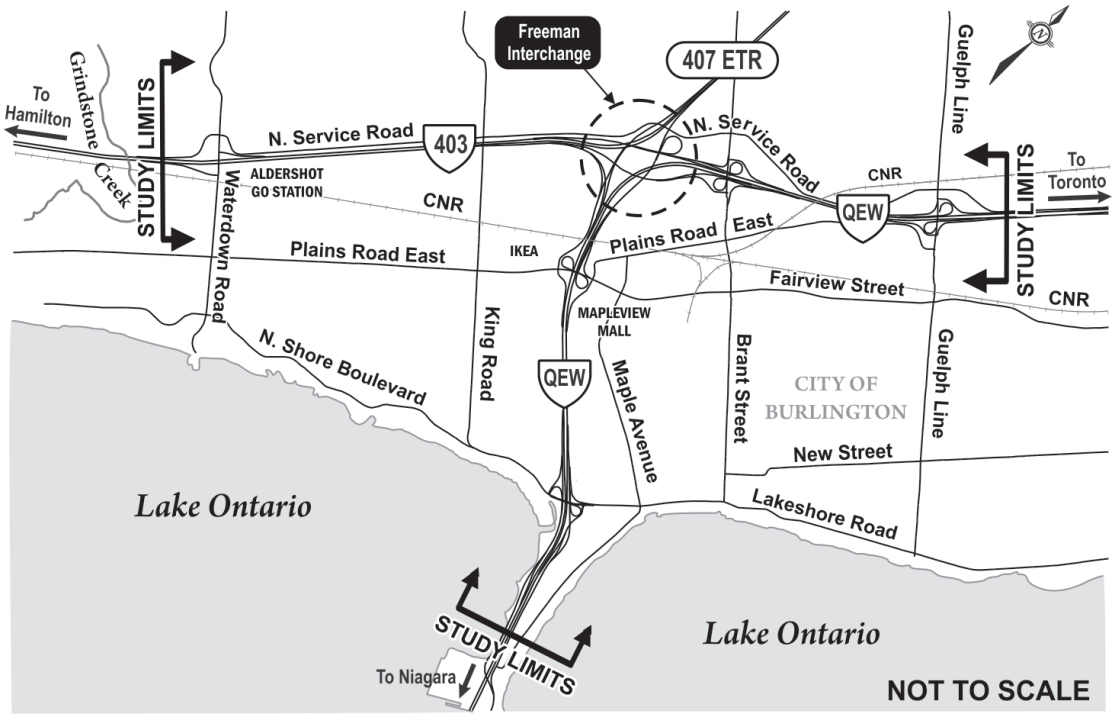
QEW and Highway 403 (Freeman) Interchange Improvements Preliminary Design and Class Environmental Assessment Study

Noise Information Package

November 2019

Project Overview

The Ontario Ministry of Transportation (MTO) has retained WSP Canada Group Limited to undertake a Preliminary Design and Class Environmental Assessment (Class EA) Study for the Queen Elizabeth Way (QEW) from the north end of the Burlington Skyway to Guelph Line and Highway 403 from QEW to Grindstone Creek, in the City of Burlington.

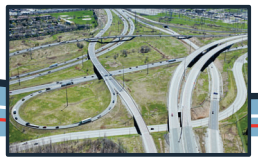


Public Information Centre (PIC) #2 took place on September 10, 2019 to provide stakeholders an opportunity to comment on the recommended plan for the proposed improvements. The PIC #2 displays can be found on the project website on the Consultation Page (https://qew403freeman.ca/).

The purpose of this information package is to summarize the results of the noise study that has since been completed and to provide an opportunity for stakeholders to comment on the study findings.

