

Rahall Transportation Institute
Research Project Description Form

Project Number: TTP 00-24

Project Title: GIS Mapping System for Maryland's Appalachian Development Highway System (ADHS) Corridors

Primary Investigator Contact Information:

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Project Objectives:

This project's objective is to incorporate Maryland'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 Maryland, April, 2002", which was prepared by the Maryland State Highway Administration in cooperation with the United States Department of Transportation's Federal Highway Administration and the Appalachian Regional Commission. The new GIS based system will be developed to allow SHA to provide cost update data to ARC in digital form, either interactively through an online data input screen or as a predefined system data input file on disk or CD. The new GIS system would then be capable of producing any required reports and/or maps reflecting the

updated information. The new GIS based system shall be developed such that hosting and maintenance responsibilities are external to SHA.

Project Abstract:

The proposed research will implement the benefits of GIS mapping capabilities into the ADHS corridors, making it compatible with MdSHA, FHWA, and the ARC's databases. The mapping functions will be able to show and easily update development status, and data in Table B for the individual cost estimate sections. This system will also show cross-sections by MdSHA 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, new section breaks, 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 linkage with other transportation and highway data, 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 Maryland.

Deliverables:

Upon completion of this project, the MdSHA will have access to a customized application in a GIS format from "The 2002 Estimate of the Cost to Complete the Appalachian Development Highway System in the State of Maryland, April, 2002". The software will be delivered in a CD-R to be installed on a computer at MdSHA. This system will have the ability to:

Update/ revise:

- Alignment of corridors
- Status of individual cost estimate sections
- Data for individual cost estimate sections
- Add additional estimate section breaks
- Add documents to individual cost estimate sections

Print:

- State map showing the status of the corridors

- Corridor strip maps showing the status
- Data from individual cost estimate sections

Hot Links:

- Ability to add pictures to individual estimate sections
- Ability to add project design and / or construction information to individual estimate sections
- Ability to link to other data bases including but not limited to topographic information

In addition Digital Raster Graphic (DRG), Wetland, Floodplain, Rails, and Airport data will be added to the base system

Computer Specifications:

- Pentium III at 1.4Ghz (Or Better Recommended)
- 500 mb RAM (Or Better Recommended)
- 80 GB hard disk (Or Better Recommended)
- Windows 2000 or later version (Required)

In addition a user-friendly manual will be provided to MdSHA and ARC.

Task Descriptions:

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

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

- a. Import existing MdSHA data in ArcGIS.
- b. Reassign attribute data lost in the import procedure.
- c. Convert road data into a projection within counties that have ADHS corridor.

2. Design an 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 (6) 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 Maryland, April, 2002.”
- f. DOQQ will be color balanced and mosaiked for the ADHS corridors.

- g. Customized templates will be developed for a state map and corridor strip maps.
- h. 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 provide by the “The 2002 Estimate of the Cost to Complete the Appalachian Development Highway System in the State of Maryland, April, 2002.”

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

- i. The values from Table B will have to be converted into a digital format appropriate to integrate within the GIS system.
- j. Create customized button to query construction and engineering estimates.
- k. Table B will be linked to the appropriate ADHS segment.
- l. Typical cross-sections will need to be scanned into a digital format.
- m. Links will also be created to the typical sections.
- n. Create customized interface to make more user friendly to none technical operators.
- o. Quality control analysis.

Milestones, Dates, Schedule:

This project will end 6 months from permission to proceed.

Budget:

Personnel

The personnel budget will get broken down in detail by task and subtask. There will be two rates of salaries; one for Rahall Transportation Institute staff at \$23 per hour and the other will be based on the rate of pay for students at \$10 per hour.

Total Salaries	Totals \$4691
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Fringe Benefits

Fringe Benefits are calculated at 30% for all full-time regular positions, 12% for all students.

Benefits Total	\$1292
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Travel

As needed, travel will be required to various parts of Maryland for groundtruthing ADHS digital road inventory and for project meetings in Baltimore and Washington DC.

Travel Total	\$1100
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Property, Supplies + Services

As considered necessary, supplies and services will be provided to complete the project.
Property Total **\$ 300**

Indirect Costs

The Rahall Transportation Institute's negotiated indirect cost Rate is 26% of the total modified direct costs.

Indirect Total **\$1919**

Total Budget **\$ 9302**

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, MdSHA, 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, such as ARC and MdSHA 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.