

UTC Project Information	
Project Title	MPC 425 – Building a Sustainable GIS Framework for Supporting a Tribal Transportation Program
University	North Dakota State University
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Agency ID or Contract Number	DTRT12-G-UTC08
Project Cost	\$146,000
Start and End Dates	January 1, 2013 - December 31, 2013
Project Duration	1 Year
Brief Description of Research Project	<p>As the oil boom in the Bakken oil field changes the way of life on the Fort Berthold Indian Reservation and increases the need to adapt to rapid change, the leaders are assessing the reservation's government structure, needs, and vision for the long term. The tribal members' awareness of the need for change is a starting point for planning for a sustainable social and economic development on the reservation. (Hall 2012).</p> <p>For sound sustainable development, maintaining close relationships among federal, state, county, and reservation agencies is critically important. Because of jurisdiction and long-standing traditions, the relationship among the entities might be complex, sensitive, and challenging. Through well-established information systems and by sharing data/information, these challenges can be overcome to achieve synergy in establishing a plan and vision for the reservation.</p> <p>In addition to the macro level impacts from such collaboration, micro level impacts cannot be ignored. These include potential improvements to ambulance service, emergency dispatch service, road travel information, assessment of oil development impact, land use management, etc. Applications to handle these services need basic</p>

	<p>information from fundamentally structured data sets. For example, UGPTI implemented HERS-ST (Highway Economic Requirements System) on the reservation by converting Indian Reservation Road (IRR) data into HPMS data format to provide sound transportation planning tools to tribal transportation planners (Benson 2010). Planning toolsools are readily available, but creating new datasets and converting from one format to another is cumbersome.</p> <p>Indian Reservation Roads are the reservation’s primary transportation facilities and are the public roads located in tribal reservations or provide access to the tribal lands. MAP-21 removed the definition of Indian Reservation Roads, but supported tribal transportation programs (TTP). Funding for the TTP is accompanied by numerous “tribal consultation” requirements for States, MPOs, and other transportation public agencies (Glaze, 2012).</p> <p>The Environmental Scientific Research Institute (ESRI) provides ArcGIS to the Indian reservations and the Bureau of Indian Affairs (BIA) (U.S. Department of Interior). ESRI also serves the reservations by providing GIS training. However, the reservation is in needs of specialized and reservation-oriented training and consultation services with limited data input and capability (MacGowan 2010). Figure 1, for example, shows the gaps between two data sources: (a) NDDOT and (b) TIGER®. NDDOT local roads and TIGER® can be utilized to generate the tribal roads for the baselines.</p> <p>Research Objectives: This project investigates the spatial information system needs for transportation in the reservation and supports development planning by providing consulting spatial information systems. Through project and application development, UGPTI will develop a relationship with the reservation which will provides a strong basis for statewide comprehensive transportation and land use analysis.</p> <p>The project will support data collection, database and table construction, data set analysis and training. The goal of the project is not only transferring technology knowledge, but also promoting safety and livability in the community and enhancing self-sufficiency of the reservations.</p>
<p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p>	<p>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.</p>

<p>Impacts/Benefits of Implementation (actual, not anticipated)</p>	<p>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.</p>
<p>Web Links</p> <ul style="list-style-type: none">• Reports• Project Website	<p>http://www.ugpti.org/resources/reports/details.php?id=866</p>