

March 28, 2022

John Antoszek  
Water Standards  
40 St. Clair Avenue West, 9th floor  
Toronto, ON  
M4V 1M2  
[john.antoszek@ontario.ca](mailto:john.antoszek@ontario.ca)

**Re: Low Impact Development Stormwater Management Guidance Manual; ERO number: 019-4971**

Thank you for the opportunity to provide feedback on the Low Impact Development (LID) Stormwater Management Guidance Manual. The Green Infrastructure Ontario Coalition (GIO) applauds the efforts of the Ontario Government to take feedback from different stakeholders into consideration in the development of this document.

GIO is an alliance of organizations that share a common vision for a healthy, green Ontario where the economic, social, environmental, and health benefits of green infrastructure are fully realized. We see low impact development as a key green infrastructure solution, and as crucial to a resilient, low-carbon future (for more details about our definition of green infrastructure, see [Appendix A](#)). As such, we are pleased to provide the following feedback to ensure that the LID Stormwater Guidance Manual is as useful a resource as possible.

### ***Green infrastructure/LID principles***

GIO heartily endorses the underlying principles in this guidance document, including the stated objectives, benefits, and co-benefits, and the need for green infrastructure/LID to play a leading role in the context of rapid urbanization and climate change. Helpfully, green infrastructure is used as an inclusive term that includes natural features and vegetation as well as “human made or engineered” features, including low impact development technologies.<sup>1</sup> Benefits of green infrastructure/LID include flood and erosion control, improved water quality, enhanced groundwater recharge, maintenance of stream baseflows, reduced thermal pollution, and cost savings from avoided damage and conventional end of pipe solutions.<sup>2</sup> The guidance manual does not create a new requirement, but rather provides information and advice on how to achieve volume reductions, reduced peaking, filtration, and other goals of long-established provincial policy. (For more on GIO’s support for the principles of ecological stormwater management, see [our EBR submission](#), July 14, 2017). We thank the Ministry staff, consultants, and reviewers who have devoted countless hours to the development of a large, detailed, thorough, and complex document over a period of more than half a decade. Thank you.

*RECOMMENDATION: GIO recommends that the Guidance Manual be finalized as quickly as possible and published for implementation.*

### ***The guidance manual needs a plain language summary***

This document is extensive (359 pages) and very complex, with many layers, moving pieces, and cascading advice. Absorbing this material in its entirety may be challenging even for some stormwater professionals. Other non-professionals with a keen interest (developers, builders, politicians, citizens groups, etc.) are likely to find it bewildering

---

<sup>1</sup> p. 11

<sup>2</sup> p. 4

in its current form. Further, we found it challenging to interpret the expectations from the text. A proper executive summary or overview should be added that summarizes the main elements of the document for all audiences, incorporating the current preface and the chapter summaries--**this is an urgent priority**. The Summary should explain in plain language the vision and goals, how the guidance manual will be used, and the process and mechanisms for implementing green infrastructure/LID in Ontario: it should provide a bird's eye view of the subject matter and a framework for understanding how the system works. This summary will be very useful as a standalone introduction to the topic for anyone who lacks the time to read and reread the entire document. It should tell readers where to find more information in the full document. It may, as an additional benefit, indicate ways in which the document should be restructured for narrative flow and improved clarity. It could fulfill the need for a citizen's guide. It will greatly increase the number and variety of people who will access the key points of the document and the guidance. GIO would be pleased to provide more detailed input on editing requirements and feedback on drafts.

*RECOMMENDATION: GIO recommends that a professional writer be hired to prepare a plain language summary overview chapter for the manual targeting all audiences. Examples and case studies should be included for clarity.*

### **Chapter overviews are needed**

Succinct summaries (about a half page or more vs. the one paragraph introductory paragraphs now provided) are needed at the beginning of each chapter, again carefully crafted for all audiences (incorporating the language found in the recommended summary). In particular, the chapter on the "Environmental Planning Process" in Ontario as currently written is a complex review of all the myriad acts, policies, and agencies that come into play. Readers would be helped by a structured chapter introduction that shows how the parts work together.

