

Noise Barriers and Berms

Background

The Ministries of Transportation and the Environment have developed policies to assess the noise impacts of transportation projects in Ontario. The assessment of impacts for The Windsor-Essex Parkway involves comparing its predicted noise levels to future noise levels in a “no-build” scenario. Mitigation is typically considered when the difference in noise levels between future “build” and future “no-build” exceeds 5 decibels.

There are two types of impacts considered for vibration:

- human response to building vibration – threshold perception limit by the average person is 0.14 mm/sec
- potential for structural damage to buildings – generally occurs at 50 mm/sec.

Predicted Noise and Vibration Impacts

The Detroit River International Crossing (DRIC) study environmental assessment determined that a noise barrier will be required adjacent to the Southwood Lakes community from Howard Avenue to North Talbot Road to mitigate future noise levels. It was determined that with a noise barrier in place, there will not be any adverse noise condition changes, and a number of residents will see a reduction in noise levels. Vibration levels for several receptors in this corridor were generally within the threshold of perception limit of 0.14 mm/sec.

Construction activities, including pile driving for the bridges, will temporarily affect sound levels at locations close to the initial construction locations. Installation of the noise barrier will take place during the winter/early spring and will be limited to daytime hours. Residents will be notified in advance of construction start.

Noise Barrier Adjacent to Southwood Lakes

To determine where noise barriers and berms will effectively reduce sound levels, predicted noise levels for The Windsor-Essex Parkway were compared to the predicted future “no-build” noise levels at receptors (using the MOE STAMSON traffic noise model). The assessment determined that a 5 metre\ high noise barrier adjacent to the Highway 401 right-of-way between North Talbot Road and Howard Avenue will benefit residents by reducing noise levels.

Noise Barrier Design Considerations

As a gateway to Canada, The Windsor-Essex Parkway and the new plaza and crossing will be major landmarks. As such, the visual and aesthetic treatment of these features and other design elements are critical. It is vital to include noise barrier aesthetics in design considerations as they will be a major visual element. Colour, texture and form must be carefully evaluated to suit the site and to meet community considerations and expectations.

A range of materials and types of noise barriers were considered for the eastern portion of The Windsor-Essex Parkway. The materials considered for the noise barrier included concrete, metal, wood, transparent, plastics, and planted/bin type.

Preferred Noise Barrier Type

Composite concrete barriers with some transparent panels were chosen as the desired noise barrier type.

- Concrete barriers are versatile with respect to shape, colour and texture options.
- Concrete barriers are more durable (against salt, ice, light, etc.) than other material and damaged areas can be repaired easily.

- Transparent panels reduce the visual impact of the noise barrier from both the residential and driver perspectives.
- Transparent panels can be coloured or tinted to offer more flexibility in the design of the barrier.

Aesthetic Design Plan

In future design stages, an aesthetic design plan will be developed for The Windsor-Essex Parkway with input from residents and stakeholders. The noise barrier in this initial construction is being planned so that additional design elements can be added at a future stage.

Based on stakeholder feedback collected during the DRIC study, a natural theme, such as a tall-grass prairie, is being explored as a possible design motif to be applied to The Windsor-Essex Parkway. The aesthetic design may go beyond the application of a literal image of a natural object, but rather be drawn from forms, textures and colours found in these natural areas.

The aesthetic design plan may be applied to the following elements:

- noise barrier (including sound barriers, safety barriers and fencing)
- retaining walls
- tunnel abutments, parapets and columns
- bridges and overpass structures
- pedestrian and service road lighting
- multi-use trail crossing structures
- landscaping.

Based on this recommendation, the noise barrier could include motifs placed at equal spacing on long, linear stretches to break up the continuous panels and to create a rhythmic experience along the stretch of road. The motifs could also occur at junctions and bends in the noise barrier as an accent feature. The motif panels can be used to interject colour, texture, or a thematic element to the continuous noise barrier. Artists and designers could be engaged in this process in order to develop a design that reflects the surrounding communities of Windsor and Essex County. These motif panels would be mounted on the surface of the standard noise barrier, allowing for flexibility to the phase at which the motifs are implemented.

The design will consider the perspectives of drivers on The Windsor-Essex Parkway and the residential community adjacent to the noise barrier including:

- **Driving Experience:** Creating a rhythmic and unique driving experience is central to the design criteria for the new noise barrier. In order to create variety while driving, solid motif panels are combined with transparent panels and strategically arranged along The Windsor-Essex Parkway. The stepping pattern created by utilizing a combination of noise barrier heights (transparent panels, standard concrete walls and a motif panel) will produce a rhythmic and stimulating visual effect from the driver's perspective.
- **Residential Experience:** A combination of transparent panels, colour and vegetation will be effectively used to reduce the visual impact of the noise barrier from the residential perspective. The recommended colour palette includes earth tone hues and greens. The proposed vegetation will act to further screen the noise barrier and will be selected based on the plant's tolerance to shade and its ability to establish quickly in order to screen the noise barrier.