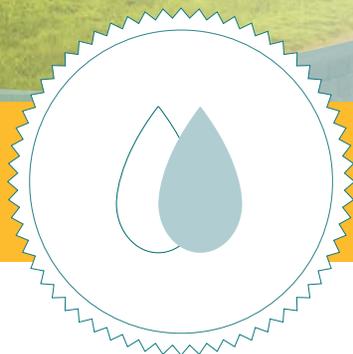




# Low Impact Development Residential Retrofits:

Engaging Residents to Adopt Low Impact  
Development on their Properties



## Residential Lands



# Welcome to the Credit Valley Conservation Be A Leader Grey to Green Series

As the Chair of Credit Valley Conservation, and City Councillor for Mississauga, I have first hand experience with pressures our communities face with aging infrastructure, changing climate, a growing population, and fiscal crisis. It's growing more difficult to find the resources to meet growing needs.

Municipal infrastructure is regularly overwhelmed and ineffective. Time and time again—especially this past summer—we're reminded that existing systems cannot manage intense storms and are failing to protect the environment.

But there is a solution, and it's not as expensive as you might think. In fact, the low impact development (LID) approach easily ties into existing systems, our public lands, road right-of-ways, commercial and institutional properties and residential homes all present opportunities. Properly maintained LID features promise a quick return on investment and many other benefits. With LID, you can:

- **Protect assets and defer larger investments.** LID barriers can slow the flow to storm sewers during intense rain events, giving them more time to process stormwater. In this way, LID helps meet asset management requirements, reduces damage to existing systems, and extends the useful life of infrastructure.
- **Save money. Smaller, more frequent events cause costly damage.** LID practices encourage infiltration and can help reduce the amount of erosion, and pollutants to creeks, rivers, and streams that leads to regular and often expensive maintenance and lost revenues from beach closures.
- **Increase tax revenue.** Free space in growing cities is at a premium. The cost of land can be as much as four times the cost of new infrastructure. LID practices require minimal land expropriation, and often fit into existing urban infrastructure, leaving more land available for development and tax revenue.
- **Build resiliency and protect the environment.** One technology alone isn't enough to ensure resiliency. Adding LID measures to a treatment train can reduce the frequency of flood-related residential damage due to overwhelmed existing systems. LID can also reduce the flow of contaminated stormwater to surface waters, which can harm aquatic environments, and increase the cost of treatment at the drinking water level.



If you see opportunities for LID in your municipality, we encourage you to review the business case (Chapter 1) and pass along this user-friendly guide to your clients, municipality's staff, property managers, land developers and infrastructure teams.

On behalf of all of us at Credit Valley Conservation, we hope this Guide can help create vibrant, healthy, sustainable communities!

Pat Mullin

A handwritten signature in black ink that reads "Pat Mullin". The signature is fluid and cursive.

Councillor, City of Mississauga and Region of Peel  
Chair, Credit Valley Conservation

P.S. This guide is a living document. We invite you to share your experiences with LID for future editions, and reach out to the CVC team for further guidance and collaboration. Please visit our website for access to all the Grey to Green guides: <http://www.creditvalleyca.ca/low-impact-development/low-impact-development-support/stormwatermanagement-lid-guidance-documents/>

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## Showcasing Water Innovation Funding Partners



## Showcasing Water Innovation Project Partners



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# 1.0 Why LID?



“Effective management of urban flooding will require adapting infrastructure and homes to extreme rainfall events. By addressing stormwater flows and reducing the impact of extreme rainfall events in new and existing subdivisions, LID, in combination with other lot-level and infrastructure risk reduction measures, can help to provide a long-term solution to urban flood losses for the insurance industry.”

– Dan Sandink,  
Institute for Catastrophic Loss  
Reduction<sup>1</sup>

The following sections will provide you with information you can use to build the case for retrofitting residential lands with low impact development practices. It will also help you secure the internal and external support you need to move forward and improve the resilience of your municipality.

### 1.1 Addressing municipal risk and liability in light of climate change and aging infrastructure

Stormwater has become a hot topic in the media across Ontario. Newmarket has experienced two extreme events in one week, the greater Toronto area (GTA) has had four extreme events over the last ten years and Ottawa and Cornwall have both had four events in the last four years. The International Panel on Climate Change warns Canadians they will continue to face more frequent and severe thunderstorms. This is alarming to the insurance industry, as annual claims have increased 20 fold since 1970 with water damage becoming the leading claim, outpacing theft and fire<sup>2</sup>. For homeowners, it's a nightmare as they learn that home damage caused by overland flooding is not covered under homeowner insurance policies in Canada. Some damage caused by sewer backups is covered by insurance policies, however it is limited. Additional coverage can be purchased at a premium rate but it may not be enough to cover all damages to property and possessions. Furthermore, repeat flood events can lead to loss of coverage all together.

As a result, residents impacted by repeated basement flooding are angry, tired, and frustrated<sup>3</sup>. In many cases, they are left



**Figure 1.1.1:** Insurance Bureau of Canada’s Report – Telling the Weather Story warns of more extreme weather for Canada and the challenges it poses for Canada’s insurance industry.

cleaning up damaged homes that could easily flood again or put their family’s health at risk. Many of these residents are holding municipalities legally responsible. Municipalities are not immune to these risks – they can be held liable for flooding damage that results from negligent design, improper construction, insufficient inspections, poor operational decisions or reliance on outdated standards or processes<sup>4</sup>.

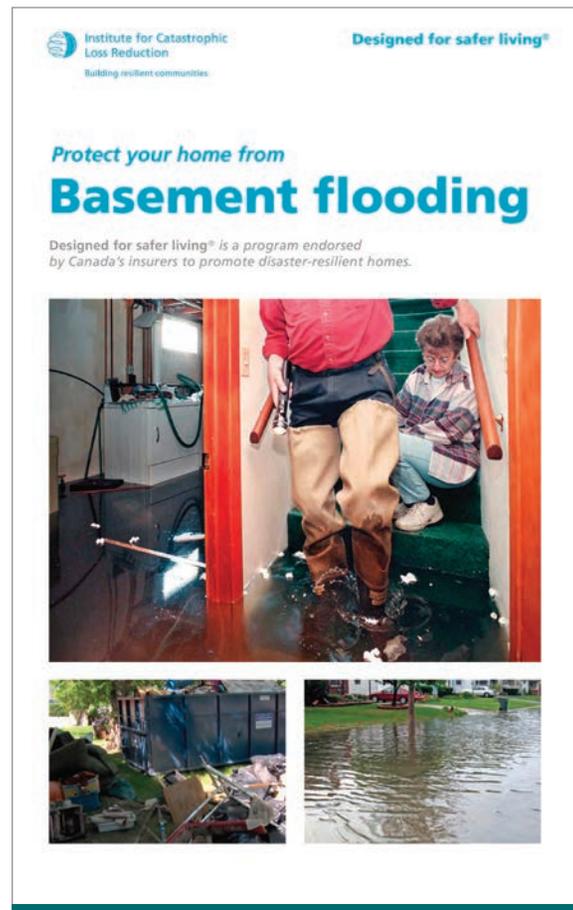
Making the situation worse for municipalities and residents is the age and poor condition of municipal infrastructure. Although 60% of Canadians think their homes are protected from extreme events<sup>5</sup>, the reality is Canada’s aging

infrastructure—which, among other roles, protects homes from flooding—is in desperate need of rapid repair and replacement to the tune of \$171 billion<sup>6</sup> for water supply, wastewater, stormwater and road infrastructure. Ontario’s infrastructure deficit has been estimated at \$100 billion<sup>7</sup> with water, wastewater, and stormwater infrastructure accounting for approximately 25%<sup>8</sup>. This estimate does not take into consideration the need for additional infrastructure to service older developments not currently receiving flood control or water quality treatment.

To bring older developments without flood control to today’s



**Figure 1.1.2:** The Insurance Bureau of Canada has noted increasing percentage of water-related personal property claims. Water damage now exceeds fire damage as the leading cause of damage to personal property, costing nearly \$1.7 billion annually (Source: Institute for Catastrophic Loss)



**Figure 1.1.3:** The Institute for Catastrophic Loss Reduction’s guide, Protect Your Home from Basement Flooding, contains helpful advice on protecting your basement (Source: Institute for Catastrophic Loss Reduction)

### Did You Know?

- Ontario’s water, wastewater, and stormwater infrastructure deficit is estimated to be \$25 Billion.<sup>9</sup>
- Like many communities across Canada, 60-75% of the GTA was built prior to flood control requirements.<sup>10</sup>

standards would cost an estimated \$56.6 billion<sup>11</sup>. This cost assumes conventional practices are feasible but does not include land acquisition costs. In growth areas around the GTA, land costs can be as high as 3-4 times that of infrastructure costs. As a result, municipalities do not have the financial resources to address all infrastructure repairs and gaps.

This leaves most cities unequipped to handle today’s high intensity rain events<sup>12</sup>. When flooding does happen, the challenges continue for municipalities. Rain events that cause widespread flooding require immediate response from the municipality. This can be challenging as the municipality must juggle multiple priorities, including listening to resident concerns, instructing the public on health and safety, protecting municipal property, assessing damage, identifying the cause of flooding and conducting maintenance and repairs to municipal infrastructure and watercourses. Councillors and



**Figure 1.1.4:** Urban flooding can cause damage to municipal infrastructure and private property. LID can reduce the total volume of runoff entering the municipal storm sewer system, which mitigates sewer capacity issues. (Source: Aquafor Beech)

staff must work overtime to properly manage a municipality's response to flooding. Clean up, staff overtime, and future flood prevention projects can all place a financial strain on the municipality.

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*On July 8, 2013, an extreme rain event caused flooding in the City of Mississauga. The City's Transportation and Works Department estimated \$1.2 Million in operational and planning costs directly resulting from this event.*

---

Older urban areas often have limited space for conventional

## 1.2 Low impact development offers new tools to assist municipalities

*Low impact development (LID) is a green infrastructure approach to stormwater management that uses simple, distributed and cost-effective landscaped features and other techniques that helps reduce basement flood risks, clean and store stormwater and helps residents conserve water.*



**Figure 1.2.1:** A rain garden in a residential neighbourhood (Source: CVC)

approaches like stormwater management ponds. LID is a new approach that can reduce over-reliance on existing flood control infrastructure<sup>13</sup> while also providing additional flood control and water quality treatment where none exists. Residential lands typically make up 40%-50% of urban areas<sup>14</sup>. These land types offer an opportunity to implement LID with no associated land acquisition costs. Targeting residential lands for lot level retrofits such as disconnecting downspouts, installation of rain gardens, permeable driveways and soakaways provides good opportunities to build capacity within the existing stormwater infrastructure.

---

*Recent monitoring of LID sites shows that when combined with other stormwater management techniques, these practices can help reduce stress on existing infrastructure. During the July 8, 2013 extreme rain event, Credit Valley Conservation monitored the performance of LID sites in Mississauga and found they were able to reduce peak flows by 60% for the 100 mm event<sup>15</sup>.*

---

### 1.3 Additional benefits of LID

Stormwater management in Ontario has evolved from flood control requirements in the 1970s, to water quality and erosion requirements in the 1980s, to water balance requirements in 2003<sup>16</sup>. With this new outlook, stormwater management has become more than just treating a storm event. It's about integrating stormwater, water, and wastewater infrastructure to reduce operational costs, encourage water conservation, and maintain stream baseflows during dry-weather periods to ensure proper wastewater assimilation, healthy fisheries, and water takings. The Great Lakes Protection Act and the Water Opportunities Act are recognizing stormwater as a resource to be treated at its source, during conveyance, and prior to entering waterways.

