



Canada-United States-Ontario-Michigan Border Transportation Partnership

Air Quality Impact Assessment

The Recommended Plan Analysis

Technical Memorandum

December 2008

1. Introduction

The purpose of this memorandum is to update the information contained in the "*Air Quality Impact Assessment - Technically and Environmentally Preferred Alternative (December 2008)*" TEPA report. The purpose of that report was to summarize the assessment of impacts and proposed mitigation for the TEPA (i.e. The Windsor-Essex Parkway, Plaza B1 and Crossing X-10B).

Subsequent to the preparation of the above noted report several refinements were developed based on further technical analysis and stakeholder consultation, with the objectives of further enhancing the benefits or mitigating the effects of the TEPA. These refinements together with a description of how the refinement improves the TEPA is discussed in the next section of this memorandum.

The combination of the TEPA and associated refinements along with the proposed mitigation measures are referred to collectively as the Recommended Plan.

2. TEPA Refinements

Core-Collector

The Windsor-Essex Parkway alignment has been shifted to integrate The Windsor-Essex Parkway into the E.C. Row Expressway corridor, further away from the Spring Garden area.

Key benefits of this refinement include the following:

- Distance between the new freeway and Spring Garden Road is increased by up to 60 m.
- Reduces impact to predominantly forested natural areas by 25 acres (10 hectares).
- Elimination of ramp west of Malden Road reduces visual impact.
- Provides larger buffer area for Spring Garden residents.
- Preserves areas of significant wildlife habitat.

This refinement is a benefit relative to the original TEPA from the perspective of traffic related air quality because the road is moved further from the residential areas.

The change in potential air quality impacts was confirmed through modelling the revised alignment for both PM and PM₁₀. These two contaminants were chosen because they were the only two contaminants where exceedances were predicted to occur because of traffic patterns. Other contaminants in the TEPA report exceed criteria, but the background concentrations are the main contributors as the cause for the exceedances.

Tables 1 and 2 below illustrate changes from the Recommended Plan to the original version of the TEPA for PM₁₀ and PM respectively. Five of the receptors (1513, 1514, 1516, 1644, and 1758) are identified in the TEPA report Tables 4.13 and 4.19 and are considered permanent receptors due to the residential area. Two additional receptors have been added and correspond to a receptor located within the green space of the Right-of-Way (receptor 1236) and a receptor located midway between the residences and the green space (receptor 1380). Both these receptors can be considered transient in that exposure will depend on the probability of a person standing in that location (or similar

locations) at the same time as the maximum air quality events. The probability of exposure is reduced, for example, during night-time hours and winter periods. The representative receptor locations are shown in Figure 1.

