

Geodesign Application for Bio-Swale Design: A Data-Driven Design Approach for a Case Site in Ottawa Street North in Hamilton, Ontario, Canada

Authors : Adele Pierre, Nadia Amoroso

Abstract : Changing climate patterns are resulting in increased in storm severity, challenging traditional methods of managing stormwater runoff. This research compares a system of bioswales to existing curb and gutter infrastructure in a post-industrial streetscape of Hamilton, Ontario. Using the geodesign process, including rule-based set parameters and an integrated approach combining geospatial information with stakeholder input, a section of Ottawa St. North was modelled to show how green infrastructure can ease the burden on aging, combined sewer systems. Qualitative data was gathered from residents of the neighbourhood through field notes, and quantitative geospatial data through GIS and site analysis. Parametric modelling was used to generate multiple design scenarios, each visualizing resulting impacts on stormwater runoff along with their calculations. The selected design scenarios offered both an aesthetically pleasing urban bioswale street-scape system while minimizing and controlling stormwater runoff. Interactive maps, videos and the 3D model were presented for stakeholder comment via ESRI's (Environmental System Research Institute) web-scene. The results of the study demonstrate powerful tools that can assist landscape architects in designing, collaborating and communicating stormwater strategies.

Keywords : bioswale, geodesign, data-driven and rule-based design, geodesign, GIS, stormwater management

Conference Title : ICULA 2018 : International Conference on Urban Landscape Architecture

Conference Location : Venice, Italy

Conference Dates : April 12-13, 2018