#### Water conservation to maintain baseflow

Climate change isn't only causing big storm events. Communities across Ontario have experienced drought and prolonged dry weather related to changing weather patterns. Low rainfall and high temperatures can result in decreasing streamflows and low groundwater levels. Municipalities that rely on groundwater supplies are restricted in how much they can grow because they do not have enough water to sustain increased population. In Municipalities where drought and groundwater supply is an issue, LID can be an effective tool to reduce their water consumption with respect to landscape watering demand. For instance, implementing a marketing strategy that focuses on LID water conservation practices for landscapes can reduce water demand.

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*A CVC study found that LID implementation in both existing and new development will mitigate base flow reductions. In Monora Creek in Orangeville, base flow will decrease by 12% if LID is not applied<sup>17</sup>.*

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#### Enhancing water quality

Water quality can affect environmental health, local economy, and overall quality of life. Poor water quality can lead to beach closures, decrease recreational and commercial fishing opportunities, and poor drinking water. Maintaining and enhancing water quality is an important component of stormwater management. In addition to volume reduction, LID practices often consist of filter media that provides water quality treatment of runoff. Filtration, combined with runoff volume reduction, significantly reduces pollutant loads that would otherwise flow to a receiving stream and eventually the Great Lakes.



Figure 1.3.1: Island Lake during the 2012 drought. (Source: Credit Valley Conservation)

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*The Lake Simcoe Conservation Authority's Stormwater Pond Maintenance and Anoxic Conditions Investigation - Final Report (2011) found that end-of-pipe ponds, if not properly maintained, can become a source of phosphorus. The LSRCA is looking at innovative ways to incorporate source and conveyance controls to reduce phosphorus loading.*

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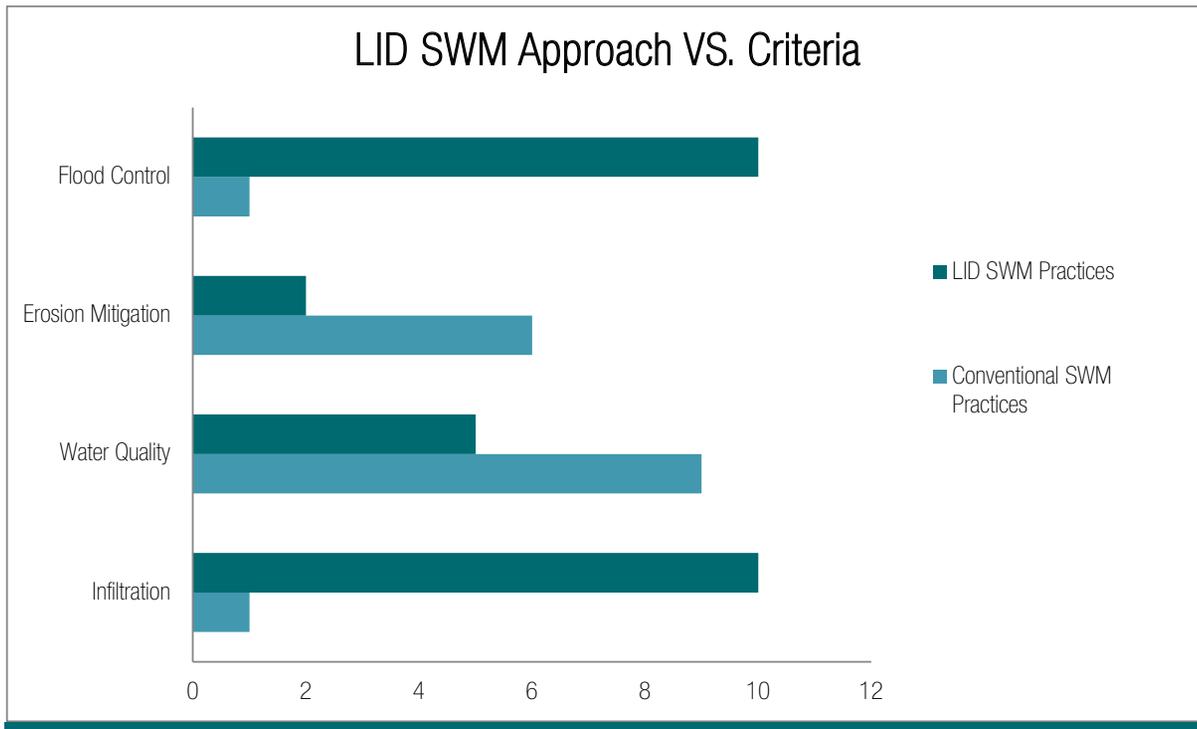
#### Helping prevent erosion

In-stream monitoring of newly urbanized areas has demonstrated increases in stream flow during rainfall events as high as ten times that of pre-development despite the use of end-of-pipe stormwater ponds. Conventional stormwater ponds are not designed to treat the excess runoff volume associated with paved surfaces. Increased stream flows during rainfall events can lead to increased erosion. Although primarily used for water quality treatment, LID monitoring shows significant on-site runoff volume reduction and can be designed for quantity control to help reduce erosion and in-stream repair.

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*The City of Mississauga will spend \$14 million for improvements to one creek in 2014 alone<sup>18</sup>.*

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**Figure 1.3.2:** Effective municipal stormwater strategies should include both LID practices and conventional stormwater management facilities to achieve comprehensive effectiveness. LID provides flood, erosion, water quality, infiltration and end-of-pipe controls. (Source: Aquafor Beech)

### Conserving water and reducing municipal energy use

Canadian household water use is some of the highest in the world. 10% of water use is for drinking and cooking and 90% of water use is for hygiene and outdoor water use<sup>19</sup>. Supplying and treating water can be a significant expense for municipalities and regional governments. For example to extract, treat and pump 500 million litres per day for a large municipality would cost approximately \$13.8 million

per year (\$38,000/day) based on an energy intensity of 0.68 kWh/m<sup>3</sup> at mid-peak energy rates of \$0.11/kWh<sup>20</sup>. Total costs for smaller municipalities would be less due to smaller water volumes, but energy costs are almost double at 1.11 kWh/m<sup>3</sup> and cost of \$0.11/kWh<sup>21</sup>. Costs are inextricably linked to energy costs which will most likely increase.

To reduce costs, municipalities across Ontario have been promoting water conservation to their residents. LID can be a helpful tool to reduce outdoor water use. For example, rain water harvesting can be used to supplement irrigation and indoor water use.

### Enhancing existing stormwater management with LID infrastructure

When applied on a broad scale, LID practices can restore natural watershed processes and ecological function. The site processes that LID practices provide vary depending on the practice, but include runoff volume reduction, the filtration of contaminants, infiltration for groundwater recharge and base flow preservation, interception of rainfall, and evapotranspiration. Once LID practices are established, these processes will occur naturally and enhance your existing stormwater management. Figure 1.3.2 shows that neither LID or conventional stormwater management alone can provide comprehensive effectiveness. Both types of practices are needed to adapt to a changing climate<sup>22</sup>.

### LID is a flexible tool to meet various landscape aesthetics

LID has many benefits that can improve the efficiency of your municipality's stormwater management systems. But in order for residents to embrace these practices, it must look good too. LID can be custom designed to meet a variety of landscape ideals. All the infrastructure resides below ground,

while above ground can be designed to meet the desired aesthetic of the homeowner. This can be simple like sod, or complex landscapes with plants, shrubs and trees.

Homeowners who embrace the aesthetic of LID landscaping are more likely to care for it. Like any other garden feature, LID landscapes needs weeding, pruning and mulching. Most homeowners who choose to implement LID features on their property have shown ownership in leading maintenance efforts.



**Figure 1.3.3:** LID is a flexible tool to meet various homeowners' landscape aesthetics (Source: CVC)



**Figure 1.3.4:** Maintaining residential LID features is simple and easily manageable by residents.

***Before you move on to the next chapter, remember residential LID retrofits can:***

- *Fill gaps in your municipality's existing stormwater program and build resiliency to climate change*
- *Be implemented quickly compared to large capital projects*
- *Help reduce costs associated with flooding and combined sewer overflow*
- *Contribute to more liveable communities and enhance the property values of your residents*
- *Demonstrate that your municipality is proactive about future infrastructure needs and environmental issues*
- *Help your municipality to conserve water.*

## 2.0 Why Marketing?



*Marketing is the process of communicating the value of a program, service, or product to target an audience.*

## Uncovering homeowners' fundamental motivations are critical in understanding what will drive them to install an LID feature on their property.

After reading Chapter 1, you should have a clear understanding of the benefits of a residential LID program. But how do you get buy-in from homeowners?

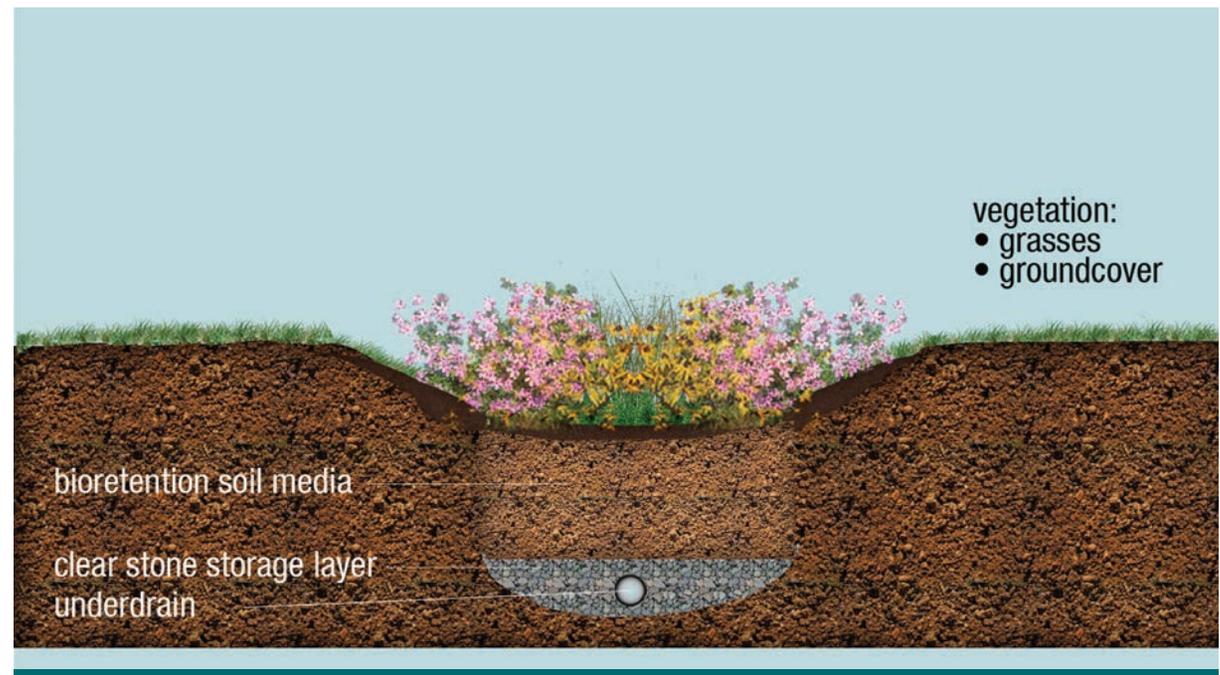
Whether your typical public outreach is education or incentive-based, low participation is a common challenge. Public outreach competes with many forms of media including the Internet, smartphones, TV, magazines, newspapers and radio. Often we develop outreach based on what we think will work best rather than researching our audience.

Municipalities often use technical information to encourage residential uptake of things like disconnecting downspouts, installing rain barrels and other LID practices. A typical example of the types of information provided to homeowners (in this case a rain garden cross-section) is shown in Figure 2.0.1. The graphic is informative and educational, but does it create the desire to install a rain garden? Does it move a resident to spend money, time, and effort to install such a feature? For the majority of residents, the image would be ineffective. This is because it doesn't present the viewer with a vision of what is possible on their property.

