Cell Phone-Based Traffic Monitoring and Other Studies Get Green Light

Clark School researchers are working closely with Maryland and Virginia transportation agencies to test and analyze technology that monitors traffic by tracking the "on" signals of vehicle-borne cell phones and mapping them against road grids.

The new systems can track several hundred thousand cell phones at once; the phones need only be turned on, not in use. By providing a constantly updated picture of traffic flow across thousands of miles of highways, cell phone tracking can help transportation agencies spot congestion and divert drivers through radio alerts or electronic road signs.

"The potential is incredible," says Phil Tarnoff, director of the Clark School's Center for Advanced Transportation Technology (CATT), who is leading the analysis. "It is going to alter the way we plan our trips and the way we drive. With a better traffic management system, we could reduce congestion by 50 percent and dramatically improve travel time, especially in the Baltimore-Washington corridor where there are four to five high-quality routes to which drivers can be diverted."

Tarnoff recognizes there are privacy concerns, but says the technology protects the privacy of cell phone users by eliminating phone numbers as soon as the tracking data is received. Data from individual phones is not retained, and travel time is calculated by averaging information from large numbers of users.

A traffic detour computer simulation.

Traffic problems in evacuations are a major concern of Hani Mahmassani, Charles Irish Sr. Chair in Civil and Environmental Engineering and director of the Maryland Transportation Initiative. His dynamic network modeling software (DYNASMART-P), supported by the Federal Highway Administration, is used by metropolitan areas in several states as well as overseas for planning evacuation scenarios. He says the success of an evacuation depends heavily on the preparation and decisions made by government officials and traffic managers.

The other key to a successful evacuation, he says, is to control the flow of traffic onto highways so that traffic does not clump up and come to a complete stop. Mahmassani says contraflow—claiming lanes that normally move toward the disaster center for travel away from it—is essential to a successful evacuation. "In a disaster, you have to use your capacity as quickly as you can and contraflow is the logical solution." Hayssam Sbayti, a Ph.D. student, is working with Mahmassani to develop a decision-support framework for optimal staging and network management in extreme situations.

Beyond our borders, Mahmassani and Elise Miller-Hooks, assistant professor of civil and environmental engineering, recently received a $995,000 grant for a two-year European Commission Coordinated-Action study of the European rail freight industry. The Maryland Transportation Initiative is the only U.S. partner in the seven-member international consortium. The Clark School will work on intermodal network modeling and service optimization, developing innovative ways to overcome barriers to seamless intermodal service and creating collaborative decision-making frameworks for integrated system management. ■

For more information on the Center for Advanced Transportation Technology, visit www.cattlab.umd.edu. *To learn more about the Maryland Transportation Initiative, visit* www.mti.umd.edu.

Regional traffic is constantly monitored at the Center for Advanced Transportation Technology.