Further, an edit of the entire document by a seasoned professional would make it more accessible and digestible by all readers, clearer, and possibly more succinct. To the extent possible, technical details and concepts should be explained for non-technical readers. Sections that are intended only for "practitioners" should be identified as such.

*RECOMMENDATION: GIO recommends the addition of expanded summaries at the beginning of each chapter, and consideration of a full document edit.*

### **Support is needed for implementation**

The manual is not a cookbook with a prescribed recipe for integrating green infrastructure/LID into stormwater management; instead, it outlines the goals, a hierarchy of strategies, options, advice, and resources for achieving the desired outcomes. This approach provides flexibility. It will also require considerable resources, skill, and judgement to implement. A steep learning curve and culture change will often be required to transition from conventional conveyance measures to LID/green infrastructure.

*RECOMMENDATION: GIO recommends that an appropriate partnership host a community of practice for practitioners responsible for implementing this guidance. We support a strong or leading role for the Conservation Authorities in a community of practice.*

*RECOMMENDATION: GIO recommends that support be provided for public outreach and education to be conducted by an organization such as Green Infrastructure Ontario and its membership.*

### **Continuous evaluation and improvement needed**

Chapter 3 of the guidance manual powerfully articulates the rationale for a target to capture and treat runoff up to the 90th percentile of precipitation events in order to prevent aquatic habitat degradation and other damaging impacts of

increased imperviousness with urbanization (plus climate change). “The overall approach is to manage rain where it falls and where snow melts in order to maintain or restore the natural hydrologic cycle to the greatest extent possible to meet the key objectives of stormwater management outlined in Section 1.3.” Based on this target, the document provides a map (fig 3.3) of the 90th percentile precipitation events, ranging from 22 mm to 32 mm across the province. This is a tailored Ontario version of the “one inch rule” adopted in some geographical more compact jurisdictions.

“This 90th percentile precipitation event ... appears to best represent the volume that is intercepted, evapotranspired (sic), or infiltrated in a natural condition before construction of urban form and infrastructure (e.g., buildings, roads, parking lots, driveways.)”<sup>3</sup>

Based on the 90th percentile target, it might seem that Ontario should work to maintain and restore the natural hydrologic cycle, using green infrastructure/LID, such that there is **zero runoff from the urban landscape up to the 90th percentile event**.

However, (and this is a potential source of confusion in the current document), the guidance does **not** recommend “turning back the clock” to natural hydrology. Instead, the expectation with respect to run-off from a new development (or redevelopment) is to ensure no increase in volume (i.e., maintain “pre-development water balance”). If a development would increase run-off due to an increase in permeable surface, the expectation is that LID measures (infiltration, reuse) will be put in place to prevent that increase. Otherwise, the status quo is maintained.

The Ministry notes that a treatment train approach, including LID, has been government policy going back to the 2003 stormwater manual, still in effect. However, the lack of specific guidance for LID has meant very limited adoption of LID and volume control measures in favour of stormwater ponds, which control peak flows but not volumes. The new guidance manual makes a significant departure from the 2003 manual, stating that source control measures (LID, green infrastructure) could eliminate the need for ponds altogether, which have limited functionality and high maintenance and decommissioning costs. In addition, the guidance manual creates a hierarchy for stormwater “control” in the following order of priority:

- site design and pollution prevention (e.g., retaining trees and topsoil),
- retention with a host of LID measures that reduce volume (and help control pollutant loads),
- LID filtration, which provides some volume benefits along with filtration of pollutants
- conventional treatment, including ponds and constructed wetlands

The manual also includes a helpful typology of LID measures and links to numerous useful how-to resources for design, construction, and maintenance.

