

A Model to Predict Impervious Surface Impacts of Land Use and Transportation System Change with UrbanSim

Isaac Lawrence

Master's Student, Natural Resources

University of Vermont

Transportation Research Scholar, UVM Transportation Research Center

Abstract: The importance of impervious surface area (ISA) as an indicator of human impact on ecosystems and a driver of increases in flooding has been well established. In order to predict impervious surface outcomes for municipal and regional Master Planning processes, Reilly et al. (2002) developed and tested a model of ISA based on commonly available planning data. Since publication, adoption of agent-based land use and transportation models by planning authorities and researchers has increased. UrbanSim, one increasingly popular model, provides a powerful, flexible environment for predicting land use and transportation system change. In order to leverage UrbanSim towards the management of flooding and stream health with impervious surface as a proxy, I propose and test a model to predict ISA within a Chittenden County, Vermont implementation of UrbanSim. In addition, I compare the model developed to Reilly et al. as well as a simple factor model commonly utilized in hydrologic modeling.