Florida Department of Transportation Research

Development of a Traffic Map Evaluation Tool for Traffic Management Center Applications

October 2019

Project Number
BDV27-977-12

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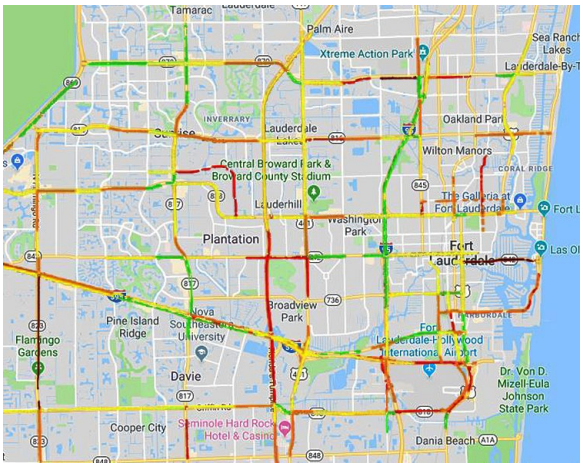
Current Situation

Traffic congestion is an inevitable part of urban transportation networks; however, increased monitoring of vehicle flows by traffic management center operators makes real-time adjustments possible that can help mitigate congestion. Over longer time periods, analysis of trends in congestion can show additional possibilities to improve traffic flows. As the number of monitoring stations increases, the challenge becomes making sense of a vast amount of data.

Research Objectives

Florida Atlantic University researchers developed an online system, the Mapping Evaluation Tool (MET), that brings together traffic data from various sources and delivers it to traffic managers as a map.



In this portion of a MET display, road segments are color-coded to show areas where speeds deviate from normal values, revealing congestion or exceptional events.

Project Activities

The researchers reviewed traffic mapping products that are currently available. They noted limitations of these products with respect to the traffic manager's work with the goal of making the MET more useful and more complete. The researchers developed novel methods to help traffic operators better understand how real-time traffic information aligns with the relevant historical information. For example, operators can examine how existing average speed on a segment compares with historical values, giving a quick picture of locations where congestion is increasing. Special attention was given to the graphical representation of performance metrics on maps. Extensive work on methods and map representation were the foundation of the MET.

Construction of the MET required building the Web-based framework, constructing and populating the traffic databases, and constructing and testing a flexible query interface. Data for real-time and historical traffic were drawn a number of sources, including (for real time) the Microwave Vehicle Detection System, HERE travel time and speed database, and SunGuide. Some of these sources also supplied historical data, but additional sources of historical information were included. An important aspect of the MET is that is extensible: both new data sources and new functionalities can be added.

The MET allows users to select one of three analysis modes: historical, real-time, or predictive. The user then selects a performance measure to be investigated; not all measures are available for all modes. Then, a region and a time period must be defined. The user is then able to customize the map representation of the data and easily spot areas of congestion in the road network.

Project Benefits

Improved software to support traffic management center operations will help to address traffic congestion and improve the safety and efficiency of Florida roadways.

For more information, please see www.fdot.gov/research/.