MOUNTAIN-PLAINS CONSORTIUM

RESEARCH BRIEF | MPC 19-391 (project 465) | June 2019

Development of Performance Matrices for Evaluating Innovative Intersections and Interchanges

the ISSUE

Complete benefits and impacts of innovative intersection and interchange designs are still unclear. There is a lack of methodologies for a quick estimation of these designs for various transportation modes (vehicular traffic, transit, bicyclists and pedestrians), as well as the access management. This study aims to answers those questions.

the RESEARCH

The study integrated multiple available methodologies for evaluating innovative designs with those specifically developed during this research. Two main modules, operational (including access management) for different transportation modes and safety, were the main focus. The study used test-case sites from the state of Utah to develop and test the modules. A combination of field assessment, microsimulation and crash data analysis was implemented to develop and calibrate specific methodologies. The modules were implemented in a user-friendly Excel model.

MOUNTAIN-PLAINS CONSORTIUM REGION 8

A University Transportation Center sponsored by the U.S. Department of Transportation serving the Mountain-Plains Region. Consortium members:

Colorado State University
North Dakota State University
South Dakota State University
University of Colorado Denver
University of Denver
University of Utah
Utah State University
University of Wyoming

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Project Title

Development of Performance Matrices for Evaluating Innovative Intersections and Interchanges

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the **FINDINGS**

The study found that the innovative intersections and interchanges benefit vehicular traffic from the operational and safety perspectives. A diverging diamond interchange can reduce vehicle delays by more than 60% and total crashes by 25%. A continuous flow intersection can reduce vehicular delays by close to 40% and total crashes by 12%. A diverging diamond interchange can also benefit transit and non-motorized transportation due to the smaller footprint than a regular diamond interchange. However, continuous flow intersections can exert more impacts on those modes due to larger footprint.

the **IMPACT**

The developed modules can significantly reduce time for the assessment of innovative designs, especially during the planning stages. It is estimated that the use of these modules would take about 5% of the time needed to develop microsimulation models (which are now mostly being used for this purpose) for each individual site.

For more information on this project, download the entire report at http://www.ugpti.org/resources/reports/details.php?id=951

For more information or additional copies, visit the Web site at www.mountain-plains.org, call (701) 231-7767 or write to Mountain-Plains Consortium, Upper Great Plains Transportation Institute, North Dakota State University, Dept. 2880, PO Box 6050, Fargo, ND 58108-6050.