

# **REVIEW UNDER THE ENVIRONMENTAL ASSESSMENT ACT**

**REVIEW OF THE  
ENVIRONMENTAL ASSESSMENT**

**HIGHWAY 400 - HIGHWAY 404 EXTENSION LINK  
(BRADFORD BYPASS)**

**ENVIRONMENTAL ASSESSMENT**

**Submitted by:**

**The Ministry of Transportation**

**EA File No. TC-CE-02**

**Review prepared pursuant to subsection 7(1) of the  
*Environmental Assessment Act*, R.S.O. 1990  
Province of Ontario**

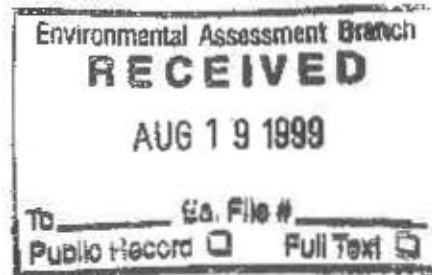
**May 2001**

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August 17, 1999

Ms. Pam Hubbard  
Manager  
Environmental Assessment and Approvals Branch  
Ministry of the Environment  
5<sup>th</sup> Floor, 250 Davisville Avenue  
Toronto, Ontario  
M4S 1H2



Dear Ms. Hubbard:

Re: "Hwy 400 - Hwy 404 Extension Link", (Bradford Bypass), Environmental Assessment, MTO, December, 1997 - EA FILE NO.: TCCE02

As requested the Ministry of Transportation (MTO) and its consultant, McCormick Rankin Corporation (MRC) have reviewed the submissions received by the Ministry of the Environment (MOE) during the public and agency review period that followed the MOE "Notice of Submission" for the above project.

As discussed with Ms. Solange Desautels the MOE Review Coordinator, MTO has provided its response in a table format, (attached). Each submission received was placed in one of four categories and given an individual number to assist in cross-referencing. The four groups and numbering codes are "Government Agencies", (GA); "Municipalities", (M); "Interest Groups", (IG); and "Public", (P).

If you require any clarification regarding the MTO response or any other assistance associated with the completion of the MOE Review or the Notice of the Completion of Review, please advise.

<Original signed by>

Frederick Leech  
Manager  
Planning and Environmental Office  
MTO, Central Region

**JUNE 22, 1999 MTO RESPONSES TO COMMENTS RECEIVED BY THE MOE DURING THE PUBLIC REVIEW OF  
THE HIGHWAY 400 - FUTURE HIGHWAY 404 EXTENSION LINK, (BRADFORD BYPASS), ENVIRONMENTAL ASSESSMENT**

Name & Address	Comments	MTO Response
<b>GOVERNMENT AGENCIES</b>		
<p>GA1 Environment Canada Rob Dobos, Secretariat Great Lakes &amp; Corporate Affairs Office Ontario Region P.O. Box 5050, 867 Lakeshore Road Burlington, Ontario L7R 4A6 (16/12/98 to MOE)</p>	<ul style="list-style-type: none"> <li>The DOE state that they have "not undertaken a detailed review of the EA reports at this time thus we do not have any specific comments on these reports"</li> <li>They indicate that "the proponent must observe several regulatory authorities administered by DOE during the construction and operation of this project, namely: section 36(3) of the Fisheries Act and provisions under the Migratory Birds Convention Act which prohibit the taking or killing of migratory birds and the destruction of their nests and eggs".</li> <li>They request that "proposed construction and operation activities associated with this project which may potentially affect the issues identified above must therefore be addressed by the proponent"</li> <li>They also indicate that they "expect to participate in any federal environmental assessment which will be undertaken in the future as triggered by other departments in the context of our role as per section 12(3) of CEAA".</li> </ul>	<ul style="list-style-type: none"> <li>Comment noted.</li> <li>At the outset of the design phase, MTO will meet with all agencies (federal, provincial, regional) to review current approval requirements (including CEAA necessary to finalize and implement design for the undertaking.</li> <li>Section 5.3.5 of the BA recognizes the Canadian Environmental Assessment Act future requirements and indicates a "Screening" under CEAA will be prepared at the design stage.</li> </ul>
<p>GA2 Fisheries and Oceans David J. Ross, Fish Habitat Biologist Bayfield Institute P.O. Box 5050, 867 Lakeshore Road, Burlington, Ontario L7R 4A6 (16/12/98 to MOE)</p>	<ul style="list-style-type: none"> <li>The DFO state that, to date they have "not participated in the route selection through reviews of biological data supporting route alternative decisions". They report that up to this point in the study OMNR has had the authority to act as agent for the DFO by administering "the sections of the Fisheries Act regarding habitat relative to provincial highway planning and highway development" and have "participated in the identification of broad fish habitat constraint areas when developing Highway 400 to Highway 404 Extension Link route alternatives".</li> <li>They also indicate that "from our initial review it appears that your project may result in a potential harmful, disruption or destruction of fisheries habitat. This is prohibited unless authorized by the Minister of Fisheries and Oceans pursuant to Section 35(2) of the Fisheries Act".</li> <li>"As detailed design of a highway influences decisions relating to impact issues of mitigation and compensation the amount of information presented is presently insufficient for DFO to provide conclusive comments at this time". "The DFO will provide more detailed comments on the proposed undertaking on receiving comments from OMNR and following consultation with all the affected federal agencies".</li> </ul>	<ul style="list-style-type: none"> <li>MTO has met with and addressed the concerns of MNR related to this study. The response to the MNR comments is provided in this table, (response to GA 9).</li> <li>MTO commits to the guiding principle of "No Net Loss" in Section 35(2) of the Fisheries Act. In addition, as an early component of the detail design phase, MTO commits to the development of a "Detailed Fisheries Habitat Management Strategy" (in consultation with OMNR and DFO) that maintains, enhances or compensates (where necessary) fish habitat potentially impacted by the proposed facility.</li> <li>At the outset of the design phase, MTO will contact regulatory agencies (federal, provincial, regional) to review current approval (including CEAA) necessary to finalize and implement design for the undertaking.</li> </ul>



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THE HIGHWAY 400 - FUTURE HIGHWAY 404 EXTENSION LINK, (BRADFORD BYPASS), ENVIRONMENTAL ASSESSMENT**

Name & Address	Comments	MTO Response
<p>GA3 Historic Sites and Monuments Board of Canada Michel Audy, Executive Secretary (no address shown) Ottawa, Ontario K1A 0M5 (4/12/98 to Canadian Heritage Landscape, cc'd to MOE)</p>	<ul style="list-style-type: none"> <li>The Historic Sites and Monuments Board stated that <i>"in the absence of additional archaeological research, the Board concluded that it could not make an informed decision on the possible national historic significance of this(the Lower Holland Landing) site"</i>.</li> <li><i>"Parks Canada reported ...that any land use issues related to this site are under the purview of the Province of Ontario". The Parks Canada report to the Board indicated that "The Province is satisfied with the environmental impact assessment for the proposed construction of a highway bypass in proximity to the Holland Landing and believes that no further archeological research is warranted at this time".</i></li> </ul>	<ul style="list-style-type: none"> <li>The project team was aware from the beginning of the study that a higher potential for archaeological resources is common along the water courses and glacial shorelines located within the study area. Background information was compiled and summarized in a report by MTO in 1994, which recommended that an archaeological assessment be completed at the preliminary design phase (Technical Report - Archaeological Background Study - Bradford Bypass, MTO 1994).</li> <li>A stage 2 archaeological assessment was carried out at the East Holland River crossing after the public process input resulted in the identification of a potential archaeological site and a location for the preliminary preferred route had been selected from which the detailed assessment could be made. This assessment is included as part of the current submission (Archaeological Services 1997, Appendix J).</li> <li>Based on the results of the archaeological assessment completed thus far, (MTO 1994, Archaeological Services 1997), it is the opinion of the project archaeological consultant that the site known as "Lower Landing" is approximately 1.5 miles away from the recommended alignment. Further, it has also been noted that the lands referenced in the current study as the "East Holland River Site" have been referred to on a historical map as "Old Indian Landing" and <u>not</u> "Lower Landing" (Archaeological Services correspondence Aug 7, 1997).</li> <li>The Ministry of Citizenship, Culture and Recreation is satisfied with the archaeological assessment of the Holland River crossing and has confirmed that the archaeological site detected within the proposed right-of-way (East Holland River Site) does not appear to be of such significance that would warrant that the proposed alignment be altered from its current location (see GA7 - MCzCR comments Dec 1998).</li> <li>MTO has committed to a Stage 3 Archaeological Assessment to define and characterize the significance and extent of the archaeological site referred to as the <u>"East Holland River Site"</u> and the potential impacts of the proposed facility. An appropriate mitigation strategy will be developed based on the results of the study.</li> </ul>
<p>GA4 Canadian Transportation Agency Ian C.W. Spear, Director Rail Infrastructure Directorate Rail &amp; Marine Branch Ottawa, Ontario K1A 0N9 (rec'd 4/11/98 by MOE)</p>	<ul style="list-style-type: none"> <li>The Canadian Transportation Agency stated that <i>"if the MTO and the railway (CNR) reach an agreement for the grade separations, it can be filed with the Agency. In that case, we do not require an environmental assessment. If however an agreement is not reached, then MTO may apply to the Agency ... for authority to build the grade separation"</i>.</li> </ul>	<ul style="list-style-type: none"> <li>Negotiations will take place with railways during design phase. See Sections 5.2.8 and 5.3.5</li> <li>MTO will respond to the possible change to rail corridor usage as appropriate once the decision is made known as indicated in Section 5.2.8 of EAR. Provision of a structure across CN tracks is contingent on there being a functioning rail line in place at the time.</li> </ul>



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Name & Address	Comments	MTO Response
	<ul style="list-style-type: none"> <li>They furthermore state that they "require written confirmation of agreement between the railway and MTO for the crossing before we can state that we will not be involved in this screening (of the project)".</li> </ul>	<ul style="list-style-type: none"> <li>MTO commits to providing agreement to CTA if required.</li> </ul>
<p>GA5 CN John F. MacTaggart, Public Works Engineer Engineering Services, Field Operations Suite 702, 277 Front Street W. Toronto, Ontario M5V 2X7 (16/11/98 to MOE)</p>	<ul style="list-style-type: none"> <li>CN stated that they are "currently under negotiations to sell a portion of our Newmarket Subdivision, north of Bradford". If sale is unsuccessful, CN state that they "will retire that portion of track in the Spring of 1999".</li> </ul>	<ul style="list-style-type: none"> <li>It is the project team's understanding that a sale of the rail corridor through proposed freeway corridor to City of Barrie has been reported. MTO will respond to the possible change to rail corridor usage as appropriate once the decision is made known as indicated in Section 5.2.8 of EAR. Provision of a structure across CN tracks is contingent on there being a functioning rail line in place at the time.</li> </ul>
<p>GA6 Ministry of Agriculture, Food and Rural Affairs Ray Valaitis, Rural Planner R.R. 3, 95 Dundas Street Brighton, Ontario K0K 1H0 (8/12/98 to MOE)</p>	<ul style="list-style-type: none"> <li>The Ministry of Agriculture, Food and Rural Affairs stated that "this Ministry is satisfied with the data, analysis and conclusion that have been outlined within this EA report".</li> </ul>	<ul style="list-style-type: none"> <li>No further action required.</li> </ul>
<p>GA7 Ministry of Citizenship, Culture and Recreation Malcolm Horne, Heritage Planner 77 Bloor Street W Toronto, Ontario M7A 2R9 (16/12/98 to MOE)</p>	<ul style="list-style-type: none"> <li>The Ministry of Citizenship, Culture and Recreation stated that they "are satisfied that the EA study took sufficient steps to consider impacts to cultural heritage features in the consideration of route alternatives".</li> <li>The Ministry also state that they "are further satisfied that the statements and commitments made in the EA report regarding the proposed assessment and mitigation process will satisfactorily address the conservation of cultural heritage features where those features are to be impacted by the construction of the highway".</li> <li>They request that all activities associated with highway construction including those involving associated features such as stormwater management facilities, service stations, temporary construction easements, mitigation/compensation measures, access roads, staging and storage areas, and others "should be assessed for their impacts to cultural heritage resources and where necessary those impacts should be mitigated".</li> <li>The Ministry "expects to review and comment on future reports on assessment and mitigation of cultural heritage resources to be impacted by this project. Any impacts to cultural heritage resources and plans for their mitigation should be reviewed by staff of MCzCR and approved prior to mitigation".</li> <li>They stated that the Ministry "has not been provided with evidence that demonstrates that there are archaeological sites of such significance that the proposed route should be altered".</li> </ul>	<ul style="list-style-type: none"> <li>No further action required.</li> <li>No further action required.</li> <li>A mitigation strategy will be developed as part of the design stage to address potential impacts to cultural heritage resources. Specifically, the visual impact of the proposed facility and the close proximity of a historically significant home (&lt;100 m) at Simcoe County Road 4 will be explored through landscaping and other options as appropriate.</li> <li>The MCzCR will be consulted to review the mitigation strategy developed for cultural heritage resources prior to construction.</li> <li>No further action required.</li> </ul>

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Name & Address	Comments	MTO Response
	<ul style="list-style-type: none"> <li>In order to answer concerns from the public, they recommend that "an archaeological assessment and any necessary mitigation of significant sites take place as early as possible at every stage of design and construction in order to allow for the maximum flexibility and sensitivity and consequently the best management of any significant sites".</li> <li>The Ministry indicated that "our concerns regarding built heritage and cultural heritage landscapes have been satisfied by the commitments made in the EA report to the assessment and mitigation of resources to be impacted by the eventual construction of the highway".</li> </ul>	<ul style="list-style-type: none"> <li>MTO has committed to a Stage 3 Archaeological Assessment in the early stages of the design phase. At the completion of that study, MC2CR will be consulted to discuss the appropriate mitigation and/or salvage strategy.</li> <li>No further action required.</li> </ul>
GA8 Ministry of Municipal Affairs and Housing Provincial Planning Services Branch John Taylor, Area Planner 777 Bay Street, 14 <sup>th</sup> Fl. Toronto, Ontario M5G 2B5 (16/12/98 to MOE)	<ul style="list-style-type: none"> <li>The Ministry of Municipal Affairs and Housing stated that the infrastructure proposed through the EA documents have been incorporated into the land use planning documents. (ie draft Official Plan for the Town of Bradford West Gwillimbury) in a fashion consistent with the Provincial Policy Statement. They have no concerns with the EA documents.</li> </ul>	<ul style="list-style-type: none"> <li>No further action required.</li> </ul>
GA9 Ministry of Natural Resources C. T. Tschirhart, Senior Planner 50 Bloomington Road West Aurora, Ontario. L4G 3G8 (15/1/99 to MOE)	<ul style="list-style-type: none"> <li>The Ministry indicated that they are "concerned with the proposed routing over the East Branch of the Holland River and the alignment from that point westward to the proposed system of on-off ramps at Bathurst Street."</li> <li>The Ministry is "reiterating its position that the proposed alignment follow Concept C, or as a secondary position Concept B."</li> </ul>	<ul style="list-style-type: none"> <li>In response to concerns identified by MNR, refinements to the preferred alignment were investigated. The originally preferred alignment was shifted north to reduce impacts on woodlands by 40% (Concept 'A'). Further reducing woodlot impacts utilizing Concepts 'B' and 'C' created significant safety and property concerns as outlined in Section 4.2.3.9.3a of the EAR.</li> <li>As indicated in Section 5.4.2.4 to the EAR, MTO has committed to construct the facility as an elevated structure through the Holland Marsh Provincially Significant Wetland. In addition, mitigation measures during construction will include development of restoration plans for areas of wetland temporarily disturbed during construction, installation of equalization culverts, delineation of protected areas with sediment fences, construction timing constraints to respect the intent of the federal Migratory Bird Regulations (1994), salvage of wetland plant material for wetland re-establishment, minimization of dewatering within wetlands and retention of lands which are surplus to MTO for the purpose of mitigation by allowing reversion to wetland as indicated in Section 5.4.2.4 of the EAR.</li> </ul>



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Name & Address	Comments	MTO Response
	<ul style="list-style-type: none"> <li>"We are concerned that the final design did not take into account previous discussions and commitments from MTO regarding wetland habitat compensation (MNR/MTO meeting minutes October 14, 1993)." Specifically, MNR contend that MTO has not adhered to "acquisition of extra lands (e.g. the entire property rather than just that portion required for MTO ROW in order that such lands can be re naturalized to provide wetland habitat functions, and thereby offset some of the negative impacts of the highway crossing."</li> </ul>	<ul style="list-style-type: none"> <li>The EA includes in its mitigation measures commitments associated with: the "retention of lands which are surplus to transportation needs for the purpose of mitigation by allowing reversion to wetland", (Wetlands Table 5-6); and maximizing "forest regeneration opportunities on lands which are surplus to transportation needs as mitigation for fragmentation of significant vegetation and to provide linkage to alternative habitat", (Vegetation, Table 5-6). However, in the EA, Section 5.2.7 "Property Acquisition" the process to be followed is only broadly explained. MTO has discussed this concern with MNR and have provided the following clarification. Immediately east of the Holland River (West Branch) the proposed alignment displaces existing Hochreiter Road from Bathurst Street to the river. As a result it will be necessary for the Ministry to purchase portions of several agricultural fields. In addition, access to others may become impractical. Several of these fields adjacent to the river were originally developed by draining wetlands. As noted in the EA, for "the purpose of mitigation by allowing reversion to wetland", MTO reconfirms its agreement to acquire the residual portions of these properties that are surplus to MTO needs. However, it must be noted this can occur only where there is a willing seller and all matters associated with liabilities and responsibilities regarding the new ownership, (The Title), have been settled to the satisfaction of all parties, including, the Ministry of Natural Resources, the Ministry of Transportation and the Management Board Secretariat.</li> </ul>
<p>GA10 Ontario Provincial Police L. J. Hassberger, Barrie Detachment Commander 20 Rose Street Barrie, Ontario L4M 2T2 (13/11/98 to MOE)</p>	<ul style="list-style-type: none"> <li>The Ontario Provincial Police state that their "main concerns would center around traffic disruption on Highway 400 during construction, the configuration of the highway itself and signing during the construction phase".</li> <li>The OPP state also that "this highway will certainly be welcome as there is no alternative route to Highway 404 except by going through Newmarket or down to the 407".</li> <li>They request consideration of the following suggestions: speed limit be maintained at 100 km/h or less, continuous overhead lighting, concrete barriers in middle of roadway, paved 3 m shoulder on both sides of travelled portion, on and off ramps have enough distance for slowing and accelerating to enter and exit highway safely, ramps be equipped with a gate which can be closed in emergency to stop traffic entering highway, proper traffic control devices, emergency (real time) overhead signs</li> <li>They request an opportunity to talk with project manager to look at design of construction area to ensure their understanding of the project.</li> </ul>	<ul style="list-style-type: none"> <li>Section 5.3.4 of the EAR identifies a review process to be accommodated during the construction phase - to include OPP as a stakeholder.</li> <li>Point noted</li> <li>Requirements in this corridor are for a rural freeway, as stated in Section 5.2.2 of the EAR, which differs in features to an urban freeway. MTO Standards for rural freeways do not require continuous overhead lighting. Median barriers are only required when there is a narrow median width. The proposed median is however 30 m, (see Section 5.2.2 of the EAR), and this does not warrant a median barrier. Shoulders widths will be as shown in Exhibit 5-3 of the EAR. Sufficient length has been provided for all access and egress ramps according to current Provincial Standards. Traffic control devices are to be provided as warranted at the time of construction.</li> <li>MTO commit to inviting the OPP to participate during the design stage.</li> </ul>

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Name & Address	Comments	MTO Response
<p>GA11 Ministry of the Environment Graham Whitelaw Land Use Policy Branch 195 St. Clair Avenue West Toronto, Ontario M4V 1P5 (20/4/99 to MOE)</p>	<ul style="list-style-type: none"> <li>The Ministry of the Environment, Land Use Policy Branch stated that "all major impacts to ground and surface water can be avoided if information gaps are addressed by implementing the outlined suggestions":</li> <li>They encourage proponents "to reference any relevant information related to ongoing or completed watershed/subwatershed plans for the study area in future consultations".</li> <li>Further, they state that "goals and objectives from these plans should be incorporated, where applicable, into future planning, design and construction elements of the undertaking".</li> <li>They request that MTO clearly identify all wells that may potentially be (directly or indirectly) impacted</li> <li>They request that MTO correct the location of municipal well shown on Figure 3.3 in Appendix G</li> <li>They request that MTO provide "basic geological cross-sections for the area along the proposed extension, to provide clear reference for stakeholders"</li> <li>They note that "impacts from road salting on shallow groundwater aquifers must be more thoroughly analyzed" and request that MTO address "impacts of road salting and storm run-off on the specialty crop agricultural areas" and that "potential qualitative effects should be considered during mitigation".</li> <li>The Ministry request that MTO provide information on "expected critical contaminants and concentrations in stormwater runoff".</li> <li>MOE requests that MTO provide a stronger commitment to "ensure that stormwater runoff from the (river crossing) bridges is completely captured and treated before being discharged".</li> <li>The Ministry is "satisfied with the noise evaluation of alternatives".</li> </ul> <p>MOE indicates that "...in addition to commitments contained in the formal EA Report, the following Conditions of Approval be applied indicating:</p> <p>"... That a detailed report dealing with noise and vibration shall be submitted to the Director of the Environmental Assessment and Approvals Branch of the Ministry of the Environment a minimum of 90 days prior to the construction of the Highway or any portion thereof..."</p>	<ul style="list-style-type: none"> <li>MTO will address MOE concerns as noted below.</li> <li>All relevant information was reviewed as available during the course of the study. Any ongoing or completed watershed/subwatershed plans for the study area will continue to be incorporated as part of future consultations.</li> <li>Goals and objectives from the above plans will be considered for incorporation into future planning, design and construction elements of the undertaking.</li> <li>Wells that may potentially be (directly or indirectly) impacted will be clearly identified early in design stage.</li> <li>The correct location of the municipal well shown on Figure 3.3 of Appendix G has been noted.</li> <li>Basic geological cross-sections will be prepared from well records if required by stakeholders for a specific reason associated with the undertaking.</li> <li>As noted in Section 5.4.2 of the EAR, MTO will prepare detailed stormwater management and groundwater protection plans at the design stage which will address quantity and quality. (Refer also to response M2).</li> <li>As noted in Section 5.4.6.1 of the EAR, stormwater runoff will be discharged to stormwater management facilities prior to discharge to watercourses where this can be reasonably achieved and will not cause unacceptable environmental, highway design, safety or operational problems.</li> <li>The Ministry of Transportation does not agree with the requested Conditions of Approval that exceed the requirements of the MTO/MOE Noise Protocol. The Noise Protocol is a formal policy agreement between the Ministries. There has been nothing identified on this project that would warrant the application of extraordinary noise assessment requirements.</li> </ul>



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Name & Address	Comments	MTO Response
	<p>"...That the Report shall be subject to approval by the Director and that it shall be prepared in accordance with the guidelines contained in the MOE/MTO Noise Protocol in effect at the time of the study..."</p> <p>"...That the Report shall address the noise/vibration impacts which will be generated during the construction of the facility as well as the control measures for all major construction activities including those due to possible pile driving/blasting operations. In addition, the Report shall re-assess the traffic noise impacts. As a minimum requirement, the re-assessment of these impacts as well as of the potential for their mitigation shall be performed at all sensitive locations which are expected to experience an increase in noise levels greater than 5 db. In addition to the summary of the traffic noise impacts, the Report shall contain a description of the proposed noise control measures and their acoustical effectiveness. Reasons (technical/economic) must be given if measures are not applied. Furthermore, a brief description shall be given of the possible increases in traffic noise levels which may occur along the various roadways leading to/from the proposed highway as well as the proposed mitigating measures and their anticipated acoustical effectiveness...."</p>	<ul style="list-style-type: none"> <li>The Ministry agrees that the noise assessment work at the design stage should follow the requirements of the Noise Protocol in effect at the time of design.</li> <li>As noted in Section 5.4.3.2 of the EA, MTO will provide a Design &amp; Construction Report to MOE which will document mitigation measures related to noise and vibration. MOE's request that MTO submit a detailed noise and vibration report to the Director of the Environmental Assessment and Approvals Branch, MOE, for review and approval no less than 90 days prior to construction is not compatible with the assessment process followed and the approvals being sought for this undertaking. In Section 5.3 of the EA, there is a description of the Ministry's commitment to "Stakeholder Consultation During the Design Stage". This consultation process is intended to ensure that MOE concerns are addressed. The subsequent review of the Design and Construction Report(s) will provide the opportunity for confirmation of agreements reached during the design stage. Therefore, a minimum 30 day review and comment period should be sufficient. With regard to further "approvals", the purpose of this EA submission under the Environmental Assessment Act is address formal approval requirements and allow the project to proceed to implementation. The imposition of additional approvals at the design stage, that are not associated with legislated requirements, is considered unnecessary.</li> </ul>

