

An aerial photograph of a mountain valley. The landscape is a mix of brownish-tan grasslands and patches of trees. Some trees are in full autumn yellow, while others are dark green. A light-colored dirt or gravel road winds through the valley. In the background, a large mountain peak is visible under a blue sky with light, wispy clouds.

The Federal Lands Highway Program

2015

The Year in Review



From the desk of the Associate Administrator

This report celebrates another year of accomplishments by the Federal Highway Administration, Office of Federal Lands Highway. Since joining FHWA in mid-July, I have had the opportunity to visit each of the Federal Lands Division Offices, multiple projects, partners, and many of the talented and dedicated team members that make Federal Lands Highway the great organization that it is. As the new Associate Administrator for Federal Lands, I am humbled and honored to be a part of an organization that has done so much for our nation by assisting our federal land management agency partners in the planning, design and construction of context and environmentally sensitive transportation projects. These projects provide vital transportation improvements for Tribal communities and access to and within our nation's parks, forests, wildlife refuges, and other federal lands.

This year the Congress passed and the President signed the "Fixing America's Surface Transportation Act." The FAST Act is a five year authorization and provides the Office of Federal Lands Highway the opportunity to plan a five year program. Due to the lack of a multi-year surface transportation authorization and multiple short-term extensions, we haven't had this opportunity in years. I'm excited about the next five years and the opportunities we now have to work with our federal land management agency partners in charting a path for the future. The FAST Act provides new authorities and funding increases in our core programs which will allow us to better serve our partners by developing innovative solutions and delivering quality projects that meet partner requirements.

The Office of Federal Lands Highway will continue our journey to become a single enterprise. While this transition will be transparent to our partners, it will allow the Office of Federal Lands to be more effective in providing practical, performance based solutions for our partners. The Single Enterprise Initiative involves making our systems consistent and transferable across Federal Lands Division boundaries which will allow us to share work and resources. This will enable the Office of Federal Lands to be more responsive to our partners and more efficient in our project delivery. In addition, the Single Enterprise enhances our investment in our most important resource — our people.

The coming year marks the 100-year anniversary of the National Park Service and the Federal-aid Road Act. The relationship between our organizations represents the longest standing agreement between two federal agencies, an incredible legacy to build on. Congratulations on yet another year of success to the dedicated employees of Federal Lands and our many partners. Enjoy taking a few minutes to review our accomplishments in 2015. With a new transportation bill, 2016 promises to be an exciting year, and we are ready for the challenge!



Handwritten signature of Tim Hess in black ink.

Tim Hess
Associate Administrator for Federal Lands
Federal Highway Administration

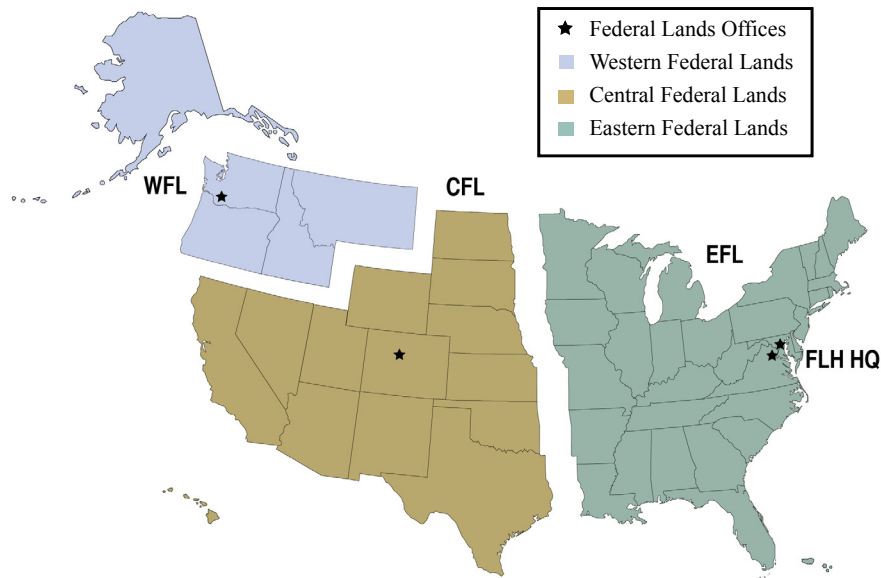
Tim Hess (3rd from left) visits with Central Federal Lands Project Team, at the Colorado County Road 43 flood damage repair site near Rocky Mountain National Park, Colorado — (left to right), Karl Eikermann, Structural Engineer; Veronica Ghelardi, Hydraulics Engineer; Tim Hess, Associate Administrator; Khamis Haramy, Geotechnical Engineer; Micah Leadford, Project Manager; Stacy Dicciccio, Highway Design Engineer; Julian Maskeroni, Project Manager and Thomas Parker, Environmental Protection Specialist