The objectives of the study are:

- Rehabilitation, widening, or replacement of bridges
- Drainage and illumination improvements
- Operational and safety improvements to the QEW and Highway 403, including managed lanes (e.g. High Occupancy Vehicle Lanes)
- Improvements to the QEW and Highway 403 through the Freeman Interchange
- Improvements to interchange ramps
- Environmental mitigation measures



MTO's Noise Policy

The QEW and Highway 403 (Freeman) Interchange Improvements are being conducted under Ministry's Class Environmental Assessment ("Class EA") process. The noise analysis is examining the impacts of the proposed work and follows the MTO Environmental Guide for Noise (the Guide), which is an approved procedure for assessing potential noise impacts.

For any noise sensitive areas (NSAs) that may experience a significant increase in the level of noise the Guide requires MTO to:

- Investigate possible noise control measures within the Right of Way (ROW);
- Mitigate noise levels if administratively, economically and technically feasible; and
- Achieve a minimum reduction of five decibels averaged over the first row noise receivers, with mitigation measures.

How Do We Identify And Measure Noise?

Noise is considered an undesired or unwanted sound and is measured in decibels (dB). When measuring noise impacts, the decibel scale is often weighted using an "A" frequency adjustment factor because it is the frequency best heard by the human ear. Noise is considered an environmental impact if it adversely affects a NSA.

The Guide identifies a typical NSA as:

- An outdoor living area of a residence at a height of 1.2 m in the backyard, normally 3 m from the rear facade; or
- A communal living area of an apartment building; or
- Hospitals, nursing homes.

Typical noise levels are:

Sound Level	Area Sound Level Found
60 to 75+ dBA	Next to Provincial Freeway (QEW, Hwy 403)
60 to 65 dBA	Near a large urban arterial roadway
55 to 60 dBA	Near a King's Highway
50 to 55 dBA	Background urban sound level
45 to 50 dBA	Background suburban sound level
40 to 45 dBA	Background rural sound level

How a Noise Study is Conducted

For highway improvements projects like the QEW and Highway 403 (Freeman) Interchange Improvements that are under the Class EA, noise levels are modelled for conditions 10 years following the anticipated completion of construction. Two scenarios are compared:

- Future sound level without the proposed highway improvements;
- Future sound level with the proposed highway improvements implemented.

For areas where the predicted noise levels exceed the criteria established in the Guide, noise mitigation measures (for example, noise barriers) are also modelled. The predicted noise levels and the effectiveness of noise barriers are determined using approved computer software models.

If predicted future noise levels **do** increase by at least 5 dBA or predicted future noise levels increase to **greater than or equal** to 65 dBA. → Noise mitigation measures will be investigated for technical, economic and administrative feasibility. If feasible, it will be considered part of the proposed undertaking and constructed as part of the highway and interchange improvements.

If predicted future noise levels **do not** increase by at least 5 dBA and predicted future noise levels are **under** 65 dBA. → No noise mitigation is provided.

The determination of whether or not mitigation is provided is based on a review of technical, economic and administrative feasibility:

- Technical Feasibility – Review the constructability of the noise mitigation (i.e. design of wall, roadside safety, shadow effect, topography, achieve a 5 dBA reduction, ability to provide a continuous barrier, etc.);
- Economic Feasibility – Carry out a cost/benefit assessment of the noise mitigation (i.e., determine cost per benefited receiver); and,
- Administrative Feasibility – Determine the ability to locate the noise mitigation on lands within public ownership (i.e., provincial or municipal right-of-way).

Noise Barriers

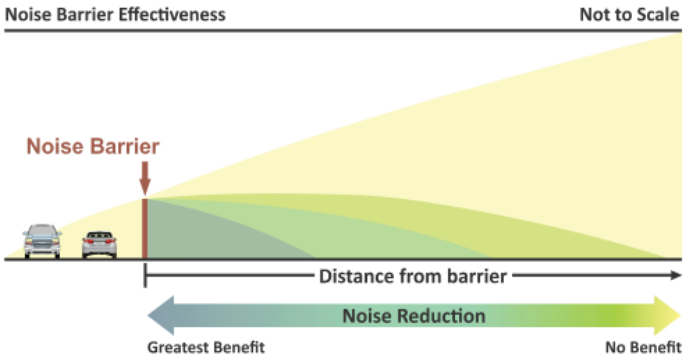
A noise barrier may be a noise wall, a noise berm, or a combination of both.

