to every 30 minutes midday and weekday service. How full are these cars now running?** The exact numbers are not available now but there has been an approximate 30% increase in ridership as a result of this change.

### 7.2.12 New stations

35. **I understand electric trains accelerate and decelerate faster, and that regenerative braking will improve travel times as well. Is Metrolinx considering adding stations now that trains can move more quickly across the lines?** Electric trains do accelerate faster, but they do not decelerate faster. Yes, more stations will be added without increasing trip times because electric trains will be able to accelerate faster and stay at top speeds longer. This will add a convenience factor that is important to many people using or contemplating using GO trains. There are 12 new GO stations, 6 new smart track stations, and 8 of these new stations will be in Toronto.

### 7.2.13 Rolling stock (trains)

36. **Are electric trains healthier than diesel trains? I would like to know more about the health benefits of electric trains.** Metrolinx diesel trains are Tier 4, which are good on emissions. With electric trains there will be zero emissions.

37. **Are the UP Express trains diesel or electric, or a combination?** The UP Express trains are diesel-electric combination. Diesel creates the electricity that powers the electric motor.
38. Great job. However, I am disappointed that Metrolinx is not selling the story the way you should be. For example, the UP Express was a multi-million dollar project. Nobody said that the advantages would be elimination of 28 level crossings – but you did that!

7.2.14 Construction

39. **What will the construction impacts be for commuters coming into Toronto?** Construction will be phased and staged, so not all work will be done at the same time. The goal is to have no impact or minimal impact. Diesel trains will run until the full electrification infrastructure is built.
8 Attachment 4: Questions of Clarification – NEWMARKET: July 5, 2017

Newmarket Community Centre
200 Doug Duncan Drive, Newmarket
July 5, 2017
6:00 pm – 8:30 pm

8.1 Overview

Approximately 87 members of the public attended the final of four Public Meetings at Newmarket Community Centre in Newmarket. The meeting began with a 30-minute open house, including a display of information boards for review. James Hartley, Metrolinx’s Electrification TPAP lead, delivered a 30-minute overview presentation, and Nicole Swerhun (Swerhun Facilitation) facilitated questions from the audience for the remainder of the meeting.

Below are the questions of clarification asked by meeting participants with answers provided by Metrolinx staff noted in italics. Questions are organized by topic area and are not in chronological order.

8.2 Questions of Clarification

8.2.1 Re-examining rail alignment

1. I previously suggested moving the rail line more west or more east so line is in the trench to address level crossings and noise, but I was told Metrolinx wouldn’t entertain route changes. Now that I see cost of level crossings is up to $85 million each (at Davis Drive, Mulock Drive, Green Lane, etc.) I would like to know what it would take to get Metrolinx to re-examine the rail alignment. The land could be obtained more cheaply now than you would be able to do in the future given growth. Metrolinx would like to eliminate all 180 at-grade crossings but we have to prioritize. There is a strategy underway to prioritize separation of high risk crossings and those with impacts to service and community. Realignment would be substantially more expensive than grade separation and it would come with many challenges, as well, including expropriation of private land.

[Metrolinx added the following clarification after the meeting: Each grade separation costs $25-85 million, depending on various factors.]

8.2.2 Train horns and whistles

2. I bought a property near the tracks, close to the King City GO Station. My biggest concern is the whistles. What is happening with whistle cessation at level crossings, especially considering that increased service will result in over 250 whistles every day? I know there’s back and forth with the municipality – where is happening with this initiative? This is a concern Metrolinx has heard across region. Whistles at level crossings are a federally regulated requirement. There is a process through Transport Canada that allows municipalities to apply for exemptions. Metrolinx is working with Transport Canada to see if any changes can be made to these regulations.

3. From what I understand, security measures would be need to be implemented and the municipality would have to accept liability for not having the whistles in order to grant the exemption. It looks like now is the best time to update these regulations because you are implementing all kinds of other mitigation strategies. Metrolinx is working to try to change the rules, but for now it’s the Transport Canada municipality exemption process.
4. Aurora Town Council is looking at motion for whistle cessation – it was considered before but decided against. There is quite a cost for crossing areas and liability. It will be a lengthy process to decide but it is being considered (Wendy from town council)

8.2.3 Double tracking and passing tracks

5. Is Metrolinx installing a second track all the way through the Barrie corridor? What happens at Aurora and Newmarket station? Will there be a crossing track to get to far side platform or will there be an under pass or over pass? The plan is to double track to just south of Newmarket, so Aurora will be impacted. Metrolinx has a list of higher priority grade separations. The ones with the most impacts will be separated first. A grade separation EA is already planned for the Wellington grade separation in Aurora.

6. When you go north from Aurora, if service is every half hour how will trains pass each other? There is double tracking between Aurora and south of Newmarket to add passing capacity. Innisfil GO Station will have 4 miles of passing track, as well.

7. Will there be a double track from Mount Joy to Lincolnville or Unionville, and how would this work with reservoir in Stouffville? There is an ongoing EA for double tracking on Stouffville line to Unionville. The 15 minute service will extend here.

8.2.4 Electrification infrastructure

8. Will the entire corridor have fencing to secure perimeter? Metrolinx will install 8-foot non-climbable fencing along the right-of-way. Noise walls can also act as security barriers.

9. What happens to the system if a weather disaster takes out a section? Does it disrupt the whole corridor or just the part where damage occurs? There are instances of natural damage to OCS wires, and if one section is brought down, power from other substations can be used to power the network. Sections of track can be isolated to turn off power – Metrolinx does this to perform maintenance.

