

# Low Impact Development Features in Urban Areas: A Municipal Perspective

“180 degrees of Engineering”  
March 20, 2014

# July 8<sup>th</sup> 2013



# Global Warming

*Positive proof of global warming.*



18th  
Century

1900

1950

1970

1980

1990

2006

# Overview

- Background discussion
- 180 Degree turnaround
- Lakeview Neighbourhood
- Elm Drive
- Approach
- Hurdles
- Lessons Learned

# Background

- Lakeview reconstruction promise
- 9 : 1 ratio
- Cost implications
- Mississauga Storm Water Quality Control Strategy
- Is there a Better Way?
- Light Bulb

# 180 Degree Turn Around

- Historical Road Reconstruction – Storm Sewer Curb and Gutter
- What is Low Impact Development?

# Hurdles

- Change in road reconstruction principles
- Senior management support
- Political support?
- Residents' "Needs and Wants"
- Municipal "Needs and Wants"
- encroachments
- Lack of Knowledge and Expertise

# Resident “Wants and Concerns”

- Remove ditches
- Maintain Parking
- No Sidewalk
- Environmental Benefits
- Prevent Flooding
- Aesthetics



# Municipal “Wants and Concerns”

- to implement environmentally responsible LID practices on both First Street and Third Street
- to improve water conveyance and eliminate standing water in the ditches,
- to improve the overall aesthetic appearance of the right-of-way with attractive plantings where feasible,
- to minimize the ditch profile for improved maintenance
- to pilot new LID designs (develop a template for other street redevelopment projects)
- reduce rehab costs

# Lakeview Approach

- 1950's





# Lakeview

First St.



Third St.





