Public Information Centre No. 1
King-Vaughan Road Bridge Replacement
Municipal Class Environmental Assessment
City of Vaughan

Date: April 7, 2016
Location: Al Palladini Community Centre,
    Meeting Room #1
Time: 7:00 pm – 9:00 pm (Drop-in Session)
The King-Vaughan Road Bridge is an arch bridge constructed in 1920, and carries one lane of vehicular traffic across the East Humber River in one continuous span.

Structural inspection of King-Vaughan Road Bridge completed in May 2012 identified that immediate attention is required with major components of the structure. The deterioration of the structure has triggered the need for a Schedule C Municipal Class Environmental Assessment (Class EA) Study to assess the appropriate rehabilitation/replacement strategy.

King-Vaughan Road is a minor arterial road under the City of Vaughan Official Plan (2010).
Project Overview

Study Purpose

- To confirm the structural condition, along with the hydraulic and safety concerns related to the existing single-lane bridge and to determine the appropriate structural rehabilitation/replacement strategy that will address the concerns and accommodate forecasted traffic demands.

Study Objectives

- To consider, evaluate, and document improvement alternatives for King-Vaughan Road, taking into account natural environment, technical and socio-economic factors.

- Consulting with stakeholders to identify and resolve or mitigate issues of concern.

- To meet the requirements of the Municipal Class Environmental Assessment process to permit the City of Vaughan to proceed with detail design and implementation.
Project Overview

Municipal Class EA Process

This project will be conducted in compliance with Schedule C of the Municipal Engineers Association "Municipal Class Environmental Assessment" (2011).

Phase 1
Identify and Describe the Problem(s)

Phase 2
Alternative Planning Solutions
- Identify reasonable alternative planning solutions.
- Evaluate the alternative solutions, taking into consideration environmental and technical factors.
- Identify a preferred solution to the problem(s).

Agency and Stakeholder Consultation
- Problem Statement
- Preferred Solution

Phase 3
Alternative Design Concepts For the Preferred Solution
- Identify alternative designs to implement the preferred solution.
- Inventory natural, social/cultural and economic environments.
- Identify the impact of the alternative designs after mitigation.
- Evaluate alternative designs.
- Identify a preferred design.

Agency and Stakeholder Consultation
- Preferred Design

Phase 4
Environmental Study Report
- Compile an Environmental Study Report (ESR).
- Place ESR on public record for review for 30 days.
- Notify the public and government agencies of completion of the ESR and of the Part II Order provision in the EA Act.

Phase 5
Implementation
- Proceed to construction of the project.
- Monitor environmental provisions and commitments.

We Are Here

Agency and Stakeholder Consultation
- ESR
Background Studies Completed

Existing Land Use

- The Study Area is located within Natural Areas of the City’s Official Plan with agricultural and rural residential land uses in the surrounding area. It is within the City’s Core Natural Heritage System as well as the Greenbelt Plan Area.

East Humber River

- The East Humber River is a permanent watercourse within the Humber River Watershed, originating at Lake Wilcox and flowing westward for approximately 18 km, where it passes under King-Vaughan Road.
- The river flows southward from King-Vaughan Road for approximately 15 km, where it converges with the Main Humber River.
- The Humber River watershed spans 903 km², from the headwaters on the Niagara Escarpment and Oak Ridges Moraine down through the fertile clay plains to the marshes and river mouth on Lake Ontario (TRCA, 2008).

TRCA, 2008
Background Studies Completed

Structural Investigation

- Existing King-Vaughan Road bridge is a single span arch structure carrying one lane of vehicle traffic across the East Humber River tributary.
- A visual inspection and detailed structural evaluation was completed for the bridge.
- The bridge has reached the end of its service life and is required to be replaced.
- Due to structural deterioration, the bridge was closed in Fall 2015. A temporary bridge was constructed overttop of the existing structure, to allow reopening of traffic to King-Vaughan Road, until a preferred design is determined.
Natural Environment

**Designated Natural Heritage Features:**
- The East Humber River Valleylands Environmentally Sensitive Area (ESA) lies south of the bridge, with forested habitat beginning approximately 100 m south of the bridge structure. No Provincially Significant Wetlands or Areas of Natural and Scientific Interest (ANSIs) are present within, or in proximity to, the Study Area.
- The Study Area is within a locally significant natural site, that provides crucial linkage of habitat along the City’s main valley land corridor for the migration of birds and animals.