10. What kind of power is going through the OCS wires and the Traction Power Facilities with respect to magnetic fields, especially in residential areas? There will be a 25kv system of current running through power lines. A streetcar is 750 DC; electrified trains would be 25,000 voltage system. EMI/EMF studies were done as part of the 2010 electrification study. The currents create a magnetic field that cancel each other out. There are more EMI/EMF effects from lights than electrification.

11. What happens to overhead wires at level crossings? Is this dangerous? There are no safety concerns with the height of the wires above the road. The OCS wires will be 7.2 to 8 meters above road, providing large clearance for tall vehicles. This is twice the truck height limit.

8.2.5 Hydrogen and alternative technologies

12. If hydrogen fuel cells were used, would we still have to cut back trees to protect lines? The feasibility study will reveal more about infrastructure requirements for hydrogen. A hydrogen fuel cell locomotive would have similar characteristics to a diesel locomotive, so it is likely there would not be much vegetation clearance required.

13. I am a Stouffville resident who backs on to the track on the reservoir. There is a silent crossing right now, with only a slight whistle in the morning and evening. Will the new increased service
schedule reinstate the horns and eliminate our silent crossing? There will be more noise with more service – new service started June 25 hourly service, and more is coming.

8.2.6 Bridge replacements and bridge barriers

14. I came from Toronto to talk about bridges in Parkdale that provide area residents with access to the lake. Please design the Dunn, Dufferin, Dowling, Jameson and Roncesvalles bridges with a plain or heritage look and avoid making them too modern and mechanical looking. The Roncesvalles pedestrian bridge is not an issue but will have barriers. The Dunn, Dufferin, Dowling, and Jameson bridges are temporary gable bridges until Metrolinx and the City of Toronto reach an agreement on who is going to do what with these bridges. If Metrolinx takes the bridges on, they will go through a design excellence process. Metrolinx will take this as feedback for the process.

8.2.7 Communication

15. Which aboriginal groups have you talked to? As part of the EA process, Metrolinx connected with about 13 groups. We’ve had face to face meetings with the Massessauga and the Huron-Wendat, among others.

[Metrolinx added the following clarification after the meeting: We have met with approximately 18 groups, including the Huron-Wendat First Nations, Williams Treaties First Nations, Six Nations of the Grand River, among others.]

16. Ensure that residents receive proper notice of when construction starts, and that spotlights do not shine into windows all night. Metrolinx will provide updates and notifications about when work is happening. Sometimes things will not go according to plan but the idea is to have a dedicated will communications person as a resource to address and mitigate impacts.

8.2.8 Contracts and procurement

17. Does Metrolinx have early thoughts on contract strategies for design, construction, and financing? How will Metrolinx ensure proper oversight so the project comes in on time and on budget?

Metrolinx will be using an Alternative Financing and Procurement (AFP) contract model for the design, build, financing, and operation. Metrolinx will prepare a concept design of electrification, which will be put out for tender. The successful proponent will design the system and will be required to maintain it for at least 30 years, making sure it’s safe and operational. The benefit of the AFP process is that it puts the risk on the contractor to provide excellent design that is stable and reliable for over 30 years. There would be financial penalties for missing key milestones. The contractor also bears the risk for being on time and on budget. Metrolinx will have oversight and will be involved in mitigating issues.

18. Will there be one design build contract for all stations or will all stations have separate contracts?

There will be numerous types of AFP contracts. For example, stations will be a package 2 AFP process and electrification is a package 3 AFP process. For a Package 1, ideally one contractor would be responsible for all stations, but you don’t always get that.

19. What is the life cycle design of the proposed electrification infrastructure and what do you see as the weakest link? A 30 year life cycle design will be built into the AFP. The AFP contractor will be responsible for designing and maintaining the infrastructure for at least 30 years, which would incentivize them to ensure the system is robust enough to last. When the contractor hands the
system back to Metrolinx after the 30 year period, the infrastructure has to be in good enough shape to last another from 10-30 years, depending on the market. The OCS and wires can last up to 60 years and power stations and transformers can last 30-40 years. The weakest link lies within the traction power/switching stations.

8.2.9 Service planning

20. Why isn’t Metrolinx extending the 15 minute service right up to Green Lane, north of Newmarket, where there are high levels of residential growth? I am concerned about the impacts on Aurora with 15 minute service. Many more people will come to Aurora to catch the train and we are already backed up. Metrolinx’s business case identified where it made sense to have 15 minute service. Increased service has to stop somewhere, and Aurora was identified as the cut-off based on the budget of the RER expansion program. The business case can be accessed via the website: http://www.metrolinx.com/en/regionalplanning/projectevaluation/benefitscases/GO_RER_Initial_Business_Case_Summary_EN.pdf.

21. How recent was that study? The initial business case for RER was published in 2015.

22. I am a resident of Newmarket and I use GO every day. There seems to be a hard stopping line for service in Aurora. What can Newmarket residents expect for service north of Aurora? The additional weekend service has been implemented, but at the same time, residents can no longer catch a GO bus to get to Toronto. We have to travel south to Aurora to catch the GO Train instead. For those of us embracing public transit, you’ve removed the opportunity for us to do that. When GO service reaches its ultimate peak, the plan is 15 minute service up to Aurora from the south. All stations north of Aurora will get hourly weekday, evening and weekend service, and half hour service during rush hour. The GO Train service has replaced the need for some buses. Buses are run when there is no train service during the day.

   Instead of going to Newmarket, buses are serving the Tannery and proceeding down Prospect Street to the GO Station. All served by bus coming from Barrie. 1h 15 min service down to train in Aurora. Every bus from Newmarket will go to Aurora to catch train. Some will terminate at East Gwillimbury. If you need to get to a GO service, can park and take VIVA, etc.

23. How late will service run? A have final service plan is not yet in place. Lakeshore trains run until about midnight and service on the Barrie line will likely be similar.

