Basement Flooding Study Area 53 Lake Shore Boulevard West/Mimico Creek Municipal Class Environmental Assessment

# 6. Phase 2: Alternative Solutions

## 6.1 Identification of Alternatives

The following alternative solutions have been identified and evaluated to address surface and basement flooding within the Study Area based on the potential solution identified through the Area 53 Capacity Assessment Study:

- Alternative 1: Do Nothing
- Alternative 2:
  - new 1500 mm storm sewer (307 m length) on Lake Shore Boulevard West, south of the TTC streetcar tracks
  - four high-capacity inlets on Lakeshore Boulevard West
  - upsizing of the local storm sewer on Legion Road to a 450 mm and 750 mm pipe, with inlet controls devices upstream
  - upsizing existing Mimico Creek outfall to 1500 mm at Humber Bay Park
- Alternative 3:
  - new 307 m of 1500 mm storm sewer (307 m length) on Lake Shore Blvd
     West, north of the TTC streetcar tracks and along existing sewer alignment
  - upsizing storm sewer crossing over the TTC streetcar tracks
  - four high-capacity inlets on Lake Shore Boulevard West
  - upsizing local storm sewer on Legion Road to 450 mm and 750 mm, with inlet controls devices on the upstream
  - upsizing existing Mimico Creek outfall to 1500 mm at Humber Bay Park

Alternatives 2 and 3 are shown in Figures 6-1 and 6-2 respectively.





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## 6.2 Evaluation Criteria and Methodology

To identify the preliminary recommended preferred solution, criteria (**Table 6-1**) have been developed to evaluate the alternative solutions.

Category	Criteria
Natural Environment	<ul> <li>Potential impacts on terrestrial and aquatic systems (vegetation, trees, wildlife)</li> <li>Potential impacts on trees (estimated number potentially injured and estimated number requiring removal)</li> <li>Potential impacts on species at Risk (SAR) and SAR habitat</li> <li>Potential impacts on surface and groundwater</li> <li>Potential impacts on water course form and function</li> <li>Potential impacts on environmental permitting and approvals</li> </ul>
Socio-Cultural	<ul> <li>Land use impacts (parks, ravines, open spaces)</li> <li>Disruption to existing community during construction (traffic, noise, dust)</li> <li>Potential impacts to archaeological and cultural heritage resources</li> </ul>
Technical	<ul> <li>Effectiveness in reducing surface and basement flooding and improving stormwater runoff quality</li> <li>Feasibility of implementation (available space, accessibility, constructability, approvals)</li> <li>Impacts on operating and maintenance requirements</li> </ul>
Economics	<ul><li>Capital cost</li><li>Operating and maintenance costs</li></ul>

## Table 6-1: Evaluation Criteria

A comparative evaluation was completed for Alternatives 2 and 3 using the noted criteria. Alternative 1 (Do Nothing) was not evaluated in detail as it does not address the problem or opportunity statement identified in **Section 5**.

Alternatives were rated based on their potential constraints relative to the other alternatives as follows:

- High Constraints (Less Preferred)
- Medium Constraints (Moderately Preferred)

Low Constraints (More Preferred)

The evaluation was completed using professional judgement and was informed through the existing conditions (**Section 3**). Input solicited from the public, agencies, stakeholders and Indigenous Communities was also considered and incorporated, as applicable.

## 6.3 **Evaluation of Alternative Solutions**

**Table 6-2** details the comparative evaluation completed for Alternative 2 andAlternative 3 as described in Section 6.1 and conceptually shown in Figures 6-1 and6-2.