**MUNICIPAL**

<p>M1 Town of East Gwillimbury Denis Kelly, Clerk-Administrator Sharon, Ontario L0G 1V0 (1/4/99 to MOE)</p>	<ul style="list-style-type: none"> <li>The Town of East Gwillimbury referenced the following resolutions:</li> <li>The Town of East Gwillimbury passed a resolution on November 3, 1997 "that correspondence dated October 27, 1997 from FROGS and a letter dated November 3, 1997 from MTO with regard to the Bradford Bypass be received; and further that the Town advise the Ministry of Transportation that it objects to the technically preferred route for the Bradford Bypass because it disrupts established communities and is routed through a developed area, and request that other locations for the bypass are given serious consideration".</li> </ul>	<ul style="list-style-type: none"> <li>The MTO study encompassed an analysis area extending from Highway 407 in the south to Highway 89 / Ravenshoe Road in the north. As a result of the assessment, the Bradford Bypass corridor was selected over other corridors including the Highway 89 / Ravenshoe Road and the Green Lane / Highway 9 corridors, as described in Section 3.5.2 of the EAR.</li> <li>The overall alignment for the freeway was optimized by taking into consideration the need to provide a safe transportation facility while minimizing and / or mitigating natural and social environmental impacts (see Section 4.2 of the EAR).</li> <li>The route avoids community features such as schools, churches, cemeteries, parks, arena and other public facilities. No severances are required and in comparison, other alternative routes would have additional community impacts.</li> </ul>
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Name & Address	Comments	MTO Response
	<ul style="list-style-type: none"> <li>The Town also passed a resolution on January 19, 1998 <i>"that the Town of East Gwillimbury reiterate its concerns over the proposed route for the Bradford Bypass as expressed in a resolution passed on November 3, 1997"</i>.</li> </ul>	
<p>M2 Lake Simcoe Region Conservation Authority Tom Hogenbirk, P. Eng., Conservation Engineer 120 Bayview Parkway Newmarket, Ontario L3Y 4X1 (10/12/98 to MOE)</p>	<ul style="list-style-type: none"> <li>Lake Simcoe Region Conservation Authority request that <i>"the "no net loss" principle should be applied to mitigate impacts on forested areas and wetlands. This may require that a portion of the highway budget be set aside for reforestation and establishment of new wetlands in order to compensate for the loss of natural features"</i> (within Maskinonge River watershed)</li> <li>They state that <i>"the Remedial Strategy requires that all new development in the Maskinonge River watershed (upstream of Glenwoods Drive) provide 80% nutrient removal rates in their stormwater treatment systems... (which) is better than Level 1 protection and should be applied to the design of the ...Bradford Bypass roadway within the Maskinonge River catchment. The remainder of the ...Bradford Bypass SWM system is to have Level 1 water quality treatment (or better), based on state of the art control measures"</i> including using infiltration techniques where feasible.</li> </ul>	<ul style="list-style-type: none"> <li>The proposed facility, where possible, was routed to areas of existing openings, areas of previous disturbance, or along edges of vegetative units, per Section 5.4.2.3.</li> <li>Where avoidance was not possible, mitigation measures were proposed for vegetation and wetlands as identified in Sections 5.4.2.3 and 5.4.2.4. During design the Conservation Authorities, other regulatory agencies and other stakeholders will be consulted regarding the development of specific mitigation measures.</li> <li>In an undertaking of this magnitude, it is not possible to commit to "no net loss" of forested land and wetlands. Compensation and regeneration opportunities for woodlands and wetland habitat on MTO surplus lands will be considered where it is feasible as indicated in the response provided for OMNR (GA9).</li> <li>The Maskinonge River watershed will be directly affected in the vicinity of the proposed interchange at the Highway 404 Extension.</li> <li>As stated in Section 5.4.6.1 of the EA, "As is standard practice for a new roadway, a Stormwater Management Plan/Report will be prepared during the design phase in accordance with MTO guidelines and in consultation with MNR, LSRCA, MOE and DFO". Mitigation will be based on detailed evaluations using applicable guidelines, (MOE, MTO or others), available at the time of design. Mitigation will occur where it is both warranted and feasible based on the most appropriate stormwater management practices, (SWMPs), at the time. An 80% nutrient removal rate and Level 1 protection are acceptable objectives, however, a <u>commitment</u> cannot be made that these objectives will be warranted and feasible at all locations.</li> </ul>
<p>M3 Nottawasaga Valley Conservation Authority Charles F. Burgess, Planner 266 Mill Street, Highway 90 R.R. 1 Angus, Ontario L0M 1B0 (2/12/98 to MOE)</p>	<ul style="list-style-type: none"> <li>The Nottawasaga Valley Conservation Authority stated that <i>"the NVCA will require plans that relate to the following through the detailed design stage: flood plain management, storm water management, fish habitat protection, erosion and sediment control"</i>.</li> <li>They would like to work closely with MOE, MNR and LSRCA through the design phase.</li> </ul>	<ul style="list-style-type: none"> <li>NVCA will be contacted to co-ordinate the biological and engineering aspects of the design at the design phase.</li> </ul>
<p>M4 Township of King Kevin D. Young, Director of Public Works 3565 King Road King City, Ontario L7B 1A1 (4/12/98 to McCormick Rankin)</p>	<ul style="list-style-type: none"> <li>The Township of King raised a question as to drainage from Marsh farmlands adjacent to Hochreiter Road.</li> <li>They pointed out a correction to report regarding Bathurst Street north of Queensville Sideroad being a boundary road and not a Regional road.</li> </ul>	<ul style="list-style-type: none"> <li>Drainage issues will be finalized during the design stage as stated in Section 5.4.6.1 of the EAR. Refer also to the response provided to the Lake Simcoe Region Conservation Authority comments (M<sup>3</sup>).</li> <li>Correction is noted.</li> </ul>



**JUNE 22, 1999 MTO RESPONSES TO COMMENTS RECEIVED BY THE MOE DURING THE PUBLIC REVIEW OF  
THE HIGHWAY 400 - FUTURE HIGHWAY 404 EXTENSION LINK, (BRADFORD BYPASS), ENVIRONMENTAL ASSESSMENT**

Name & Address	Comments	MTO Response
	<ul style="list-style-type: none"> <li>• They queried means of access between farmlands along Hochreiter Road to be separated by freeway.</li> <li>• They stated that <i>"Bathurst Street and Queensville Sideroad are not capable of handling traffic generated from an interchange on Bathurst Street at Hochreiter Road and future improvements to said roads would be required"</i>.</li> <li>• Township Council indicated that <i>"perhaps this bypass would alleviate the traffic congestion along Highway 9"</i>.</li> </ul>	<ul style="list-style-type: none"> <li>• As indicated on Exhibit 5- 2 of the EA a "Realigned Hochreiter Road" is proposed. An underpass of the Bradford Bypass at the Holland River to access properties on the south side of the Bypass is also indicated as a possibility on that exhibit. At the design stage the need for this underpass will be reviewed with respect to the request of MNR.</li> <li>• Responsibility for future municipal road improvements remain with the Township however MTO are responsible for improvements to the portion of road within their R.O.W.</li> <li>• Section 5.4.1 reflects that operational improvements are expected to municipal road network.</li> </ul>
<p>M5 Corporation of the Town of Bradford, West Gwillimbury Frank Jonkman, Mayor P.O. Box 160 Bradford, Ontario L3Z 2A8 (16/12/98 to MOE)</p>	<ul style="list-style-type: none"> <li>• The Town of Bradford stated that <i>"the conclusion reached after consultation with our affected citizens is that the location of the Technically Preferred Route for this new facility is satisfactory"</i>.</li> <li>• The Town requests a commitment by MTO that the 'Cloverleaf' at County Road 4 <i>"be constructed in such a way that service roads can be integrated with the ramps and use the same signalized intersections"</i>, to provide needed access for future urban land use east and west of County Road 4 and avoid increased industrial and commercial traffic flow through residential street.</li> <li>• They request that the proposed flyover on Sideroad 10 be a minor 'cloverleaf' to provide industrial traffic access without need to go through residential areas.</li> <li>• They questioned whether negotiations on the above can be during EA review process otherwise <i>"Council will opt for a mediation process after Notice of Completion of Review is published in an attempt to avoid requesting a hearing"</i>.</li> </ul>	<ul style="list-style-type: none"> <li>• Support noted.</li> <li>• Request is noted. The MTO cannot commit to the ramp configuration suggested for new interchanges due to operational problems which may be encountered. Further consideration of access will be provided in subsequent design work.</li> <li>• Request is noted, however, the interchange is not warranted based on current plans as described in Section 4.2.3.8 of the EAR. Additional ramps would be subject to a separate study.</li> </ul>
<b>INTEREST GROUPS</b>		
<p>IG1 Chippewas of Georgina Island Rob Porte, Cultural Portfolio Georgian Island Council R.R. 2, Sutton West, Ontario L0E 1R0 (14/12/98 to MOE)</p>	<ul style="list-style-type: none"> <li>• Georgina Island First Nation stated that it is <i>"opposed to any construction or development including road construction and archeological digs at the site known as Lower Holland Landing due to disturbance and destruction of this ancient place. We will continue to be opposed to anything that disturbs or destroys this ancient place. This place must remain undisturbed"</i>.</li> </ul>	<ul style="list-style-type: none"> <li>• Refer to response provided for the "Historic Sites and Monuments Board of Canada" comments (GA3).</li> </ul>

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THE HIGHWAY 400 - FUTURE HIGHWAY 404 EXTENSION LINK, (BRADFORD BYPASS), ENVIRONMENTAL ASSESSMENT**

Name & Address	Comments	MTO Response
	<ul style="list-style-type: none"> <li>• They suggest that Ravenshoe Road in Keswick would be cost effective and cross less marsh land.</li> <li>• letter of 8/7/98 raised same concerns.</li> </ul>	<ul style="list-style-type: none"> <li>• The use of Ravenshoe Road as an alternative was considered during the study and was determined not to be a reasonable option as identified in Section 3.5.2 of the EAR.</li> </ul>
<p>IG2 East Gwillimbury Watch Jean Martin 7 Algonquin Forest Drive Newmarket, Ontario L3Y 4V8 (rec'd 7/12/98 by MOE)</p>	<ul style="list-style-type: none"> <li>• East Gwillimbury Watch is "<i>concerned about necessity for building this road</i>".</li> <li>• Questions whether developers "<i>are the ones pushing for the road</i>".</li> <li>• They state that "<i>there are many more appropriate places to place east-west links</i>".</li> <li>• They state that "<i>everything seems to be proved by computer modelling, based on doubtful input on future growth</i>".</li> <li>• They stated that they "<i>would like to see a much more thorough need assessment and a more detailed assessment of the whole project</i>".</li> <li>• They stated that "<i>the Lower Landing has historical significance and should be ruled out as a place to construct a highway</i>".</li> <li>• They suggest that "<i>wetlands need protection. ... To deliberately put a road in such a location is evidence of poor planning</i>".</li> </ul>	<ul style="list-style-type: none"> <li>• Section 3.1.2.2 of the EAR identifies a vehicle demand which will warrant a freeway facility.</li> <li>• In carrying out the Bradford Bypass EA study the MTO, in consultation with the municipalities in the area, considered the total needs and alternatives prior to identifying the preferred Provincial facility. The EA document provides an understanding of total traffic demands in the area (see Section 3.1.2.2)</li> <li>• The MTO study encompassed an analysis area extending from Highway 407 in the south to Highway 89 / Ravenshoe Road in the north. As a result of the assessment, the Bradford Bypass corridor was selected over other corridors including the Highway 89 / Ravenshoe Road and the Green Lane / Highway 9 corridors, as described in Section 3.5.2 of the EAR.</li> <li>• Approved Official Plans for York Region, Simcoe County, Town of Bradford-West Gwillimbury and Town of East Gwillimbury reflect substantial development over the coming decade. Freeway will respond to travel demands and EAR acknowledges broader development issues as described in Section 5.4.6.3 of the EAR.</li> <li>• Refer to response provided for the "Historic Sites and Monuments Board of Canada" comments (GA3).</li> <li>• From the outset, one of guiding principles of route alternative generation and evaluation was the sensitivity of the Holland Marsh PSW. MTO has, through consultation with MNR, developed alternatives to minimize impacts to the PSW and have committed to constructing the facility as an elevated pier structure within its boundaries to maintain the physical and biological features and functions.</li> </ul>



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THE HIGHWAY 400 - FUTURE HIGHWAY 404 EXTENSION LINK, (BRADFORD BYPASS), ENVIRONMENTAL ASSESSMENT**

Name & Address	Comments	MTO Response
<p>IG3 Environmentalists Plan Transportation Joan Doiron, Chair 43 English Ivyway Willowdale, Ontario M2H 3M3 (14/12/98 to MOE and MTO)</p>	<ul style="list-style-type: none"> <li>The Environmentalists Plan Transportation stated that the EA "fails to account for long term region-wide impact of the expressway" (ie opening up large area to suburban development). "An area far larger than the narrow corridor studied would be adversely affected".</li> <li>They suggest that "the study restricts its focus on the impact of the construction of the road" and "avoids discussion of environmental impact of such (future) development".</li> <li>They suggest that any new transportation infrastructure in York Region should further the aim of the Official Plan to concentrate growth in the southern part of the region. "No new roads should be built in this area while new development can be concentrated elsewhere... in areas where new development will have a less detrimental environmental impact and where it can lead to decreased dependence on the automobile".</li> </ul>	<ul style="list-style-type: none"> <li>Approved Official Plans for York Region, Simcoe County, Town of Bradford-West Gwillimbury and Town of East Gwillimbury reflect substantial development over the coming decade. Freeway will respond to travel demands and EAR acknowledges broader development issues as described in Section 5.4.6.3 of the EAR.</li> </ul>
<p>IG4 Canadian Heritage Landscapes David and Carol Ladell 20866 Yonge Street RR 1, Newmarket, Ontario L3Y 4V8 (13/11/98 to MOE and MCzCR Ministers, also 12/11/98 to many incl. above Ministers)</p>	<ul style="list-style-type: none"> <li>Canadian Heritage Landscapes members Mr. &amp; Mrs. Ladell stated that "the MTO has decided to build a super highway over an irreplaceable cultural heritage landscape site at Lower Holland Landing".</li> <li>They report that "this highway puts Canada in violation of 1970 and 1972 United Nations International Conventions to control the destruction of cultural heritage throughout the world".</li> <li>They suggest that the Ontario Heritage Foundation is a decoy... and is not looking after our heritage.</li> <li>They indicate that their residence is at The Lower Landing or Soldier Bay, which includes "extensive multi-component sites established sometime before A.D. 800 that continued to witness use through to the 19<sup>th</sup> century".</li> <li>They suggested that they are "prepared to give, through deed, lease or right of way whatever property is needed to fully preserve this entire heritage site".</li> <li>They report that they "intend to stop or cause rerouting of this east-west highway that would destroy the "sense of place" or cultural heritage landscape of The Lower Landing, but also act as a dam between Lake Simcoe and The Holland Marsh".</li> <li>They "know of no effort by any Ontario Government Official to be up front and honest with citizens... about the destruction and cover up of this heritage site".</li> <li>They suggest that the "citizens of Ontario have been deceived by MTO and a major Canadian Heritage Site will be destroyed if they proceed".</li> </ul>	<ul style="list-style-type: none"> <li>Refer to response provided for the "Historic Sites and Monuments Board of Canada" comments (GA3).</li> <li>Information was not withheld from the public through the public consultation process. Information was summarized on panels for general review at Public Information Centres. In addition, specialist staff were on hand to address questions related to specific elements of concern. This is a standard approach to public consultation.</li> </ul>

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THE HIGHWAY 400 - FUTURE HIGHWAY 404 EXTENSION LINK, (BRADFORD BYPASS), ENVIRONMENTAL ASSESSMENT**

Name & Address	Comments	MTO Response
IG5 Canadian Heritage Landscapes Willard Petersen 80 West Drive Brampton, Ontario L6T 3T6 (12/12/98 to MOE)	<ul style="list-style-type: none"> <li>Canadian Heritage Landscapes member Mr. Petersen stated that "MTO has either overlooked, ignored or suppressed knowledge of the existence of this landscape by proposing a route that would destroy it".</li> <li>They suggest that "MTO had knowledge of this historical site throughout the EA process".</li> <li>They suggest that "MTO suppressed this knowledge from the public until it submitted its EA proposal to MOE in October 1998".</li> <li>They suggest that the "MTO Project Team Members and its leader Steve Jacobs deceived the public by withholding this information".</li> <li>They note that "in the past few years it has come to their attention that the United Nations Convention of 1972, to which Canada is signatory, is not being taken seriously by the Ontario government whom the citizens of Ontario have the right to expect would uphold it".</li> </ul>	<ul style="list-style-type: none"> <li>Refer to response provided for the "Historic Sites and Monuments Board of Canada" comments (GA3).</li> </ul>
IG6 Transport 2000 Ontario Rail Ways To The Future Committee Ross Snetsinger, Chair 247 Silverbirch Avenue Toronto, Ontario M4C 3L6 (16/12/98 to MOE)	<ul style="list-style-type: none"> <li>Rail Ways to the Future Committee member Mr. Snetsinger stated that "a couple of million could preserve the rail line to Barrie".</li> <li>He states that "recent financial analysis of the Parkdale to Washago portion of the CN Newmarket Subdivision indicated that a provincial investment of \$33 million would reap an annual return of \$6 million".</li> </ul>	<ul style="list-style-type: none"> <li>Comments are noted.</li> <li>Rail is not a competitive mode in terms of travel time and convenience for passenger travel and freight as stated in Section 3.3.4 of the EAR.</li> <li>City of Barrie is pursuing GO Rail service in this corridor.</li> </ul>
IG7 York Region Federation of Agriculture (no address shown) Virginia McLaughlin, President (14/12/98 to MOE)	<ul style="list-style-type: none"> <li>The York Region Federation of Agriculture stated that it is opposed to the current proposal as it "does not address the (transportation) needs of farmers in the northern parts of the Region as well as Durham Region and the Regions to the east and west" - to provide rapid and convenient access to markets and suppliers.</li> <li>They support Ravenshoe Road route since it would provide a "virtually continuous link from Ottawa to Goderich via Highway 7 and Highway 89" and also "builds on existing infrastructure rather than opening up large blocks of green space".</li> </ul>	<ul style="list-style-type: none"> <li>In carrying out the Bradford Bypass EA study the MTO, in consultation with the municipalities in the area, considered the total needs and alternatives prior to identifying the preferred Provincial facility. The EA document provides an understanding of total traffic demands in the area (see Section 3.1.2.2)</li> <li>The MTO study encompassed an analysis area extending from Highway 407 in the south to Highway 89 / Ravenshoe Road in the north. As a result of the assessment, the Bradford Bypass corridor was selected over other corridors including the Highway 89 / Ravenshoe Road and the Green Lane / Highway 9 corridors, as described in Section 3.5.2 of the EAR.</li> <li>While it is within the MTO mandate to provide for the safe, efficient movement of people and goods between regions and between urban areas, this study concentrated on problems which focussed on growth in congestion between Highway 400 and Highway 404 Extension. Significant urban growth is expected in this area warranting additional road capacity. Furthermore, long distance north-south traffic must split to travel around Lake Simcoe, therefore creating a demand for east-west road capacity between these freeways. The demand for a direct linkage between Ottawa and Goderich was not anticipated to become a significant factor in the analysis of alternative routes.</li> </ul>



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THE HIGHWAY 400 - FUTURE HIGHWAY 404 EXTENSION LINK, (BRADFORD BYPASS), ENVIRONMENTAL ASSESSMENT**

Name & Address	Comments	MTO Response
<b>PUBLIC</b>		
P1 [REDACTED]	<ul style="list-style-type: none"> <li>• [REDACTED] stated that prior to purchasing property (in September 1997), they were informed that the Bradford Bypass would cross at Holborn Road however the bypass is proposed at their southern property line.</li> <li>• They suggest that the highway will result in noise and garbage in the yard and devaluation of property.</li> <li>• They indicate that MTO staff has suggested that no houses will be affected by the construction.</li> </ul>	<ul style="list-style-type: none"> <li>• No property is required by MTO from the [REDACTED] on the basis of design to date. At no point in the planning and consultation process was a crossing at Holborn Road identified by MTO as a preferred alternative</li> <li>• Noise assessment at the design stage is described in Section 5.4.3.2 of the EA</li> </ul>
P2 [REDACTED]	<ul style="list-style-type: none"> <li>• [REDACTED] stated that "I protest, object with my whole being to the indignity of your plan for the graves and remains of my family who may be buried on the site".</li> <li>• "I protest and reproach you for planning to violate the earth and natural beauty of this area".</li> <li>• "I find fault and censor all aspects of this project".</li> <li>• "I will look forward to a response to this letter as a confirmation that it has been read."</li> </ul>	<ul style="list-style-type: none"> <li>• Refer to response provided for the "Historic Sites and Monuments Board of Canada" comments (GA3).</li> <li>• This project was carried out under the full requirements of the Ontario Environmental Assessment Act and all other applicable legislation and policy with full public input throughout.</li> <li>• MOE Review will contain response.</li> </ul>
P3 [REDACTED]	<ul style="list-style-type: none"> <li>• [REDACTED] stated that they "have difficulty accepting "planning for the past" as our province pushes backward with a mid-twentieth century highway system that is built to accommodate yesterday's and today's personal choice of transportation".</li> <li>• They question whether "more environmental encroachment and harm with a future east/west transportation corridor" is necessary. The area is a flood zone, a natural wildlife habitat, an historical archeological area and farm land.</li> </ul>	<ul style="list-style-type: none"> <li>• Need for the facility is clearly documented in Section 3.0 of the EAR. Specifically Section 3.3 discusses Alternatives to the Undertaking.</li> <li>• The overall alignment for the freeway was optimized by taking into consideration the need to provide a safe transportation facility while minimizing and / or mitigating natural and social environmental impacts (see Section 4.1.2)</li> </ul>
P4 [REDACTED]	<ul style="list-style-type: none"> <li>• [REDACTED] stated that she is concerned with environmental issue of building a highway on a flood plain and marsh.</li> </ul>	<ul style="list-style-type: none"> <li>• Bridge piers or fill will be placed such that the surface of the road will be constructed above the Regulatory Flood elevation and sufficient conveyance will be provided under the bridge structures to avoid upstream flood impacts. A hydraulic analysis was completed to determine the impact of the recommended alignment on upstream flood risk. Based on the analysis, it was concluded that it will be feasible to construct the facility such that the increase in the Regulatory flood elevations upstream of the river crossings will not exceed 0.10 metres. This conforms with the requirements of the Lake Simcoe Region Conservation Authority. A more detailed hydraulic analysis will be required in conjunction with the design of the river crossings.</li> </ul>

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THE HIGHWAY 400 - FUTURE HIGHWAY 404 EXTENSION LINK, (BRADFORD BYPASS), ENVIRONMENTAL ASSESSMENT**

Name & Address	Comments	MTO Response
	<ul style="list-style-type: none"> <li>• [REDACTED] has concerns about potential loss of Class 'A' agricultural lands.</li> <li>• [REDACTED] has concerns regarding impact to water and private wells and compensation</li> <li>• [REDACTED] has concerns about soil erosion and noise problems.</li> </ul>	<ul style="list-style-type: none"> <li>• Agricultural impacts have been minimized by avoiding major severances, locating the alignment along mid-concession or along existing lot lines as indicated in Section 5.4.4.1 of the EAR.</li> <li>• Wells will be protected through preparation of stormwater management and groundwater protection plans at the design stage which address both quantity and quality as indicated in Section 5.4.2.6 of the EAR.</li> <li>• Soil erosion and sedimentation will be minimized during and subsequent to construction through design strategies and contract specifications as described in section 5.4.6.2. A noise mitigation strategy will be developed according to the MTO / MOE noise protocol as described in Section 5.4.3.2 of the EAR.</li> </ul>
P5	<ul style="list-style-type: none"> <li>• [REDACTED] stated that the proposed route "places the road on some of the most environmentally sensitive land in the area". Prefers original MTO route within Ravenshoe Corridor in, which roads are partly built.</li> <li>• [REDACTED] suggested that the proposed route would disrupt significant Native burying grounds and former aboriginal settlements.</li> </ul>	<ul style="list-style-type: none"> <li>• The MTO study encompassed an analysis area extending from Highway 407 in the south to Highway 89 / Ravenshoe Road in the north. As a result of the assessment, the Bradford Bypass corridor was selected over other corridors including the Highway 89 / Ravenshoe Road and the Green Lane / Highway 9 corridors, as described in Section 3.5.2 of the EAR.</li> <li>• Refer to response provided for the "Historic Sites and Monuments Board of Canada" comments (GA3).</li> </ul>
P6	<ul style="list-style-type: none"> <li>• [REDACTED] stated that they "acknowledge the need for the Bradford Bypass".</li> <li>• They noted concerns regarding wildlife. "The highway should be as wildlife-friendly as possible". Suggest "reflective stripes to warn animals... and fencing / curbs to prevent turtles and frogs... crossing". Suggest low speed limit, lots of curves and warning signage. Request marsh areas and bird and mammal nesting areas be avoided.</li> </ul>	<ul style="list-style-type: none"> <li>• Acceptance noted.</li> <li>• The overall alignment for the freeway was optimized by taking into consideration the need to provide a safe transportation facility while minimizing and / or mitigating natural and social environmental impacts (see Section 4.2 of the EAR). The MTO intends to address terrestrial passage for small mammals within wildlife corridors, monitor wildlife movement patterns and potential areas of conflict. To minimize road kills they will provide a wide grassed open median, fencing of the right of way, provision of good visibility for drivers and the consideration of cautionary wildlife crossing signage will be investigated, as stated in Exhibit 5-6 of the EAR.</li> </ul>
P7	<ul style="list-style-type: none"> <li>• [REDACTED] stated that he and his wife had objections to the bypass.</li> <li>• [REDACTED] suggested that the "highway will expose our family to significant levels of harmful air pollution".</li> <li>• [REDACTED] suggested that the "highway will cause contamination of well water" (approx. 25 m from ROW).</li> </ul>	<ul style="list-style-type: none"> <li>• Objections are noted.</li> <li>• Based on information available from other Ministry projects, there is no reason to expect significant local effects on air quality.</li> <li>• Wells will be protected through preparation of stormwater management and groundwater protection plans at the design stage which address both quantity and quality as indicated in Section 5.4.2.6 of the EAR.</li> </ul>