24. Metrolinx put in two new bridges and both are double track. Both have capacity for two sets of independent track. I assume this means that sometime in the future, north of Aurora and Unionville will have extra service. (Don Hamilton Unionville City of Markham Ward 3 Councillor). As engineers design rail corridors and bridges, they are always thinking long term to allow for potential expansion. There are no immediate plans for extra service on these tracks but if the population has increased 40 years from now, Metrolinx would be in a position to accommodate extra service.

8.2.10 Parking and station access

25. If you are using same design for each station, keep in mind that certain stations will need different treatments for parking/kiss and ride areas so they do not interfere with the neighbourhood and local traffic. There will be a traffic assessment at each new station to determine entrances and exits to the station in partnership with the municipality. The Station Access Plan deals with all existing stations and will apply to all new stations.
26. I am interested in whether Metrolinx will increase parking on site for existing stations, and whether Metrolinx will mitigate the traffic coming to each station. Consider a design that places the kiss and ride and additional parking inside the station area with vehicle access from Sheppard rather than the local streets.

27. When will Metrolinx build a parking garage at Unionville GO Station enhance parking? Station and parking upgrades are outlined in the Station and Parking Access Plan, which can be accessed via: http://www.metrolinx.com/en/regionalplanning/projectevaluation/studies/GO_Rail_Station_Access_Plan_EN.pdf

8.2.11 Bradford Layover

28. Metrolinx is proposing to store trains overnight at the Bradford layover facility to accommodate enhanced service from Aurora going south. These trains will have to pass through Newmarket to get to the Aurora GO Station. Will Newmarket get the nuisance of additional trains but not the benefits? Newmarket is also getting additional service, but not full 15 minute service. Newmarket is getting half hour service during rush and hourly service off peak. Today Newmarket only has service in the morning, evening and on the weekend.

29. Will the Bradford Layover result in more horns and bells in Newmarket or not? Trains will make their way across those five Newmarket at-grade crossings to make it to the Bradford Layover, resulting in more noise. Right now we have a 5:30 am train. How many more will we get coming out of the layover? Yes, there will be additional noise. Metrolinx is removing the non-revenue train during the Bradford layover. With increased service there will be more whistles heading toward the layover which crosses 5 level crossings. It is not more trains, only the trains that are finishing their final run – some trains will come from the north.

8.2.12 Grade separation

30. If the OCS wires are going to be so far above the vehicles, why do you need to do grade separation? Why not leave all crossings the way they are? Grade separation doesn’t have to do with electrification per se. However, many of the rail corridors (e.g. Barrie) currently have only morning and evening trains, but will be switching to all day service up to every 15 minutes. This will be a dramatic increase in trains on rail corridor. This means the at-grade crossing arm gates will down longer and more often, impacting traffic flow. Grade separations are being prioritized to mitigate this impact.

31. What is grade separation? The terms ‘level crossing’ or ‘at-grade crossing’ refer to when the road and the rail are at the same level. Grade separation moves the road under rail or the rail under road.

32. Are there plans for grade separation at McGowan Road and Centennial Station? The platform is beside the street and there is a lot of train congestion here that will only get worse with increased service. There is a strategy underway to prioritize grade separations. All crossings were rank ordered. 10 out of 38 first tier at-grade crossings have been identified for the first wave of separation with others planned as funding arrives.

33. Is McCowan Road included in the first 10 grade separations? No. McCowan road is not included in the list of Tier 1 grade separations. For a list of Tier 1 grade separations as outlined in the RER Level Crossings Strategy visit the website:
8.2.13 New stations
34. Will there be a Mulock station, and if yes, when? Yes, there will be a station at Mulock. The EA process for this station should begin in the fall of 2017.

8.2.14 Trees and vegetation removal
35. It looks like there are 16kms of proposed noise barriers along the Stouffville corridor, mostly through old Unionville and Markham. Will there be a significant loss of trees to accommodate the vegetation clearance zone? Yes, potentially. Noise walls are usually installed on the property boundary. Any trees in the area between the track and the noise wall would have to be removed. If the foundation of a noise wall is in conflict with other trees, Metrolinx would first determine whether there are ways to build the noise wall without removing trees.

8.2.15 Construction
36. What kind of impacts and disruptions are expected during the construction phase for those who live right behind tracks? Minimal impacts are expected for the construction of the electrification infrastructure. OCS poles will be placed every 65 metres apart. Contractors will drill a hole, insert the pole, and move along. There will be minimal time spent in one spot. For track infrastructure, there will be a longer period of construction for grading work and the installation of track and signals. Impacts, communication: A construction mitigation plan will be put in place with a construction liaison committee. There is also a community relations person dedicated to each corridor. You can sign up to receive regular notices and updates via email, including a schedule with details about where and how long construction will be underway in your neighbourhood.
9 Attachment 5: Agenda and Feedback Form

Please see the following pages for the agenda and feedback form, which were combined into one booklet.
Thank you for your feedback. Please leave your completed feedback form at the registration table on the way out and/or share your thoughts online at gotransit.com/electrification or electrification@metrolinx.com.

c/o GO Rail Network Electrification Project
20 Bay Street, Suite 600
Toronto, ON M5J 2W3
1-888-438-6646

Please forward all feedback by July 14, 2017 to be included in the published meeting summary.

GO Rail Network Electrification Project -
Transit Project Assessment Process (TPAP)
Public Meeting #3 – June 26, 28, 29, & July 5, 2017

Background:
Metrolinx and Hydro One are co-proponents, jointly working on a Transit Project Assessment Process (TPAP) to examine the environmental impacts of converting several GO rail corridors from diesel to electric propulsion.

