Executive Summary

Technology Deployment Initiative and Partnership Program Requests for Funding FY 2004

A brief summary of the following nine FY 2004 requests is provided:

• Evaluation of Dimethyl Sulfioxide (DMSO)	$145,000
• Showcasing of Technology Deployment Initiatives	$ 50,000
• Bore Hole Log Software & Hardware	$ 16,000
• GPS Digital Camera Integration	$ 3,250
• Innovative Contracting Manual	$145,000
• Public Involvement Tool for Construction	$ 1,500
• Predicting Potential Environmental Impacts	$260,000
• Frost Heave monitoring and Reduction	$ 90,000
• Aerial inspection and surveying	$518,250

Attached are the nine FY 2004 WFLHD Technology Deployment Initiative Partnership Program (TDIPP) Request for Funding statements The total proposed WFLHD Technology Deployment Program is $1,229,000.

We have developed these proposals through a systematic process following the FLH Technology Road Map. These proposals have been coordinated with all functional areas within WFLHD and our customers.

Executive Summary

Technology Deployment Initiatives and Partnership Program
Request for Funding
FY2004

Project Title: The Evaluation of the Dimethyl Sulfoxide (DMSO) Method for Determining Rock Quality	**FHWA Strategic Goal Area:** Mobility, Productivity
Background: The investigation into the total failure of base and surface courses on the Nestucca River Access Road in the late 1960's led to the discovery that some aggregates used to construct the project pavement contained swelling clays. Swelling of the clays when the aggregates became wet caused the aggregate to break apart and degrade quickly to gravelly silt and clay resulting in failure of the pavement. This recognition led WFLHD in 1978 to develop a test to predict aggregate degradation potential.	**Estimated Costs:** The total estimated cost of this proposal including deployment is $145,000 **Duration:** Lab Study/Final Report July 2005 Submission AASHTO Fall 2005 Presentation at TRB Spring 2006
Scope: The project would begin by examining WFLHD laboratory records to identify 15 quarries (three each in western Idaho, eastern Washington, eastern Oregon, northwestern Oregon, and southwestern Oregon) having DMSO test values distributed approximately equally between 0 to 50 percent DMSO loss. Samples would be obtained from each quarry and shipped to the WFLHD Materials Testing Laboratory.	**Champions:** Dave Lofgren, WFLHD Engineering Geologist, Champion Brad Neitzke, WFLHD Materials Engineer Bruce Wasill, WFLHD Quality Assurance Engineer

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Project Title: Showcasing of Technology Deployment Initiatives	**FHWA Strategic Goal Area:** Productivity
Background: The Technology Deployment (TD) team deploys research and provides products and services that are essential, indispensable, and connected to our Federal Land Management customers and partners. The initiatives the team promotes are critical to innovation. The TD program includes a broad mix of projects that cut across traditional transportation modes and technical disciplines. Our program continually evolves to meet changing national priorities and client needs.	**Estimated Costs:** The estimated cost for deployment between the three divisions during FY2004 is $150,000. **WFLHD - $50,000** *CFLHD - $50,000* *EFLHD - $50,000* **Duration:** Technology Deployment FY 2004
Scope: Travel and miscellaneous technology activities will be authorized to promote and showcase products.	**Champions:** Bradley Roberts, WFLHD Technology Deployment Roger Surdahl, CFLHD Technology Deployment Heather Woll, CFLHD Technology Deployment Gary Brown, EFLHD Technology Deployment

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Project Title: Bore Hole Log Software & Hardware	**FHWA Strategic Goal Area:** Productivity
Background: This will complete the porting of the recently completed Bore Hole Logging application to the MS Windows Operation System (OS). The advancements in ruggedized technology has matured to provide the necessary hardware platform for the harsh field environment.	**Estimated Costs:** Total estimated cost including deployment is $16,000 **Duration:** 2004 / Final Report Spring 2005
Scope: The deliverable will be the full evaluation through field-testing of a ruggedized mobile (wearable) PC (MS Windows OS), a ruggedized Tablet PC (MS Windows Tablet PC OS), and a ruggedized handheld (MS Pocket PC OS). Concurrent to the field testing of the first two platforms mentioned above, the porting of the certified version of the Bore Hole Log application to MS Pocket PC OS will be completed to full test on the ruggedized handheld.	**Champions:** Gary Evans, WFLHD, 360-619-7737 Bradley Roberts, WFLHD, 360-619-7777