Noise Wall

Noise Berm

How a Noise Barrier Works

The barrier is used to alter the path between the noise source and the receiver.



Noise barriers typically have a maximum height of 5 m and a minimum 5 dBA reduction **must** be achieved in order for a noise wall to be warranted based on MTO policy. The further away a receptor (i.e. house) is from a barrier, the less effective the barrier becomes.

Noise barriers must meet safety and structural standards, and must be installed in accordance with MTO Road Side Safety Policy, to avoid becoming a roadside hazard.

How Was Noise Considered During This Study?

We recognize that noise is an issue to the adjacent communities and businesses. A noise assessment was undertaken to determine noise impacts in the study area associated with the preferred alternative. This includes identifying noise sensitive areas within and adjacent to the study area, completing noise modelling, and if appropriate, proposing mitigation measures.

The results of the noise assessment are provided in the exhibits on the following pages. For clarity, the study area has been divided into sections and each exhibit covers one section:

- QEW South - from the Burlington Skyway to the QEW/Highway 403 (Freeman) Interchange
- QEW East - from the Freeman Interchange to Guelph Line
- Highway 403 - from Waterdown Road to the Freeman Interchange

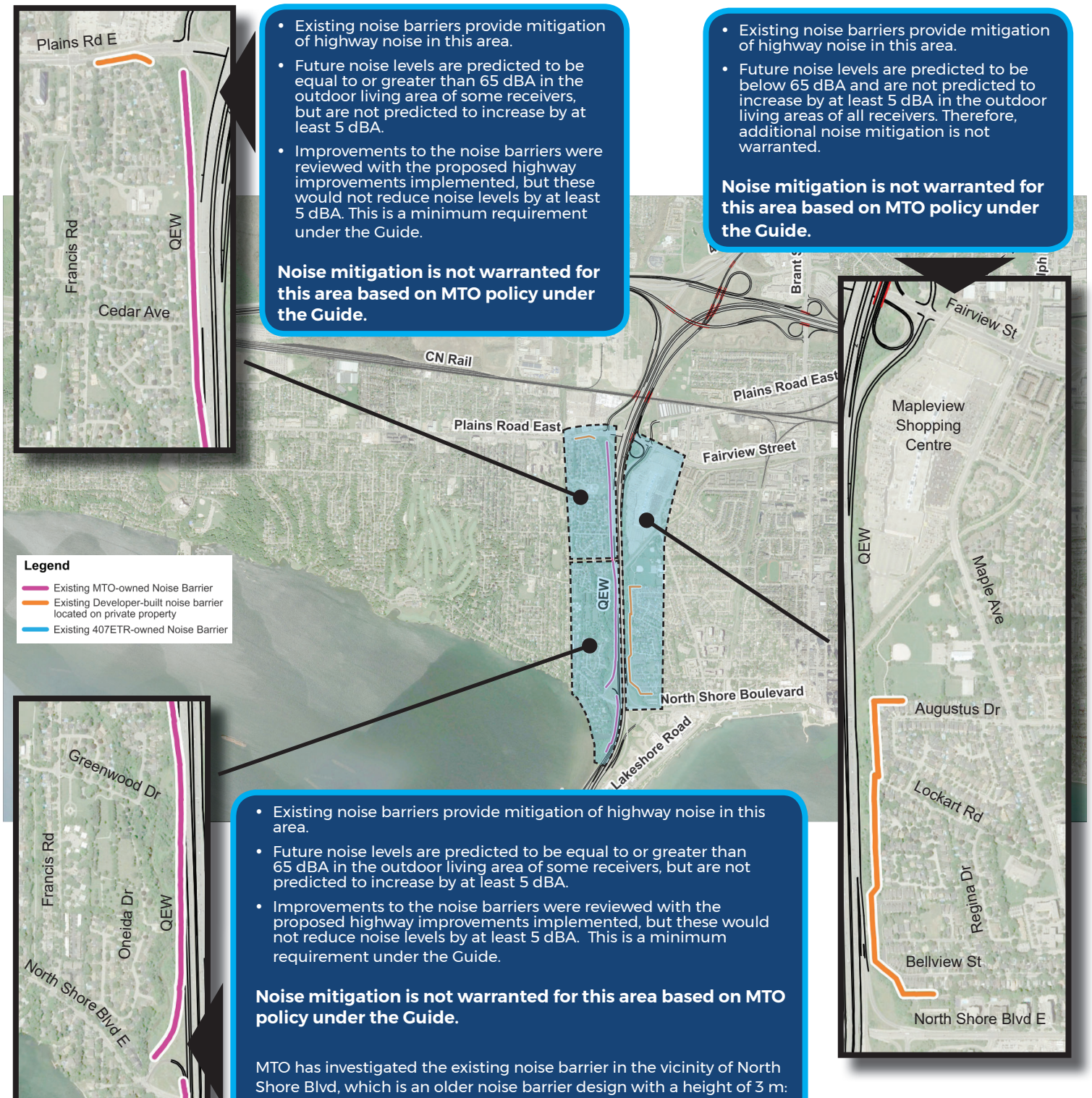
QEW South - from the Burlington Skyway to the QEW/Highway 403 (Freeman) Interchange

