Welcome to the First Public Information Centre

Ken Whillans Drive Extension and Downtown Drainage Improvements Class Environmental Assessment (EA) Study

July 9, 2008

You can participate in this Study by:

- Signing the attendance register
- Reviewing the display panels
- Asking questions and discussing your ideas with us
- Submitting your completed comment sheet by July 23, 2008
- Indicating on your comment sheet whether you would like to be added to the Study Mailing List.

FLOWER CITY
BRAMPTON.CA

Aquafor Beech Limited

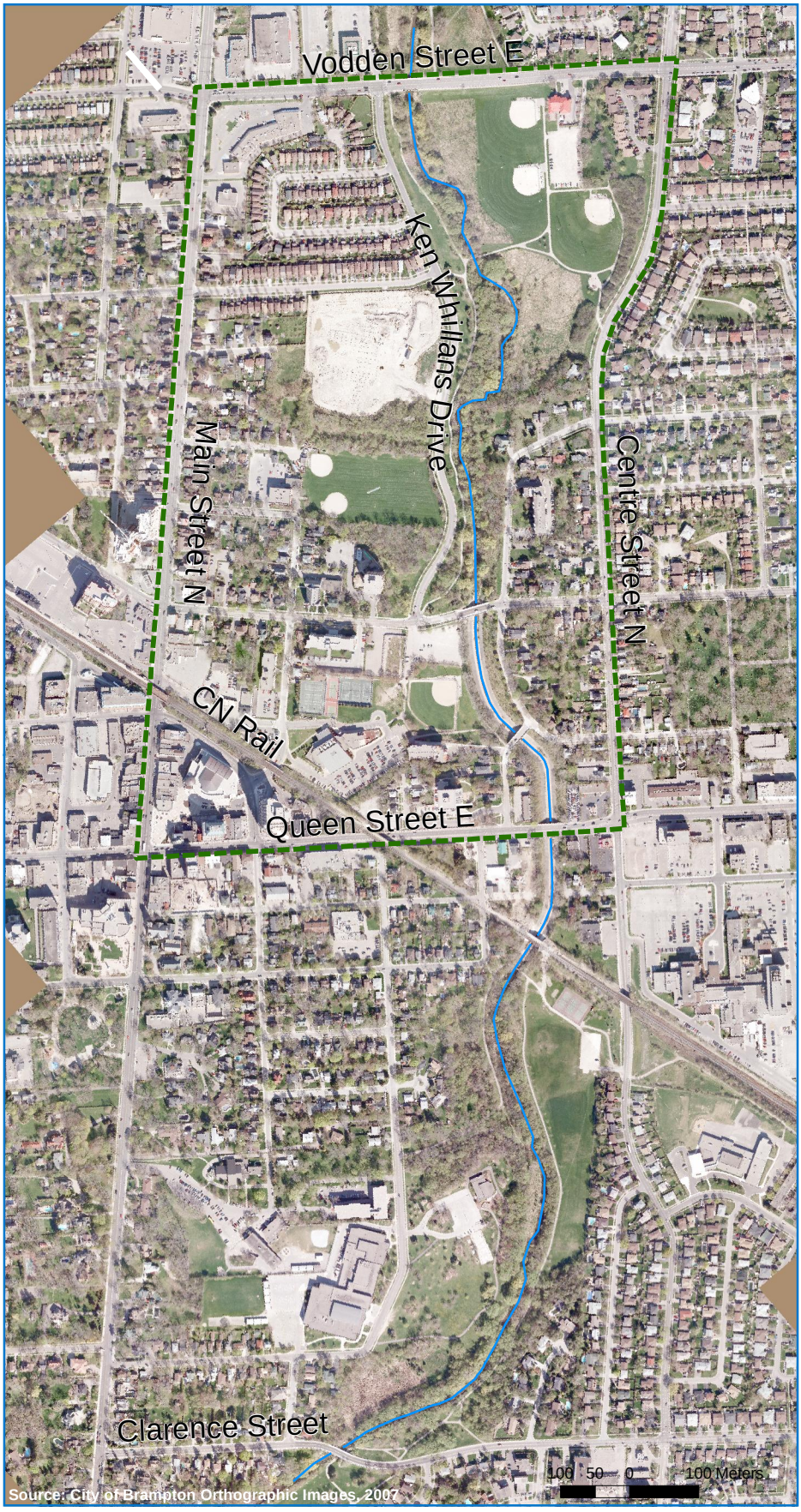
UMA | AECOM

Purpose of the First Public Information Centre

The purpose of the Public Information Centre (PIC) is to introduce the Study and provide interested and/or potentially affected stakeholders with an opportunity to participate in the planning process. This PIC is being held to present and receive public input on the following:

- Need and justification (i.e., problem or opportunity identification) for considering transportation and drainage improvements within downtown Brampton
- Existing conditions within the Study Area
- Recommended Evaluation Criteria for assessing Alternative Solutions
- Evaluation of Alternative Solutions to address the identified problem(s)
- Identification of a Preliminary Preferred Solution
- Potential benefits associated with the Preliminary Preferred Solution
- Future scheduled EA activities.

Study Area



FLOWER CITY BRAMPTON.CA

Aquafor Beech Limited

UMA | AECOM

Purpose of the Study

- The City of Brampton is responsible for implementing the required transportation improvements in a timely manner to accommodate population and employment growth.

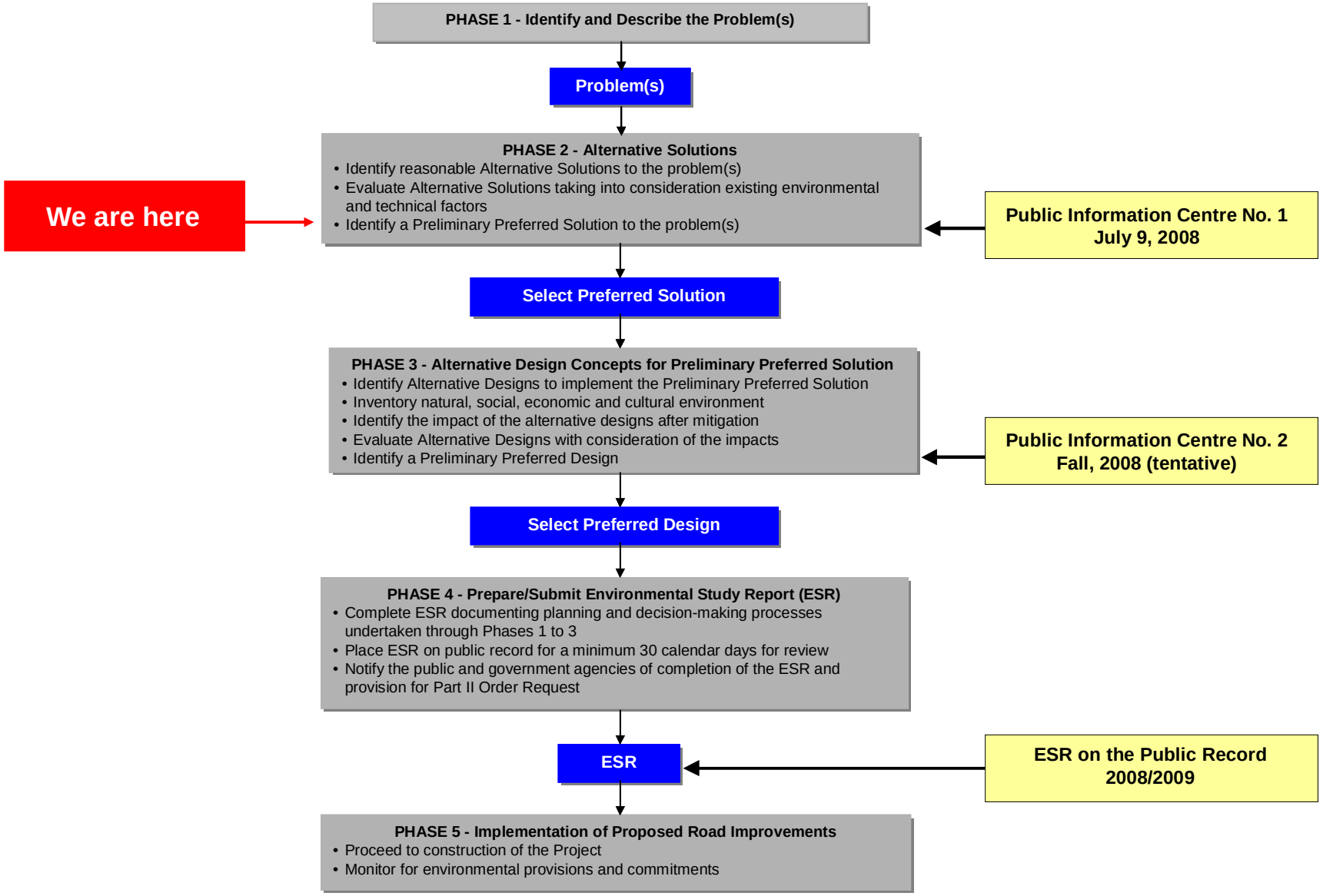
- In keeping with this responsibility, the City of Brampton has identified the need to consider an extension of Ken Whillans Drive in the area bounded by Church Street, Union Street and Nelson Street to address operational deficiencies and increased traffic demands as a result of intensified growth in the residential and employment population.

- As the potential road extension falls within the regulatory limits of Etobicoke Creek, the Study has been expanded to include consideration of drainage improvements for the downtown area.

- When considering new roads or major infrastructure improvements, the municipality is obligated to carry out a Class EA Study in accordance with the Municipal Engineers Association (MEA) Municipal Class EA process (October 2000, as amended in 2007). The Municipal Class EA is an approved process used to assess needs, evaluate options and recommend a solution.

- The purpose of this Study is to undertake a Schedule 'C' Class EA. Approved under the Ontario *Environmental Assessment Act*, the scope of a Schedule 'C' Class EA requires completion of Phases 1 through 4 of the Municipal Class EA process, as described on the next panel.

Schedule C Class EA Process



Planning Policy Framework

Places to Grow, Growth Plan (2006)

- Identifies a portion of the Brampton Central Area, including the lands subject to this Class EA Study, as part of an Urban Growth Centre
- Sets out specific targets for densities within the Urban Growth Centre based on the principals of intensification, supporting transit and active modes of transportation, and creating high-quality livable (healthy) and complete urban communities.

Forecasted Growth in Brampton (2008)

- Located within the Region of Peel, the City of Brampton is the third largest City within the Greater Toronto Area (GTA). As noted below, the City's population is projected to reach over 700,000 by the year 2031, which represents an increase of 266,000 (or approximately 58% between the existing (2006) population and 2031). As a result, forecasted housing and employment will increase by approximately 64% and 58% respectively.

