

**Project A: Highway 401 Widening and Concrete Median Barrier from east of Essex County Road 42 easterly to west of Merlin Road
Initiate Detailed Design and Class Environmental Assessment Study (GWP 3034-19-00)**

2019 TESR REVIEW

FACTOR	2008 TESR / EA APPROVED PLAN	2019 TESR / UPDATED PLAN REVIEW	TESR ADDENDUM WARRANTED
Existing Conditions			
Terrestrial Environment	<p>Vegetation:</p> <ul style="list-style-type: none"> ➢ No Areas of Natural and Scientific Interest (ANSI) - regionally / provincially significant or life science / earth science; ➢ No Provincially Significant Wetlands (PSW) or Locally Significant Wetlands (LSW); ➢ No Environmentally Significant Areas (ESAs). <ul style="list-style-type: none"> • Vegetation within the ROW is dominated by cultural old field meadow communities, common and tolerant to disturbance by regular highway maintenance. • Within roadside ditches and near culverts, localized pockets of tolerant wetland species were encountered. These areas were dominated by Cattail (<i>Typha sp.</i>), Reed Canary Grass (<i>Phalaris arundinacea</i>), Common Reed (<i>Phragmites australis</i>) and Purple Loosestrife (<i>Lythrum salicaria</i>). • The most common individual roadside tree species encountered within the ROW are the non-native White Poplar (<i>Populus alba</i>), Manitoba Maple (<i>Acer negundo</i>), and White Elm (<i>Ulmus americana</i>). • Hedgerows were found throughout the study area along the ROW boundary. Hedgerows are common / tolerant species, the proposed works are not anticipated to impact these features. • No species of conservation concern (SoCC) or Species at Risk (SAR) were identified within the study area. <p>Birds:</p> <ul style="list-style-type: none"> • The majority of the breeding bird species that are expected to be within the Highway 401 area are common in rural settings. • Nesting of migratory birds was evident on bridges and culverts along the project limits, and nesting is likely in some of the woody vegetation in the ROW that may be disturbed for the construction activities in and along the ROW. • There is also potential for nesting to occur in woody vegetation along the Highway 401 ROW, by common and tolerant bird species, such as American Robin. 	<ul style="list-style-type: none"> • No significant changes to existing terrestrial environmental conditions within the 2008 study area. • Additional field investigations were carried out between June 12-13, 2019 and July 20, 2019. The findings confirmed: <p>Vegetation:</p> <ul style="list-style-type: none"> ➢ No Areas of Natural and Scientific Interest (ANSI) - regionally / provincially significant or life science / earth science; ➢ No Provincially Significant Wetlands (PSW) or Locally Significant Wetlands (LSW); ➢ No Environmentally Significant Areas (ESAs) ➢ No SoCC or SAR plants confirmed within the study area. ➢ Phragmites confirmed at all structures including median. ➢ The median is narrow, disturbed and dominated by grasses and herbs and considered a cultural meadow. ➢ The watercourses are more naturalized although the majority are dominated by Phragmites. <p>Birds:</p> <ul style="list-style-type: none"> ➢ Confirmed Cliff Swallow nests on the Tilbury Creek, Little Baptiste Creek and Baptiste Creek structures. ➢ No barn swallow nests observed on structures where works are occurring, but they were observed flying around the study area and nesting in 4 culverts where no works are proposed. 	No



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	<p>Wildlife:</p> <ul style="list-style-type: none"> • Northern Leopard Frog and Green Frog were confirmed within the project area during field work completed in 2006. • Habitat along the Highway 401 is also suitable for: Gartersnake (<i>Thamnophis sirtalis sirtalis</i>), Dekay's Brownsnake (<i>Storeria dekayi</i>) and Red-bellied Snake (<i>Storeria occipitomaculata</i>) • Habitat characteristics are also suitable for common mammal species including Grey Squirrel (<i>Sciurus carolinensis</i>), Woodchuck (<i>Marmota monax</i>), Raccoon (<i>Procyon lotor</i>), Eastern Cottontail (<i>Sylvilagus floridanus</i>), White-tailed Deer (<i>Odocoileus virginianus</i>) and Striped Skunk (<i>Mephitis mephitis</i>). Grey Squirrel, Raccoon and White-tailed Deer were recorded during the field surveys in 2006. • There are no deer wintering areas or raptor nest sites, or any other mapped significant wildlife habitat, along the project limits or vicinity. 	<p>Wildlife:</p> <ul style="list-style-type: none"> ➢ 1 SCC confirmed present during field investigations: Monarch, and there is potential for 5 additional SCC to occur: Snapping Turtle, Midland Painted Turtle, Eastern Milksnake, Prairie Milkweed and Winged Loosestrife. ➢ SAR: Barn Swallow confirmed flying around the study area and nesting in four (4) culverts; Eastern Foxsnake has been recorded near the study area. Habitat for this species includes all watercourses and associated riparian habitats. <p>While New SAR species exist within the study area, this does not result in a significant change in existing terrestrial conditions and can be mitigated with standard contract provisions, therefore does not warrant a change to the EA approved plan.</p>	
Aquatic Environment	<ul style="list-style-type: none"> • All watercourses along project limits are considered 'warmwater', supporting various warmwater bait/forage fish (various minnow, darter and shiner species etc.) and panfish (Pumpkinseed) and lie within the Thames River watershed. • There are numerous watercourses along the project limits that have the potential to support aquatic Species at Risk (SAR) listed under the Species at Risk Act (SARA), based on the SAR Distribution Maps provided by DFO. 	<ul style="list-style-type: none"> • Additional fisheries investigations were carried out in June 2019. The key findings were: <ul style="list-style-type: none"> ➢ 13 watercourses with fish and fish habitat. ➢ All watercourses have a warmwater thermal regime. ➢ McIntosh Drain: DFO Aquatic SAR Mapping indicates the potential for Mapleleaf Mussel (<i>Quadrula quadrula</i>), listed as Special Concern under Ontario's <i>Endangered Species Act</i> (ESA) and the federal <i>Species at Risk Act</i> (SARA). ➢ Baptiste Creek: potential for encountering Mapleleaf Mussel and also identified the crossing as "Critical Habitat" for the Threatened SAR. ➢ Since Parson's report was issued, Mapleleaf Mussel has been downlisted under the SARA and is not listed as Special Concern under Ontario's ESA and the federal SARA. 	No

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		No significant changes to existing aquatic conditions within the study area since the 2008 TESR.	
Groundwater Resources	<ul style="list-style-type: none"> The predominant groundwater source within and surrounding the study area is the overburden aquifer system. Majority of the study area relies on potable water supplies from Lake Erie or Lake St. Clair. Majority of the study area can be considered a recharge zone, relying on rainfall events to recharge underlying aquifers. Majority of the study area is considered to have a low susceptibility to groundwater contamination resulting from surface activities. No wellhead protection areas are identified within the study area. 	<ul style="list-style-type: none"> Thirteen (13) MECP (2019) water well records are located within 500 meters of the site. No Water Taking EASRs are located within 500 meters of the site. The study area is identified as an area without high groundwater susceptibility to contamination. <p>No significant changes to existing groundwater resources within the study area since the 2008 TESR.</p>	No
Land-Use	<ul style="list-style-type: none"> The study area for Highway 401 is located within the boundaries of the Municipality of Chatham-Kent. Majority of adjacent land uses within the study area are agricultural with an emphasis on crop production. Other land uses include, light industrial/commercial, government/institutional, aggregate operations, open field, residential estate, built up areas, recreational and woodlots. The land uses in the vicinity of the Queen's Line interchange are primarily rural. No areas of speciality crop were observed during the field surveys for the 2006 cropping system. No areas of irrigation were noted within the study area or at the existing interchange locations. No areas of landforming were noted within the study area or at the existing interchange locations. No areas of areas of Organic Certified agricultural products were noted within the study area or at the existing interchange locations. 	<ul style="list-style-type: none"> Land Use adjacent to Highway 401 within the study area are primarily agricultural but also consist of light industrial/commercial, government/institutional, aggregate operations, open field, residential estate, built up areas, recreational and woodlots. <p>No significant changes to existing and future land uses within the study area since the 2008 TESR.</p>	No

