

Attachment 1 – Summary of the Environmental Assessment Study process

The Environmental Assessment Study followed the Municipal Engineers Association Municipal Class Environmental Assessment process as a Schedule C project

The MCEA classifies Schedule C projects as having potential for significant environmental effects and must proceed under the full planning and documentation procedures specified in the MCEA document. Recognizing the complexities of the project study area and immediate environs, the EAS was undertaken following the planning and design process for a Schedule C road project including the need for a new structured water crossing per the Municipal Engineers Association Municipal Class Environmental Assessment.

Schaeffers led and managed a cross and multi-disciplinary project team providing professional services supporting consultation and expertise in technical study of the natural, economic, social and transportation environments. More specifically the project team was comprised of the services and disciplines tabled below.

Name	Expert Service/Discipline Area
Schaeffers Consulting Engineers (Schaeffers & Associates Ltd.)	Project Management Class EA Public Consultation Transportation Engineering Stormwater Management Preliminary Cost Estimates Contamination Assessment
Poulos & Chung Ltd.	Transportation Planning
Savanta Inc	Natural Heritage
Lucas & Associates Ltd.	Socio-Economic
Archaeological Services Inc.	Archaeology Built Heritage and Cultural Landscape
Terraprobe Inc	Geotechnical Hydrogeology
GEO Morphix Ltd	Geomorphology
Hardy Stevenson & Associates	Public Facilitation
Novus Environmental Inc.	Air Quality Noise Climate Change
First Nations Engineering Services	First Nations Consultation

Led by Schaeffers, the project team undertook a Communication and Consultation Plan engaging stakeholders including Indigenous communities (First Nations and Métis) and the public

The EAS featured a Communication and Consultation Plan that engaged interested and affected study area and project stakeholders, Indigenous communities and public at key study milestones. The Communication and Consultation Plan included formal and informal methods of communication and consultation organized around study phases, engaging stakeholder groups including a Citizen Liaison Committee, and Technical Advisory Group, Indigenous communities and the general public at Public Information Centres.

An outline of key study milestones and overview of stakeholder engagement follows, noting that a fulsome record and documentation of the Communication and Consultation Plan is included as part of the Environmental Study Report.

Key milestones and main points of contact as follows:

- Notice of Study Commencement – issued May 11, 2017
- Technical Advisory Group Meeting #1 – June 2017
- Citizen Liaison Committee Meeting #1 – June 2017
- Public Information Centre #1 – June 29, 2017
- Technical Advisory Group – Meeting #2 June 2018
- Citizen Liaison Committee – Meeting #2 – June 2018
- Public Information Centre #2 – June 28, 2018
- Draft Environmental Study Report submission – Technical Advisory Group (includes regulatory and approval agencies) – December 21, 2018
- Technical Advisory Group Meeting # 3 – May 2019
- Citizen Liaison Committee Meeting #3 – May 2019
- Final Draft Environmental Study (revision to Draft Environmental Study Report December 21, 2018) – May 2019
 - Technical Advisory Group – May 13, 2019
 - Citizen Liaison Committee - Final Draft Environmental Study Report for review – May 15, 2019

Public

The Communication and Consultation Plan used various methods communication including notification, printed media, project mailbox, and correspondence providing information on the Study's status and progress at key Study milestones. Schaeffers hosted and has maintained a project page website through study duration. Interest members of the public on the project mailing list were provided with summaries of

Public Information Centre #1 and Public Information Centre #2 including display boards and opportunity for feedback.

Indigenous Communities (First Nations and Métis)

Indigenous communities per the MCEA are to be consulted. Schaeffers through early consultation efforts with the Ontario Ministry of Indigenous Relations and Reconciliation and Ministry of Environment Conservation Project initialized a Indigenous communities contact list that was expanded to include those provided by the City of Vaughan at the outset of the study.

Schaeffers engaged the services of First Nations Engineering Services Ltd. (FNESL) following PIC 1 and in preparation PIC 2 to facilitate and provide customized consultation with Indigenous Groups and organizations, potentially affected by the project.

