



## Evaluating the Effects of Green Stormwater Infrastructure on Urban Street Flooding

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**Abstract.** Street flooding due to the failure of stormwater systems to drain all runoff during a storm event poses a risk to the public due to hazardous driving conditions. The negative effects of street flooding is not limited to large or extreme storm events; smaller more frequent events may also pose significant risk due to the cumulative effects of nuisance flooding. Prior research on the implementation of green stormwater infrastructure (GSI) has shown that GSI mitigates stormwater in urban catchments, particularly for smaller frequent storms. To examine the impacts of integrating a network of GSI on the performance of a stormwater system and street flooding under frequent storm events, a stormwater model will be developed for a sub-basin in Westminster, CO, a suburb near Denver, CO, using SWMM5 integrated into PCSWMM. In order to capture the effect of green stormwater infrastructure on street flooding, a dual-drainage modeling approach will be utilized to capture the interaction between the stormwater drainage system and the preferential overland flow pathways. First, a model of the current stormwater system including any GSI already in place will be created to determine the current drainage characteristics for a design storm. Then various networks of GSI will be added to the model to test the impacts on street flooding under the same rainfall characteristics. Analysis of the stormwater model will include uncertainty analysis of the resulting street flooding, model calibration, and parameter sensitivity analysis. The results of this model evaluation and GSI impacts on street flooding will be used as inputs for a probabilistic traffic model to analyze the effect of street flooding on traffic patterns under hazardous conditions.