

# MOUNTAIN-PLAINS CONSORTIUM

RESEARCH BRIEF | MPC 15-287 (project 425) | March 2017

## Building a Sustainable GIS Framework for Supporting a Tribal Transportation Problem



### the ISSUE

Due to the recent oil boom, the Fort Berthold Reservation, home to the Mandan, Hidatsa, and Arikara Nation, has experienced a dramatic increase in highway and local traffic. To support energy transportation and provide safe roads, the reservation needs cost-efficient and effective transportation planning for present and future needs. A quality road network for the reservation is crucial for transportation operations and management.

### the RESEARCH

The objectives of this study were to: (1) integrate road networks to provide comprehensive road network using multiple public sources, and (2) provide guides to perform a quality control assessment before delivering data and using these data for geospatial analysis. This research will also provide the fundamental concepts for quality assurance and quality control.



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

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North Dakota State University  
South Dakota State University

University of Colorado Denver  
University of Denver  
University of Utah

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University of Wyoming



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## Project Title

Building a Sustainable GIS Framework for Supporting a Tribal Transportation Problem

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## Sponsors | Partners

North Dakota DOT  
USDOT, Research and Innovative Technology Administration

## the FINDINGS

Researchers demonstrated how to integrate multiple road networks to provide comprehensive digital roads using public sources and provide guides to perform a quality control assessment before delivering data and using these data for geospatial analysis. They also provided the fundamental concepts for quality assurance and quality control. Thus, tribal geographic information system (GIS) professionals working with other reservations will gain second-hand experience configuring quality checks and processes for automation and running the automated data checks.

## the IMPACT

With the integrated road networks, the tribal transportation agency can develop bike lane management, ambulance service coverage analysis, truck-only lane management, road sign asset management, road maintenance management, and so on. The authors recommend that the agency develop linear referencing systems on the proposed road network to adopt efficient asset management and version control. The linear referencing system should comply with state or federal guidelines for improved communication. To develop an application in an appropriate manner, the road network should include additional attributes based on needs of the Mandan, Hidatsa, and Arikara Nation.

For more information on this project, download the entire report at <http://www.ugpti.org/resources/reports/details.php?id=866>

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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