Citizen Liaison Committee

A Citizen Liaison Committee (CLC) was formed early in the study process to provide interested community members with the opportunity to discuss options for the Kirby Road. The CLC included representation from the MacKenzie Ridge Ratepayers Association, Maplewood Ravines Ratepayers Association, residents at large from the City of Vaughan and Richmond Hill and the Vaughan Chamber of Commerce that were engaged through study duration and met at key study milestones including ahead of ahead of Public Information Centres and to present the recommended Preliminary Preferred Design Concept for the project. Schaeffers submitted the Final Draft Environmental Study Report to the CLC for any additional feedback in finalizing the Environmental Study Report. City staff attended Citizen Liaison Committee meetings to monitor the process.

Technical Advisory Group

A Technical Advisory Group (TAG) was formed early in the study process to provide a forum for regulatory authorities, approval agencies and the City to provide guidance to the Kirby Road EAS project team. The Technical Advisory Group included staff representation from York Region, Toronto and Region Conservation Authority (TRCA) York Region Transit, City of Richmond Hill, Ministry of Natural Resources and Forestry, Ministry of Environment Conservation and Parks, Ministry of Municipal Affairs and Housing and the City of Vaughan. The TAG met formally three times throughout the study duration and ahead of key study milestone providing guidance, feedbacks and technical review and comment of materials. The Draft Environmental Study Report was

provided for review in December 2018. A Final Draft Environmental Study Report May 2019 was provided to the TAG on May 13, 2019 for review and comment to finalize the Environmental Study Report.

Recognizing Rizmi Holdings Limited as sole private sector proponent, the City staff participated as a key review and approval agency as part of the Technical Advisory Group. City staff from the Policy Planning and Environmental Sustainability, Development Planning, and Infrastructure Planning and Corporate Asset Management departments participated on the TAG throughout study duration. City TAG members, led by Infrastructure Planning and Corporate Asset Management, facilitated internal engagement including cross department and multi-disciplinary technical reviews and preparation of comments and feedback to the Kirby Road EAS project team at study milestones.

The Kirby Road EAS project team engaged key TAG regulatory and approval agencies including MNRF, TRCA and MECP, in a round of consultation holding focused one-on-one meetings around key concerns and comments on the recommended preferred alternative road alignment 5 as presented at Public Information Centre #2 and Draft Environmental Study Report December 21, 2018. Key concerns and comments centered on weighting of natural environment relative to transportation, social and economic factors and highly recommended alternative road alignment 5 conformity with infrastructure policies of the Oak Ridges Moraine Conservation Plan.

Environmental Assessment Study Phases

The following outlines an overview of the Schaeffers planning and design process organized around the phases of the Municipal Class EA and the decision-making framework with input and feedback from stakeholders and the public at key milestones and through study duration.

Project Study Area and Limits

The project study area spans the 2 kilometres concession east-west and covers an area of approximately 170 hectares extending 200 metres north and south centered on existing 20.1 metre unopened road allowance owned by the City. Situated in the Oak Ridges Moraine Conservation Plan, a number of Provincially and Regionally designated environmentally sensitive areas are found both within and in proximity to the project study area east with limits between the existing signalized intersections of Dufferin Street and Kirby Road and Bathurst Street at Gamble Road at the City's eastern boundary with the City of Richmond Hill.

Phases 1 and 2 – Problem and Opportunity Statement and Alternative Solutions

The EAS reaffirmed the need and justification for Kirby Road missing link connecting Bathurst Street to Dufferin Street as part of the preferred planning solution

Key elements of the study process completed under Phases 1 and 2 more specifically included review of the provincial regional and local planning policy and regulatory context framework and existing study project study area conditions.

City Transportation Master Plans (having satisfied Phases 1 and 2) and the York Region Transportation Master Plan provided broader Regional and City-wide transportation planning foundation for undertaking transportation planning and traffic analysis for the project study area.