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Name & Address	Comments	MTO Response
<p>P8 [REDACTED]</p>	<ul style="list-style-type: none"> <li>• [REDACTED] suggested that the "highway will cause a great deal of mental stress as a consequence of high levels of ambient noise".</li> <li>• [REDACTED] stated that [REDACTED] had concerns that: proximity of highway right of way to house (approx. 16 m) "presents a noise and exhaust pollution level that will be detrimental to family health".</li> <li>• [REDACTED] suggests that the 6 m deep highway cut next to well will "endanger water source by pollution or lack of water".</li> <li>• [REDACTED] expects that the value of property has been greatly reduced by highway.</li> <li>• [REDACTED] requests Ministry buy 9.5 acre property and house under hardship policy.</li> </ul>	<ul style="list-style-type: none"> <li>• A noise mitigation strategy will be developed according to the MTO / MOE noise protocol as described in Section 5.4.3.2 of the EAR.</li> <li>• Based on information available from other Ministry projects, there is no reason to expect significant local effects on air quality.</li> <li>• A noise mitigation strategy will be developed according to the MTO / MOE noise protocol as described in Section 5.4.3.2 of the EAR.</li> <li>• Wells will be protected through preparation of stormwater management and groundwater protection plans at the design stage which address both quantity and quality as indicated in Section 5.4.2.6 of the EAR.</li> <li>• Point noted.</li> <li>• Property acquisition is normally initiated two to three years in advance of the Ministry's scheduled construction period. In instances where construction has not yet been scheduled, owners whose property will be required for the project may initiate the advance purchase of their property on a willing buyer/seller basis. For more information owners should contact the Central Region Property Section, (416) 235-4953.</li> </ul>
<p>P9 [REDACTED]</p>	<ul style="list-style-type: none"> <li>• [REDACTED] stated that [REDACTED] does not want view from residence destroyed.</li> <li>• [REDACTED] suggests Holborn Road instead of farmland.</li> </ul>	<ul style="list-style-type: none"> <li>• Effects and commitment to mitigation as per Section 5.4 of the EAR. Landscaping will be further considered in consultation with property owners during subsequent design.</li> <li>• The overall alignment for the freeway was optimized by taking into consideration the need to provide a safe transportation facility while minimizing and / or mitigating natural and social environmental impacts (see Section 4.2 of the EAR).</li> </ul>
<p>P10 [REDACTED]</p>	<ul style="list-style-type: none"> <li>• [REDACTED] stated that they were dismayed that MTO are persisting in building Bypass.</li> <li>• They suggested that the highway "will eliminate hundreds of acres of prime farmland currently supporting crops and cattle".</li> </ul>	<ul style="list-style-type: none"> <li>• As indicated in Section 5.4.2.8 of the EAR, the proposed Link will remove 190.37 ha of high capability mineral soils from potential agricultural use, however there are no areas where lower capability soil provided a reasonable alternative route. The impacts to agriculture were reduced by minimizing land parcel severances, maintaining access to properties and continued viability of farming operations and farm community activities. OMAFRA is satisfied with the data, analysis and conclusion that has been outline in the EA report.</li> </ul>

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THE HIGHWAY 400 - FUTURE HIGHWAY 404 EXTENSION LINK, (BRADFORD BYPASS), ENVIRONMENTAL ASSESSMENT**

Name & Address	Comments	MTO Response
	<ul style="list-style-type: none"> <li>• They suggest that the highway will <i>"disrupt Class '1' wetlands and destroy species that are unique to this area"</i>.</li> <li>• They suggest that <i>"the highway roadbed will be built over a floodplain creating a dam that will be dangerous if this area is flooded again"</i>.</li> <li>• They suggest upgrades to Green Lane/Bathurst St/Hwy 9 eliminates need for 400-404 link.</li> </ul>	<ul style="list-style-type: none"> <li>• The potential impact to wetland resources was addressed throughout the EAR. It was a major consideration in selection of the preferred alignment. In the view of the project team, it was not possible to avoid some wetland impacts within the study area. The approach adopted was to minimize wetland impacts by minimizing length of wetland crossing, crossing wetland areas already disturbed by past land uses and by committing to place the facility on a raised structure in wetland areas. The feasibility of allowing areas now in a disturbed state to regenerate to wetlands will also be considered. (Refer also to response GA9).</li> <li>• Bridge piers or fill will be placed such that the surface of the road will be constructed above the Regulatory Flood elevation and sufficient conveyance will be provided under the bridge structures to avoid upstream flood impacts. A hydraulic analysis was completed to determine the impact of the recommended alignment on upstream flood risk. Based on the analysis, it was concluded that it will be feasible to construct the facility such that the increase in the Regulatory flood elevations upstream of the river crossings will not exceed 0.10 metres. This conforms with the requirements of the Lake Simcoe Region Conservation Authority. A more detailed hydraulic analysis will be required in conjunction with the design of the river crossings.</li> <li>• The MTO study encompassed an analysis area extending from Highway 407 in the south to Highway 89 / Ravenshoe Road in the north. As a result of the assessment, the Bradford Bypass corridor was selected over other corridors including the Highway 89 / Ravenshoe Road and the Green Lane / Highway 9 corridors. However as the study progressed, and in response to public input, the MTO responded by carrying out a specific review of the Green Lane / Highway 9 corridor as an alternative to the Bradford Bypass corridor (the results are documented in Appendix B to the EAR). This review confirmed the Bradford Bypass corridor as being preferred for a freeway corridor with a 4 lane arterial corridor in the Green Lane / Highway 9 corridor.</li> </ul>
<p>P11</p> <div style="background-color: black; width: 150px; height: 100px;"></div>	<ul style="list-style-type: none"> <li>• [REDACTED] stated that <i>"non car modes of transportation are not considered and only cars are considered capable of accommodating the diversity of origins and destinations of the projected traffic"</i>. <i>"Road travel by private car... is not sustainable for it depends on fossil fuels"</i>. <i>"Public transit is more energy efficient"</i>.</li> <li>• [REDACTED] suggests that the proposed road will stimulate urban growth in the opposite end of York Region from where the Region's OP considers development desirable, causing destruction of prime farmland</li> </ul>	<ul style="list-style-type: none"> <li>• Need for the facility is clearly documented in Section 3.0 of the EAR. Specifically Section 3.3 discusses Alternatives to the Undertaking.</li> <li>• Some environmental issues have not been addressed since they are beyond the scope of the EAR and this Review, and must therefore be addressed in another forum (ie global warming, urban sprawl, greenhouse effects).</li> <li>• Approved Official Plans for York Region, Simcoe County, Town of Bradford-West Gwillimbury and Town of East Gwillimbury reflect substantial development over the coming decade. Freeway will respond to travel demands and EAR acknowledges broader development issues as described in Section 5.4.6.3 of the EAR.</li> </ul>



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THE HIGHWAY 400 - FUTURE HIGHWAY 404 EXTENSION LINK, (BRADFORD BYPASS), ENVIRONMENTAL ASSESSMENT**

Name & Address	Comments	MTO Response
	<ul style="list-style-type: none"> <li>• [REDACTED] suggests that increased urban sprawl has detrimental effects on water supply and runoff in Lake Simcoe watershed.</li> </ul>	<ul style="list-style-type: none"> <li>• Municipal water supply will not be adversely affected by the proposed highway. Highway runoff will be addressed through quality and quantity stormwater management facilities as indicated in Section 5.4.6.1. of the EAR</li> </ul>
<p>P12 [REDACTED]</p>	<ul style="list-style-type: none"> <li>• [REDACTED] stated that they are concerned with the highway consuming part of farm and adjacent farm lands.</li> <li>• They indicated that the highway location is in contradiction to Bradford-West Gwillimbury Official Plan stating preservation and enhancement of agricultural resource are principles.</li> <li>• They suggest that the freeway will affect farm operation and lifestyle.</li> <li>• They understand that access to two adjacent (leased) farms is eliminated. Request access tunnel. Side Road 10 operations will otherwise be impacted by farm equipment.</li> <li>• They are concerned with possible noise from highway, forest damage, impact to wildlife. They expect impacts to natural watercourses and pike spawning area.</li> <li>• They wish reply to letter</li> </ul>	<ul style="list-style-type: none"> <li>• The Town of Bradford stated that <i>"the conclusion reached after consultation with our affected citizens is that the location of the Technically Preferred Route for this new facility is satisfactory"</i> (see Comment M5).</li> <li>• Impacts to agricultural operations were considered in the generation, analysis and evaluation of alternatives. The potential impacts of the technically preferred route and proposed mitigation measures are indicated in Section 5.4.4.1 of the EA. The Ministry is required to compensate a property owner according to the provisions of the Expropriations Act. Compensation is generally based on the market value of the property or the loss in market value in the case of a partial acquisition. If the Ministry buys only a portion of a property, the effect of the acquisition on the rest of the property will be taken into consideration. In addition, there is provision for payment of other reasonable expenses actually incurred, upon final settlement.</li> <li>• MTO does not compensate farmers who rent lands that become more difficult to access because of the undertaking. It is recognized that this impact can occur and that the farmer may be forced to rent other lands to continue the operation, however, given that construction is not currently scheduled, there should be sufficient time for tenant farmers to adjust their renting patterns.</li> <li>• Mitigation measures which will be adopted to minimize environmental impacts have been documented in Section 5.4.2 and 5.4.3 of the EAR. Specific details of the mitigation to be provided locally will be determined during subsequent design.</li> <li>• MOB Review will contain response.</li> </ul>
<p>P13 [REDACTED]</p>	<ul style="list-style-type: none"> <li>• [REDACTED] stated that Tenant farmer's direct access will be cut off by highway. Requests access tunnel for farming.</li> <li>• They are concerned that destruction of prime agricultural land for transportation contradicts Bradford-West Gwillimbury Official Plan regarding protection of Class I farmland.</li> </ul>	<ul style="list-style-type: none"> <li>• Comments are associated to those of adjacent landowners of P12. See response for P12.</li> <li>• The Town of Bradford stated that <i>"the conclusion reached after consultation with our affected citizens is that the location of the Technically Preferred Route for this new facility is satisfactory"</i></li> </ul>

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Name & Address	Comments	MTO Response
	<ul style="list-style-type: none"> <li>They suggested that there will be an impact to natural waterway leading to Holland Landing, consequent impacts to wildlife and increased possibility of flooding are concerns.</li> </ul>	<ul style="list-style-type: none"> <li>MTO has committed to span the provincially significant wetland associated with the Holland River, thereby preserving current functions with regards to wildlife movement.</li> <li>Bridge piers or fill will be placed such that the surface of the road will be constructed above the Regulatory Flood elevation and sufficient conveyance will be provided under the bridge structures to avoid upstream flood impacts. A hydraulic analysis was completed to determine the impact of the recommended alignment on upstream flood risk. Based on the analysis, it was concluded that it will be feasible to construct the facility such that the increase in the Regulatory flood elevations upstream of the river crossings will not exceed 0.10 metres. This conforms with the requirements of the Lake Simcoe Region Conservation Authority. A more detailed hydraulic analysis will be required in conjunction with the design of the river crossings.</li> </ul>
P14 [REDACTED]	<ul style="list-style-type: none"> <li>[REDACTED] stated that she "strongly objects to tactics taken by MTO to move the alignment further north at Bathurst Street, thus affecting property".</li> <li>[REDACTED] indicated that proposal goes through property [REDACTED] was assured by-pass would not affect property when given building permit as it would be placed south. "Should never have been given a building permit during the study period" nor been told it would not affect property.</li> </ul>	<ul style="list-style-type: none"> <li>A technically preferred route was presented for review and comment to municipalities, other government agencies and to the public at information centres in November 1996. To address comments received an alignment modification was developed to avoid a significant woodlot area. This alignment was carried forward and included in the Environmental Assessment submission to MOE (evaluation provided on page 123 of the EA). At the time of submission affected property owners received by direct mail a Notice of the Submission. It is not known whether or not all property owners reviewed the EAR.</li> <li>Assurance was not provided by MTO. Building permit was not provided by MTO. With respect to the specific alignment in the vicinity of Bathurst Street the route reflects the need to minimize the impact on woodlots to the south while trying to minimize impacts to a marina on the north and at the same time providing access to agricultural lands to the west of Bathurst Street (see Section 4.2.3.9 of the EAR).</li> </ul>
P15 [REDACTED]	<ul style="list-style-type: none"> <li>[REDACTED] suggested that the Link should cross at one of the road allowances (11th, 12th, 13th, 14th) of Bradford West Gwillimbury to avoid dividing prime farm land.</li> </ul>	<ul style="list-style-type: none"> <li>Agricultural impacts have been minimized by avoiding major severances, locating the alignment along mid-concession or along existing lot lines as indicated in Section 5.4.4.1 of the EAR.</li> </ul>
P16 [REDACTED]	<ul style="list-style-type: none"> <li>[REDACTED] stated that they don't want highway running through backyard.</li> </ul>	



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Name & Address	Comments	MTO Response
	<ul style="list-style-type: none"> <li>• They suggest joining Ninth Line with Holburn Road.</li> </ul>	<ul style="list-style-type: none"> <li>• The MTO study encompassed an analysis area extending from Highway 407 in the south to Highway 89 / Ravenshoe Road in the north. As a result of the assessment, the Bradford Bypass corridor was selected over other corridors including the Highway 89 / Ravenshoe Road and the Green Lane / Highway 9 corridors, as described in Section 3.5.2 of the EAR.</li> <li>• Roadway infrastructure improvements were considered for several corridors including Holburn Road and Ninth Line as described in Section 3.3.3 of the EAR. Those types of improvements were not expected to address out-of-way travel issues and were not expected to provide suitable traffic operations at major crossing roads where traffic signals are used.</li> </ul>
P17 [REDACTED]	<ul style="list-style-type: none"> <li>• [REDACTED] suggested that improved highways badly needed</li> <li>• [REDACTED] suggests that MTO is unlikely to find artifacts</li> </ul>	<ul style="list-style-type: none"> <li>• Support noted.</li> </ul>
P18 [REDACTED]	<ul style="list-style-type: none"> <li>• [REDACTED] notes that "proposed highway route through ...property represents a "fine tuning" of route planning to avoid impacting a heritage farm building on Leslie Street and to remove impacts on residential properties on 2<sup>nd</sup> Concession and Leslie Street".</li> <li>• They have questions concerning proposed route including:                             <ul style="list-style-type: none"> <li>• What is possibility of route changing due to consultation?</li> <li>• What is next step of EA process after Dec. 16?</li> <li>• What are opportunities for additional comment or recourse for past and future endeavours?</li> <li>• What is timing for property acquisition?(impact on leasing commitments)</li> <li>• Not in a position currently to object or support the initiative.</li> <li>• Requests to be advised of appeals, response to questions and to set up meeting to discuss matter.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• MTO can not predict outcome of review and therefore can not comment on possibility of route relocations that may result from review.</li> <li>• MOE will address in their Review document.</li> <li>• Property acquisition is normally initiated two to three years prior to construction. Construction timing is not known at this time.</li> <li>• The project team will be available for meetings that MOE request to address comments received on the EA.</li> </ul>

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Name & Address	Comments	MTO Response
<p>P19 [REDACTED]</p>	<ul style="list-style-type: none"> <li>• [REDACTED] stated that [REDACTED] is opposed to highway since other corridor exists (i.e. Green Lane/Bathurst Street/ Hwy 9).</li> <li>• [REDACTED] has concerns with flooding due to building on flood plain.</li> <li>• [REDACTED] is concerned with noise from and expense of bridge at Albert's Marina.</li> </ul>	<ul style="list-style-type: none"> <li>• The MTO study encompassed an analysis area extending from Highway 407 in the south to Highway 89 / Ravenshoe Road in the north. As a result of the assessment, the Bradford Bypass corridor was selected over other corridors including the Highway 89 / Ravenshoe Road and the Green Lane / Highway 9 corridors. However as the study progressed, and in response to public input, the MTO responded by carrying out a specific review of the Green Lane / Highway 9 corridor as an alternative to the Bradford Bypass corridor the results are documented in Appendix B to the EAR. This review confirmed the Bradford Bypass corridor as being preferred for a freeway corridor with a 4 lane arterial corridor in the Green Lane / Highway 9 corridor.</li> <li>• Bridge piers or fill will be placed such that the surface of the road will be constructed above the Regulatory Flood elevation and sufficient conveyance will be provided under the bridge structures to avoid upstream flood impacts. A hydraulic analysis was completed to determine the impact of the recommended alignment on upstream flood risk. Based on the analysis, it was concluded that it will be feasible to construct the facility such that the increase in the Regulatory flood elevations upstream of the river crossings will be not exceed 0.10 metres. This conforms with the requirements of the Lake Simcoe Region Conservation Authority. A more detailed hydraulic analysis will be required in conjunction with the design of the river crossings.</li> <li>• A noise mitigation strategy will be developed according to MTO / MOE noise protocol as described in Section 5.4.3.2 of the EAR.</li> </ul>
<p>P20 [REDACTED]</p>	<ul style="list-style-type: none"> <li>• [REDACTED] stated that [REDACTED] is opposed to highway location due to reduced property value of River Drive Park and destruction of golf course and marina which are great assets to the area.</li> <li>• [REDACTED] suggested use of Green Lane route.</li> </ul>	<ul style="list-style-type: none"> <li>• Golf course and marina are expected to be maintained as viable businesses during and following freeway construction as indicated in Exhibit 5-6 (Economic Environment) of the EAR which states that "...the functional and economic viability of both enterprises will remain" and furthermore that "consultation will be necessary during the detailed design phase to minimise impacts to each business".</li> <li>• The MTO carried out a specific review of the Green Lane / Highway 9 corridor as an alternative to the Bradford Bypass corridor. The results are documented in Appendix B to the EAR. This review confirmed the Bradford Bypass corridor as being preferred for a freeway corridor with a 4 lane arterial corridor in the Green Lane / Highway 9 corridor.</li> <li>• With respect to the specific alignment in the vicinity of Bathurst Street the route reflects the need to minimize the impact on woodlots to the south while trying to minimize impacts to a marina on the north and at the same time providing access to agricultural lands to the west of Bathurst Street (see Section 4.2.3.9).</li> </ul>



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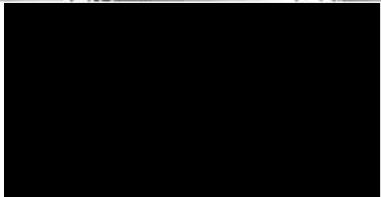




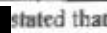

Name & Address	Comments	MTO Response
P21 [REDACTED]	<ul style="list-style-type: none"> <li>[REDACTED] stated that [REDACTED] supports bypass and would like to see work expedited with the 404 extension.</li> </ul>	<ul style="list-style-type: none"> <li>No further action required.</li> </ul>
P22 [REDACTED]	<ul style="list-style-type: none"> <li>[REDACTED] stated that [REDACTED] is "not at all confident and comfortable that MTO has conducted sufficient due diligence based on lack of public meetings and the absence of information".</li> <li>[REDACTED] suggested that the "proposed raised highway would literally obliterate the Lower Landing archeological site".</li> <li>[REDACTED] indicated that the route of the proposed elevated highway would run along the southern boundary cutting dramatically into sections of the golf course. The business is an asset to the local community as an employer, tax base and consumer of local goods and services, provides service to local public</li> <li>[REDACTED] questions whether the Government falls under the same rules and regulations as the golf course had to. Experts have told [REDACTED] that salt and pollutants spilling from this elevated roadway would severely impact vegetation and wildlife for more than 120 m in each direction. Sensitive silver birch and premium grasses could not survive in the highway environment. Diverse and plentiful wildlife population would be negatively impacted.</li> <li>[REDACTED] suggests using Green Lane or Queensville Sideroad as they are more viable routes.</li> <li>[REDACTED] requests continued opportunity to be involved before final decisions made.</li> </ul>	<ul style="list-style-type: none"> <li>Refer to response provided for the "Historic Sites and Monuments Board of Canada" comments (GA3).</li> <li>The specific alignment in the vicinity of Bathurst Street reflects the need to minimize the impact on woodlots to the south while trying to minimize impacts to a marina and golf course to the north and at the same time providing access to agricultural lands to the west of Bathurst Street. Earlier discussions with the owner suggested that mitigation is possible. Appendix E of the EAR includes Minutes of Meeting which indicate that [REDACTED] believed that there is space on his property to re-orient some holes if a partial taking is required. Section 5.4.4.2 of the EAR commits MTO to consult further with the golf course owner regarding reconfiguring affected facilities during subsequent design.</li> <li>The Government is proceeding under the Environmental Assessment Act for project approval, in addition to adherence to other provincial and federal legislation, whereas the golf course would have been approved under the Planning Act in adherence with local Official Plans.</li> <li>MTO intend to follow specialist advice regarding mitigation measures that can be developed as part of the design stage to minimize the potential impacts imposed by salt spray or salt laden runoff as a result of the proposed elevated roadway in proximity to the golf course and its associated vegetation.</li> <li>The overall alignment for the freeway was optimized by taking into consideration the need to provide a safe transportation facility while minimizing and / or mitigating natural and social environmental impacts (see Section 4.2.3).</li> <li>With respect to the specific alignment in the vicinity of Bathurst Street the route reflects the need to minimize the impact on woodlots to the south while trying to minimize impacts to a marina on the north and at the same time providing access to agricultural lands to the west of Bathurst Street (see Section 4.2.3.9).</li> <li>Request noted.</li> </ul>

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Name & Address	Comments	MTO Response
	<ul style="list-style-type: none"> <li>• [REDACTED] reports in April 1999 that "My Greens Superintendent who leased a portion of the land to my south, was informed by his landlord that the MTO might proceed with the land purchase. However there was no formal notification given ..."</li> </ul>	<ul style="list-style-type: none"> <li>• Property acquisition is normally initiated two to three years in advance of the Ministry's scheduled construction period. In instances where construction has not yet been scheduled, owners may initiate the advance purchase of their property. The property purchase activities of individual owners are treated as confidential matters. The communication of activities to a lessee are determined by the negotiated terms and conditions of the agreement of purchase and sale.</li> </ul>
P23 [REDACTED]	<ul style="list-style-type: none"> <li>• [REDACTED] supports bypass and requests some literature.</li> </ul>	<ul style="list-style-type: none"> <li>• Support noted.</li> <li>• MTO to provide material.</li> </ul>
P24 [REDACTED]	<ul style="list-style-type: none"> <li>• [REDACTED] stated that [REDACTED] had concerns that route crosses Lots 12 &amp; 13 in Concession 8 and severs subject lands into two parcels, which will unnecessarily compromise current plans to develop lifestyle community. [REDACTED] indicated that route will occupy 11.7 ha (14%) and unuseable parcel will occupy 4.9 ha (6%).</li> <li>• [REDACTED] indicated that the northernmost parcel will have no access to public roads</li> <li>• [REDACTED] requests that route be shifted north to the mid concession line requiring only slight realignment to portions between Simcoe County Road 4 and Lots 12 &amp; 13.</li> <li>• [REDACTED] agrees with full interchange at Simcoe County Road 4, grade separation only at 10 Sideroad and no interchange at Middleton Road.</li> <li>• [REDACTED] has serious concerns about noise mitigation for planned residential development on subject lands.</li> <li>• [REDACTED] requested that the angle of grading not visually impact residents of properties to south and those planned on subject lands.</li> </ul>	<ul style="list-style-type: none"> <li>• Development is not yet approved and lands are currently zoned Agricultural.</li> <li>• As indicated in the EAR, alternative access is provided on the project where warranted. Exhibit 5-2 displays the relationship of the proposed alignment to the properties in Concession 8. Although an objective was to be mid-concession to avoid severances there are locations where this was not always possible due to other sensitivities and constraints. The Ministry is required to compensate property owners according to the provisions of the Expropriations Act. If the Ministry buys only a portion of a property, the effect of the acquisition on the rest of the property is taken into consideration. This may include acquisition of isolated portions of the property for which access can not be provided.</li> <li>• The overall alignment for the freeway was optimized by taking into consideration the need to provide a safe transportation facility while minimizing and / or mitigating natural and social environmental impacts (see Section 4.2.3).</li> <li>• Support noted.</li> <li>• A noise mitigation strategy will be developed according to MTO / MOE noise protocol as described in Section 5.4.3.2 of EAR.</li> <li>• Further discussions into the design of the freeway will be sought at a later design phase to achieve a balance of visual enhancements locally, as discussed in Section 5.3.1 of the EAR.</li> </ul>



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Name & Address	Comments	MTO Response
<p>P25</p> 	<ul style="list-style-type: none"> <li>•  stated that the proposed highway link "will have devastating effect on the extremely sensitive wetland area". A four lane freeway would eventually destroy wildlife completely.</li> <li>•  suggests expansion of local routes already planned and approved should be sufficient to address present traffic congestion.</li> </ul>	<ul style="list-style-type: none"> <li>• The potential impact to wetland resources was addressed throughout the EAR. It was a major consideration in selection of the preferred alignment. In the view of the project team, it was not possible to avoid some wetland impacts within the study area. The approach adopted was to minimize wetland impacts by minimizing length of wetland crossing, crossing wetland areas already disturbed by past land uses and by committing to place the facility on a raised structure in wetland areas. The feasibility of allowing areas now in a disturbed state to regenerate to wetlands will also be considered. (Refer also to response GA9).</li> <li>• Section 3.1.2.2 of the EAR identifies a vehicle demand which will warrant a freeway facility.</li> <li>• Need for the facility is clearly documented in Section 3.0 of the EAR. Specifically Section 3.3 discusses Alternatives to the Undertaking.</li> </ul>
<p>P26</p> 	<ul style="list-style-type: none"> <li>•  stated that  is opposed to highway link as it will damage and extensively pollute fish pond near Holland River.</li> <li>•  suggests that extensive wetlands on property will be destroyed.</li> </ul>	<ul style="list-style-type: none"> <li>• The specific nature of the small residential pond was not investigated as part of the fisheries habitat assessment in the EAR. The recommended alignment will affect the current form of the man-made feature, however, in consultation with the landowner a modification/relocation strategy will be developed as part of the design phase.</li> <li>• In consultation with the Ontario Ministry of Natural Resources (OMNR), minor shifts in the alignment between the branches of the Holland River were evaluated to minimize impacts to many natural, cultural, and socio-economic features including: Provincially Significant Wetlands, large contiguous woodland blocks, speciality crop farms, a marina, and, two major river crossings. The majority of the large woodland blocks south of the marina are not considered part of the larger wetland complex (MNR Wetland Mapping, Exhibit 6, Appendix 4) and the wetland areas have undergone various levels of previous disturbance. However, the extent and significance of the large woodlands/disturbed wetland community in this area is recognized as "Natural Heritage Feature 11" in Appendix G of the EAR which also illustrates the expected extent of the edge type impacts within the disturbed wetland areas. Due to the north-south orientation of the wetland feature, some impacts from an east-west roadway were unavoidable. It was agreed during early consultations with OMNR that when a crossing of the provincially significant wetland was required, the crossing location should be directed to the more disturbed zones of the wetland complex.</li> </ul>