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	<ul style="list-style-type: none"> The Minimum Distance Separation (MDS) calculation is not required for the proposed improvements to Highway 401. 		
Property Waste and Contamination	<ul style="list-style-type: none"> Areas of actual contamination within the limits of the study area were not identified; however, the land uses and/or features, which may represent potential sources of contamination, were located within the study area. The following areas have a high potential for site contamination within the study area: <ul style="list-style-type: none"> Septic lagoons are located near the west limits of the study area, north of Highway 401; An industrial facility located to the south of Highway 401, west of Baptiste Road; An industrial park located along Industrial Park Road north of Highway 401, east of Baptiste Road; and, Fuel service stations located to the north and south of Highway 401, east of Baptiste Road. 	<ul style="list-style-type: none"> A Contamination Overview Study (COS) was conducted to identify areas/properties with actual and/or potential soil and groundwater contamination. No sources of actual contamination were located within the Study Area. Out of the areas of high potential for contamination, none were recommended for further environmental investigations such as a Phase One or Phase Two Environmental Site Assessments (ESA) as the properties identified were not going to be impacted by the construction of the preferred alignment at the time of the 2008 COS. <p>No significant changes to existing site contaminated uses within the study area since the 2008 TESR.</p>	No
Noise Sensitive Areas	<ul style="list-style-type: none"> The following noise sensitive receptor locations were selected for the Noise Study within the study area: <ul style="list-style-type: none"> R1a: Residential houses along west side of Queen St. R2-R3: Queen St. north of Hwy 401 R4-R6: Regal Drive – residential subdivision east of Queen St. R7-R8: Wheeler Line R9-10: Industrial Park Dr. / Coutts Line R11: Queen's Line south of Highway 401 R12: McKinlay Line R13 and R15: Queen's Line between Highway 401 and Merlin Rd. R16a: Gleeson Line Site investigations of the residential development east of Queen Street determined that the outdoor living areas at the houses adjacent to Highway 401 are exposed to highway traffic noise with no mitigation as recommended by the developer's noise report. The responsibility for noise mitigation rests with the developer and 	<ul style="list-style-type: none"> A noise assessment was carried out in 2019 by WSP to review potential noise impacts at the adjacent Noise Sensitive Areas (NSAs) in accordance with the MTOs "Environmental Guide for Noise", October 2006. The noise analysis determined that there are a number of receiver locations where potential noise mitigation has been reviewed. Similar to the noise assessment findings in the 2008 TESR, the assessment concluded that a noise barrier would be technically and economically feasible for the residential areas on the south side of Highway 401 east and west of Queen Street in Tilbury, however, based on MECP requirements, those who develop land for residential uses adjacent to an existing or planned noise generator (i.e. highway, roadway, factory, etc.) are responsible for 	No

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	the Municipality of Chatham-Kent. Nonetheless, this noise assessment for the Highway 401 improvements includes receiver locations within this development for the purposes of analysis to determine the potential noise impacts from the highway widening from four lanes to six lanes.	ensuring that noise levels in the outdoor living area are consistent with the provincial objective of 55 dBA ten years after construction. No significant changes to existing Noise Sensitive Areas (NSAs) within the study area since the 2008 TESR. Nonetheless, an updated noise assessment is being undertaken to determine potential noise impacts to adjacent NSAs from the proposed improvements being implemented as part of this DB Ready process.	
Cultural Resources / Archaeology	<ul style="list-style-type: none"> Stage I archaeological assessment concluded: <ul style="list-style-type: none"> The existing corridor has been previously disturbed by the highway construction within the ROW and the highway widening will occur towards the median. Stage II archaeological assessment not required. All the bridge structures in the study corridor are greater than 40 years old and therefore eligible for inclusion in the Ontario Heritage Bridge List. None are currently listed. A cultural heritage resource assessment identified two (2) cultural heritage landscapes and five (5) built heritage resources are located within the study area right-of-way of Highway 401. 	<ul style="list-style-type: none"> A Stage 1 archaeological assessment was completed as part of the Preliminary Design Study. Areas being impacted as part of the proposed improvements being implemented by this DB Ready process were determined to be disturbed by the Stage 1 archaeological assessment. No further archaeological work was recommended for these impacted areas No changes in cultural landscapes and heritage features. The Municipality of Chatham-Kent, County of Essex and Town of Lakeshore confirmed none of the structures along Highway 401 are listed on their heritage inventory of built heritage resources within the study area. <p>No significant change to existing cultural / archaeological resources within the study area since the 2008 TESR.</p>	No

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Recommended Plan			
Highway 401 Mainline	<ul style="list-style-type: none"> Widen Highway 401 inward on existing median from four to a six-lane cross-section with median barrier and associated storm sewer drainage system. 	<ul style="list-style-type: none"> Widening of Highway 401 from four to six lanes; Installation of Tall Wall median barrier and associated storm sewer drainage system; Provision of five new overhead signs at existing Interchange locations to accommodate the new 6 lane cross section; Widening and Rehabilitation of the Tilbury Creek (06X-0050/B1 & 06X-0050/B2), Little Baptiste Creek (13X-0187/B1 & 13X-0187/B2), and Baptiste Creek (13X-0188/B1 & 13X-0188/B2) Bridges. <p>The proposed works being implemented as a part of this DB Ready phase do not significantly differ from the 2008 EA approved plan.</p>	No
Emergency Services	<ul style="list-style-type: none"> Emergency responses times may be impacted with construction of a median barrier wall and the associated removal of the median turnarounds. Mitigation measures for emergency vehicle access were discussed with emergency service providers. Maintenance/snow clearing will be provided as part of the MTO winter maintenance activities. Consultation with emergency service providers about their service needs along Highway 401 will continue during the subsequent detail design phase. 	<ul style="list-style-type: none"> Emergency services have been contacted as part of this Design-Build Ready process and will continue to be consulted in the subsequent Design-Build phase. <p>No significant change to potential impacts to emergency services and the commitment to consult emergency service providers as identified in the 2008 TESR.</p>	No
Drainage	<ul style="list-style-type: none"> Median drainage is facilitated by the open, depressed median and a series of ditch inlets with 250 to 300mm CSP outlets to the right-of-way highway ditches. There are a number of watercourses / municipal drains that cross Highway 401 within the study limits. The significant crossings within the study area include Trembley (Tilbury) Creek, Little Baptiste Creek and Baptiste Creek. 	<ul style="list-style-type: none"> A drainage assessment is currently being prepared as part of the DB Ready process. Drainage provision are anticipated to remain within the highway right-of-way and any new property impacts will be avoided. <p>No significant change to the drainage provisions as identified in the 2008 TESR.</p>	No