Market research shows that people respond better to material that inspires desires or wants rather than presenting an informed argument. Companies use advertisements with images and messaging that target a specific audience.

These advertisements aim to create an emotional response that drives the purchase of a product or service. The target audience buys the product or service based on the vision and emotion the advertisement elicits. These companies know who their customer is and what their messaging and imaging needs to be to attract them<sup>23</sup>.

Marketing LID to residents should take the same approach. To improve participation and uptake, first you need to understand the audience and the messages you need to send to connect with that audience. Market research provides an understanding of desires, perceptions, and drivers. This research is used to create a marketing plan and deliver effective outreach.



**Figure 2.0.1:** Although informational, this LID practice cross-section does little to convince homeowners to install LID practices. So why would we use it in our marketing materials? (Source: CVC)



**Figure 2.0.2:** What do you feel when you see this image? Images can elicit an emotional response from your audience – a key step to driving action.

## 2.1 What are Canadians thinking?

In order to market a product, it is important to first understand what people think of it. This section will provide you with a better understanding of the Canadian attitude towards water, infrastructure, and flood risk, as well as feelings about their homes' landscape and varying landscape aesthetics. While you can use this information as a starting point, ultimately your team and municipality should collect this information from your targeted residential area(s).

### The disconnect in Canada

Unfortunately, most Canadians are unaware of the poor condition of municipal water infrastructure. However they do see the possibility of extreme weather affecting their own community. According to the 2013 RBC Water Attitudes Study, 90% of Canadians think that a catastrophe like Hurricane Sandy could hit their community<sup>24</sup> and a majority believe there is a need to prepare for potential extreme weather that impacts stormwater management systems<sup>25</sup>. However, only 19%<sup>26</sup> of Canadians believe that infrastructure updates are needed now. In fact, 78% of Canadians think our water infrastructure is in good shape and not in need of investment<sup>27</sup>.

As noted in Chapter 1, the reality is Canadian municipalities face a massive stormwater infrastructure deficit of \$172 billion, excluding land costs. The July 8, 2013 flood event in Ontario cost \$940 million in damages and water damage is

now the leading insurance claim in Canada<sup>28</sup>. The 2013 RBC Water Attitudes Study makes it clear that Canadians are not ready for extreme weather and are at increased risk.

The survey notes that Canadian preparedness is focused on home maintenance. For example, Canadians think maintenance of rain gutters is the most important way to protect their home from flooding<sup>29</sup>. Roof gutter maintenance is important, however Canadians seem to have little consideration for a home's hard (impermeable) surfaces and their impact. 53% of Canadians would not make changes to a pervious surface<sup>30</sup>. 54% feel that a paved driveway continues to be a major part of home landscape. For their yards, 86% have sod in their front and back lawns<sup>31</sup>. These types of landscapes do not reduce runoff or water use.

To create a desire for landscapes that reduce runoff and improve water efficiency, you must first alter perceptions.

### Lackluster language

When engaging residents, you often rely on language you are comfortable using. For instance, professionals will typically use technical language to educate and inform. Technical language may include words like maintenance, canopy cover, native plants, naturalization, sustainable, stormwater, watershed, runoff, or flooding. We understand the intention and purpose of these words. However, in four market research

surveys comprised of 300 single-family homeowners in 11 Greater Toronto Area (GTA) municipalities, none of these words were used by participants when describing their home's landscape<sup>32</sup>.

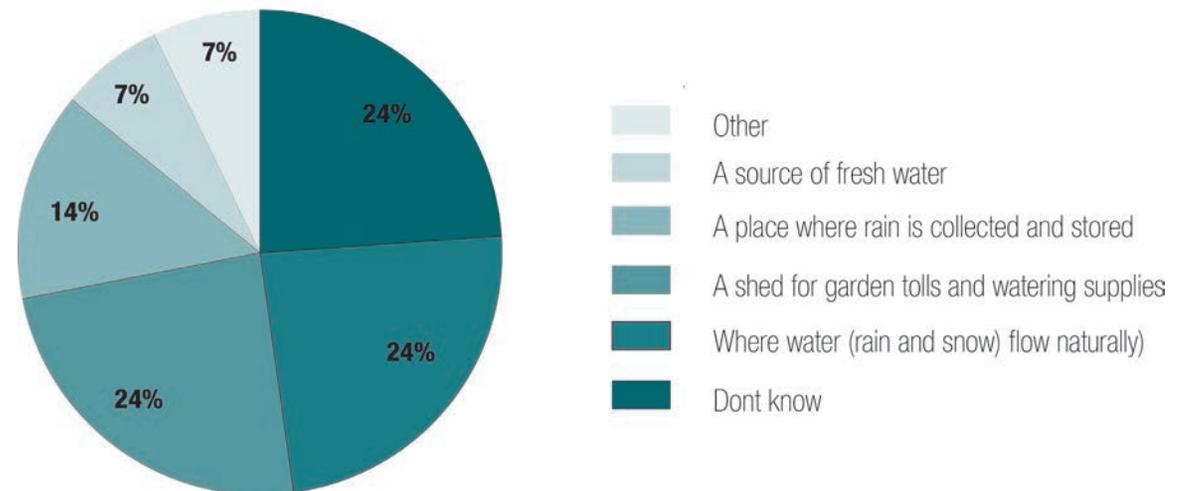
Generally speaking, the public does not understand technical language, stormwater principles, objectives, or the infrastructure that manages it. Stormwater management, for the most part, is out of sight and out of mind for residents. Broader terms such as watershed leave most residents confused. In a survey of GTA residents, less than 25% of respondents demonstrate a clear understanding of the term "watershed." The same percentage of respondents thought a watershed was a garden shed in which people kept tools and watering supplies. You need to consider, what kind of language will makes sense to residents.

## The emotional connection

Market research completed on Greater Toronto Area homeowners shows that residents understand emotional language. Homeowners have an emotional attachment to their home and landscape, not a rational one. They view their landscape as an extension of themselves, reflecting the image they want to present to the outside world. In fact, they identify "beauty" as the most important aspect of an "ideal" landscape for their home<sup>33</sup>.

Homeowner respondents from the market research survey also illustrated their "ideal landscape" with colour-filled

## What is a Watershed?



**Figure 2.1.1:** The public misunderstands the term "watershed." (Source: Adapted by Aquafor Beech from research conducted by Freeman Associates)

gardens in full bloom, outdoor living rooms for entertaining, porches, patios and decks, hot tubs, gazebos and other garden sculptures, hanging baskets and urns full of flowers, play areas for children, ornamental trees and shrubs. Respondents described their drawings as "lush," "beautiful," "a reflection of me/us," "tranquil," "colourful," "oasis," "inviting," "dream landscape," "a private retreat," and "a place to entertain family and friends."<sup>34</sup> These are all examples of emotional language.

## The spectrum of residential landscape aesthetic

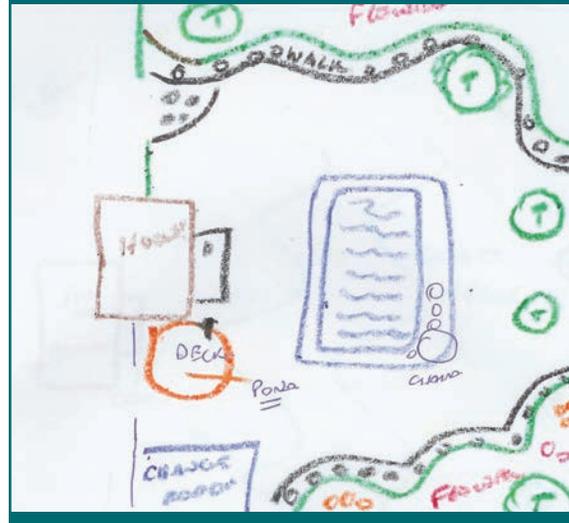
Based on market research conducted with GTA residents, homeowners generally fall into one of four categories with respect to landscape aesthetics ranging from highly controlled to fully naturalized. By understanding what kind of landscape has aesthetic appeal, you can reach a broader target audience.

Typical public outreach encourages residents to adopt a more naturalized water-efficient or biodiverse landscape. However, this means we are appealing to only a small segment of the target audience. An outreach program will have more success if it appeals to a larger target audience.

## Highly controlled ←

### FIRST STAGE

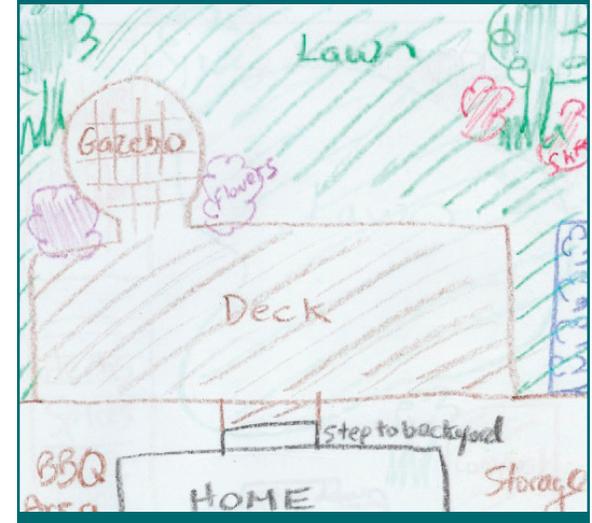
#### TYPE 1: 15 to 20%



**Type 1:** These homeowners have and desire controlled, neat and tidy landscapes. Their landscapes tend to be very traditional with large turf grass areas and only foundation plantings and limited canopy cover. Lawns are heavily irrigated, fertilized, weeded and mowed to maintain a neat and clean appearance. This group represents about 15% to 20% of the single-family homeowner population.

### SECOND STAGE

#### TYPE 2: 25 to 30%



**Type 2:** These homeowners prefer a neat, organized landscape aesthetic with traditional elements. They favour colourful gardens and more use of trees and shrubs than their Type 1 counterparts. Their approach to gardening is more conservative than Type 3 and 4, but is more varied than Type 1. This group represents on average about 25% to 30% of the single-family homeowner population.

→ Highly adaptable

### THIRD STAGE

#### TYPE 3: 35 to 40%



**Type 3:** These homeowners hold a more varied aesthetic. Their landscapes are well planned with defined spaces, but there is a mix of vegetative cover and lawn areas are minimized by the use of more expansive gardens. This group is receptive to new ideas and will be the first to adopt new trends such as ornamental grasses, outdoor 'living rooms,' and landscape art. This group represents 35% to 40% of the single-family homeowner demographic.

### FOURTH STAGE

#### TYPE 4: 10 to 15%



**Type 4:** This group tends to have a more open and varied aesthetic. Their landscapes are a mix of gardens and undefined spaces. They tend to embrace what they view as a "natural" aesthetic, but what other types view as messy and unorganized. Gardens tend to be heavily planted with a large range of plants, including natives, and turf grass areas are usually minimal. This group represents about 10% to 15% of the single-family homeowner population. (Source: Freeman Associates)

## 2.2 Putting it all together

Municipal outreach that focuses on technical language and using terms such as “water-efficient,” “naturalization,” “native plants,” “sustainable,” or “water-conserving” will continue to reach only members of your community within the Type 4 group (10-15%). It will fail to reach a broader single-family homeowner market (Types 2 and 3). If we don’t change our approach we will continue to preach to the converted. To reach a greater segment of the target audience, it is important that we connect with homeowners’ intrinsic emotions, desires, and motivations.

Effective marketing will generate change over time by moving the homeowners along the spectrum to more sustainable landscapes. By designing marketing approaches and materials based on market research to target Type 2 and Type 3 homeowners, programs will be far more effective at securing uptake. As long as the outcome of the change is positive for the homeowner, further changes continue. Over time, long-term sustained change takes place. The goal of every LID residential program must be to secure sustained behaviour change amongst all property owners. This is an important element in managing impacts from climate change, extreme storm events and drought.