Purpose of the Public Meeting:
To provide updates on:

- Public Meeting #2 feedback;
- Overall project since the last consultation round in November 2016, including progress on, and changes to, the following:
  - Vegetation Compensation Protocol;
  - Visual mitigation and Design Excellence;
  - Noise Mitigation Plan;
  - Cultural Heritage Studies and recommendations;
  - Archaeology Studies and recommendations; and
  - Allandale Tap facility location;
- Next steps for the project

AGENDA

6:30 pm       Open House
7:00          Welcome, Introductions and Agenda Review
              Swerhun Facilitation
7:05          Overview Presentation
              Metrolinx
7:35          Facilitated Questions & Discussion
8:15          Wrap-Up & Next Steps
8:30          Adjourn
1. Do you have any feedback regarding the updated materials and information presented by Metrolinx?

- Bridge Barrier and/or OCS Visual Effects & Mitigation:

- Noise & Vibration:

- Vegetation & Tree Removal:

- Cultural Heritage:

- Proposed Bridge Replacements:
10 Attachment 6: Electrification EA Update

The Electrification EA Update provided meeting participants with new information and updates on the electrification project. Please see the Update on the following pages.
Electrification Update

Moving forward with electrification requires Metrolinx to complete an Environmental Assessment (EA) to identify potential impacts of this new infrastructure and ways to mitigate those impacts. EAs for this type of transit project happen under the Transit Project Assessment Process (or TPAP).

Work on the TPAP has been underway since late 2015, and a significant amount of technical work and public consultation has already been completed. In February and March of 2016, the first round of consultation focused on the TPAP process, electrification infrastructure requirements, and proposed traction power facility locations. The second round of consultation followed in November 2016 and focused on impacts and mitigation options for noise, vibration, and vegetation/trees. In total, 28 public meetings have been held to date.

The purpose of this third round of public consultation for the TPAP is to share information and seek feedback on the draft EA technical studies that have been completed prior to submitting the Environmental Project Report (EPR) for public review.

This guide provides updates on new information since the second round of consultation in the Fall of 2016, and seeks public feedback regarding these updates, as well as any other thoughts or comments the public would like to see considered prior to completion of the TPAP.

What are the plans for GO Transit Expansion?

The Province of Ontario has committed to electrifying the Metrolinx-owned portions of the GO Transit system, and to bringing more train trips to every GO rail corridor (see map below). Trains will be running up to every 15 minutes, there will be service in both directions, and more all-day service. There will also be 150 km of new track (to allow for more uninterrupted service), new bridges and tunnels, and new and renovated stations.

TECHNICAL REPORTS AVAILABLE

The Environmental Project Report is the final product of the TPAP process. There are a number of Technical Appendices that inform the Project Report, and highlights from those Appendices are reflected in this Guide and also available for review at gotransit.com/electrification.

The Technical Appendices include the baseline environmental conditions in the GO corridors that will be electrified, the anticipated impacts, as well recommendations for mitigating those impacts.

Key topics covered include (but are not limited to):

✓ Natural environment ✓ Cultural heritage
✓ Archaeology ✓ Air quality
✓ Noise and vibration ✓ Visual impacts
✓ Stormwater management
✓ Land use & socio-economics
✓ Electromagnetic Interference & Fields (EMI/EMF)
What kind of infrastructure is required for electrification?

The TPAP examines the potential environmental effects of constructing and operating the new electrification infrastructure required to convert the existing GO Transit system from diesel to electric propulsion. The project will design and implement traction power supply and distribution components including an Overhead Contact System (OCS) along the rail corridors, bridge modifications, new electrical feeder routes, as well as a number of electrical power supply/distribution facilities located in the vicinity of the rail corridors.

Electrification of the GO Transit network requires electrical power to be supplied from Ontario's electrical system through Hydro One's existing high voltage grid via connections to the proposed Traction Power Substations. As a result, Metrolinx and Hydro One are co-proponents of the TPAP.

Recap of November 2016 Meetings

Participants said that they would like Metrolinx to:

**Electrification-Related Feedback:**
- Go above and beyond minimum noise and vibration mitigation requirements.
- Proactively communicate with communities on all aspects of the projects (from construction all the way through until there is increased service).
- Create conditions for replacement trees to thrive.
- Include diverse and native species.
- Ensure noise, vibration, and tree removal compensation is locally applied.
- Be open to alternative types of technology for trains on the rail corridor.

**Feedback Received Not Related to Electrification:**
- Separate at-grade crossings.
- Consider the impacts that providing additional local service will have on the regional service Metrolinx is mandated to provide.
- Integrate GO Service with local transit service.
- Ensure the service remains affordable.
- Review and revise outdated policy and strengthen the procurement process.

The Integrated Summary report from Round 2, as well as links to all previous meeting summaries, can be found at gotransit.com/electrification.

Vegetation & Tree Removal

Vegetation removal is required within a maximum 7m zone of the outermost electrified track to minimize the risk of tree limbs falling on the track or overhead wires and to ensure safety for maintenance workers, GO riders, and neighbours.

**Vegetation Approach – Private Property**

Metrolinx will seek design solutions to minimize tree removal on private property. In the case where a safety risk cannot be avoided, then Metrolinx will consult with land owner and seek municipal tree removal permit. Trees will be compensated as per Municipal requirements.

**Vegetation Approach – Metrolinx Property**

Technically, Metrolinx can remove trees within Metrolinx property without permits or compensation. Metrolinx is developing a methodology to compensate for trees removed on Metrolinx’s property. Metrolinx will partner with Conservation Authorities and municipalities to develop the final compensation strategy.

