

A Four-Dimensional, Real-Time, Transportation Visualization System

ABSTRACT

This research developed a system for visualizing 4D, “real-time” comprehensive transportation data for the road networks of Washington, D.C, Northern Virginia and the entire state of Maryland with the potential to incorporate the entire world. This effort employed a combination of OpenGL and other modeling techniques to develop a scalable, highly interactive 4D model using available GIS and transportation infrastructure data in conjunction with real-time traffic management center data and NOAA weather data. This prototype system interacts with real-time traffic databases to show animations of real-time traffic data (volume and speed) along with incident data, (accident locations, lane closures, responding agencies, etc.), and weather data. A user can “fly” or “drive” through a region to inspect conditions at an infinite number of angles and distances. The software also allows users to monitor the status of and interact with traffic control devices such as dynamic message signs, CCTV feeds, traffic sensors, and even view the location of emergency response vehicles equipped with GPS transceivers. It is anticipated that this system will be useful to a number of groups including traffic management, law enforcement and national security agencies, television and media personnel, and the public. The prototype system includes the entire state of Maryland, Northern Virginia, and the District of Columbia. Because the system uses standard GIS data and relatively standard transportation databases to derive traffic measures, the system can be scaled to incorporate other states and agencies.

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