



This research initiative is funded under the auspices of the CFIRE Tier 1 University Transportation Center.

Title: Making Freight-Centric Communities More Livable: Measuring the Impact of Advanced Technologies

Description:

Communities that attract or retain industrial viability are considered less livable, but reducing, limiting, or mitigating freight operations have direct, measurable economic impacts. This research will measure benefits of advanced technologies and practices to safely blend freight with passenger, transit, bicycle, and pedestrian traffic including Safe Routes to School. These technologies could mitigate a community's safety, noise, and environmental concerns and accelerate implementation of improved practices.

This research involves scenario-based analyses to evaluate quantifiable livability benefits of adopting these technologies. Advanced technologies such as ITS, intersection management, dynamic mobility, dynamic route guidance, and drayage optimization will be reviewed for application suitability. As a case study, a selected subset of advanced ITS technologies will be applied in the Memphis area and evaluated for their sustainability, cost effectiveness, transferability to other regions, and safety impacts.

CFIRE partner institutions bring different research experiences and strengths that coalesce in the proposed research including cutting-edge modeling approaches in simulating the behavior of many elements of the freight transportation system, designing ITS travel information systems, and using GIS and related information technologies. Additionally, the Federal Highway Administration has shown a strong interest in using Memphis as a test bed for evaluating the application of advanced technologies to improve the efficiency of freight movement in an urban environment.

Outcomes:

The proof of concept approach will provide empirical information about various technologies, land use planning techniques, and operational improvements that reduce emissions, noise, and congestion, which in turn increases economic competitiveness and livability. Metrics related to urban goods movement will be developed at the outset to quantify freight impacts.

**Deliverables:**

The deliverables will be reports summarizing best practices and containing guidelines that can be used by private sector transportation firms to implement ITS technologies to reduce congestion and optimize operations. In addition, techniques for integrating livability concepts into the planning process, specifically for accommodating pedestrian and bicycle movements in corridors of substantial freight activity, will be documented.

Industry Impact:

The results of this research will benefit both the private and public sectors. The private sector will be provided with a blueprint on how they use ITS technologies to optimize drayage operations and reduce vehicle miles traveled (VMT). The public sector will be presented with guidelines to be used in the planning process to insure that livability issues are addressed in freight-centric corridors.

Research Team:

- Martin Lipinski, University of Memphis (Executive Committee Representative & Project Coordinator)
- Stephanie Ivey, University of Memphis
- Peter Lindquist, University of Toledo
- Sarah Schaffer, University of Toledo
- Qi-Feng Wang, University of Toledo
- Teresa Adams, University of Wisconsin-Madison
- Maria Hart, University of Wisconsin-Madison

Funding:

- Total: \$403,619
- UTC Funds: \$208,206

Duration:

- 18 months

Student Involvement

- University of Southern Mississippi: One graduate student for one semester
- University of Alabama in Huntsville: One student for three semesters