AMT Deux Montagnes line, Montreal.
OCS Visual Effects & Mitigation

The installation of Overhead Catenary System (OCS) infrastructure will affect the viewshed along the rail corridor, particularly in areas of vegetation/tree clearing. Areas of ‘high’ visual impact will be identified and specific design measures will be incorporated to mitigate visual impacts. These strategies will address the range of visual conditions, area allocations, and mitigation needs that will be found along the corridor. The installation of OCS infrastructure will affect the views at GO Stations, particularly in areas of vegetation/tree clearing. A Design Excellence process will be followed to integrate OCS design into GO Stations to reduce the extent of visual impacts.

Bridge Barrier

Visual Effects & Mitigation

All overhead and pedestrian bridges will require bridge barriers for safety, which may affect views across the bridge. Metrolinx is developing an approach for the design of bridge barriers to visually enhance their appearance and will review options for enhancing aesthetics of bridge barriers in consultation with interested/affected municipalities as appropriate.

Cultural Heritage

Understanding impacts on properties with cultural heritage value or interest is part of the TPAP process. There are three types of modifications that will need to be made to heritage properties as a result of electrification, including:

- Attaching the Overhead Catenary System (OCS) at GO stations and bridges
- Attaching flash plates on bridges
- Attaching bridge barriers to overhead bridges

There are 12 heritage properties potentially impacted by electrification infrastructure: 3 that are provincially significant, 9 that are locally significant. Heritage Impact Assessments will be completed for all 12 of these properties, and the HIAs will have recommendations that will inform the final design.

Proposed Bridge Replacements

A preliminary investigation as part of the TPAP identified that some bridges are too low to meet the minimum vertical clearance required or are required to be replaced due to protective barrier requirements to accommodate electrification. The bridges below are proposed for replacement.
Noise & Vibration

A Noise and Vibration Study was completed to understand the noise & vibration effects of future electrified GO Transit Expansion service levels (also known as RER or Regional Express Rail).

There are two key protocols in place that Metrolinx follows:

- The 1995 draft Transit Noise and Vibration Protocol from the Ontario Ministry of Environment and Climate Change/GO; and
- The 2013 Noise Guideline (NPC-300) from the MOECC which applies to stationary noise sources such as announcements at train stations.

These protocols stipulate that:

- Mitigation must be considered if the project is expected to cause a 5 dB increase or greater in the average noise relative to the existing noise level or the MOE objectives of 55 dBA for daytime and 50 dBA for night-time are exceeded;
- Mitigation is required if it is administratively, operationally, economically, and technically feasible; and
- Noise barriers are considered technically feasible if they can reduce noise by at least 5 dB.

Based on these protocols, the Noise and Vibration Study has proposed noise barriers in a number of corridors where they have been determined technically feasible (see table below). More detailed study will be completed to confirm the administrative, operational and economic feasibility of implementing these barriers.

<table>
<thead>
<tr>
<th>Location</th>
<th>Kilometres of Proposed Noise Barriers *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Union Station Rail Corridor</td>
<td>0.9 km</td>
</tr>
<tr>
<td>Lakeshore West Corridor</td>
<td>0 km</td>
</tr>
<tr>
<td>Kitchener Corridor</td>
<td>1.3 km</td>
</tr>
<tr>
<td>Barrie Corridor</td>
<td>39.4 km</td>
</tr>
<tr>
<td>Stouffville Corridor</td>
<td>15.8 km</td>
</tr>
<tr>
<td>Lakeshore East Corridor</td>
<td>11.3 km</td>
</tr>
</tbody>
</table>

* Numbers are approximate, proposed barrier is a new or retrofitted 5m noise wall.

Why electrify?

There are a number of benefits to electrification:

A fast, more attractive service.
- Electric trains can accelerate faster and stay at top speed for longer, saving time for customers;
- By attracting additional riders, frequent electric train service reduces road congestion; and
- Regenerative braking puts energy back into the system.

A more efficient, reliable service.
- More frequent service reduces reliance on scheduled trips and increase the number of available seats;
- Lower operating and maintenance costs; and
- More trips are possible with electric service compared to diesel.

Reduced greenhouse gas emissions and improved local air quality.

Project Milestones

Below is a list of key project milestones and dates:

- **TPAP Notice of Commencement:** June 14, 2017: A 120 day period is provided to complete a final round of public and stakeholder consultation that will focus on the EPR – WE ARE HERE NOW.
- **Notice of Completion:** October 11, 2017. At this time, the EPR will be finalized.
- **30-Day Public Review:** October 12 – November 10, 2017. During this time, the public will have an opportunity to review the EPR.
- **35-Day Minister Review:** November 11 – December 15, 2017. During this time, the Minister of Environment and Climate Change will review the EPR.

NEXT STEPS

Feedback from this round of public consultation will help inform and refine the Environmental Project Report (EPR) which is required by the TPAP.
11 Attachment 7: Hydrogen Feasibility Study Handout

Please see the following pages for the Hydrogen Feasibility Study handout.
Hydrogen Feasibility Study

Metrolinx, an agency of the Province of Ontario, is upgrading its commuter rail system into Regional Express Rail. The Greater Toronto and Hamilton Area (GTHA) is now home to nearly 7 million people and heading towards 10 million by 2041. To address the urgent transit needs of the GTHA, the Province of Ontario committed to implement Regional Express Rail and make other improvements to the GO system. By 2025, electrified trains will be running every 15 minutes or better, all day and in both directions, within the most heavily travelled sections of the GO network.

As part of the Regional Transportation Plan, Metrolinx is committed to running faster, more frequent GO service to keep GHTA residents moving on public transit. This includes offering all-day service every 15-minutes service in both directions on sections of the rail network owned by GO Transit.

Metrolinx is committed to finding the most sustainable solution for electrifying the GO rail network. That’s why, in addition to studying the environmental impacts of traditional electrification, Metrolinx is also examining the feasibility of another form of electrification - hydrogen powered vehicles.

