Florida Department of Transportation Research

Use of Dynamic Traffic Assignment in FSUTMS in Support of Transportation Planning in Florida
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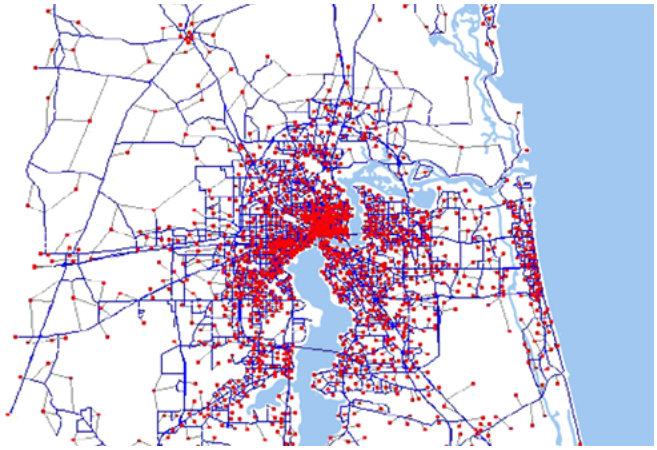
Transportation planning is based on the physical structure of roadway networks and, less tangibly, on choices individuals make about their transportation needs and use of the roads. For a task this complex, computer modeling is essential. In Florida, transportation planning often uses the Florida Standard Urban Transportation Model Structure (FSUTMS) to provide a consistency of data and approach. Currently, demand forecasting in FSUTMS uses static traffic assignment, in which properties of transportation networks, such as travel times and flow rates, are constant over time and drivers are described homogeneously. Dynamic traffic assignment (DTA) could greatly advance FSUTMS by allowing scenarios in which transportation measures vary with time and drivers are treated as individuals, permitting new levels of detail and precision, thus supporting better demand and performance forecasting.

In this project, Florida International University researchers developed processes and associated tools for successful implementation of DTA in Florida. In reviewing the state of the art, the researchers identified demand forecasting software packages that include DTA; however, DTA implementation varies widely among the packages in areas such as time-dependent shortest path, traffic assignment to paths, and assuring convergence of solutions. Each area was examined for its impact on computational performance and solution quality. DTA's powerful ability to handle millions of travelers on networks with tens of thousands of links means that computational time can be many hours. Therefore, finding the right balance of efficiency and accuracy was essential.

Before developing an implementation of DTA for FSUTMS, the researchers identified needs and issues related to demand forecasting among practitioners, conducting a survey of Florida modelers, a user needs workshop, and interviews with workers familiar with DTA. These efforts guided the next phase of the study, developing



This graphic shows part of a network of Jacksonville roads used to test dynamic traffic assignment (DTA) tools in this study. With over 54,000 links and 26,000 nodes, the network shows the scale of problems DTA can tackle.

assessment tools. Researchers catalogued DTA methods by assignment assessment criteria to help agencies select methods. For each criterion, a statement informs users whether the criterion is generally applicable or specific to applications such as long-range plan modeling, short-range plan modeling, corridor/impact studies, and others. A demonstration was developed to show how the assessment criteria can be used.

Finally, the researchers developed a support environment for the use of DTA, the Integrated System Support for Trip Assignment (ISSTA), which supports dynamic (time-variant) trip matrix estimation at a fine-grained resolution (15-30 minutes) based on available trip matrices from demand forecasting models and count data. In addition, ISSTA supports model calibration to real-world measures and is able to import standard-coded data from multiple sources.

Methods such as DTA give planners tools to more accurately understand future needs in transportation, resulting in more efficient use of financial and environmental resources and giving Florida a more effective transportation system.

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For more information, visit http://www.dot.state.fl.us/research-center