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Name & Address	Comments	MTO Response
P27 [REDACTED]	<ul style="list-style-type: none"> <li>[REDACTED] stated that he is concerned that proposed freeway construction will severely impact a significant historical site in Lot 118, East Gwillimbury.</li> <li>[REDACTED] suggests that proper archeological investigation of the Lower Landing area could reveal a valuable storehouse of information about the history of Canada.</li> </ul>	<ul style="list-style-type: none"> <li>Refer to response provided for the "Historic Sites and Monuments Board of Canada" comments (GA3).</li> </ul>
P28 [REDACTED]	<ul style="list-style-type: none"> <li>[REDACTED] stated that <i>"The Lower Landing" area is both environmentally and historically important and irreplaceable</i>. Surely it can be preserved while still allowing for the perceived need to connect the two major highways.</li> </ul>	<ul style="list-style-type: none"> <li>Refer to response provided for the "Historic Sites and Monuments Board of Canada" comments (GA3).</li> </ul>
<b>INTEREST GROUP</b>		
IG1 F.R.O.G.S. [REDACTED]	<p>The introduction to the F.R.O.G.S. submission states that:</p> <p><i>"We believe MTO's EA Study process and final EAR do not satisfy the requirements of the Act or your Ministry's Guidelines due to the proponent's failure to:</i></p> <ul style="list-style-type: none"> <li><i>- assess all reasonable alternatives at an appropriate (early) stage of the decision process</i></li> <li><i>- consult effectively with affected stakeholders</i></li> <li><i>- accurately document the decision-making process</i></li> <li><i>- properly prove the need and justification for this proposed undertaking".</i> <p>The FROGS comments have been structured into the above four areas of concern.</p> <p><b>Assessing Alternatives:</b></p> <ul style="list-style-type: none"> <li><i>"...in our view, MTO failed to properly assess all reasonable alternatives as required by the Act by:</i> <ul style="list-style-type: none"> <li><i>- restricting the available alternatives to those solely within MTO's mandate</i></li> <li><i>- refusing to expand the study area to include the Green Lane / Highway 9 corridor</i></li> <li><i>- considering the Green Lane corridor as a freeway only after significant, potentially irreversible decisions had been made".</i></li> </ul> </li> </ul> </li></ul>	<ul style="list-style-type: none"> <li>The MTO properly assessed all reasonable alternatives as part of the Bradford Bypass study. This is described extensively in Chapters 3 &amp; 4 of the EA report.</li> <li>The MTO can only seek approval for projects that fall under its mandate. However it was not possible for MTO to consider a solution to the transportation problem in isolation from the issues facing all other municipal jurisdictions in the area (Simcoe, York, Bradford West Gwillimbury, East Gwillimbury).</li> </ul>



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THE HIGHWAY 400 - FUTURE HIGHWAY 404 EXTENSION LINK, (BRADFORD BYPASS), ENVIRONMENTAL ASSESSMENT**

Name & Address	Comments	MTO Response
	<p>Consultation with affected stakeholders:</p> <ul style="list-style-type: none"> <li><i>"...it appears to us that MTO utilized consultation almost exclusively for the purpose of ensuring, wherever possible, that the EAR would stand up to all identified criticism".</i></li> </ul>	<ul style="list-style-type: none"> <li>In carrying out the Bradford Bypass EA study the MTO, in consultation with the municipalities in the area, considered the total needs and alternatives prior to identifying the preferred Provincial facility. It is of note that Provincial freeways will be used in some circumstances for local trips and local roads will be used by long distance trips to complete their journeys. The EA document provides an understanding of total traffic demands in the area (see Section 3.1.2.2). It also addresses what additional / alternative solutions are being considered by other jurisdictions (see Section 3.1.2.2). The MTO study encompassed an analysis area extending from Highway 407 in the south to Highway 89 / Ravenshoe Road in the north. As a result of the assessment, the Bradford Bypass corridor was selected over other corridors including the Highway 89 / Ravenshoe Road and the Green Lane / Highway 9 corridors.</li> <li>As the study progressed, and in response to public input, the MTO responded by carrying out a specific review of the Green Lane / Highway 9 corridor as an alternative to the Bradford Bypass corridor (the results are documented in Appendix B to the EAR). This review confirmed the Bradford Bypass corridor as being preferred for a freeway corridor with a 4 lane arterial corridor in the Green Lane / Highway 9 corridor. The 4 laning of the Green Lane / Highway 9 corridor was in fact the subject of an EA study by York Region which concluded with the recommendation to build a 4 lane arterial. This recommendation was then subjected to a bump-up request by FROGS to consider the Green Lane / Highway 9 corridor as an alternative to the Bradford Bypass - to be the only major corridor in the northern part of the Region. This bump-up request was denied by the Minister of the Environment.</li> <li>The MTO developed and carried out a consultation process which meets with the requirements of the EA Act and furthermore received endorsement of that process from stakeholders and the public at the outset during the first Public Information Centre in June 1993 (see Appendix C of the EAR).</li> </ul>

**JUNE 22, 1999 MTO RESPONSES TO COMMENTS RECEIVED BY THE MOE DURING THE PUBLIC REVIEW OF  
THE HIGHWAY 400 - FUTURE HIGHWAY 404 EXTENSION LINK, (BRADFORD BYPASS), ENVIRONMENTAL ASSESSMENT**

Name & Address	Comments	MTO Response
	<ul style="list-style-type: none"> <li><i>"We are disappointed to note that many of the responses provided to MTO have not found their way into the final EAR. We are also concerned that the summary of the comments contained in the final EAR may cause the reader to incorrectly assume that this project has more stakeholder support than it really does".</i></li> <li><i>"Other concerns of our association are with respect to information that was either not provided or alternatively withheld from the public at these PIC's. Information of this nature includes noise, flooding, salt damage, effect on private wells and the importance of Lot 118 to Canada's and our First Nation's heritage".</i></li> <li><i>"We would ask that these additional stakeholder comments be added to the Official File for this EAR" (ie 61 FROGS cards, letter from Mr. Penstone)</i></li> </ul> <p><b>Accurately document the decision-making process:</b></p> <ul style="list-style-type: none"> <li><i>"As we see it, MTO has failed to put forward a properly documented convincing case to support its decision to pursue a new freeway in the Bradford Bypass corridor. We believe the above noted series (see pgs 28 - 42 of their submission) of decisions have little if any correlation to the decision points reported by MTO in Exhibit 2-1 of the EAR. Further, we have seen no study documentation whatsoever to support MTO's proposal to stage this project by starting off with a two lane, at grade roadway".</i></li> </ul>	<ul style="list-style-type: none"> <li>All comments which were provided either in writing or verbally from government agencies, interest groups and the general public have been duly considered, responded to through correspondence, modifications to the design, clarifications and any means of proactively addressing the issues (see Section 2.2 of EAR). The original input is on file, however, for reasons of providing an EAR of manageable size, individual comment sheets are not included. Also, names and addresses have been withheld as indicated on comment sheets for confidentiality reasons. The summaries of input received represent the public reaction in a condensed format.</li> <li>Information was not withheld from the public at the PIC's. Information was summarized on panels for general review. In addition, specialist staff were on hand to address questions related to specific elements of concern such as those noted in the comment. This is a standard approach to public consultation.</li> <li>As stated in Appendix C of the EAR, Chapter 5, pg. 6, all FROGS comments have been duly recorded. Mr. Penstone's letter is also on record.</li> <li>The Bradford Bypass corridor has been selected based on significant and exhaustive consideration of all potential opportunities, as described in Section 3.5 of the EAR.</li> <li>Within that consideration was a comparative analysis of the Newmarket corridor, the Highway 9 / Green Lane corridor and the Bradford corridor, as described in Appendix B of the EAR. Support for the Bradford Bypass corridor was compiled from several levels of consideration - (i) the original Highway 89 Extension EA's (1979 and 1984), (ii) the Highway 404 / 89 Overview, (all of which identified a need for a new roadway corridor), (iii) the current study which featured the development of corridor alternatives for a new roadway (which resulted in a comparison of 5 corridors), (iv) the comparison of the highest ranked three corridors (as noted above) and (v) confirmation in the Green Lane ESR for the need in that corridor for only a four lane arterial</li> </ul>



**JUNE 22, 1999 MTO RESPONSES TO COMMENTS RECEIVED BY THE MOE DURING THE PUBLIC REVIEW OF  
THE HIGHWAY 400 - FUTURE HIGHWAY 404 EXTENSION LINK, (BRADFORD BYPASS), ENVIRONMENTAL ASSESSMENT**

Name & Address	Comments	MTO Response
	<p><b>Property prove the Need and Justification:</b></p> <ul style="list-style-type: none"> <li><i>"...in our view, MTO is (by making the policy decision that this road must be a controlled access freeway) no longer justified in seeking to solve local traffic congestion problems with this freeway. Accordingly, the only justifiable purpose of this freeway is to connect Highway 400 to Highway 404 to serve inter regional and inter urban travellers. This connection can effectively serve these needs if it is located anywhere between the Ravenshoe Road corridor to the north and Stouffville Sideroad to the south".</i></li> </ul>	<ul style="list-style-type: none"> <li>Section 3.1.2.2 of the EAR identifies a vehicle demand which will warrant a freeway facility. A freeway is also expected to provide improvements to fuel efficiency, reduced fuel emissions, improved road safety, and stronger economic links to supply and market for agriculture.</li> <li>An opportunity exists to implement the project in stages as stated in Section 5.3.2. Any decision regarding implementation timing, sequence or staging will be subject to future internal MTO analysis and does not affect the scope or rationale for seeking approval for the full project under the EA Act.</li> <li>The Ministry of Transportation has, as one of its mandates, to provide for the safe, efficient movement of people and goods between regions and between urban areas. Since the mid - 1970's and escalating in recent years, MTO have been urged to address the unresolved transportation problems in the area south of Lake Simcoe (see Section 3.1.2.1 of the EAR).</li> <li>There have been several travel demand studies carried out over the same 20 + year period and it was again thoroughly examined in the EA study (see Section 3.1.2.2 of the EAR). The results of that analysis reaffirmed that without the Bradford Bypass the east-west summer demand east of Highway 400 would exceed capacity by 2021 and that the average daily traffic would reach capacity a few years later. This shortfall is expected to be alleviated by several municipal road and existing highway upgrades as well as a controlled-access freeway which complements the Province's "cellular" highway framework, as described in Section 3.1.2.5 of the EAR.</li> <li>The Recommended route not only provides for trips between Highway 400 and Highway 404 but also provides intermediate access points at 3 major crossing roads to accommodate local travel needs.</li> </ul>



Ministry of  
Transportation

Ministère des  
Transports

Planning & Environmental Office  
Central Region  
3rd Floor, Building 'D'  
1201 Wilson Avenue  
Downsview, Ontario  
M3M 1J8  
Tel: (416) 235-5485  
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Planning & Environmental Office  
2nd Floor  
301 St. Paul Street  
St. Catharines, Ontario  
L2R 7R4  
Tel: (905) 704-2177  
Fax: (905) 704-2044

RECEIVED

MAR 09 2000

MINISTRY OF THE ENVIRONMENT  
ENVIRONMENTAL ASSESSMENT & APPROVALS BRANCH

Date: March 7, 2000

[REDACTED]  
Town of Bradford West Gwillimbury  
P.O. Box 160  
Bradford, Ontario  
L3Z 2A8

Dear [REDACTED]

Re: Proposed "Hwy 400 - Hwy 404 Extension Link", (Bradford Bypass) - Simcoe Road 4 Interchange

Thank you for your letter of February 2, 2000 forwarding a reconfiguration of the above interchange proposed by the Town's Planning Consultant, "J. Ross Raymond & Associates", (attached).

It appears that this is the same reconfiguration requested by the Town of Bradford West Gwillimbury in [REDACTED] December 16, 1998 letter to the Ministry of the Environment, (in response to an MOE 60-day public review).

[REDACTED] letter to MOE requests that:

- The "Cloverleaf" at County Road 4, *"be constructed in such a way that service roads can be integrated with the ramps and use the same signalized intersections"*, to provide needed access for future urban land use east and west of County Road 4 and avoid increased industrial and commercial traffic flow through residential street.

(It should be noted that the interchange at County Road 4 is not a "Cloverleaf" configuration. "Cloverleaf" designs are normally avoided. Other configurations such as the Parclo A-4 being proposed will provide better operational qualities and characteristics, at lower property and construction costs.)

As requested in your letter, the Ministry's planning consultant, "McCormick Rankin Corporation" and ministry staff reviewed the suggested change. It is the position of the project team that the proposed reconfiguration cannot be supported. It is not a question of the details of its design. It is the basic configuration itself. The Bradford Bypass has been planned to provide a high standard of operational quality and safety to its users. Reduction of safety standards on a newly planned freeway in an area where existing development or land features do not control or constrain design cannot be justified.



To clearly identify and explain the problems associated with the reconfiguration of the interchange proposed by your consultant I have attached technical assessment memorandums provided by the Ministry's Central Region Traffic Management Office and the Ministry's consultant, "McCormick Rankin".

Your letter also indicates that the design your consultant has suggested is "... *virtually identical to the Victoria Avenue (Niagara Road 24) - Queen Elizabeth Way interchange which was recently reconstructed by your Ministry....*".

The attached memo from [REDACTED] of McCormick Rankin identifies several technical inaccuracies with this observation that should be noted. However, simply stated, the history of the QEW and the rationale for the design of the Victoria Avenue interchange do not present a precedent that justifies a similar design on the Bradford Bypass, (or any other new freeway). It is in fact probably more appropriate to conclude from the attached history of the QEW at Victoria Avenue that to not protect for a Parclo A-4 interchange at Simcoe Road 4, from the outset, would be poor planning.

A separate issue involving this interchange was brought to the Ministry's attention in October of 1999. Property owners and their consultants in the vicinity of the proposed Bradford Bypass/Simcoe Road 4 interchange contacted Ministry staff to question the feasibility of a new direct access to Simcoe Road 4 between the 8<sup>th</sup> Line and the Bypass. They were advised at that time that the Bradford Bypass study did not identify the need for any new direct access at this location and based on the recommended plan an access at this location for an additional signalised intersection would conflict with the construction and operation of the interchange. However, the Ministry's project team had not been advised that the Town's July 1998 draft Official Plan had been revised in June of 1999 to include a new service road parallel to and south of the proposed Bradford Bypass.

As a result of these private sector inquiries, the Ministry has since had several discussions with both you and the Town's planning consultant [REDACTED]. During these recent discussions several other modifications to the interchange were suggested to MTO. These included:

1. a northerly realignment of the Bypass;
2. a direct connection of the proposed arterial road to the interchange off ramp, (from the west to N/S Simcoe Road 4 ramp); and,
3. a right in - right out access to the west side of Simcoe Road 4;

The rationale for the recommended alignment, rather than further north, is provided in the MTO Bradford Bypass Environmental Assessment Submission currently being reviewed by Ministry of the Environment under the formal requirements of the EA Act.

With regard to the second suggestion the attached memorandum from the Ministry's Traffic Management Office provides in detail technical reasons why this direct connection to a freeway ramp is unsafe and unacceptable.

The acceptability of a right in - right out arterial road access is uncertain. A traffic impact assessment would be required, for review by the Ministry, to determine if there are potential unacceptable adverse effects on the operation and safety of the road network. Please be advised that the section of Simcoe Road 4 south of the interchange and north of the 8<sup>th</sup> Line, where a right in - right out access might be considered, is a County of Simcoe road. Therefore, prior to any further discussions of this option with MTO, the Town must consult with the County of Simcoe and obtain their formal position regarding this suggestion.

There was a finding during the Ministry's review of these requests for interchange modifications that the Town should be aware of. In both the July 1998 version and the June 1999 version of the draft OP the Bradford Bypass is incorrectly aligned on "Schedule F-2 TRANSPORTION", (it is too far north of the 8<sup>th</sup> Line). In addition, the configuration of the interchange is incorrectly represented, (ramps are either of the wrong configuration or missing), the median appears to be shown as 100 m wide rather than 15-22 m and the basic minimum right-of-way requirements for the facility are not shown. In August 1997, the Ministry's consultant forwarded to the Town's consultant, [REDACTED], 1:10,000 scale plans as well as the CADD drawings of the Recommended Plan for the Bradford Bypass. These plans are still accurate and should be referred to.

In conclusion, the Town's December 16, 1998 letter to the MOE states that:

- "...the conclusion reached after consultation with our affected citizens is that the location of the Technically Preferred Route for this new facility is satisfactory....", and
- The letter asks MOE if negotiations on the Town's requests can occur during the EA review process otherwise; "Council will opt for a mediation process after Notice of Completion of Review is published in an attempt to avoid requesting a hearing".

MOE is presently preparing its "Review" of the Bradford Bypass EA submission. Their Review document will include the comments received during the initial review period and the MTO response to each. MOE will then publish a "Notice of Completion of Review" which will initiate a second public review period.

In light of our recent discussions and in response to the information provided by the Ministry to the Town in this letter, your update of Town's position regarding the Ministry's Recommended Plan for the Bradford Bypass will be greatly appreciated. Please recognize that changes, such as those presently being requested by the Town, if pursued, would be subject to their own environmental assessment and public/agency consultation requirements. Therefore, if it is possible to bring all or any of the Town's outstanding comments or concerns to conclusion, the Ministry of the Environment should be advised.

Thank you in advance for your time taken to assist us in addressing and hopefully resolving these outstanding matters. Should you require any further information at this time, please call.

Sincerely,

[REDACTED]  
[REDACTED]  
[REDACTED]  
Planning & Environmental Office  
MTO, Central Region

Attachments: History of QEW/Victoria Ave. Interchange;  
MRC Memorandum Feb.10, 2000;  
Traffic Management Office Memorandum, Feb. 22, 2000;  
Town of Bradford West Gwillimbury Letter, Feb. 2, 2000.



Cc:



### THE QEW/VICTORIA AVE INTERCHANGE

The following is provided in response to the Town of Bradford West Gwillimbury's observation, in support of its request for a reconfiguration of the proposed Bradford Bypass/Simcoe Road 4 interchange, that: "...The design is virtually identical to the Victoria Avenue (Niagara Road 24) - Queen Elizabeth Way interchange..."

The Queen Elizabeth Way has a unique history, which sets it apart from other similar freeway facilities in Ontario. The QEW as we know it today can be traced back to two major transportation initiatives in the early part of the 20<sup>th</sup> century. A 1916 Toronto-Hamilton Highway Commission recommendation led to the 1931 construction of a section, referred to as The Middle Road, from Hwy 27 in Etobicoke to Hwy 10 in Port Credit as a labour relief program during the depression.

In 1934, following a change of government, the original concept was changed to a four lane divided highway to improve safety. In the early 1930's a similar project was being planned for the Hamilton to United States corridor. Shortly after 1934 a decision was made to link the Middle Road and the New Niagara Highways together to form a single high-speed facility between Toronto and New York State. This change, combined with the cross section revision, established the conceptual design of the QEW. The section of the "New Niagara Highway" from Hamilton to St. Catharines was completed in 1939. (The Middle Road and New Niagara Highway was renamed the Queen Elizabeth Way in early 1939 in anticipation of the Royal Visit. The remaining sections of the QEW were completed in stages due to wartime restrictions related to the Second World War.)

Like other contemporary highways of the time, the QEW was, for the most part, constructed along existing concession roads. As a result this section of QEW did not initially have access restrictions, although permits were required. While the QEW was regarded as a model superhighway in the 1940's, the dramatic increase in traffic following the Second World War, coupled with an escalating accident rate necessitated a review of access controls for the highway. This led to the decision to fully control access to QEW. New interchanges and service roads were required to provide access to and from the adjacent properties.

In 1966 the Victoria Avenue interchange was under construction. At the same time a Functional Planning Report was being prepared that recommended replacing the existing design with a Parclo A-4 configuration, (the same configuration proposed by the Ministry at the Bradford Bypass/Simcoe Road 4 interchange). This design was in fact protected for through corridor control/land management until the early 1980's.

In 1992 a QEW preliminary design study reconfirmed that a Parclo A-4 interchange at this location is the configuration that would provide the best operational characteristics of the alternatives under consideration. However, it was also determined that recent development in the vicinity of the Victoria Avenue interchange, following the relaxation of corridor controls by the Ministry in the early 1980's, had created difficulties with respect to the original concept of a Parclo A-4 interchange. Replacement of the existing interchange with a Parclo A-4 interchange would now have significant property impacts that would adversely affect operating farms and existing commercial establishments. As a result, the modification of the existing configuration that includes new buttonhook ramps in the southeast quadrant was selected instead.

In conclusion, 34 years ago planners of the Victoria Avenue/QEW interchange recognized that the Parclo A-4 interchange configuration was required at this location, however, the opportunity was not protected for. Planners of the Bradford Bypass have determined that a Parclo A-4 interchange configuration is required at the Bradford Bypass/Simcoe Road 4 interchange. This configuration will be protected for as part of the Recommended Plan for the Bradford Bypass which has been submitted to the Ministry of the Environment for formal review and approval under the requirements of the Environmental Assessment Act.





## Town of Bradford West Gwillimbury

P.O. Box 160, Bradford, Ontario L3Z 2A8

Administration Centre: 3541 Line 11 at Hwy. 400 • Tel. (905) 775-5366 • Fax (905) 775-0153

February 2, 2000

**FAXED (416-235-4940; 2 pages)  
AND MAILED**

Ministry of Transportation  
Central Region Planning & Environmental Office  
1201 Wilson Avenue  
Atrium Tower, 3<sup>rd</sup> Floor  
Downsview, ON M3M 1J8

Attn: [REDACTED]



Dear [REDACTED]:

Re: Bradford Bypass - County Road 4 Interchange  
Town of Bradford West Gwillimbury

Further to our telephone conversation on January 27, 2000, I enclose a proposed redesign for the Bradford Bypass - County Road 4 interchange. The sketch shows an alternative location for the eastbound on and off ramps at County Road 4. It also provides for the service road concept that is identified in the draft Official Plan.

The design is virtually identical to the Victoria Avenue (Niagara Road 24) - Queen Elizabeth Way interchange which was recently reconstructed by your Ministry.

Would you please review the proposal and forward your comments to the Planning Department. Should you or your consultants have any questions, please do not hesitate to call. If you would like to speak directly with the Town's Planning Consultant, [REDACTED] he can be reached in Gravenhurst at [REDACTED].

Yours very truly,

[REDACTED]

EHH/mm

Encl.

cc: [REDACTED]



PROPOSED  
SERVICE ROAD

TECHNICALLY PREFERRED ALIGNMENT  
NOVEMBER 8, 1999  
PLANS SUBJECT TO PUBLIC REVIEW.  
ALIGNMENT MAY UNDERGO MODIFICATIONS.  
RESULT, ALL INFORMATION SHOWN ON  
PLAN SHOULD BE TREATED ACCORDINGLY.

800 LINE

ARTIE

WEST

18+000

RIVER

DIVISION

BRADFORD

DISSETTE STREET

ALTERNATIVE LOCATION  
FOR THE EASTBOUND "ON"  
AND "OFF" RAMP AT  
THE PROPOSED  
HWY 400/404 LINK AND  
C.R. 4 INTERCHANGE

0 km SCALE 0.5 km



# MEMO

TO:

FROM:

DATE: February 10, 2000

COPIES: 2

OUR FILE: W.O. 2341-200

SUBJECT: Bradford Bypass EA – Simcoe Road 4

2341-200 - 000 - (1) Work Order E012341-Bradford Bypass EA\2341.700\2341.703 Property Issues\fa memo feb 9.doc

In response to your request to review the "proposed redesign for the Bradford Bypass – County Road 4 interchange" as provided recently by the Town of Bradford West Gwillimbury, we have examined the sketch provided and have the following comments.

## QEW Interchange Used for Comparison

The Town's inference that the sketched configuration is "virtually identical" to the recently reconstructed interchange of QEW and Victoria Avenue (Regional Road 24 in the Region of Niagara) is not truly correct. McCormick Rankin prepared the ESR for Casablanca Boulevard to Victoria Avenue for TREC and so have some knowledge of the interchange.

That interchange in Niagara (image of the configuration is attached), was until recently, a diamond configuration for the eastbound direction. It also featured integration with a service road alongside the QEW that had a grade separated crossing at Victoria Avenue. The new interchange included the realignment of the service road and ramps that no longer connect to Victoria Avenue but rather, connect to the service road. This configuration is very similar to the configuration of the westbound ramps.

The ramps at the interchange have been located on the east side of the crossing road most likely to minimize property impacts. This aspect considered, ramps were located on the opposite side of Victoria Avenue where there were less constraints. Since a service road already existed, the typical Parcel A or B would not fit into the constrained lands available and a significantly different configuration was required. The configuration used for the westbound ramps was likely taken to be acceptable in this situation.

It is important to note that this interchange does not serve a major urban node nor will operational capacity likely be a concern.

## **Bradford Bypass Interchange**

The interchange configuration at Simcoe Road 4 for the eastbound ramps as provided by the Town features a Parclo 'B' exit ramp with an approximate radius of 100m. While the radius of the ramp is adequate, this is not a desirable configuration given that the approach to the circular ramp would be along a 3% down grade. In these cases deceleration is more difficult on a slippery road surface and aggressive driving can lead to loss of vehicle control.

