Project Title:

Assessment of Planning Models for Indian Reservation Roads

University:

North Dakota State University

Principal Investigators:

Dr. Denver Tolliver
Associate Director UGPTI
Phone: (701)231-7190

Doug Benson
Associate Research Fellow
Phone: (701)231-8388

Description of Need:

State and metropolitan transportation agencies have planning models to forecast highway condition and investment needs and analyze the benefits and costs of potential improvements. In comparison, tribal planners have few (if any) tools. One option (or remedy) is to transfer the same technologies used by state planners (e.g., the Highway Economic Requirements System (HERS)) to tribal planners. With this in mind, Benson (in an earlier MPC project) translated the Indian Reservation Roads (IRR) database into an HPMS-like format that can be read by HERS-ST. While HERS test runs on the converted database are continuing, the thoroughness of the data poses many challenges. While most state highways are paved, many miles of Indian Reservation Road are unpaved. HERS-ST lacks specific mechanisms for analyzing the deterioration and costs of unpaved roads or low-type surfaces such as bituminous treatments or very thin asphalt layers. Therefore, supplemental methods may be needed to fully analyze the types of roads found on reservations.

Objectives:

The three main objectives of this project are: (1) test and evaluate HERS-ST as a potential highway planning tool for Indian Reservation Roads, (2) assess the potential of other models for complementing HERS-ST, and (3) assess the feasibility of updating HERS-ST so that it can provide better analyses of Indian Reservation Roads. In pursuit of the first objective, the Indian Reservation Road networks with the most comprehensive and complete data will be selected from the universe of the database. A sample

network may comprise a tribe's paved road system or a part of that system. HERS-ST will then be run on these groups of highways and the results will be assessed in terms of reasonableness. In pursuit of objective 2, the usefulness of other models (such as the World Bank's highway planning and design model) will be assessed for analyzing low volume roads, including unpaved surfaces. Also, the potential of using results from a recently-completed MPC study to develop gravel road life expectancies and cost functions will be investigated. In pursuit of objective 3, the feasibility of modifying the HERS analytical engine (and the procedures necessary to do so) will be evaluated.

MPC Critical Issues Addressed by Research:

Economic Analysis of Investments and Impacts, Integrated Asset Management Systems.

Contributions/Potential Applications of Research:

This project will not generate new research findings. However, it will hopefully lay the foundation for making highway planning models available to IRR planners in the near future. It may lead to a project next year which entails the actual enhancement of HERS-ST or the development of a companion model.

Potential Technology Transfer Benefits:

Hopefully, this trail-blazing project will make it possible for highway planning models to be made available to IRR planners in the near future. It will also enhance their knowledge of the highway planning models used by state and federal governments, such as the HERS-ST. This, in itself, is a useful outcome.

Time Duration:

July 1, 2010 to June 30, 2011

Total Project Cost:

$84,665

MPC Funds Requested:

$59,000

Sources of Matching Funds:

North Dakota State University will match the project through the contributed time of researchers and the MPC director. Tribal planners and TTAP centers will contribute time during the assessment and feedback phases of the project.
$25,665