What is included in the feasibility study on hydrogen?

As part of our work to deliver GO RER, the Ministry of Transportation is working with Metrolinx to study the feasibility of using hydrogen to power vehicles (‘hydrail’) on the GO rail network.

The study will explore all of the issues associated with implementing trains powered by hydrogen fuel cells. This will draw on lessons learned in Germany where hydrogen-powered trains are being introduced in late 2017/18 for passenger service. The study will need to explore everything from fuel supply and storage, to vehicle design and fleet planning, to statutory and regulatory requirements, to standards and operational rules, to testing economic viability and impact on RER’s business case, and understanding the associated timescales should implementation go ahead.

As part of the study, this fall the province will bring together industry leaders in fuel cell technology for a symposium hosted by the University of Toronto to explore the potential application of hydrogen fuel cell technology to electrify the GO rail network.

Why hydrogen, why now?

Metrolinx completed its Electrification Study in 2010. At that time, the conclusion was that hydrogen fuel cell technology was not suitable for use in Ontario. Since 2010, hydrogen fuel cell technology has advanced to the point that other jurisdictions are taking a much closer look. For example, Germany is poised to deploy trains powered by hydrogen fuel cells that are currently undergoing final testing. To make sure we get this right, Ontario is exercising its due diligence to ensure that we chose the appropriate technology to electrify the GO rail network.

What does this mean for electrification?

If the feasibility study determines that hydrail is an option for our GO rail network and we ultimately decide to proceed with this technology, we would still be electrifying our network. It is a different technology, but it is still electrification.
Ontario is committed to running electrified trains on the GO rail network by 2025. Studying the feasibility of hydrail technology is part of our due diligence to ensure that we choose the appropriate technology to electrify the GO rail network.

Metrolinx is currently undertaking a GO Rail Network Electrification TPAP to assess the environmental impacts of converting several GO rail corridors from diesel to electric service. We are moving forward on electrification. Our assessment of hydrail will be happening in tandem with the Electrification TPAP - this will make sure that we stay on-track for 2025.

**Would choosing hydrogen result in another EA? How long would this take?**

Whether or not choosing hydrogen will require a new EA will be one of the outcomes of the feasibility study. One of our goals in moving the study of hydrogen in parallel with the TPAP is to ensure we look at the feasibility of a fuel cell based rail system and its environmental footprint vs a traditional overhead wires approach.

An environmental assessment would be required for the fuel production, storage and refueling facilities.

**Is hydrogen safe, both for riders and for those in the community?**

Yes. Hydrogen is routinely transported on roads and highways by truck throughout communities all over North America, both as a compressed gas and in liquid form. Hydrogen is integral to production in various industries, including metals and automotive manufacturing, and its production, storage and distribution comprises a well-established infrastructure.

Hydrogen is also used safely as a transportation fuel. More than 215 hydrogen fueling stations for automobiles are in operation around the world. More than 50 of these are in the U.S. and about half of them are self-service stations for drivers, supporting more than 2,000 passenger fuel cell-electric vehicles, most built by Honda, Hyundai and Toyota. All these vehicles and fueling stations have had to comply with rigorous public safety standards. Many experts in the field believe hydrogen is safer than other conventional fuels, because it is non-toxic and dissipates so quickly when vented.

In Canada, there are a few hydrogen fueling facilities, and around 10 fuel cell-electric vehicles are currently registered to drivers in British Columbia and Ontario. Established codes and standards exist, as well as training materials for first responders, which ensure that hydrogen is managed safely in accordance with proper procedures.

**Why is hydrogen considered a form of electrification?**

Electricity is used to split water into hydrogen fuel which is then pumped into the vehicle’s tank. The hydrogen is then used to generate electricity on the vehicles using fuel cells. Finally that electricity is used to drive electric traction motors to move the vehicle. There is no combustion in this process. Hydrogen acts an ‘energy carrier’ between electricity generated using renewable technologies and electricity driving electric motors.
12 Attachment 8: Recap of November 2016 Regional Open House Meetings

Over 600 people attended the Metrolinx Regional Open House meetings between November 7th and November 29th 2016. Thirteen meetings were held in multiple municipalities across the Greater Toronto and Hamilton Area (GTHA), with the smallest meeting having 15 participants and the largest having 95 participants. The purpose of the meetings was to share information, review proposed mitigation strategies, and seek feedback on the following three Transit Project Assessment Process (TPAP*) to build new track and electrification infrastructure on Metrolinx-owned rail corridors:

- GO Rail Network Electrification TPAP (with Hydro One as co-proponents);
- Barrie Rail Corridor Expansion TPAP; and
- Lakeshore East – Don River to Scarborough Expansion TPAP.

The Regional Open House meetings also included review of Metrolinx’s Regional Transportation Plan, providing an opportunity to formally incorporate new insights into the plan, while ensuring momentum is maintained on the projects underway.

Meetings began with a 30-minute open house, including a display of information boards for review. Then Metrolinx staff delivered a 30-minute overview presentation, followed by questions from the audience, facilitated by Swerhun Facilitation. Participants were given the opportunity to attend two 30-minute workshop rotations designed to present and seek feedback on noise and vibration issues and mitigation strategies, and tree removal processes and compensation strategies. In some meetings, participants preferred to continue the facilitated question period, in which case no workshops were held. Metrolinx staff and technical experts were available to answer questions around the information boards and roll plans (i.e. maps of the entire network that illustrate where proposed mitigation measures are being considered) for the remainder of the evening.

The recap below summarizes the common themes from the feedback received across all 13 Metrolinx Regional Open House meetings in November 2016. Summary reports for each of the 13 meetings are available at [www.gotransit.com/electrification](http://www.gotransit.com/electrification).

