Rahall Transportation Institute

Research Project Description Form

Project Number: TTP 00-22

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

Primary Investigator Contact Information:

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Project Objectives:

This project's objective is to incorporate Alabama'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 Alabama, April, 2002", which was prepared by the Alabama Department of Transportation in cooperation with the United States Department of Transportation's Federal Highway Administration and the Appalachian Regional Commission.

Project Abstract:

The proposed research will implement the benefits of GIS mapping capabilities into the ADHS corridors, making it compatible with State DOTs, 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 and roadway photos by ALDOT 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. In addition, the system will also incorporate a function in a GIS environment developed by ALDOT to viewing roadway photologs for the ADHS corridors. 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 Alabama.

Deliverables:

Upon completion of this project, the ALDOT will have 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 Alabama, April, 2002". 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
- Photolog Viewing Tool

Specification:

- Pentium III at 1.0Ghz (Recommended)
- 500 mb RAM (Recommended)

- 80 GB hard disk (Recommended)
- Windows 2000 (Required)
- ArcGIS 8.2 or above (Required)

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

Task Descriptions:

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

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

a. Import existing ALDOT 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 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.

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 Alabama, April, 2002."

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

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

Milestones, Dates, Schedule:

This project will end 6 months from permission to proceed.

Budget:

$27337.03

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, ALDOT, 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 ALDOT 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.

In addition costs were acquired at the request of the Regional Planning Commission to incorporate various datasets.

1. Tax Parcel map are a valuable resource for a lot of different agencies. This is a good one to start building GIS awareness. From preliminary evaluation of the state of Alabama just a few counties already have the data in a digital format. The cost to digitize the tax parcel map is $3.00 per parcel.
2. The State of Alabama at present time does not have complete coverage with USGS DOQQ. At the present time 1761 DOQQ are available, out of an estimated 3520 needed to complete the State. Additional counties can be color balanced and mosaic for $1,000 per county providing coverage is available.
3. Elevation data is available for free at 30m resolution. Further discussion is recommended with all parties interested.
4. Wetland data is available for free and can be incorporated for an extra $100.
5. Floodplain data is available from FEMA but is not very good. This product was called a Q3 and the program has been discontinued. FEMA has been budgeted $300,000,000 on a map modernization program and perhaps opportunities for partnering can be arranged.
6. Utilities will require further discussion.
7. ALDOT Roadways are available for free at the scale of 1:100,000. This can be incorporated for extra $100.
8. Rails are at the scale of 1:2,000,000 and can be incorporated for $100.

9. Water and sewer will require further discussion.
10. Endangered species are available by counties and will require further discussion
11. National Register of Historic Places are not available to the public. Further discussion is required.
12. Airports are available but no accuracy data is provided. Can be incorporated for and extra $100
13. Hazardous material sites are available and can be incorporated for $100.