Credit Valley Conservation
inspired by nature

LID TTT – Credit Valley Conservation Workshop
November 17, 2017 – 9:30 a.m. to 3:00 p.m.

Self-Guided Walkthrough

A. First Steps

1. Open Tool (LID-TTT.exe)
2. Create Scenario

B. Existing Condition

1. *Config screen*:
    - Project Name = Site
    - Project Title = Example PreDev
    - Scenario = Pre development
    - Location = Richmond Hill
    - Storm Type = Storm Event,
    - Total Rainfall Depth (mm) = 25mm
    - Duration (hrs) = 4
    - Storm Distribution = SCS Storm Distribution Selection
    - Runoff Volume Control Target (mm) = 25mm
2. *Config*: Save and Continue
3. Save input file as 'ExamplePre' at desired location on your computer
4. *Draw screen*: Using scroll (zoom) and click and drag (pan) functions of your mouse locate the site Latitude= 43.9168, Longitude=-79.3763. The location is along Highway 404, north of Highway 407, northeast of Richmond Hill and just north of Victoria Square (on the east side of Honda Boulevard).
5. *Draw*: Select "Outfall" icon and and place an outfall on the east side of the property along Woodbine Avenue
    - Name = Ditch
    - Catchment = 1
    - Outfall Elevation (M) = 233
6. *Draw*: Select "Subcatchment" icon and outline Subcatchment "Site" (Double-Right-Click to confirm area after drawing) – *Catchments are approximate*
    - Subcatchment Name = Site

- Soil = Clay Loam
- Catchment = 1
- 0% paved surface, 5% Roof, 80% Row Crop, 15% Open Space
- Outlet = "Ditch"
- Width = 100m, Slope = 1%, Depression Storage for Pervious Areas = 4 mm
- *All Other Parameters = Defaults*
- Click 'Confirm' to finalize subcatchment

7. *Draw*: Click on Report to run model
8. *Report*: Review Results and answer the following:
   - *What is the External Outflow in m^3?* _____
   - *What is the Infiltration in mm?* _____
   - *What is the Peak Flow at node Ditch in m3/s?* _____
   - *What is the Phosphorus Loading at node Ditch in kg?* _____
9. *Report*: Click on "GIS" on the Menu Bar to return to Draw screen
10. *Draw*: Click on " … " on the Menu Bar (below where is says "Site PreDev") and when the menu opens, click "Save" to save the JSON file

C. Proposed Condition

1. *Draw*: Click on " … " on the Menu Bar and click on 'Config'
2. *Config*: Change Scenario to 'Post development' and hit Continue
3. *Draw*: Click on " … " on the Menu Bar and click on 'Save As'. Save the file as 'ExamplePost'
4. *Draw*: Click on 'Click to add scenario' and select Open Scenario. Open 'ExamplePost'. Hit OK for the error message 'stormwater-electron'
5. *Draw*: Click on " … " below Site PreDev and click on 'Config'
6. *Config*: Project Name = "Site PostDev"
   - Project Title = "Example PostDev"
7. *Config*: Click "Continue" to return to the Draw screen
8. *Draw*: Click on 'Pre-Development Site Pre Devp' , Click on " … " and click on 'Config'
9. *Config*: Change Scenario back to 'Pre development' and hit Continue
10. *Draw*: Click on 'Post-Development Site Post Devp' to open post scenario
11. *Draw*: Using existing polygon 'Site' to trace a new Subcatchment
    - Subcatchment Name = 'Building'
    - Soil Type = Clay Loam

- Catchment = 1
- 0% paved surface, 100% Roof
- Width = 100m
- Slope = 1%
- All Other Parameters = Defaults
- Note that since an outlet has not been selected it is highlighted in Red.
- Click Confirm

