Enhanced Role of Activity Center Transportation Organizations in Regional Mobility

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Summary:

In the past, Transportation Management Associations (TMAs) and Business Improvement Districts (BIDs) have had limited involvement in real time traffic operations. However it has been observed that there is recent evolution in this direction. This project studies the feasibility and effectiveness of TMAs in traffic operations. The project has recently completed a nationwide survey to study the role and activity of TMAs and BIDs in major activity centers in the United States in traffic operations. This project also studies upcoming technologies such as applications of Vehicle-to-Vehicle (V2V) and Vehicle-to-Infrastructure (V2I) communication applications alongside other more traditional strategies such as "Keep the Box Clear" campaigns in increasing the feasibility of involvement of TMAs in traffic operations.

Keep the Box Clear Campaign

- When a vehicle "Blocks the Box", they are entering an intersection with insufficient space to exit. As a result, the vehicle obstructs the passage of pedestrians and crossing vehicles.
- This is a critical issue as it produces congestion, increases emissions rates and travel time, creates a negative economical impact on local businesses and causes pedestrian safety concerns.
- The purpose of this analysis is to determine if a Keep the Box Clear Campaign is a suitable option for Georgia. Our methodology to conduct this experiment is to first determine 10-20 intersections around Community Improvement Districts (CIDs) or Business Improvement Districts (BIDs) and investigate how many vehicles are blocking the box.
- Knowing the number of vehicles that block the box will provide insight on the amount of green time wasted, pedestrian and vehicle safety issues, and lost throughput of vehicles during a blocking session.
- Lastly, recommendations for candidate intersections for this campaign will be made based on the analysis in this research.

Example of a box installed in an intersection in New York. (Source: Google Earth)

Potential safety concerns for pedestrians. (Source: Harris)

Vehicles blocking the box at the intersection of Lenox Mall Entrance and Peachtree Rd. (Source: GDOT)

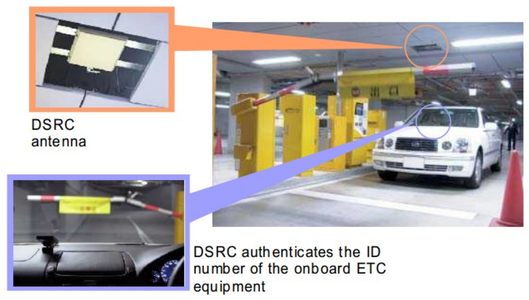
This research is sponsored by the Georgia Department of Transportation under Research Project 13-16. Opinions expressed here are those of the authors and not necessarily those of the Georgia Department of Transportation

Connected Vehicle Applications

- Recently, there has been a rising opportunity for organizations such as TMAs and BIDs to become actively involved in real-time operations, alternative transportation mode use, and traffic-control services with the introduction of dedicated short range communications (DSRC).
- The objective of this research is to determine which V2V and V2I applications will be able to assist these organizations while keeping within a reasonable price range.
- First, it will be determined if these applications will be accessible in an environment with a high density of vehicles. If found accessible, applications will then be reviewed on the basis that they can provide a positive affect on the mobility of the surrounding communities.
- Lastly, recommendations for V2V and V2I applications will be made based on the analysis in this research.

The following applications are examples of potential accessible applications:

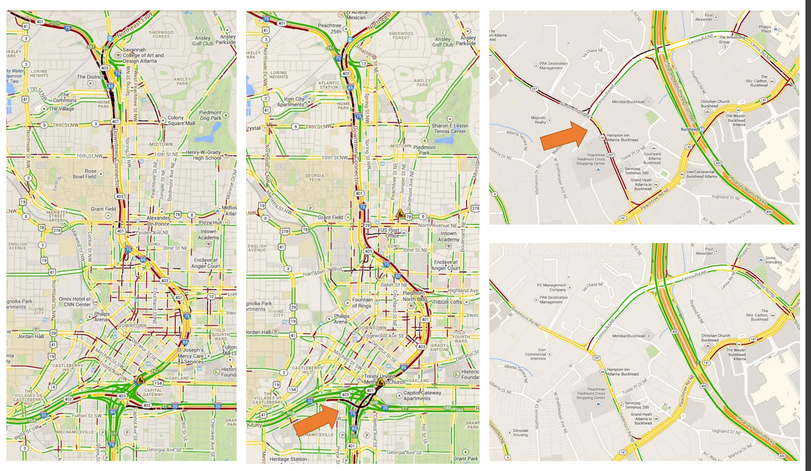
- Parking Management Systems
- Access Control
- Commercial Vehicle Management



Parking Management Systems. (Source: Iwami, 2008)

Congestion Correlation with Crowd Sourced Data

- Extraction of congestion information from crowd-sourced data platforms
  - Additional information on arterials and ramps
  - Flexibility of detection points
  - Measurement of queue lengths
- Time-staggered correlation or inverse correlation of congestion between points on network
- Pro-active congestion mitigation
- Evaluation of congestion mitigation strategies (such as intersection control by police officers)



Color-coded traffic maps. (Source: Google Maps)

Transportation Management Associations (TMA) Traffic Operations Survey Results

- The TMA Traffic Operations Survey focuses on the current traffic operations services and transportation system management practices of various TMAs.
- The survey was emailed to 174 TMAs and BIDs around the nation and 51 responses were received, a 29.3% response rate. Of the responding organizations only eight (18%) organizations provided traffic services including traffic control improvements, signal timing, and collection of traffic data.
- These findings determined that only a minority of organizations are involved in traffic operations due to the high capital and maintenance costs involved.
- The organizations that are involved in traffic operations provided data on their websites including incident alerts, live traffic views, and real-time traffic or shuttle information. Very few of the organizations that used data to provide traffic operations services generated the data themselves.
- The survey results determined that few organizations are actively attempting to assume a role in traffic operations.

Results: