GIS and Tribal Traffic Safety

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• This study investigates the potential for new advances in Geographic Information Systems (GIS) to enhance the collection, availability, and use of information related to transportation safety.

• Conducted in partnership with Esri, the study includes a assessment of Tribal geo-related traffic safety needs, uses and applications. Focus in on the traffic safety processes including awareness, detection, reporting, analysis, programming and improvements.

• Through collaborative analysis with tribal communities, the study will also develop prototypes for potential use that will be evaluated through a series of stakeholder assessments.
Methodology

• Review and assess current issues, barriers, uses, data, and interests in using GIS for Tribal transportation safety.

• Devise a series of prototype applications that could be used by Tribes to assist in their transportation safety data gathering, planning, assessment and implementation efforts.

• Review and assess the range of capacities of GIS to assist in Tribal transportation safety data gathering, planning and implementation in Region 5.

• Assess the value, barriers and implementation paths for promising GIS prototype applications.
Lit Review: Sample Findings

- Native Americans in Minnesota are 2.5 times more likely to be killed in motor vehicle crashes than other Minnesotans.

- The Minnesota Tribal Road Safety Summit stated that the process of data collection needs accurate and timely data along the analytical tools to identify safety problems and potential solutions.

- Data quality has become increasingly important to tribal governments. Driven by external funding opportunities and the needs to better prioritize roadway improvements, the increasing demand for crash data quality improvements is evident across in tribes. Tribes face difficulties in responding data requests from different agencies, and inaccurate/duplication in reporting due to jurisdictional complexity.

- To mitigate these challenges, tribes in Minnesota refer to the D-16 Manual, and the National Model Minimum Uniform Crash Criteria as standards for categorizing crashes. They also utilize tools, such as Computer aided dispatch (CAD) systems (SMART and BULLBERRY) and Indian Crime Awareness Research and Evaluation (I-CARE).

- Created in 2006, MnDOT’s Crash Mapping Analysis Tool (MnCMAT) produces GIS-based charts, maps and reports. This tool was used to apply for additional highway safety improvement program (HSIP) funding from FHWA, and it was made available to tribes by MnDOT online.

- To date, Tribes report highly differential capacity to use GIS for their own needs and solutions, but have expressed interest in how it might be used.
Conceptual Model

- End-to-End Safety Data and Use In Tribes
Prototypes

CrashCollectionTool

1. Enter Information

C1. Case Identifier

C2. Crash Date and Time

C3. Crash County

C4. Crash City/Place (political jurisdiction)

C5. Crash Location Longitude

C6. Crash Location Latitude

C7. First Harmful Event (required)

C8. Location of First Harmful Event Relative to the Trafficway

C9. Manner of Crash/Collision Impact

http://agis.maps.arcgis.com/apps/GeoForm/index.html?appid=a4d91ec2786d47789b56a8581140b1bf&webmap=d3347d9888954fe48078332ec9aa4db6
Prototypes

http://agis.maps.arcgis.com/apps/webappviewer/index.html?id=aae1099b8c8a401f82e954b15b138a5d
Prototypes
Prototypes: StoryMaps

Metal Mining Industry Cluster
Iron ore has been one of Minnesota's most abundant natural resources for many years...
Click to open story map

Agriculture Industry Cluster
Agricultural products have been a staple of the Minnesota economy...
Click to open story map

Food Processing Industry Cluster
The food processing industry of Minnesota is one of the most competitive industries...
Click to open story map

Interactive Atlas
Visit our interactive map, loaded with data about freight rail's impact... (high bandwidth required)
Click to open interactive atlas

http://freighteconomy.org
Prototypes
Next Step:
ACTT Workshop
Breakout Demonstration/Focus Group
October 13, 2015

• Train Native American Students to Assist with Workshop.

• Conduct Overview of GIS Uses in Traffic Safety

• Provide Interactive Discussion with Tribal Representatives

• Provide Post Workshop Summary and Follow-on with Representatives.
Next Step:
Prototype Development and Testing

• A complete series of prototype applications will be produced that could be used by Tribes to assist in their transportation safety planning, assessment and implementation.

• Tasks will include actual creation of GIS prototypes using sample safety data, and structured feedback on the value for Tribes, as well as for the overall Tribal stakeholders (e.g., Tribes, BIA, DOT).
Expected Benefits

- It is expected that the study will create both a general framework for understanding GIS use for Tribal safety, as well as specific implementable GIS based applications.

- These applications are aimed to improve safety data collection, analysis and reporting, including hot-spot and other analyses. The applications will also utilize the latest software as well as traffic safety data.

- The availability of easy to interpret maps of safety trends and conditions should assist in focusing safety information gathering and improvement efforts as well as information sharing of best practices among Tribes.

- The creation of an Indian Tribe GIS platform will provide multi-level data that can improve the understanding of Tribal traffic safety trends, directions and solutions.
Thank You