

C2
Advances in Data Collection and Analytics

DUBUQUE SMARTER TRAVEL

Chandra Ravada, Chi Wah Wu
Dubuque Metropolitan Planning Organization, 7600 Commerce Park, Dubuque, IA 52002
563-556-4166
cravada@ecia.org

In 2014, the City of Dubuque, and its transit partners: East Central Intergovernmental Association (ECIA), Dubuque Metropolitan Area Transportation Study (DMATS), Iowa Department of Transportation (IADOT), and IBM Research launched the “Smarter Travel Study (STS).” The STS is designed to collect data on participant’s travel patterns through smartphone technology. The STS utilizes the systems, algorithms, and analytics developed by IBM Research in combination with real-time origin, destination data. The research will assist in increasing transit ridership by capturing 8% of overall transportation trips within the metro area over the three-year study. The results will help implement practices and policies that incorporate lower-cost and lower-impact travel options within Dubuque; and is designed to be replicated in Metro areas with populations less than 200,000.

Smartphones enable both individual trip summary and regional travel demand analysis. Through this technology, trips are decomposed into different modes of transportation (driving, walking, or biking). More specifically, categorized OD based on purpose of trips gives rich information for designing/providing transportation services to the community. The ODs are generated by augmenting the GPS data with a manually input travel diary and survey.

The STS targets the general public in the Dubuque area. The trip analysis system (TAS) consists of a mobile app and a centralized analytics engine. The TAS segments the trips and identifies the travel mode by using embedded GPS; and provides trip summaries and generates meaningful patterns to support traffic operation planning and transit system design. The trip purposes are classified based on the destination, trip time, trip day, and stop time at the destination. Smartphone data is validated with the participant’s travel diary data - as well as screen line testing utilizing the regional Travel Demand Forecast model.

IBM and DMATS staff developed optimized transit routes for the Jule transit system using a volume algorithm heuristic to efficiently solve a mixed integer program; which will minimize average travel time for bus routes, while keeping the operating costs constant; and provide routes based on demand during peak/off peak times. The first set of routes was provided in November 2015 (implementing fall of 2016). The second set of routes will be provided in August 2016.

The conclusion of this study will help the City make educated decisions on where to utilize their limited transportation resources for transit and transportation infrastructure and will make road, trail, and transit improvements based on the travel patterns in the Dubuque area.