

Smart Traffic Routing with Efficient & Effective Traffic System STREETS

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The City of Dubuque is a leader in the use of traffic signal systems and field hardware to manage and operate a sophisticated and advanced signal network that benefits the road-users that live within, that work within, visit within or just pass through the Dubuque region. These devices have served to reduce delay and improve safety for these road-users. This includes adjusting signal timings based on the traditional study of traffic conditions. Much of this effort is placed upon a small number of traffic engineers and technicians within the City. With the advent of new technology and integration, with terms like; advanced analytics, “deep learning”, smart cities, artificial intelligence throughout our society and within the transportation industry, the opportunity to “do more with our technology” was discussed and planned for in the Dubuque region. Area leaders, planners and administrators came together to describe a future smart traffic signal system that leverages the advances in technology. The vision is to create the next generation of integrated traffic signal system that includes rapid simulation of future traffic conditions based on real-time data collection. It also includes communicating the modeled changes to road-users before they leave and in route to balance delay and reduce congestion. The dynamic rerouting of traffic to balance road-user delay is also expected to have safety benefits with a reduction in crashes and reduction in pollutants.

This future enhanced smart traffic system for the Dubuque region has been given the name: Smart Traffic Routing with Efficient & Effective Traffic System (STREETS).

The Dubuque STREETS project has taken the next step from a future project described within the Dubuque Metropolitan Area Transportation Study (DMATS) to the completion of system engineering documents that are consistent with Federal Highway Administration (FHWA) processes and guidelines for the deployment of Intelligent Transportation System (ITS) projects.

The goal of the STREETS project is to develop a smart, next generation, traffic management and control system. In addition to providing sound information to the stakeholders, this project will serve as a framework, nationally, for deployment of similar systems in small urban areas with populations under 100,000.

The ultimate deployment of STREETS will cover nine (9) corridors with 64 signalized intersections within the City of Dubuque. Some benefits from implementation of the STREETS include:

- Reducing wear and tear on major corridors
- Reduced congestion
- Improved travel times
- Improved safety
- Reduced emissions
- Enhanced system monitoring capabilities

The proposed STREETS project is expected to dynamically react to congestion detected/predicted by the Micro-simulation model, and proactively change signal timing based on predicted traffic flow data while disseminating congestion and alternate route information for motorists.

Keywords: Reducing wear and tear on major corridors; Reduced congestion; Improved travel times; Improved safety; Reduced emissions; Enhanced system monitoring capabilities