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Illumination and Traffic Signals	<ul style="list-style-type: none"> Decision lighting exists at all of the existing interchanges within the study limits. There are no traffic signals located at the interchange ramp terminals within the study limits. Partial illumination is warranted for decision areas and critical points for the ramps at the Highway 401 interchange at Queen's Line. Partial illumination exists for the ramp exits at all interchanges and will require relocation to accommodate the proposed highway improvements. 	<ul style="list-style-type: none"> No changes are being proposed at the Queen's Line interchange within the study area. As such, no illumination or traffic signals are being considered as part of the improvements being implemented as part of this Design-Build Ready process. <p>No significant change to illumination or traffic signal requirements as identified in the 2008 TESR.</p>	No
Utilities	<ul style="list-style-type: none"> The following utilities and their approximate locations have been identified. <ul style="list-style-type: none"> ➢ Union Gas Limited ➢ Chatham-Kent Hydro ➢ Chatham-Kent PUC ➢ Bell Canada ➢ Hydro One Network Inc. Disruptions to utility services as a result of the preferred highway widening improvements are not anticipated. Impacts to/relocation of the existing utilities are anticipated to be minor, and would occur through consultation with the affected utility providers in the subsequent detail design phase. 	<ul style="list-style-type: none"> Utility relocations are currently being review, but utility relocations will likely be avoided. <p>No significant change to utility relocations as identified in the 2008 TESR.</p>	No
EA Commitments, Environmental Impacts, and Mitigation			
Erosion and Sediment Control	<ul style="list-style-type: none"> Preliminary recommendations were provided based on the MTO's Erosion and Sediment Control Best Management Practices. An Erosion and Sedimentation Control will be developed during the subsequent detail design phase. The recommendations will be reconfirmed during detailed design to confirm suitability and to minimize erosion. 	<ul style="list-style-type: none"> Erosion and sediment control measures will be developed in accordance with OPSS 182 and 805. Erosion and sediment control measures should remain in place until all site restoration activities are completed and disturbed areas are no longer susceptible to erosion and sedimentation. An Erosion and Sedimentation Control Plan will be developed and implemented to minimize risk of 	No

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		<p>sedimentation of the waterbody during all phases of the project.</p> <p>No significant change to erosion and sediment control impacts and mitigation as identified in the 2008 TESR.</p>	
Management of Excess Material and Property Contamination	<ul style="list-style-type: none"> There is potential to encounter contaminated material from undertaking improvement works to Highway 401, which will require removal of existing pavement, site excavation and grading, and application of new pavement. These materials will be sorted and either reused if feasible, recycled, or disposed of at an approved landfill facility in accordance with OPSS 180 Implementation of the contingency plan measures provides a provides a mechanism for dealing with soil contaminant issues if they arise during construction. Standard mitigation will be used for dust control (i.e. water, calcium chloride) during construction. 	<ul style="list-style-type: none"> Property acquisitions are not required to accommodate the construction work in the areas where high potential for contamination has been identified, property specific Phase One ESAs are not required to be completed in these areas. Excess materials generated in the area of the Queen Street Overpass will be managed in accordance with Ontario Provincial Standard Specification (OPSS) 180. No additional environmental investigations are recommended for APECs with a low potential for contamination. <p>No significant changes to site contamination impacts and mitigation as identified in the 2008 TESR.</p>	No
Terrestrial Ecosystems	<ul style="list-style-type: none"> Direct impacts to the right-of-way vegetation where construction work is proposed are not anticipated to be significant due to the character, function and minor extent of the removal. The majority of the direct removal impacts are into the median areas. Tolerant and non-native (naturalized) shrub species will also be directly impacted (i.e. removed) during construction grading in various locations within the ROW along the project limits. Species likely impacted include (but are not limited to) Hawthorn species, Staghorn Sumac, Gray Dogwood, Red-osier Dogwood, Willow sp., and White Mulberry. Removal of localized patches of this woody vegetation is not considered to result in a significant ecological impact as these species are common throughout the project study area and will 	<ul style="list-style-type: none"> Install erosion and sediment control measures in accordance with OPSS 805. Re-stabilize and re-vegetate exposed surfaces as soon as possible following disturbance, specifically within 15 days near watercourses and within 45 days in graded areas. A Phragmites Management Plan shall be implemented by the contractor. Vegetation removal (including grubbing and removal of plants, grasses, trees and shrubs) is avoided during the identified migratory bird nesting season (April 1 to August 31). 	No

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	<p>likely continue to re-colonize the right-of-way and adjacent area after construction.</p> <ul style="list-style-type: none"> Removal of vegetation (including trees, shrubs, and herbaceous plants) can harm nesting birds and should therefore be completed outside of the bird nesting season which runs from April 1 to August 31 in all years. If an active nest is found within the work area at any time (including times outside of the typical nesting season), construction in the vicinity must cease until the young birds have fledged or the nest is otherwise abandoned. Ensure that no active nests will be removed or disturbed in accordance with the <i>Migratory Birds Convention Act</i>. The proposed widening works will lengthen culverts into the median, and may reduce the existing use of the culverts by some species of wildlife, however it is anticipated that tolerant species such as Raccoon and Striped Skunk will continue to use the culverts. Proposed widening includes the installation of a concrete median barrier that may have impacts on wildlife but can be mitigated by encouraging wildlife to use culverts and structures under the highway where feasible. Standard mitigation measures will be applied to minimize direct impacts to habitat features and wildlife within / along the right-of-way, protect habitat features from potential indirect impacts, both during and following construction, and prevent impacts to migratory bird nests and nesting activities during construction. Given the existing four-lane highway, species using the adjacent habitats are already tolerant of noise and disturbance. 	<ul style="list-style-type: none"> No active nests (nests with eggs or young birds) will be removed or disturbed in accordance with the MBCA. If works cannot avoid the migratory bird nesting seasons (April 1 to August 31), temporary exclusionary measures will be installed for migratory birds at all structures where nesting was confirmed and where works are proposed (i.e., WC-8 [Baptiste Creek], WC-10 [Little Baptiste Creek], WC-12 [Tilbury Creek]). Temporary exclusion measures will be installed by April 1 and maintained until August 31 during the year of construction. Any wildlife incidentally encountered during construction will not be knowingly harmed and will be allowed to move away on its own. An on-site Environmental Inspector will be trained at the outset of the project in the identification of SAR likely to be encountered within the study area. If Barn Swallow nesting is documented on one or more of the three (3) sets of bridges being widened in the year prior to construction, registration under O. Reg 242/08 should be completed and associated mitigation measures developed at that time. There is high potential for Eastern Foxsnake to occur within the study area and therefore there is potential for loss of Eastern Foxsnake habitat for the widening of the three (3) sets of bridges. MTO should review to determine if registration under Ontario Regulation 242/08 is appropriate or if consultation with MECP is required to ensure compliance with the ESA. <p>While new commitments have been identified to address potential SAR impacts within the study area based on new SAR requirements since the 2008</p>	

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		<p>TESR, a change to these commitments do not warrant a significant change to the EA approved plan.</p>	
<p>Fisheries and Aquatic Resources</p>	<ul style="list-style-type: none"> Site-specific mitigation measures will be refined during subsequent detail design phase once the details of the proposed works and their associated impacts have been refined and confirmed. Where SAR species or high potential for their presence has been identified and instream works are required, a SAR permit will be required from DFO prior to construction. DFO should be consulted during Detail Design in relation to other relevant requirements of the SARA, construction timing and current SAR sampling Protocols. 	<ul style="list-style-type: none"> Fish impact assessment was carried out in accordance with the requirements of the MTO/DFO/OMNR <i>Fisheries Protocol for Protecting Fish and Fish Habitat on Provincial Highway Undertakings – Version 3</i> (Pilot, 2016) and the associated guidance provided in MTO's (2013) <i>Environmental Guide for Noise</i>. DFO Aquatic SAR Mapping indicates the potential for Mapleleaf Mussel (<i>Quadrula quadrula</i>), listed as Special Concern under Ontario's <i>Endangered Species Act</i> (ESA) and the federal <i>Species at Risk Act</i> (SARA). A warmwater permissible in-water construction timing window of July 1st to March 15th will be implemented at the Baptiste Creek, Little Baptiste Creek, and Tilbury Creek crossings as outlined in OPSS 182. It is not anticipated that the proposed works at Baptiste Creek, Little Baptiste Creek or Tilbury Creek will result in a harmful alteration, disruption or destruction (HADD) for fish and fish habitat. The proposed rehabilitation activities at Baptiste Creek bridge, Little Baptiste Creek bridge and Tilbury Creek bridge can proceed without a review by DFO under the Fisheries Act. At all three bridges, the permanent impacts include a minor increase in footprint below the high water level for construction of the new abutments, located outside the normal wetted width of the channel at Baptiste Creek and Little Baptiste Creek, with partial encroachment into the wetted channel at Tilbury Creek. Additionally, there will be a loss of riparian vegetation within the existing open median. These impacts, along with the 	<p>No</p>