For GIO, this guidance promises to initiate a transformational change in the way stormwater is managed in Ontario. It will ensure that use of LID measures for volume retention and filtration become standard practice.

It will not eliminate the damage that has already been done, but it will limit further rampant damage as rapid urbanization continues, exacerbated by climate change.

The trigger for implementing the hierarchy is development, including new development, redevelopment, and linear development (roads, trails, etc.). So there does not appear to be a driver for otherwise integrating LID into the **existing**

---

<sup>3</sup> p. 61

developed landscape. But LID will be available as a familiar and cost-effective set of tools for addressing stormwater issues, e.g., stream degradation, groundwater depletion. GIO applauds this manual as a giant step forward in the protection and use of green infrastructure/low impact development to achieve water cycle quality and quantity goals, as well as co-benefits such as natural cooling.

*RECOMMENDATION: GIO recommends that the Ministry partner with interested parties (e.g., municipalities, professionals, Conservation Ontario, developers, industry representatives, GIO, and others) to monitor and evaluate implementation, including the production of an annual progress report that identifies barriers and solutions to the achievement of Ontario's stormwater goals across the landscape, including existing developed areas, and opportunities for further advances, and recommended next steps.*

### **Rural landscape needs to be included**

The importance of a watershed-based approach is emphasized in the guidance manual. However, watersheds do not follow boundaries of urban development. If the watershed (and groundwatershed) is to be protected, green infrastructure/LID principles and measures need to be applied across the landscape. Although rural areas may lack curb and gutter, they have drainage systems, including agricultural drainage. With some adaptation, most green infrastructure/LID measures could be applied to the rural landscape to prevent run-off, protect water quality, ensure groundwater recharge, etc. **An integrated approach across the settled landscape is required.**

*RECOMMENDATION: GIO recommends an integrated landscape-wide watershed-based approach to the use of LID/green infrastructure in stormwater management, including rural as well as urban areas.*

### **Climate change impacts need to be updated**

Many of the references in the chapter on climate have become dated with the recent release by the International Panel on Climate Change of AR6 and ongoing developments in climate science, including increased geographic refinement in projections.

*RECOMMENDATION: GIO recommends that the climate change chapter be reviewed and updated by a climate scientist with knowledge of the current data as it pertains to Ontario.*

### **Promote LID on private property**

There is significant material on monitoring and managing LID measures installed on private property, but not about strategies for getting these measures installed, particularly funding sources (e.g., stormwater fee and credit systems).

*RECOMMENDATION: GIO recommends that guidance be included for measures to promote and incent LID on private property, including stormwater fees and credits.*

### **Strengthen Better Site Design**

A number of elements are included in "Better Site Design,"<sup>4</sup> which is treated as preliminary to the stormwater management hierarchy.<sup>5</sup> This content should be strengthened. As the manual notes, "The application of better site design techniques is the most cost-effective means of achieving stormwater management targets, as many of the techniques are no-cost approaches, and some may in fact represent a potential cost savings."<sup>6</sup>

---

<sup>4</sup> p. 12

<sup>5</sup> p. 63

<sup>6</sup> p. 12

*RECOMMENDATION: GIO recommends an expanded role for Better Site Design and Pollution Prevention, including soil and trees, as a more formal element at the very top of the “Stormwater Control Hierarchy.”*

We would be happy to discuss these comments and recommendations in more detail. Please reach out to Jennifer Court.

Contact:

Jennifer Court (she/her)

Executive Director

Green Infrastructure Ontario Coalition

c: 416.346.6788 | e: [jcourt@greeninfrastructureontario.org](mailto:jcourt@greeninfrastructureontario.org)

[greeninfrastructureontario.org](http://greeninfrastructureontario.org)

## Appendix A: About Green Infrastructure

GIO defines green infrastructure as the natural vegetative systems and green technologies that collectively provide society with a multitude of economic, environmental, health, and social benefits. It also includes soil in volumes and qualities adequate to sustain green infrastructure and absorb water, as well as technologies like porous pavements, rain barrels and cisterns, which are typically part of green infrastructure support systems. The green technologies in this definition replicate the functions of ecosystems, such as stormwater storage and filtration.