The Kirby Road EAS project team undertook a localized project study area transportation assessment and updated traffic analysis corroborating the need and justification for extending Kirby Road between Bathurst Street and Dufferin Street as 36 metre arterial road as part of the preferred planning solution that:

- Contributes to completing and strengthening the east- west arterial grid network for all modes and as part of broader planned Kirby Road improvements from Bathurst Street to Weston Road in north Vaughan
- Facilitates active transportation including cycling facilities within the right-of-way
- provides regional connectivity including as part of a broader strategic goods movement corridor under the York Region Transportation Master Plan
- Necessitates traversing the Oak Ridges Moraine Conservation Plan area
- Necessitates a new watercourse crossing

Phase 3 – Alternative Design Concepts for Preferred Solution

Schaeffers work plan for Phase 3 of the planning and design process were framed and organized around two phases (3A and 3B) that included the, preparation of inventory of natural, socio-economic and technical environments and development long list of alternative road alignments

Long List of Alternative Road Alignments and Screening

A long list of nine road alternative options with varying horizontal alignments were developed with consideration to area sensitivities, fixed points and existing unopened

road allowance. More specifically, alternative alignments were generally identified and characterized by avoidance of the wetland and the extent of diversion (minor, moderate and major) as measured from an assumed centre line the of the existing unopened road allowance.

The long list of alternative options were screened and rationalized with consideration to a broad set of criteria grouped under technical socio-economic and natural environments.

Screening results provided the basis of short listing of the alternative road alignments options, to be carried forward that included Options 4, 5 and 6 and 6a (see attachment 1a) as presented for consultation at Public Information Centre #1.

Short List Road Alternative Alignment and Cross-Section Options: Net Effects Analysis

Schaeffers work plan key elements under this phase included:

- Confirm short list of alternative road alignments and identify alternative design concepts
- Prepare detailed inventory of natural, social, economic environments for short-listed options
- Identify potential impacts on the environment and develop mitigation measures
- Evaluate, select and confirm preferred design concept(s)

The short list of alternative road alignment options (4,5,6, and 6a) were developed including geometric aspects of the horizontal and vertical alignments, and were subject to a comparative analysis of the advantages and disadvantages as based on net effects analysis, evaluating the natural, transportation, social and economic environments. Road cross-sections for the 36 metre were the subject of separate identification of options examining the and evaluation.

Assessment and evaluation of the short-listed road alignment alternatives (4) and cross sections (5) was based and informed with inputs from cross-discipline technical study and investigations undertaken the Kirby Road EAS project team.

Phase 4 Environmental Study Report

Schaeffers prepared a Draft Environmental Study Report in December 2018

In December 2018, Schaeffers prepared a Draft Environmental Study Report documenting the planning and design process and basis of the preferred alternative road alignment 5 as the selected horizontal alignment for the Preliminary Preferred

Design Concept. Road alignment Alternative 5 follows a horizontal linear alignment centered on the City's unopened road allowance and included a bridge structure at a point crossing the Provincially Significant Wetland.

The Draft Environmental Study Report was provided to Technical Advisory Group December 21, 2018 for an informal 6-week technical review and comment period. Key concerns and comments centered on the natural environment including conformity of the preferred alternative road alignment 5 with the Oak Ridges Moraine Conservation Plan, significance of the natural environment and weighting relative to transportation social and economic environments.

Concerns and comments were the subject of the Kirby Road EA project team focused meetings with key regulatory review agencies leading to Schaeffers and the Kirby Road EAS project team revisiting and subsequently modifying and refining horizontal alignment 5.

Schaeffers prepared a revised Final Draft Environmental Study Report in May 2019 documenting a revised and modified alignment 5A

Building from nets effects analysis, assessment and comparative analysis through short-list of 4 alternatives (4, 5, 6 and 6a), the Kirby Road EAS project team revisited the preferred alternative road alignment 5. The alignment 5 was modified and refined to address individual polices of the Oak Ridges Moraine Conservation Plan and to avoid and minimize adverse effects including:

- Avoid crossing of Provincially Significant Wetland
- Avoid crossing of interior forest within 200m from the woodland edge
- Maximize the use of existing unopened road allowance
- Minimize encroachment into private property and property acquisition requirements

The refined preferred alignment 5A avoids crossing the Provincially Significant Wetland optimizes a crossing location of the creek and minimized impact to interior forest.

Notwithstanding that there are no current plans for north-south trail connections in the study area, the City of Vaughan staff advised preliminary preferred design concept is to provide for options at the crossing that consider and do not preclude the opportunity for north-south continuous pedestrian and cycling connecting to the TCPL forming part of the broader Super Trail.