Whereas the ramps of the Niagara interchange intersected with a service road accessing two directions, this ramp arrangement would feed directly to and from Simcoe Road 4 and the adjoining service road to the west. This access arrangement is in part since there is no proposal to extend the service road easterly from Simcoe Road 4. The intersection of the ramps and service road at Simcoe Road 4 would likely require installation of traffic signals. The spacing of traffic signals for the interchange and those at 8<sup>th</sup> Line would be approximately 250m. TAC standards which apply to arterials, indicate that an arterial road with an interchange terminal requires a minimum spacing of 200m to a collector and 400m to an arterial roadway from the ramp terminal intersection. Given that 8<sup>th</sup> Line operates locally as an arterial, the spacing of 250m is substantially inadequate.

This arrangement would also lack in operational capacity as compared to the recommended configuration. With the MTO configuration, the heavy S-E move is accommodated with a direct ramp. The move is replaced in the Town scheme with at best, a channelized right turn with a yield condition. Similarly, the N-E loop ramp that provided easy access to the freeway would be replaced by a signalised left turn with the Town scheme. This is again a reduction in service levels over what is recommended.

In addition to the above, the Town's scheme shifts much of the property requirement to the east side property, thereby transferring impacts from those already identified in the EAR. It is understood that the east side property is to be retained as open lands / conservation area in the draft OP and so this proposal may conflict with this intent.

## **DISCUSSION**

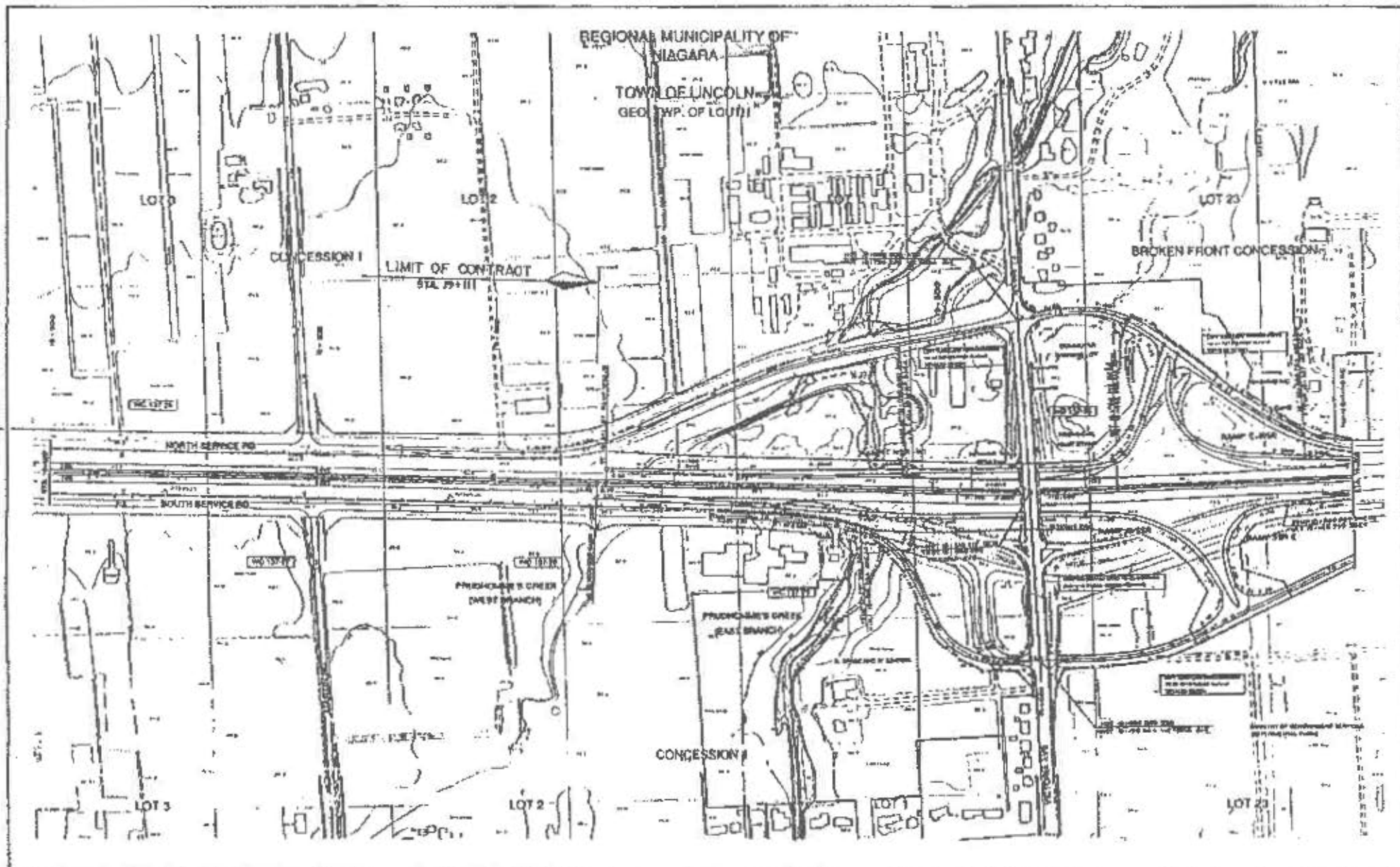
The Town has indicated that as a result of introducing a unique type of interchange in Niagara recently, MTO should be willing to also introduce a similar interchange along the Bradford Bypass.

The interchange capacity becomes one overriding factor in comparing the two. In the context of the Niagara interchange, there is no major node of development nearby and so long as sufficient access is provided there and the environs are protected, the interchange will be adequate. Capacity is not an issue. This is not the case for the Bradford Bypass at Simcoe Road 4. In that location, the intended interchange is the only one between Highway 400 and Highway 404 Extension. It directly serves Bradford and the growing rural communities in Bradford West Gwillimbury. In this case, operational capacity is critical and must be protected. It has been shown through technical comparisons and experience that the recommended Parclo 'A4' is best for this situation.



The other overriding factor is that of intersection spacing. There is not enough space between the Town's interchange terminal along Simcoe Road 4 and the intersection at 8<sup>th</sup> Line. This is a problem that would result in operational and road safety implications.

In summary, the proposal presented by the Town of Bradford West Gwillimbury is not appropriate to the location along Simcoe Road 4 and cannot be compared with the QEW interchange at Victoria Street in Niagara since the context of that interchange selection was very different to that of the Bradford Bypass.



SCALE  
40m 50m  
METRES



# LEGEND

- LOCATION OF ANALYSED NOISE RECEPTOR
- LOCATION NUMBER OF ANALYSED NOISE RECEPTOR

QUEEN ELIZABETH WAY  
CASABLANCA BOULEVARD TO VICTORIA AVENUE  
QWP 340-82-00

EXHIBIT

C-11



# MEMORANDUM

---

To: [REDACTED] Date: February 22, 2000  
Highway Planning and Environmental Office  
3<sup>rd</sup> Floor, Building 'D'

From: Central Region - East  
Traffic Management Office  
6th Floor, Building 'D', [REDACTED]

Re: W.P. 377-90-00 Hwy. 400 – Hwy. 404 Extension Link 'Bradford Bypass'  
Town of Bradford Proposal Redesign of County Road 4 Interchange

---

I have reviewed the Town of Bradford's redesign proposals for the Bradford Bypass and County Road 4 (formerly Yonge Street) interchange. The following analysis of each of the two proposals was based on the impacts to traffic operations and traffic safety. Recommendations as to the acceptability of the proposals are included.

## Proposal One:

Proposal One replaces the Ministry's preferred Parclo A-4 interchange design with a modified Parclo B design, in order to afford access to and from a newly proposed Service Road that intersects County Road 4 from the west. The Town's submission proposes that the redesigned w-n/s and n/s-e ramps join to form the east leg, and the proposed Service Road forms the west leg of a cross intersection south of the Bradford Bypass, at County Road 4.

The redesign has at least six major negative effects that the Ministry's design does not have:

1. Reduces intersection capacity by removing direct access to the Bypass. Introduces a left turn for the n-e move, and a stop or yield condition for the s-e move. The 2011 peak hour turning volume for the n-e move is projected to be 530 vehicles for the a.m. peak. Signals would be required. A cursory intersection and signal timing analysis was conducted using Canadian Capacity Guide software, and projected volume assumptions that are thought to be conservative. The intersection, under the proposed design, would need a minimum of fully protected southbound dual left turn lanes, at least 375m in length to accommodate this move.

Even with no pedestrians included in the timing, and 70% of the green time allocated to the n/s phase, there is an 85% chance of discharge overload for the n-e left turn during the a.m. peak. The overall intersection operates with a degree of saturation of 1.7, which is not acceptable when a degree of saturation of 1.0 is considered to be at capacity. In terms of scope, it is likely that County Road 4 need to be widened to accommodate five southbound lanes (2L, 2T,R) and four northbound lanes (L,2T,R), plus widening to accommodate median islands and to afford appropriate turning radii for representative trucks.

2. Signalization of County Road 4 and the Bypass ramp terminal in its current location only allows a distance of 250 meters to the intersection of County Road 4 and the 8<sup>th</sup> Line. A distance of 400 meters between intersections is required (TAC). Should the County Road 4 and Bypass intersection break down under the assumed signalized conditions, queuing through to the intersection of 8<sup>th</sup> Line is possible, and is an operational and safety concern;
3. The throat and curve of the east oriented ramp is shared by n-e and s-e traffic, introducing conflict points previously avoided. Increases potential for sideswipe collisions between north to east and south to east vehicles merging at the throat of the ramp. Introduces potential for turning movement collisions under the altered (assuming signalized) design that direct access ramps would avoid.
4. The w-n/s ramp appears to have no separation from the n/s-e ramp. As proposed, the increased potential for head-on collisions exists and is exacerbated by centrifugal forces acting upon w-n/s exiting vehicles, returning a high probability of these vehicles being directed into the path of n-e and s-e vehicles sharing this ramp. Should a physical barrier be introduced to separate the moves, a roadside hazard is introduced. Neither of these conditions exists under the Ministry's proposed design alternative. The proposed is significantly less safe, and has higher associated collision (societal) costs.
5. The Parclo B exit ramp has an exit curve radii of approximately 100m, and although the proposed radius exceeds the minimum standards of 80m for the type, the radius is still less than the Ministry's proposed design. Further the Parclo B type exit ramp has a loop configuration, which does not afford as gradual deceleration opportunity as do Parclo 'A' ramps. The sudden introduction of a curve in such a design often surprises drivers and typically these types of exit ramps have higher rates of collisions, and;



6. The proposed exit ramp is on a 3% downgrade. Exit ramps on downgrades are not conducive to gradual slowing of a vehicle, as the vehicle exiting from high freeway operating speeds will continue to be propelled by the vehicles' momentum, requiring more reliance on mechanical braking systems rather than a natural slowing on an upgrade, such as the Ministry's design provides for. In addition, these forces are exacerbated in poor weather and road surface conditions.

In addition to the negative safety and operational impacts the redesign has, the overall appropriateness of this design is questioned for other reasons. The modified Parclo B redesign, where the ramps are shifted to the east side of the interchange, is a design one might expect to see when constrained by substantial controls such as natural dividing features like watercourses, or when limited by major property or environmental constraints. The Construction of the Bradford Bypass, at this particular location, is not subject to such constraints and in fact, the redesign encroaches on an area previously identified in the EA to be retained as open land/conservation area.

As identified in the Planning Study, a Parclo A-4 interchange was selected at County Road 4, as it is "a major arterial road serving the county and is an integral part of the Bradford road network. Traffic demand will be high given the growth expectations for the Bradford community, both residential and commercial/industrial".

The Parclo A-4 interchange is one having high capacity, capable of transitioning high speed freeway traffic to arterials at a natural rate, eliminates weaving and overall has few conflict points due to its direct design. The Bradford Bypass, is able to be designed to 140km/h design speeds, and thus the geometrics of the ramps, and in particular the ramp loop radii, meet and exceed Ministry design standards for four-lane, divided rural freeways.

The Traffic Management Office finds Proposal One unacceptable. The modified Parclo B design returns reduced capacity, ramp geometrics, and overall is less safe and efficient than the Ministry's Parclo A-4 preferred design alternative.

#### Proposal Two:

Proposal Two retains a Parclo A-4 interchange design, but introduces a 'T' intersection of a newly proposed Service Road on the west side of the w-n/s ramp. The throat of the w-n/s ramp is widened to allow east and west movements from the intersection of the ramp with County Road 4, westerly down the ramp to the point of the 'T' intersection with the Service Road.

The introduction of a 'T' intersection onto a high volume, high speed exit ramp violates driver expectation, and is detrimental to the safe and efficient operation of this w-n/s ramp.

Presumably the ramp traffic would have the ROW, and the Service Road traffic would be controlled by a "Stop" regulation while exiting, and left turns from the proposed bi-directional ramp (to the point of the 'T' intersection), are from a yield condition. This introduces increased probability of the following collision types not associated with the Ministry's design:

- 1) Rear end collisions with thru (e-n/s) ramp traffic and right turning service road traffic;
- 2) Angle collision potential of left turning vehicles onto Service Road from proposed bi-directional throat with thru ramp traffic;
- 3) Potential for vehicles to become confused at the service road, turning left and entering the w/n-s ramp travelling the wrong way. Increased head-on collision on the ramp, or worse, by permitting bi-directional from the throat of the ramp to the Service Road, increases probability for a vehicle to continue down the ramp the wrong way and onto the Bypass. Head-on collisions have greater probability of occurring due to higher volumes on the Bypass and would have high severity implications due to increased speeds, and;
- 4) Increased potential for loss of control collisions for thru ramp traffic, attempting to avoid any of the above conditions.

The proposed redesign is associated with increased collision potential, of a more varied and severe a nature, and having higher associated collision (societal costs) by introducing conflicts not found in the Ministry's proposed design. This proposal is detrimental to traffic safety operations. The Traffic Management Office finds Proposal Two unsafe and unacceptable.

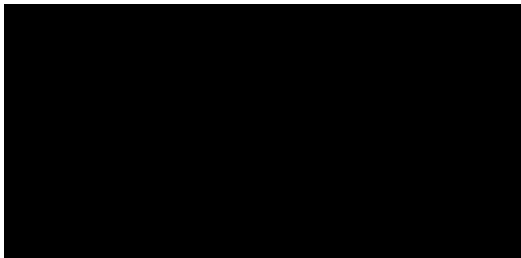


The Ministry has adopted many of the design and safety recommendations put forth by the Highway 407 Safety Review Committee. Accordingly, our position is reflected in one excerpt from that review.

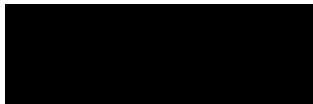
"A well-designed road will provide the intended level of service, at an acceptable cost, with an acceptable level of safety. It will also reflect local values and policy, which will vary from location to location. If it has been designed with care and sound judgement, it will place appropriate importance on safety, cost, service, environmental values and appearance"(pp 18)

The Ministry of Transportation has the opportunity to carry forward a good design, that meets or exceeds standards, thus providing a level of safety and efficiency that best serves the majority of users. Therefore, accepting anything other than this, namely accepting either one of the Town's proposals is contrary to good professional practise and fails to meet these obligations to our clients, the travelling public.

The Traffic Management Office cannot support either of the redesign proposals, based on the information provided.

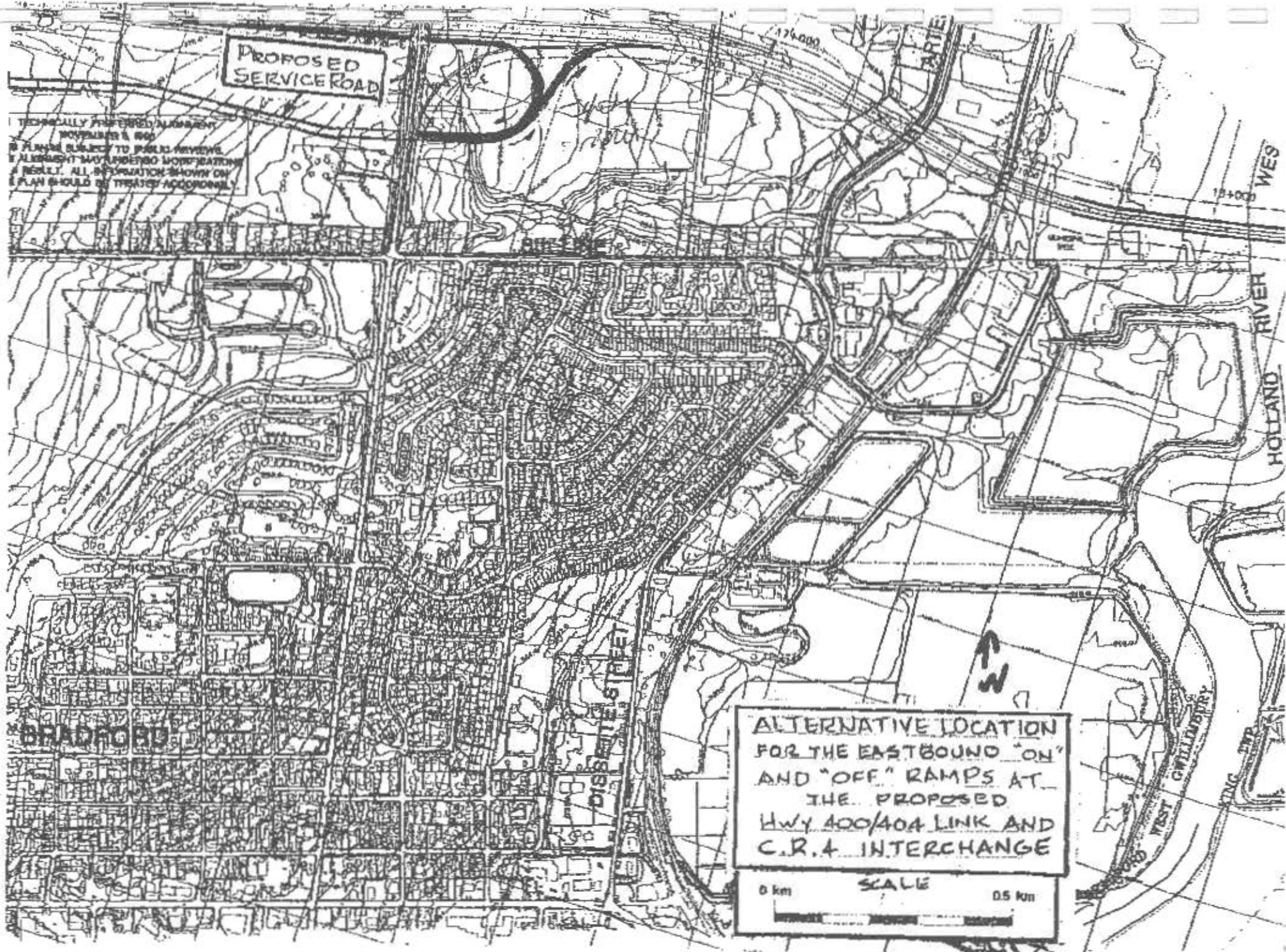


c.c



Attachments (2)





PROPOSED  
SERVICE ROAD

TECHNICALLY PREFERRED ALIGNMENT  
IS SUBJECT TO PUBLIC REVIEW  
ALIGNMENT MAY UNDERGO MODIFICATIONS  
AS A RESULT. ALL INFORMATION SHOWN ON  
THIS PLAN SHOULD BE TREATED ACCORDINGLY.

BRADFORD

DISSAULT STREET

HOLLAND RIVER  
WEST

ALTERNATIVE LOCATION  
FOR THE EASTBOUND "ON"  
AND "OFF" RAMPs AT  
THE PROPOSED  
HWY 400/404 LINK AND  
C.R.4 INTERCHANGE

0 km SCALE 0.5 km

'PROPOSED ONIE'



**PROPOSAL 7400**

CARBEE HOLDINGS LTD.  
ESSENTIAL DEVELOPMENT LTD.  
FRAMBEE HOLDINGS LTD.  
JOVIC DEVELOPMENT LTD.  
MICHALEE HOLDINGS LTD.

**HIGHWAY 77**

**TECHNICALLY PREFERRED ALIGNMENT**  
**NOVEMBER 5, 1998**  
THIS PLAN IS SUBJECT TO PUBLIC REVIEWS.  
THE ALIGNMENT MAY UNDERGO MODIFICATIONS  
AS A RESULT, ALL INFORMATION SHOWN ON  
THE PLAN SHOULD BE TREATED ACCORDINGLY.

CHARTER CONSTRUCTION LTD.  
PATRICIAN HOMES LTD.  
THREE SEASONS HOMES LTD.

CARBEE HOLDINGS LTD.  
ESSENTIAL DEVELOPMENT LTD.  
FRAMBEE HOLDINGS LTD.  
JOVIC DEVELOPMENT LTD.  
MICHALEE HOLDINGS LTD.

**8th LINE**

## Appendix D

### Ministry of Transportation's Noise Assessment and Air Quality Impact Assessment



Planning & Environmental Office  
Central Region  
3rd Floor, Airlam Tower  
1201 Wilson Avenue  
Downsview, Ontario  
M3M 1J8

Tel: (416) 235-5485  
Fax: (416) 235-4940

[REDACTED]  
Ministry of the Environment  
Environmental Assessment & Approvals Branch  
2 St. Clair Avenue West, Floor 12 A  
Toronto, Ontario  
M4V 1L5

February 14, 2001

Dear [REDACTED]

Re: MTO ENVIRONMENTAL ASSESSMENT SUBMISSIONS, DECEMBER 1997, EA FILE NO.  
TCCEO2: "Hwy 400 - Hwy 400 Extension Link" - (Bradford Bypass) and "Hwy 404  
Extension", Davis Drive (York Regional Road 31) to Hwy 12.

As requested the Ministry has reviewed the comments that you received from the following agencies regarding the above environmental assessments

- Fisheries and Oceans Canada, September 13, 2000 and October 13, 2000 regarding navigable waters;
- Fisheries and Oceans Canada, October 3, 2000 regarding fisheries;
- Health Canada, December 18, 2000 regarding noise assessment;
- Health Canada, December, 1, 2000 regarding air quality assessment;
- Ontario Ministry of the Environment, November 9, 2000 regarding air quality assessment.

Navigable water:

The identified design stage requirements are acknowledged.

Fisheries:

The identified design stage requirements are acknowledged.

Air Quality:

Individual responses, prepared by [REDACTED] MTO Environmental Systems Specialist, to the Health Canada and the MOE air quality comments are attached, (attachments dated January 8, 2001).

Noise Assessment:

A response, prepared by [REDACTED], MTO Senior Environmental Planner - Acoustics, to the Health Canada noise assessment comments is attached, (memo dated February 7, 2001).

Please advise if you require any further clarification or assistance to complete your review of the Environmental Assessments for these two projects.

[REDACTED]  
Central Region, MTO

# Memorandum

To:

From:

Date: February 7, 2001

Subject: Health Canada Noise Comments for Highway 404 and Bradford Bypass  
E.A.'s

Following are my comments on the questions raised by Health Canada in their letter of December 18<sup>th</sup>, 2000, to Ms Solange Desautels from the Ministry of the Environment.

## Use of $L_{Aeq24H}$

The Ministry of Transportation uses an average 24-hour sound level for freeways to estimate impacts because we find that the traffic data is most accurate for that time period.

Typically, on freeways, such as Highway 404, there is a slight reduction in traffic volumes at night when compared to the average daily volumes. This would result in approximately a one decibel increase in the 18 hour day time sound levels and a five decibel reduction in the 8 hour night time levels. The difficulty in doing this correction is that often the percentage of heavy trucks is significantly higher at night reducing the day/night difference to less than 3 decibels. Given the difficulty in accurately predicting highly detailed future hourly road traffic volumes, including the hourly percentages of commercial vehicles, the Ministry prefers to use an average daily sound level for the assessment of future highway noise impacts. The Ontario Ministry of the Environment supports this approach.

## Evaluation of Outdoor Noise for Environmental Assessments

In Ontario, legal requirements for noise protection are outlined very broadly in the provisions of both the "*Environmental Protection Act*" and the "*Environmental Assessment Act*". However, the requirements outlined in both of these pieces of legislation are not detailed enough to provide specific direction. Because of this, Ontario government policy was developed to further define the legislation as it applies to different situations.



A Guideline<sup>1</sup> was created to guide the development of residences adjacent to freeways. It recognizes that a developer has the ability to setback and site buildings in a way to minimize noise impacts. In addition, buildings can be constructed to lessen indoor noise levels and noise barriers can be constructed to reduce noise level for both outdoor and indoor areas. During the development of the Guideline it was recognized that a developer has no control over the generation of noise from highways. Ministry of Transportation (and Communications) and Ministry of the Environment developed a Noise Protocol<sup>2</sup> to control the generation of noise from the construction and operation of highways. The Ministry has the ability to minimize noise impacts through location of the highway, use of "quiet" pavement types, traffic control, and construction of noise barriers. During the development of the Protocol, it was recognized that the Ministry has limited control over adjacent development and the design of new homes.

The Ministry is not required under any Provincial Policy or Legislation to assess indoor noise and therefore only assess the noise levels at the ground floor level for outdoor recreational areas for residences.

Following discussions with [REDACTED] from Health Canada it was agreed to provide estimates of indoor sound levels by subtracting 10 decibels from the outdoor sound level tables in the E.A.'s to estimate the indoor sound levels at night.

### Attenuation by Rows of Trees

The Ministry of Transportation currently uses a correction factor, where the average height of the trees extends at least 5 metres above the line-of-sight between the receiver and the source, an attenuation of 5 dBA is provided by each 30 metres depth of trees. The maximum attenuation assumed for dense woods is 10 dBA. This is the recommended correction in the FHWA Model<sup>3</sup> that was in place in 1997 when the EA's were prepared.

The current information from ISO 1996<sup>4</sup> has a correction factor considerably less than that. They suggest that the adjustment should be as follows:

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1 "Guideline on noise and new residential development adjacent to freeways", Ministry of Housing, April 1979.