In early 2020, the Green Infrastructure Ontario Coalition (GIO), with financial support from the Greenbelt Foundation, published *An Economic Impact Assessment of the Green Infrastructure Sector in Ontario*. This assessment defines the green infrastructure sector and its key economic sub-sectors; those sub-sectors serve as a useful way to understand the broad scope of green infrastructure.

- Landscape Horticulture and Open Spaces
- Green Roofs and Walls
- Green Stormwater Management
- Urban Forests
- Parks
- Natural Heritage
- Cross Sectoral Support Services

For examples of specific types of green infrastructure assets, or to understand the relationship between “green infrastructure” and other commonly used terms, see Figure 1.

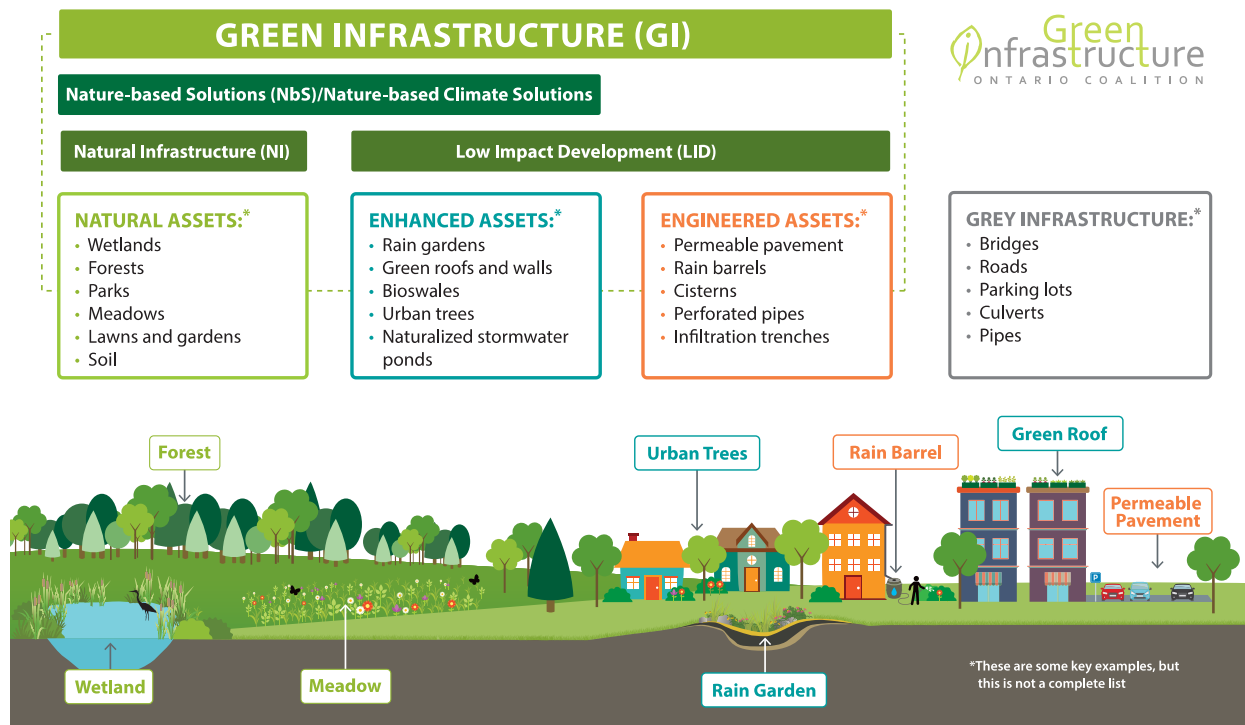


Figure 1 – Green Infrastructure infographic showing the relationship between key terms and listing examples of green infrastructure assets