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		<p>temporary and localized disturbance during construction are not anticipated to limit or impair the habitat's capacity to support one or more life processes for fish. There are no impacts to aquatic SAR listed as Threatened or Endangered under either the ESA and/or SARA. Therefore, a HADD at Baptiste Creek, Little Baptiste Creek and Tilbury Creek bridges is not anticipated.</p> <p>No significant changes to aquatic impacts and mitigation as identified in the 2008 TESR.</p>	
Groundwater	<ul style="list-style-type: none"> Comprehensive drainage, spills and sediment and erosion control plans will be in place during all stages of construction and operation to avoid potential impacts to surface water and groundwater. The PTTW process will be addressed during the detail design phase, to assess the potential impacts of construction on groundwater resources. A residential well water survey for the study area will be carried out in the detail design phase to further determine if water wells within the study area will be impacted during construction. 	<ul style="list-style-type: none"> An EASR will be required for the remaining works during the Design-Build Phase. An EASR report shall be prepared by the Design-Builder. Site specific environmental mitigation and monitoring program will be implemented. No major groundwater quality issues in the Study Area are anticipated. Should any groundwater contamination be identified during excavation/water pumping activities, groundwater testing and management will be completed in accordance with groundwater mitigation measures provided in the Groundwater Assessment Report. A residential well water survey for the study area will be carried out in the detail design phase to further determine if water wells within the study area will be impacted during construction. <p>No significant change to groundwater impacts and mitigation as identified in the 2008 TESR.</p>	No
Drainage and Surface Water	<ul style="list-style-type: none"> Stormwater management practices (SWMPs) will be implemented for drainage protection and to minimize environmental degradation; 	<ul style="list-style-type: none"> A drainage assessment is currently being prepared as part of the DB Ready process. Drainage provision are anticipated to remain within the 	No

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	<ul style="list-style-type: none"> Erosion and sediment control measures will be implemented to protect the watercourses and drainage channels within the study area; and, All open ditches within the limits of the project will be constructed to allow proper stormwater flow to the watercourse/municipal drains within the study area. 	<p>highway right-of-way and any new property impacts will be avoided.</p> <p>No significant change to drainage / surface water impacts and provisions as identified in the 2008 TESR.</p>	
Adjacent Land Uses / Property	<ul style="list-style-type: none"> The Highway 401 widening occurs towards the median, as such, no adjacent property is required to accommodate this highway improvement. No direct impacts to agriculture were identified with the widening of Highway 401 towards the median, as the highway widening does not require adjacent property. 	<ul style="list-style-type: none"> No property acquisition is required for the proposed improvements being implemented as part of the Design-Build Ready phase. <p>No significant change to impacts to adjacent land uses / property as identified in the 2008 TESR.</p>	No
Noise	<ul style="list-style-type: none"> A Noise Impact Assessment was carried out during the Preliminary Design Study based on the criteria outlined in the MTO Noise Guide (2006). Noise mitigation is the responsibility of the developer of this subdivision and the Municipality of Chatham-Kent, therefore a noise wall is not recommended. During construction of the improvements, the contractor will be required to abide by the Contract Operational Constraints and municipal noise control by-laws. 	<ul style="list-style-type: none"> A noise assessment was carried out in 2019 by WSP to review potential noise impacts at the adjacent Noise Sensitive Areas (NSAs). A noise barrier would be technically and economically feasible for the residential subdivisions on the south side of Highway 401 east and west of Queen Street in Tilbury. However, the noise wall is not administratively feasible. MTO will proceed with the Design-Build phase without the inclusion of a noise wall along the Highway 401 eastbound shoulder to ensure no delays to the highway widening project. If noise concerns are raised during the Design-Build project, MTO will determine the need for a noise wall. MTO will then determine the implementation / construction strategy in a future phase. <p>Any changes to noise mitigation measures will not result in a change to the EA approved concept. If required, noise mitigation will remain within the</p>	No

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		highway right-of-way and will not require any new property impacts. As such, no significant change.	
Air Quality	<ul style="list-style-type: none"> An air quality assessment was carried out to determine the potential air quality impacts from the proposed improvements to Highway 401. For the proposed highway improvements, the air quality assessment determined that there is essentially no difference in modelled Year 2031 air quality whether the Highway 401 is widened or not. 	<ul style="list-style-type: none"> No change to adjacent air quality sensitive receptors within the study area. <p>No significant change to air quality impacts and mitigation as identified in the 2008 TESR.</p>	No
Archaeology	<ul style="list-style-type: none"> A Stage I archaeological assessment was carried out. The highway widening would not require a Stage II archaeological assessment. There is always potential to uncover archaeological material during any construction project. If the Contractor's operations expose any items that may indicate an archaeological find, work in the area will be suspended immediately and MCL will be contacted. 	<ul style="list-style-type: none"> A Stage 1 archaeological assessment was carried out in 2008; no archaeological resources are anticipated to be encountered with the widening into the already disturbed study area. <p>No further archaeological assessment is required for the proposed improvements being implemented as part of the Design-Build Ready phase. No significant change.</p>	No
Heritage Resources	<ul style="list-style-type: none"> All the bridge structures in the study corridor are greater than 40 years old and therefore eligible for inclusion in the Ontario Heritage Bridge List. None are currently listed. The need for a Cultural Heritage Evaluation Report (CHER) for any of the impacted structures using the applicable MTO criteria and scoring methods with the view of listing eligible structures in the Ontario Heritage Bridge List will be determined in the detail design phase. 	<ul style="list-style-type: none"> MTO pre-screened the structures within the study area and determined that a CHER is not required for any of the works as part of this study. <p>No significant changes to impacts to heritage resources anticipated for the proposed improvements being implemented as part of the Design-Build Ready phase.</p>	No
Construction Staging	<ul style="list-style-type: none"> The exact construction staging/sequencing will be determined during the detail design phase. <ul style="list-style-type: none"> This will include a review of maintaining Highway 401 as two lanes in each direction at all times, or reducing Highway 401 to one lane per direction in construction phases. 	<ul style="list-style-type: none"> Proposed construction strategy for the proposed highway widening is consistent with the construction staging as identified in the 2008 TESR. <p>No significant change to proposed construction staging for the highway widening.</p>	No

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	<ul style="list-style-type: none"> Short term, off-peak closures may be required during some operations. This will be confirmed during detail design. Advance signing of construction zones will be provided. 		
Illumination	<ul style="list-style-type: none"> Partial illumination is warranted for decision areas and critical points for all the ramps at the Highway 401 interchange at Queen's Line. Partial illumination exists for the ramp exits at all interchanges and will require relocation to accommodate the proposed highway improvements. 	<ul style="list-style-type: none"> No changes are being proposed at the Queen's Line interchange within the study area. As such, no illumination or traffic signals are being considered as part of the improvements being implemented as part of this Design-Build Ready process. <p>No significant change to illumination or traffic signal requirements as identified in the 2008 TESR.</p>	No
Utilities	<ul style="list-style-type: none"> Disruptions to utility services as a result of the highway widening improvements are not anticipated. Impacts to/relocation of the existing utilities are anticipated to be minor, and would occur through consultation with the affected utility providers in the subsequent detail design phase. 	<ul style="list-style-type: none"> Utility relocations are currently being review, but utility relocations will likely be avoided. <p>No significant change to utility impacts as identified in the 2008 TESR.</p>	No
Landscape and Snowdrift	<ul style="list-style-type: none"> A landscaping plan will be developed in the subsequent detail design phase in consultation with the Lower Thames Valley Authority, the Chatham-Kent Stewardship Network and the public. Certain sections of Highway 401 within the study limits have been identified as prone to snow drifting and accumulation, leading to occasional concerns with winter driving conditions and winter maintenance difficulties. The recommended plantings to provide additional snow hedges/fencing and/or ditching to provide additional snow storage will be further reviewed during subsequent detail design phase 	<ul style="list-style-type: none"> Landscaping will be reviewed in the subsequent Design Build phase. <p>No significant changes as landscaping being reviewed in the subsequent Design Build phase will be consistent with the commitments outlined in the 2008 TESR.</p>	No

