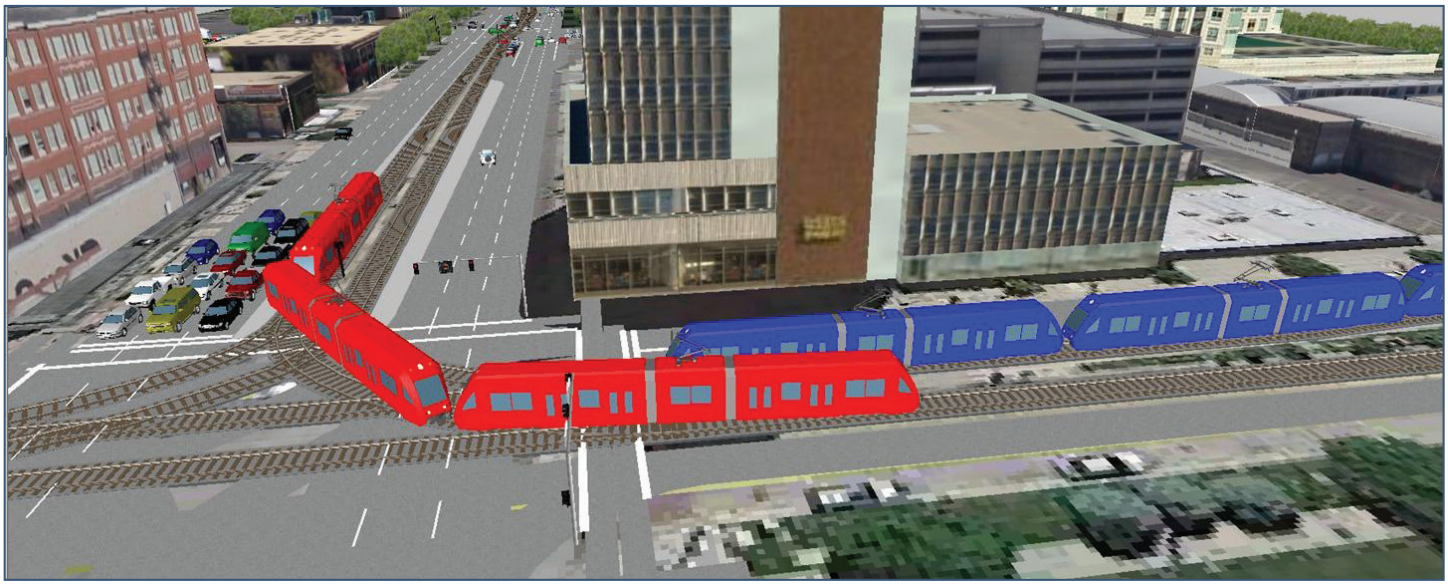
MOUNTAIN-PLAINS CONSORTIUM

PROJECT BRIEF | July 2014

Traffic Modeling of Transit Oriented Development: Evaluation of Transit Friendly Strategies and Innovative Intersection Designs in West Valley City, Utah



the ISSUE

This project quantifies the traffic impacts of traffic oriented development (TOD) using a study network in West Valley City, Utah. This part of West Valley City will go through many development and land use changes in the next 15 years, with the focus on transit use. Consequently, there is a need to design the best possible TOD features for the area.

the RESEARCH

The purpose of TOD is to motivate people to change their travel mode choices. Changing the built environment to accommodate walking and transit vehicles could increase the number of transit users. Recommendations from research on the relationship between travel and the built environment have been adapted and applied to the project network. Proposed improvements evaluated in this project are: enhanced street connectivity, traffic calming measures, innovative intersections, and transit-friendly designs. Performance evaluation measures used are related to traffic analysis, street connectivity and transit accessibility. Microsimulation and macrosimulation are used to build and evaluate a variety of travel demand and street network design scenarios. A GIS-based street connectivity analysis is conducted, and the application of a new tool for transit accessibility analysis is demonstrated using spatio-temporal accessibility measurements.The project resulted in recommendations for future development of the observed network into a TOD-supportive environment.

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University of Colorado Denver
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University of Utah
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Project Title

Traffic Modeling of Transit Oriented Development: Evaluation of Transit Friendly Strategies and Innovative Intersection Designs in West Valley City, UT

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the FINDINGS

Comparison of travel times and speeds on different segments for 2009 and 2040 showed a significant increase in travel time for only one of 12 segments we compared on our test network. This means that new network designs for 2040 need to focus on intersection operations. Increased street connectivity without improving intersection operations will not accommodate the traffic demand for 2040 PM peak period, under the assumption that mode shift does not occur. Comparing street connectivity scenarios for different network segments between main intersections, street widening and enhanced connectivity show similar results, implying that enhanced connectivity could be a good alternative approach for the corridors. Adding traffic calming measures to the network design with increased connectivity, increases total network delay. Innovative intersections scenarios analysis showed that quadrant and Michigan U-turn intersections perform better than conventional intersections in all four observed time periods. Quadrant intersections have the potential to decrease VMT and, with the design that supports street connectivity, can improve the TOD potential of our test network. All these conclusions should be observed with the assumption that enhanced network designs do not cause mode shift and thus decrease the number of private automobile users for 2040. This project also includes conceptual frameworks for measuring street connectivity and transit accessibility, which could serve as indicators of transit quality of service and both spatial and temporal coverage once proposed transit service changes are implemented as a part of the future TOD site.

the IMPACT

The project covered several topics that have the potential to impact TOD, including street connectivity, traffic calming, innovative intersections and transit friendly designs. This is a rare evaluation of traffic operations in potential TOD environments and will be useful for researchers who attempt to evaluate TOD from this perspective. The project required cooperation of experts in public transportation, traffic operations, intersection design, and urban planning, who agreed that the methods applied in the project are beneficial for their disciplines.

For more information on this project, download the entire report at http://www.ugpti.org/resources/reports/details.php?id=772

For more information or additional copies, visit the Web site at www.mountain-plains.org, call (701) 231-7938 or write to Mountain-Plains Consortium, Upper Great Plains Transportation Institute, North Dakota State University, Dept. 2880, PO Box 6050, Fargo, ND 58108-6050.