	Existing (2006)	2011	2021	2031	Change (2006-2031)
Population	459,000	522,000	652,000	725,000	266,000
Housing	140,500	155,000	200,000	230,000	89,500
Employment	196,700	225,000	280,000	310,000	113,300

Source: City of Brampton, 2008

Planning Policy Framework (cont'd)

City of Brampton Official Plan (2006)

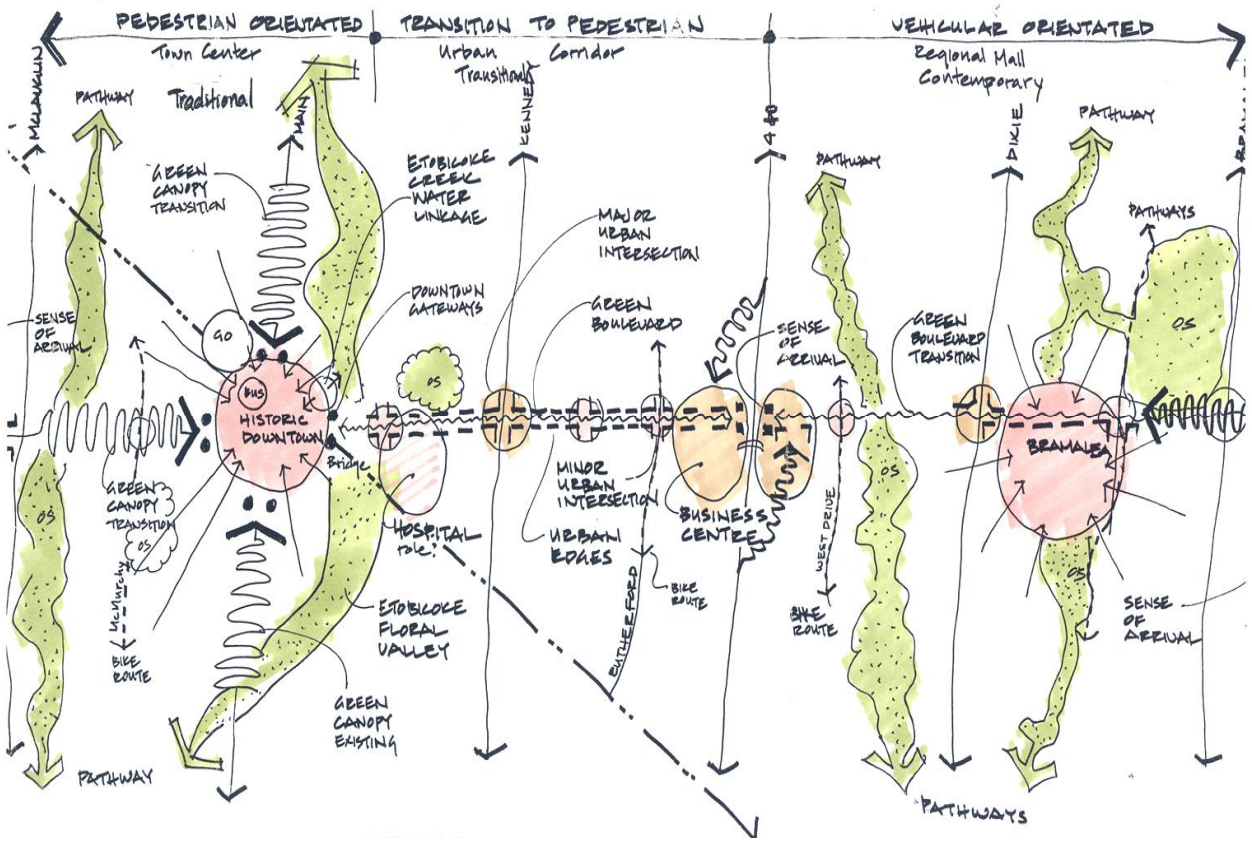
- Designates land use within the Study Area as Open Space, Residential, Major Institutional and Central Area Boundary
- The Study Area is situated within a Special Policy Area (SPA), which includes lands that have historically existed in the flood plain.

Downtown Brampton Secondary Plan, Area 7 (1998)

- Supports redevelopment of the Secondary Plan Area, generally bounded by Fletcher's Creek in the west, Etobicoke Creek in the east, Vodden Street in the north and Harold Street in the south
- Identifies the need for extensions to the road network, including 'the extension of Ken Whillans Drive south from its intersection with Nelson Street, with a possible connection to Maple Avenue'
- Promotes alternative transportation uses, such as a major rail line corridor extending south easterly from beyond Main Street to beyond Queen Street, rights-of-way for bicycle trails along the Main Street and Queen Street corridors, and high occupancy vehicle lanes and/or reserve bus lanes along the Main Street corridor northerly from Church Street to beyond Vodden Street.

Central Area Vision Document

The Central Area Vision was prepared and endorsed by Council in 2005. It is a high-level visionary document that evaluated the components of the Central Area and set out general principles for land use and urban design for the various identified precincts and character areas. This document sets the stage for the City's ongoing review and update of the land use planning framework for the Central Area, such as planning policy and urban design studies. It also provides a guide for other initiatives and projects undertaken by the City or private sector within the Central Area. The Vision document identified 3 precincts within the Central Area: Downtown, Queen Street Corridor and Bramalea City Centre.



FLOWER CITY
BRAMPTON.CA

Aquafor Beech Limited

UMA | AECOM

Downtown Precinct Vision

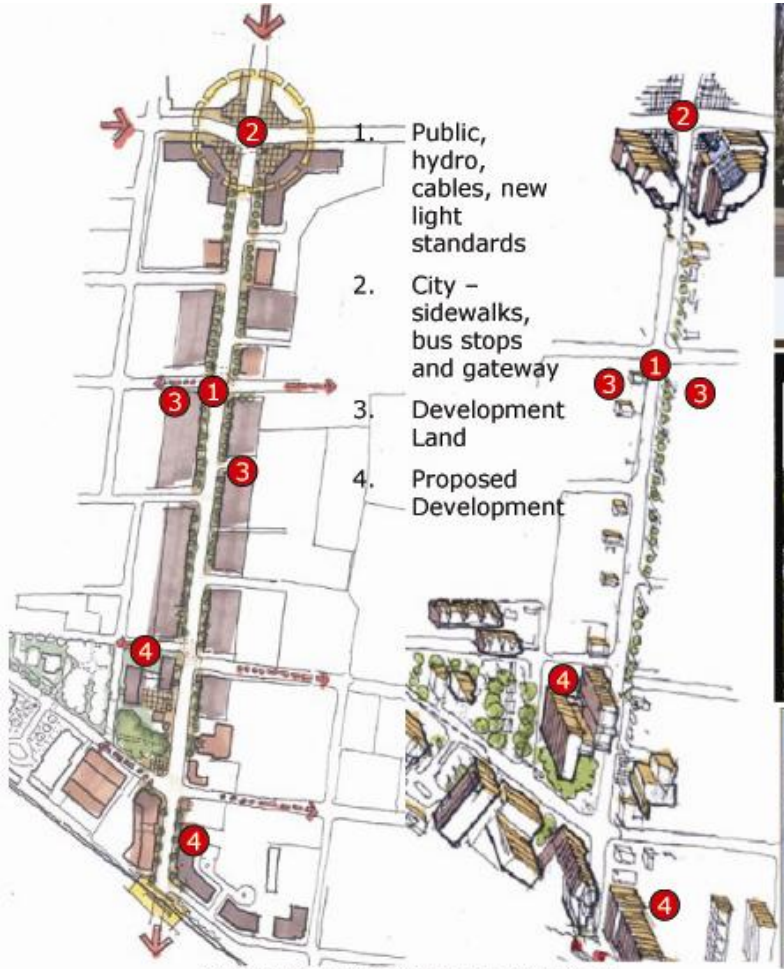
The Vision for the Downtown core builds on a well-established area, with a strong character, based on its urban tradition. The downtown will house the most important civic and cultural institutions, and public spaces. Downtown development emphasis will be on **quality and not quantity** (e.g., scale, height, mass) and will share the following goals:

- Reinforce the Downtown's role as a **destination,** with the most important **civic, institutional, cultural and entertainment facilities** supported by residential, commercial and employment functions
- Downtown's strength will be as a **creative centre**, a **liveable place** for entertainment, leisure, civic activities offering a variety of experiences 24/7 including niche market retail, and varied residential forms
- A **transit oriented, pedestrian friendly area**, with easy access for a variety of transit modes including cars, various types of transit, pedestrians, bikes and supportive built forms
- **Integrate built, natural and heritage elements** with new developments of mixed use, mid-rise, and street oriented built form with strong urban character and level of design
- New development will be balanced and **coherent** with **traditional forms** and details, and appropriate forms and building heights, with denser forms at key locations
- A complex **network of public spaces** in urban context will complement this character and the built form
- **Quality streetscapes**, gateways, comprehensive wayfinding and signage, and quality public art
- The reintroduction of **Etobicoke Creek** as a major character element integrated with the surrounding built form and open space system.

1. Four Corners
2. George Street
3. Train Station
4. **Main Street North**
5. **Rosalea Park/ Etobicoke Creek**
6. Hospital Site
7. John Street
8. Main Street South
9. Gum Factory/ Fairgrounds Area
10. Queen Street West
11. Queen Street East

Main Street North Vision

The Main Street North redevelopment will be based on building types integrating with the surrounding area character with higher intensity developments at the edges complemented by strong streetscape and the restoration of the canopy of trees and landscaping.



Sketch: Main Street North Looking North

Main Street North Vision

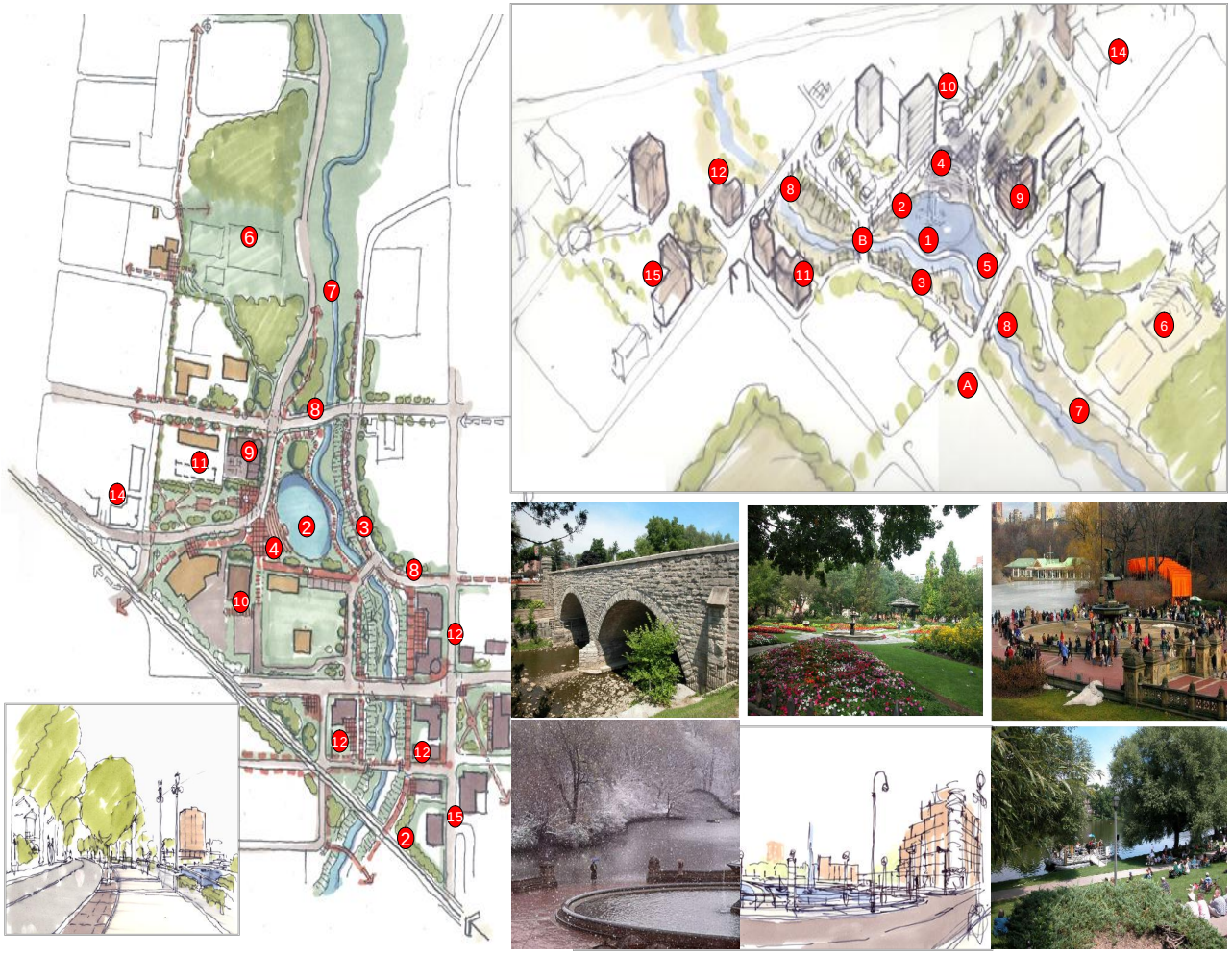
FLOWER CITY BRAMPTON.CA

Aquafor Beech Limited

UMA | AECOM

Rosalea / Etobicoke Creek Vision

Rosalea Park and Etobicoke Creek area's redevelopment will be based on the hidden treasure of the river and the reconfiguration of the channel, which will evolve in an urban park with attractive river walks, water features, bridges, heritage gardens, and public art, bordered by high quality built form of institutional and residential developments.



1. Rosalea Park shall be one of the major assets to strengthen Downtown.
2. Excellent opportunity to expand Downtown with water, nature and variety of open space.
3. Built form shall front onto water pond and compliment space.
4. Channel reconfigured in more naturalized form (low area dug-up and development with water and storage).
5. Create River walk.
6. Variety of open space – Urban parks, culture, active, nature, patios, terrace.
7. Open creek to Downtown.
8. Connect and provide access for pedestrians, police, cars, trucks.
9. Strengthen quality and character of urban park,
10. Use Built Form as key points to define, frame, and act as Land or Agriculture Focal Elements.
11. Provide variety of Quality Open Space for event spots, gatherings and linear walkways.
12. Theme - Water, Nature, Lost River.
13. Views, Vistas, Markers.
14. Purchase Land and expand Creek side walk-way.
15. Technical Studies: Reduce flood area, increase storage.
16. Heritage, Art, Culture.

Transportation and Transit Master Plan (2004)

- Identifies a need for the extension of Ken Whillans Drive from Church Street to Nelson Street

- Promotes additional road connections across freeways and “bypasses” of key nodal intersections. In the instance of the Ken Whillans Drive extension, the key nodal intersection is the Main Street/Queen Street intersection

- Identifies transit improvements, such as the Queen Street AcceleRide Bus Rapid Transit Program and the Hurontario Street Higher Order Transit Study. As a result, the implementation of transit improvements may potentially reduce vehicular capacity on Queen Street and Main Street in the heart of downtown Brampton.

Transportation/Traffic Study (2008)

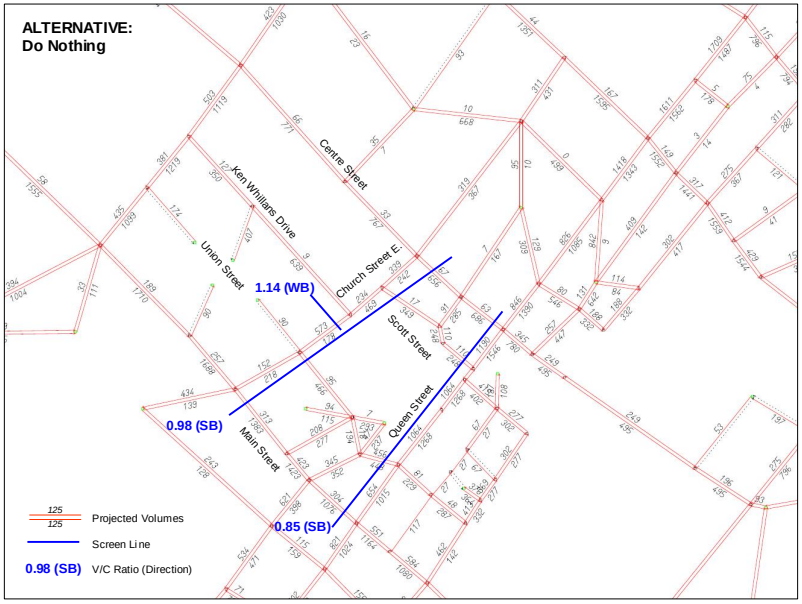
Purpose of the Transportation/Traffic Study

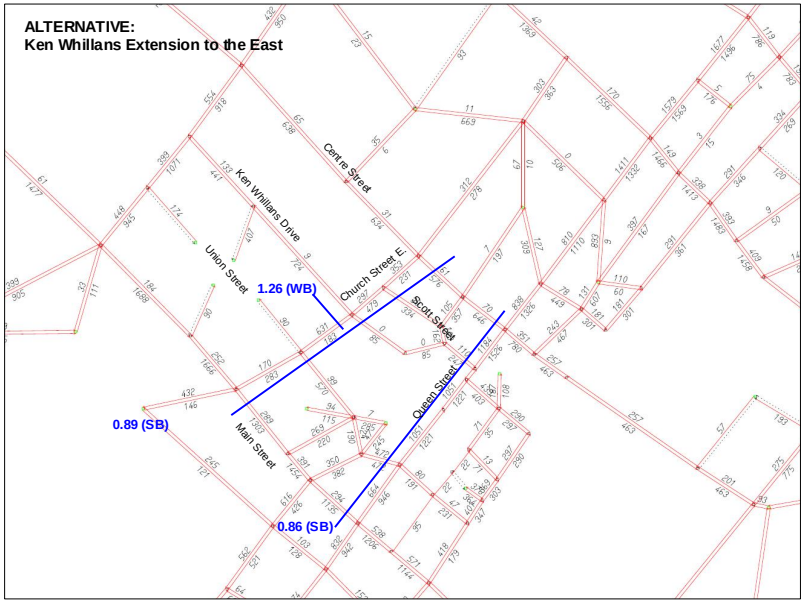
- As part of this EA project, a Transportation/Traffic Study was undertaken to:
  - identify the need and provide justification for the extension of Ken Whillans Drive from a transportation/traffic perspective; and,
  - identify and assess potential options in terms of road network connectivity and possible alignment of the proposed extension.
- During Phase 3 of this Class EA, the Transportation/Traffic Study will be incorporated into the assessment of alternative design concepts for the proposed extension.

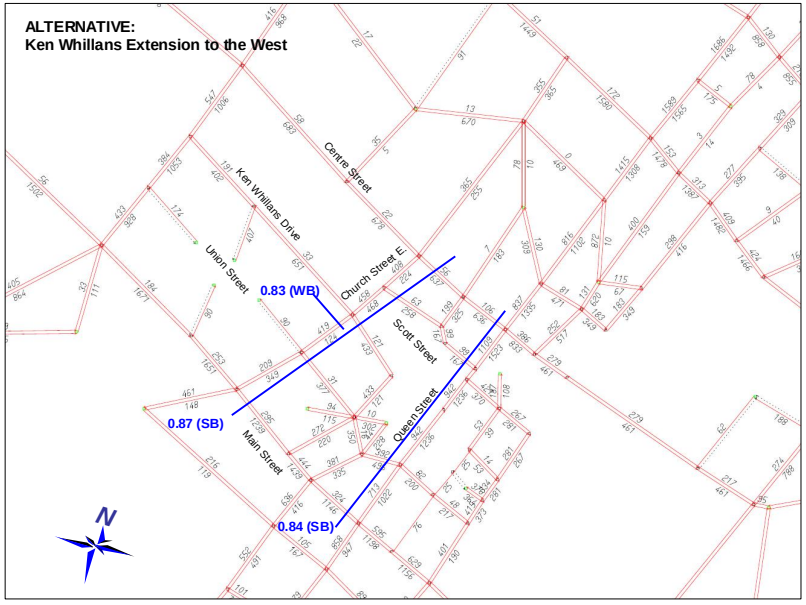
Results of the Transportation/Traffic Study

- Need for the extension of Ken Whillans Drive is justified as it provides additional capacity and connectivity to the road network within the Central Area of Brampton
- The new element (or link) within the downtown road network would provide an opportunity to better reflect and accommodate existing and future traffic patterns as the network is established (completed) in the downtown area
- The extension will complete a “missing” link in the downtown road network (north-south grid) and provide an alternative route to the already congested Main Street.

Transportation Model Assessment Network Alternatives







Screenline Analysis Results

Volume to Capacity (V/C) Ratios

Definitions:

Screenline - A cordon line crossing all roads carrying traffic in a specific direction within the assumed area (e.g. east-west screen line crosses all north-south roads)

Volume - Projected traffic volume (number of vehicles) passing a link of roadway during a specific period of time (usually a peak hour)

Capacity - Maximum volume of traffic the roadway link is able to pass during one hour (depends on roadway configuration – number of traffic lanes)

Screen line V/C - traffic volumes and road capacities of all roads crossed are added and compared (value =/> 1.0 indicates that traffic volume is higher than available capacity)

Based on the Transportation Model Analysis – Forecasted AM Peak Hour Traffic Volumes (2031 land use, population and employment).

FLOWER CITY BRAMPTON.CA

Aquafor Beech Limited

UMA | AECOM

Need and Justification for Ken Whillans Drive Extension

- Ken Whillans Drive is a north-south local collector road parallel to Main Street between Vodden Street East in the north and Church Street East in the south. Aside from the limited length of Union Street, Ken Whillans Drive is the only roadway providing north-south connectivity for the lands between Main Street and Etobicoke Creek.
- The potential reduction in vehicular capacity on Main Street and Queen Street as a result of future transit improvements will place a greater emphasis on the need to provide alternative routes for vehicular traffic to bypass the Main Street and Queen Street intersection. The extension of Ken Whillans Drive is anticipated to be an important link in the local road network as it provides continuity in the north-south direction. In addition, the extension of Ken Whillans Drive may be considered as a potential link within the City's Pathways Master Plan.
- The intersection of Queen Street and Main Street experiences a relatively high volume to capacity (v/c) ratio, indicating that certain road sections are approaching capacity levels for the existing intersection configuration. Further increases in traffic volumes would lead to congested conditions at this intersection.
- Based on the traffic analysis carried out for this Study, the extension of Ken Whillans Drive would attract a substantial volume of traffic (approximately 400 vehicles in peak direction), which would reduce traffic along Main Street, along Church Street, and from the Main Street and Queen Street intersection.
- From a traffic perspective, the southerly extension of Ken Whillans Drive is justified as this option completes a 'missing' link in the downtown road network and provides an alternative route to the already congested Main Street.

Existing Hydraulic Conditions

History

- The Etobicoke Creek bypass channel was built through downtown Brampton in the early 1950's in response to frequent flooding of the downtown area.
- The bypass consists of a concrete channel, approximately 600 m long and 22 m wide, extending from Church Street to the Canadian National Railway (CNR) line.
- No flooding from Etobicoke Creek has been experienced in downtown Brampton since the bypass channel was constructed. However, a significant portion of the area remains within the Regulatory floodplain of the creek.
- The Regulatory floodplain represents the lands which would be inundated due to flooding from large storm events such as the Regional Storm event. In this area of Southern Ontario, the Regional Storm is Hurricane Hazel.

Spring Runoff

Low Flow

Existing Hydraulic Conditions (cont'd)

Downtown Brampton Special Policy Area (SPA)

- In the 1980's, the flood-susceptible area of downtown Brampton was designated as a "Special Policy Area" (SPA).
- New development in the SPA must endeavor to provide as high a level of flood protection as is possible, up to the Regulatory Flood.

Results of Hydraulic Assessment (2008)

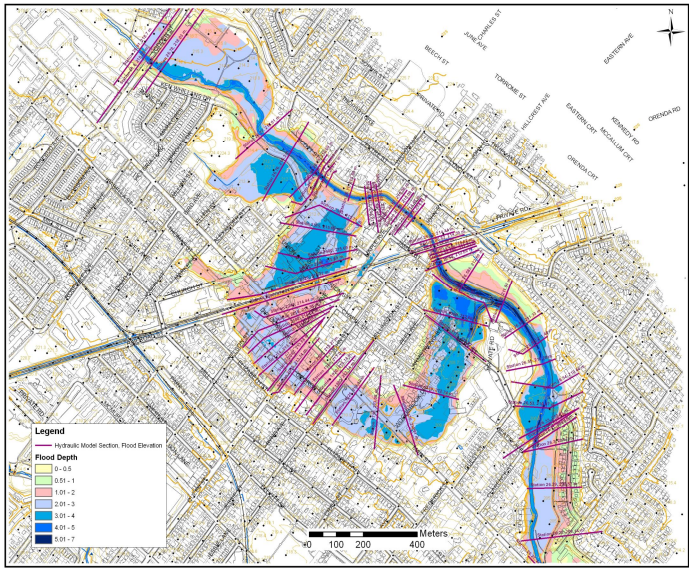
Existing Conditions for Large Storm Events

- Hydraulic modelling indicates that floodwaters begin to spill into downtown Brampton near the intersection of Ken Whillans Drive and Church Street, as the flow in Etobicoke Creek approaches the 100-year return period flood.

- In the extreme case of the Regional Storm flood, Hurricane Hazel, nearly half of the total flow in Etobicoke Creek would spill through downtown Brampton.

- Flood flows in downtown Brampton would flow southwest from the Rosealea Park area, southward down George Street and Main Street past Gage Park, then southeast, rejoining the main channel of Etobicoke Creek near Mary Street.

- Currently, approximately 38.5 hectares of land in downtown Brampton are located within the Regulatory Floodplain of Etobicoke Creek.



FLOWER CITY
BRAMPTON.CA

Aquafor Beech Limited

UMA | AECOM

Problem and Opportunity Statement

(i) The downtown area is expected to experience intensified growth in population and employment. In addition, transit improvements are proposed on Main Street and Queen Street which could result in the reduction of lane capacity for vehicles on these roadways.

The existing road network in this area has limited north-south connectivity. As a result, major roads such as Main Street are operating at near capacity and will become fully congested as traffic volumes increase in the future.

As presently configured, the north-south road network in the immediate and surrounding area for Ken Whillans Drive will not be able to accommodate the travel demands and growth anticipated over the next 25 years.

(ii) The Study Area for the proposed extension of Ken Whillans Drive is situated within the floodplain area regulated by the TRCA. Under existing conditions for large storm events, flood flows begin to spill into the downtown area at a low point immediately north of Rosalea Park near the intersection of Church Street and Ken Whillans Drive. The potential extension of Ken Whillans Drive beyond its intersection with Church Street presents an opportunity to co-ordinate potential downtown drainage improvements with the proposed road network improvements.

Existing Environmental Conditions

Natural Environment

- Etobicoke Creek flows parallel to Ken Whillans Drive, on the east side, and is conveyed through a concrete bypass channel (approximately 600 m long and 22 m wide) from Church Street in the north to the CNR line in the south
- Etobicoke Creek provides habitat for a number of fish species, such as the White Sucker (*Catostomus commersonii*), Common Shiner (*Notropis cornutus*), Blacknose Dace (*Rhinichthys atratulus*), Longnose Dace (*Rhinichthys cataractae*), Creek Chub (*Semotilus atromaculatus*), Fantail Darter (*Etheostoma flabellare*), and Johnny Darter (*Etheostoma nigum*)
- Study Area provides habitat for opportunistic wildlife species (e.g., birds, reptiles, amphibians, and mammals)
- Natural cover in proximity to Etobicoke Creek is comprised of forest/woodland, marsh, meadow, and manicured lawn
- A number of urban trees are situated along Ken Whillans Drive and beyond its intersection with Church Street, as well as at the north end of Scott Street.

Existing Environmental Conditions (cont'd)

Socio-Economic Environment

- Ken Whillans Drive passes through an urbanized setting, comprised of commercial, recreational and residential land uses
- The area considered for the possible road extension passes through or in proximity to the Church Street Parking Lot, Rosalea Park, Brampton Tennis Club, Brampton YMCA, and a Senior's Residence
- Ken Whillans Drive is a school bus route for both Public and Separate School Boards.

Cultural Environment

- Study Area has low archaeological potential due to previous disturbances
- Heritage features include the bank of Etobicoke Creek in the vicinity of the Church Street Bridge as well as properties on Scott Street, Church Street, among others.

Transportation Alternatives

Alternative 0: Do Nothing

- No changes to the existing road network

Alternative 1: Limit Development or Redevelopment

- Limit growth in downtown Brampton

Alternative 2: Implementation of Transportation System / Demand Management

- Transportation System / Demand Management involves strategies to optimize road network capacity (e.g., adding High Occupancy Vehicle (HOV) lanes) or influence trip patterns (e.g., promoting the use of public transit, ride sharing, cycling and walking)

Alternative 3: Improvements to Alternative Modes of Transportation

- Enhanced transportation services to encourage the use of transit, cycling and pedestrian modes of travel over the automobile

Alternative 4: Intersection and Operational/Safety Improvements

- Localized improvements at key intersections, such as at Main Street and Queen Street and/or Church Street (e.g., additional turning lanes)

Alternative 5: Improve other Roads

- Redistribute traffic by improving access and through flow on other existing roadways, such as Main Street, Church Street, etc.

Alternative 6: Ken Whillans Drive Extension from Church Street to Nelson Street

- An extension of Ken Whillans Drive from Church Street to Nelson Street

Alternative 7: Ken Whillans Drive Extension from Church Street to Scott Street

- An extension of Ken Whillans Drive from Church Street to Scott Street

Recommended Evaluation Criteria for Transportation Alternatives

The following preliminary list of Evaluation Criteria (or Factors) are recommended to evaluate Transportation Alternatives:

Natural Environment
- Terrestrial Impacts
  (e.g., Vegetation Removal)
- Fisheries Impacts
  (e.g., Fish and Fish Habitat)

Social Environment
- Property Impacts
  (e.g., Property Acquisition, Building Removal)
- Access Impacts
  (e.g., Property Entrances, Increased Traffic)
- Aesthetic Impacts
  (e.g., Noise, Visual)
- Construction Disruption
  (e.g., Traffic, Dust)
- Compatibility with Planning Policies
  (e.g., Official Plan, Secondary Plan)

Cultural Environment
- Heritage Potential
- Archaeological Potential

Economic Environment
- Cost Implications
  (e.g., Construction, Operating/Maintenance)

Engineering Environment
- Road Network Capacity / Flexibility
- Traffic Operations / Safety
- Stormwater Management
- Utility Impacts

