

EA INFO SHEET – Noise

November 2016

QUICK OVERVIEW

GO Transit Expansion is bringing more train trips to every GO rail corridor. Trains will be running up to every 15 minutes, there will be service in both directions, more all-day service, and there will be faster electric trains. There will also be 150 km of new track (to allow for more uninterrupted service), new bridges and tunnels, and new and renovated stations.

This EA Info Sheet includes key information on:

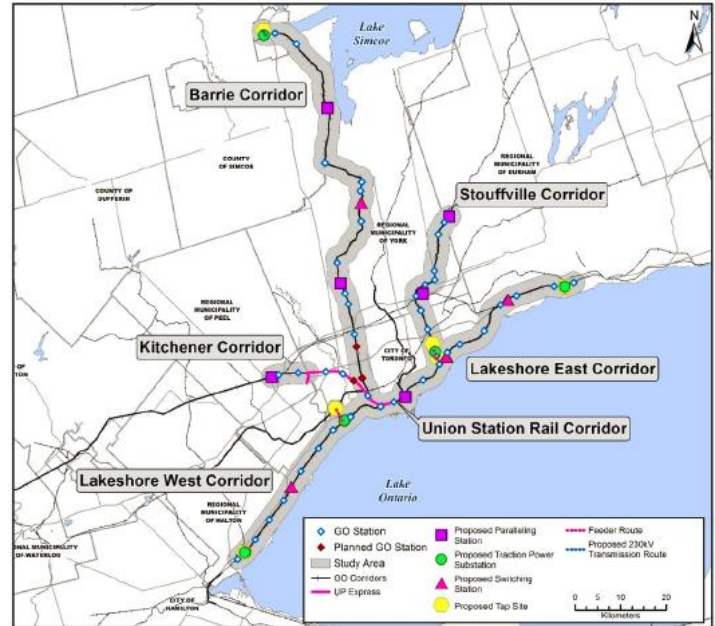
- Sources of noise;
- How to read Metrolinx maps showing areas that will experience an increase of 5 dB (or greater) noise;
- Current regulations regarding noise and mitigation required;
- What Metrolinx is currently doing to mitigate noise;
- Key challenges being explored related to noise;
- Next steps in the process and questions for you.



WHAT MAKES THE NOISE?

The key sources of noise include:

- Train engine
- Wheels on the rail
- Cooling fans on the engine and for climate control in the trains
- Horns/whistles on the trains



OUTSIDE OF THIS EA, WHAT IS METROLINX ALREADY DOING?

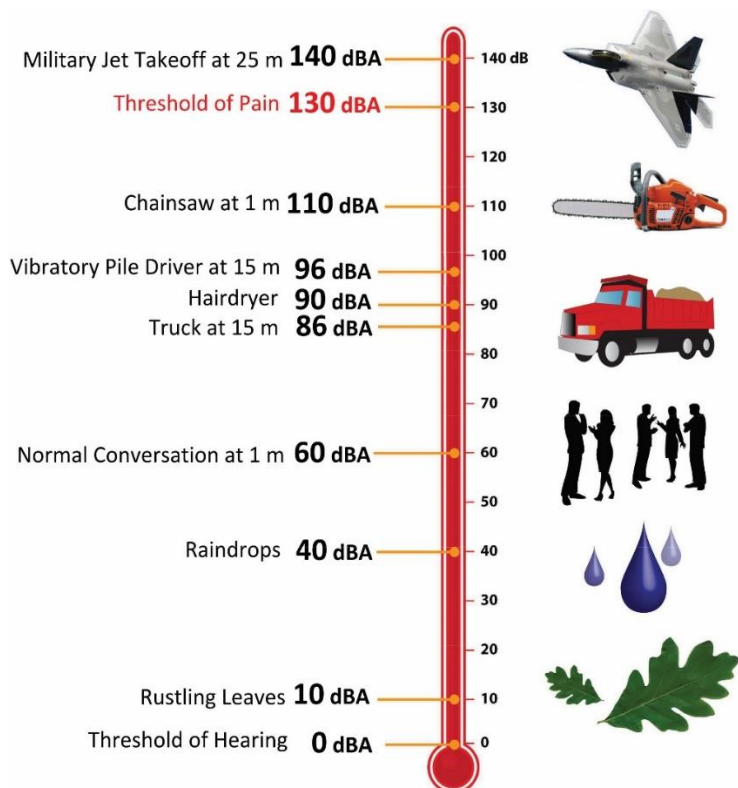
Metrolinx is working hard to identify opportunities to reduce noise. Key activities include:

1. Connecting with Transport Canada on the existing bells and whistles regulation and some of the challenges it creates in an urban environment.
2. Examining the use of leading-edge infrastructure materials and design which can reduce noise through advances in technology (such as improvements in track structure, curves and welds, the use of rail dampers on track).
3. Examining options for mitigating noise on those corridors where service and operations have increased significantly without the additional infrastructure that would trigger provincial requirements to consider noise mitigation.
4. Investigating noise concerns and undertaking maintenance or other actions to address noise if possible.
5. Informing communities at least two weeks in advance of the start of construction activities and any noise mitigation plans that will be in place during construction.

IMPORTANT NOISE DEFINITIONS

Term	Definition
dB	Decibel – unit of noise measurement
dBA	Noise levels adjusted to how humans actually experience different frequencies
L_{eq}	Average sound level over a specified time period (e.g. L_{eq} 16 hr)

COMPARING SOURCES OF NOISE (dBA)



WHAT'S THE IMPLICATION OF CONSIDERING AVERAGE NOISE?

The benefit of using an average noise measure is that it takes into account *both* the amount of noise from any one train passing, as well as the frequency of the noise. If the noise happens frequently enough that it raises the average by 5 dB or greater, then it is considered an important enough impact to require mitigation options to be investigated.

The challenge of using an average is that the noise experienced by any one train passing may be higher than the average, however this does not trigger mitigation to be investigated.

WHEN IS MITIGATION REQUIRED?

There are two key protocols in place that Metrolinx follows regarding mitigating noise impacts:

- The 1995 draft Transit Noise and Vibration Protocol from the Ontario Ministry of Environment and Energy (MOEE)/GO; and
- The 2013 Noise Guideline (NPC-300) from the Ontario Ministry of Environment and Climate Change (this applies to stationary noise sources including train stations, covering things like, for example, announcements at the station).

The 1995 draft MOEE/GO Transit Noise Protocol stipulates that:

- Mitigation must be considered if the project is expected to cause a 5 dB increase or greater in the average noise (referred to as " L_{eq} ") relative to the existing noise level or the MOE objectives of 55 dBA for daytime and 50 dBA for night-time
- The Protocol also states that noise mitigation is required if it is administratively, operationally, economically and technically feasible
- The Protocol also states that noise barriers are considered technically feasible if they can reduce noise by at least 5 dB

WHAT'S NOTICEABLE (dB)

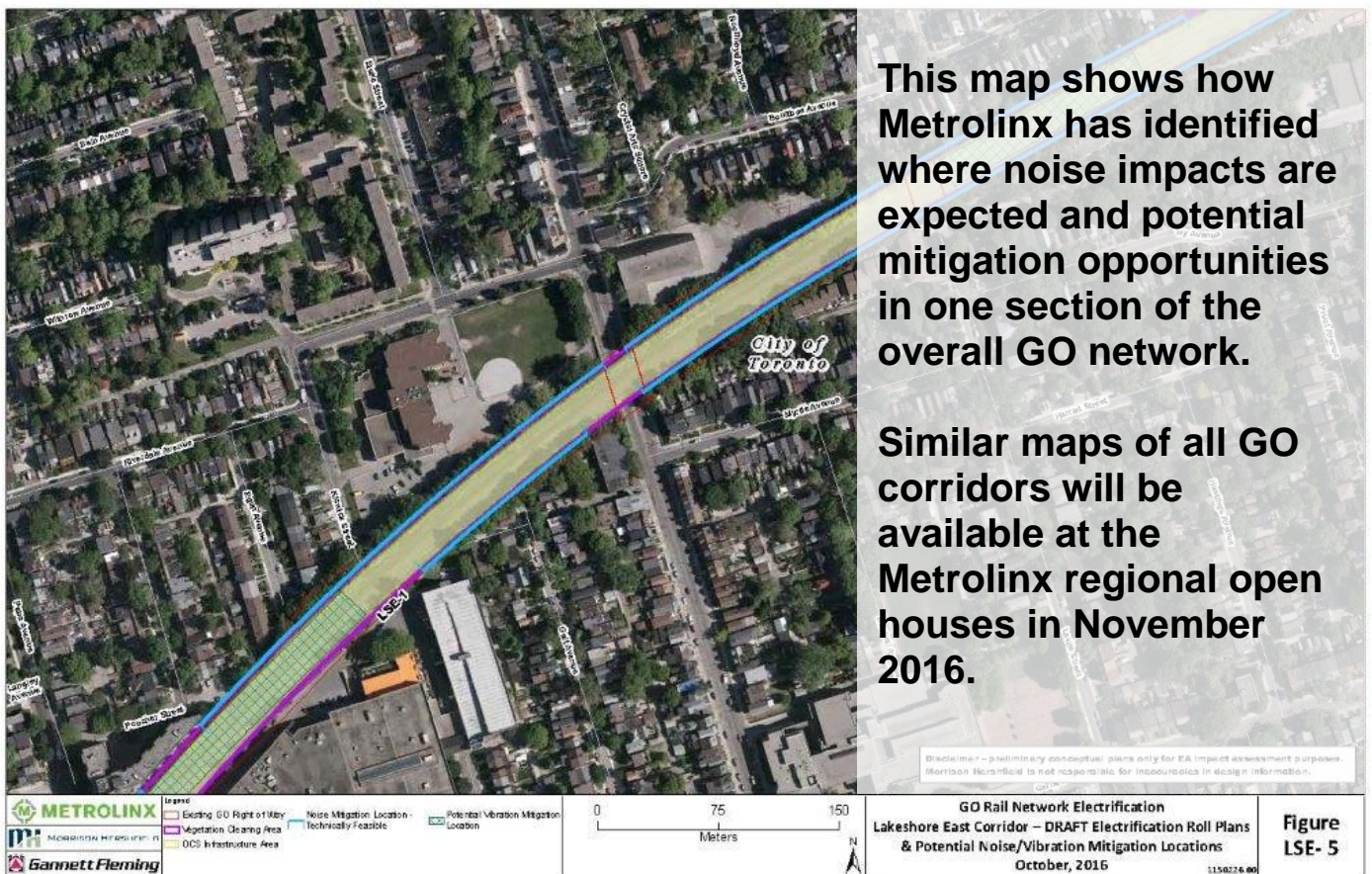
Increase in sound level	Perception
0 to 2.99 dB	Insignificant
3-4.99 dB	Noticeable
5 to 9.99 dB	Significant
10 dB or greater	Very significant

