MNAI Project: Modeling Oshawa Creek Outfalls

Background

Green infrastructure, in both natural (e.g. forests, riparian zones, wetlands, etc.) and human made (e.g. bioswales, street trees etc.) benefit the City by providing environmental, economic and social services for “free”.

Integrating natural assets into the capital decision-making and financial planning process, along with traditional grey infrastructure, recognizes the services they provide, both direct and indirect, are part of the municipal infrastructure. services Compared to engineered assets, well managed natural assets become more valuable over time helping to offset the cost typically associated with developing, maintaining and replacing engineered infrastructure which often requires a much larger footprint to collect, direct, store and treat stormwater.

Oshawa’s Strategic Plan identifies the need to manage and fund present and future assets, including parks and open spaces in order to ensure safe and reliable infrastructure. The City is developing a Corporate Asset Management Plan with a focus on core infrastructure assets to meet Provincial requirements for municipalities to develop and adopt a strategic asset management policy.

Natural assets such as trees and natural heritage systems have not historically been integrated into asset management planning. However, there is growing support for including natural assets into this management process. By working with MNAI, the City hopes to start the process of applying similar attention to natural assets as are applied to typical engineered assets.

Study Area

The Oshawa Creek Corridor is the main conveyance of storm water into Lake Ontario. The study area for the purpose of this project is the main Oshawa Creek as identified in Attachment 1. It has 41 direct outfalls draining to it . This area is highly developed with mixed residential, commercial and industrial land uses. While water quality of storm water within the pilot area is a concern as it picks up pollutants which are not treated before entering the creek, the banks of the creek are also experiencing some active creek erosions that may require attention from the City from time to time.

In general, this stretch of Oshawa Creek is located in an incised valley lands (with the exception of the mid-town mall area, in which it contains the regulatory floodplain. Within the valley lands and adjacent to the creek there are a number of parks, greenspaces, urban forests and a well-used recreational trail network. The green space

that surrounds the creek area faces many challenges including flooding, erosion and invasive plant species.

Project Scope

The intent of this project is to investigate the feasibility of improving the general conditions of a watercourse with respect to areas related to creek erosion and water quality by means of constructing some forms of green infrastructure along its banks, preferably at the existing storm sewer outfalls and/or implementing some forms of LIDs within its respective drainage areas.

The stretch of Oshawa Creek from Adelaide Avenue west to Oshawa Harbor is selected as the study area for this exercise.

It is expected that the modeler will utilize the existing available Otthymo and Hec-Ras models for the Oshawa Creek Watershed and will undertake, but not limited to, the following tasks in this exercise:

- Quantify the benefits of constructing some forms of low maintenance and economical stormwater management measures such as, bio-retention areas, LIDs, etc. by means of undertaking a modeling exercise.
- Review the available technologies/methodologies for modeling a LID facility and determine its applicability to this project before undertaking the modeling exercise.
- Assess the Climate Change impact in the modeling exercise to determine the sizing requirements for all the recommended facilities.
- Make recommendations to the City and CLOCA based on the findings of the modeling exercise on whether or not it is more efficient for the City to implement LID measures along our creek system in the downstream areas rather than providing for an extended detention storage in every single upstream stormwater management pond considered for development purpose as it would normally be called for by CLOCA under their current practice.
- Meet and consult with staff of the City, CLOCA and MNAI at various stages of the project to share information and obtain buy-ins from them.
- Provide the City with a discussion paper summarizing the relevant details of the exercise including the assumptions made along the way and the conclusion drawn from the results of the modeling.
- Assist staff in making recommendations of how we could enhance the usefulness of our creek corridor green infrastructure to the health of its watershed.

Overall Project Outcome

The modeling work will contribute to achieving the following MNAI project outcomes:

1. Incorporate LID and green infrastructure into the watershed that is resilient to erosion;
2. Reduce the need for reactive mitigation of uncontrolled bank erosion resulting from upstream effects of development;
3. Provide cost savings through avoided engineering control measures; and
4. Identify actions that the City could take over the medium-longer term to further maintain the health of natural areas within the vicinity of the Creek to increase water storage and decrease erosion.