**Ecological Land Classification:**
- Three natural vegetation community types were identified in the Study Area, with five distinct Ecological Landscape Classification (ELC) community types recorded. The Study Area consisted predominantly of Dry-Moist Old Field Cultural Meadow (CUM1-1).
- Trees present along the banks of the East Humber River tributary include Manitoba Maple and Hawthorn.

**Mammals:**
- Evidence of three mammal species was recorded (Coyote, Raccoon and White-tailed Deer) during the field investigations, which are common in urban and riparian habitats.
Background Studies Completed

Natural Environment

**Birds:**
- Bird inventories in June and July 2015 recorded 34 species, all of which are considered common breeders in Ontario and are representative of urban and riparian areas.

**Species At Risk (SAR):**
- Two avian SAR observed outside of the Study Area (Bobolink and Eastern Wood Pewee).
- Evidence of potential Bank Swallow or Northern Rough-Winged Swallow nest burrows were observed north of the Study Area.
- Bobolink and/or Eastern Meadowlark could potentially occur in the Study Area due to suitable habitat west of the bridge.
- Eastern Wood-Pewee could potentially occur in the Study Area due to the presence of forest edges.
- Barn Swallows may nest under the bridge; however no nest was observed at the time of surveys.
- Bank Swallows could occur in the area; however, the river banks within the Study Area are low and not typical of those used by the species.
Natural Environment

*Fish Community:*

- The East Humber River is considered occupied habitat for Redside Dace.
- 16 species of fish were recorded within the reach approximately 100 m south of King-Vaughan Road, and are indicative of a warm to cool water fish community in the summer.
- Rainbow trout, which is an introduced species, represented the only migratory salmonid species reported.
- Other species reported include American Brook Lamprey, Blacknose Dace, Common Shiner, Fantail Darter, Rainbow Darter, and Rock Bass.
Background Studies Completed

Hydraulic Assessment

- Hydrologic and hydraulic models have been obtained from the TRCA.
- Under existing conditions, the bridge only has the capacity to pass the 1:10 year event without overtopping.
- Under temporary conditions, there will be a nominal increase in flood elevation at the bridge, which rapidly dissipates upstream, without impacting any structures, and for which the City has approval from all of the impacted landowners.
- Subject to confirmation from the City, a rural arterial road is required to pass a 25 year event and a minimum freeboard requirement of 0.5m in accordance with the current MTO criteria.

Regional floodline showing existing and temporary flow increase during temporary works
Fluvial Geomorphic Assessment

- Fluvial geomorphic characterization was undertaken for the East Humber River to identify existing and recent historic channel conditions, erosion threshold indicators.

- The results of rapid assessment confirm generally good quality channel performance in terms of both stability and habitat. Scoring is relatively similar for both sides of the crossing.

- In areas where rooting reinforcement does not spread below the channel invert, the river bed has been subject to incision.

- Some channel widening is currently seen in undercuts where the upper banks are slightly cantilevered or rolled over the lower bank.

- The proposed opening width to satisfy geomorphic requirements is 16.4m. The proposed bankfull cross-section under the crossing is 9.4m wide.
Background Studies Completed

Archaeology

• A Stage 1 Archaeological Assessment was completed for the Study Area (approx. 4.56 ha).
• It was concluded that approx. 33.8% of the Study Area has low to no archaeological potential. The remainder of the Study Area (66.2%) exhibits archaeological potential, where a Stage 2 Archaeological Assessment is required prior to any form of land alteration.

Built Heritage and Cultural Heritage Assessment

• There were no heritage designated properties within one kilometre of the Study Area.
• The King-Vaughan Road Bridge is contextually associated with the Humber River and the Toronto Carrying-Place Trail, an important early historic trail connecting Lake Ontario with Holland River where dozens of pre-contact Aboriginal sites have been identified along its length.
Transportation and Traffic Study

- A Transportation and Traffic study was undertaken to examine the implications of keeping or removing the bridge.