**Project B: Highway 401 Rehabilitation, Widening and Concrete Median Barrier at the Queen Street Overpass and McDougall Drain Bridge
Complete Detailed Design and Class Environmental Assessment Study
2019 TESR REVIEW**

FACTOR	2008 TESR / EA APPROVED PLAN	2019 TESR / UPDATED PLAN REVIEW	TESR ADDENDUM WARRANTED
Existing Conditions			
Terrestrial Environment	<p>Vegetation:</p> <ul style="list-style-type: none"> ➢ No Areas of Natural and Scientific Interest (ANSI) - regionally / provincially significant or life science / earth science; ➢ No Provincially Significant Wetlands (PSW) or Locally Significant Wetlands (LSW); ➢ No Environmentally Significant Areas (ESAs). <ul style="list-style-type: none"> • Vegetation within the ROW is dominated by cultural old field meadow communities, common and tolerant to disturbance by regular highway maintenance. • Within roadside ditches and near culverts, localized pockets of tolerant wetland species were encountered. These areas were dominated by Cattail (<i>Typha sp.</i>), Reed Canary Grass (<i>Phalaris arundinacea</i>), Common Reed (<i>Phragmites australis</i>) and Purple Loosestrife (<i>Lythrum salicaria</i>). • The most common individual roadside tree species encountered within the ROW are the non-native White Poplar (<i>Populus alba</i>), Manitoba Maple (<i>Acer negundo</i>), and White Elm (<i>Ulmus americana</i>). • Hedgerows were found throughout the study area along the ROW boundary. Hedgerows are common / tolerant species, the proposed works are not anticipated to impact these features. • No species of conservation concern (SoCC) or Species at Risk (SAR) were identified within the study area. <p>Birds:</p> <ul style="list-style-type: none"> • The majority of the breeding bird species that are expected to be within the Highway 401 area are common in rural settings. • Nesting of migratory birds was evident on bridges and culverts along the project limits, and nesting is likely in some of the woody vegetation in the ROW that may be disturbed for the construction activities in and along the ROW. 	<ul style="list-style-type: none"> • No significant changes to existing terrestrial environmental conditions within the 2008 study area. • Additional field investigations were carried out between June 12-13, 2019 and July 20, 2019. The findings confirmed: <p>Vegetation:</p> <ul style="list-style-type: none"> ➢ No Areas of Natural and Scientific Interest (ANSI) - regionally / provincially significant or life science / earth science; ➢ No Provincially Significant Wetlands (PSW) or Locally Significant Wetlands (LSW); ➢ No Environmentally Significant Areas (ESAs) ➢ No SoCC or SAR plants confirmed within the study area. ➢ Phragmites confirmed at all structures including median. ➢ The median is narrow, disturbed and dominated by grasses and herbs and considered a cultural meadow. ➢ The watercourses are more naturalized although the majority are dominated by Phragmites. <p>Birds:</p> <ul style="list-style-type: none"> ➢ Confirmed Cliff Swallow nests at McDougall Drain bridge. ➢ No barn swallow nests on the two sets of bridges, but they were observed flying around the study area. <p>Wildlife:</p> <ul style="list-style-type: none"> ➢ 1 SCC confirmed present during field investigations: Monarch, and there is potential for 5 additional SCC to occur: Snapping Turtle, Midland Painted Turtle, Eastern Milksnake, Prairie Milkweed and Winged Loosestrife. 	No



FACTOR	2008 TESR / EA APPROVED PLAN	2019 TESR / UPDATED PLAN REVIEW	TESR ADDENDUM WARRANTED
	<p>Wildlife:</p> <ul style="list-style-type: none"> • Habitat along the study areas are suitable for: Gartersnake (<i>Thamnophis sirtalis sirtalis</i>), Dekay's Brownsnake (<i>Storeria dekayi</i>) and Red-bellied Snake (<i>Storeria occipitomaculata</i>) • Habitat characteristics are also suitable for common mammal species including Grey Squirrel (<i>Sciurus carolinensis</i>), Woodchuck (<i>Marmota monax</i>), Raccoon (<i>Procyon lotor</i>), Eastern Cottontail (<i>Sylvilagus floridanus</i>), White-tailed Deer (<i>Odocoileus virginianus</i>) and Striped Skunk (<i>Mephitis mephitis</i>). Grey Squirrel, Raccoon and White-tailed Deer were recorded during the field surveys in 2006. 	<ul style="list-style-type: none"> ➢ SAR: Barn Swallow confirmed flying around the study area and Eastern Foxsnake has been recorded near the study area. Habitat for this species includes all watercourses and associated riparian habitats. <p>While New SAR species exist within the study area, this does not result in a significant change in existing terrestrial conditions and can be mitigated with standard contract provisions, therefore does not warrant a change to the EA approved plan.</p>	
Aquatic Environment	<ul style="list-style-type: none"> • Both watercourses are considered 'warmwater', supporting various warmwater bait/forage fish (various minnow, darter and shiner species etc.) and panfish (Pumpkinseed) and lie within the Thames River watershed. 	<ul style="list-style-type: none"> • Fisheries investigations were carried out in June 2019. The key findings were: <p>McDougall Drain:</p> <ul style="list-style-type: none"> ➢ The McDougall Drain Bridge crosses a permanent flowing tributary to Jeannettes Creek from south to north under Highway 401. ➢ During the June 2019 field investigations, McDougall Drain was electrofished upstream and downstream of the Highway 401 and the following fish species were identified: Green Sunfish, Pumpkinseed Sunfish, Yellow Perch and Round Goby (invasive species). ➢ No aquatic SAR were identified during background review. ➢ The watercourse has a warmwater thermal regime with a recommended restricted in-water timing window between March 15 to July 1 of any given year. <p>Queen Street:</p> <ul style="list-style-type: none"> ➢ The Queen St. North concrete circular culvert conveys permanent surface and storm drainage from Tilbury south to north under Highway 401 towards Big Creek. 	No

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		<ul style="list-style-type: none"> ➤ During the June 2019 field investigations, the Queen St. North culvert was electrofished north of Highway 401 bridge and the following species were identified: Yellow perch, Largemouth Bass and Rosyface Shiner. ➤ No aquatic SAR were identified during background review. ➤ The watercourse has a warmwater thermal regime with a recommended restricted in-water timing window between March 15 to July 1 of any given year. <p>No significant changes to existing aquatic conditions within the study area since the 2008 TESR.</p>	
Groundwater Resources	<ul style="list-style-type: none"> • The predominant groundwater source within and surrounding the study areas are the overburden aquifer system. • Majority of the study areas can be considered a recharge zone, relying on rainfall events to recharge underlying aquifers. • The study areas are considered to have a low susceptibility to groundwater contamination resulting from surface activities. • No wellhead protection areas are identified within the study areas. • 	<ul style="list-style-type: none"> • No Water Taking EASRs are located within 500 meters of the sites. • The study area is identified as an area without high groundwater susceptibility to contamination. <p>No significant changes to existing groundwater resources within the study area since the 2008 TESR.</p>	No
Land-Use	<ul style="list-style-type: none"> • The study areas are located within the boundaries of the Municipality of Chatham-Kent. • Majority of adjacent land uses are agricultural with an emphasis on crop production. Other land uses include, light industrial/commercial, government/institutional, aggregate operations, open field, residential estate, built up areas, recreational and woodlots. • There are some small urban communities adjacent to Highway 401. 	<ul style="list-style-type: none"> • Land Use adjacent to Highway 401 are primarily agricultural but also consist of light industrial/commercial, government/institutional, aggregate operations, open field, residential estate, built up areas, recreational and woodlots. <p>No significant changes to existing and future land uses within the study area since the 2008 TESR.</p>	No

