LID – Making It Work
The Development Perspective

September 2011

Kleinberg

Demonstration project :

1.TRCA

2.City of Vaughan

3.Environment Canada

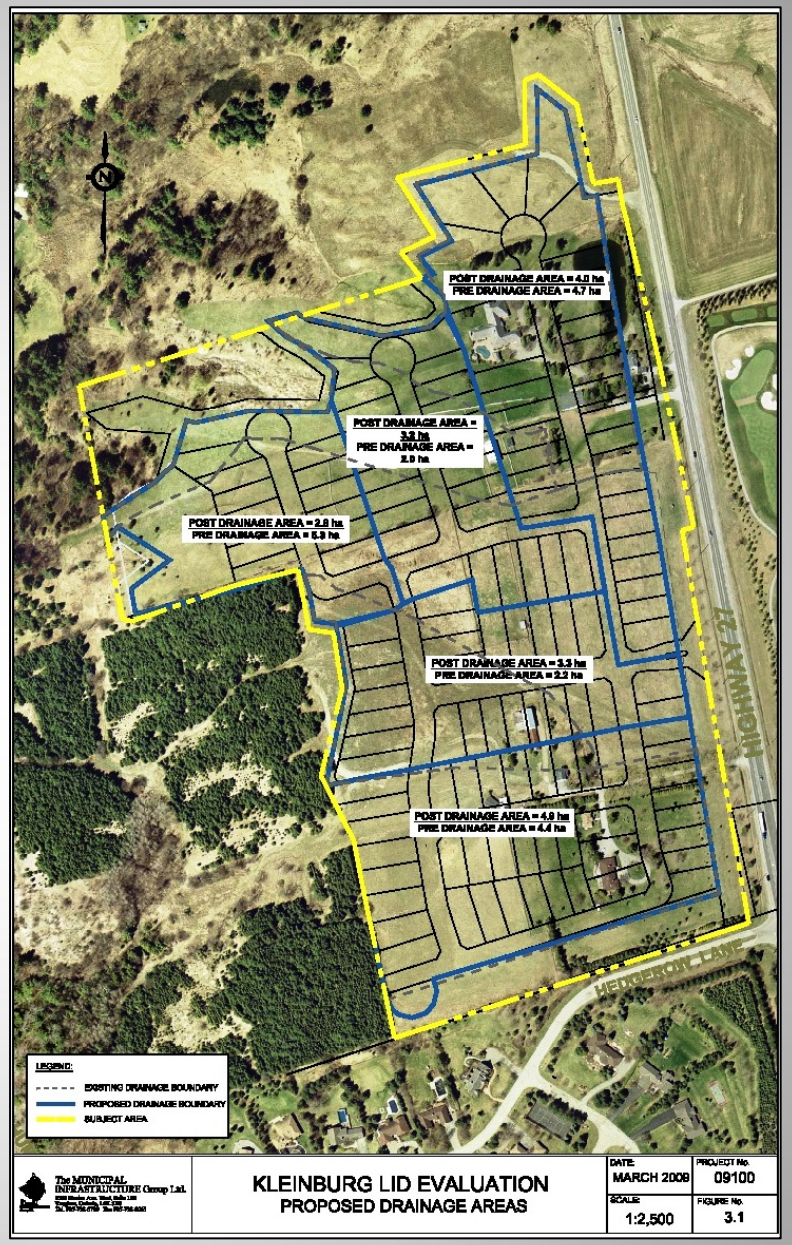
•Sorbara Development Group (Developer and Builder)

•Municipal Infrastructure Group (Consulting Engineer)

Single family detached plan – 50 to 60 foot frontages.

Base comparable was the Functional Servicing Study which proposed a traditional storm sewer network and a single end of pipe wet pond SWMP.

The main goal of the study was to establish an LID selection matrix to determine the most appropriate onsite techniques that could be implemented as an alternative to the FSR.



Kleinberg Solutions

SWM CRITERIA	REQUIRED TREATMENT	LOW IMPACT DEVELOPMENT MEASURES						
		Permeable Pavement	Roof leaders to rear yards with increased topsoil depth	Rain Barrels	Modified ROW- Enhanced Grass Swale	Modified ROW- Infiltration Trench	Stormwater Tree Clusters * (3 locations)	Pervious Lot Area
EROSION CONTROL	12mm applied over lot area = **12.7m³**	An estimated **9.8m³** of storage in the subgrade materials	Topsoil balance results in additional void storage of **96m³** per lot	Could provide up to **1m³** per lot	Ancillary benefits	An estimated **5.4m³** of void storage in the infiltration medium	An estimated **72m³** of storage in the infiltration medium	An estimated **8.9m³**
WATER QUALITY Enhanced protection	**2.5m³** of infiltration permanent pool volume per lot	An estimated **9.8m³** of storage in the subgrade materials	Topsoil balance results in additional void storage of **96m³**	Could provide up to **1m³** per lot	Provides water quality treatment through proper design	An estimated **5.4m³** of void storage in the infiltration medium	An estimated **72m³** of storage in the infiltration medium	An estimated **8.9m³**
WATER BALANCE Maintain predevelopment infiltration	Total Annual Infiltration = **120m³/yr.**	Estimated infiltration = **8m³/yr**	See pervious lot area column	Ancillary benefits	Ancillary benefits	Estimated infiltration = **60m³/yr**	Estimated infiltration = **405 m³/yr**	Estimated infiltration = **77m³/yr**

*Note: *Estimated benefits from the tree clusters apply to the subdivision as a whole and not a single lot*