*To develop an effective marketing strategy, whether your audience is residents or businesses, you must:*

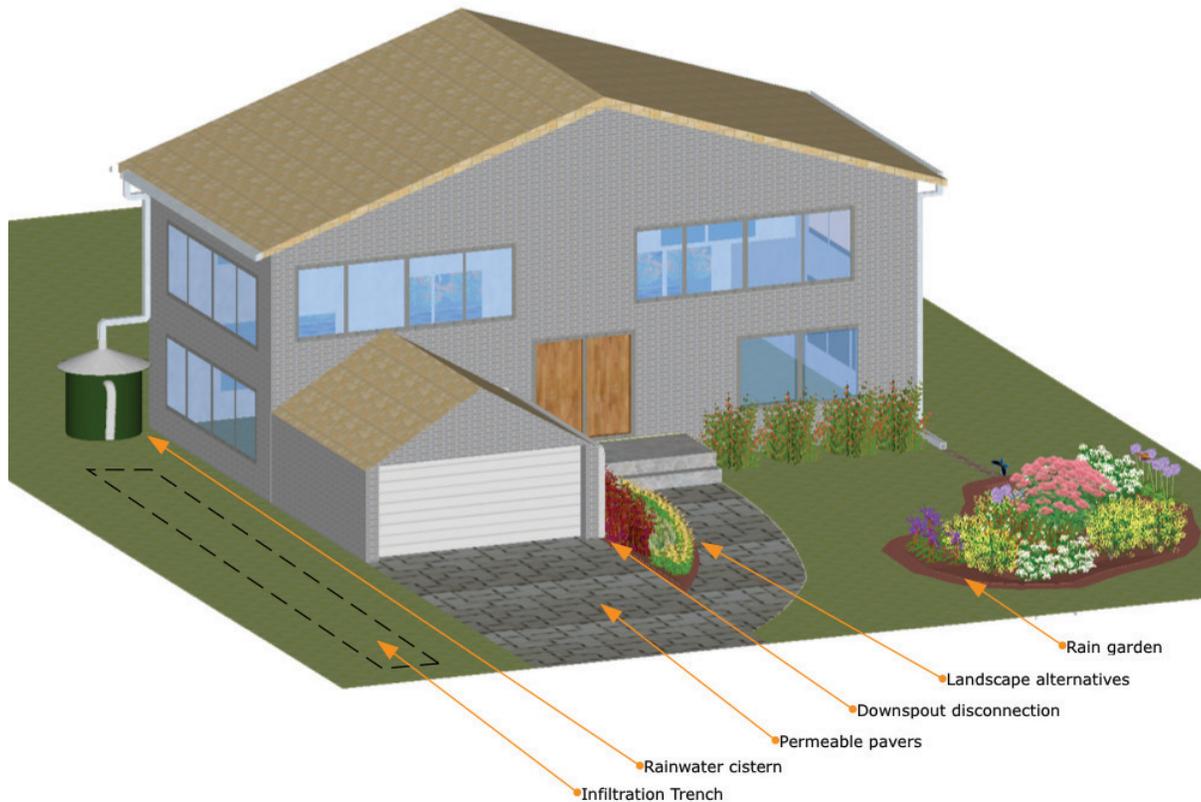
- *Establish clear program goals*
- *Identify the most cost effective approaches to meeting those goals*
- *Define the target audience through market segmentation and analysis*
- *Develop a marketing strategy based on a sound understanding of the target markets. Include tailored approaches and programming addressing both the end user (the resident) and the vendor (contractor/retailer) marketplace.*

*As you move forward with this guide, you will learn how to achieve these objectives.*

# 3.0 What are Your LID Options?



## Take a look at a typical home. What opportunities exist to implement LID?



On residential lands, hard surfaces such as the roof, patio, walkways and driveways can all be targeted to collect, treat, and infiltrate runoff. The practices you choose will vary depending on neighbourhood and site constraints (Chapter 4) and landscape ideals identified during market research (Chapter 5).

This chapter will provide examples of residential landscape alternatives and LID retrofits that are options for a municipal program. For a good “how to” resource for homeowner LID installation, see TRCA’s *Greening Your Grounds: A Homeowners Guide to Stormwater Landscaping Projects*, available for purchase at [TRCA.on.ca](http://TRCA.on.ca).

For more technical information and design guidance on LID practices, see the *Low Impact Development Stormwater Management Planning and Design Guide*, available at

**bealeader.ca**

### 3.1 Landscape alternatives

Landscape alternatives capture rainfall in leafy green foliage. This allows for infiltration, filtration, and evapotranspiration of rainfall and runoff. Landscape alternatives can be designed to require little maintenance and less irrigation after establishment than sod lawns. They are a great water conservation tool.

Landscape alternatives allow homeowners to customize their property's landscape to their liking. A guiding principal when designing landscape alternatives is "the right plant for the right place". Use of both native and non-native plants is acceptable as long as the non-native plants are not invasive and do not require frequent watering.

There are various landscape alternatives available, including:

- Fusion Landscaping®
- Xeriscaping
- Tree Clusters

#### Fusion Landscaping®

A great example of a landscape alternative is the Region of Peel's Fusion Landscaping® program. Fusion Landscaping® combines the lush splendour of traditional gardens with modern, eco-friendly plants. This program uses local market research and social marketing to promote behavioural change, address residents' unique needs, and reduce outdoor water

use. For more information, see [peelregion.ca/watersmart](http://peelregion.ca/watersmart) or refer to the Peel Fusion Landscaping® case study in Appendix A.

#### Xeriscaping



**Figure 3.1.1:** Landscape alternatives can be established in any green space. They are most frequently established in front yards. (Source: Region of Peel)

Xeriscaping refers to landscaping, plantings and gardening practices that reduce or eliminate the need for watering. Synonymous with terms such as water-conservative, xeriscaping was originally promoted in areas with perennial water shortages.

With xeriscaping, plants are selected based on their ability to survive with little water. Additional benefits include reducing water bills, lower maintenance requirements, better plant survival and aesthetics during drought periods. Xeriscaping can be used alone or it can be combined with a larger residential LID program.

#### Tree clusters

Tree clusters are another residential landscape alternative. They provide some of the function of forested areas by intercepting rainfall and allowing for evapotranspiration and infiltration of stormwater runoff.

Tree clusters improve water quality, generate organic soils, absorb greenhouse gases, and provide shade for homes. Tree clusters require larger lot sizes and preferably no overhead wires. They can be planted as a standalone feature or part of a larger residential LID landscape.

### 3.2 Rain gardens

On the outside, rain gardens look like a typical garden. However, their function is much greater than a normal garden. Rain gardens are landscaped areas that include a surface depression of approximately 150 mm (6 inches) that allows runoff from residential property to collect and easily absorb into the ground. Within the rain garden a special type of soil, referred to as bioretention soil media, can be used to improve the amount of water that gets absorbed by the garden and infiltrated into the native soils.



**Figure 3.2.1:** Residential rain gardens are a great way to reduce runoff from both roof and landscape surfaces. (Source: Fern Ridge Landscaping)

Location is very important to a functioning rain garden. When looking at potential locations, look for low areas where runoff can be easily be directed into the garden.

Rain gardens are a great option for residential LID retrofits because homeowners can customize the garden to suit their desired style. They can be planted with a variety of vegetation including shrubs, grasses and flowers.

A well-designed rain garden can be maintained with minimal care which is a great marketing point for homeowners.

In the first two years, the plants will need watering to ensure they become established. After this establishment period, the garden should only need simple maintenance such as weeding.

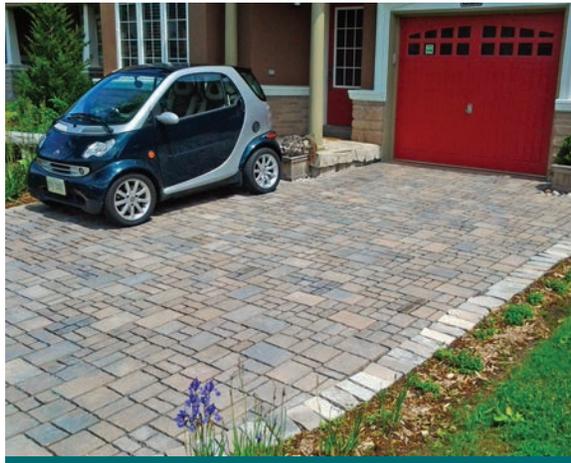


**Figure 3.2.2:** Rain gardens are frequently established at the outlet of downspouts. (Source: Aquafor Beech)

### 3.3 Permeable pavement

Permeable pavement are surfaces that encourage infiltration. They can be used in place of conventional asphalt or concrete pavement. These alternatives contain pores, spaces or joints that allow stormwater to pass through to a stone base where it is infiltrated into the underlying native soil or temporarily detained. Types of permeable pavement include:

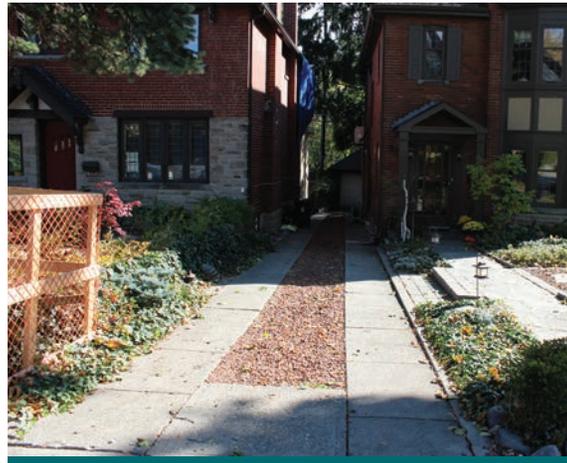
- Pervious concrete
- Porous asphalt
- Permeable interlocking concrete pavers (PICP, or just permeable pavers)



**Figure 3.3.1:** A driveway paved with permeable interlocking pavers. (Source: Fern Ridge Landscaping)

Permeable pavement can be used for both driveways and walkways. When infiltrating driveway runoff, confirm whether your residential neighbourhood is in a wellhead protection area. Driveway runoff should not be infiltrated in a wellhead protection area due to the risk of groundwater contamination. Contact your local Conservation Authority for more information on wellhead protection areas.

Focus on aesthetic appeal when marketing permeable pavers to homeowners. They come in a variety of colours and shapes, and can be laid out to form patterns or designs that enhance the landscape of residential properties.



**Figure 3.3.2:** A strip of pervious gravel with large block pavers. (Source: Aquafor Beech)

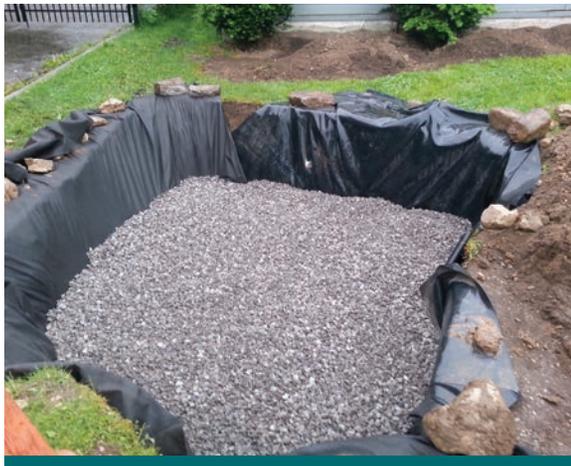
Permeable pavement may also appeal to homeowners because it typically has a longer life span than traditional asphalt. As well, light coloured pavers typically require less winter maintenance. Water and snow generally seep through the joints of the pavers before ice can form. This reduces the amount of salt homeowners need to use on their driveways, walkways or patios.