2 "A Protocol for Dealing with Noise Concerns During the Preparation, Review and Evaluation of Provincial Highways Environmental Assessments". February 1986

3 Barry, T.M., and Reagan, J.A., "FHWA Highway Noise Prediction Model, Report No. FHWA-RD-77-108", U.S. Federal Highway Administration, Office of Research, Washington, D.C., December 1978.

4 "Acoustics - Attenuation of Sound During Propagation Outdoors - Part 2", International Organization for Standardization, ISO/DIS 9612-2:1996. Geneva, Switzerland: International Organization for Standardization, 1996.

Distance	Correction in dB
< 10 m	0.00
10 to 20 m	1.00
20 to 200 m	.05 dB per m
Maximum	10.00 dB

The Ministry will use a new adjustment factor to account for the extra attenuation caused by vegetation when we do the detailed noise study associated with the detail design phase of the projects. Since the level of design information that is available at this time is very preliminary, there would not be a great improvement in the accuracy of the noise predictions to readjust the sound level calculations that have been done to date. The new predicted sound levels will be available as part of the public consultation process at the future design phase.

### Pavement Type

Table 1 outlines the difference between the three types of pavements that are used by the ministry.

Table 1  
Sound Level Differences in dBA at 100 km/h  
25% Medium Trucks/75% Heavy Trucks

% Comm.	Average	OFC	PCC	DGAC	Difference Between OFC and:	
					PCC	DGAC
30%	0.0	-1.8	1.2	-0.6	3.0	1.2
25%	0.0	-1.8	1.3	-0.6	3.1	1.2
20%	0.0	-1.8	1.4	-0.6	3.3	1.2
15%	0.0	-1.9	1.5	-0.6	3.4	1.3
10%	0.0	-1.9	1.7	-0.6	3.7	1.3
5%	0.0	-2.0	2.0	-0.6	4.0	1.4
0%	0.0	-2.2	2.4	-0.7	4.6	1.6

Explanation of Section Headings	
Average	Average of all three types of pavements
OFC	Open Graded Asphaltic Concrete
PCC	Portland Cement Concrete
DGAC	Dense Graded Asphaltic Concrete

The Ministry has not made a decision as to what pavement is being used. The MTO used the average type of pavement in both E.A.'s. Both types of asphalt pavement are quieter than the one used in the noise evaluation. If MTO uses PCC pavement it will be approximately 2 dBA louder than is reported in the E.A.'s. The decision as to what pavement will be used will be made during the detail design phase of these projects.



and will be available as part of the public consultation process at the future design phase.

### Accuracy of Noise Prediction Models

The highway noise prediction model used is the FHWA Model and the STAMINA 2.0 highway noise prediction model. This is the model jointly approved by the Ministry of Transportation and the Ministry of the Environment (MOE).

Included in the modelling were:

- the posted speeds for the roadways in the area used in the noise analysis,
- the pavement surface used for construction of the highway (average pavement),
- the elevations, contours and location of all of the NSA's near the right-of-way,
- highway grade,
- intervening rows of homes and barriers,
- type of ground cover, soft ground (Alpha 0.66 or 5 dBA per distance doubling),
- percentage of commercial traffic, and
- distance from the roadway.

The model is accurate within plus or minus 1.5 dBA, provided the input as listed above that is used in the program is accurate. Atmospheric affects are not accounted for in the model. The accuracy of the model decreases with distance. I would say that the model is only accurate within this range to a distance of approximately 200 metres.

### 4a Appendix 3

In Appendix 3 of the Bradford Bypass E.A. the number used is a receiver location (83). There is often more than one house per location. The 83 receiver locations represent a total of 214 homes when summarized in Exhibit 5.5 of the E.A.. The receiver locations are shown on the plans that are attached to the E.A.'s.

### Discontinuity of Truck Source Height

The Stamson<sup>5</sup> noise prediction model that was used in the calculations for the sound levels for the Highway 404 EA used a correction factor to adjust the source height of heavy trucks. The assumption in the model is that if there are any heavy trucks in the traffic flow that the source height is adjusted to 0.5 m. Depending upon the percentage commercial, it is adjusted up to a maximum height of 2.44 m if the percentage commercial is greater than or equal to 30 percent.

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<sup>5</sup> Schroter, V. and Chiu, C., "ORNAMENT, Ontario Road Noise Analysis Method for Environment and Transportation", Technical Document, Noise Assessment and Systems Support Unit, Ontario Ministry of the Environment, October 1989.

I believe that this is a relatively conservative approach to have the source height where there are any trucks to start at 0.5 m above pavement.

If you require any additional information please call me.

Yours truly



CTB/cib



**ENVIRONMENTAL NOISE IMPACT ASSESSMENT - HWY 404 EXTENSION EA**  
 Davis Drive (York Regional Rd. 31) to Hwy 12.

As requested by Health Canada Noise Data Tables in the EA have been modified to provide an estimate of indoor noise levels by subtracting 10 dBA from estimated outdoor levels at receivers, (January, 2001).

Outdoor levels/Receptor No.s from the Highway 404 Extension EA, Appendix 2, "Noise Impact Report", Appendix "F", "Sound Level Results for the Preferred Route".

Table 2.F

Receptor No.	No. Of Residences	Outdoor Ambient Leq, dBA	Future Outdoor Leq, dBA	Future Leq Minus Ambient Leq, dBA	Indoor Ambient Leq, dBA	Future Indoor Leq, dBA	Future Leq Minus Ambient (Indoors) Leq, dBA
1R1	2	48.1	58.1	10	38.1	48.1	10
1R2	1	44.7	57.0	12	34.7	47.0	12
1R3	1	46.7	57.7	11	36.7	47.7	11
1R4	6+	45.0	45.8	1	35.0	35.8	1
1R5	1	62.8	64.9	2	52.8	54.9	2
1R6	1	64.1	67.3	3	54.1	57.3	3
1R7	6	48.8	54.7	6	38.8	44.7	6
1R8	1	45.0	62.9	18	35.0	52.9	18
1R9	4	56.9	61.6	5	46.9	51.6	5
1R10	2	51.5	64.5	13	41.5	54.5	13
1R11	1	55.5	59.0	4	45.5	49.0	4
1R12	3	49.0	61.3	12	39.0	51.3	12
1R13	3	54.5	56.2	2	44.5	46.2	2
1R14	1	60.3	60.9	1	50.3	50.9	1
1R15	1	52.4	62.2	10	42.4	52.2	10
1R16	2	62.4	64.2	2	52.4	54.2	2
1R17	1	59.3	64.5	5	49.3	54.5	5
1R18	2	45.0	59.5	15	35.0	49.5	15
1R19	1	46.3	66.9	21	36.3	56.9	21

**ENVIRONMENTAL NOISE IMPACT ASSESSMENT - HWY 404 EXTENSION EA**  
 Davis Drive (York Regional Rd. 31) to Hwy 12.

As requested by Health Canada Noise Data Tables in the EA have been modified to provide an estimate of indoor noise levels by subtracting 10 dBA from estimated outdoor levels at receivers, (January, 2001).

Outdoor levels/Receptor No.s from the Highway 404 Extension EA, Appendix 2, "Noise Impact Report", Appendix "F", "Sound Level Results for the Preferred Route",

Table 4.F

Receptor No.	No. Of Residences	Outdoor Ambient Leq, dBA	Future Outdoor Leq, dBA	Future Leq Minus Ambient Leq, dBA	Indoor Ambient Leq, dBA	Future Indoor Leq, dBA	Future Leq Minus Ambient (Indoors) Leq, dBA
2R1	5	57.0	63.5	7	47.0	53.5	7
2R2	1	45.0	58.5	14	35.0	48.5	14
2R3	1	45.0	59.9	15	35.0	49.9	15
2R4	1	49.0	59.1	10	39.0	49.1	10
2R5	2	64.4	64.5	0	54.4	54.6	0
2R6	1	59.0	65.8	7	49.0	55.8	7
2R7	Displaced	45.0	56.4	21	35.0	56.4	21
2R8	1	45.0	60.8	16	35.0	50.8	16
2R9	1	47.0	63.0	16	37.0	53.0	16
2R10	1	45.0	58.5	14	35.0	48.5	14
2R11	4	45.0	50.0	5	35.0	40.0	5
2R12	2	50.3	53.7	3	40.3	43.7	3
2R13	12	46.9	65.5	19	36.9	55.5	19
2R14	1	51.5	60.7	9	41.5	50.7	9
2R15	3	45.8	57.3	12	35.8	47.3	12
2R16	Displaced	47.8	60.7	13	37.8	50.7	13
2R17	2	45.0	63.4	18	35.0	53.4	18
2R18	2	52.4	55.2	3	42.4	45.2	3

Note: 2R13 represents The Pollock Estate subdivision



**ENVIRONMENTAL NOISE IMPACT ASSESSMENT • HWY 404 EXTENSION EA**  
 Davis Drive (York Regional Rd. 31) to Hwy 12.

As requested by Health Canada Noise Data Tables in the EA have been modified to provide an estimate of indoor noise levels by subtracting 10 dBA from estimated outdoor levels at receivers, (January, 2001).

Outdoor levels/Receptor No.s from the Highway 404 Extension EA, Appendix 2, "Noise Impact Report", Appendix "F", "Sound Level Results for the Preferred Route".

Table 6.F

Receptor No.	No. Of Residences	Outdoor Ambient Leq, dBA	Future Outdoor Leq, dBA	Future Leq Minus Ambient Leq, dBA	Indoor Ambient Leq, dBA	Future Indoor Leq, dBA	Future Leq Minus Ambient (Indoors) Leq, dBA
3R1	1	45.0	58.4	13	35.0	48.4	13
3R2	1	48.5	59.5	11	38.5	49.5	11
3R3	1	51.8	61.7	10	41.8	51.7	10
3R4	6	45.0	50.2	5	35.0	40.2	5
3R5	6	47.0	54.6	8	37.0	44.6	8
3R6	34	45.0	60.1	15	35.0	50.1	15
3R7	1	45.0	62.0	17	35.0	52.0	17
3R8	Displaced	47.1	68.2	21	37.1	58.2	21
3R9	1	47.1	64.9	18	37.1	54.9	18
3R10	6	52.9	56.9	4	42.9	46.9	4
3R11	2	45.0	54.2	9	35.0	44.2	9
3R12	Displaced	62.3	63.6	1	52.3	53.6	1
3R13	2	62.6	63.2	1	52.6	53.2	1
3R14	2	56.4	61.8	5	46.4	51.8	5
3R15	2	48.0	58.4	10	38.0	48.4	10
3R16	1	50.5	55.1	5	40.5	45.1	5
3R17	1	58.8	59.4	1	48.8	49.4	1
3R18	1	63.4	62.1	-1	53.4	52.1	-1
3R19	1	45.0	55.3	10	35.0	45.3	10
3R20	2	45.0	55.1	10	35.0	45.1	10

3R6 - Elm Grove Trailer Park (1st two rows and residences along Catering Road)

**ENVIRONMENTAL NOISE IMPACT ASSESSMENT - HWY 404 EXTENSION EA**  
 Davis Drive (York Regional Rd. 31) to Hwy 12.

As requested by Health Canada Noise Data Tables in the EA have been modified to provide an estimate of indoor noise levels by subtracting 10 dBA from estimated outdoor levels at receivers, (January, 2001).

Outdoor levels/Receptor No.s from the Highway 404 Extension EA, Appendix 2, "Noise Impact Report", Appendix "F", "Sound Level Results for the Preferred Route",

Table 8.F

Receptor No.	No. Of Residences	Outdoor Ambient Leq, dBA	Future Outdoor Leq, dBA	Future Leq Minus Ambient Leq, dBA	Indoor Ambient Leq, dBA	Future Indoor Leq, dBA	Future Leq Minus Ambient (Indoors) Leq, dBA
4R1	3	45.0	54.5	10	35.0	44.5	10
4R2	2	45.0	56.0	11	35.0	46.0	11
4R3	1	45.0	59.9	15	35.0	49.9	15
4R4	8	62.4	61.0	-1	52.4	51.0	-1
4R5	1	54.2	53.8	0	44.2	43.8	0
4R6	1	61.8	61.9	0	51.8	51.9	0
4R7	Displaced	58.9	65.7	7	48.9	55.7	7
4R8	24	58.8	64.8	6	48.8	54.8	6
4R9	1	63.9	70.1	6	53.9	60.1	6
4R10	1	61.8	67.8	6	51.8	57.8	6
4R11	1	54.8	60.6	6	44.8	50.6	6
4R12	1	60.0	65.8	6	50.0	56.8	6
4R13	1	49.8	55.2	5	39.8	45.2	5
4R14	1	51.8	58.3	7	41.8	48.3	7
4R15	1	56.0	62.2	6	46.0	52.2	6
4R16	1	62.1	62.4	0	52.1	52.4	0
4R17	2	45.1	50.3	5	35.1	40.3	5
4R18	Displaced	58.7	62.3	4	48.7	52.3	4

4R8 - Summer Breeze Trailer Park; one half of total sites.



**ENVIRONMENTAL NOISE IMPACT ASSESSMENT - HWY 404 EXTENSION EA**  
**Davis Drive (York Regional Rd. 31) to Hwy 12.**

As requested by Health Canada Noise Data Tables in the EA have been modified to provide an estimate of indoor noise levels by subtracting 10 dBA from estimated outdoor levels at receivers, (January, 2001).

Outdoor levels/Receptor No.s from the Highway 404 Extension EA, Appendix 2,  
 "Noise Impact Report", Appendix "F", "Sound Level Results for the Preferred Route",

**Table 10.F**

Receptor No.	No. Of Residences	Outdoor Ambient Leq, dBA	Future Outdoor Leq, dBA	Future Leq Minus Ambient Leq, dBA	Indoor Ambient Leq, dBA	Future Indoor Leq, dBA	Future Leq Minus Ambient (Indoors) Leq, dBA
5R1	3	57.9	62.7	5	47.9	52.7	5
5R2	2	55.3	60.1	5	45.3	50.1	5
5R3	3	52.1	56.0	4	42.1	46.0	4
5R4	8	53.3	57.3	4	43.3	47.3	4
5R5	8	59.4	64.8	5	49.4	54.8	5
5R6	13	53.3	60.7	7	43.3	50.7	7
5R7	15	50.3	57.3	7	40.3	47.3	7
5R8	72	45.0	50.0	5	35.0	40.0	5
5R9	6	46.1	50.7	5	36.1	40.7	5
5R10	10	45.0	46.3	1	35.0	36.3	1
5R11	20	45.7	53.4	8	35.7	43.4	8
5R12	25	45.0	48.6	4	35.0	38.6	4

NSA LOCALE	NUMBER OF HOUSES WITHIN 600m INCREASED INDOOR NOISE LEVELS PROPOSED ALIGNMENT				
	WITHOUT LINK	INCREASE WITH LINK IN PLACE			WITH LINK
Leq24hr		0-5dBA	5-10dBA	>10dBA	
<b>HIGHWAY 400</b>					
<35 dBA	6	5	1	0	0
35-40 dBA	2	2	0	0	1
40-45 dBA	0	0	0	0	7
45-50 dBA	2	2	0	0	0
>50 dBA	0	0	0	0	2
Subtotal by Locale	10	9	1	0	10
<b>10 SIDEROAD</b>					
<35 dBA	27	17	8	2	0
35-40 dBA	5	5	0	0	17
40-45 dBA	4	4	0	0	17
45-50 dBA	3	3	0	0	4
>50 dBA	8	8	0	0	9
Subtotal by Locale	47	37	8	2	47
<b>COUNTY ROAD 4 (HWY. 11)</b>					
<35 dBA	26	11	15	0	1
35-40 dBA	9	9	0	0	10
40-45 dBA	0	0	0	0	24
45-50 dBA	8	8	0	0	8
>50 dBA	5	5	0	0	5
Subtotal by Locale	48	33	15	0	48
<b>HOLLAND RIVER (west branch)</b>					
<35 dBA	42	39	0	3	0
35-40 dBA	0	0	0	0	39
40-45 dBA	0	0	0	0	0
45-50 dBA	0	0	0	0	3
>50 dBA	0	0	0	0	0
Subtotal by Locale	42	39	0	3	42
<b>HOLLAND RIVER (east branch)</b>					
<35 dBA	33	24	4	5	5
35-40 dBA	0	0	0	0	19
40-45 dBA	0	0	0	0	4
45-50 dBA	0	0	0	0	4
>50 dBA	0	0	0	0	1
Subtotal by Locale	33	24	4	5	33
<b>EAST of YONGE STREET</b>					
<35 dBA	12	4	3	5	0
35-40 dBA	0	0	0	0	4
40-45 dBA	0	0	0	0	3
45-50 dBA	0	0	0	0	5
>50 dBA	0	0	0	0	0
Subtotal by Locale	12	4	3	5	12
<b>EAST of 2nd CONCESSION ROAD</b>					
<35 dBA	0	0	0	0	0
35-40 dBA	2	0	2	0	0
40-45 dBA	5	5	0	1	4
45-50 dBA	4	4	0	0	7
>50 dBA	11	10	0	0	11
Subtotal by Locale	22	19	2	1	22
<b>TOTAL NUMBER OF NSAs</b>	<b>214</b>	<b>165</b>	<b>33</b>	<b>16</b>	<b>214</b>



**Response to the Ministry of the Environment Comments on  
"Air Quality Impact Predictions for the Bradford Bypass and Highway 404  
Extension"**  
(November 9 Memorandum from [REDACTED])

January 8, 2001

**1. Introduction**

This paper is intended to address Ministry of the Environment's comments on the following two air quality impact assessment reports prepared by the Provincial and Environmental Planning Office of the Ministry of Transportation:

- Air Quality Impact Predictions for the Bradford Bypass; and
- Air Quality Impact Predictions for Highway 404 Extension.

Responses to individual comments follow the General Response, which is intended to clarify MTO's approach to air quality impact assessment for the two proposed projects under consideration.

**2. General Response**

The approach adopted in the MTO assessment is a worst-case scenario analysis. The worst-case conditions represent the "limits" of the Gaussian Plume Dispersion models commonly used in predicting the air quality impacts of highways (in this case, the California State Department of Transportation model - CALINE-4). This approach is well established in the U.S. and carries the following understanding: "If the worst-case conditions do not generate a violation of the air quality criteria for pollutants directly associated with highway traffic, then, for all practical purposes, compliance with the criteria has been demonstrated."

In those instances where the worst-case scenario analysis reveals the possibility of non-compliance, transportation agencies may undertake a detailed site-specific dispersion modelling study. Such a study would be based on "most likely" future traffic/meteorological conditions rather than worst-case conditions.

Dispersion modelling is central to predicting air quality impacts, but dispersion modelling can be inaccurate. MTO has tried to reduce the potential for inaccuracies by drawing upon the extensive set of air quality, traffic and meteorological measurements made in its 1994 Highway 404 study. The concentration measurements that provide the best correlation between pollutant concentrations and traffic volume are those for carbon monoxide and oxides of nitrogen. These two pollutants are much more directly associated with highway traffic than secondary or partly secondary pollutants such as ozone and particulate matter.

The methodology and generalized results of the 1994 Highway 404 study are relevant to the current assessments; however, they are not directly applicable. For one, the traffic volumes involved in the 1994 study are much higher than those anticipated on the Bradford Bypass and Highway 404 Extension. Furthermore, since 1994, vehicle emission rates have improved considerably due to stricter emission standards, higher diesel fuel quality, and the introduction of the provincial DriveClean program. Hence, MTO expects the air quality impacts of the two projects under consideration here to be much smaller and therefore not in need of the same level of effort and scrutiny that was invested in the 1994 study.

### 3. Responses to Individual Comments

#### Response to General Comment 1:

The two reports are very similar, since both address the potential air quality impacts of a four-lane highway under the same worst-case condition. The principal distinction between them is the difference in background ambient pollutant concentrations. These were obtained from the nearest MOE monitoring sites available for each proposed highway<sup>1</sup>.

Differences in the length and shape (alignment) of the two highways are immaterial in a worst-case scenario analysis so long as the worst-case conditions selected encompass the characteristics of both proposed highways. This criterion was met in our analysis.

Specifically, the worst-case scenario assumes the wind direction to run almost parallel to the highway (5 degrees off the highway axis), at any point along the highway, over a one-hour period. This assumption helps obviate the need to account for the precise shape of the highway, especially with the proposed highways which run essentially along a straight line through flat terrain.

Highway length affects concentrations, but only for wind directions parallel or almost parallel to the highway - not for wind directions oblique or perpendicular to the highway. Furthermore, this effect is, self-limiting; namely, the incremental increase of pollutant concentration per km of highway decreases with each additional km and approaches a limiting value for a highway link of approximately 10 km length. This observation is based on our modelling experience and the results of the sensitivity analyses documented in the CALINE-3 and CALINE-4 manuals.

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<sup>1</sup> Due to the absence of reliable long-term estimates, current rather than future ambient background concentrations were used. The adoption of Canada Wide Standards is expected to help reduce ambient pollutant concentrations over the next 10 years and, thus, render the MTO estimates conservative.



The 1994 Highway 404 study, on which our current predictions are based, considered the full stretch of the highway from below Sheppard Avenue to Steeles Avenue. Hence, the current assessments are based on data derived from a long stretch of highway with concentrations that approach limiting values under the worst possible wind direction. It is highly unlikely that this wind direction can be sustained over a one-hour period<sup>2</sup>. Hence, the MTO assessments deal with highway length in a worst-case sense.

#### Response to General Comment 2:

The MTO assessment did not attempt to predict particulate matter (PM) concentration impacts for the vicinity of the proposed highways. This decision has a number of reasons. First, the 1994 Highway 404 study measurement results do not reveal an unambiguous relation between highway traffic volume and ambient PM concentrations. Second, a large fraction of the PM in the troposphere is secondary pollution and is of a regional nature (see Seinfeld and Pandis, "Atmospheric Chemistry and Physics", page 99 (1998)). Third, according to MOE estimates, transportation is responsible for only 11% of the PM across Ontario. Forth, there is considerable uncertainty about the magnitude of future vehicle PM emission rates. If current USEPA efforts succeed, diesel and gasoline powered road vehicle emissions may drop by as much as 90% over the next ten years.

In spite of the difficulties to discern a specific highway's impact on local PM levels and to make 10-year projections, we decided to try MOE's suggestion and apply the USEPA Part-5 model. The results are as follows.

With default parameters, the Part-5 model predicts the year 2000 fleet-average total PM-2.5<sup>3</sup> emission rate as 0.061 g/mile. The year 2010 rate would be more pertinent for our purpose here; however, Part-5 cannot make any provision for potential regulatory changes over such a long period of time. It is safe to assume though that emission rates will be at least 50% lower in 2010. Hence, we assume that the 2010 fleet will emit approximately 0.03 g/mile. This assumption is in part based on the observation that the fleet-average emission rate for 2000 is 50% lower than that for 1990 (Part-5 predictions).

With the 2010 estimate<sup>4</sup>, one can readily predict the upper limit of the PM-2.5 concentration change expected in the vicinity of the proposed highways by

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<sup>2</sup> The sensitivity of pollutant concentrations to highway length decreases with increasing variability of wind direction. And, at the very low wind speed assumed in MTO's worst-case scenario analysis (1 m/s or 3.6 km/h), wind direction is hardly ever constant over a one-hour period.

<sup>3</sup> PM-2.5 designates the fraction of the particulate matter with a nominal diameter of less than 2.5 micron. Canada Wide Standards call for a 24-hour PM-2.5 criterion of 30 microgram/m<sup>3</sup> by 2010.

<sup>4</sup> The fleet-average emission rate estimate applies to the entire fleet of gasoline and diesel powered road vehicles. Gasoline powered vehicles generally emit much smaller quantities of particulate matter than diesel powered vehicles.

assuming that PM-2.5 is dispersed in the same manner as CO and is not subject to any wet or dry deposition. This approach yields a concentration change of 3.1 microgram/m<sup>3</sup> at 100 m due to highway traffic.

The 3.1 microgram/m<sup>3</sup> estimate represents the worst-case scenario concentration impact over a one-hour period. The provincial PM ambient air quality criteria are based however on 24-hour exposure levels. The conversion from 1-hour to 24-hour estimates can be based on 1994 Highway 404 study results. Specifically, during this study, PM-10 levels were measured both continuously by employing a TEOM and discretely by standard 24-hour sampling and analysis. The ratio of the maximum hourly PM-10 and the average PM-10 readings (average of all 24-hour readings) was 1/3<sup>6</sup>. Using this ratio, one may estimate the expected 24-hour impact to be approximately 1 microgram/m<sup>3</sup>, which is a small impact relative to the background ambient PM concentrations observed in Ontario. For instance, MOE's 1998 monitoring results indicate maximum 24-hour concentration levels ranging from 41.1 to 67.3 microgram/m<sup>3</sup>, as measured at twelve PM-2.5 monitoring sites across the province.

The above derivation, which may be described as semi-qualitative, suggests that the expected impact of the proposed highways on local PM-2.5 levels is small relative to current background concentration levels and would be difficult to discern. Hence, MTO's original decision not to include the prediction of PM impacts, especially of relatively low-capacity highways, was reasonable.

### Response to General Comment 3:

The calculated concentrations represent one-hour averages under the worst-case conditions. Longer-term averages have lower values. For instance, eight-hour worst-case concentrations are expected to be approximately 50% lower than one-hour worst-case concentrations (see Cooper, C.D. et. al., "Identifying Worst-case Persistence Factors for CO Modelling Near Intersections in Orlando, Florida", JAWMA, 42, 1461-65 (1992)).

The choice of one-hour averaging is based on several reasons. First, transportation agencies such as MTO are trying to establish a relation between traffic volumes and ambient concentrations. This relation becomes weaker as averaging times increase. Second, most of the current air quality criteria specify one-hour limits. Third, worst-case conditions are highly unlikely to persist over more than one hour, and MTO's assessment is based on a worst-case scenario analysis.

Long-term exposure to toxic substances such as benzene is admittedly an important subject. However, currently there are no provincial ambient air quality criteria for such substances.