- The study examined existing (2015) and forecast (2021) traffic conditions for King-Vaughan Road and Highway 27 with and without the crossing.

- The study noted a potential alignment for the GTA West Transportation Corridor crossing King-Vaughan Road and the Study Area.

- There were no reported collisions at the King-Vaughan Road Bridge.

Forecast Year 2021

- Very little traffic is forecast to use King-Vaughan Road in the year 2021 due to the alignment and discontinuity of the roadway.

- Should King-Vaughan Road Bridge be removed, it would adversely impact the operation of the Highway 27 and Kirby Road intersection, but improve conditions at the Highway 27 and King-Vaughan-Road intersection, assuming current roadway configurations and all traffic projected to use the crossing diverts to Kirby Road via Kipling Avenue and Highway 27. Planned future improvements to widen Highway 27 and expand the intersections would address these concerns.
Problem Statement

The following problem statement has been developed for this EA:

“Based on initial investigation and consultations, the following deficiencies and opportunities have been identified:

- Significant deteriorated structural condition;
- Sub-standard (single lane) width;
- Substandard hydraulics; and
- Opportunity to improve structure opening to enhance geomorphology.”
Planning Alternatives

The following planning alternatives have been identified for consideration in addressing the problems and opportunities discussed above:

**Planning Alternative 1:** Do Nothing: Leave the King-Vaughan Road Bridge over the East Humber River Tributary in its current state, recognizing that the existing bridge has been temporarily replaced through construction of a single lane temporary bridge over top of the existing structure. This alternative will result in continuing deterioration of the structure.

**Planning Alternative 2:** Rehabilitation of the Structure: Complete rehabilitation of the existing structure as required to maintain vehicular access with minimal disruption to traffic.

**Planning Alternative 3:** Replacement of the Structure: New two lane vehicle bridge using existing or alternative bridge alignment.

**Planning Alternative 4:** Remove Bridge Structure: This would interrupt continuous access of King-Vaughan Road from Hwy 27 to Pine Valley Drive. No new structure would be constructed and vehicular traffic will be diverted to north to King Road or south to Kirby Road.
## Planning Alternatives Assessment

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Legend: Least → Preference → Most

- **PREFERRED**
Based on the results provided the Planning Alternative Assessment table and the assessment of Alternatives, Planning Alternative 3: Replacement of the Structure: New two lane vehicle bridge using existing or alternative bridge alignment is recommended to be carried forward as the preferred planning alternative for assessment of design alternatives and preliminary design.

Associated Benefits

- Provide new bridge that meets current design standards
- Provide 2 lanes of Traffic
- Improves Hydraulic Capacity
- Provides opportunity to enhance geomorphology

With proper environmental constraint avoidance and mitigation planning, the benefits of Planning Alternative 3 outweigh its potential impacts to the natural and cultural environment. Further studies and impact assessment to the natural and cultural environment will be conducted during the detail design phase to minimize, mitigate, and compensate, as appropriate, for associated impacts.
Next Steps

- Receive public comments by **April 29, 2016**;
- Review and confirm preferred planning alternative and assessment in light of comments received from the public and agencies to date, and confirm or modify alternative;
- Develop alternative design concepts;
- Complete detailed impact analysis;
- Develop proposal for mitigation of negative effects;
- Technical advisory meeting No. 2;
- PIC No. 2, and
- Prepare and submit the Environmental Study Report.
We Would Like To Hear From You

Please complete the comment sheet and place in the Comment Box or send your comments by email/fax/letter to either of the following project team members by **April 29, 2016**.

You can view tonight’s information boards again on our website:  
[https://www.vaughan.ca/projects/engineering_projects/king_vaughan_road_bridge/Pages/default.aspx](https://www.vaughan.ca/projects/engineering_projects/king_vaughan_road_bridge/Pages/default.aspx)

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Thank you for your participation