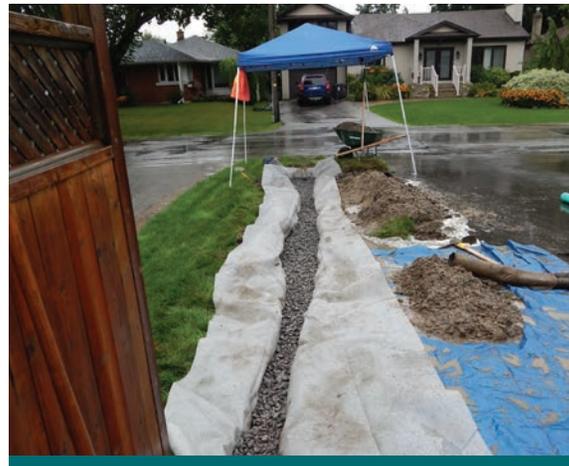
**Figure 3.3.3:** A backyard walkway paved with permeable interlocking pavers (Source: Fern Ridge Landscaping)

### 3.4 Soakaways and infiltration trenches

Soakaways, also known as infiltration galleries and dry wells, are excavations in native soil that are filled with geotextile fabric and clean granular stone. Soakaways are typically designed with a perforated pipe inlet from a relatively clean water source, such as a roof or pedestrian area. When possible, soakaways should be installed in areas where native soils allow for infiltration. If poorly draining soils are present, an underdrain can be installed to remove standing water.



**Figure 3.4.1:** Construction of a residential soakaway. (Source: CVC)

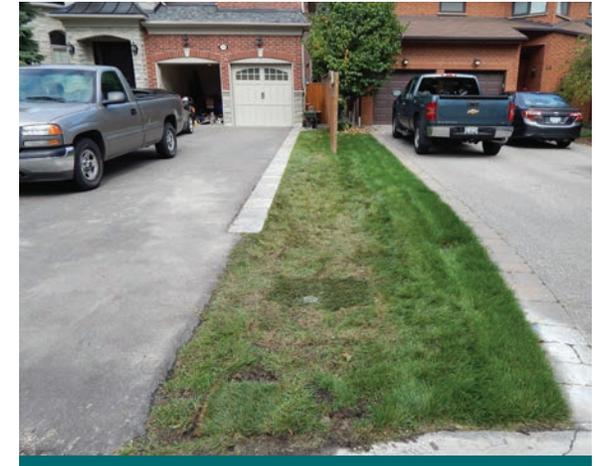


**Figure 3.4.2:** An infiltration trench being installed to improve lot drainage and mitigate basement flooding. (Source: Aquafor Beech)

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*When marketing infiltration trenches to homeowners, focus on the benefits they provide. These systems are more likely to be installed by homeowners that need to solve a practical problem, such as poor lot drainage and basement flooding.*

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**Figure 3.4.3:** This photo shows the infiltration trench shortly after the turf installation. Instead of turf, plantings could have been incorporated into the design. (Source: Aquafor Beech)

### 3.5 Rainwater harvesting

Rainwater harvesting is the process of collecting and storing rainwater for future use. Harvested water can be used for a variety of indoor and outdoor non-potable uses with minimal treatment. Rainwater harvesting provides an easy and low-cost option for homeowners to reduce the volume of runoff conveyed from their properties to the municipal storm sewer system.

*Marketing campaigns should focus on highly visual options, such as beautiful plants and gardens. Your residential LID marketing program can still promote rainwater harvesting, but they are ideally positioned as enhancements or extras to properties that undergo more landscape-based retrofits.*

#### Rainwater harvesting systems

Rainwater harvesting systems collect rainwater from roof runoff and store it until it is needed. These systems are typically used for irrigation, however with additional equipment and proper treatment this water can be used for indoor purposes like toilet flushing and laundry. By using rainwater around the home residents can reduce their water bills while also



**Figure 3.5.1:** Rainwater storage tanks can hold more water than rain barrels and can be installed outdoors above ground for seasonal use, or buried below ground for year-round use.

reducing the amount of stormwater runoff entering the storm sewer system.

Rainwater storage tanks come in a variety of dimensions and shapes to accommodate both the size and desired aesthetics of residential properties. They can fit unobtrusively against the home, buried underground, or even placed below a deck.

#### Rain barrels

While they provide similar functions to rainwater harvesting systems, rain barrels have much more limited storage space. Rain barrels are installed at the outlet of downspouts and intercept water draining down roofs. Water collected in rain

barrels can be used for irrigation.

Rain barrels come in a variety of shapes, sizes and styles. Residents can choose a style of rain barrel that is best suited to their home and personal tastes. For example, rain barrels can be decorated to create garden art.



**Figure 3.5.2:** Rain barrels are a common LID practice promoted by many municipalities.



# 4.0 Selecting Neighbourhoods to Retrofit



There are many factors to consider when strating your LID residential retrofit. Small municipalities may be able to target their entire community for retrofit. However, for medium and large municipalities with multiple land uses, identifying specific residential areas may be the best approach.

As your first step, it is important for you and your municipality to review or identify your water management priorities. This will give you a better understanding of what you are trying accomplish (i.e. runoff reduction, flood risk reduction, water quality enhancement or peak flow reduction) and the tools you have to accomplish those priorities. Sometimes priorities and objectives can be found in a master drainage plan, source water protection plans or in watershed studies. It is critical you consider this before you begin selecting neighborhoods as some LID strategies may not be best suited for the residential area or community selected.

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*CVC's Grey to Green Enhanced Stormwater Management Master Planning Guide can help you set stormwater management goals, objectives and targets for your municipality. See*

**bealeader.ca**

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If your water management plans have not already identified the residential areas best suited for LID retrofits you will need to do so. There are several variables to consider when choosing your site. This chapter will provide you with guidance on how to select suitable neighbourhoods. Selecting your neighbourhood requires technical input from municipal staff members who are familiar with stormwater management and environmental issues. It is also a good idea to get input from staff about infrastructure gaps and planned upgrades, resident concerns, community greening, water usage and basement flooding. This will assist you in selecting the site(s) most in need and most receptive to retrofits. As staff collect technical information about potential sites, the aim will be to determine which areas will receive the greatest benefit from LID measures and which site-specific conditions will create challenges. You may also require information from external government and agency contacts,.

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***Conservation authorities can help!***  
*Many conservation authorities have expert staff that can provide advice and guidance on implementing LID projects. Be sure to contact your local conservation authority to see what approvals are required, if any, and if they can provide guidance, comment on the design or provide other assistance.*

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## 4.1 Desktop analysis

A desktop review of technical information is the first step in defining a target area for marketing efforts. Many of these items are available through your municipal GIS services. The following sections outline the various studies, plans, by-laws and other tools and resources that can be used for desktop analysis.

### Watershed studies, subwatershed studies, and stormwater master plans

These studies characterize the health of the watershed and identify issues, targets, and strategies within the framework of existing municipal stormwater infrastructure and highlight important information on natural hydrologic conditions. For more information see Appendix B – Desktop Analysis.

### Source protection plans

Source protection plans address activities and land uses surrounding wells and surface water intakes. These plans are watershed-based and founded in years of monitoring, scientific investigation, and modelling. Source protection plans will identify locations of wellhead protection areas which can influence the types and location of LID practices employed.

## Surficial geology (Soil Studies/Analysis)

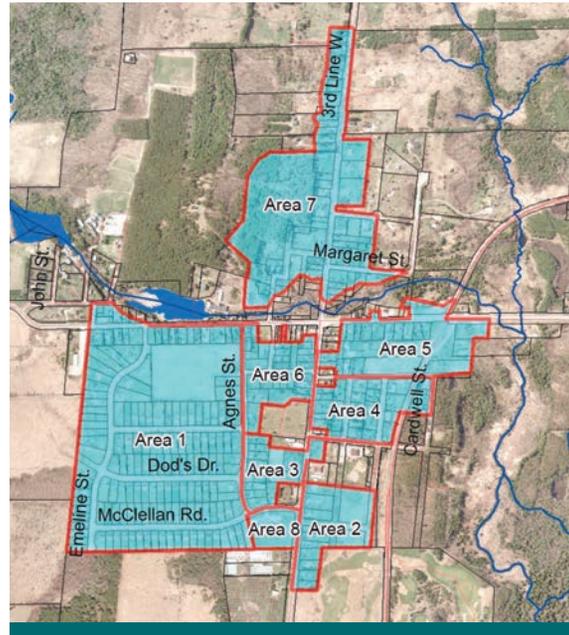
Review surficial geologic conditions to define areas where infiltration practices will be more successful, especially if the goals of your project are to increase groundwater recharge and to reduce runoff volumes. In well-drained areas, infiltration practices such as soakaways and rain gardens could be promoted. In areas with high water tables, landscape alternatives may be the best option. For more details see Appendix B – Desktop Analysis.

## Zoning

In your municipality, there are likely several different types of residential zones, including:

- Rural residential
- Estate residential
- Single-detached dwellings
- Semi-detached and duplex dwellings
- Townhouses
- Multi-unit residential

Examining residential zoning can help you identify larger areas of similar residential zones. Targeting these areas is not essential, but it provides several advantages. Land use regulations on properties with the same zoning is consistent (e.g., setbacks, permitted uses, minimum lot sizes), and landscape maintenance approaches should be similar.



**Figure 4.1.1:** Potential residential LID targeting areas in Alton Village, Ontario. The project team took zoning and age of development into consideration when delineating these areas. (Source: Aquafor Beech)

## By-law and policy review

LID practices do not necessarily conform to conventional design standards. Municipal by-laws and policies may need to be amended to facilitate LID implementation on residential properties. Municipalities considering implementing LID to optimize water management should consider an internal review of policies concerning stormwater, grading and

landscaping to determine where barriers to implementation exist. Appendix B – Desktop Analysis identifies typical municipal by-laws, the general provisions they include, and their impact on residential LID retrofits.

Credit Valley Conservation conducted a review of residential roof drainage municipal by-laws in 2013. Of the 18 Ontario municipalities under review, five could be considered progressive because they require roof drainage to be discharged to pervious surfaces where possible. Two additional municipalities did not allow direct connection to the municipal storm sewer system, but did not specify surface outlets to be pervious. Eleven of the municipal by-laws reviewed did not require residential roof drainage to be disconnected from the municipal storm sewer system.

## 4.2 Field assessment

Now that your project team has conducted a desktop review, you know potential residential areas for your residential LID program. Your next step is to conduct a residential field assessment to confirm your desktop analysis and collect additional information. This will help you to make a final selection of target neighbourhood(s).

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*When conducting a field assessment, be sure to bring a camera and a map that you can mark-up.*

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The field assessment will collect information that helps your project team determine the technical feasibility of retrofits within the potential retrofit area and any other information that is pertinent to the implementation of LID practices. To assist you in conducting your field work, Appendix C – Field Assessment contains a Residential Field Assessment Form adapted from the Centre for Watershed Protection's Subwatershed Restoration Manual 11<sup>35</sup> for LID and other stormwater measures.

## Using the field assessment form

The field assessment form is broken down into six sections to help you assess a neighbourhoods potential for a LID retrofit program:

- Neighbourhood characteristics
- General lot characteristics
- Drainage characteristics
- Rooftop / drainage characteristics
- Best management practices info
- Recommended actions

You will need to fill out a field assessment sheet for each possible retrofit neighbourhood. The completed sheet will help

your project team identify opportunities and constraints within the target neighbourhoods.

Take, for example, a neighbourhood where homes have mostly impervious area with minimal yard or garden and a small grade change of the roof drain. This type of neighbourhood will need retrofit options that include grading, reduction of hard surfaces, and LID features that can work in small areas.

The field assessment form is meant to be simple and quick. For many characteristics, including percent tree cover and percent roadside swales, an estimate is sufficient. Some characteristics listed on the form, such as dominant soil type and percent within wellhead protection area, will require additional desktop analysis. Simply review materials collected during the desktop analysis and compare them to photos and field assessment sheets.



