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Assessing the use of UrbanSim for energy consumption estimates: A Chittenden County case study

UrbanSim is an agent-based model that simulates the development of a given geographic area (ie. city, town, or state), including land use, transportation, and environmental impacts over 20 years or more. Although the combustion of fossil fuels is closely linked to land use and transportation, there has been little use of UrbanSim for the prediction of energy consumption. I present my progress on the development of such an indicator for the UVM Transportation Research Center's Chittenden County 2005 Baseyear Model of UrbanSim, and summarize similar past applications and their utility. Predictions for annual energy consumption can be grouped in three main sectors: 1.) residential 2.) commercial/industrial and 3.) transportation. Estimates are essentially based off the variables/indicators associated with residential units (household income, year built, number of residents), employment locations (sq. ft. per sector), and road segments (VMT, fuel economy). Although data for the residential and transportation portion of the energy consumption indicator is readily available, developing the commercial/industrial portion will be significantly more difficult and has yet to be accomplished.