## Table 6-2: Evaluation of Alternative Solutions

Category	Criteria	Alternative 2	Alternative 3
Details		<ul> <li>new 1500 mm storm sewer (307 m length) on Lake Shore Boulevard West, south of the TTC streetcar tracks</li> <li>four high-capacity inlets on Lakeshore Boulevard West</li> <li>upsizing of the local storm sewer on Legion Road to a 450 mm and 750 mm pipe, with inlet controls devices upstream</li> <li>upsizing existing Mimico Creek outfall to 1500 mm at Humber Bay Park</li> </ul>	<ul> <li>new 307 m of 1500 mm storm sewer (307 m length) on Lake Shore Blvd West, north of the TTC streetcar tracks and along existing sewer alignment</li> <li>upsizing storm sewer crossing over the TTC streetcar tracks</li> <li>four high-capacity inlets on Lake Shore Boulevard West</li> <li>upsizing local storm sewer on Legion Road to 450 mm and 750 mm, with inlet controls devices on the upstream</li> <li>upsizing existing Mimico Creek outfall to 1500 mm at Humber Bay Park</li> </ul>
Natural Environment	Potential impacts on terrestrial and aquatic systems (vegetation, trees, wildlife)	<ul> <li>Alternatives Focus Area overlaps:</li> <li>City of Toronto Natural Heritage System</li> <li>Ravine and Natural Feature Protection By-law</li> <li>Highly Vulnerable Aquifer</li> <li>Unevaluated wetland and woodland</li> <li>Tree and shrub removal required</li> <li>Direct fish habitat in Mimico Creek (adjacent to direct fish habitat in Mimico Creek Tributary at Legion Road, but not overlapping the tributary)</li> <li>The following candidate SWH were identified within the Alternatives Focus Area that may be impacted:</li> <li>Waterfowl Stopover and Staging Areas (Aquatic)</li> <li>Bat Maternity Colonies</li> <li>Turtle Wintering Areas</li> <li>Amphibian Breeding Habitat (Woodland)</li> <li>Special Concern and Rare Wildlife Species: Canada Warbler, Common Nighthawk, Eastern Wood-pewee, Wood Thrush, Monarch, Eastern Milksnake, Northern Map Turtle and Snapping Turtle.</li> <li>General wildlife, including birds protected under the <i>Migratory Birds Convention Act, 1994</i>, may utilize the vegetation communities and isolated trees and shrubs for various annual life cycle stages</li> </ul>	<ul> <li>Alternatives Focus Area overlaps:</li> <li>City of Toronto Natural Heritage System</li> <li>Ravine and Natural Feature Protection By-law</li> <li>Highly Vulnerable Aquifer</li> <li>Unevaluated wetland and woodland</li> <li>Tree and shrub removal required</li> <li>Direct fish habitat in Mimico Creek (adjacent to direct fish habitat in Mimico Creek Tributary at Legion Road, but not overlapping the tributary)</li> <li>The following candidate SWH were identified within the Alternatives Focus Area that may be impacted:</li> <li>Waterfowl Stopover and Staging Areas (Aquatic)</li> <li>Bat Maternity Colonies</li> <li>Turtle Wintering Areas</li> <li>Amphibian Breeding Habitat (Woodland)</li> <li>Special Concern and Rare Wildlife Species: Canada Warbler, Common Nighthawk, Eastern Wood-pewee, Wood Thrush, Monarch, Eastern Milksnake, Northern Map Turtle and Snapping Turtle.</li> <li>General wildlife, including birds protected under the <i>Migratory Birds Convention Act, 1994</i>, may utilize the vegetation communities and isolated trees and shrubs for various annual life cycle stages</li> </ul>
Natural Environment	<ul> <li>Potential impacts on trees (estimated number potentially injured and estimated number requiring removal)</li> </ul>	42 trees may require removal if the full Anticipated Impact Area is disturbed. Furthermore, 29 trees would be injured	<ul> <li>Similar results to Alternative 2 anticipated (Tree review was not completed for Alternative 3)</li> </ul>
Natural Environment	Potential impacts on Species at Risk (SAR) and SAR habitat	<ul> <li>The following SAR, identified to have a medium probability of occurrence within the Natural Environment Study Area, have the potential to be affected by proposed works:</li> <li>American Eel</li> <li>Red-headed Woodpecker</li> <li>Little Brown Myotis;</li> <li>Eastern Small-footed Myotis;</li> <li>Northern Myotis</li> <li>Tri-colored Bat</li> </ul>	<ul> <li>The following SAR, identified to have a medium probability of occurrence within the Natural Environment Study Area, have the potential to be affected by proposed works:</li> <li>American Eel</li> <li>Red-headed Woodpecker</li> <li>Little Brown Myotis;</li> <li>Eastern Small-footed Myotis;</li> <li>Northern Myotis</li> <li>Tri-colored Bat</li> </ul>
Natural Environment	Potential impacts on surface and groundwater	Area deemed as Highly Vulnerable Aquifer	Area deemed as Highly Vulnerable Aquifer
Natural Environment	Potential impacts on water course form and function	Increase in discharge to Mimico Creek has potential to increase erosion potential and/or alter sediment deposition patterns within the wetland areas and/or watercourse	Increase in discharge to Mimico Creek has potential to increase erosion potential and/or alter sediment deposition patterns within the wetland areas and/or watercourse