Evaluation of Transportation Alternatives

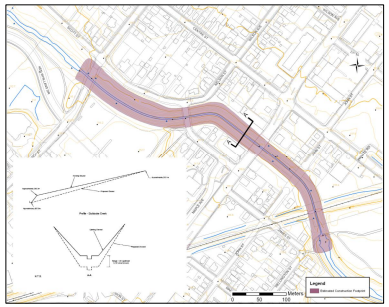
Criteria \ Alternatives	Do Nothing	Limit Development or Redevelopment	Implementation of Transportation System/Demand Management	Improvements to Alternative Modes of Transportation	Intersection and Operational/Safety Improvements	Improve other Roads	Ken Whillans Drive Extension (Church to Nelson)	Ken Whillans Drive Extension (Church to Scott)
Natural Criteria								
Terrestrial Impacts	**Preferred:** Vegetation removal is not required.	**Preferred:** Vegetation removal is not required.	**Partially Preferred:** Localized impacts on existing roadside vegetation.	**Partially Preferred:** Localized impacts on existing roadside vegetation.	**Partially Preferred:** Localized impacts on existing roadside vegetation.	**Partially Preferred:** Localized impacts on existing roadside vegetation.	**Partially Preferred:** Removal of some roadside vegetation is required.	**Least Preferred:** Removal of some roadside vegetation is required, including a number of mature trees in the vicinity of Etobicoke Creek and Scott Street.
Fisheries Impacts	**Preferred:** No in-stream works are required.	**Preferred:** No in-stream works are required.	**Preferred:** No in-stream works anticipated.	**Preferred:** No in-stream works are anticipated.	**Preferred:** No in-stream works anticipated.	**Partially Preferred:** Some in-stream works may be required, depending on the proposed road improvements.	**Preferred:** No in-stream works anticipated.	**Partially Preferred:** No in-stream works anticipated. Road construction in close proximity to Etobicoke Creek.
Social Criteria								
Property Impacts	**Preferred:** No impact on properties.	**Preferred:** No impact on properties.	**Partially Preferred:** Property takings may be required, depending on the proposed measures or modes.	**Partially Preferred:** Property takings may be required, depending on the proposed measures or modes.	**Partially Preferred:** Property takings may be required, depending on the proposed intersection improvements.	**Partially Preferred:** Property takings may be required, depending on the proposed road improvements.	**Least Preferred:** Property takings will be required, which will affect both residential and recreational land uses.	**Least Preferred:** Property takings will be required, which will affect both residential and recreational land uses.
Access Impacts	**Preferred:** No impact on access or existing property entrances.	**Preferred:** No impact on access or existing entrances.	**Partially Preferred:** Property access and existing entrances may need to be removed or relocated, depending on the proposed measures or modes.	**Partially Preferred:** Property access and existing entrances may need to be removed or relocated, depending on the proposed measures or modes.	**Partially Preferred:** Property access and existing entrances may need to be removed or relocated, depending on the proposed intersection improvements.	**Partially Preferred:** Property access and existing entrances may need to be removed or relocated, depending on the proposed road improvements.	**Partially Preferred:** Some access and entranceways to existing properties adjacent to or along the path of the extended roadway will need to be removed or relocated. Potential to enhance/improve access to existing recreational facilities.	**Least Preferred:** Some access and entranceways to existing properties adjacent to or along the path of the extended roadway will need to be removed or relocated.
Aesthetic Impacts	**Preferred:** No aesthetic impacts.	**Preferred:** No aesthetic impacts.	**Partially Preferred:** Localized aesthetic impacts, depending on the proposed measures or modes.	**Partially Preferred:** Localized aesthetic impacts, depending on the proposed measures or modes.	**Partially Preferred:** Localized aesthetic impacts, depending on the proposed intersection improvements.	**Partially Preferred:** Localized aesthetic impacts, depending on the proposed road improvements.	**Partially Preferred:** Temporary impact on aesthetics along the extent of new roadway during construction.	**Partially Preferred:** Temporary impact on aesthetics along the extent of new roadway during construction.
Construction Disruption	**Preferred:** No construction disruption.	**Preferred:** No construction disruption.	**Partially Preferred:** Localized construction disruption.	**Partially Preferred:** Localized construction disruption.	**Partially Preferred:** Localized construction disruption.	**Partially Preferred:** Localized construction disruption.	**Least Preferred:** Construction disruption due to increased noise, dust, traffic delays, and access modifications (short term impact only).	**Least Preferred:** Construction disruption due to increased noise, dust, traffic delays, and access modifications (short term impact only).
Compatibility with Sustainable Growth and Planning Policies	**Least Preferred:** Not consistent with the Official Plan, Downtown Secondary Plan, Transportation and Transit Master Plan, Provincial Growth Plan, and Rosalea/Etobicoke Creek Vision.	**Least Preferred:** Not consistent with the Official Plan, Downtown Secondary Plan, Transportation and Transit Master Plan, Provincial Growth Plan, and Rosalea/Etobicoke Creek Vision.	**Preferred:** Consistent with the Official Plan, Downtown Secondary Plan, Transportation and Transit Master Plan, and Provincial Growth Plan.	**Preferred:** Consistent with the Official Plan, Downtown Secondary Plan, Transportation and Transit Master Plan, and Provincial Growth Plan. Potentially contributes to the Rosalea/Etobicoke Creek Vision.	**Preferred:** Consistent with the Official Plan, Downtown Secondary Plan, Transportation and Transit Master Plan, and Provincial Growth Plan. Potentially contributes to the Rosalea/Etobicoke Creek Vision.	**Preferred:** Consistent with the Official Plan, Downtown Secondary Plan, Transportation and Transit Master Plan, and Provincial Growth Plan. Potentially contributes to the Rosalea/Etobicoke Creek Vision.	**Preferred:** Consistent with the Official Plan, Downtown Secondary Plan, Transportation and Transit Master Plan, and Provincial Growth Plan. Potentially contributes to the Rosalea/Etobicoke Creek Vision.	**Preferred:** Consistent with the Official Plan, Downtown Secondary Plan, Transportation and Transit Master Plan, and Provincial Growth Plan. Does not contribute to Rosalea/Etobicoke Creek Vision.
Cultural Criteria								
Heritage Potential	**Preferred:** No impact on heritage property.	**Preferred:** No impact on heritage property.	**Preferred:** Impact on heritage properties is not anticipated or can be avoided.	**Preferred:** Impact on heritage properties is not anticipated or can be avoided.	**Preferred:** Impact on heritage properties is not anticipated or can be avoided.	**Preferred:** Impact on heritage properties is not anticipated or can be avoided, depending on the proposed road improvements.	**Partially Preferred:** Impact on heritage properties is not anticipated or can be avoided.	**Least Preferred:** Property on Scott Street is designated by the City of Brampton as a “Category B: Significant [Heritage] Feature”.
Archaeological Potential	**Preferred:** No physical ground disturbance is required.	**Preferred:** No physical ground disturbance is required.	**Partially Preferred:** Affects previously disturbed Rights-of-Way.	**Partially Preferred:** Potential for physical ground disturbance.	**Partially Preferred:** Affects previously disturbed Rights-of-Way.	**Partially Preferred:** Affects previously disturbed Rights-of-Way.	**Partially Preferred:** Construction will occur within a previously disturbed area.	**Partially Preferred:** Construction will occur within a previously disturbed area.
Economic Criteria								
Construction Costs	**Preferred:** No cost to implement.	**Preferred:** No cost to implement.	**Least Preferred:** Cost to implement is high.	**Least Preferred:** Cost to implement is high.	**Partially Preferred:** Cost to implement is moderate.	**Least Preferred:** Cost to implement is high.	**Least Preferred:** Cost of construction, property acquisition and possible utility relocation is high.	**Least Preferred:** Cost of construction, property acquisition and possible utility relocation is high.
Maintenance Costs	**Preferred:** No maintenance cost.	**Preferred:** No maintenance cost.	**Partially Preferred:** Cost to maintain and operate is moderate.	**Partially Preferred:** Cost to maintain and operate is moderate.	**Partially Preferred:** Cost to maintain and operate is moderate.	**Partially Preferred:** Cost to maintain and operate is moderate.	**Partially Preferred:** Cost to maintain and operate is moderate.	**Partially Preferred:** Cost to maintain and operate is moderate.
Engineering Criteria								
Road Network Capacity/Flexibility	**Least Preferred:** Does not provide north-south connectivity in local road network.	**Least Preferred:** Does not provide north-south connectivity in local road network.	**Least Preferred:** Does not provide north-south connectivity in local road network.	**Least Preferred:** Does not provide north-south connectivity in local road network.	**Least Preferred:** Does not provide north-south connectivity in local road network.	**Least Preferred:** Does not provide north-south connectivity in local road network.	**Preferred:** Provides north-south connectivity in local road network.	**Preferred:** Provides north-south connectivity in local road network.
Traffic Operations and Safety	**Least Preferred:** Does not alleviate traffic congestion on local arterial roadways.	**Least Preferred:** Does not alleviate traffic congestion on local arterial roadways.	**Least Preferred:** Does not alleviate traffic congestion on local arterial roadways.	**Least Preferred:** Does not alleviate traffic congestion on local arterial roadways.	**Least Preferred:** Does not alleviate traffic congestion on local arterial roadways (limited improvement).	**Partially Preferred:** May alleviate traffic congestion on local arterial roadways, however can result in the redistribution of traffic and hence introduce congestion on other roads within the network. Does not resolve local traffic problems.	**Preferred:** Potential to alleviate traffic congestion on local arterial roadways.	**Partially Preferred:** Potential to alleviate traffic congestion on local arterial roadways. Residents on Scott Street will be exposed to additional traffic.
Stormwater Management	**Preferred:** No impacts on stormwater management.	**Preferred:** No impacts on stormwater management.	**Partially Preferred:** Some impact on stormwater management is anticipated.	**Partially Preferred:** Some impact on stormwater management is anticipated.	**Partially Preferred:** Some impact on stormwater management is anticipated.	**Partially Preferred:** Some impact on stormwater management is anticipated.	**Partially Preferred:** Some impact on stormwater management is anticipated.	**Partially Preferred:** Some impact on stormwater management is anticipated.
Utility Impacts	**Preferred:** No need for utility relocation.	**Preferred:** No need for utility relocation.	**Partially Preferred:** Utility relocation may be required, depending on the proposed measures or modes.	**Partially Preferred:** Utility relocation may be required, depending on the proposed measures or modes.	**Partially Preferred:** Utility relocation may be required, depending on the proposed intersection improvements.	**Partially Preferred:** Utility relocation may be required, depending on the proposed road improvements.	**Least Preferred:** Utility relocation will be required.	**Least Preferred:** Utility relocation will be required.
Overall Results	**Carried forward** ▪ Does not solve Problem. ▪ Carried forward for comparison purposes only.	**Not carried forward** ▪ Does not solve Problem. ▪ Continue with implementation of Sustainable Growth and Planning Policies.	**Not carried forward** ▪ Does not solve Problem in short term. ▪ Continue ongoing initiatives.	**Not carried forward** ▪ Does not solve Problem in short term. ▪ Continue ongoing initiatives.	**Not carried forward** ▪ Does not solve Problem. ▪ Continue to assess intersection operations for future improvements.	**Not carried forward** ▪ Does not solve Problem. ▪ Significant impacts to properties as existing Right-of-Way width is insufficient for widening.	**Carried forward** ▪ Solves Problem. ▪ Assess Design Concepts.	**Not carried forward** ▪ Solves Problem. ▪ Greater impact on natural, social, and cultural environments.