- Existing noise barriers provide mitigation of highway noise in this area.
- Future noise levels are predicted to be equal to or greater than 65 dBA in the outdoor living area of some receivers, but are not predicted to increase by at least 5 dBA.
- Improvements to the noise barriers were reviewed with the proposed highway improvements implemented, but these would not reduce noise levels by at least 5 dBA. This is a minimum requirement under the Guide.

Noise mitigation is not warranted for this area based on MTO policy under the Guide.

- Existing noise barriers provide mitigation of highway noise in this area.
- Future noise levels are predicted to be below 65 dBA and are not predicted to increase by at least 5 dBA in the outdoor living areas of all receivers. Therefore, additional noise mitigation is not warranted.

Noise mitigation is not warranted for this area based on MTO policy under the Guide.



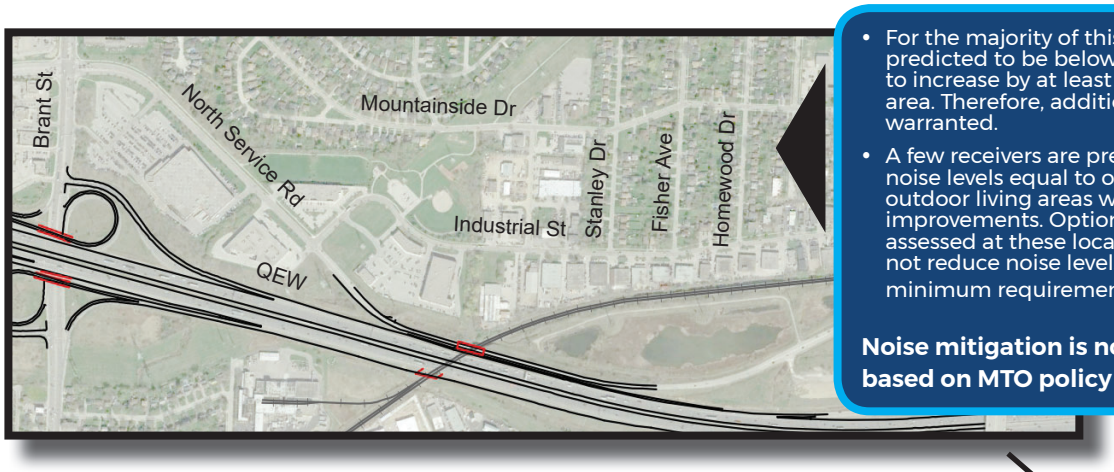
- Existing noise barriers provide mitigation of highway noise in this area.
- Future noise levels are predicted to be equal to or greater than 65 dBA in the outdoor living area of some receivers, but are not predicted to increase by at least 5 dBA.
- Improvements to the noise barriers were reviewed with the proposed highway improvements implemented, but these would not reduce noise levels by at least 5 dBA. This is a minimum requirement under the Guide.

