Rahall Transportation Institute
Research Project Description Form

Project Number: TTP 00-28
Project Title: GIS Mapping System for North Carolina's Appalachian Development Highway System (ADHS) Corridors

Primary Investigator Contact Information:

Name: Sean Litteral
Institution: Nick J. Rahall II Appalachian Transportation Institute
Address: Marshall University, One John Marshall Drive, Huntington, WV 25755
Department: GIS
Phone: 304-696-2594
Email address: littera2@marshall.edu

External Project Contact:
Name: Jason Wang
Institution: Appalachian Regional Commission
Address: 1666 Connecticut Ave NW, Washington, DC 20009-1068
Phone: 202-884-7725

Project Objective: This project's objective is to incorporate North Carolina's ADHS corridors into a GIS mapping system. The information incorporated into this GIS structure will be acquired from "The 2002 Estimate Of The Cost To Complete The Appalachian Development Highway System In the State of North Carolina, April, 2002", which was prepared by the North Carolina Department of Transportation in cooperation with the United States Department of Transportation's Federal Highway Administration and the Appalachian Regional Commission.

Abstract: The proposed research will implement the benefits of GIS mapping capabilities into the ADHS corridors, making it compatible with State Transportation Departments, FHWA, and the ARC. The mapping functions will be able to show and easily update development status and Table B for the individual cost estimate sections for detailed classifications of ADHS development status. This system will also show cross-sections by NCDOT individual estimate sections. It will also incorporate aerial imagery at the one-meter resolution for the ADHS corridors. The system will incorporate easy updates to different development status and

changes to corridor alignments, along with the ability to display Table B data and show typical cross-sections. Expected benefits of this project include extended cooperation between government agencies and lower cost of shared resources. This project will provide a more accurate digital map inventory of the ADHS corridors for transportation and economic development issues in the state of North Carolina.

Task Descriptions:

1. Structure existing NCDOT digital road data into GIS compatible with ARC.

Task 1 will include the following three (3) subtasks:

a. Import existing NCDOT data in ArcGIS.
b. Reassign attribute data lost in the import procedure.
c. Convert road data into a projection that includes ARC region.

2. Design integrated State ADHS maps complete with corridor strip maps following the detailed requirements contained in "Instruction Manual for Preparation and Submission of the Appalachian Development Highway System 2002 Cost to Complete Estimate" for both types of maps.

Task 2 will include the following four (4) subtasks:

d. Combine existing data into a digital ADHS state map. Incorporate correct color-coding and legend symbolization into the map.
e. ADHS will be segmented based on the corridor strip maps included in the "The 2002 Estimate of the Cost to Complete the Appalachian Development Highway System in the State of North Carolina, April, 2002."
f. Customized templates will be developed for a state map and corridor strip maps.
g. Modified button will be created to print the maps on an 11*17 format for state maps and strip maps.

3. Data values for individual estimate will be queried based on the information provided by the "The 2002 Estimate of the Cost to Complete the Appalachian Development Highway System in the State of North Carolina, April, 2002."

Task 3 will include the following Six (6) subtasks:

h. The values from Table B will have to be entered into a digital format and integrated within the GIS system.
i. Create customized button to query construction and engineering estimates.
j. Table B will be linked to the appropriate ADHS segment.
k. Typical cross-sections will need to be scanned into a digital format.

l. Links will also be created to the typical sections.
m. Create customized interface to make more user friendly to non technical operators.

Milestones, Dates, Schedule: This project will end 6 months from permission to proceed.

Yearly and Total Budget: Total: $26,391.00

Student Involvement: The project will provide employment support for 2 graduate students. The student workers will support the Principal Investigator as project assistants.

Relationship to Other Research Projects:

Project Title: "Proposed GIS Mapping System for West Virginia's Appalachian Development Highway System (ADHS) Corridors"
Project Sponsor: Nick J. Rahall II Appalachian Transportation Institute
Project PI: Sean Litteral
Relationships: Project provided proof of concept for other Department of Transportation within the Appalachian Region.

Project Title: "Develop GIS Implementation Strategy for WVDOT"
Project Sponsor: Nick J. Rahall II Appalachian Transportation Institute
Project PI: Dr. Herbert Tesser
Relationships: This project would help with the implement the proposed project

Project Title: "Automated Road Extraction Using Satellite Images"
Project Sponsor: Nick J. Rahall II Appalachian Transportation Institute
Project PI: Dr. Herbert Tesser
Relationships: Some of the technology developed on this project could assist with the road data accuracy.

Project Title: "Endangered Species Identification along Corridors in WV Using GIS"
Project Sponsor: Nick J. Rahall II Appalachian Transportation Institute
Project PI: Dr. Mike Little
Relationships: The environmental databases developed on this project can be used to provide environmental data.

Technology Transfer Activities: Final and progress reports will be available on the RTI Website. Reports and GIS data will be submitted to applicable organizations. Opportunity for the Principal Investigator to present findings through the Transportation Seminar Series to invited guests from ARC, NCDOT, USDOT, and other RTI Principal Investigators as well as any other interested parties will be provided. We will also seek opportunities to demonstrate

the research concept and technology to transportation and economic development professionals.

Potential Benefits of this Project:

Public and local governments can readily implement the results of this research. This project will provide future benefits to other research projects for providing a base to incorporate their findings on the Geographic Information System.

TRB Keywords: GIS, Geographic Information System, Linear Referencing System.