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.

MOUNTAIN-PLAINS CONSORTIUM REGION 8

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South Dakota State University
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University of Denver
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Lead Investigator(s)

EunSu Lee
elee#@njcu.edu
North Dakota State University

Project Title

Building a Sustainable GIS Framework for Supporting a Tribal Transportation Problem

Co Investigator(s)

Denver Tolliver, PhD

Research Assistant(s)

JaeSung Choi
Graduate Research Asst. PhD

Chijioke Ifepe
Graduate Research Asst. PhD

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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, 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.