# Lakeview LID



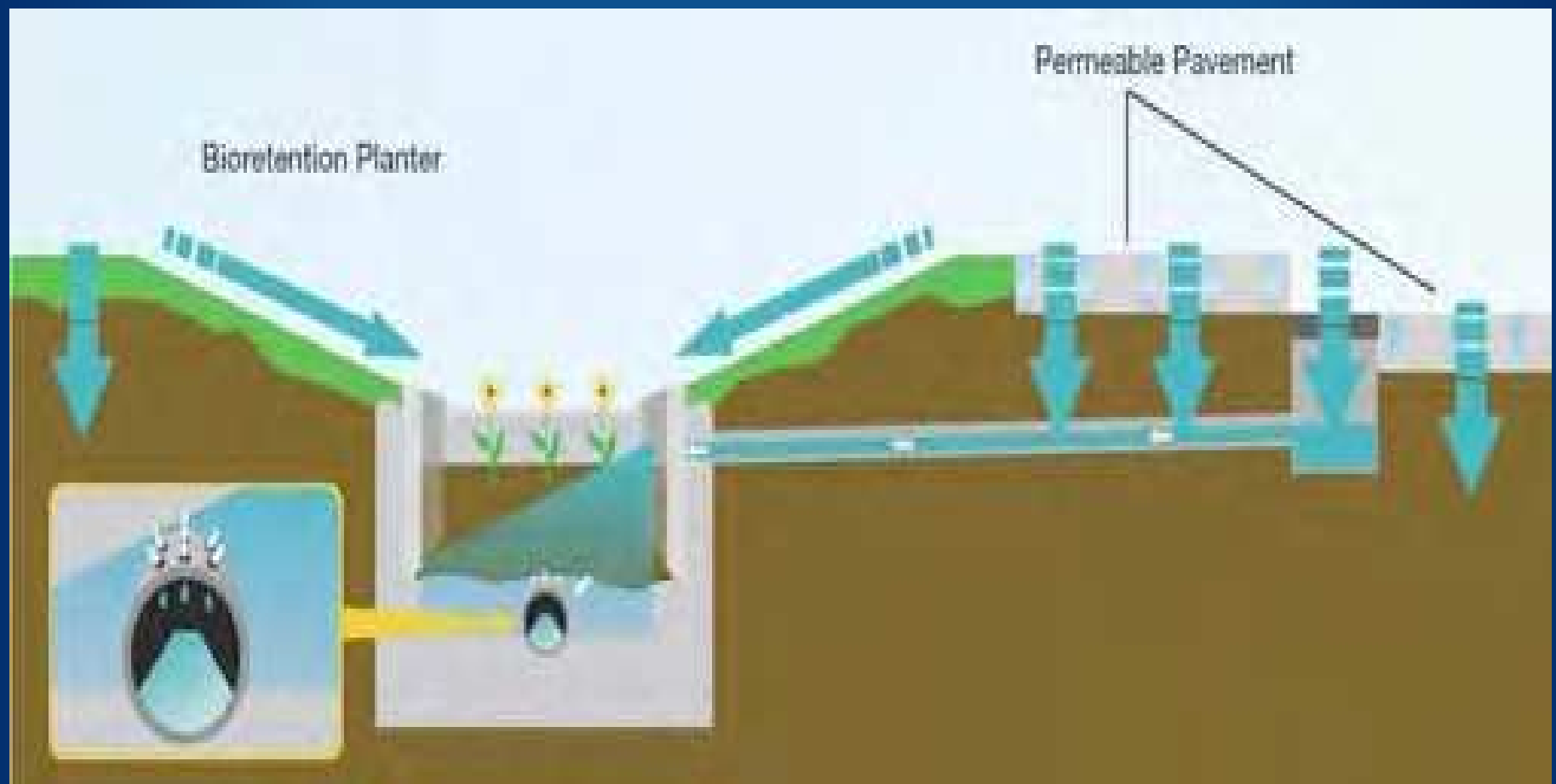
# Lessons Learned

- Perseverance
- Education
- Two way Trust
- Resident Champion
- Communication
- Construction Inspection
- Maintenance Plan

# Elm Drive

- Background
- Reconstruction Needs
- LID Candidate
- Partnership with CVC and PDSB
- Design Details

# Elm Drive Cross Section







# Elm Drive Post Construction



# Lessons Learned of Elm Drive

- Utility coordination
- Smoking area
- Need for bioswale fencing
- Proper design drawings
- Plant replacement
- Sufficient site inspection budget
- Warranty provisions

# Resolution

- Resolution 0046-2014
- Adopted by City Council March 5 2014

# FCM Award of Excellence in Water for 2014

<http://www.fcm.ca/home/awards/fcm-sustainable-communities-awards/2014-winners/2014-water.htm>

# Questions







- LID is an approach to land development (or re-development) that works with nature to manage stormwater as close to its source as possible. LID employs principles such as preserving and recreating natural landscape features, minimizing effective imperviousness to create functional and appealing site drainage that treat stormwater as a resource rather than a waste product. There are many practices that have been used to adhere to these principles such as bioretention facilities, rain gardens, vegetated rooftops, rain barrels, and permeable pavements. By implementing LID principles and practices, water can be managed in a way that reduces the impact of built areas and promotes the natural movement of water within an ecosystem or watershed. Applied on a broad scale, LID can maintain or restore a watershed's hydrologic and ecological functions. LID has been characterized as a sustainable stormwater practice by the Water Environment Research Foundation and others.

# Facts and figures

- Only 1 of 89 recorded rainfalls less than 25mm has resulted in discharge to storm sewers, compared to 100% for conventional roads
- 99% reduction in total suspended solid levels in storm sewer discharge



# Questions We Want to Answer

- Why change from historical norms
- What are LID's and how do they work
- Differences between typical SWM and LIDs
- Maintenance costs
- Municipal wants and concerns
- Residents wants and concerns
- Must Haves ....should haves
- Lessons Learned
- Can we eat popcorn with the Movie

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# Why Change to LID's

- Very costly to upgrade – storm sewers, curbs
- Shrinking road rehab budgets

# What are LID's and How do they Work

# Differences between LID's and Traditional SWM

# Lessons Learned

- parking, driveway, ditch issues most important
- need too work with the residents throughout the process – need a street champion to ensure residents actively involved
- will need to have a dedicated on-site construction co-ordinator during construction
- need to assist residents with maintenance during first year

# PIC #1 - June 25, 2009

- overview of project presented
- pilot project – first in Mississauga
- opportunity for beautification and sustainability
- can still accommodate resident needs and wants
- questionnaire for resident input

3 boulevard treatment options include:



