

# MOUNTAIN-PLAINS CONSORTIUM

PROJECT BRIEF | May 2015

## A Bicycle Network Analysis Tool for Planning Applications in Small Communities



### the **ISSUE**

Bicycle mode share has been increasing in recent years because of municipal efforts to promote alternative transportation. However, bicycles are often neglected in the travel forecasting modeling process. This research addresses this problem by developing bicycle network analysis tools for estimating bicycle trips in smaller communities with limited resources.

### the **RESEARCH**

This research developed bicycle network analysis tools that can perform the following functions: initial bicycle origin-destination demand generation, bicycle traffic assignment, and bicycle origin-destination demand adjustment. The analysis tools were used in sequence to estimate bicycle demand. First, bicycle data was used as input in a doubly constrained gravity model for the estimation of an initial bicycle demand matrix. The initial bicycle demand matrix was then allocated to the bicycle network by bicycle traffic assignment. Lastly, the initial bicycle origin-destination matrix was adjusted so that the generated (estimated) data better matches the observed data. After the development of the network analysis tools, a case study at the Utah State University campus was conducted to demonstrate the applicability of the tools.



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Colorado State University  
North Dakota State University  
South Dakota State University

University of Colorado Denver  
University of Denver  
University of Utah

Utah State University  
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### Project Title

A Bicycle Network  
Analysis Tool for Planning  
Applications in Small  
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### Sponsors | Partners

LTAP/USU

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## the FINDINGS

The application of the developed analysis tools in the USU case study revealed that the majority of estimated link flows matched observed link flows. As such, the bicycle network analysis tools developed in this study may prove useful for planning applications in communities with limited resources. There were, however, some estimated link flows that were significantly different from its corresponding observed link flows. These deviations are likely due to a data inconsistency problem that was identified in the original travel survey (from which data was extracted). Given more careful data collection, the tools developed in this research can be used to analyze bicycle demand and bicycle volumes on a transportation network.

## the IMPACT

The bicycle network tools developed in this study can help governing bodies determine efficient allocation of resources to achieve the planning goals of a region. As such, we expect that the study will be relevant to the Utah Department of Transportation (UDOT) and various Metropolitan Planning Organizations (MPOs). However, we believe the study to be most beneficial for smaller communities in Utah that may not have the resources to develop and maintain a full-scale bicycle planning model.

For more information on this project, download the entire report at <http://www.ugpti.org/resources/reports/details.php?id=798>

For more information or additional copies, visit the Web site at [www.mountain-plains.org](http://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.



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