

Land-Use/Transportation Integration

Forecasting regional development for socioeconomic and transportation planning

Location: Nashville Area, Tennessee

Partners: Nashville Area Metropolitan Planning Organization; Kimley-Horn and Associates, Inc.

Context: The Nashville Area Metropolitan Planning Organization (MPO) is responsible for transportation planning in five counties plus parts of two other counties in central Tennessee. The MPO covers an area of approximately 2,900 square miles and accommodates around 1.3 million people. The area is fast growing in both population and employment, with projected population growth in the seven county area of approximately 17% between 2008 and 2015, and employment growth of about 11% during that same period.



In 2009, the MPO was engaged in an update of its Long Range Transportation Plan. They wanted to achieve a close linkage between its transportation planning and land use planning. Achieving this linkage required increasing the accuracy of the Regional Travel Demand Model for generating population and employment data, and on allocating growth across the seven-county area. The MPO also wanted a robust database that would allow for convenient updates, would support both alternative land use scenario planning and long-term visioning, and would allow working in partnership with local member jurisdictions.

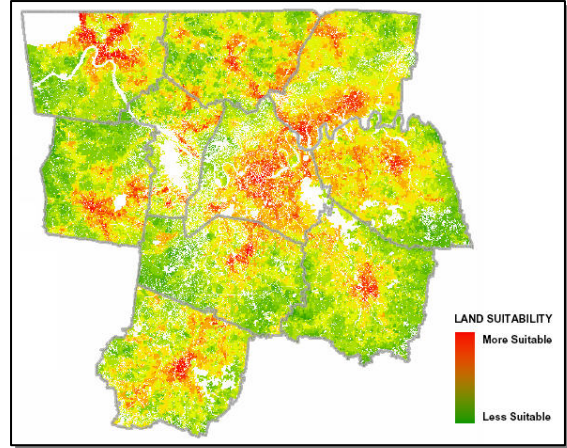
Project Description: The Nashville MPO retained Kimley-Horn and Associates to develop a spatial data planning framework to forecast development patterns and intensities together with socioeconomic data for future years. Kimley-Horn used CommunityViz[®]'s mapping and data analysis component, Scenario 360[™], to systematically evaluate competing build-out scenarios for the region based on the carrying capacity of the land and certain policy decisions that would guide future growth and development.

“Beyond adding land-use modeling to their technical capabilities, [CommunityViz] helped MPO planners effectively communicate to their member jurisdictions the challenges and opportunities associated with regional land use planning.”

—Camille Barchers,

Source data for the project included population and employment projections, census population estimates, available zoning maps and ordinances for each city and county in the planning area, available growth management plans, tax assessor data for the seven counties, and information from focus group meetings. The model used data for the region at the parcel level and allowed local governments to modify the model as needed. In order to process the large amount of data efficiently, seven micro models were created, one for each county.

The consultant used a three-step CommunityViz-based allocation model for growth. To estimate supply of land available for development, they analyzed the carrying capacity of the land, taking into consideration constraints to development and areas of conflict for development. This resulted in a build-out potential for each micro model as measured by number of dwelling units, retail gross square footage, office gross square footage, and industrial footage supported by each of the parcels. Next, they analyzed the desirability of each parcel by assessing elements such as physical features and proximity to roads, transit, and parks. They used supply, desirability and demand (population and employment forecasts) to allocate projected new population and/or employment by parcel. They chose to use the CommunityViz probability-based allocation method, which operates on the premise that a parcel's capacity is used in proportion to its relative desirability. The information generated was aggregated up to the traffic analysis zone (TAZ) level for use in the macro area model, and reported for use in the planning horizon years of 2015, 2025, and 2035. The final step in the process translated the results for input into the Regional Travel Demand Model.



“Overall, this is, and will remain, an important tool for our member agencies to help them make better decisions when it comes to investing our limited transportation resources. This can also help them shape their future land-use policies in a way that complements their transportation goals and objectives.”

–Matt Meservy,
Nashville Area MPO

Technology and Tools: CommunityViz 3.3 was used to develop the spatial data planning framework and to forecast development patterns and intensities and future year socioeconomic data. The “Allocator Wizard” tool within CommunityViz was used to set up a supply/demand allocation based on capacity and desirability of features. The MPO will use TransCAD with the TAZ-level data to develop the Regional Travel Demand Model.

Outcomes: The MPO has become a data clearinghouse for GIS data, increasing interaction with their member communities on land-use planning. The model is now in the hands of the MPO, which will keep it updated with existing land use data as new data becomes available. The MPO will loan out each County’s individual model for use by County planners as they update their county’s growth management plans. The MPO is also expanding the model to include counties served by Cumberland Region Tomorrow, a non-profit organization that encourages growth planning across a 10-county area of Tennessee.

The model developed in this project will form the basis of the Long Range Transportation Plan (LRTP), scheduled to be completed in 2010. In addition, as part of its overall transportation planning mandate, the MPO has embarked on two large sub-area plans.

KEY LINKS

CommunityViz
<http://www.communityviz.com>
 Nashville Metropolitan Planning Organization
<http://www.nashvillempo.org>
 Kimley-Horn and Associates, Inc.
<http://www.kimley-horn.com>
 Urban Resource Group
<http://www.kimley-horn.com/urg>

The MPO has embarked on two large sub-area plans. Kimley-Horn, in conjunction with other sub-consultants, was retained to develop and test alternative planning scenarios, using CommunityViz, for both of these sub-area plans.