Impacts are measured as Least Preferred, Partially Preferred or Preferred based on the anticipated environmental effects associated with construction. In this regard, a rating of Least Preferred has the greatest anticipated negative impact, while a rating of Preferred has the least anticipated negative impact.

Drainage Improvement Alternatives

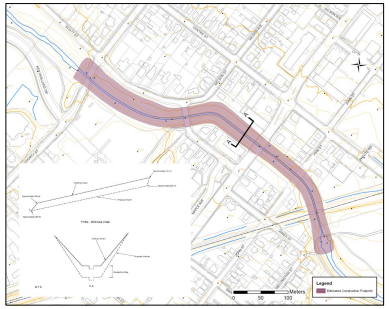
Alternative 1. Re-grade/Steepen the existing concrete bypass channel

- Remove existing 2 m drop structure at the downstream end of the bypass channel
- Re-grade concrete channel with a steeper profile
- Construction zone would be limited to the existing concrete channel width, from just downstream of the existing drop structure to just upstream of Church Street.



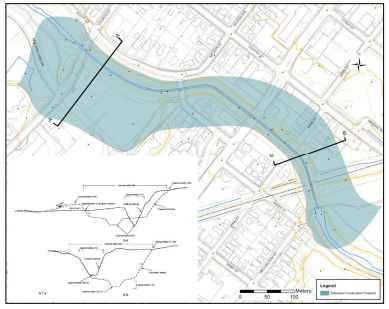
Alternative 2. Deepen the existing concrete bypass channel

- Lower or “deepen” the existing concrete channel by approximately 2 m throughout
- Create new 2 m drop structure at the upstream end of the bypass channel
- Construction zone would be limited to the existing concrete channel width, from just downstream of the existing drop structure to just upstream of Church Street.



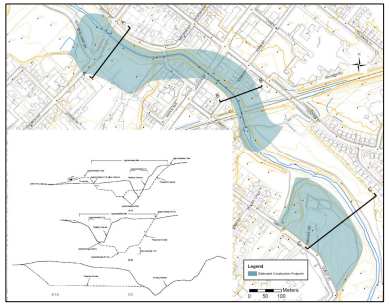
Alternative 3. Re-construct the bypass channel as a wide, natural channel

- Removal of existing concrete bypass channel through downtown Brampton
- Construct a new wider natural channel
- Construction zone would include all lands required for a new 90 m wide valley from downstream of the existing bypass outlet to upstream of Church Street, together with any associated grading to match existing ground elevations
- Requires replacement of four bridge crossings (CNR, Queen St., Scott St., Church St.) with new structures that span the wider 90 m valley.



Alternative 4. Re-construct the bypass channel as a wide, natural channel and widen the downstream valley adjacent to Mary Street

- Same as Alternative 3, but also includes grading works to widen the valley adjacent to Mary Street
- Includes the removal of the existing building and widening of the valley by roughly 150 m through this reach.



FLOWER CITY
BRAMPTON.CA

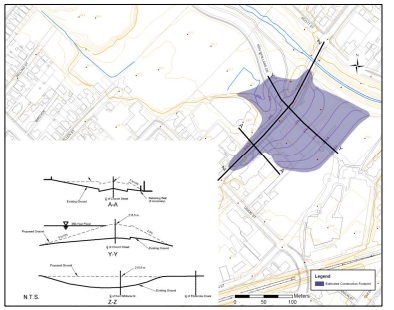
Aquafor Beech Limited

UMA | AECOM

Drainage Improvement Alternatives

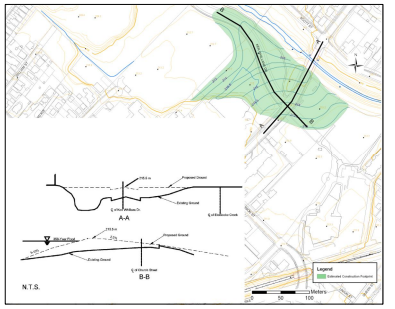
Alternative 5a – Flood protection landform along Church Street

- Re-grading Church Street and the surrounding area in order to raise the ground elevation at this location and reduce the frequency of spilling into downtown
- Gentle grading to raise the profile of Church Street by up to roughly 1.5 m to 2 m
- Gentle slopes of roughly 5-10% on the upstream (i.e., “wet”) side of the landform, and slopes of roughly 2.5% on the downstream (i.e., “dry”) side of the landform
- Construction zone would consist of all lands on which fill would be placed to create the landform.



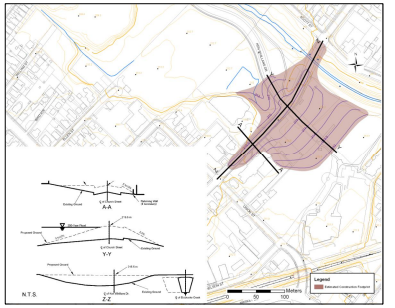
Alternative 5b – Flood protection landform across Ken Whillans Drive

- Same as Alternative 5a, except the crest of the landform feature would be located across Ken Whillans Drive, approximately 100 m north of Church Street
- Gentle grading to raise the existing ground by up to roughly 1.5 m to 2 m
- Gentle slopes of roughly 5-10% on the upstream (i.e., “wet”) side of the landform, and slopes of roughly 2.5% on the downstream (i.e., “dry”) side of the landform
- Construction zone would consist of all lands on which fill would be placed to create the landform.



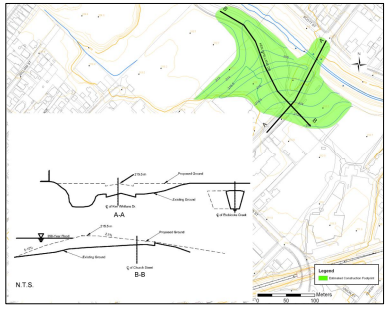
Alternative 6a – Flood protection landform along Church Street and widen bridge at Church Street

- Includes all of the work described above for Alternative 5a to construct a landform feature along Church Street
- Includes widening the Church Street bridge over the bypass channel; wider bridge opening would be roughly twice the span of the current bridge
- Construction zone would include all lands within the construction zone for Alternative 5a, and the lands which will require grading works to transition the channel into, and out of, the new bridge.



Alternative 6b – Flood protection landform across Ken Whillans and widen bridge at Church Street

- Includes all of the work described above for Alternative 5b to construct a landform feature across Ken Whillans Drive
- Includes widening the Church Street bridge over the bypass channel; wider bridge opening would be roughly twice the span of the current bridge
- Construction zone would include all lands within the construction zone for Alternative 5b, and the lands which will require grading works to transition the channel into, and out of, the new bridge.



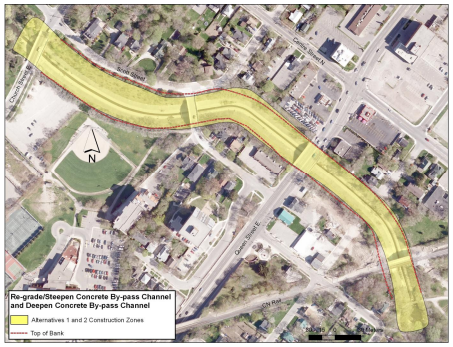
FLOWER CITY BRAMPTON.CA

Aquafor Beech Limited

UMA | AECOM

Drainage Improvement Alternatives

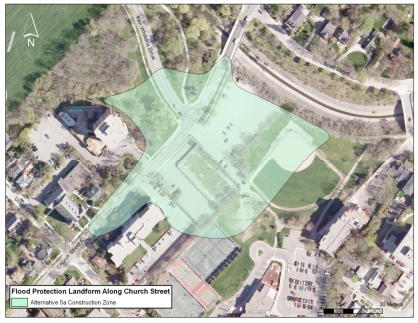
Alternatives 1 and 2



Alternative 3

Alternative 4

Alternative 5a



Alternative 5b

Alternative 6a

Alternative 6b

FLOWER CITY
BRAMPTON.CA

Aquafor Beech Limited

UMA | AECOM

Recommended Evaluation Criteria for Drainage Improvement Alternatives

The following preliminary list of Evaluation Criteria (or Factors) are recommended to evaluate Drainage Improvement Alternatives:

Natural Environment
- Terrestrial Impacts
  (e.g., Vegetation Removal)
- Fisheries Impacts
  (e.g., Disruption to Fish and Fish Habitat)

Social Environment
- Property Impacts
  (e.g., Property Acquisition, Building Removal)
- Visual Impacts
  (e.g., Area of Construction Impact)

Cultural Environment
- Heritage Potential
- Archaeological Potential

Economic Environment
- Construction Cost

Compatibility with TRCA / Provincial Policies
- Amount of Fill Required
- Potential increases to upstream Regional Flood levels at existing flood-susceptible buildings

Engineering Factors
- Flood Reduction Potential / Flood Frequency
- Infrastructure Impacts