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Project Title: GPS Digital Camera Integration	**FHWA Strategic Goal Area:** Mobility, Productivity
Background: Currently, users carry a standalone GPS unit into the field while taking digital photos. Back at the office, the photos are downloaded from the camera and the GPS coordinates are downloaded from the GPS unit. Using information manually recorded in the field, the user runs GPS Photo Link, which matches the photos and the GPS coordinates. The software also links to aerial photos from the Internet based on the GPS coordinates of where the picture was taken. The software produces an html file that contains the digital photos, the GPS coordinates, and the links to the aerial photographs.	**Estimated Costs:** The total estimated cost of this proposal including deployment is $3250 **Duration:** 2004 / Final Report March 2005
Scope: *Phase One:* Obtain the package that includes a camera with GPS and GPS Photo Link software that works with the camera. *Phase Two:* Developing a camera configuration that combines GPS capabilities and a laser range finder into one compact package. The GPS Photo Link software will be updated to use the GPS and the distance information.	**Champions:** Greg Humphreys, WFLHD, 360-619-7576 Bradley Roberts, WFLHD, 360-619-7777

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Project Title: Innovative Contracting Manual of Practice for Federal Lands Highway	**FHWA Strategic Goal Area:** Mobility, Productivity
Background: Innovative contracting differs from conventional contracting by the use of incentives to motivate contractors to provide quality transportation facilities while minimizing travel delays and maintaining a competitive bidding process FLH primarily uses a design-bid-build process with set completion dates and traditional owner-oversight of all key decisions, materials, and specifications As the FLH program grows, environmental restriction increase, and visitor usage of public lands rise, innovative contracting provides opportunities to meet demands on time sensitive projects where the public is impacted.	**Estimated Costs:** The total estimated cost of this proposal including deployment is $145,000 **Duration:** Draft Manual Summer 2005 Final Manual Fall 2005 FLH Staff presentation Spring 2006
Scope: The deliverable will be a manual of innovative contracting methods establishing the state of the practice for designing and constructing transportation projects. The manual will address the effectiveness of each contracting method, the method's potential impact on quality, the comparison of cost to benefit, the development of contract provisions for implementation, and an explanation of the FLH contracting process for each method.	**Champions:** Ricardo Suarez., WFLHD, A technical review team representing all FLH divisions will be composed of contracting, project delivery, construction, and legal staff

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Project Title: Public Involvement Tool for Construction	**FHWA Strategic Goal Area:** Human and Natural Environment
Background: Public information materials: provide information about a transportation investment that is underway or in the planning stage; is an essential form of communication in any public involvement process; and communicate quickly. The typical construction newsletter contains information on the project scope, construction schedule, alternative routes, and planned closures in a simple and in straightforward fashion. In the rural community, the local restaurants serve as a tangible link to the community as a social gathering place Information provided at these venues provides dialogue with the local resident, sportsman, and sightseer**.**	**Estimated Costs:** The total estimated cost of this proposal including deployment is $1,500 **Duration:** Fall / Winter 2004 Final Report Spring 2005
Scope: WFHLD will produce placemat newsletters for dissemination to local restaurants to make sure the word gets out about the construction schedule, alternative routes and temporary road closures. The project selected is the Salmon River Road in Riggins, Idaho.	**Champions:** Mike Helvey, WFLHD Construction Project Engineer Jane Traffalis, WFLHD Construction Operations Engineer