**Electrification-Related Feedback**

- Go above and beyond minimum noise and vibration mitigation requirements
- Proactively communicate with communities on all aspects of the projects
- Create conditions for replacement trees to thrive
- Include diverse and native species in replacement trees
- Ensure noise, vibration, and tree removal compensation is locally applied
- Be open to alternative types of technology for trains on the rail corridor

**Feedback Received Not Related to Electrification**

- Separate at-grade crossings
- Consider the impacts that providing additional local service will have on the regional service
- Integrate GO Service with local transit service
- Ensure the service remains affordable to all who use it
- Review and revise outdated policy and strengthen the procurement process

Prepared By: Swerhun Facilitation 08-14-2017
13 Attachment 9: MOEE/GO Transit Protocol for Noise and Vibration Assessment

Please see the following pages for the MOEE/GO Transit Protocol for Noise and Vibration Assessment.
Tuesday, January 10, 2006

Total number of pages being transmitted, including this page 8

<table>
<thead>
<tr>
<th>TO:</th>
<th>FAX #</th>
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<tbody>
<tr>
<td>Peter Van Delden, RWFI</td>
<td>519-823-1316</td>
</tr>
</tbody>
</table>

RE: Draft Protocol for Noise and Vibration Assessment (Draft #8)

FROM: Dan Fransay • Tel. (416) 869-3600 ext.5478 • Fax (416) 869-1563

MESSAGE: As requested, please find attached the Draft Protocol for Noise and Vibration Assessment (Draft #8), dated December 1994.

Please note that it is not clear what status this document has with MOE and also that GO Transit has not accepted the approach in the protocol.

Therefore, reference to the draft protocol will have to be worded appropriately. Once you've prepared a draft response to the peer review, could you please provide a draft copy to Geoff Bubbers at AGM for review by GO staff to ensure the wording is accurate with respect to the status of the protocol.

cc Geoff Bubbers, AGM
1.0 PURPOSE

GO Transit and the Ministry of Environment and Energy (MOEE) recognize that commuter rail transit facilities produce noise and vibration which may affect neighbouring properties. This document identifies the framework within which criteria will be used to assess noise and vibration from proposed GO Transit rail projects. The framework in this document is to be applied for planning purposes in order to address the requirements of the Environmental Assessment Act and is to be utilized during implementation of the project.

The purpose of this document can be summarized by the following:

- assist GO Transit in the preparation of Environmental Assessments;
- streamline the MOEE's noise impact review of Environmental Assessments; and
- make available to the public a consistent approach for Environmental Assessments.

This Protocol does not apply to existing GO Transit operations, nor does it apply to projects undertaken by other non-GO Transit rail operators.

2.0 SCOPE

- Establish noise and vibration objectives for GO Transit rail projects.
- Establish methods of assessment - measurement and prediction.
- Enable the comparison of alternatives.
- Establish the framework for the assessment of mitigation where impacts are identified.

3.0 DEFINITIONS

Adjusted Noise Impact:

The adjusted noise impact is the equivalent sound level resulting from the introduction of the GO Transit rail project adjusted to indicate greater impact at higher post-project sound levels.
Ambient Noise:

The ambient noise is the sound existing at a point of reception in the absence of all noise from the GO Transit rail project. In this Protocol, the ambient is taken to be the noise from road traffic and existing industry. The ambient specifically excludes transient noise from aircraft and railways.

Day-time Equivalent Sound Level:

$L_{eq,16}$ is the day-time equivalent sound level. The definition of equivalent sound level is given in Reference 2. The applicable time period is from 07:00 to 23:00 hours.

GO Transit Rail Project:

GO Transit rail project means a project to add or expand rail service and/or a layover site that requires approval under the Environmental Assessment Act be obtained by carrying out an environmental assessment.

Layover Site:

Layover site means a GO Transit facility dedicated to overnight storage of GO trains.

Night-time Equivalent Sound Level:

$L_{eq,8}$ is the night-time equivalent sound level. The definition of equivalent sound level is given in Reference 2. The applicable time period is from 23:00 to 07:00 hours.

Point of Reception:

**Day-time:** 07:00 to 23:00 hours

Day-time point of reception is any outdoor point on a sensitive property where sound originating from the Project is received and which is no less than 15m from the nearest track's centre line. For at-grade sensitive land uses, e.g., low density residential development, this point is normally 3m from the unit in the front or back yard whichever is most exposed to the noise source at a height of 1.5m. For residential uses such as apartment units, this is normally the plane of the apartment bedroom or living room window.
Nighttime: 23:00 to 07:00 hours

Night-time point of reception is the plane of a bedroom window where sound originating from the Project is received and which is no less than 15m from the nearest track's centre line. At the planning stage, this is usually assessed at the nearest facade.

Point of Vibration Assessment:

Point of Vibration Assessment is the location 5m to 10m away from the building foundation in a direction parallel to the tracks or adjusted as required to accommodate site conditions.

Rail Service:

Rail Service means the operation of GO trains along transit corridors (including GO Transit commuter stations) and access routes between GO facilities and these corridors. Layover sites are not part of the Rail Service and are therefore assessed separately.

Sensitive Land Use:

Sensitive land use means a residential dwelling or place where people ordinarily sleep or a commercial/industrial operation that is exceptionally sensitive to noise or vibration. Noise and vibration impacts will be assessed for lands which have been committed for sensitive land uses. Committed uses include uses such as: existing development, approved site plans, approved condominium plans or draft approved plans of subdivision.

Vibration Velocity:

Vibration shall be assessed using the running average RMS (Root-Mean-Square) vibration velocity (mm/sec).