Evaluation of Drainage Improvement Alternatives

Criteria \ Alternatives	Alternative No. 0 Do Nothing	Alternative No. 1 Re-grade/Steepen Concrete By-pass Channel	Alternative No. 2 Deepen Concrete By-pass Channel	Alternative No. 3 Reconstruct By-pass Channel as a Wide, Natural Channel	Alternative No. 4 Reconstruct By-pass Channel as a Wide, Natural Channel and Widen Downstream Valley adjacent to Mary Street	Alternative No. 5a Flood Protection Landform along Church Street	Alternative No. 5b Flood Protection Landform across Ken Whillans Drive	Alternative No. 6a Flood Protection Landform along Church Street and Widen Bridge at Church Street	Alternative No. 6b Flood Protection Landform across Ken Whillans Drive and Widen Bridge at Church Street
Natural Criteria									
Terrestrial Impacts									
Amount of Vegetation Removal	**Preferred:** No vegetation removal required.	**Partially Preferred**: Total approximate area of vegetative cover[1] is 10,090 m^2. Deciduous forest, woodland and old field meadow (approximately 185 trees/shrubs[2] are located within the construction zone[3]).	**Partially Preferred**: Total approximate area of vegetative cover is 10,090 m^2. Deciduous forest, woodland and old field meadow (approximately 185 trees/shrubs are located within the construction zone).	**Least Preferred:** Total approximate area of vegetative cover is 13,316 m^2. Deciduous forest, woodland, and old field meadow (approximately 500 trees/shrubs are located within the construction zone).	**Least Preferred:** Total approximate area of vegetative cover is 24,099 m^2. Old field meadow, woodland, and deciduous forest (approximately 820 trees/shrubs are located within the construction zone).	**Preferred:** No vegetative cover present. Manicured grassland present throughout (approximately 50 trees/shrubs are located within construction zone).	**Partially Preferred to Preferred:** Total approximate area of vegetative cover is 4,440 m^2. Deciduous forest (approximately 120 trees/shrubs are located within the construction zone)	**Preferred:** Total approximate area of vegetative cover is 130 m^2. Woodland and old field meadow (approximately 60 trees/shrubs are located within the construction zone).	**Partially Preferred to Preferred:** Total approximate area of vegetative cover is 4,330 m^2. Deciduous forest, woodland and old field meadow (approximately 150 trees/shrubs are located within the construction zone).
Fisheries Impacts									
Disruption to fish and fish habitat in Etobicoke Creek	**Partially Preferred to Preferred:** No short-term impact, however fish and fish habitat are at risk in the event of a 350-year storm.	**Least Preferred:** In-stream works will be required within Etobicoke Creek.	**Least Preferred:** In-stream works will be required within Etobicoke Creek.	**Least Preferred:** Significant in-stream works will be required within Etobicoke Creek.	**Least Preferred:** Significant in-stream works will be required within Etobicoke Creek. Works will require excavation of contaminated soils due to past use of the land as a waste disposal site (closed 1960).	**Preferred:** Construction will take place in close proximity to Etobicoke Creek.	**Preferred:** Construction will take place in close proximity to Etobicoke Creek.	**Least Preferred:** In-stream works will be required within Etobicoke Creek.	**Least Preferred:** In-stream works will be required within Etobicoke Creek.
Social Criteria									
Property Impacts									
Area of property acquisition	**Preferred:** No property acquisition required.	**Preferred:** Construction is anticipated to impact approximately 8 m^2 of private property (i.e., 1 land parcel).	**Preferred:** Construction is anticipated to impact approximately 8 m^2 of private property (i.e., 1 land parcel).	**Least Preferred:** Construction is anticipated to impact approximately 15,587 m^2 of private property (i.e., 28 land parcels).	**Least Preferred:** Construction is anticipated to impact approximately 23,000 m^2 of private property (i.e., 29 land parcels).	**Least Preferred to Partially Preferred:** Construction is anticipated to impact approximately 6,560 m^2 of private property (i.e., 3 land parcels).	**Least Preferred to Partially Preferred:** Construction is anticipated to impact approximately 1,684 m^2 of private property (i.e., 2 land parcels).	**Least Preferred to Partially Preferred:** Construction is anticipated to impact approximately 6,580 m^2 of private property (i.e., 3 land parcels).	**Least Preferred to Partially Preferred:** Construction is anticipated to impact approximately 1,700 m^2 of private property (i.e., 3 land parcels).
No. of Residential Dwellings Removed	**Partially Preferred to Preferred:** Removal of residential dwellings is not required, however residential dwellings within downtown Brampton are at risk of flooding in the event of a 350-year storm.	**Preferred:** As there are no residential dwellings within the construction zone, no removal of residential dwellings is required.	**Preferred:** As there are no residential dwellings within the construction zone, no removal of residential dwellings is required.	**Least Preferred:** Removal of 12 residential dwellings is required.	**Least Preferred:** Removal of 12 residential dwellings is required.	**Partially Preferred:** Removal of residential dwellings is not required. However, the limit of construction zone is adjacent to a high rise apartment complex of 72 units. Construction activity will interfere with access to two (2) high rise apartment complexes of 49 to 72 units.	**Partially Preferred to Preferred:** Removal of residential dwellings is not required. However, the limit of construction zone is adjacent to a high rise apartment complex of 49 units.	**Partially Preferred:** Removal of residential dwellings is not required. However, the zone is adjacent to a high rise apartment complex of 72 units. Construction activity will interfere with access to two (2) high rise apartment complexes of 49 to 72 units.	**Partially Preferred to Preferred:** Removal of residential dwellings is not required. However, the limit of construction zone is adjacent to a high rise apartment complex of 49 units.
No. of Non-Residential Buildings Removed (Recreational/Institutional)	**Partially Preferred to Preferred:** Removal of non-residential buildings is not required, however non-residential buildings within downtown Brampton are at risk of flooding in the event of a 350-year storm.	**Preferred:** No removal of non-residential buildings is required. However, construction will interfere with trails and natural areas adjacent to Etobicoke Creek.	**Preferred:** No removal of non-residential buildings is required. However, construction will interfere with trails and natural areas adjacent to Etobicoke Creek.	**Least Preferred:** Removal of six (6) non-residential buildings is required. In addition, removal of two (2) recreational fields is required, including a baseball diamond and tennis court. Furthermore, construction will interfere with public trails and natural areas adjacent to Etobicoke Creek.	**Least Preferred:** Removal of at least seven (7) non-residential buildings is required. In addition, removal of two (2) recreational fields is required, including a baseball diamond and tennis court. There is one (1) institutional building (Royal Canadian Legion - Branch 15) within the construction zone. Furthermore, construction will interfere with public trails and natural areas adjacent to Etobicoke Creek.	**Least Preferred to Partially Preferred:** No removal of non-residential buildings is required. However, the parking lot, baseball diamond, and 1-2 tennis courts to the south of Church Street will be removed. In addition, construction will interfere with a public trail and natural area adjacent to Etobicoke Creek.	**Partially Preferred:** As there are no non-residential dwellings within the construction, no removal of non-residential buildings is required. However, the parking lot will be removed and baseball diamond reconfigured to the south of Church Street. In addition, construction will interfere with a public trail and natural area adjacent to Etobicoke Creek.	**Least Preferred to Partially Preferred:** As there are no non-residential dwellings within the construction zone, no removal of non-residential buildings is required. However, the parking lot, baseball diamond, and 1-2 tennis courts to the south of Church Street will be removed. In addition, construction will interfere with a public trail and natural area adjacent to Etobicoke Creek.	**Partially Preferred:** As there are no non-residential dwellings within the construction zone, no removal of non-residential buildings is required. However, the parking lot will be removed and baseball diamond reconfigured to the south of Church Street. In addition, construction will interfere with a public trail and natural area adjacent to Etobicoke Creek.
Visual Impacts									
Area of Construction Impact	**Preferred:** No construction impact area.	**Least Preferred to Partially Preferred:** Approximate area of anticipated construction impact is 22,525 m^2. Visual impacts are not localized.	**Least Preferred to Partially Preferred:** Approximate area of anticipated construction impact is 22,525 m^2. Visual impacts are not localized.	**Least Preferred:** Approximate area of anticipated construction impact is 86,340 m^2. Visual impacts are not localized.	**Least Preferred:** Approximate area of anticipated construction impact is 133,000 m^2. Visual impacts are not localized.	**Partially Preferred:** Approximate area of anticipated construction impact is 25,120 m^2, with peak of landform feature centred on Church Street. Visual impacts are localized.	**Partially Preferred:** Approximate area of anticipated construction impact is 26,230 m^2, with peak of landform feature across Ken Whillans Drive and north of Church Street. Visual impacts are localized.	**Partially Preferred:** Approximate area of anticipated construction impact is 25,120 m^2, with peak of landform feature centred on Church Street. Visual impacts are localized.	**Partially Preferred:** Approximate area of anticipated construction impact is 26,230 m^2, with peak of landform feature across Ken Whillans Drive and north of Church Street. Visual impacts are localized.

[1] Vegetative cover represents areas composed of forest, woodland, and meadow, or combinations thereof. Vegetative cover does not include manicured grassland.
[2] Number of trees/shrubs affected was determined using aerial photography provided by the City of Brampton (Spring, 2007).
[3] Construction zone refers to the anticipated area of construction impact or the resultant construction footprint. Impacts are identified using the worse case scenario (e.g., removal of all structures/features within the construction zone).