FIGURE 1- REPRESENTATIVE RECEPTOR LOCATIONS

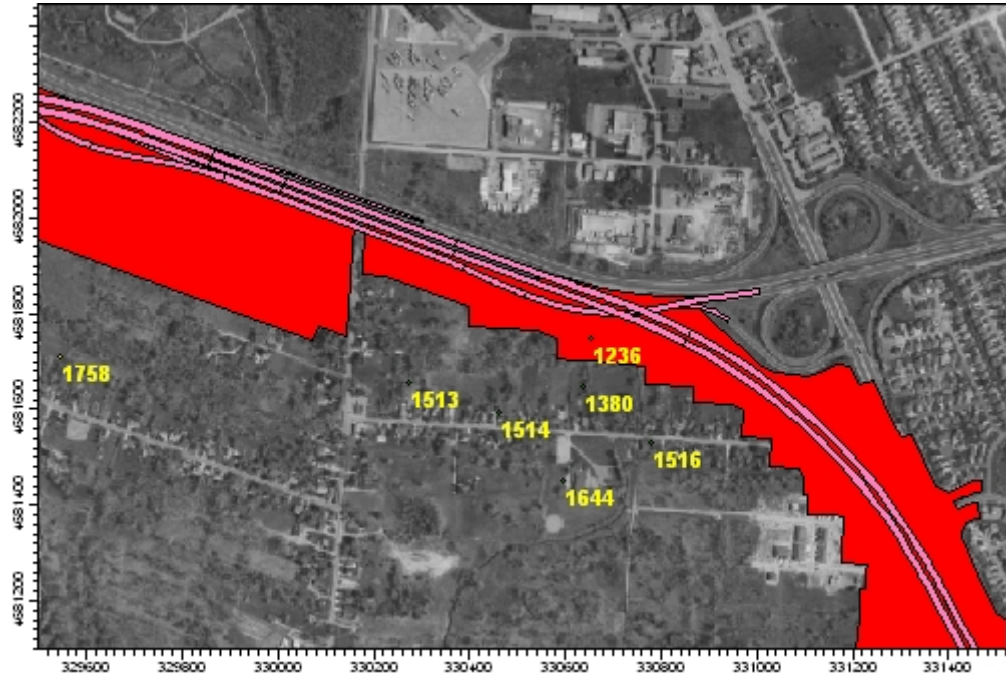


Table 1 shows that the refinement results in a decrease relative to the original TEPA of up to 50 days exceedances for PM and almost 40 days for PM₁₀ (however, exceedances are still predicted). As mentioned in the TEPA report, actual PM exceedances are considered to be over-predicted due to a number of factors in the modelling, but the differences in exceedances can be a useful evaluation tool.

Maximum predicted concentrations also drop significantly for the receptors closest to the road with over a 250 µg/m³ decrease for PM and a 60 µg/m³ decrease for PM₁₀ at receptor 1236. This receptor is located approximately 50 m from The Windsor-Essex Parkway and is considered a transient receptor. Other receptors show a lower change with the refinement relative to the TEPA as they are located further from the road and impacts from the road become less appreciable. Maximum concentrations are predicted to exceed 24-hour Ambient Air Quality Criteria (AAQC) for most receptors for both the future "No-Build" and the Recommended Plan. However, 90th percentile concentrations are closer to the criteria. As the methodology assumes a background that actually occurs only 10% of the time is occurring 100% of the time, it is likely that even the 90th percentile concentrations are over-predicted.

Maximum and 90th percentile concentrations for both PM and PM₁₀ at permanent receptors (1758, 1516, 1513, 1514), while increased with the Recommended Plan relative to the future "No-Build" condition, are generally within 10% of the future "No-Build". This change can be considered marginal.

Overall, the Recommended Plan with the refined core-collector system represents an improvement to air quality conditions in the Spring Garden area relative to the TEPA, and represents a marginal change relative to the future "No-Build" condition.

TABLE 1- PM₁₀ EXCEEDANCES AND MAXIMUM CONCENTRATIONS WITH RECOMMENDED PLAN

Contaminant	24-hour AAQC, µg/m ³	Background used in modelling, µg/m ³	Year	Receptor Number	Exceedances, days			Maximum concentrations, µg/m ³			90th percentile concentrations, µg/m ³		
					Future "No-Build"	TEPA	Recommended Plan (with Refinement)	Future "No-Build"	TEPA	Recommended Plan (with Refinement)	Future "No-Build"	TEPA	Recommended Plan (with Refinement)
PM ₁₀ 24 hr	50	42	2035	1236	66	216	191	62	147	79	52	110	65
				1380	30	131	97	58	70	61	50	58	54
				1513	4	83	50	53	61	58	47	53	51
				1514	7	76	39	54	61	56	48	52	50
				1516	39	85	48	56	61	57	50	54	51
				1644	6	38	16	53	55	53	48	50	49
				1758	0	20	5	49	54	51	45	49	48