**Figure 4.2.1:** Staff completes a field assessment on a residential neighbourhood in Mississauga, On. (Source: CVC)

# 5.0 Building Support and Building your Team



Now that you have identified a target area in your municipality for residential LID retrofit, you need to build your team. You may already have formed a core technical team to assist with identifying the target residential areas. However, as you move forward the team will need to broaden. Continue to identify staff, departments, councillors, and external organizations that are interested and appropriate for the core project team or to participate in an advisory role.

The first thing to do as you move forward is secure the support of management or senior staff. This should be done before formalizing the team or looking to external organizations. To help build a succinct business case for a residential LID marketing plan, refer to Chapters 1 and 2.

Once you have the support of managers and senior staff, invite potential team members to be a part of the project. Managers and senior staff can speak to their respective department, role of staff, budgets, and provide decision-making authority within the team itself. These people will help formalize the project team and provide insight on external stakeholder and advisory roles.

The task of building a project team shouldn't be exhausting. However, it is important to consider the interdisciplinary nature of a residential LID program and roles staff/management may need to fill. Your program may involve engineering, planning, marketing, communications (internal and external with residents), landscaping, operations and maintenance, and other tasks. At the same time, availability of resources and

staff may require you to be flexible. Smaller municipalities may not have all the staff or skill sets required for this type of project and may need to look for help from local organizations or community groups.

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*Consider forming strategic partnerships with community groups to spread the word about your residential retrofit program. The Cities of Kitchener and Waterloo have teamed up with REEP Green solutions, an environmental non-profit organization, to help them achieve their outreach goals. Through their RAIN program, REEP provides one-on-one consultations that help homeowners address water issues on their property.*

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## 5.1 The role of your project team

The role of your project team will be to lead the development and implementation of the residential LID program. The project team determines program goals, objectives, and staff roles. As the program begins, the project team will also need to measure and determine its effectiveness (see Chapter 8). With any municipal program, it is important to get feedback

from people with strong links in the targeted neighbourhood or communities.

Depending on the number of people serving in an advisory role, you may want to form an advisory committee. The purpose of the committee is to provide regular input and feedback to the project team, including the review of program goals and objectives. The advisory committee can be comprised of representatives from local businesses, community associations, religious organizations, neighbourhood associations, conservation authorities, or even the municipal council. Municipal councillors can be effective advocates for your program and assist with the engagement of residents. The advisory committee brings external perspectives and expertise to the design and delivery of the residential LID program. An advisory committee should also have good community representation. This representation is crucial for building support in the target areas. When the program begins, the advisory committee can also help by distributing marketing materials to residents and promoting events or projects.

## 5.2 Municipal council support

Engaging municipal councillors on the development of residential LID program is vital. The project team should carefully consider when and how to engage them. The support of municipal council for any program is usually necessary for success, but building and sustaining the support can

be challenging. Competing interests and a typically limited understanding of LID or stormwater management can make a residential LID program difficult to sell. Here are some strategies for engaging and securing council support:

- Identify a potential champion or champions on municipal council who can advocate for the LID project.
- Identify opportunities for councillor participation or recognition in LID related projects, such as ribbon cuttings, tree planting, and press releases.
- Present the impacts of not implementing LID measures, such as flooding, increased liability, higher insurance costs, infrastructure damage, and poor constituent relations.
- Provide regular program updates and announce success stories.

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*For any planned LID project it is important to communicate with the elected councillor of the project area. Be sure to provide that councillor with a briefing well in advance of implementation.*

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**Figure 5.2.1:** Members of the public tour a successful LID project. Accompanying the tour are team leaders, designers, project champions and local municipal councillors. (Source: CVC)



# 6.0 Understanding Your Community



Prior to initiating your residential LID program or any outreach, it is important that you understand your target community.

The most effective way to understand residents in the targeted community is to conduct market research with a demographically representative sample. Market or primary research provides important details about residents' perspectives, intrinsic motivations, and identifies barriers to their uptake of LID measures.

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*If you don't have the staff expertise, hire a professional to conduct your market research.*

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The costs associated with conducting market research may seem difficult to justify, but the insights about what will (and won't) work with residents will prove invaluable. It will also ensure marketing dollars are directed to where they have the greatest impact and return on investment.

If primary market research is beyond the budget of your municipality's LID program, draw on the experience of other municipalities, conservation authorities and NGOs. Review marketing strategies and plans from other municipalities and organizations that have delivered similar programs. Once there is a clear direction based on the experiences of other municipalities and organizations, your team can test concepts with community representatives on your advisory team.

Here are some examples of NGOs that have teamed up with municipalities and conservation authorities to promote residential LID retrofits in Ontario:

**REEP Green Solutions** has partnered with the City of Kitchener to run a home visit program called RAIN for homeowners interested in residential retrofits.

**RainScaping** has provided expertise and experience to Lake Simcoe Region Conservation Authority's LID program.

**Region of Peel's Fusion Landscaping® Program** has worked with municipalities in the region to promote water efficient gardening. See Appendix A for the Fusion Landscaping® Case Study.

**CVC's Alton LID Landscaping Demonstration Project** is working with the Town of Caledon to promote residential LID practices in the neighbourhood of Alton. See Appendix A for the Alton Village LID Landscaping Case Study.

**TRCA's Greening Your Grounds Program** is working with City of Brampton and City of Toronto to provide "how-to" LID resources for residents and contractors.

## 6.1 Demographics

The first step in market research is to secure demographic data. This includes gender, age, level of income and education, number and age range of children, country of origin, languages spoken and other valuable information. This information is used to create a profile of residents in the LID program target area(s). A demographic profile provides guidance for recruiting a representative sample of residents for market research. The profile is an integral step in the market research process because it ensures the residents recruited for the research session(s) match the percentages and demographics of the residents in the LID program target area(s).

Table 6.1.1 provides an example of a demographic profile. It compares information from two municipalities in the GTA. The size of the research sample is based on the size of the single-family home population to be targeted by the program.

Columns 3 and 4 indicate the minimum number of homeowners that need to be recruited (e.g.  $n = 60$ ) to ensure a statistically relevant sample size for each municipality. The remainder of the table provides the demographic makeup, by percentage, of the area population. Note the demographic differences of these two communities. It is this difference that makes it impossible to design a one-size-fits-all marketing program.

**Table 6.1.1: Demographic profiles**

Demographic variable		Screening quota range	
		Municipality 'A'	Municipality 'B'
<b>Population</b>		n = 90-120	n = 60
<b>Gender</b>	Female	40%	50%
	Male	60%	50%
<b>Marital Status</b>	Married/Cohabitation	55%	80%
	Single	40%	10%
	Divorced/Separated/Widowed	5%	10%
<b>Children at home</b>	Yes	50%	80%
<b>Single-Detached Owner - Occupied Dwelling</b>		100%	100%
<b>Primary responsibility for care of home's lanscape</b>	Yes	60% +	60% +
	Spouse (or child)	30%	30%
	Landscape contractor	< 10%	< 10%
<b>Household income: Mix</b>	>\$30,000	30%	-
	\$30,000 to \$49,999	25%	-
	\$50,000 to \$69,999	25%	-
	\$70,000 or more	20%	-
<b>Education</b>	Less than High School	20%	< 5%
	High School Graduate	30%	25%
	College or Trade Certificate	30%	32%
	University Graduate or above	20%	40%
<b>Age</b>	25 to 44	45%	40%
	45 to 64	45%	50%
	65+	10%	10%
<b>Place of birth</b>	Canada	85%	50%
	Asia and Middle East	-	25%
	UK/Europe	10%	15%
	Other	5%	10%

Source: Freeman Associates

*To design a program that resonates with your target market, you must understand their motivations, perceptions, intrinsic beliefs and dynamics.*

## 6.2 Where to get demographic data

The data needed to create residential demographic profiles is collected through the national census and available through Statistics Canada (StatsCan). This data can be provided for specific neighbourhoods at a cost. Costs vary significantly depending on the scope of work. Smaller requests may be in the range of several hundred dollars while larger projects may cost tens of thousands of dollars. Larger municipal economic development departments may also have the census data available by neighbourhood.

*Statistics Canada can provide valuable information for your demographic profiles using GIS data. This includes streets, neighbourhood coordinates, and postal codes.*

Larger municipalities may have marketing specialists on staff that can help develop a demographic profile, guide the market research, and develop a marketing strategy. For smaller municipalities without internal expertise, it is important to hire a marketing consultant, or partner with an organization or larger municipality that has a marketing specialist on staff who can provide guidance.

*The top-performing companies in the world use specialists to conduct market research on a regular basis. You're not selling laptops, you're selling something most homeowners don't think they need. To create desire for these landscapes, you must know the motivations of the residents you are trying to reach.*

### 6.3 Identifying your sample group(s)

Primary market research provides very specific insights about the target audience, in this case, single-family homeowners. This detailed information enables the development of a marketing program specifically designed to resonate with single-family homeowners and motivate them to implement LID measures.

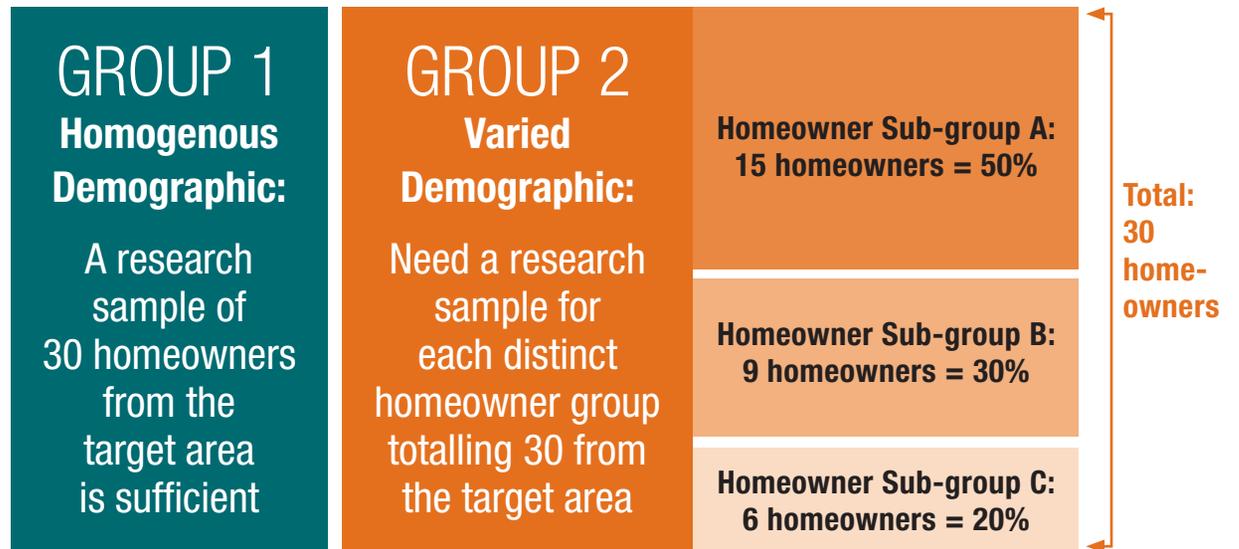
To secure a representative research sample of single-family homeowners, develop a recruitment screener based on the demographic profile. The screener is used by a recruitment agency to screen or pre-select homeowners for the research session.

The number and size of the focus group research session(s) is based on the population size of the residential LID program area(s) and the range in demographics. For example, if there are more than 2,000 single family residents but the demographic is homogenous (similar breakdown by gender,

country of origin, languages spoken, age and education level), a research sample of 30 homeowners recruited from the target area would provide sufficient confidence. If, on the other hand, the population of single-family homeowners included three distinct demographic groups, it would be important to recruit in appropriate percentages from all three. A marketing specialist and/or the recruitment agency should be able to create the recruitment screener.

