LID: A Tale of Two Sites
Partnering with GLSLCI and RBC to Further Low Impact Developments in Thunder Bay

Beverly St
Memorial Ave

GREAT LAKES & ST. LAWRENCE CITIES INITIATIVE A.M. | JUNE 18, 2015
Introduction | Objective

Intent of RBC funded LID project
Lessons learned
Next steps to complete project
Introduction | Intent of Project

Stormwater Quality
Reduce peak flow
Urban forest canopy
Aesthetics along our image route
Educational Opportunities
Climate Change/Adaptation
These two climate change impacts will increase
Introduction | LID’s Defined

An land planning and engineering design approach to manage stormwater runoff
Quality and quantity
Decentralized facilities
Newer concept in stormwater management in Thunder Bay
Introduction | Function of LID

Typical Thunder Bay Arterial  Pre-developed Watershed
Introduction | Site

Great Lakes

Lakehead Watershed

We are here

City Limits

0 50km
Introduction | Site

City of Thunder Bay

Project Location

Memorial LID

Project Location
Design Process | A Tale of Two Sites

Beverly St

Memorial Ave
### Design Process | Site Contrasts

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Ground Water Table</td>
<td>2000-3000 mm below existing grade</td>
<td>Less than 1000mm below grade</td>
<td>Not as suitable for bioretention so required change in LID type and budget</td>
</tr>
<tr>
<td>Soil type</td>
<td>Dry course fill material</td>
<td>Silt and muskeg</td>
<td>Not as suitable for bioretention so required change in LID type and budget</td>
</tr>
</tbody>
</table>
## Design Process | Site Contrasts

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<tbody>
<tr>
<td>Topography</td>
<td>Berm of fill material, little ex. moisture</td>
<td>Existing low area, predominantly wet</td>
<td>Less excavation required, but requires more subtle grading and less tolerance for error.</td>
</tr>
<tr>
<td>Utilities</td>
<td>None present to restrict</td>
<td>2 ex. 600mm storm trunk lines bisect site and close to surface</td>
<td>Design constraint and requires more cover than existed.</td>
</tr>
</tbody>
</table>
### Design Process | Site Contrasts

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<tr>
<td>Pedestrian Circulation</td>
<td>Adjacent sidewalks but no desire lines through site</td>
<td>Adjacent sidewalks but desire line from signalized intersection to businesses</td>
<td>Future pedestrian placeholder required and accommodation for grades</td>
</tr>
<tr>
<td>Visibility</td>
<td>View of LID filtered from main 2 streets with ex. berm</td>
<td>View of LID highly visible from main street and adjacent businesses</td>
<td>Public perception higher resulting in additional aesthetic consideration and additional consultation with adjacent business owners</td>
</tr>
</tbody>
</table>
Design Process | Approaches

Beverley Bioretention LID

Memorial Biofiltration LID
Lessons Learned | **Design**

Every site is different
Can not use cookie cutter design
Must choose design from suite of solutions involving a multi-disciplinary team
Development of in-house expertise is required
Site analysis prior to design is critical
Lessons Learned | Construction

Education of staff and operators

Locally sourced materials

Soil media mixture, plants and seed mix, concrete formations (fibrecrete)
Next Steps | Education

- Education and awareness
  - Benefits of LID infrastructure
  - Promotional opportunities for businesses
  - Volunteer opportunities
  - Educational signage
Brad Doff
Sustainability Coordinator (acting)
Tel 807.625.2950
bdoff@thunderbay.ca
## Construction | Administration

<table>
<thead>
<tr>
<th></th>
<th>Beverly LID</th>
<th>Memorial LID</th>
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</thead>
<tbody>
<tr>
<td>Estimated cost</td>
<td>$102,183.20</td>
<td>$130,079.22</td>
</tr>
<tr>
<td>Actual cost</td>
<td>$56,655.61</td>
<td>TBD</td>
</tr>
<tr>
<td>Funding amounts</td>
<td>CN EcoConnexions $25,000 CAN</td>
<td>RBC Blue Water $36,000 CAN</td>
</tr>
</tbody>
</table>
Construction | Administration

Beverly LID Actual Costs
- Greening: 35%
- Construction: 33%
- Materials: 21%
- Concrete: 11%
- Events: 0%

Memorial LID Estimated Costs
- Greening: 27%
- Construction: 16%
- Materials: 15%
- Concrete: 1%
- Events: 41%
Design Process | A Tale of Two Sites
Introduction | Team

City Structure

Team members
- EarthCare Thunder Bay
- Engineering Division
- Environment Division
- Parks Division
- Realty Services

Partners