TABLE 2 – PM EXCEEDANCES AND MAXIMUM CONCENTRATIONS WITH RECOMMENDED PLAN

Contaminant	24-hour AAQC, µg/m ³	Background used in modelling, µg/m ³	Year	Receptor Number	Exceedances, days			Maximum concentrations, µg/m ³			90th percentile concentrations, µg/m ³		
					Future "No-Build"	TEPA	Recommended Plan (with Refinement)	Future "No-Build"	TEPA	Recommended Plan (with Refinement)	Future "No-Build"	TEPA	Recommended Plan (with Refinement)
PM 24 hr	120	84	2035	1236	48	229	179	144	487	217	125	374	183
				1380	10	123	94	128	177	152	115	153	134
				1513	0	70	19	113	145	134	103	128	118
				1514	0	63	14	117	141	128	106	126	116
				1516	19	77	34	133	150	135	115	130	120
				1644	0	18	2	117	131	121	106	116	110
				1758	0	0	0	99	120	113	95	111	106

Concentrations that exceed the criteria are indicated in *bold italic*

Howard Avenue Diversion

The southern portion of Howard Avenue has been diverted to The Windsor-Essex Parkway interchange.

Key benefits of this refinement include the following:

- Regional traffic is diverted away from Howard Avenue.
- Regional mobility improvements with direct connection of Howard Avenue to The Windsor-Essex Parkway / Highway 3 interchange.

This refinement is a benefit to residents along Howard Avenue from the perspective of air quality related to traffic due to reduced traffic volumes along Howard Avenue.

Highway 3 Roundabout

A roundabout is included in The Windsor-Essex Parkway/Howard Avenue Diversion/Highway 3 interchange.

Key benefits of this refinement include the following:

- Optimum traffic operations at this junction.
- Reduce number and severity of collisions.
- Reduced engine idling.
- Reduced traffic queuing.
- Potential location for gateway features.

This refinement provides a benefit from the perspective of local air quality related to traffic. The design of the roundabout will improve traffic operations at this junction, which will reduce engine idling and traffic queuing and thereby improve local air quality relative to the intersection previously proposed for the TEPA.

Cousineau and Hearthwood Tunnels

The location and length of tunnels at Cousineau Road and Hearthwood Place has been revised.

Key benefits of this refinement include the following:

- Enhanced community connection across Cousineau tunnel.
- Eliminated constructability concerns associated with "L-shaped" tunnel.
- Maintains overall length of tunnelling in this area.

This refinement does not result in a change from the perspective of air quality related to traffic as compared to the original TEPA. Tunnels do not change air emissions, rather they only shift local air emissions to other locations. The closest permanent sensitive receptors are located approximately 100 m away from the proposed refinements, and differences between the Recommended Plan and original TEPA would be marginal.

Huron Church Line Intersection Relocation

A cul-de-sac design for local residential access and relocation of the proposed Huron Church Line intersection has been incorporated. Expanded buffer zones have been provided.

Key benefits of this refinement include the following:

- Increased buffer for residences near the intersection of Huron Church Line and the new service road.
- Safer and more convenient access for residences in close proximity to the intersection.

This refinement does not result in a change from the perspective of air quality related to traffic as compared to the original TEPA.

Expanded Windsor-Essex Parkway Buffer Zones

Expanded buffer zones have been provided at various locations along The Windsor-Essex Parkway corridor.

Key benefits of this refinement include the following:

- Additional separation between residents and the new freeway and service road.
- Increased green space creation.

Permanent sensitive receptors that would have been located within the expanded buffer zones have been removed and therefore are no longer impacted. Sensitive receptors located beyond the buffer zones are impacted to the same extent as with the original TEPA.

3. Conclusion

Air quality in the Windsor area is dominated by transboundary pollution. The contribution to the Windsor airshed for traffic related air quality is small and limited to areas close to the roadway. Idling and congestion can have an impact on air quality nearest the roads. Both the original TEPA and the Recommended Plan reduce idling and congestion, and traffic related air quality is expected to be improved relative to the future "No-Build" condition. Most sensitive permanent receptors are currently exposed to traffic within the future "No-Build" corridor, and the increased traffic from the Recommended Plan is offset by the decrease in idling from the future "No-Build". One exception to this is in the Spring Garden area where idling was typically not a concern previously and the increased traffic was predicted to result in an impact under maximum conditions. Moving the traffic closer to the existing E.C. Row Expressway represents an improvement to air quality conditions over the original TEPA for the Spring Garden area.