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<sup>6</sup> This ratio is derived from PM-10 rather than PM-2.5 data. Empirical evidence with gaseous pollutants (persistence factor results) suggests that this ratio is "reasonable".



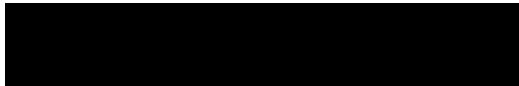
The issue of 24-hour exposure to PM is addressed in our response to General Comment 2.

**Response to General Comment 4:**

As noted in the MOE memorandum, Table 5 of the MTO report summarizes some of the measurement results of the 1994 Highway 404 study. The purpose of this Table is to merely inform the reader of what was actually observed during 1994 next to a typical highway. Given the uniqueness and comprehensiveness of the 1994 MTO study, this information is deemed to be worthwhile; although, strictly speaking, it represents the consequences of larger traffic volumes than anticipated on the planned 4-lane highways.

**Response to Comments in the Conclusion**

These comments centre on PM emissions. This subject was addressed above under our response to General Comment 2.



**Response to Health Canada Comments on  
"Air Quality Impact Predictions for the Bradford Bypass and Highway 404  
Extension"**

January 8, 2001

**Introduction**

Health Canada points concerning the nature of MTO's two air quality impact assessments,

- Air Quality Impact Predictions for the Bradford Bypass and
- Air Quality Impact Predictions for Highway 404 Extension.

are addressed individually in the following paragraphs.

**Response to First General Comment**

The MTO assessments make no claim to have addressed transportation's role in air quality across Ontario. Their primary goal is to address the needs and concerns of those who would be most directly impacted by the proposed highways, namely individuals who are or may be residing in the immediate vicinity of proposed highways. They will be subject to higher levels of primary pollutant concentrations than those living further away. Hence, if the assessment suggests that even the immediate vicinity of the proposed highway would be in compliance with the appropriate air quality criteria under a credible worst-case scenario, then one can conclude that the expected impacts are "acceptable".

The regional air quality impacts of road traffic, along with those of other sources of pollution, are reflected in the ambient background pollutant concentrations for the region. Therefore, the MTO study accounts for the prevailing regional air quality by adding the background concentration levels of primary pollutants to the corresponding calculated concentration impacts of the proposed highways. These background concentration levels are based on the ambient air pollutant concentration levels measured at MOE monitoring stations closest to the study site. The decision on "acceptable" air quality is based on the magnitudes of these sums. Hence, for primary pollutants, such as carbon monoxide and oxides of nitrogen, the contributions of all sources, not just the proposed highways, are accounted for.

In the case of secondary pollutants, such as ozone and to a lesser extent particulate matter (since it has a primary and a secondary component), the MTO analysis has not accounted for the impact of the highway (or highway segment) under consideration. Here, we have argued, as Health Canada has noted, that the contribution of a highway segment is small relative to other sources and this



contribution is insignificant for those living in the immediate vicinity of the highway. Over 50% of the ozone in Ontario are traceable to sources in the U.S.A. and only 11% of all particulate matter in the troposphere are traceable to transportation. For further discussion on potential particulate matter impacts please see the Attachment.

In conclusion, the Health Canada point about cumulative and long-term effects is acknowledged and ambient background levels have been included in the MTO assessment. However, it is not practicable for MTO air quality impact assessments for specific highway projects to address the broader long-term regional air quality issues of the Province of Ontario.

#### **Response to Second General Comment**

As noted by Health Canada, MTO project specific Environmental Assessments must base their technical assessments of findings on current official ambient air quality criteria, not on the extensive but often contradictory literature on potential health risks of air pollutants. It is acknowledged that there is an ongoing emergence of new information. However, it should be the responsibility of federal and provincial regulatory agencies, not MTO, to monitor and assess this information and, if warranted, to change the appropriate criteria.

#### **Response to First Specific Comment**

Table 1 in MTO's report provides MOE estimates of transportation's contribution to air pollution in Ontario. This information does not apply to a specific location in Ontario and is not used in any of our predictions. It is merely to inform the reader of the role of transportation in air pollution across Ontario.

#### **Response to Second Specific Comment**

To our best knowledge, the 30 microgram/m<sup>3</sup> figure is the 2010 PM-2.5 criterion not a current criterion. The attached note on potential PM-2.5 impacts has been prepared to address the noted switch from PM-10 to PM-2.5 criteria.

With regard to differences between the MTO table and "background concentrations supplied previously by the Ministry of the Environment", the differences in the background concentration levels are explicable. The figures in Table 4 are typical figures for the whole province while those in Table 11 are site-specific figures which have been used in calculating expected pollutant concentrations in the immediate vicinity of the proposed highways.

## Attachment

### A Short Note on Potential PM-2.5 Impacts

The local PM-2.5 impacts of the proposed highways may be estimated, at least semi-qualitatively, by using predictions of the USEPA Part-5 model.

With default parameters, the Part-5 model predicts the year 2000 fleet-average total PM-2.5<sup>1</sup> emission rate as 0.061 g/mile. The year 2010 rate would be more pertinent for our purpose here; however, Part-5 cannot make any provision for potential regulatory changes over such a long period of time. It is safe to assume though that emission rates will be at least 50% lower in 2010. Hence, we assume that the 2010 fleet will emit approximately 0.03 g/mile. This assumption is in part based on the observation that the fleet-average emission rate for 2000 is 50% lower than that for 1990 (Part-5 predictions).

With the 2010 estimate<sup>2</sup>, one can readily predict the upper limit of the PM-2.5 concentration change expected in the vicinity of the proposed highways by assuming that PM-2.5 is dispersed in the same manner as CO and is not subject to any wet or dry deposition. This approach yields a concentration change of 3.1 microgram/m<sup>3</sup> at 100 m due to highway traffic.

The 3.1 microgram/m<sup>3</sup> estimate represents the worst-case scenario concentration impact over a one-hour period. The provincial PM ambient air quality criteria are based however on 24-hour exposure levels. The conversion from 1-hour to 24-hour estimates can be based on 1994 Highway 404 study results. Specifically, during this study, PM-10 levels were measured both continuously by employing a TEOM and discretely by standard 24-hour sampling and analysis. The ratio of the maximum hourly PM-10 and the average PM-10 readings (average of all 24-hour readings) was 1/3<sup>3</sup>. Using this ratio, one may estimate the expected 24-hour impact to be approximately 1 microgram/m<sup>3</sup> which is a small impact relative to the background ambient PM concentrations observed in Ontario. For instance, MOE's 1998 monitoring results indicate maximum 24-hour concentration levels ranging from 41.1 to 67.3 microgram/m<sup>3</sup>, as measured at twelve PM-2.5 monitoring sites across the province.

The above derivation suggests that the expected impact of the proposed highways on local PM-2.5 levels is small relative to current background concentration levels and would be difficult to discern.

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<sup>1</sup> PM-2.5 designates the fraction of the particulate matter with a nominal diameter of less than 2.5 micron. Canada Wide Standards call for a 24-hour PM-2.5 criterion of 30 microgram/m<sup>3</sup> by 2010.

<sup>2</sup> The fleet-average emission rate estimate applies to the entire fleet of gasoline and diesel powered road vehicles. Gasoline powered vehicles generally emit much smaller quantities of particulate matter than diesel powered vehicles.

<sup>3</sup> This ratio is derived from PM-10 rather than PM-2.5 data. Empirical evidence with gaseous pollutants (persistence factor results) suggests that it is a "reasonable" number to use.



Ministry of  
Transportation

Ministère des  
Transports

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 Ontario

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M3M 1J8

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[REDACTED]  
Ministry of the Environment  
Environmental Assessment & Approvals Branch  
2 St. Clair Avenue West, Floor 12A  
Toronto, Ontario  
M4V 1L5

October 31, 2000

Dear [REDACTED]

Re: MTO ENVIRONMENTAL ASSESSMENT SUBMISSIONS, DECEMBER 1997,  
EA FILE TCCE02:  
The "Hwy 400 - Hwy 400 Extension Link" - (Bradford Bypass), Environmental Assessment,  
and,  
The "Hwy 404 Extension Environmental Assessment", Davis Drive to Hwy 12

In response to inquiries from the Ministry of the Environment and Health Canada the Ministry of Transportation has prepared the attached additional air quality assessment information in regard to the above two Environmental Assessment submissions, (2 reports, 8 plans, 3 page site reference list).

By courier, copies of this letter have forwarded the attached information for review and comment to:

- [REDACTED]  
- [REDACTED]  
- [REDACTED]  
As the anticipated federal "Responsible Authority" under CEAA, although CEAA has not been triggered, [REDACTED] of DFO has been set a set as well.

It is our understanding that [REDACTED] are aware that their comments are to be sent directly to your attention and that all comments are requested by mid-November of this year to allow you to complete your review this fall.

If you require any additional information or assistance please call.

Yours truly,

[REDACTED]  
Planning & Environmental Office  
Central Region, MTO

Cc

[REDACTED]

Fisheries and Oceans  
867 Lakeshore Road  
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Burlington, Ontario  
L7R 4A6

[REDACTED]

Health Canada  
Office of Environmental Health Assessment  
Room 426 "D", "Jeanne Mance Building"  
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Technical Support Section  
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North York, Ontario  
M2M 4J1

[REDACTED]

Environment Canada  
867 Lakeshore Road  
P.O. Box 5050  
Burlington, Ontario  
L7R 4A6



## Highway 4004 Extension

All dimensions shown are measured in metres from the nears edge of pavement to the centre of building

Identification Number	Distance (in Metres)	Building Type
1R1	150	Residents
1R2	60	Residents
1R3	225	Residents
1R6	140	Residents
1R7	190	Residents
1R8	70	Residents
1R9	230	Residents
1R10	165	Residents
1R11	470	Residents
1R12	175	Residents
1R14	80	Residents
1R15	130	Residents
1R17	140	Residents
1R19	50	Residents
2R1	210	Residents
2R2	290	Residents
2R3	260	Residents
2R4	315	Residents
2R5	270	Residents
2R6	120	Residents
2R7	50	Residents
2R8	160	Residents
2R9	100	Residents
2R10	440	Residents
2R15	250	Residents
2R16	80	Residents
2R17	105	Residents

3R1	215	Residents
3R2	125	Residents
3R3	215	Residents
3R4	400	Residents
3R5	150	Residents
3R6	160	Residents
3R8	45	Residents
3R11	225	Residents
3R12	210	Residents
3R15	340	Residents
3R16	315	Residents
3R17	230	Residents
3R18	370	Residents
3R19	225	Residents
3R20	230	Residents
4R1	260	Residents
4R2	180	Residents
4R3	105	Residents
5R1	55	Residents
5R1A	65	Residents
5R6	170	Residents
5R7	230	Residents
4R4	350	Residents
4R5	330	Residents
4R6	110	Residents
4R7	57	Residents
4R8	60	Residents
4R9	25	Residents
4R10	35	Residents
4R11	165	Residents
4R12	45	Residents
4R13	275	Residents
4R14	150	Residents
4R15	85	Residents
4R16	90	Residents
4R17	470	Residents
4R18	120	Residents
Note:		Recreation complex Mt Albert Road west of 404 at Sharon
Note:		Public School south of 404 on Regional Road 21



# Highway 400 to Highway 404 Extension (Bradford By-pass)

All dimensions shown are measured in metres from the nears edge of pavement to the centre of building

Identification Number	Distance (in Metres)	Building Type
1	250	residents
2	590	residents
3	345	residents
4	430	residents
5	560	residents
9	180	residents
10	50	residents
12	520	residents
13	380	residents
15	335	residents
17	480	residents
26	400	residents
29	200	residents
32	105	residents
33	180	residents
41	470	residents
42	95	residents
43	430	residents
51	320	residents
52	145	residents
56	70	residents
57	70	residents
59	80	residents
61	375	residents
63	290	residents
65	180	residents
66	165	residents
67	205	residents
75	50	residents
77	75	residents
78	145	residents
83	385	residents
79	330	residents
80	250	residents

# **Air Quality Impact Predictions for the Bradford Bypass**

## **Report**

**Prepared by**

**Toros Topaloglu, Ph.D., P.Eng.  
Provincial and Environmental Planning Office  
Ministry of Transportation of Ontario**

**October 30, 2000**



# Air Quality Impact Predictions for the Bradford Bypass

## 1. Introduction

The Ministry of Transportation of Ontario (MTO) is planning to link Highways 404 and 400. This highway connection is to be built to the north of Bradford, in an essentially rural area. The preliminary design calls for a four-lane highway - two lanes in each direction - with a 25 metre median.

This report was prepared by MTO's Provincial and Environmental Planning Office for the Planning and Environmental Office of the Central Region to help assess the air quality implications of the proposed undertaking. It includes a brief review of the background information used in the assessment (Section 2), followed by the methodology (Sections 3), analysis and results (Section 4), and conclusions (Section 5) of the study.

## 2. Background

Transportation, and road transportation in particular, is a significant contributor to air pollution. It is, however, not the only contributor. Industrial, commercial, residential, agricultural and other activities contribute also to air pollution. Hence, it is not easy to discern, with a high degree of accuracy, the local air quality impact of a specific highway in the presence of all other contributing sources of pollution. This task is further complicated by the variability of meteorological and traffic conditions, which have a strong influence on local air quality.

The primary pollutants from road vehicles (automobiles, trucks, etc) are carbon monoxide (CO), oxides of nitrogen (NO<sub>x</sub>), and volatile organic compounds (VOC). NO<sub>x</sub> has two principal constituents, NO and NO<sub>2</sub>. Vehicles emit mainly NO, which oxidize in the atmosphere relatively quickly to NO<sub>2</sub>. These two compounds are collectively designated NO<sub>x</sub>. VOC has a large number of constituents, most of which are not particularly toxic. The principal exceptions are benzene, 1,3-butadiene, formaldehyde and acetaldehyde. The concentrations of these four specific pollutants in the immediate vicinity of well-travelled roads can be related to emissions from vehicles.

A second group of transportation related pollutants are not direct vehicle emissions. The principal members of this group are ozone (O<sub>3</sub>) and particulate matter (PM). Ozone is one of the products of complex photochemical reactions in which NO<sub>x</sub> and VOC play key roles. These reactions occur over large regions and take considerable time for completion. Hence, local ambient concentrations of ozone are not directly related to emission rates of NO<sub>x</sub> and VOC of specific sources, such as road traffic. Similarly, but to a lesser extent, particulate matter is a regional pollutant. It emanates from a large number of sources, including road vehicles, and is also formed in secondary reactions in the atmosphere from gaseous pollutants such as NO<sub>x</sub> and SO<sub>x</sub> (oxides of sulphur).

Particulate matter smaller than 10 micron in diameter ( $PM_{10}$ )<sup>1</sup> is of greater concern, since it can travel further in the pulmonary system and cause more harm.

Road transportation's share of these pollutants varies widely with location and time. Table 1 below provides average values for the province of Ontario over the full year of 1997. Ozone is not included in this table, since it is not a primary pollutant and cannot be readily associated with specific emission sources.

**Table 1: Road Transportation's Share in Pollutant Emissions (1997)**

Pollutant	Road Transportation Share (%)
Carbon Monoxide (CO)	50
Oxides of Nitrogen ( $NO_x$ )	38
Volatile Organic Compounds (VOC)	21
Particulate Matter ( $PM_{10}$ )	11

Source: Ministry of the Environment of Ontario (MOE)

Pollutants can affect human health and the environment adversely. The federal government regulates their emissions from road vehicles. This practice dates back to 1966, when the state of California first started to set limits on emission rates for automobiles and light trucks, in grams of pollutant emitted per mile (g/mile) on a prescribed urban driving cycle. Recent emission standards, listed in Table 2, represent a better than 90% reduction of emissions since the pre-control era.

**Table 2: Progress of New Automobile Emission Standards**

Period	Emission Levels/Standards (g/mile)		
	CO	$NO_x$	VOC
Typical pre-control levels	77	4-6	10
1981-1995	3.4	1.0	0.41
1995-2001 (Tier I)	3.4	0.4	0.25
2001 - 2006 (NLEV)	3.4	0.2	0.075
2007 + (Tier II)		0.07	

Note: Table 2 contains some simplifications to allow a more compact presentation. For instance, NLEV and Tier II standards are not adopted, yet, in Canada. However, there is little doubt that they will be adopted soon in some form, since harmonization of US and Canadian standards is a commercial necessity. In the US, Tier II standards will be phased in over 2004 to 2007 and will allow averaging, banking and trading in emission credits to encourage early reduction of sulphur in gasoline.

The emission standards under consideration for 2001 and 2007 in Canada (already adopted in the US) demonstrate the emphasis on reducing the precursors of ozone,  $NO_x$  and VOC, from gasoline powered light-duty vehicles. More recently, emissions of PM have become the centre of attention. Diesel powered vehicles are major contributors of PM and  $NO_x$ . Hence, US regulatory efforts have focused on reducing PM and  $NO_x$  emissions from heavy-duty diesel engines and vehicles (trucks and

<sup>1</sup> Inhalable particulate matter



buses)<sup>2</sup>. Most recent and future heavy-duty diesel engine emission standards are provided in Table 3<sup>3</sup>.

**Table 3: Progress of Heavy-Duty Diesel Engine Emission Standards<sup>4</sup>**

Period	Emissions (grams of pollutant / horsepower-hour)			
	CO	NO <sub>x</sub>	VOC	PM
1990	15.5	6.0	1.3	0.60
1991-93	15.5	5.0	1.3	0.25
1994-97	15.5	5.0	1.3	0.10
1998-2003	15.5	4.0	1.3	0.10
2004-2007	15.5	2.3	0.2	0.10
2007 +(proposed)	15.5	0.20	0.14	0.01

Notes: 1/ The emission units express amount of pollutant emitted per unit amount of work done.

2/ VOC corresponds to hydrocarbons (HC) for 1990-2003 and non-methane hydrocarbons for 2004+.

It is important to note that the US EPA proposed standards for the period commencing in 2007 would see emissions of NO<sub>x</sub>, VOC and PM drop to 10% of their levels in 2004. This will mean a quantum reduction in heavy-duty truck emissions.

Despite the unprecedented technical progress of the last three decades, it has become evident that vehicle emission standards alone cannot ensure good air quality. While new vehicles are cleaner, their numbers and use have increased steadily taking back most benefits of technical progress. Furthermore, in-use vehicles emit significantly more than suggested by new vehicle emission standards, in part due to real-life driving conditions and deterioration of emission control equipment with usage.

Until recently, meeting emission standards has been almost the sole responsibility of vehicle and engine manufacturers. This is now changing. Under stricter emission standards, vehicle manufacturers have been calling for "cleaner" fuels to help them reduce emissions. Fuel composition, for instance the sulphur, benzene, and aromatic content of gasoline, influence emission rates of PM, NO<sub>x</sub>, benzene and other toxic volatile and semi-volatile organic compounds. Furthermore, fuel composition affects the manufacturers' ability to employ better emission control technologies.

The vehicle manufacturers' calls have already succeeded in bringing fuel quality under regulation. For instance, the sulphur content of diesel fuel and gasoline is being reduced dramatically. This development alone is expected to produce major air quality benefits.

<sup>2</sup> Currently, gasoline powered automobiles and light trucks are not subject to PM emission standards, but diesel powered ones are.

<sup>3</sup> Heavy-duty vehicle emissions are regulated via engine emission standards rather than vehicle emission standards.

<sup>4</sup> Strictly speaking these are US standards; however, they apply equally to Canada under various Memoranda of Understandings. This regulatory framework is a practical outcome of the fact that practically all heavy-duty highway vehicle engines used in Canada are imported from the U.S.A.

In conclusion, vehicle and fuel emission standards strongly affect air quality, particularly in the vicinity of heavily travelled roads, but they are not adequate to protect public health and the environment. Hence, senior governments have adopted ambient air quality criteria (AAQC). Ontario's short-term exposure criteria for transportation related pollutants are most pertinent for the worst-case scenario analysis of this study. The most relevant current criteria and those expected to be in effect in 2010 (future criteria) are listed in Table 4.

**Table 4: Ontario Ambient Air Quality Criteria (AAQC)**

Pollutant	Current AAQC	Future AAQC	Background Conc.
CO	30 ppm (1 hour)		0.27 ppm
NO <sub>2</sub>	0.2 ppm (1 hour)		0.014 ppm
Ozone	0.080 ppm (1 hour)	0.065 ppm (8 hour)	0.025 ppm
PM <sub>10</sub>	50 micro-g/m <sup>3</sup> (24 hour)	30 micro-g/m <sup>3</sup> (24 hour)	22 micro-g/m <sup>3</sup>
Benzene	N/A		1-7 micro-g/m <sup>3</sup>
1,3-Butadiene	N/A		0.1-1.5 micro-g/m <sup>3</sup>
Formaldehyde	65 micro-g/m <sup>3</sup>		2-4 micro-g/m <sup>3</sup>
Acetaldehyde	N/A		2-3 micro-g/m <sup>3</sup>

Source: Ministry of the Environment of Ontario and the U.S. Environmental Protection Agency

Notes: ppm stands for parts per million by volume and micro-g/m<sup>3</sup> for microgram per cubic metre. N/A stands for not applicable

Over the last decade, greenhouse gas (GHG) emissions of transportation and other anthropogenic sources have also become a matter of concern, since they may affect the global climate. The principal anthropogenic greenhouse gases are carbon dioxide, nitrous oxide and methane. These compounds have no known deleterious effects on human health at ambient concentration levels and are not considered pollutants. Therefore, they are normally not taken into account in air quality impact assessments. They constitute a global environmental problem; their impacts are not localized and may extend across the globe. Hence, efforts to limit GHG emissions have to be addressed through international agreements, such as the Kyoto Protocol, and need to encompass broader transportation planning issues.

### **3. Methodology**

The methodology employed in this study draws upon MTO's first-hand experience with highway air quality impact assessment and the numerous contributions made by other agencies and individuals to this complex subject.

The potential long-term air quality impacts of a highway are assessed in terms of expected changes in the concentration of road traffic related pollutants in the vicinity of the highway. These concentration changes will, in turn, depend on projected changes in traffic volume and associated factors. Hence, air quality impact assessment is necessarily based on predictions. The following paragraphs summarize the scientific knowledge and methods used in these predictions.



There is strong and well-documented empirical evidence that the concentrations of CO and NO<sub>x</sub> in the immediate vicinity of a highway are proportional to their rates of emission on the highway<sup>5</sup>. So, everything else being equal, doubling emission rates will result in doubling of ambient concentrations at a given site. CO in particular, being stable and not prone to deposition, is an excellent "marker" of road traffic and is most often used in modelling highway air quality impacts. NO<sub>x</sub>, taken as the aggregate of all oxides of nitrogen, is also an excellent marker even though the concentrations of its constituents change over time and distance.

VOC, on the other hand, consisting of over 100 chemicals - some highly reactive, many emitted by numerous other sources - are much more difficult to treat in the same manner. Ozone and particulate matter are secondary pollutants whose concentrations do not directly depend on highway traffic. Thus, CO and NO<sub>x</sub> concentration changes are the most direct consequences of traffic and lend themselves to systematic prediction. The concentrations of VOC have to be inferred from CO and NO<sub>x</sub> emissions while those of O<sub>3</sub> and PM cannot be related to emissions from a specific highway.

The ambient concentration of a pollutant, such as CO, is however not only a function of its emission rate but a large number of other variables as well<sup>6</sup>. Hence, knowledge of emission rates (a major task in itself) is not sufficient to predict corresponding ambient concentrations. The influence of other variables has to be taken also into account. Most of these are meteorological variables such as wind speed, direction and variability (atmospheric stability), and mixing height. But, they also include distance from the highway, the topography of the site, and the presence and size of objects on the ground (surface roughness).

For a given emission rate, ambient concentrations drop with increased distance from the highway, increased wind speed and variability and greater mixing height. As far as wind direction is concerned, the maximum concentrations prevail with the wind blowing at an angle of 5 degrees off the highway axis (almost parallel to the highway). Wind in this direction causes an accumulation of pollutants, giving rise to higher ambient concentrations.

Above observations suggest that air quality is a strong function of environmental factors, traffic conditions, and distance from the highway. Since it would be very time consuming to model all possible conditions, the practical approach adopted in air quality impact assessment is one of predicting the consequences of the worst-case scenario only. This scenario entails the coincidence of the worst credible traffic and meteorological conditions. It is understood that if all provincial ambient air quality criteria are met under the worst-case scenario with a sizeable margin of "safety", air quality will be significantly better than required by provincial guidelines under ordinary conditions.

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<sup>5</sup> Horowitz, J.L. Air Quality Analysis for Urban Transportation Planning. Cambridge, Massachusetts: The MIT Press, 1982.

<sup>6</sup> Pasquill, F. and Smith, F. B. Atmospheric Diffusion. West Sussex, England: Ellis Harwood Ltd. 1983.

The worst credible set of conditions for the site in question is selected as follows:

- Peak hour traffic volumes and associated emission rates
- No benefit derived from NLEV, Tier II, and gasoline reformulation standards<sup>7</sup>
- Two scenarios for heavy-duty diesel vehicle share of total traffic volume: 10% and 15% heavy-duty diesel vehicles
- Lowest credible wind speed of 1 metre per second
- Wind direction at 5 degrees to the principal axis of the highway
- High degree of atmospheric stability (stability class F)
- A nominal mixing height of 1000 m
- A nominal surface roughness of 1.75 m
- Ambient ozone concentration of 50 ppb (this rather high level of ozone ensures that NO is promptly converted to NO<sub>2</sub>)

Distance of the receptor from the highway is not set; instead, predictions are made for distances of 20, 40, 100, and 200 metres from the edge of the highway. These distances should span the relative location of current and future residents along the highway. As indicated in Section 4 of the report, concentrations of highway related pollutants decline rapidly with distance from the highway.