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Property Waste and Contamination	<ul style="list-style-type: none"> • A Contamination Overview Study was carried out to identify areas of actual or potential property waste or contamination. • Areas of actual contamination within the limits of the study area were not identified; however, the land uses and/or features, which may represent potential sources of contamination, were located within the study area. 	<ul style="list-style-type: none"> • A Contamination Overview Study (COS) was conducted to identify areas/properties with actual and/or potential soil and groundwater contamination. • A 250-metre buffer zone was added to the Highway 401/Queen Street Overpass (referred to as "Study Area A") and the Highway 401/McDougall Drain Bridge (referred to as "Study Area B"), to determine potential migration of contaminants from properties/areas adjacent to the Right-of-Way (ROW). • No sources of actual contamination were located within the two Study Areas. • APECs have been identified within Study Area A. • No APECs with moderate potential for contamination were identified at the time of this report. • No additional environmental investigations are recommended for APECs with a low potential for contamination. <p>No significant changes to existing site contaminated uses within the study area since the 2008 TESR.</p>	
Noise Sensitive Areas	<ul style="list-style-type: none"> • A noise assessment was carried out to assess the potential noise impacts. • Residential subdivisions have recently been developed and/or continue to be developed along the south side of the Highway 401, east and west of Queen Street in Tilbury. • Site investigations of the residential development east of Queen Street determined that the outdoor living areas at the houses adjacent to Highway 401 are exposed to highway traffic noise with no mitigation as recommended by the developer's noise report. The responsibility for noise mitigation rests with the developer and the Municipality of Chatham-Kent. 	<ul style="list-style-type: none"> • A noise assessment was carried out in 2019 by WSP to review potential noise impacts at the adjacent Noise Sensitive Areas (NSAs) in accordance with the MTOs "Environmental Guide for Noise", October 2006. • The noise analysis determined that there are a number of receiver locations where potential noise mitigation has been reviewed. • Similar to the noise assessment findings in the 2008 TESR, the assessment concluded that a noise barrier would be technically and economically feasible for the residential areas on the south side of Highway 401 east and west of Queen Street in Tilbury, however, based on MECF requirements, 	No

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		<p>those who develop land for residential uses adjacent to an existing or planned noise generator (i.e. highway, roadway, factory, etc.) are responsible for ensuring that noise levels in the outdoor living area are consistent with the provincial objective of 55 dBA ten years after construction.</p> <p>No significant changes to existing Noise Sensitive Areas (NSAs) within the study area since the 2008 TESR.</p>	
Cultural Resources / Archaeology	<ul style="list-style-type: none"> Stage I archaeological assessment concluded: <ul style="list-style-type: none"> The existing corridor has been previously disturbed by the highway construction within the ROW and the highway widening will occur towards the median. Stage II archaeological assessment not required. All the bridge structures in the study corridor are greater than 40 years old and therefore eligible for inclusion in the Ontario Heritage Bridge List. None are currently listed. 	<ul style="list-style-type: none"> A Stage 1 archaeological assessment was completed as part of the Preliminary Design Study. Areas being impacted as part of the proposed improvements being implemented by this DB Ready process were determined to be disturbed by the Stage 1 archaeological assessment. No further archaeological work was recommended for these impacted areas No changes in cultural landscapes and heritage features. The Municipality of Chatham-Kent, County of Essex and Town of Lakeshore confirmed none of the structures along Highway 401 are listed on their heritage inventory of built heritage resources within the study area. <p>No significant change to existing cultural / archaeological resources within the study area since the 2008 TESR.</p>	No
Recommended Plan			
Highway 401 Queen Street Overpass and	<ul style="list-style-type: none"> Widening the Queen Street and McDougall Drain bridges to accommodate the Highway 401 expansion from four to six lanes and the addition of a median barrier wall. 	<ul style="list-style-type: none"> Widening and Rehabilitation of the Queen St. Overpass (06X-0051/B1 & 06X-0051/B2) Bridges; 	No

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McDougall Drain Bridges		<ul style="list-style-type: none"> Widening and Rehabilitation of the McDougall Drain (13X-0190 /B1 & 13X-0190 /B2) Bridges. <p>No significant change to the proposed plans for the Queen Street and McDougall Drain bridges as identified in the 2008 TESR.</p>	
Emergency Services	<ul style="list-style-type: none"> Mitigation measures for emergency vehicle access were discussed with emergency service providers. Maintenance/snow clearing will be provided as part of the MTO winter maintenance activities. Consultation with emergency service providers about their service needs along Highway 401 will continue during the subsequent detail design phase. 	<ul style="list-style-type: none"> Emergency services have been contacted as part of this Design-Build Ready process and will continue to be consulted in the subsequent Design-Build phase. <p>No significant change to potential impacts to emergency services and the commitment to consult emergency service providers as identified in the 2008 TESR.</p>	No
Drainage	<ul style="list-style-type: none"> Median drainage is facilitated by the open, depressed median and a series of ditch inlets with 250 to 300mm CSP outlets to the right-of-way highway ditches. McDougall Drain is a more significant crossing within the study area. 	<ul style="list-style-type: none"> A drainage assessment is currently being prepared as part of the DB Ready process. Drainage provision are anticipated to remain within the highway right-of-way and any new property impacts will be avoided. <p>No significant change to the drainage provisions as identified in the 2008 TESR.</p>	No
Illumination and Traffic Signals	<ul style="list-style-type: none"> Decision lighting exists at all of the existing interchanges within the study limits. There are no traffic signals located at the interchange ramp terminals within the study limits. 	<ul style="list-style-type: none"> No changes are being proposed at the Queen's Line interchange within the study area. As such, no illumination or traffic signals are being considered as part of the improvements being implemented as part of this Design-Build Ready process. <p>No significant change to illumination or traffic signal requirements as identified in the 2008 TESR.</p>	No

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Utilities	<ul style="list-style-type: none"> The following utilities and their approximate locations have been identified. <ul style="list-style-type: none"> ➢ Union Gas Limited ➢ Chatham-Kent Hydro ➢ Chatham-Kent PUC ➢ Bell Canada ➢ Hydro One Network Inc. Disruptions to utility services as a result of the preferred highway widening improvements are not anticipated. Impacts to/relocation of the existing utilities are anticipated to be minor, and would occur through consultation with the affected utility providers in the subsequent detail design phase. 	<ul style="list-style-type: none"> Existing Entegrus overhead hydro line on the west side of Queen Street will be relocated westerly, outside of the planned bridge construction work zone. <p>No significant change to utility relocations as identified in the 2008 TESR.</p>	No
EA Commitments, Environmental Impacts, and Mitigation			
Erosion and Sediment Control	<ul style="list-style-type: none"> Preliminary recommendations were provided based on the MTO's Erosion and Sediment Control Best Management Practices. An Erosion and Sedimentation Control will be developed during the subsequent detail design phase. The recommendations will be reconfirmed during detailed design to confirm suitability and to minimize erosion. 	<ul style="list-style-type: none"> Erosion and sediment control measures will be developed in accordance with OPSS 182 and 805. Erosion and sediment control measures should remain in place until all site restoration activities are completed and disturbed areas are no longer susceptible to erosion and sedimentation. An Erosion and Sedimentation Control Plan will be developed and implemented to minimize risk of sedimentation of the waterbody during all phases of the project. <p>No significant change to erosion and sediment control impacts and mitigation as identified in the 2008 TESR.</p>	No
Management of Excess Material and Property Contamination	<ul style="list-style-type: none"> There is potential to encounter contaminated material from undertaking improvement works to Highway 401, which will require removal of existing pavement, site excavation and grading, and application of new pavement. These materials will be sorted and either reused if feasible, recycled, or disposed of at an approved landfill facility in accordance with OPSS 180. 	<ul style="list-style-type: none"> Property acquisitions are not required to accommodate the construction work in the areas where high potential for contamination has been identified, property specific Phase One ESAs are not required to be completed in these areas. 	No