Evaluation of Drainage Improvement Alternatives

Alternatives / Criteria	Alternative No. 0 Do Nothing	Alternative No. 1 Re-grade/Steepen Concrete By-pass Channel	Alternative No. 2 Deepen Concrete By-pass Channel	Alternative No. 3 Reconstruct By-pass Channel as a Wide, Natural Channel	Alternative No. 4 Reconstruct By-pass Channel as a Wide, Natural Channel and Widen Downstream Valley adjacent to Mary Street	Alternative No. 5a Flood Protection Landform along Church Street	Alternative No. 5b Flood Protection Landform across Ken Whillans Drive	Alternative No. 6a Flood Protection Landform along Church Street and Widen Bridge at Church Street	Alternative No. 6b Flood Protection Landform across Ken Whillans Drive and Widen Bridge at Church Street
Cultural Criteria									
Heritage Impacts									
No. of Heritage Properties	**Partially Preferred to Preferred:** No heritage features affected, however the strong heritage character of downtown Brampton is at risk of damage in the event of a 350-year storm.	**Least Preferred:** Construction will impact approximately 7,960 m^2 of Heritage property within Etobicoke Creek between Church Street and Scott Street. This property is designated by the City of Brampton as a "Category A: Significant [Heritage] Feature".	**Least Preferred:** Construction will impact approximately 7,960 m^2 of Heritage property within Etobicoke Creek between Church Street and Scott Street. This property is designated by the City of Brampton as a "Category A: Significant [Heritage] Feature".	**Least Preferred:** Construction will impact approximately 9,750 m^2 of Heritage property. Property on Scott Street is designated by the City of Brampton as a "Category B: Significant [Heritage] Feature". This property is located within the construction zone.	**Least Preferred:** Construction will impact approximately 9,750 m^2 of Heritage property. Property on Scott Street is designated by the City of Brampton as a "Category B: Significant [Heritage] Feature". This property is located within the construction zone.	**Partially Preferred to Preferred:** No heritage features have been identified within the construction zone, and therefore no heritage features are affected.	**Least Preferred to Partially Preferred:** Construction will impact approximately 1,500 m^2 of Heritage property in the vicinity of Church Street and Etobicoke Creek. Property on Scott Street, Alexander Street and within Etobicoke Creek is located within the construction zone. The above noted properties are designated by the City of Brampton as a "Category A and B Significant [Heritage] Feature".	**Partially Preferred to Preferred:** Construction will impact approximately 250 m^2 of Heritage property within Etobicoke Creek south of Church Street. This property is designated by the City of Brampton as a "Category A: Significant [Heritage] Feature".	**Least Preferred to Partially Preferred:** Construction will impact approximately 1,560 m^2 of the Heritage property. Property on Union Street is designated by the City of Brampton as a "Category B Significant [Heritage] Feature". Construction zone will encroach upon this heritage property.
Archaeological Potential	**Partially Preferred to Preferred:** No impact to archaeological resources as ground disturbance is not required, however areas of archaeological potential are at risk in the event of a 350 year storm.	**Partially Preferred to Preferred:** Most of the construction zone has been disturbed in the past as a result of re-routing the creek channel, and therefore archaeological potential is considered to be low.	**Partially Preferred to Preferred:** Most of the construction zone has been disturbed in the past as a result of re-routing the creek channel, and therefore archaeological potential is considered to be low.	**Partially Preferred to Preferred:** Most of the construction zone has been disturbed in the past as a result of re-routing of the creek channel, and therefore archaeological potential is considered to be low.	**Partially Preferred to Preferred:** Most of the construction zone has been disturbed as a result of past urbanization and of re-routing the creek channel, and therefore archaeological potential is considered to be low.	**Partially Preferred to Preferred:** Most of the construction zone has been disturbed as a result of past urbanization, and therefore archaeological potential is considered to be low.	**Partially Preferred to Preferred:** Most of the construction zone has been disturbed as a result of past urbanization, and therefore archaeological potential is considered to be low.	**Partially Preferred to Preferred:** Most of the construction zone has been disturbed as a result of past urbanization, and therefore archaeological potential is considered to be low.	**Partially Preferred to Preferred:** Most of the construction zone has been disturbed as a result of past urbanization, and therefore archaeological potential is considered to be low.
Economic Criteria									
Costs									
Construction Cost[4]	**Preferred:** $0	**Least Preferred to Partially Preferred:** Approximately $8.1M	**Least Preferred to Partially Preferred:** Approximately $8.7M	**Least Preferred:** Approximately $53.6M	**Least Preferred:** Approximately $60.1M	**Partially Preferred to Preferred:** Approximately $2.1M	**Partially Preferred to Preferred:** Approximately $2.3M	**Partially Preferred:** Approximately $4.6M	**Partially Preferred:** Approximately $4.8M
Compatibility with TRCA/Provincial policies									
Placement of fill in the floodplain	**Preferred:** No fill required.	**Preferred:** No fill required.	**Preferred:** No fill required.	**Partially Preferred to Preferred:** Some fill required to construct channel banks through Rosalea Park. However, this is more than offset by the "cut" required to build the wide natural channel downstream.	**Partially Preferred to Preferred:** Some fill required to construct channel banks through Rosalea Park. However, this is more than offset by the "cut" required to build the wide natural channel downstream.	**Least Preferred to Partially Preferred:** Approximately 22,500m^3 of fill required.	**Least Preferred to Partially Preferred:** Approximately 22,500m^3 of fill required.	**Least Preferred to Partially Preferred:** Approximately 22,500m^3 of fill required.	**Least Preferred to Partially Preferred:** Approximately 22,500m^3 of fill required.
Potential increases to upstream Regional Flood levels at existing flood-susceptible buildings: - on Scott St: 5 homes and an apartment complex - on Alexander St: a school - on Ellen St: 1 home	**Partially Preferred to Preferred:** No impact to Regional Flood elevations at existing flood-susceptible buildings.	**Partially Preferred to Preferred:** No impact to Regional Flood elevations at existing flood-susceptible buildings.	**Partially Preferred:** Moderate increase (0.3m to 0.4m) to Regional Flood elevations at existing flood-susceptible buildings.	**Preferred:** Decrease (0.1m to 1.4m) in Regional Flood elevations at existing flood-susceptible buildings, including the potential removal of 2 buildings on Scott St. from the floodplain.	**Preferred:** Decrease (0.1m to 1.4m) in Regional Flood elevations at existing flood-susceptible buildings, including the potential removal of 2 buildings on Scott St. from the floodplain.	**Partially Preferred:** Moderate increase (0.3m to 0.4m) to Regional Flood elevations at existing flood-susceptible buildings.	**Least Preferred to Partially Preferred:** Some increases (0m to 0.7m) to Regional Flood elevations at existing flood-susceptible buildings.	**Partially Preferred:** Moderate increase (0.2m to 0.3m) to Regional Flood elevations at existing flood-susceptible buildings.	**Least Preferred to Partially Preferred:** Some increases (0m to 0.7m) to Regional Flood elevations at existing flood-susceptible buildings.
Engineering Criteria									
Flood Reduction Potential / Flood Frequency	**Least Preferred:** No reduction in flooding. Spill into downtown begins at 100-year flood.	**Least Preferred to Partially Preferred:** Reduced spill into downtown for the 100-year flood. Small decrease in the spill into downtown for the 350-year flood. Small decrease in spill for the Regional Storm.	**Partially Preferred:** Spill into downtown eliminated for the 100-year flood. Spill into downtown for the 350-year flood is reduced significantly. Small decrease in spill for the Regional Storm.	**Partially Preferred to Preferred:** No spill into downtown for the 100-year, 350-year or Regional floods. Significant backwater continues for the Regional flood.	**Preferred:** No spill into downtown for the 100-year, 350-year or Regional floods. Backwater reduced significantly.	**Partially Preferred:** No spill into downtown for the 100-year or 350-year flood. Very small decrease in spill for the Regional Storm.	**Partially Preferred:** No spill into downtown for the 100-year or 350-year flood. Very small decrease in spill for the Regional Storm.	**Partially Preferred:** No spill into downtown for the 100-year or 350-year flood. Very small decrease in spill for the Regional Storm.	**Partially Preferred:** No spill into downtown for the 100-year or 350-year flood. Very small decrease in spill for the Regional Storm.
Infrastructure impacts	**Preferred:** None.	**Partially Preferred:** Works generally limited to the existing channel. Potential impacts to bridge abutments / footings may require structural works, as well as some relocation of existing utility plant.	**Partially Preferred:** Works generally limited to the existing channel. Potential impacts to bridge abutments / footings may require structural works, as well as relocation of existing utility plant.	**Least Preferred:** Significant impacts including the replacement and widening of 4 bridge crossings, and potential relocation/modification of associated municipal services and utility plant.	**Least Preferred:** Significant impacts including the replacement and widening of 4 bridge crossings, and potential relocation/modification of associated municipal services and utility plant.	**Partially Preferred to Preferred:** Reconstruction of portions of Church St. (approx. 400m) and Ken Whillans Dr. (approx. 100m). Relocation/ modification of associated municipal services and utility plant.	**Partially Preferred to Preferred:** Reconstruction of portions of Ken Whillans Dr. (approx. 200m). Relocation/ modification of associated municipal services and utility plant.	**Least Preferred to Partially Preferred:** Reconstruction of portions of Church St. (approx. 400m) and Ken Whillans Dr. (approx. 100m). Relocation/ modification of associated municipal services and utility plant. Replacement and widening of Church St. bridge.	**Least Preferred to Partially Preferred:** Reconstruction of portions of Ken Whillans Dr. (approx. 200m). Relocation/ modification of associated municipal services and utility plant. Replacement and widening of Church St. bridge.
Overall Results	**Carried forward:** Does not address the problem; Carried forward for comparison.	**Not carried forward:** Greater impact on natural and cultural environments.	**Not carried forward:** Greater impact on natural and cultural environments.	**Not carried forward:** Significant impact on natural, social, and economic environments.	**Not carried forward:** Significant impact on natural, social, and economic environments.	**Not carried forward:** Greater impact on social environment.	**Carried forward:** Least impact on natural, social and economic environments.	**Not carried forward:** Greater impact on natural and social environments.	**Not carried forward:** Greater impact on natural environment.

Impacts are measured as Least Preferred, Partially Preferred or Preferred based on the anticipated environmental effects associated with construction. In this regard, a rating of Least Preferred has the greatest anticipated negative impact, while a rating of Preferred has the least anticipated negative impact.

[4] Construction costs include setup, removals (e.g., concrete channel), utility removals/relocation, road re-construction, restoration, and bridge replacement (where required). Construction costs do not include the cost of property acquisition.

Preliminary Preferred Solution

Based on the evaluation of Transportation and Drainage Improvement Alternatives, a combination of the following Alternatives was selected as the Preliminary Preferred Solution:

Transportation Alternative 6:
Ken Whillans Drive Extension (Church Street to Nelson Street)

- An extension of Ken Whillans Drive from Church Street to Nelson Street with intersection improvements.

and

Drainage Improvement Alternative 5b:
Flood Protection Landform across Ken Whillans Drive

- Re-grading Ken Whillans Drive and the surrounding area in order to raise the ground elevation at this location and reduce the frequency of spilling into downtown.

Preliminary Preferred Solution (cont'd)

The benefits associated with implementation of the Preliminary Preferred Solution include:

- Completes 'missing' link in the downtown road network
- Provides an alternative route to the already congested Main Street
- Improves traffic flow and reduces congestion in downtown Brampton
- Reduces traffic delays and driver frustration
- Limits spill into downtown up to the 350-year storm event
- Limited removal of predominately roadside vegetation
- Cost effective flood reduction solution.

Next Steps

Following this PIC, the Project Team will:

- Review your comments
- Respond to your written questions
- Confirm/select the Preferred Solution based on consideration of comments received from the public and agency representatives
- Complete a detailed environmental inventory of the Study Area
- Develop and evaluate Alternative Design Concepts and identify potential impacts
- Host PIC No. 2 to receive input on Alternative Design Concepts and the Preliminary Preferred Design Concept from the public and agency representatives.

Notices will be placed in local newspapers and mailed to those who request being added to the Study Mailing List to announce the second PIC.

Remain Involved in the Study

Your comments are important as they will be reviewed and considered as part of the Study. Please indicate your interest to remain involved with the Study by submitting your completed comment sheet or by contacting either of the following Project Team members:

Khurram Tunio, P.Eng.
Senior Project Engineer
City of Brampton
8850 McLaughlin Road
Brampton, ON L6Y 5T1
Tel: 905-874-2500
Fax: 905-874-2599
Email: khurram.tunio@brampton.ca

Greg Smith, P.Eng.
Consultant Project Manager
UMA Engineering Ltd.
5080 Commerce Boulevard
Mississauga, ON L4W 4P2
Tel: 905-238-0007
Fax: 905-238-0038
Email: greg.smith@uma.aecom.com

There is an opportunity at any time during the Class EA process for interested persons to provide comments and review outstanding issues with the Project Team.

Thank you for attending and offering your input.