Preliminary Preferred Design Concept

The following provides an overview of key aspects associated with Preliminary Preferred Design Concept as presented in the Final Draft Environmental Study Report May 2019.

Description

Key functional and structural elements of the Preliminary Preferred Design Concept (see Attachment 1a) including the following:

- Horizontal alignment that follows accommodates a new minimum 36 metre right-of-way following an alignment centered on the existing unopened road allowance and curves south avoiding the Provincially Significant Wetland (see attachment 1a)
- A 36 metre right-of-way that provides a multi-use path on both sides of the road facilitating shared pedestrian and cycling facility and allows opportunity to convert to separated pedestrian and cycling facilities in response to growth consistent with City's Pedestrian and Bicycle Master Plan
- Four (4) general purpose lanes, two (2) in each direction with lane widths that will accommodate and facilitate vehicles including buses and trucks per Region and City standards (see attachment 1b)
- Auxiliary centre and turn lanes facilitating vehicular travel demand, movements and operations at intersections (see attachment 1b)
- Structured crossing new water crossing – oversized culvert for the new watercourse crossing and retaining walls protecting the PSW and 200m buffer to interior. The culvert is sized to allow for wildlife passage and protect and not preclude the opportunity and option for a future north-south trail connection facilitating continuation of pedestrian and cycling linkages and connecting south to the planned future Vaughan Super Trail along the existing TCPL corridor
- Four (4) new culverts conveying local drainage of which the one located closest to Bathurst Street is designed and sized to protect and not preclude the opportunity for a future north-south trail connection facilitating continuation of pedestrian and cycling linkages and connecting south to the planned future Vaughan Super Trail along the existing TCPL corridor
- 100m retaining wall on the north side of the road along the edge that protects the 200m-deep interior woodland habitat to protect the forest
- 75m-long retaining wall will be required along the south side to preserve the existing cultural heritage house located at the in the southwest quadrant of the future Kirby Road and Bathurst Street intersection.

Preliminary Cost Estimate

Led by Schaeffers, the Kirby Road EAS project team prepared preliminary capital and property cost estimates and a lifecycle removal and replacement and operations 50 year cost analysis for the Preliminary Preferred Design Concept (refined preferred alignment 5A)

Capital cost estimate for the project including roadworks and associated infrastructure is in the order of \$26.7 million. Preliminary cost estimate for property for the PPD (refined preferred alignment 5A) is in the order of \$16.6 million as itemized in the table below.

Item Description	Cost Estimate
Engineering Fees	\$3,358,072
Tree Removal	\$298,000
Site Preparation	\$1,292,505
Earthworks	\$3,031,740
Services	\$3,172,960
Roadworks	\$4,335,050
Structures	\$7,567,100
Miscellaneous	\$124,744
Contingency	\$3,477,026
Capital Cost Totals	\$26,657,196
Property	\$16,564,654
Total	\$43,221,850

Lifecycle removal and replacements cost were estimated under that considered the construction of a similar road project and as based on preliminary capital cost estimate. Preliminary costs estimate over a 50 year lifecycle analysis considered the life, removal and replacement by item, recognizing one-time costs and adjusted for inflation. Overall forecasts under a 50-year analysis are in the order of \$21.1M (2019 dollars) and \$148.6 (future dollars) with annual operation and maintenance costs approximately \$427K per year.

Preliminary cost estimates and analysis are subject to revision and refinement through future processes for advancing implementation and construction and securing and property acquisition respectively and over the lifecycle of the project.

Project Implementation

The Final Draft Environmental Study Report May 2019, subject to finalizing the ESR to the City's satisfaction, outlines a process for provision to amend ESR and advancing Phase 5 implementation and construction including permits and approvals, as well as commitments to future additional environmental investigations and monitoring. Key future commitments include development of plans mitigating impacts of the natural environment, staking of the PSW, updates and additional studies for species, Headwater Drainage Assessment, and completion a Stage 2 Archaeological Assessment, resource specific cultural heritage assessment for the residence at 11490 Bathurst Street.