4.0 NOISE

4.1 Rail Service

For the purposes of assessment, rail service is considered to include the operation of trains on the rail line and the operation of trains inside commuter stations. Idling of trains inside commuter stations is considered part of the operation. Noise produced by layover sites is not considered part of the rail service and is assessed separately, see Section 4.2.
4.1.1 Objective

The desirable objective is that the day-time (16 hour) $L_{eq}$ produced by the rail service operation of the GO Transit project does not exceed the higher of the ambient sound level, combined with the sound level from existing rail activity, or 55 dB $L_{eq}$. Furthermore, that the nighttime (8 hour) $L_{eq}$ produced by the rail service operation of the GO Transit project does not exceed the higher of the ambient sound level, combined with the sound level from existing rail service, or 50 dB $L_{eq}$.

4.1.2 Impact Assessment Method

The noise impact of GO Transit rail projects shall be assessed using prediction methods acceptable to the MOEE (see Reference 1). The noise impact from rail service shall be assessed on a 16 hour (day-time) basis using $L_{eq,16}$, and 8 hour (night-time) basis using $L_{eq,8}$. The impact assessment method should base its assessment on future GO Transit train volume projections, from the commencement of operations to a maximum of twenty years (typical GO Transit planning horizon).

4.1.3 Impact Assessment Criteria

The impact at a point of reception shall be expressed in terms of the Adjusted Noise Impact. The Adjusted Noise Impact shall be based on the difference between:

- pre-project noise, which is the combination of the ambient noise and the rail noise; and
- post-project noise, which is the combination of the ambient noise and the post-project rail noise.

Where the pre-project noise is less than 55 dB $L_{eq}$ during the daytime or 50 dB $L_{eq}$ during the nighttime, the pre-project noise shall be taken as 55 dB $L_{eq}$ daytime or 50 dB $L_{eq}$ nighttime.

The impact shall be rated with respect to the objectives as follows:

<table>
<thead>
<tr>
<th>Adjusted Impact Level</th>
<th>Impact Rating</th>
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<tbody>
<tr>
<td>0-2.99 dB</td>
<td>Insignificant</td>
</tr>
<tr>
<td>3-4.99 dB</td>
<td>Noticeable</td>
</tr>
<tr>
<td>5-9.99 dB</td>
<td>Significant</td>
</tr>
<tr>
<td>10 + dB</td>
<td>Very Significant</td>
</tr>
</tbody>
</table>
Where a GO Transit rail project may produce road traffic noise impact, these noise impacts shall be assessed in accordance with the methods approved for the Environmental Assessment of roadway projects, e.g., Class EA.

4.1.4 Mitigation

When a 'significant or greater' impact is predicted, the potential to mitigate will be evaluated based on administrative, operational, economic and technical feasibility. If deemed feasible, the mitigation measures shall ensure that the predicted sound level from the GO Transit rail project is as close to, or lower than, the rail service objective.

4.2 Layover Sites

For the purposes of assessment, a layover is considered to include the idling of trains in an area off the mainline track that is designated for such use. Due to operational constraints, GO Transit will usually generate layover alternatives that closely parallel mainline tracks.

4.2.1 Objective

The desirable objective is that the $L_{eq}$ in any hour produced by the operation of the layover site does not exceed the higher of the ambient sound level, including the sound level from existing industry, or 55 dB $L_{eq}$.

4.2.2 Impact Assessment Method

The noise impact of GO Transit layover sites should be evaluated on a case-by-case basis, by predicting the one hour $L_{eq}$ at a point of reception, using prediction methods acceptable to the MOEE. The noise impact assessment should incorporate all noise sources associated with the layover operation.

4.2.3 Impact Assessment Criteria

For the purposes of site selection, the noise impact shall be assessed utilizing the rating method of Section 4.1.3, with the exception that the minimum pre-project $L_{eq}$ shall be 45 dB $L_{eq}$.
4.2.4 Mitigation

When a 'noticeable or greater' impact is predicted, the potential to mitigate will initially be evaluated based on administrative, operational, economic and technical feasibility. In addition, the feasibility shall consider the effectiveness of mitigation with respect to site specific conditions and other sources of noise not included in the original impact assessment. If deemed feasible, the mitigation measures shall ensure that the predicted sound level from the GO Transit rail project is as close to, or lower than, the layover objective.

4.3 Construction

Noise and vibration impacts from the construction of a project shall be examined. For the purposes of impact assessment and identifying the need for mitigation, the guidelines in Reference 5 apply.

5.0 VIBRATION

The assessment of ground-borne vibration shall be confined to that produced by the operation on the line and shall exclude vibration due to maintenance and/or construction activities.

5.1 Objective

The desirable objective is that the vibration velocity produced by the GO Transit project does not exceed 0.14 mm/s at a point of vibration assessment. Where the vibration from existing operation exceeds 0.14 mm/s, the desirable objective is to not exceed the existing vibration level.

5.2 Assessment Method

The vibration impact of a GO Transit rail project shall be assessed using field measurements of vibration velocities. Where applicable, the assessment shall include vibration generated by non-GO Transit rail traffic.

5.3 Impact Assessment Criteria

The impact at a point of vibration assessment will fall into one of the following categories:

- existing and future vibration velocity remains less than 0.14 mm/s;
- existing vibration velocity is less than 0.14 mm/s, future vibration is expected to exceed 0.14 mm/s;
existing vibration velocity is greater than 0.14 mm/s, future vibration is not expected to exceed this value; and

- existing vibration is greater than 0.14 mm/sec, future vibration is expected to exceed this figure.

GO Transit will not increase vibration velocity to a level that will cause structural damage.

5.4 Mitigation

When the vibration velocity at a point of vibration assessment exceeds the objective by 25%, the requirement to mitigate will be evaluated based on administrative, operational, economic and technical feasibility.

6.0 REFERENCES


