



# Low Impact Development for ALLEVIATING STORMWATER RUNOFF IN HARTFORD, CT 2011 CAPSTONE PROJECT



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## PROBLEM STATEMENT

Many cities in America experience high stormwater runoff due to vast impervious surface across their landscape. Increased stormwater runoff generates unhealthy pollutant loads to urban streams and also represents an increased energy demand on sewage treatment. Classic solutions to obtain a sustainable wastewater infrastructure are costly and disruptive to the transportation infrastructure. Hartford, Connecticut is one such American city which experiences high stormwater runoff. The Low Impact Design(LID) Capstone team' primary objective was to assess suitable LID designs that would reduce stormwater runoff for a residential neighborhood in northern Hartford.



TREE BOX



Porous Asphalt



BIORETENTION



RAIN BARREL



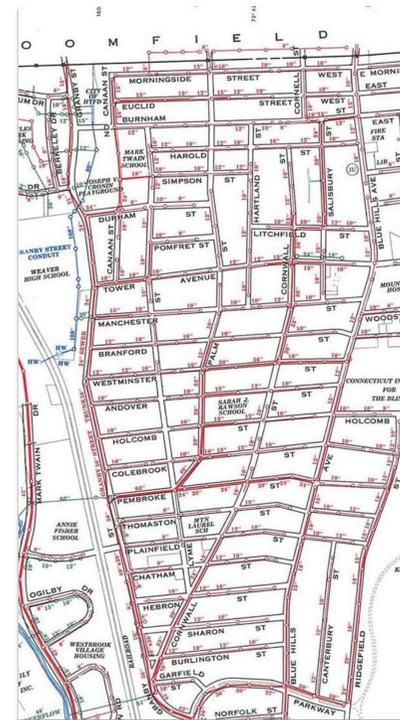
VEGETATED SWALE



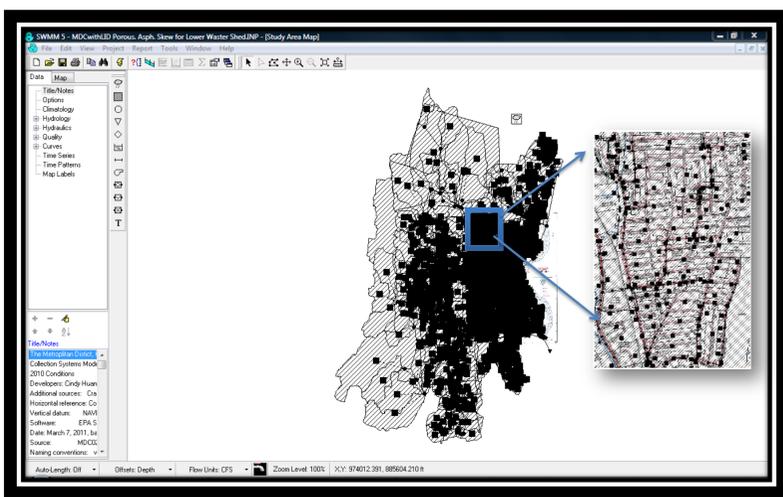
AERATION

## OBJECTIVES

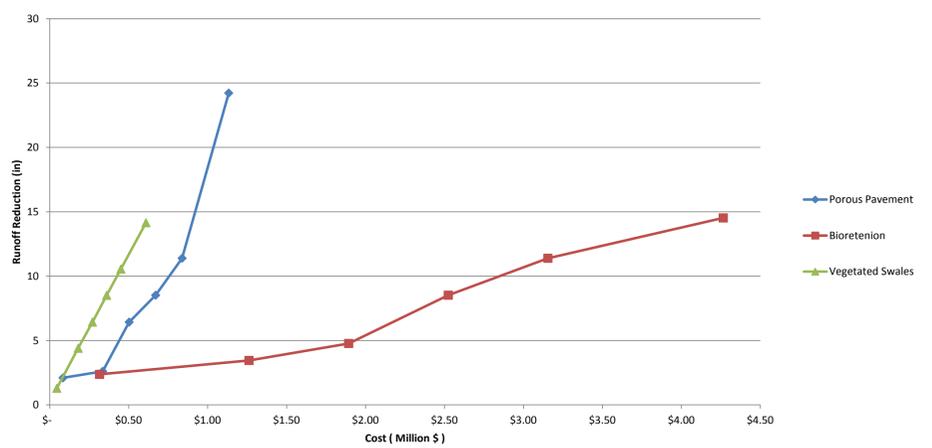
- Study the effectiveness of various low-impact transportation overlays in alleviating stormwater generation and obtain a sustainable wastewater infrastructure.
- Find the potential LID CO<sub>2</sub> sink capacity.
- Perform a cost benefit analysis of Nitrogen release reductions from Combined Sewer Overflows (CSO).
- Analyze impact of LID designs on transportation metrics and the potential limits of LID benefits without adversely impacting transportation.
- Update CSO systems by modeling potential designs.



## SWMM



## Cost Benefit Analysis



## RESULTS & CONCLUSIONS:

The LID Capstone team found that the three most suitable LID devices for the residential neighborhood were Bioretention, Porous Asphalt, and Vegetated Swales. These LID devices are designed to be implemented on the street roadways. The optimal reduction for the Granby section of Hartford, CT was found to be one-way porous pavement, implemented at 5mi, skewed for the bottom of the watershed.