Noise mitigation is not warranted for this area based on MTO policy under the Guide.

MTO has investigated the existing noise barrier in the vicinity of North Shore Blvd, which is an older noise barrier design with a height of 3 m:

- As part of MTO's highway asset renewal, this noise barrier will be considered for replacement due to the limited remaining service life of the structure.
- This infrastructure renewal is **separate** from the Class EA process. The noise barrier will be investigated for replacement when provincial infrastructure funding permits. The replacement noise barrier will be brought up to current MTO standards.

QEW East - from the Freeman Interchange to Guelph Line

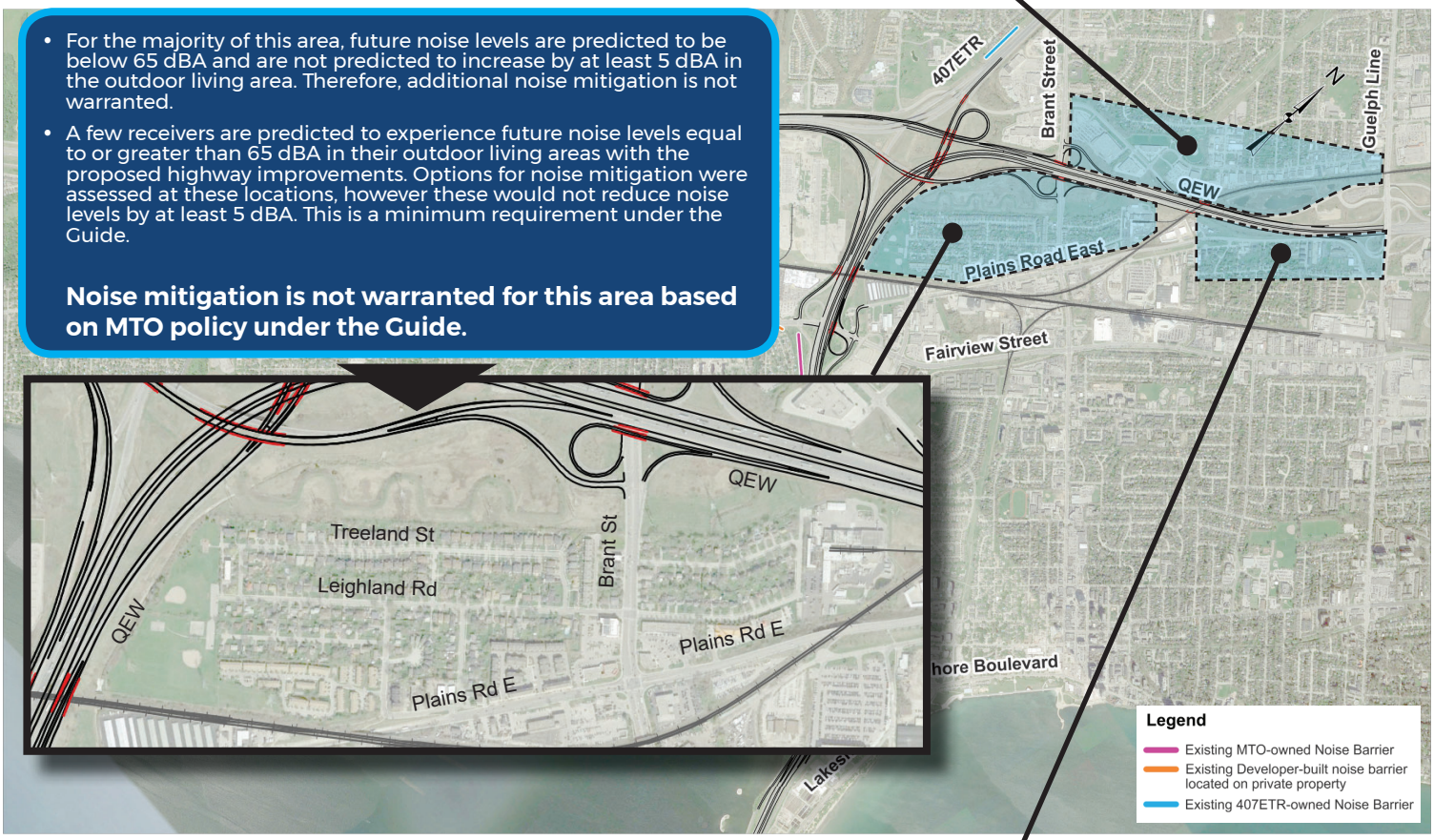


- For the majority of this area, future noise levels are predicted to be below 65 dBA and are not predicted to increase by at least 5 dBA in the outdoor living area. Therefore, additional noise mitigation is not warranted.
- A few receivers are predicted to experience future noise levels equal to or greater than 65 dBA in their outdoor living areas with the proposed highway improvements. Options for noise mitigation were assessed at these locations, however these would not reduce noise levels by at least 5 dBA. This is a minimum requirement under the Guide.

Noise mitigation is not warranted for this area based on MTO policy under the Guide.

- For the majority of this area, future noise levels are predicted to be below 65 dBA and are not predicted to increase by at least 5 dBA in the outdoor living area. Therefore, additional noise mitigation is not warranted.
- A few receivers are predicted to experience future noise levels equal to or greater than 65 dBA in their outdoor living areas with the proposed highway improvements. Options for noise mitigation were assessed at these locations, however these would not reduce noise levels by at least 5 dBA. This is a minimum requirement under the Guide.

Noise mitigation is not warranted for this area based on MTO policy under the Guide.