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	<ul style="list-style-type: none"> Implementation of the contingency plan measures provides a provides a mechanism for dealing with soil contaminant issues if they arise during construction. Standard mitigation will be used for dust control (i.e. water, calcium chloride) during construction. 	<ul style="list-style-type: none"> Excavations within the median of Highway 401 are proposed to be surficial, groundwater control is not expected to be required for these areas. Excess materials generated in the area of the Queen Street Overpass will be managed in accordance with Ontario Provincial Standard Specification (OPSS) 180. Excess soils will be disposed of as per OPSS 180. No additional environmental investigations are recommended for APECs with a low potential for contamination. <p>No significant changes to site contamination impacts and mitigation as identified in the 2008 TESR.</p>	
Terrestrial Ecosystems	<ul style="list-style-type: none"> Direct impacts to the right-of-way vegetation where construction work is proposed are not anticipated to be significant due to the character, function and minor extent of the removal. The majority of the direct removal impacts are into the median areas. Tolerant and non-native (naturalized) shrub species will also be directly impacted (i.e. removed) during construction grading in various locations within the ROW. Species likely impacted include (but are not limited to) Hawthorn species, Staghorn Sumac, Gray Dogwood, Red-osier Dogwood, Willow sp., and White Mulberry. Removal of localized patches of woody vegetation is not considered to result in a significant ecological impact as these species are common and will likely continue to re-colonize the right-of-way and adjacent area after construction. Removal of vegetation (including trees, shrubs, and herbaceous plants) can harm nesting birds and should therefore be completed outside of the bird nesting season which runs from April 1 to August 31 in all years. Ensure that no active nests will be removed or disturbed in accordance with the <i>Migratory Birds Convention Act</i>. 	<ul style="list-style-type: none"> Install erosion and sediment control measures in accordance with OPSS 805. Re-stabilize and re-vegetate exposed surfaces as soon as possible following disturbance, specifically within 15 days near watercourses and within 45 days in graded areas. A Phragmites Management Plan shall be implemented by the contractor. Vegetation removal (including grubbing and removal of plants, grasses, trees and shrubs) is avoided during the identified migratory bird nesting season (April 1 to August 31). No active nests (nests with eggs or young birds) will be removed or disturbed in accordance with the MBCA. If works cannot avoid the migratory bird nesting seasons (April 1 to August 31), temporary exclusionary measures will be installed for migratory birds at the McDougal Drain Bridges. 	No

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	<ul style="list-style-type: none"> The proposed widening works will lengthen culverts into the median, and may reduce the existing use of the culverts by some species of wildlife, however it is anticipated that tolerant species such as Raccoon and Striped Skunk will continue to use the culverts. Proposed widening includes the installation of a concrete median barrier that may have impacts on wildlife but can be mitigated by encouraging wildlife to use culverts and structures under the highway where feasible. Standard mitigation measures will be applied to minimize direct impacts to habitat features and wildlife within / along the right-of-way, protect habitat features from potential indirect impacts, both during and following construction, and prevent impacts to migratory bird nests and nesting activities during construction. Given the existing four-lane highway, species using the adjacent habitats are already tolerant of noise and disturbance. 	<ul style="list-style-type: none"> Temporary exclusion measures will be installed by April 1 and maintained until August 31 during the year of construction. Any wildlife incidentally encountered during construction will not be knowingly harmed and will be allowed to move away on its own. An on-site Environmental Inspector will be trained at the outset of the project in the identification of SAR likely to be encountered within the study area. If Barn Swallow nesting is documented on bridges being widened in the year prior to construction, registration under O. Reg 242/08 should be completed and associated mitigation measures developed at that time. There is high potential for Eastern Foxsnake to occur within the study area and therefore there is potential for loss of Eastern Foxsnake habitat for the widening of the three (3) sets of bridges. MTO should review to determine if registration under Ontario Regulation 242/08 is appropriate or if consultation with MECP is required to ensure compliance with the ESA. <p>While new commitments have been identified to address potential SAR impacts within the study area based on new SAR requirements since the 2008 TESR, a change to these commitments do not warrant a significant change to the EA approved plan.</p>	
Fisheries and Aquatic Resources	<ul style="list-style-type: none"> Site-specific mitigation measures will be refined during subsequent detail design phase once the details of the proposed works and their associated impacts have been refined and confirmed. Where SAR species or high potential for their presence has been identified and instream works are required, a SAR permit will be required from DFO prior to construction. DFO should be consulted during Detail Design in relation to other relevant requirements of 	<ul style="list-style-type: none"> Fish impact assessment was carried out in accordance with the requirements of the MTO/DFO/OMNR <i>Fisheries Protocol for Protecting Fish and Fish Habitat on Provincial Highway Undertakings – Version 3 (Pilot, 2016)</i> and the associated guidance provided in MTO's (2013) <i>Environmental Guide for Fish and Fish Habitat</i>. 	No

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	the SARA, construction timing and current SAR sampling Protocols.	<ul style="list-style-type: none"> There are no records of documented or potential aquatic species at risk (SAR) listed under Ontario's <i>Endangered Species Act</i> (ESA) and/or the federal <i>Species at Risk Act</i> (SARA) within either of the study area watercourses. A warmwater permissible in-water construction timing window of July 1st to March 15th will be implemented at the McDougall Drain crossing as outlined in OPSS 182. There is no in-water work proposed at the Queen St. North culvert associated with rehabilitation of the Queen Street North overpass. It is not anticipated that the proposed works occurring at the McDougall Drain bridges or at the Queen Street North overpass within 30 m of the Queen Street North culvert will result in a harmful alteration, disruption or destruction (HADD) to fish and fish habitat. The proposed rehabilitation activities McDougall Drain bridge and Queen Street North overpass can proceed without a review by DFO under the <i>Fisheries Act</i>. At the Queen Street North overpass, the potential for indirect impacts to the adjacent Queen Street North culvert can be mitigated with the application of standard construction related mitigation measures, such that a HADD to fish and fish habitat is not anticipated. At McDougall Drain bridges, the permanent impacts include a minor increase in footprint below the high water level for construction of the new abutments, located outside the normal wetted width of the channel, as well as a loss of riparian vegetation within the existing open median. These impacts, along with the temporary and localized disturbance during construction are not anticipated to limit or impair the habitat's capacity to support one or more life processes for fish. Therefore, a HADD at McDougall Drain bridges is not anticipated. 	