**For example:**

## HOMEOWNER POPULATION: 2,000



## 6.4 Focused research session

Once your residential homeowner sample group(s) has been screened and selected, a third-party marketing consultant proceeds with the focused research session(s). Use of a marketing consultant is highly recommended to avoid biasing responses from your sample group. If the respondents know the questioner or the organization he/she represents, there is risk they will provide responses they think are agreeable with that person or organization. Separation between the municipality and focus research sessions is critical.

To save costs, consider partnering with a local college or university. They may be able to provide assistance to review and interpret collected data.



**Figure 6.4.1:** Avoid focus groups like the one above as dominant personalities can influence others and skewer your results.

Prior to the focus research session, the marketing consultant will develop a list of questions to ask your sample group(s) that consist of both open-ended and closed ended questions. As adapted from previous residential market research studies<sup>36</sup> the intention of the questions and analysis should be to:

- Uncover homeowners' fundamental motivations (what drives their decisions and why) regarding their property
- Understand residents' perceptions of lot-level LID features
- Identify images and messages pertaining to lot level LID features that resonate with homeowners
- Identify key stakeholders that directly influence the practices and attitudes of homeowners
- Identify potential barriers towards the application of LID features on a homeowner's property.
- Determine the preferred lot-level LID features for residential properties based on resident perceptions

The market information from your focus research session should give you significant confidence that the data is representative of target neighbourhood or community demographic(s). Perspectives and most importantly, intrinsic beliefs are largely shared amongst individuals of the same or similar demographic. By understanding their motivations, intrinsic beliefs, and perceptions of your targeted neighbourhood(s) you can develop a LID residential program with a tailored marketing plan.

## 6.5 What about the contractors?

Word of mouth is a powerful and effective marketing tool that can help you spread your message about LID. Marketing research of homeowners in the GTA has shown that the most trusted advisor concerning landscape design, maintenance and plant selection are landscape professionals and garden center staff<sup>37</sup>. So why not leverage these people to promote your LID program?

You can identify contractors, businesses and service providers in your targeted community through your focus research sessions. Building relationships with local businesses, contractors and service providers will benefit both of you. They can provide you with valuable insight about your targeted community. They can also help you to promote your program with greater effectiveness because of the trust and relationships they have already built in the targeted community. In return, you provide them with new business opportunities and the chance to develop specialized expertise.

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*Trade associations such as Landscape Ontario who represent some of these service provider groups can be a great resource for reaching members and helping develop programming.*

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It is important to realize that securing contractor and retailer participation in a real and transformative way involves research, looking at potential incentives, and determining how your program will benefit you, the contractor and service providers. As you move forward with collecting information from contractors and service providers, it will be important to ask the following:

- why would any contractor participate in your residential LID program?
- what training/education is needed?
- would financial incentives be needed?
- what are the costs for LID features, installation and training?
- when are the busy periods for contractors and service providers?
- what supplies are needed and where can I purchase them?

Additional questions specific to your project can also be asked. By understanding the perspective of contractors and service providers, you will be able to deliver a more effective LID retrofit program.

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*CVC offers a variety of training and seminars for contractors including LID construction. For more information visit*

**bealeader.ca**

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## 6.6 Learning from others

Primary research with residents and product and service providers offers the best and most accurate data about the target neighbourhood or community for your LID residential program. However when primary research is not feasible, in-depth secondary research is necessary.

Conduct a search on terms such as “low impact development”, “lot level LID” and “lot level stormwater management” and a number of web sites with quality information on residential LID programs will be displayed. This approach will identify municipalities, conservation authorities, and NGOs in Canada and the United States who are delivering residential LID programs. Contacting these organizations, interviewing the individuals responsible for implementing the LID programs, and identifying the most successful programs or initiatives will provide the foundation for your residential LID marketing strategy. One-on-one interviews provide an opportunity to

learn from experiences and avoid costly mistakes. Be sure to request copies of marketing plans and strategies, as well as samples of communications and marketing materials developed by these organization. Secure feedback from your advisory committee on ideas and samples collected from other organizations to narrow down options before developing your LID materials and program for residents.

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*See the Alton Village Case Study in Appendix A to learn how community groups and local businesses can help implement your LID program.*

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Overall, the more thorough the market research undertaken before developing the marketing strategy, the greater the likelihood of delivering an effective LID residential program on time and on budget.

As you move forward with your market research data, the next chapters will help guide you on the development, implementation and monitoring of your marketing plan for your residential LID program.

# 7.0 Creating a Marketing Plan



Understanding your target audience is critical to the development of an effective marketing plan for your residential LID program. The primary goal of your marketing plan should be to create a want or desire for LID landscapes. No amount of outreach or education on the benefits of LID will change residents' minds unless they first have this desire for it. The marketing plan sets the direction for achieving this goal.

To achieve the first goal of creating a want or desire for LID, it helps to position LID landscapes as desirable and “on trend,” which is a common motivator among many demographic groups. Keep in mind this can be a long-term initiative that requires long-term support for your market plan. However, when LID landscapes become on trend, the marketplace will take over and municipal support is required less.

There are many ways to promote your message, including advertising, demonstration sites, displays at retail stores, and establishing partnerships with local garden centres and nurseries for staff to speak confidently about LID. The following sections will provide guidance on key components of creating the marketing plan, including messaging, images, advertising/promotion, “how-to” resources, demonstrations sites and specialty events.

## 7.1 Using effective messages and images

The messages you use to communicate with homeowners need to be based on the findings from market research. They must resonate with the intended audience, for instance, tapping into homeowners' emotional connection with their home and landscape, such as the imagery and language



**Figure 7.1.1:** Magazines use vivid pictures and emotional language to attract readers. (Source: CVC)

used in the magazine cover in Figure 7.1.1. Refer to your primary or secondary market research to see what words resonate with your target community. If there are questions or concerns about messaging, try referring to home or gardening magazines to see the type of messaging they use and/or discuss with your advisory committee.



**Figure 7.1.2:** The image and wording draws from the market research with homeowners conducted on behalf of the City of Mississauga. The image reflects an “ideal” landscape and the text uses residents' own words to describe fusion landscaping. (Source: Region of Peel)

As stated in Chapter 2, it is recommended that you avoid the use of overly technical language in your messages. These technical messages can include terms like “low impact development,” “rain gardens,” and “infiltration trenches.” These terms may not connect with a larger segment of the population and will fail to create the desire for LID landscapes<sup>40</sup> that you are looking for. Instead, when it is time to market your residential LID program, the campaign should focus on simple concepts that resonate with homeowners, such as the messaging in Figure 7.1.2.

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*The Fusion Landscaping® campaign is an example of an effective way to connect with homeowners. The campaign was launched by Peel Region and Durham Region to reduce water use. Rather than focus on this topic, the campaign uses residents emotional connections to their landscape. Homeowners reduce their water use by using the plants and landscaping techniques advertised as part of the Fusion Landscaping® campaign. For more details, refer to Appendix C.*

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Many people are visually motivated. Try providing residents with a vision of what their landscape could look like rather than trying to inform or educate them about LID measures and their benefits. When selecting images, refer to your primary or secondary research as it will tell you what images resonate with your target community.

Keep in mind that existing market research shows that homeowners have a generally negative view of naturalized or uncontrolled landscapes<sup>41</sup>. Research also shows that

homeowners define a beautiful landscape as one with lush green grass, colorful gardens, and a clean and well-organized landscape<sup>42</sup>.

## 7.2 Developing advertising and promotion

Each day residents are bombarded with advertising and promotions through channels such as direct mail, newspapers,



**Figure 7.2.1:** Outdoor signage is one way of spreading your message to residents. This sign used market research data to showcase desirable landscape features and wording that resonates with the target audience. (Source: Region of Peel)

radio, television, internet, billboards, inserts, in-store offerings, and transit ads. Capturing and holding residents' attention has never been more challenging.

There are a number of options for advertising and promoting your residential LID program. Social media, outdoor signage, print advertising, websites, special events, demonstration sites and word of mouth are some of the most common approaches. To help determine the types of advertising and promotion that works best, refer back to your market research and discuss with your marketing consultant as well as your project and advisory teams. Once the types of advertising and promotion are selected for use, discuss with your team how such initiatives can be combined. By combining multiple promotional activities, you have a better chance of sparking homeowner interest—and interest and desire is critical for action.

### 7.3 Contractors and material suppliers

Identifying contractors and material suppliers is a critical component of your marketing plan and should be part of your market research phase (Chapter 6). As you develop your marketing plan, it will be important to engage contractors, material suppliers, and home renovation retailers. Before meeting with members from these groups, take the time to refer back to your research (Chapter 6) and determine what will motivate them to be involved. Improved profit margins, attracting new customers, advertising or financial incentives

can all be options in garnering their support and having them help drive your residential LID program forward. Meeting with these stakeholders in person or with their trade associations to discuss the program and establish roles is recommended to avoid any confusion during the rollout of the marketing plan.

Developing these types of partnerships prior to roll out will take time, and you should account for this when developing your marketing plan. For instance, it may take multiple meetings to gain support from a trade association, contractor, supplier or retailer, determine how they can be involved, and the possible training needed. Your partnership may require a memorandum of understanding or possibly a formal legal agreement which outlines the responsibilities of all parties involved.

### 7.4 Creating demonstration sites

Demonstration sites provide real world examples of LID features intended for replication by homeowners. Demonstration sites must show LID at its very best. They should include eye-catching, dynamic designs that are well-maintained and located in high-traffic areas. When identifying potential demonstration site locations, refer to your field reconnaissance and market research. Depending on the available resources, demonstration sites can be put in place at key locations, such as:

- Feature homes in target residential areas. An application process or lottery may be used to secure one or more sites to demonstrate a residential LID project. These front yard makeovers serve as model homes in target neighbourhoods.
- Project partner locations, such as nursery and garden centres, local retailers, churches, local community group sties, public schools, and conservation areas.
- Municipal sites, such as community centres and recreation facilities, municipal offices, transit stations, public parks, and along municipal right-of ways.

Demonstration sites capitalize on three strong motivators for the homeowner: a beautiful landscape, peer association, and being on-trend.



**Figure 7.4.1:** Homeowners must want what they see, so demonstration gardens and landscapes must be visually impactful, well-maintained, use quality material, and be readily replicable. (Source: CVC)

## 7.5 Holding specialty events

Directly engaging the homeowner through special events is an effective means of building interest, creating a sense of community, and drawing on individual desire for peer association. The use of open house-style events where municipal staff stand behind tables armed with engineering schematics and informational brochures is not recommended to make this connection and build interest. Instead, use special events.

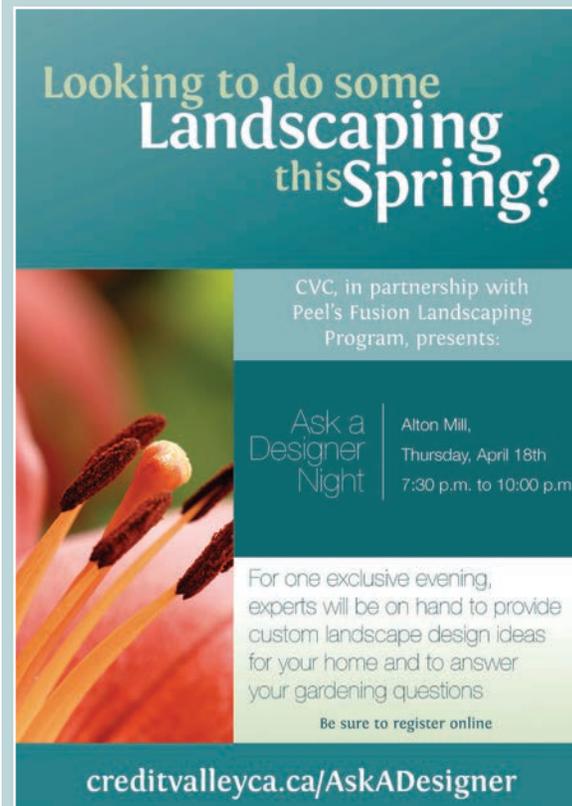
Special events can be a successful way to launch your residential LID program. You can tailor these events to match the interests of your target market. They will provide you with an opportunity to showcase the beauty of landscapes with LID features, secure the participation of homeowners and provide a promotional opportunity for program partners.