12. *Draw*: Select and outline new Subcatchment
    - Subcatchment Name = 'Parking'
    - Soil = Clay Loam
    - Catchment = 1
    - 80% Paved, 20% Landscaped
    - Width = 100m
    - Slope = 1%
    - Depression Storage for Pervious Areas = 5 mm
    - All Other Parameters = Defaults.
    - Click Confirm
13. *Draw*: Select and Outline LID "Infiltration"
    - Name = "Infiltration"
    - LID Type = "Infiltration/Exfiltration systems"
    - Catchment = 1
    - Outlet = "Ditch", Width = 100m
    - 0% paved surface, 100% Landscaped
    - *Surface Subheading*
        - Berm Height = 5mm
        - Surface Roughness = 0.1
        - Surface Slope = 1%
    - *Storage Subheading*
        - Thickness = 1000mm
        - Void Ratio = 0.4
        - Seepage Rate = 15mm/hr
        - Clogging Factor = 0
        - Design Drawdown Time = 36 hrs
    - *Drain Subheading*

- Is There a Drain = Yes
- Flow Coefficient = 0.05
- Flow Exponent = 1
- Offset Height = 900mm

- Click Confirm

14. *Draw*: Select Subcatchment 'Building'
    - Receiving LID = 'Infiltration'
    - Outlet = 'Infiltration'
15. *Draw*: Select Subcatchment 'Parking',
    - Receiving LID = 'Infiltration'
    - Outlet = 'Infiltration'
16. *Draw*: Select and Outline Subcatchment "Park"
    - Soil = Clay Loam
    - Catchment = 1
    - 0% paved surface, 100% Landscaped
    - Outlet = "Ditch"
    - Width = 100m
    - Slope = 1%
    - Depression Storage for Pervious Areas = 5mm
    - All Other Parameters = Defaults
17. *Draw*: Under Drawn Elements menu on the right, select 'Site' and click Delete
18. *Draw*: Click on " … " below Site PostDev to Save
19. *Draw*: Click on "<->" (the double-arrow symbol in the middle of the menu) to run model and compare pre and post development scenarios

D. <u>Results</u>

1. *Report*: Review Design Storm Performance Goals
    - *Are Design Performance Goals Met?* _____
2. *Report*: Review Water Balance Comparison
    - *What is the Pre-Development Infiltration (mm)?* _____
    - *What is the Post-Development Infiltration (mm)?* _____
    - *Is Infiltration Maintained?* _____
3. *Report*: Review LID Summary
    - *What is the drawdown time (hrs)?* _____

- *Based on Effective Impervious to Pervious Ratios, is the LID Appropriately Sized?* _____

4. *Report*: Review Loading Summaries
    - *What is the Pre-Development Site Loading for TP (kg)?* _____
    - *What is the Post-Development Site Loading for TP (kg)?* _____
    - *Does TP Loading Increase or Decrease?* _____
5. *Report*: Review Peak Flows
    - *What is the Pre-Development Peak Outflow (m^3/s)?* _____
    - *What is the Post-Development Peak Outflow (m^3/s)?* _____
    - *Are Pre-Development Peak Flows Exceeded?* _____
6. *Report*: Click on GIS to return to the Draw screen

E. Iterative Design

1. *Draw*: Double Left-Click on 'Infiltration' LID and Resize = Increase the area. Remember to reduce the area of 'Park'. You will notice that vertices snap to vertices of other polygons.
2. *Draw*: Edit Infiltration LID (Storage Depth, Drain Offset height)
3. *Draw*: Click on "<->" to run model
4. *Report*: Are Goals from Part 4 satisfied?
    - *Are Design Performance Goals Met?* _____
    - *Is Infiltration Maintained?* _____
    - *Based on Effective Impervious to Pervious Ratios, is the LID Appropriately Sized?* _____

F. **Bonus Goals**

1. Add Storage Node "Dry Pond" upstream of "Ditch". Set bottom elevation at 234 m. Enter 3 m for maximum depth. Choose 'Lined'. Enter reasonable values for Depth Area curve
2. Route "Infiltration" and "Park" flows to "Dry Pond"
3. Connect "Dry Pond" to "Ditch" using a Swale. Enter 0.5 mm/h seepage for swale
4. Return to "Config" and change "Storm Type" to "Average Annual" for both pre and post development scenarios. Select 800 mm as total precip
5. Compare pre to post TSS and TP loading