

Technology Deployment Initiatives and Partnership Program Request for Funding FY 2005

FHWA Strategic Goal Area: Productivity, Human & Natural Environment

Focus Technology: Geographic Information Systems

Project Title: Use of spatial technologies for enhanced productivity in project delivery

Problem Statement: Spatial data is essential for highway design projects. The current practice of using traditional point based survey data for highway design is antiquated and inefficient. This proposal presents a way to spatially enable all aspects of the project delivery process for highway design in WFLHD.

The FLH partner agencies are increasingly using spatial technologies to map their resources and analyze this data for planning and engineering. Additionally, the A&E contactors are using spatial technologies for delivering our products. However, the WFLHD is lacking in leveraging spatial technologies. The use of spatial technology is limited to planning section only. Through the use of spatial technology, WFLHD can share natural resource information with client agencies, resource agencies, and A&E consultants. Additionally, WFLHD can benefit from spatial technology during planning activities, reconnaissance trips, and PS&E field reviews.

A range of spatial technologies will be used to leverage the productivity enhancement for project delivery. The tasks will include data interchange between CADD system and spatial system, creating a spatial database, enabling various sections in project delivery to use tools to populate this database, and utilizing this data for planning and design.

Proposal: A spatial database stores condition and attributes of roads, forests, wetlands, habitat resources and provides capabilities to analyze them by querying on coordinates and/or associated attributes. This proposal includes setting up a spatial data workflow process for WFLHD for evaluation purpose. Once, this system is evaluated and fine-tuned it can be rolled out to other FLH divisions. The system will include setting up a spatial database, purchasing data and software for base-layer data, setting up data interchange between CADD/spatial data, developing processes for including collected GPS data into spatial database, and using spatial data for highway planning and design activities.

This proposal will be used as a proof of concept to evaluate the productivity enhancement of spatial data in project delivery process. The initial system will be tested by following activities that represent a subset of all project delivery and technical services activities:

- Task 1
 - Setup a spatial database
 - Setup a spatial data server and web server
 - Setup data interchange between CADD system and spatial data
- Task 2
 - Purchase base level topographic data and imagery data
 - Setup workflow processes using GPS tools (i.e., field notes using GPS tools, using GPS

tools for geotechnical and/or hydraulic field data collection, etc.)

- Task 3
 - Spatial data sharing with customers, partners, contractors, and state DOTs
 - Summarize results and experiences in a Final Report
- Task 4
 - Disseminate information through publications, demonstrations, and presentations

Benefits: Start relying on GPS spatial referencing in the field. Quickly locate proposed design locations and references. Start using the expensive surveyed data to the maximum potential by integrating attributes data to the cultural features. Increase the ability to share data across functional areas and client agencies. Visually identify and run reports on features.

Resources/Cost: For the two years duration this project, the following total cost of \$600,000 will be incurred:

<i>Tasks</i>	<i>FY2005</i>	<i>FY2006</i>
<i>Task 1</i>	\$200,000	\$100,000
<i>Task 2</i>	\$100,000	\$50,000
<i>Task 3</i>	\$50,000	\$50,000
<i>Task 4</i>	\$0	\$50,000
<i>Total</i>	\$350,000	\$250,000

Duration: February 1, 2005-September 2006

Organization/Method: The spatial data server and database will be developed and supported by a consultant/contractor for initial design as well as maintenance and support. The workflow processes for using spatial tools will be developed in-house with some consultant support. The spatial/CADD data interchange will be designed and supported by the respective software vendors through a consulting contract. Once the system is developed, a limited number of highway design projects will use this for evaluation. After the evaluation period, the system will be rolled out to other FLH divisions for comprehensive use in project delivery process.

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