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Category	Criteria	Alternative 2	
		Proposed alteration could alter existing vegetation at the stormwater outfall discharge point impacting bank stability and flow energy dissipation	Proposed alteration cou outfall discharge point ir dissipation
		Areas of Mimico Creek where no bank protection exists may require protection	Areas of Mimico Creek v protection
Natural Environment	<ul> <li>Potential impacts on environmental permitting and approvals</li> </ul>	<ul> <li>Ontario Regulation 166/06 permit required</li> <li>MECP will be consulted to confirm additional survey requirements and permitting needs during the detailed design phase of the Project</li> </ul>	<ul> <li>Ontario Regulation 166</li> <li>MECP will be consulted permitting needs during</li> </ul>
Natural Environment Evaluation Ranking		Medium Constraints	
Socio-Cultural	<ul> <li>Land use impacts (parks, ravines, open spaces)</li> </ul>	<ul> <li>Portion of Humber Bay Park open space and area around Mimico Creek outfall will be temporarily impacted during construction</li> </ul>	<ul> <li>Portion of Humber Bay I outfall will be temporarily</li> </ul>
Socio-Cultural	<ul> <li>Disruption to existing community during construction (traffic, noise, dust)</li> </ul>	Less disruption anticipated than Alternative 3	<ul> <li>Alternative 3 directly from (east of Legion Road) and disruption during construction</li> </ul>
Socio-Cultural	Potential impacts to archaeological and cultural heritage resources	<ul> <li>Stage 1 archaeological assessment (PIF Number: P123-0482-2021) completed for the Basement Flooding Protection Program Area 53 Capacity Assessment Study. Alternative 2 appears to be located in areas of deep and extensive disturbance removing all archaeological potential. Field review needed to confirm potential impacts to archaeological resources</li> <li>No direct or indirect impacts anticipated to built heritage resources or cultural heritage landscapes</li> </ul>	<ul> <li>Stage 1 archaeological completed for the Base Capacity Assessment S of deep and extensive of Field review needed to resources</li> <li>No direct or indirect imp cultural heritage landsca</li> </ul>
Socio-Cultural Evaluation Ranking		Low Constraints	
Technical	Effectiveness in reducing surface and basement flooding and improving stormwater runoff quality	<ul> <li>Similar effectiveness in reducing surface and basement flooding and improving stormwater runoff quality</li> <li>With the implementation of Alternative 2, the storm drainage system can convey both the major and minor systems during the 100-year design storm as per the City's criteria for basement flooding protection.</li> </ul>	<ul> <li>Similar effectiveness in improving stormwater ru</li> <li>With the implementation convey both the major a storm as per the City's of</li> </ul>
Technical	<ul> <li>Feasibility of implementation (available space, accessibility, constructability, approvals)</li> </ul>	<ul> <li>Alternative 2 is more feasible with the installation of the new larger storm sewer on the south side of TTC streetcar tracks</li> <li>Alternative 2 has more available space for construction</li> <li>Alternative 2 has less disruption to access fronting Lake Shore Blvd West as it avoids condominiums east of Legion Road</li> </ul>	<ul> <li>Alternative 3 is less feas required to cross TTC st approvals from TTC</li> </ul>
Technical	Impacts on operating and maintenance requirements	Similar impacts on operating and maintenance	Similar impacts on operative structures on operative structures of the structure st
Technical Evaluation Ranking		Medium Constraints	
Economics	Capital cost	Capital cost for Alternative 2 estimated to be \$4.5 million	<ul> <li>Capital cost anticipated TTC tracks and traffic n</li> </ul>
Economics	Operating and maintenance costs	Similar operating and maintenance costs	Similar operating and m
Economics Evaluation Ranking		Medium Constraints	
Preferred Alternative? (Yes/No)		Yes	

### Alternative 3

Id alter existing vegetation at the stormwater npacting bank stability and flow energy

where no bank protection exists may require

/06 permit required d to confirm additional survey requirements and g the detailed design phase of the Project

#### Medium Constraints

Park open space and area around Mimico Creek y impacted during construction

nts condominiums on Lake Shore Boulevard West nd potentially results in greater traffic and access uction

assessment (PIF Number: P123-0482-2021) ment Flooding Protection Program Area 53 Study. Alternative 2 appears to be located in areas disturbance removing all archaeological potential. confirm potential impacts to archaeological

acts anticipated to built heritage resources or apes

#### Medium Constraints

reducing surface and basement flooding and unoff quality

n of Alternative 3, the storm drainage system can and minor systems during the 100-year design criteria for basement flooding protection.

sible than Alternative 2 as the storm sewer is treetcar tracks and requires more complicated

ating and maintenance

### **High Constraints**

I to be higher for Alternative 3 related to crossing nanagement

aintenance costs

### Medium Constraints

No

## 6.4 **Preferred Solution and Rationale**

The preferred solution is Alternative 2 **(Figure 6-1)** that will be included as part of the Basement Flooding Area 53 Capacity Assessment Study Assignment number 53-33. The rationale for selecting Alternative 2 as the preferred solution is based on a combination of the following key factors:

- Alternative 2 has better constructability with the installation of the new larger storm sewer on the south side of the TTC streetcar tracks
- Alternative 2 results in less disruption to the community during construction with less construction activity fronting directly the condominiums/businesses and reduced impacts to TTC streetcar operations
- Alternative 2 is anticipated to have lower capital cost

As previously noted in this report, Assignment number 53-33 also includes sanitary sewers that will be reconstructed at lower elevations. These sanitary works, as described in **Section 3.1.1**, were not reviewed or evaluated within the scope of this Schedule B Municipal Class Environmental Assessment study as they will be within the existing road allowance and are therefore considered Schedule A+ (pre-approved).