Table 5.1: LID Scenario Toolbox

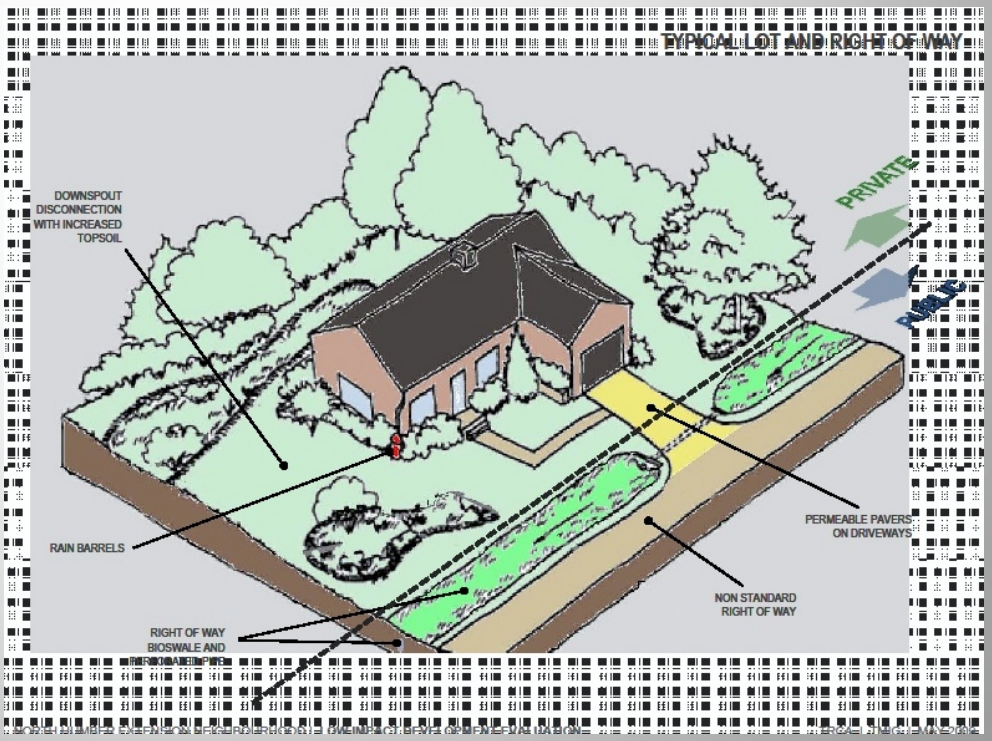
Kleinberg Outcomes

The FSR has been modified to reflect the study recommendations.

The project is now draft plan approved and construction will commence in 2012.

SDG has now included LID techniques in a second plan in the community of Stouffville.

PUBLIC	PRIVATE
Non standard ROW (Option 3)-Enhanced Grassed Swale with Infiltration trench	Permeable pavers on the driveways
ROW Bio swale adjacent to parkland	Rain barrels
Stormwater tree clusters	Downspout disconnection with increased top soil
Dispersed Discharge systems	



LID Benefits

- **Provides a toolbox of non prescriptive options to work with in the design of more sustainable communities.**
- **Design outcome can be tailored to site specific situations.**
- **It can save time and costs through the elimination or reduction of traditional end of pipe solutions.**
- **It can allow developers and municipalities to conserve land and maintenance costs through dual use facilities in parks.**
- **It can satisfy growing consumer identification with sustainable solutions.**

LID Pre Conditions

- Approval agencies must be aligned in acceptance of LID otherwise it will be a barrier to adoption by the development industry.
  - Avoidance of requirements for – or financing of redundant back up systems.
  - LID must be a tool box option that allows time and cost savings.

LID Pre Conditions

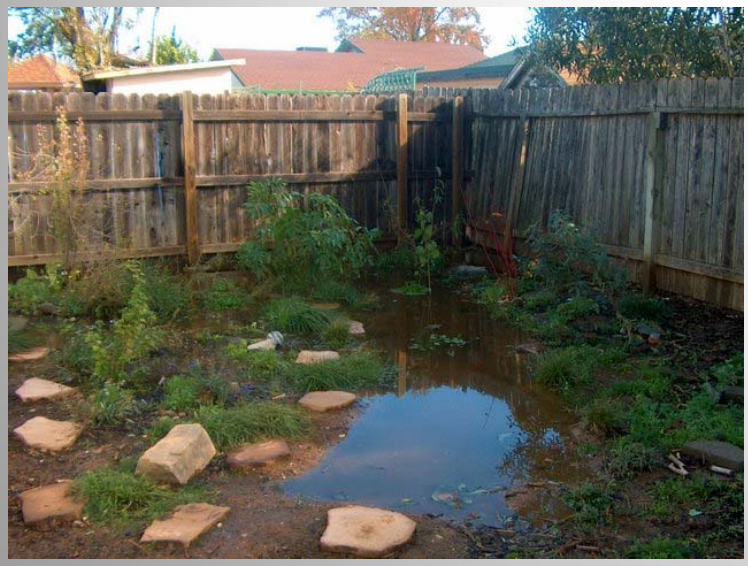
LID and the Consumer

- While new home purchasers identify with the objectives of green building and sustainable communities the majority are **NOT** willing to pay more for LID features.
  - Negative reaction to “Eco Tax”
  - Energy Star standards – included rather than optioned.

Consumer Concerns

Participation in maintenance is an issue to consumers.

They worry and in large part are very conservative in their purchase decisions.



Conclusion

LID is overdue.

But it has to become a solution that offers time and cost savings.

It cannot be sold as an additional layer of approval requirements.

It cannot be sold as an additional cost that the consumer will pay – they will not.

It must be a consultative and outcome oriented toolbox that if utilized cooperatively WILL result in better community design.