UTC Project Information	
Project Title	MPC 418 – 400 South Corridor Assessment
University	University of Utah
Principal Investigator	Milan Zlatkovic, Research Assistant Professor
PI Contact Information	Civil and Environmental Engineering University of Utah 110 Central Campus Dr. Suite 2000 Salt Lake City, Utah 84112 Phone: (801) 819-5925 Email: milan@trafficlab.utah.edu
Funding Agencies	USDOT, Research and Innovative Technology Administration
Agency ID or Contract Number	DTRT12-G-UTC08
Project Cost	$200,000
Start and End Dates	January 1, 2013 – June 30, 2014
Project Duration	1.5 Years
Brief Description of Research Project	Light Rail Transit (LRT) is the fastest growing rail transportation mode in urban environments in the US. LRT usually operates in a semi-exclusive right-of-way (ROW) at street grade with different separations and protections from other traffic, but can sometimes operate in exclusive, fully grade-separated, or non-exclusive, mixed traffic ROW. Operating LRT in semi-exclusive or non-exclusive ROW can cause some safety problems, mainly caused by turning vehicles, pedestrians at LRT/pedestrian malls, and/or complex intersection geometry. Major characteristics of transportation technology, specifically designed for rapid transit modes which should be followed during design/implementation, include special guideways and crossings, upgraded widely spread stations, upgraded vehicles, off-board fare collection, high capacity, Transit Signal Priority (TSP) of preemption, and speed competitive to private cars. In order to make LRT faster, more reliable and competitive, as well as to resolve some safety problems, it is necessary to provide certain priority or preemption to Light Rail Vehicles (LRVs). Depending on the specific location, traffic operations and safety requirements, either preemption or TSP for LRT are implemented (off course, there are situations when none of these techniques is used). TSP is an operational strategy that facilitates the movement of in-service transit vehicles through traffic-signal controlled intersections. It makes transit faster, more reliable and more cost-effective. Expected benefits of TSP vary depending on the application, but include improved schedule adherence and reliability and reduced travel time for transit, leading to increased transit quality of service. Potential negative impacts consist primarily of delays to non-priority traffic, and these impacts depend on the characteristics of the implemented TSP strategies.

Utah Transit Authority (UTA) is expanding its LRT service in the Salt Lake Valley. There are currently three LRT lines that connect Downtown Salt Lake City (SLC) with Sandy, West Valley City, Daybreak, and the University of Utah Campus. Another LRT line that connects Downtown with the Salt Lake City International Airport is currently in the testing phase, and is expected to start operation in April 2013. The introduction of the new line will provide LRT frequencies in the downtown area of more than twelve LRVs per hour. While this will significantly improve the quality of transit service in the downtown area, it will undoubtedly have impacts on other vehicular and pedestrian traffic. The highest impacts are expected along the 400 S corridor, which is one of the major East-West arterials that connect Downtown SLC with the University of Utah campus, and along Main Street through the heart of Downtown.

For that reason, it is necessary to assess all impacts and benefits of the proposed LRT system, and design optimal operational strategies that would provide more balance among different transportation systems in this area. The TSP strategies need to provide certain priority for LRT, improving its efficiency and safety, with minimal impacts on other traffic. This cannot be done without careful planning, designing, and evaluating different alternatives, which are the main objectives of this study. The study will provide detailed analysis, guidelines and recommendations to UTA, Utah Department of Transportation (UDOT) and the City of Salt Lake about the implementation of the LRT system. Because of the increasing importance of LRT in many metropolitan areas which are facing similar problems, the study will also be useful for planners and engineers on the national level.

Research Objectives:
The main research objectives of this study are as follows:

- Gather, organize, and analyze existing data into compatible formats;
- Assess weaknesses in existing data to set scope for future data acquisition;
- Compile past and new data into applicable baseline compatible with traffic simulation software;
- Improve efficiency of intersections and the corridor using micro-simulation;
- Create simulations for future growth and transportation projections (estimated 5, 10, and 20 year projections);
- Deliver information compatible with UTA and SLC Transportation Department resources;
- Propose recommendations to improve multi-modal corridor movement in conjunction with UDOT, SLC, and UTA.

The study will also be used as a test-bed of the cross-resolution modeling software which is being developed under the University of Utah lead. This software will enable much faster and more efficient

	assessment of existing and future traffic and transit operations on different levels (from planning – macro, to detailed intersection analysis – micro levels).
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	The highest impacts are experienced at intersections closest to the downtown area and some intersections in the University of Utah area. After the detailed analysis, three improvement strategies are recommended to be considered for implementation. The first is to change the phase sequence at 400 South and Main Street intersection, so that the LRT movements are served in conjunction with vehicular through movements, and to perform signal parameter optimization. The second recommendation is to modify the preemption settings for the intersection of N Temple and 400 W. The third recommendation is to optimize signal timing parameters for intersections in the University area based on the field data.
Impacts/Benefits of Implementation (actual, not anticipated)	The recommended improvements were shared with the stakeholders, and some field implementations were considered. The study also provided a significant amount of data and results which will be used for future research and implementation of person-based methodologies for analyzing traffic and transit operations. The simulation models developed in this research included sophisticated traffic control systems that can be used for assessment of similar transportation systems.
Web Links • Reports • Project Website	http://www.ugpti.org/resources/reports/details.php?id=867