WHAT AREAS WILL EXPERIENCE A 5 dB INCREASE (OR GREATER)?

Metrolinx works with noise models to understand the amount of noise that will be generated by the increased service. The whole GO system includes about 250 km of rail corridors with two or more tracks. Metrolinx is working to compare the noise generated by existing GO service to the amount of noise that will be generated once the new GO infrastructure has been built and the higher levels of service are provided.

The key in this analysis is to identify areas where noise is expected to increase by 5 dB or more (as per the Province's Transit Noise and Vibration Protocol). Early results indicate that there are approximately 100 km where this increase will be experienced (which represents about 20% of the approximately 500 km of total track). Corridor Plans for the entire GO system are available and show the locations where the > 5 dB is expected (see sample map below).

The maps also show that noise barriers (noise walls) would be effective at mitigating the noise impact for about 65 km, and would be ineffective for about 35 km because as a result of the geometries involved, a 5 metre barrier is unable to generate 5 dB of attenuation.



How to read the “Roll Plan” maps (like the one above):

- The **BLUE** and **ORANGE** lines in the map show where average noise (relative to the existing noise level) is expected to increase by 5dB or greater.
- **BLUE** lines identify stretches where noise mitigation is technical feasible.
- **ORANGE** lines identify stretches where noise mitigation is not technically feasible.
- **YELLOW** lines identify existing or planned noise barriers (already identified through other projects).
- **GREEN** lines identify potential vibration mitigation locations.

KEY CHALLENGES BEING EXPLORED

This Environmental Assessment will not define what the noise mitigation will be (see below for an explanation of next steps in the process), but Metrolinx is thinking ahead to what options will best meet community's needs. Noise walls are typically the most effective at reducing noise, and they also take up much less space than a berm. There are also other technologies that work to reduce the noise generated by the wheels on the rails – like rail dampeners and resilient wheels – that may also be feasible.



Even with all of the work being done to mitigate noise, we know there are challenges that remain. For example:

- We know that in some areas noise barriers are not technically effective (for example at rail crossings or when people live in tall buildings in units much higher than a noise wall or on bridges that can't support the weight of a noise wall)
- We know noise barriers can limit connectivity between areas and can be visually intrusive
- We know in some areas it's impossible to build a noise barrier because there is not enough space
- Some areas that are currently very noisy would not qualify for a noise barrier (since an increase of greater than 5 dB is not expected), however much quieter areas would qualify (because they are expected to experience an increase of greater than 5 dB)
- An average noise increase (L_{eq}) could be substantially lower than the actual noise experienced with any one train passing



NEXT STEPS

This EA process will identify areas where noise mitigation will be considered as well as options for mitigating noise. The next steps that Metrolinx will follow in identifying what type of noise mitigation will be implemented and where, include:

1. Further analysis of the noise mitigation options will be undertaken during detailed design to establish what types of mitigation will be implemented and where. This will include further consideration of the administrative, operational, economic and technical feasibility as per the Protocol.
2. Metrolinx will carry out additional public engagement on proposed noise mitigation solutions once detailed design has progressed and updated analysis results are available.

QUESTIONS FOR YOU

1. We know there are important benefits as well as key challenges associated with construction of noise walls. **What are some of the challenges specific to your community? What would you like to see Metrolinx consider in order to address them?**
2. This EA will identify areas where noise mitigation should be investigated further, but will not identify the preferred mitigation measure. **What advice do you have for Metrolinx on how to continue to involve you and your community in future discussions regarding noise mitigation?**
3. Do you have any other advice for Metrolinx at this point?

For more information contact: electrification@metrolinx.com or call 1-800-GET-ON-GO or (416)869-3200