Ditch improvements



Grassed swales



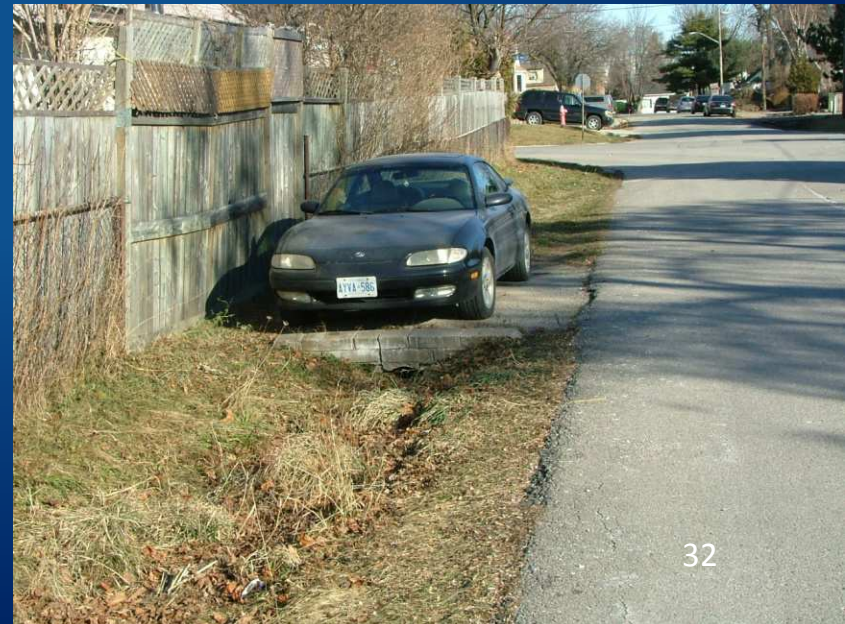
Vegetated swales



# Design Issues (cont'd)



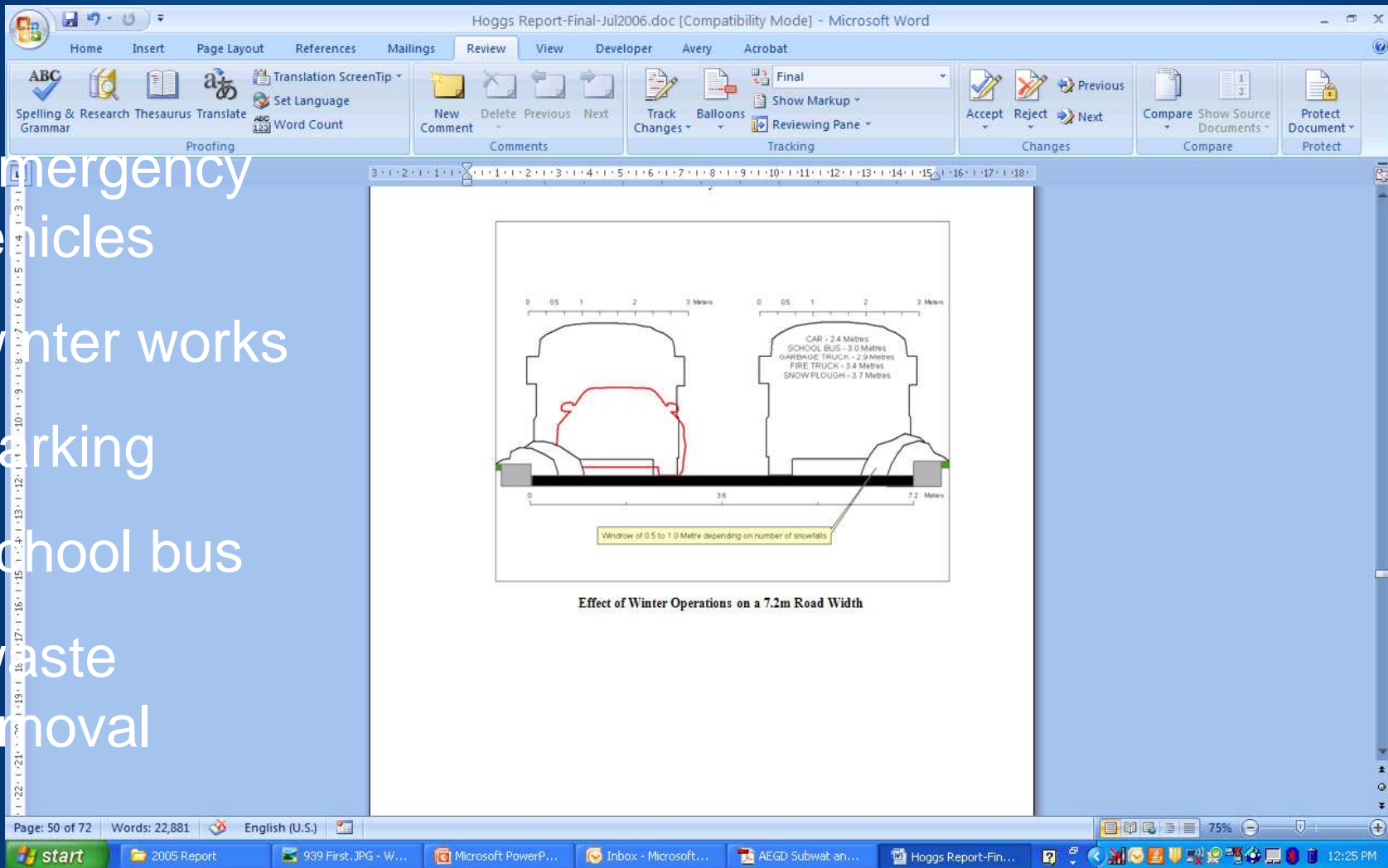
- Flooding
- Encroachment





# Road Widths (Emergency Vehicle Access)

- emergency vehicles
- winter works
- parking
- school bus
- waste removal



# Parking

- high priority for residents
- need to maintain maximum spaces
- no vehicle encroachment in ditch
- minimize road widening





# Designs Details