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Project Title: Predicting Potential Environmental Impacts on Public Land Transportation Projects	**FHWA Strategic Goal Area:** Environment
Background: Environmental Streamlining and Stewardship is a primary goal area for the FHWA – one of its Vital Few goal areas. NEPA was intended to lead to better decisions. One way to measure effectiveness in achieving environmental goals is to compliment our NEPA documentation with after construction studies to quantify the success of our stewardship**.**	**Estimated Costs:** Cost of this proposal including deployment is $260,000 **Duration:** For purpose of this initiative, a three-year duration is estimated Final Report Spring 2007
Scope: There are two major objectives to be met by this initiative. The first is to obtain after construction (post approval) data that shows the mitigation success of the measures carried out by the FLH Divisions. The second is to determine whether the impacts typically predicted and mitigation solutions recommended during NEPA are viable for the unique conditions found along highways This study will develop a concise and technically credible protocol to monitor the effectiveness of the selected mitigation efforts unique to highway construction projects. .	**Champions:** Ricardo Suarez., WFLHD, A technical review team representing all FLH divisions will be composed of contracting, project delivery, construction, and legal staff

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Project Title: Frost Heave monitoring and Reduction	**FHWA Strategic Goal Area:** Productivity
Background: Frost heave is currently a problem in many of the northern areas of the United States. Frost heave can damage roadway foundations, retaining walls, and other susceptible transportation features.	**Estimated Costs:** Cost of this proposal including deployment is $90,000 **Duration:** 2004- 2006, Final Report
Scope: There are two major objectives to be met by this initiative. Our plan is to monitor current frost heave sites by surveying a baseline at known areas of severe frost heave. In addition to this, thermistor strings and data loggers would be installed to measure the actual depth of frost penetration. Different remedial measures to eliminate the frost heave will be constructed as part of the Cascade-Warm Lake construction project. These will include the placement of geocomposite drains, the use of "Rock Cap" drainage layers, and significantly deeper cutoff drains than what is normally installed. After construction, the thermistor strings will be reinstalled and ground surveys redone (with new baseline at the same location) in order to measure the relative effectiveness of the different measures to eliminate the frost heave	**Champions:** Gary Evans., WFLHD,

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Project Title: Aerial inspection and surveying	**FHWA Strategic Goal Area:** Safety, Productivity Environment
Background: FLH is responsible for providing transportation-engineering services to other civilian government agencies and the traveling public. The degree of success for this core function relies on the on the timeliness, accuracy, and quality of the inspection and survey data. Collection methods for this data in the past have been a best guest approach backed up with limited video, digital pictures, and sketches. Three of our primary client agencies are the National Park Service, US Forest Service, and the Bureau of Indian Affairs. In addition, FLH maintains the national Bridge Inventory Program on most Federally owned lands. WFL also works closely with county, state, and Federal Land Management Agencies in repairing and restoring federally owned roads damaged by natural disasters or catastrophic failures in Alaska, Idaho, Montana, Oregon, Washington, and Wyoming. FLH has always depended on traditional methods of gathering field inspection and surveying data**.**	**Estimated Costs:** The total estimated cost of this proposal including deployment is $518,250 *Phase I* = $249,000 *Phase II* = $269,250 **Duration:** *Phase I* Summer/Fall/Winter 2004/2005 *Phase II* Spring/Summer/Fall 2005 Final Report Spring 2006
Scope: WFL will acquire the equipment and capabilities outlined below in Phase I in the Summer of 2004. The equipment will be utilized for the life of the Revegetation Effectiveness Monitoring Protocol and the Revegetation Assessment and Strategy Protocol. The master work plan will be tailored around these initiatives. The remainder of the master work plan will include the discipline work plans containing their specific processes and procedures. The equipment will be actively showcased to other Federal Agencies, private sector organizations, and various local and national Technology forums. The equipment and refined discipline specific processes and procedures will be made available to the certified client agencies. Certified client agencies will have personnel who have been trained by the vendor or the champions in all facets of the equipment operation and data collection methods.	**Champions:** Scott Riley, USFS Umatilla National Forest 541.278.3829 Bradley Roberts, WFLHD 360.616.7777

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