TECHNOLOGY DEVELOPMENTS

Tribal Providers Conference
Anchorage, Alaska

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Federal Highway Administration, Office of Federal Lands
Director of Innovation and Technology Deployment
Innovation
Innovation
How will we move?
- America’s population will grow by 70 million by 2045

How will we move things?
- By 2045, freight volume will increase 45 percent.

How will we adapt?
- Climate change will include global mean sea level rise, temperature increases, and more frequent and intense storm events
Fixing America’s Surface Transportation Act
Section 1444 – Every Day Counts

- Identify and deploy proven innovative practices and products that:
  - Accelerate innovation deployment;
  - Shorten the project delivery process;
  - Improve environmental sustainability;
  - Enhance roadway safety; and
  - Reduce congestion.
Every Day Counts

“Every two years identify a new collection of innovation best practices and data for deployment”

- Request for Information (RFI) in the Federal Register in early December
Every Day Counts Initiatives

- National Impact
- Readiness
- Game Changing
- Urgency and Scale
AID Demonstration Funding

MAP-21 = $30,000,000 program
FAST Act = ??

- **Multiple awards** each fiscal year
- Apply when **project ready to initiate** within 6 months
- **Full cost of innovation** (up to $1M per award)
- **Award goal of $1M** dedicated to Federal Land Management Agencies and Tribal Governments
Gifford Pinchot National Forest
Layout Creek Bridge Project for Aquatic Restoration

Before

After

Innovation
Prefabricated Pre-stressed Concrete Beams
Geosynthetic Reinforced Soil Abutments

$137,336
Gifford Pinchot National Forest
Layout Creek Bridge Project for Aquatic Restoration

<table>
<thead>
<tr>
<th></th>
<th>GRS-IBS Design</th>
<th>Conventional Design</th>
<th>% Saved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Costs</td>
<td>$17.5K</td>
<td>$20K – $45K</td>
<td>13-61%</td>
</tr>
<tr>
<td>Overall Project Cost</td>
<td>$267K</td>
<td>$290K-$340K</td>
<td>8-22%</td>
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</tbody>
</table>

- Construction was faster than conventional construction
- No maintenance needed after one year of service
- Eliminated the “bump” at the ends of the bridge
- No uncommon equipment was needed
When GRS-IBS Use Optimal

- Span Length < 140 feet
- Abutment Height < 30 feet
- Short Timelines
- Low Scour Potential
Ohkay Owingeh Tribe

White Swan Bridge

Innovation

Prefabricated Pre-stressed Concrete Beams
Geosynthetic Reinforced Soil Abutments

$200,000
Ohkay Owingeh Tribe

White Swan Bridge

<table>
<thead>
<tr>
<th>Conventional Design</th>
<th>$1.0 M (engineers estimate)</th>
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</thead>
<tbody>
<tr>
<td>GRS – IBS Design</td>
<td>$411K</td>
</tr>
<tr>
<td>Cost Savings</td>
<td>$589K</td>
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</tbody>
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Replaced a battery of four 4’ X 10’ culverts with a single span bridge
- Open span allowed water to flow more freely
- Minimized sediment deposit
- GRS abutments required less excavation
- Eliminated the need for a concrete beam seat
Ohkay Owingeh Tribe
White Swan Bridge

- Bridge built using force account
  - Estimated contractual cost for outside Contractor = $105,000
  - Ohkay Owingeh Road Crew = $52,103

$52,897 Cost Savings
Assiniboine and Sioux Tribes of the Fort Peck Reservation

Continuously Operating Reference Stations (CORS) Project

Innovation
Continuously Operating Reference Stations (CORS) $325,000
Pueblo of Acoma
Construction Manager / General Contractor Delivery

- **Bundling** $6.8M suite of projects
  - Combination of infrastructure improvements projects, emergency projects, and critical maintenance projects

- Goal is to **stretch the existing funding** by capturing savings gained through innovations and risk reductions

- **Economic stimulus** for the local community

Innovation
Construction Manager / General Contractor
$563,000
Other Applications

- National Park Service – Safety Data Management System - $296,800
  Under Review
- Gwichyaa Zhee Gwich’in Tribe – Geosynthetic Reinforced Soil Integrated Bridge System
- Confederated Salish and Kootenai Tribes (CSKT) – Folded Steel Plate Girder Bridge
- Fish & Wildlife Service – Dynamic Bike Warning System
Strategic Highway Research Program (SHRP2)

- Gila River Indian Community – Sacaton Bridge
  - Engineering News Record’s Best Project Award in the Highways/Bridges category - Southwest Region
    - Used a pre-fabricated prestressed girder bridge (second use in AZ);
    - Slide in bridge construction, and
    - Construction Manager / General Contractor

- Reduced closure period from 6 months to 11 days
- Even with the complication of site flooding, team delivered under budget and without change orders
Coordinated Technology Implementation Program Webinars

**Design and Build Your Own Geosynthetic Reinforced Soil—Integrated Bridge System**

**Design With Your Own Staff**
Build With Your Own Crew

Coordinating a new bridge? Have you considered building it yourself with a GRS IBS and making Every Bay Count?

This webinar is your opportunity to learn about using GRS IBS and the simplicity of installation.

Join us to hear "how-to-do-it yourself" experiences of state agencies share how they designed and built their own GRS IBS in the Logan Creek Bridge project in the Uintah Basin National Wildlife Refuge, Utah, the replacement of the Dry Creek Bridges in the Rattlesnake River, Idaho, and the construction of the White River Bridge in the Uinta-Canyon National Forest, NM.

Learn about:
- How easy the system is to design
- What skills and maintenance steps are already present to build
- What equipment you already own, and what you need and
- How much time and money you can expect to save

Live Webinar * September 30, 2015
1 pm EST / 12 pm CST / 11 am MST / 10 am PST

https://connect.dot.connectsolutions.com/GRS
Audio Number: 1-888-684-9852 Password: 3356498

**Wildlife and Highways: Finding Solutions**

Transportation planners and natural resource managers are increasingly asked to respond to the public’s concerns about the effects of highways on wildlife, especially regarding animal/vehicle collisions.

This webinar will discuss these common issues in transportation ecology and walk through a decision process to find solutions. Scenarios discussed on the webinar include:

- How wildlife transportation planners and resource managers deal with a highway segment with a large number of deer/vehicle collisions?
- Is it possible to use existing structures for wildlife passage, and how would we determine if that’s feasible?
- How can we use a planned bridge replacement to enhance aquatic and terrestrial animal passage?

Join us to discuss a number of useful resources to use to tackle these and other transportation ecology questions.

Live Webinar
July 22, 2015
1 pm EST / 12 pm CST / 11 am MST / 10 am PST

https://connect.dot.connectsolutions.com/wildlife
Audio Number: 1-888-684-9852 Password: 3356498
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