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*CVC's "Ask a Designer Night" in Alton Village used a specialty event location normally reserved for weddings, decorated with lights, flowers, and photos of landscapes. No technical diagrams were shown. Over 50 people attended from a Village with a population of 1,000. See the Alton Case Study in Appendix A for more information.*

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### Ask a Designer Night:



**Figure 7.5.1:** Example of a postcard sent to Alton residents promoting CVC's Ask A Designer Night. See Appendix C for the Alton Village LID Case Study. (Source: CVC)



**Figure 7.5.2:** Flowers, lighting and comfortable chairs were used to help create a warm atmosphere at CVC's Ask a Designer Night. (Source: CVC)



**Figure 7.5.3:** The Ask a Designer Night engaged residents by encouraging them to bring photos of their property. Expert designers were on-hand to provide advice tailored specifically to their needs. (Source: CVC)

## 7.6 Budget and schedule

When developing the marketing plan, consider both the size and number of audiences you are trying to reach and your program goals to understand the type and scope of the marketing you will need to undertake. Larger scale residential LID programs may have multiple audiences depending on demographic types.

Your LID program goals, the scope, and type of marketing required should inform your budget. Talk to the experts – a marketing consultant can provide advice on marketing strategies that fit your budget and achieve the greatest results.

As you crunch numbers, do not forget about the value of market research. The more you know about how to reach your target audience(s) and achieve your program goals, the better you are able to develop an effective program with your available budget. Table 7.6.1 provides an overview of marketing program components and the potential cost range. Please note that the cost ranges within the table vary significantly. However, to have confidence in your budget you will need to gather quotations, evaluate what truly can be developed and managed internally, and determine the absolute must-haves for your marketing program.

**Table 7.6.1:** Estimated range of costs for implementing a marketing plan<sup>43</sup>.

	Marketing components	Cost considerations	Estimated cost for 2-year program
<b>Development of a marketing plan</b>	Qualitative research	in-person research session: \$10,000 per session \$100 per participant recruitment costs Report >\$10,000	\$24,000 - \$60,000
	Marketing plan		\$15,000 - \$50,000
<b>Potential marketing plan components</b>	Social media campaign	\$2,500 - \$50,000 per month	\$60,000 - \$1,200,000
	Outdoor signage	Bus exterior - \$150-\$8,500 Shelter- \$150-\$2,500 Bench - \$75-\$500 Bus interior - \$20-\$125 Billboard - \$700-\$2,500 (4 week period)	\$6,000 - \$95,000
	Print advertising	Local paper: \$250-\$1,000/quarter page \$500-\$2,500/full-page	\$6,000 - \$36,000
	Web site		\$10,000 - \$150,000
	Creative	Total cost depends upon municipality's internal communication resources	\$0 - \$250,000
	Special events	\$250 - \$25,000 per event	\$1,000 - \$50,000
	Demonstration sites	\$5,000 to \$30,000 per site	\$5,000 - \$375,000
	Incentives and rebates		\$25,000 - \$1,000,000
<b>Program benchmarking and tracking</b>	Quantitative survey (telephone, email, on-line) – For tracking purposes only and dependent on size of survey		\$10,000 - \$100,000

## 8.0 Rolling out Your Marketing Plan



The best marketing strategy in the world can fall flat if it isn't well implemented. The implementation or rollout plan provides the road map for delivering your marketing plan. Depending on the size and scope of your marketing plan, you may have several segments of your marketing plan being implemented at the same time. To ensure they work cohesively, it is critical that you work closely with your marketing consultant and your team.

## 8.1 Project timelines

Prior to implementing your marketing plan, it is important to create detailed project timelines. By creating detailed project timelines, your team will have an effective means to track and monitor progress and to prevent the marketing plan from going off track. This is important as a market based approach can be a longer term commitment. On an ongoing basis, the entire team should refer back to the timeline to track progress, making adjustments where necessary.

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*Implementation plans are fully informed by the marketing plan and include a step-by-step process for effective delivery of each component. Treat the plans as living documents that are revisited and updated throughout the project.*

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## 8.2 Making sure staff are ready

Your staff should understand the overall marketing plan, as well as their individual role in it. New roles for staff may require additional training or an update to their existing skill set. For example, they may need to become knowledgeable in LID construction inspection, landscape design or improve their public speaking skills. Refer back to your marketing plan to identify available staff, their responsibilities, and whether additional training is needed to implement the marketing plan.

## 8.3 Ensuring contractors and material providers are prepared

It is important that partnering contractors and material providers are ready and understand their role in the marketing plan (Chapter 6 – 7). If residents have questions regarding your program, contractors and material providers should be prepared with answers or be able to direct people to appropriate resources.

As noted in Chapter 7, to assist contractors, suppliers, and retailers with preparedness, training sessions for contractors or staff may be required to ensure a knowledgeable team member is available and they understand residential LID program. Training and discussions need to happen prior to roll out. In addition, if financial incentives are being offered to contractors and material providers, you must ensure that you have the staff and administrative structure to provide that

incentive. Overall, residents will become frustrated if they are ready to implement an LID landscape and find that the local retailer or contractor is unprepared.

## 8.4 Preparing your resident groups

Like the contractors and service providers, your resident groups should understand and be ready to implement their role in the marketing plan. Resident groups are a link to your target community and can provide input on to how the marketing plan is implemented allowing for any last minute changes. These resident groups will further enhance the promotion of your LID program by creating stronger social ties and a support system that gives you access to community resources. They can also act as early adopters to LID landscape practices by hosting demonstration sites for the target community. If members of the resident group agree to be a demonstration site, it is beneficial to have it completed or ready for construction during your marketing plan rollout. Garden or plantings parties around a residential LID demonstration site are a great way to showcase to your target community.

## 8.5 Make sure homeowner resources are available

Homeowners interested in changing their landscape with LID will have questions. These include:

- What are my landscape options?
- How do I get started?
- What maintenance activities are required?
- Is funding available?
- Can I change my landscape without a contractor?

- Where can I find qualified landscape professionals?
- What and where can I purchase supplies?

Supporting resources need to be available for residents who have developed an interest in implementing LID following the rollout of the marketing plan. These supporting resources are where more of the technical “how-to” guidance for your residential LID program should be introduced. These resources should provide information for the questions above on a number of topics, including how to select the best type of LID practice, selecting the right plants, how to install LID

practices, estimated costs and how to maintain LID practices.

With these supporting resources, it is important to continue to use messaging and imagery developed through the market research. Consider home and garden magazines as a template for your informational resources. These publications convey how-to information in a manner that encourages the uptake of new ideas or practices that are not intimidating to the reader. Most homeowners will flip through decor magazines before renovating or remodeling the interior of their home to get ideas, find suppliers, and determine how they will move forward.

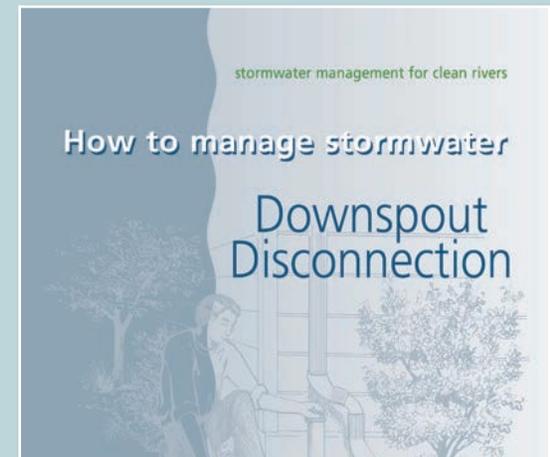
### Supporting resources to help develop your materials:



The Fusion Landscapes® brochure available at [durham.ca](http://durham.ca) or [watersmartpeel.ca](http://watersmartpeel.ca)



Toronto and Region Conservation Authority's Greening Your Grounds: A Homeowner's Guide to Stormwater Landscaping Projects available at [trca.on.ca](http://trca.on.ca)



City of Portland's: How to manage stormwater factsheets available at [portlandoregon.gov/bes/31870](http://portlandoregon.gov/bes/31870).

It is recommended that a variety of options be provided to homeowners for information resources. These could possibly include having a website, maintenance training events, YouTube videos, smart phone applications as well as how to brochures that provide answers relevant website links. Municipal staff and/or project partners should also be able to answer questions via telephone and email.



**Figure 8.5.4:** CVC and project partners organized a community BBQ in the Lakeview neighbourhood. Residents were provided with expert advice on how to maintain their new LID landscapes, installed as part of a road retrofit project by the City of Mississauga.

## 8.6 Evaluating success and demonstrating accountability

Before implementing your marketing plan, make sure that you have developed a method for evaluating its effectiveness. This includes measuring the effectiveness of the marketing plan itself, through the amount of uptake within the target neighbourhood(s), as well as technical effectiveness of the implemented LID practices. Having measured results makes it easier to secure future funding to expand or continue a program.

### Measuring public uptake

Measuring the effectiveness of your marketing program is absolutely essential. The monitoring protocol you employ should be based on project goals established at the outset of the projects.

Creating a photographic catalogue and employing field reconnaissance before implementation provides a benchmark against which to measure progress. You may also wish to establish seasonal check-ins with landscape contractors and retailers to determine interest levels and the number of projects residents have initiated.

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*Consider creating a database with addresses of homes that have implemented LID landscapes. Be sure to include the year that retrofits were implemented.*

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The principal outcome of your marketing program is LID uptake. If you secure good media coverage, host special events, have well-attended workshops and good retail presence yet there is little or no uptake of LID by homeowners, your marketing program isn't effective. If your marketing plan is having little uptake, you will need to revisit your plan and do further market research to identify why you aren't achieving your goals.

If monitoring indicates that uptake by homeowners is lagging or has stalled after an initial surge, it is likely time for follow-up meetings with homeowners to determine why they did or did not participate. That way you have an understanding of what is and is not working. Go back to your advisory committee or to community groups you have worked with to get their opinion. If you still have questions, it may require additional market research and update of your market plan.

## Technical monitoring

Stormwater and water use monitoring can provide a means by which to evaluate the effectiveness of LID programs. Monitoring can provide valuable information on the effectiveness of LID in reducing stormwater peak flows, volumes, in-stream erosion, pollutant loadings, and potable water use. This data can be used as part of the decision making process to establish stormwater management priorities, refine design guidance, and establish both monetary (utilities, rebates, grants, and capital budgets) and development (in-fill/redevelopments, by-laws and permits) policies.

For further information on how to conduct a residential lands monitoring program refer to Appendix D Options for the Monitoring of Residential Lands. The document outlines staffing considerations, data collection approaches, and monitoring equipment necessary for residential stormwater and water use monitoring. Monitoring options should be chosen based on implementation rate, size of implementation area, staff expertise, budget, and intended uses of monitoring data.

## 8.7 Tying it all together

The task of developing and implementing a municipality-wide LID program can be daunting. Consider smaller-scale projects for the first few initiatives. Use demonstration projects as a learning opportunity, monitor and evaluate all aspects, and refine your program. Build on successes and expand the LID

residential program as expertise, time and resources permit. An effective marketing plan should integrate all your LID initiatives and does not need to be limited to your residential LID program (i.e. road right-of-way, business and multi-residential, public lands, and new development) and build their synergies. Cross-marketing is one of the most cost-effective means of reaching your audiences.

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### ***Need more help?***

*CVC's has a suite of guides tools, case studies and other resources to help you get LID into the ground. Visit*

**bealeader.ca**

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