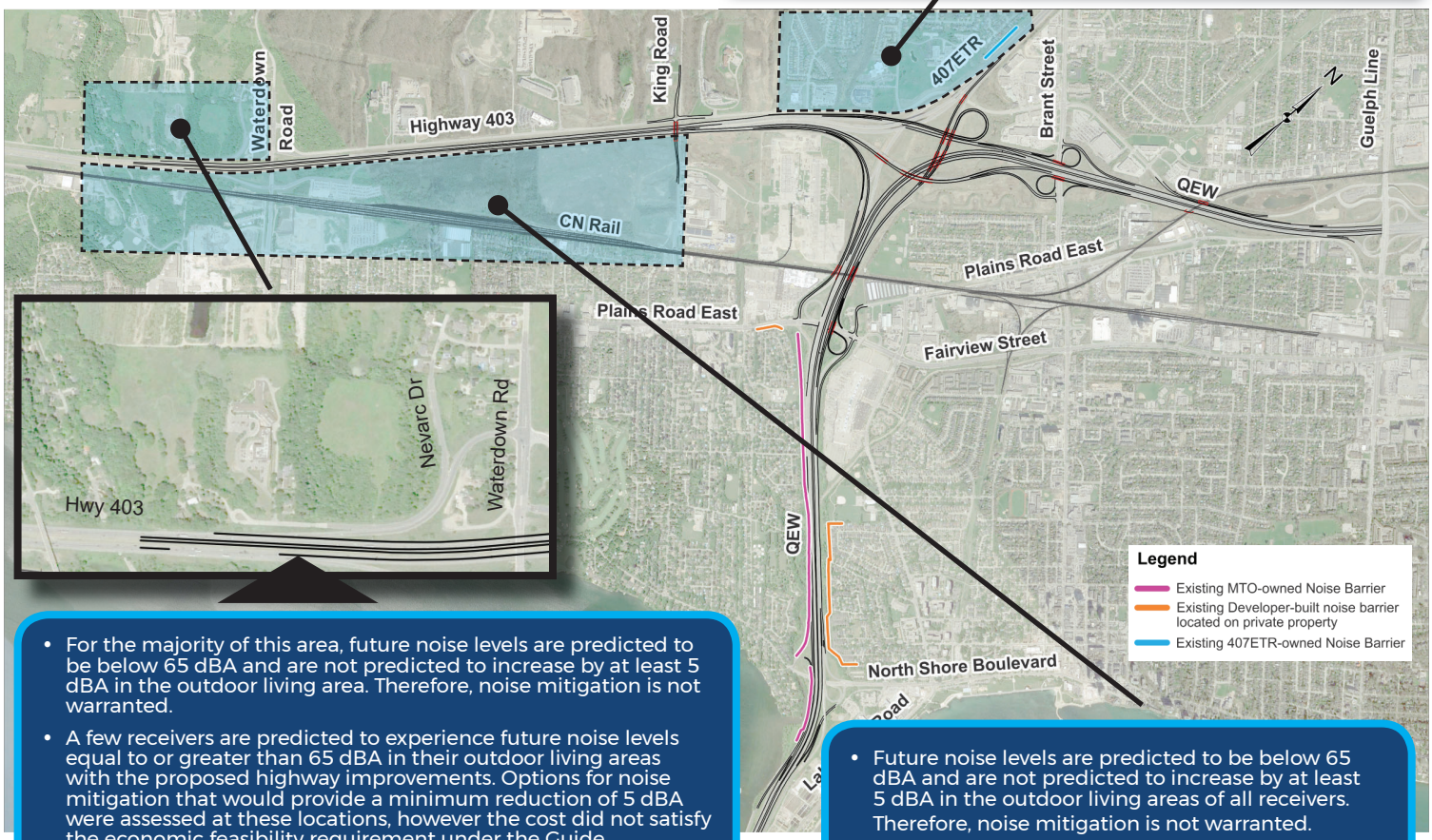
- An existing berm along the south side of the QEW between the CN Railway underpass and Cleta Street provides mitigation of highway noise in this area.
- Future noise levels are predicted to be below 65 dBA and are not predicted to increase by at least 5 dBA in the outdoor living area and therefore additional noise mitigation is not warranted.

Noise mitigation is not warranted for this area based on MTO policy under the Guide.

Highway 403 - from Waterdown Road to the Freeman Interchange

- Existing berms and noise barriers along the 407ETR provide mitigation of highway noise in this area.
- Future noise levels are predicted to be below 65 dBA and are not predicted to increase by at least 5 dBA in the outdoor living areas of all receivers. Therefore, additional noise mitigation is not warranted.

Noise mitigation is not warranted for this area based on MTO policy under the Guide.



- For the majority of this area, future noise levels are predicted to be below 65 dBA and are not predicted to increase by at least 5 dBA in the outdoor living area. Therefore, noise mitigation is not warranted.
- A few receivers are predicted to experience future noise levels equal to or greater than 65 dBA in their outdoor living areas with the proposed highway improvements. Options for noise mitigation that would provide a minimum reduction of 5 dBA were assessed at these locations, however the cost did not satisfy the economic feasibility requirement under the Guide.

Noise mitigation is not warranted for this area based on MTO policy under the Guide.

- Future noise levels are predicted to be below 65 dBA and are not predicted to increase by at least 5 dBA in the outdoor living areas of all receivers. Therefore, noise mitigation is not warranted.

Noise mitigation is not warranted for this area based on MTO policy under the Guide.