FACTOR	2008 TESR / EA APPROVED PLAN	2019 TESR / UPDATED PLAN REVIEW	TESR ADDENDUM WARRANTED
		No significant changes to aquatic impacts and mitigation as identified in the 2008 TESR.	
Groundwater	<ul style="list-style-type: none"> Comprehensive drainage, spills and sediment and erosion control plans will be in place during all stages of construction and operation to avoid potential impacts to surface water and groundwater. The PTTW process will be addressed during the detail design phase, to assess the potential impacts of construction on groundwater resources. A residential well water survey for the study area will be carried out in the detail design phase to further determine if water wells within the study area will be impacted during construction. 	<ul style="list-style-type: none"> An Environmental Activity and Sector Registry (EASR) will be required for the proposed dewatering activities at the Queen Street Overpass and McDougall Drain bridges. A residential well water survey for the study area will be carried out in the detail design phase to further determine if water wells within the study area will be impacted during construction. Site specific environmental mitigation and monitoring program will be implemented. No major groundwater quality issues in the Study Area are anticipated. Should any groundwater contamination be identified during excavation/water pumping activities, groundwater testing and management will be completed in accordance with groundwater mitigation measures provided in the Groundwater Assessment Report. <p>No significant change to groundwater impacts and mitigation as identified in the 2008 TESR.</p>	No
Drainage and Surface Water	<ul style="list-style-type: none"> Stormwater management practices (SWMPs) will be implemented for drainage protection and to minimize environmental degradation; Erosion and sediment control measures will be implemented to protect the watercourses and drainage channels within the study area; and, All open ditches within the limits of the project will be constructed to allow proper stormwater flow to the watercourse/municipal drains within the study area. 	<ul style="list-style-type: none"> A drainage assessment is currently being prepared as part of the Detailed Design process. Drainage provision are anticipated to remain within the highway right-of-way and any new property impacts will be avoided. <p>No significant change to drainage / surface water impacts and provisions as identified in the 2008 TESR.</p>	No

FACTOR	2008 TESR / EA APPROVED PLAN	2019 TESR / UPDATED PLAN REVIEW	TESR ADDENDUM WARRANTED
Adjacent Land Uses / Property	<ul style="list-style-type: none"> The widening of both study areas occur towards the median, as such, no adjacent property is required to accommodate this highway improvement. No direct impacts to agriculture were identified with the widening of Highway 401 towards the median, as the highway widening does not require adjacent property. 	<ul style="list-style-type: none"> No property acquisition is required for the proposed improvements to the Queen Street and McDougall Drain bridges. <p>No significant change to impacts to adjacent land uses / property as identified in the 2008 TESR.</p>	No
Noise	<ul style="list-style-type: none"> A Noise Impact Assessment was carried out during the Preliminary Design Study based on the criteria outlined in the MTO Noise Guide (2006). Noise mitigation is the responsibility of the developer of this subdivision and the Municipality of Chatham-Kent, therefore a noise wall is not recommended. During construction of the improvements, the contractor will be required to abide by the Contract Operational Constraints and municipal noise control by-laws. 	<ul style="list-style-type: none"> A noise assessment was carried out in 2019 by WSP to review potential noise impacts at the adjacent Noise Sensitive Areas (NSAs). A noise barrier would be technically and economically feasible for the residential subdivisions on the south side of Highway 401 east and west of Queen Street in Tilbury. However, the noise wall is not administratively feasible. MTO will proceed with the Design-Build phase without the inclusion of a noise wall along the Highway 401 eastbound shoulder to ensure no delays to the highway widening project. If noise concerns are raised during the Design-Build project, MTO will determine the need for a noise wall. MTO will then determine the implementation / construction strategy in a future phase. <p>Any changes to noise mitigation measures will not result in a change to the EA approved concept. If required, noise mitigation will remain within the highway right-of-way and will not require any new property impacts. As such, no significant change.</p>	No

FACTOR	2008 TESR / EA APPROVED PLAN	2019 TESR / UPDATED PLAN REVIEW	TESR ADDENDUM WARRANTED
Air Quality	<ul style="list-style-type: none"> An air quality assessment was carried out to determine the potential air quality impacts from the proposed improvements to Highway 401. For the proposed highway improvements, the air quality assessment determined that there is essentially no difference in modelled Year 2031 air quality whether the Highway 401 is widened or not. 	<ul style="list-style-type: none"> No change to adjacent air quality sensitive receptors adjacent to the Queen Street and McDougall Drain bridges. <p>No significant change to air quality impacts and mitigation as identified in the 2008 TESR.</p>	No
Archaeology	<ul style="list-style-type: none"> A Stage I archaeological assessment was carried out. The highway widening would not require a Stage II archaeological assessment. There is always potential to uncover archaeological material during any construction project. If the Contractor's operations expose any items that may indicate an archaeological find, work in the area will be suspended immediately and MCL will be contacted. 	<ul style="list-style-type: none"> A Stage 1 archaeological assessment was carried out in 2008; no archaeological resources are anticipated to be encountered with the widening into the already disturbed study area. <p>No further archaeological assessment is required for the proposed improvements being implemented as part of the Detailed Design phase. No significant change.</p>	No
Heritage Resources	<ul style="list-style-type: none"> All the bridge structures in the study corridor are greater than 40 years old and therefore eligible for inclusion in the Ontario Heritage Bridge List. None are currently listed. The need for a Cultural Heritage Evaluation Report (CHER) for any of the impacted structures using the applicable MTO criteria and scoring methods with the view of listing eligible structures in the Ontario Heritage Bridge List will be determined in the detail design phase. 	<ul style="list-style-type: none"> MTO pre-screened the Queen Street and McDougall Drain bridges within the study area and determined that a CHER is not required for any of the works as part of this study. <p>No significant changes to impacts to heritage resources anticipated for the proposed improvements being implemented as part of the Detailed Design phase.</p>	No
Construction Staging	<ul style="list-style-type: none"> The exact construction staging/sequencing will be determined during the detail design phase. <ul style="list-style-type: none"> This will include a review of maintaining Highway 401 as two lanes in each direction at all times, or reducing Highway 401 to one lane per direction in construction phases. Short term, off-peak closures may be required during some operations. This will be confirmed during detail design. Advance signing of construction zones will be provided. 	<ul style="list-style-type: none"> Proposed construction strategy for the proposed widening and rehabilitation for the Queen Street and McDougall Drain bridges is consistent with the construction staging as identified in the 2008 TESR. Due to vertical clearances, Queen Street will be closed during the bridge widening and detour routes will be utilized. Municipalities were consulted with and are in agreement with the closure. 	No

FACTOR	2008 TESR / EA APPROVED PLAN	2019 TESR / UPDATED PLAN REVIEW	TESR ADDENDUM WARRANTED
		No significant change to proposed construction staging for the highway widening.	
Illumination	<ul style="list-style-type: none"> Partial illumination exists for the ramp exits at all interchanges and will require relocation to accommodate the proposed highway improvements. 	<ul style="list-style-type: none"> No illumination or traffic signals are being considered as part of the improvements being implemented as part of this Detailed Design process. <p>No significant change to illumination or traffic signal requirements as identified in the 2008 TESR.</p>	No
Utilities	<ul style="list-style-type: none"> Disruptions to utility services as a result of the highway widening improvements are not anticipated. Impacts to/relocation of the existing utilities are anticipated to be minor, and would occur through consultation with the affected utility providers in the subsequent detail design phase. 	<ul style="list-style-type: none"> Existing Entegrus overhead hydro line on the west side of Queen Street will be relocated westerly, outside of the planned bridge construction work zone. <p>No significant change to utility relocations as identified in the 2008 TESR.</p>	No
Landscape and Snowdrift	<ul style="list-style-type: none"> A landscaping plan will be developed in the subsequent detail design phase in consultation with the Lower Thames Valley Authority, the Chatham-Kent Stewardship Network and the public. Certain sections of Highway 401 within the study limits have been identified as prone to snow drifting and accumulation, leading to occasional concerns with winter driving conditions and winter maintenance difficulties. The recommended plantings to provide additional snow hedges/fencing and/or ditching to provide additional snow storage will be further reviewed during subsequent detail design phase 	<ul style="list-style-type: none"> Landscaping will be reviewed in the subsequent Design Build phase. <p>No significant changes as landscaping being reviewed in the subsequent Design Build phase will be consistent with the commitments outlined in the 2008 TESR.</p>	No