All above conditions specifying the worst-case scenario are unambiguous, simple specifications, except for emission rates. Emission rates cannot be specified. They are complex functions of traffic volume, driving conditions, composition of the vehicle fleet, and environmental factors. Traditionally, predictions of the US EPA vehicle emissions model, Mobile 5<sup>8</sup>, are used to fulfil this need. This is, however, not entirely satisfactory, since the model is based on emission rates measured under laboratory conditions and over a specific test cycle not representative of highway driving. Furthermore, it does not account for the emissions contributed by heavy-duty vehicles (heavy trucks and buses). Hence, the current study uses emission rates based on actual measurements made in MTO's Highway 404 air quality impact study.

Since emission rates are such an important determinant of air quality, the next section of the report is devoted to a brief description of MTO's 1994 Highway 404 Study and its principal conclusions.

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<sup>7</sup> This assumption is inordinately pessimistic, since future standards will undoubtedly result in lower emission rates than adopted here by 2011 and before.

<sup>8</sup> There is a "Canadianized" version of this model, Mobile 5C, which MTO has used for predicting future vehicle fleet composition. It accounts for the unique composition of Ontario's as well as GTA's light-duty vehicle fleet.



### 3.1 Input from MTO's 1994 Highway 404 Study (Highway 401 to 407)

In 1994, MTO conducted an extensive air quality impact assessment of the planned Highway 404 expansion between Highways 401 and 407<sup>9</sup>. In this study, traffic flows, meteorological conditions, and the ambient concentrations of 88 air contaminants were measured simultaneously over a 4-month period at three monitoring stations adjacent to the highway (one on each side of the highway at 30-50 m from the edge of the highway, the third at 330 m). The study was conducted in consultation with the Ministry of the Environment, who also provided quality assurance and quality control of measurements and reviewed the study report.

These measurements helped assess, in great detail, the prevailing air quality in the immediate vicinity of Highway 404 in 1994, and by extension the expected air quality in the vicinity of any heavily travelled 8-lane highway (peak hourly volume of 14,800). Some of these results are provided in Table 5.

**Table 5: Highway 404 Study Measurement Results**

Pollutant	Average Level	Maximum Level
CO, ppm	0.64	3.0
NO <sub>2</sub> , ppm	0.025	0.143
VOC, ppm	2.20	5.8
O <sub>3</sub> , ppm	0.0228	0.0885
PM <sub>10</sub> , micro-g/m <sup>3</sup>	29.7	78.3
Benzene, micro-g/m <sup>3</sup>	3.95	9.61
1,3-Butadiene, micro-g/m <sup>3</sup>	1.38	10.42
Formaldehyde, micro-g/m <sup>3</sup>	2.21	3.60
Acetaldehyde, micro-g/m <sup>3</sup>	1.88	3.80

It is worth noting that the measurements did not exceed the AAQC (see Table 3), except those for ozone and particulate matter. These two, particularly ozone, are regional pollutants, whose concentrations exceed AAQC in most parts of the province, on a number of days in a given year. Hence, the highway cannot be held responsible for their high concentrations.

In addition to providing a direct assessment of the prevailing air quality in 1994, the measurements, along with dispersion modelling, helped develop and verify the air quality prediction methodology. An important element of this methodology was the derivation of emission rates. This was achieved by comparing measured and calculated contributions of the highway to the ambient CO and NO<sub>x</sub> concentrations. Measured contributions were based on differences of pollutant concentrations upwind and downwind of the highway. Calculated contributions were based on extensive modelling with the dispersion model of the California State Department of Transportation

<sup>9</sup> Ministry of Transportation of Ontario. Air Quality Impact Assessment of Highway 404 Widening. 1998.

(CALINE4)<sup>10</sup>. The model inputs included measured traffic volumes on Highway 404 proper as well as on all ramps and major roads in the vicinity. This extensive effort provided confirmation of the methodology employed and produced more accurate emission rates, representative of the traffic conditions and the total vehicle fleet on Ontario's major highways. On average, approximately 8% of the vehicle fleet at this site consisted of heavy-duty trucks and buses. These vehicles are powered mainly by diesel engines and typically have higher NO<sub>x</sub> and PM emission rates than light-duty vehicles. Their CO and VOC emission rates, on the other hand, are generally lower than those of light-duty vehicles.

Strictly speaking, the emission rates deduced in the 1994 Highway 404 Study apply to the 1994 environment on Highway 404. However, they can be extrapolated to 2010, using the MOBILE 5C as a tool to predict changes (i.e., ratios and not absolute values) of emission rates in response to fleet turnover and regulatory developments. Unfortunately, MOBILE 5C<sup>11</sup> does not account for recent changes in emission standards, which will have a profound effect on the air quality impact of highway vehicles by 2010. One of these changes is too important to neglect; namely, the heavy-duty diesel engine emission standards for 2004.

These heavy-duty engine standards listed in Table 3 are not immediately convertible to vehicle emission rates. Truck and bus emission rates are deduced more directly by testing complete vehicles on chassis dynamometers<sup>12</sup>. The results of such testing with new buses and trucks, along with extrapolation of these results to 2010 are provided in Table 6. The extrapolation accounts for the already adopted 2004 engine emission standards, but not for proposed emission and fuel quality standards which are likely to come into force by 2007. The principal benefits of the 2004 standards are reflected in the NO<sub>x</sub> and PM emissions.

**Table 6: Heavy-Duty Diesel Truck and Bus Emission Rates**

Period	Vehicle Emission Rates (gram/mile)			
	CO	NO <sub>x</sub>	VOC	PM <sub>10</sub>
2000	8.2	18.4	0.1	0.3
2010	8.2	9.2	0.1	0.1

The combination of measured (for 1994) and extrapolated (for 2000 and 2011) emission rates are provided in Table 7. The emission rates in this table apply to the "average" vehicle, accounting for the full spectrum of vehicles on the highway. Multiplication of these rates with traffic volume, number of all vehicles crossing the highway over a unit

<sup>10</sup> California State Department of Transportation. CALINE4 – A Dispersion Model for Predicting Air Pollutant Concentrations. 1984.

<sup>11</sup> The consequences of new vehicle emission and fuel quality standards are built into the next generation of this model, namely MOBILE 6. Unfortunately, MOBILE 6 is still being developed and is not available for use.

<sup>12</sup> The test data used in this report is produced by the Transportation Emission Testing Laboratories of West Virginia Laboratories and is documented in a February 15, 2000 report.



of time provide total emissions generated by the highway traffic per unit time and distance. The Table includes percentage of heavy-duty diesel trucks and buses as a variable. The 8% truck/bus (mostly truck) share corresponds to the observed percentage of these vehicles during the 1994 Highway 404 study. Central Region requested air quality estimates to include also 10% and 15% truck shares, to ensure assessment of worst-case scenarios. The principal consequence of higher heavy-duty vehicle shares, as far as this report is concerned, is higher NO<sub>x</sub> and PM emissions per "average" vehicle. Table 7 does not include PM emission rates, since PM emissions cannot be readily associated with road traffic.

**Table 7: Vehicle Emission Rates Based on Hwy 404 Study Results**  
(Grams of Pollutant Emitted per Mile Travelled by the "Average" Highway Vehicle)

Period	Percent Truck/Bus (%)	CO (g/mile)	NO <sub>x</sub> (g/mile)	VOC (g/mile)
1994	8	15.7	4.2	2.2
2000	8	10.7	3.3	1.7
2010	8	8.9	2.7	1.5
2000	10	10.6	3.6	1.7
2010	10	8.9	2.8	1.5
2000	15	10.5	4.4	1.7
2010	15	8.8	3.2	1.5

As anticipated the principal consequence of higher truck traffic share is higher NO<sub>x</sub> emission rates.

The VOC emission rates in Table 7 may not be as accurate as the CO and NO<sub>x</sub> rates, since they are based on Mobile 5C predictions only. As noted in Section 2, the VOC measurements conducted during the Highway 404 study did not correlate well with highway traffic and could not be used to improve upon MOBILE 5C predictions. Nevertheless, these emission rates are deemed to be sufficiently accurate to allow for a robust worst-case analysis. The validity of this assertion can be judged by comparing the emission rates in Table 7 with the emission standards listed in Table 1.

The emission rates of the more toxic components of VOC<sup>13</sup> are even more difficult to derive. Commonly, these rates are deduced from total VOC emission rates and detailed chemical analysis on the exhaust of typical in-use vehicles. The information used here is obtained from the US EPA and is listed below in Table 8. It should be noted that this information represents conservative estimates, since it is based on emissions from vehicles running on regular gasoline (not the clean gasoline now mandated in the US and in Canada).

<sup>13</sup> Among the constituents of VOC, only formaldehyde is currently subject to an ambient air quality criterion.

**Table 8: Percentage of Air Toxics in Gasoline Vehicle Exhaust (2000)**

Pollutant	Percentage of the VOC
Benzene	2.0 %
1,3-Butadiene	0.5 %
Formaldehyde	1 %
Acetaldehyde	0.5 %

Note: The benzene fraction of VOC was reduced from 3.6% to 2.0 % to account for the reduction of the average benzene content of gasoline from approximately 1.6% in 1994 to 0.8% in the second half of 1999, as reported by Environment Canada.

In the near future and certainly by 2010, these percentages are expected to be significantly lower than suggested above.

### **3.2 Summary of the Methodology**

Before providing results, it may be advisable to recap the methodology outlined above and to note a few of its pros and cons.

The expected concentration of the principal pollutants associated with highway traffic can be calculated for the worst credible scenario applicable to the site. Two parameters weigh heavily in this process: predicted peak hour traffic volume and flux<sup>14</sup> of pollutants from the highway. The calculation exploits the empirically established simple result that the ambient air concentrations of traffic related pollutants, in the immediate vicinity of the highway, depend linearly on their respective fluxes. The flux of each pollutant, in turn, is affected by the volume, composition and flow conditions of traffic and is proportional to the emission rate of that pollutant by the "average" vehicle on the highway.

This study draws upon the measurement results of MTO's extensive Air Quality Impact Assessment for Highway 404 to deduce real-world emission rates that apply more closely to the highway driving conditions in Ontario. However, Highway 404 results had to be extended to encompass up-to-date and future vehicles and higher heavy-duty vehicle shares in the traffic stream.

The advantages of the methodology adopted here are that it is more accurate (since it minimizes the number of assumptions and employs as much empirical evidence as possible), simpler, and more transparent than dispersion modelling only. Its principal disadvantage is that it produces worst-case predictions that are indeed worse than what would be experienced under most conditions. This disadvantage may be overcome by appreciating the fact that the worst-case scenario represents a very rare event.

<sup>14</sup> The flux of a pollutant expresses the grams of pollutant emitted per unit time and per unit distance of highway by all vehicles operating over that time and distance.



#### **4. Analysis and Results - Bradford Bypass**

The results of this study are a strong function of traffic volume predictions. In worst-case analysis, the traffic volume of interest is the peak hour traffic volume; i.e., the number of vehicles traversing the highway during the one hour of the day when traffic volumes are at their peak. The worst-case peak-hour traffic volume used in this study are 5000 vehicles per hour for 2000 and 7200 vehicles per hour in 2010. The traffic volume for year 2000 is hypothetical, it serves as a baseline figure and as a means to demonstrate the influence of traffic volume on key pollutant concentrations. The year 2010 traffic volume of 7200 vehicles per hour corresponds to 1800 vehicles per hour per lane – the design volume for a highway operating at 120 km/hour. This number probably overestimates the expected 2010 traffic volume on the Bypass.

The next step in the analysis is the estimation of worst-case pollutant concentration increases due to the presence of the highway. More precisely, the object is to predict the expected increases in the concentrations of key pollutants as one moves from a condition of no pollution to a situation of a four-lane highway operating under the worst credible traffic and meteorological conditions at the site. The estimates are calculated by scaling the worst-case scenario predictions for the 1994 Highway 404 Study according to the relation below:

$$\text{Impact of Bypass in 2000/2010}^{15} = \text{Impact as of 1994 Study} \times \text{TR2} / \text{TR1} \times \text{ER2} / \text{ER1},$$

where TR2 = Peak-hour traffic volume for Bradford Bypass in 2000/2010  
TR1 = Peak-hour traffic volume for 1994 Hwy 404 Study  
ER2 = 2000/2010 Emission rates  
ER1 = 1994 Emission rates

This approach, namely scaling the 1994 Hwy 404 Study predictions with respect to traffic volume and emission rates rather than independent prediction of impacts, helps integrate the extensive measurement and modelling results of the Study in a consistent manner. Such measurements and modelling would be prohibitively expensive to repeat.

The CO, NO<sub>x</sub> and VOC concentration impacts, derived by applying the above outlined method, are presented in Tables 9 and 10, for 10% and 15% heavy-duty diesel vehicle shares, respectively.

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<sup>15</sup> More precisely, "Impact of the Planned Four-Lane Highway 404 Section between Bloomington and Aurora Roads".

**Table 9: CO, NO<sub>x</sub> and VOC Concentration Impacts  
(10% Heavy-Duty Vehicle Share)**

Pollutant	Period	Concentration (ppm for CO / NO <sub>2</sub> and µg/m <sup>3</sup> for others)			
		20 m from Hwy	40 m from Hwy	100 m from Hwy	200 m from Hwy
CO	2000	1.84	1.05	0.69	0.52
	2010	2.12	1.21	0.80	0.61
NO <sub>2</sub>	2000	0.055	0.039	0.030	0.027
	2010	0.058	0.042	0.032	0.029
Benzene	2000	6.7	3.8	2.5	1.9
	2010	8.2	4.7	3.1	2.3
1,3-Butadiene	2000	1.7	1.0	0.6	0.5
	2010	2.1	1.2	0.8	0.6
Formaldehyde	2000	3.3	1.9	1.3	1.0
	2010	4.1	2.3	1.5	1.2
Acetaldehyde	2000	1.7	1.0	0.6	0.5
	2010	2.1	1.2	0.8	0.6

**Table 10: CO, NO<sub>x</sub> and VOC Concentration Impacts  
(15% Heavy-Duty Vehicle Share)**

Pollutant	Period	Concentration (ppm for CO / NO <sub>2</sub> and µg/m <sup>3</sup> for others)			
		20 m from Hwy	40 m from Hwy	100 m from Hwy	200 m from Hwy
CO	2000	1.82	1.04	0.69	0.52
	2010	2.10	1.20	0.79	0.60
NO <sub>2</sub>	2000	0.067	0.048	0.037	0.033
	2010	0.067	0.048	0.037	0.033
Benzene	2000	6.7	3.8	2.5	1.9
	2010	8.2	4.7	3.1	2.3
1,3-Butadiene	2000	1.7	1.0	0.6	0.5
	2010	2.1	1.2	0.8	0.6
Formaldehyde	2000	3.3	1.9	1.3	1.0
	2010	4.1	2.3	1.5	1.2
Acetaldehyde	2000	1.7	1.0	0.6	0.5
	2010	2.1	1.2	0.8	0.6

The results quantify the expected contribution of the highway to local air quality, at distances of 20 metres to 200 metres from the edge of the highway. These results suggest a few important observations. Clearly, the highway's influence on air quality drops strongly with distance. This drop is steeper for CO than for NO<sub>2</sub>, since NO<sub>2</sub> requires some time to be produced from NO. At a distance of 200 m from the highway, the expected influence of the highway on CO concentration is approximately one-quarter of that at 20 m. For NO<sub>2</sub>, the drop is 50%. The share of heavy-duty vehicles in the traffic stream will have a significant impact on NO<sub>2</sub> concentrations but not on the concentrations of other pollutants. Over the period of 2000 to 2010, two competing



effects will affect air quality: increasing traffic volume and declining emission rates for individual vehicles. The net effect of these two effects seems to cancel out for NO<sub>2</sub>, in the specific scenario of 15% heavy-duty vehicle share in the traffic stream.

In order to estimate future air quality, the current ambient concentrations (background concentrations) of the pertinent pollutants need to be added to the predicted concentration impacts in Tables 9 and 10. These background concentrations are available for NO<sub>2</sub> and benzene from MOE's Stouffville monitoring station, not too far from the study site, and for CO from MOE's North York station. These background concentrations are listed in Table 11. Unfortunately, the Stouffville station does not monitor CO. The North York readings of CO, recorded at Finch and Yonge, are expected to overstate the background concentration at the study site, which is a rural area. No directly relevant background readings are available for 1,3-butadiene, formaldehyde and acetaldehyde; however, it is reasonable to assume these to be near zero in a substantially rural setting at some distance from industrial and commercial emission sources.

**Table 11: Background Concentrations**

Pollutant	Background Concentration
CO	1.0 ppm
NO <sub>2</sub>	0.012 ppm
Benzene	1.0 micro-g/m <sup>3</sup>

These background concentration levels are added to the expected concentration impacts of the proposed 4-lane highway (listed in Tables 9 and 10) to arrive at predicted worst-case ambient concentration levels, which are presented in Tables 12 and 13, for 10% and 15% heavy-duty vehicle traffic volume shares.

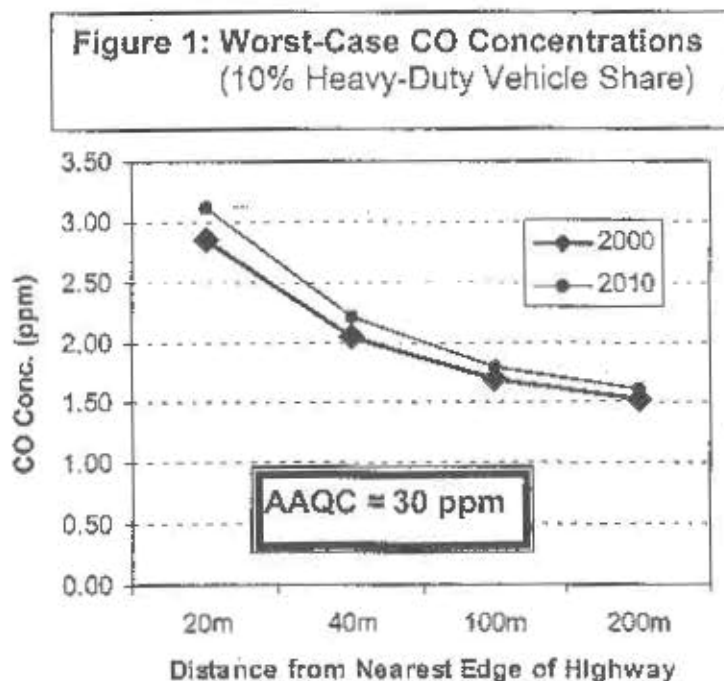
**Table 12: Worst-Case Ambient Concentrations of CO, NO<sub>2</sub> and VOC (10% Heavy-Duty Vehicle Share)**

Pollutant	Period	Concentration (ppm for CO / NO <sub>2</sub> and micro-g/m <sup>3</sup> for others)			
		20 m from Hwy	40 m from Hwy	100 m from Hwy	200 m from Hwy
CO	2000	2.84	2.04	1.69	1.52
	2010	3.12	2.21	1.80	1.61
NO <sub>2</sub>	2000	0.067	0.051	0.042	0.039
	2010	0.070	0.054	0.044	0.041
Benzene	2000	7.7	4.8	3.5	2.9
	2010	9.2	5.7	4.1	3.3
1,3-Butadiene	2000	1.7	1.0	0.6	0.5
	2010	2.1	1.2	0.8	0.6
Formaldehyde	2000	3.3	1.9	1.3	1.0
	2010	4.1	2.3	1.5	1.2
Acetaldehyde	2000	1.7	1.0	0.6	0.5
	2011	2.1	1.2	0.8	0.6

**Table 13: Worst-Case Ambient Concentrations of CO, NO<sub>2</sub> and VOC  
(15% Heavy-Duty Vehicle Share)**

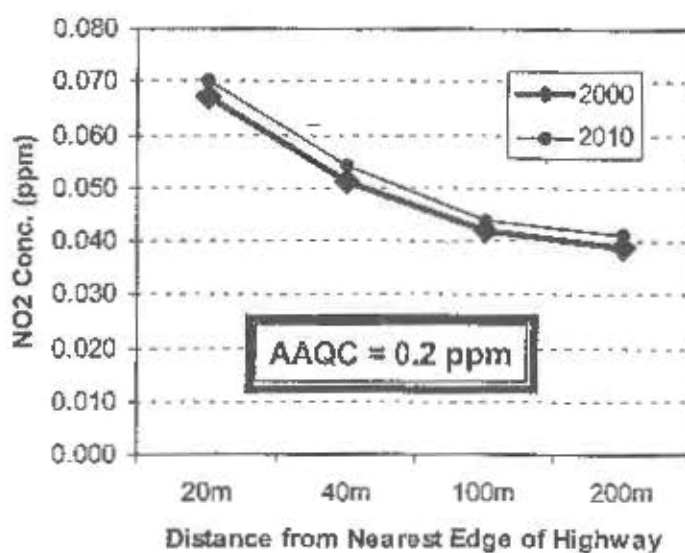
Pollutant	Period	Concentration (ppm for CO / NO <sub>2</sub> and micro-g/m <sup>3</sup> for others)			
		20 m from Hwy	40 m from Hwy	100 m from Hwy	200 m from Hwy
CO	2000	2.82	2.04	1.69	1.52
	2010	3.10	2.20	1.79	1.60
NO <sub>2</sub>	2000	0.079	0.060	0.049	0.045
	2010	0.079	0.060	0.049	0.045
Benzene	2000	7.7	4.8	3.5	2.9
	2010	9.2	5.7	4.1	3.3
1,3-Butadiene	2000	1.7	1.0	0.6	0.5
	2010	2.1	1.2	0.8	0.6
Formaldehyde	2000	3.3	1.9	1.3	1.0
	2010	4.1	2.3	1.5	1.2
Acetaldehyde	2000	1.7	1.0	0.6	0.5
	2010	2.1	1.2	0.8	0.6

Comparison of predicted local ambient pollutant concentrations with the ambient air quality criteria in Table 3, suggests that the impact of the highway will not bring the ambient air quality in violation with the provincial criteria under worst-case conditions and very close to the highway. In fact, as far as pollutants directly contributed by the highway is concerned, there is a very large safety margin. This point is illustrated further in Figures 1 -3 below. Figure 1 and 2 present CO and NO<sub>2</sub> concentration profiles for the 10% heavy-duty vehicle share scenario. Figure 3 presents the NO<sub>2</sub> concentration profile for the 15% heavy-duty vehicle scenario. The CO profile for this case is essentially identical to that of the 10% heavy-duty vehicle scenario.

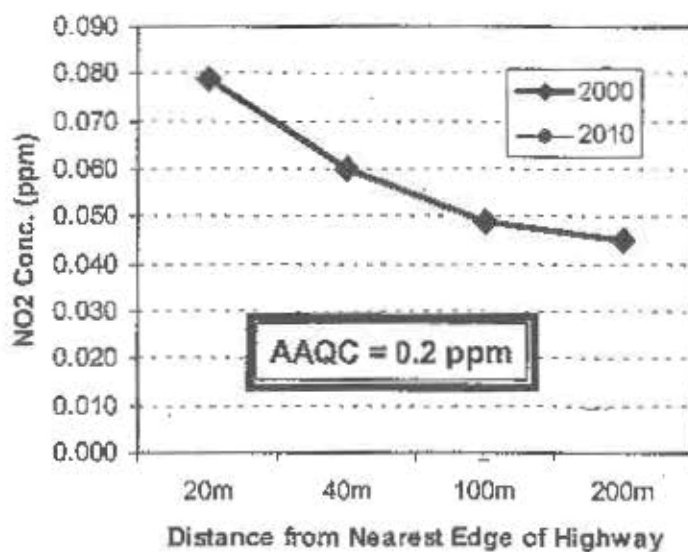




**Figure 2: Worst-Case NO<sub>2</sub> Concentration  
(10% Heavy-Duty Vehicle Share)**

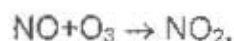


**Figure 3: Worst-Case NO<sub>2</sub> Concentrations  
(15% Heavy-Duty Vehicle Share)**



**Note:** The NO<sub>2</sub> concentration profiles for 2000 and 2010 are identical, since the effects of traffic volume increase and emission rate decline cancel each other.

The concentrations of ozone and particulate matter are not directly related to the presence of the highway. In fact, NO emissions of highway vehicles scavenge ozone according in the reaction,



causing a reduction of ambient ozone concentrations in the immediate vicinity of the highway. Higher ozone concentrations across the province are, however, of concern. The provincial anti-smog plan (ASP) is aimed at addressing this concern.

Residents of the area are currently subject to prevailing background concentration levels in Southern Ontario. These are 0.025 ppm for ozone, 11 micro-g/m<sup>3</sup> for PM<sub>2.5</sub> and 22.1 micro-g/m<sup>3</sup> for PM<sub>10</sub>. The proposed Bradford Bypass is not expected to add significantly to these background concentration levels.



## **5. Conclusions**

The potential air quality impacts of the proposed Bradford Bypass were predicted for two credible worst-case scenarios over the 2000 - 2010 timeframe. These scenarios assume the coincidence of peak traffic volumes with poor meteorological conditions (low wind speeds in a direction almost parallel to the highway and high atmospheric stability). Furthermore, they do not assume any benefit due to stricter federal light-duty vehicle emission and gasoline quality standards planned for the 2000 - 2010 timeframe. The only distinction between the two scenarios is the share of heavy-duty vehicles in the traffic stream, namely 10% and 15%.

Air quality predictions are based on MTO's extensive measurement and modelling results for Highway 404 in Toronto along with site-specific considerations in the proposed corridor for the highway.

The results clearly indicate that, even under the worst-case scenario and highly conservative assumptions, the concentrations of pollutants directly related to the planned Bradford Bypass will not exceed provincial ambient air quality criteria. In fact, they will remain much below these criteria. The effect of the Bypass on the concentration of regional pollutants (specifically ozone and particulate matter) is deemed to be insignificant relative to the collective contribution of US and Canadian emission sources.

The low levels of pollutant concentrations expected under the worst-case scenarios make it unnecessary to predict air quality impacts under other conditions and at specific geographic locations along the highway. Any such predictions would produce even lower concentrations and would not contribute further insights.