The Federal Lands Highway Program

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U.S. Department of Transportation
Federal Highway Administration

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Special thanks to the Federal Lands employees responsible for taking the majority of the beautiful photographs contained in this report.

Front Cover: Sevenmile-Gooseberry Road, Utah

Back Cover: Snake River Overlook, Grand Tetons National Park, Wyoming



Vision

To be the partner of choice to Federal Lands Management Agencies and Tribes. We will implement **innovative** transportation solutions that provide **access** to and through public lands.

Mission

Improving transportation to and within Federal and Tribal Lands by **providing** technical services to the highway/transportation community, as well as building accessible and **scenic** roads that ensure the many national treasures, within our Federal Lands, can be enjoyed by all.

Blue Ridge Parkway, Virginia

Our Role

The Federal Highway Administration (FHWA) Federal Lands Highway Program (FLHP) was established in 1982 to promote effective, efficient, and reliable administration for a coordinated program of public roads and bridges; to protect and enhance our Nation's natural and cultural resources; and to provide needed transportation access for Native Americans. The Federal Government, through various Federal Land Management Agencies (FLMAs): the **National Park Service (NPS)**; **USDA Forest Service (FS)**; **U.S. Fish and Wildlife Service (FWS)**; **Bureau of Indian Affairs (BIA) and Tribal Governments**; **Bureau of Land Management (BLM)**; **Department of Defense (DOD)**; **U.S. Army Corps of Engineers (USACE)**; and **Bureau of Reclamation (BOR)**, have ownership responsibilities for more than 30% of the Nation's land. This responsibility covers more than 500,000 miles of public and administrative roads on federal land across the U.S. and its island territories.

The Office of Federal Lands Highway (FLH) is relied upon by these partners to solve and manage unique challenges that are wide-ranging in environment, geography and complexity, through engineering solutions that are sensitive to the context of the land. We are often confronted by unique terrain, work restrictions, and challenging deadlines. Whether it is building highly visible and political projects, constructing roads that are national landmarks, or providing critical access on low-volume transportation facilities, FLH is at the forefront of consistently delivering distinct and sound engineering projects.

FLH consists of a Headquarters Office (HFL) in Washington, District of Columbia and 3 field Division Offices: Eastern Federal Lands (EFL) in Sterling, Virginia; Central Federal Lands (CFL) in Lakewood, Colorado; and Western Federal Lands (WFL) in Vancouver, Washington.

Federal Lands' role is categorized into two areas: Program Administration and Project Delivery. Program Administration addresses stewardship and oversight for our resources; as well as management and oversight of the program including responsibility for the Highway Trust Fund, totaling over \$1 billion per year. Project Delivery is the development of projects from scoping and preliminary design through the construction of a project. Within those areas, we support Innovation & Technology Deployment and Professional Development that comprise FLH's four business lines. All of this comes together to support the delivery of the program.

FLH is uniquely enabled and entrusted to administer many different types of funds to facilitate transportation improvements for our many Partners.

Now in its 34th year, the program and our role continue to expand to include more Federal partners and road networks. FLH expertise and credibility has grown to deliver a wider variety of transportation projects and improvements nationwide.

We are responsible for:

- *Transportation Planning*
- *Program Administration*
- *Project Management*
- *Environmental Compliance*
- *Preparation of Plans, Specifications and Estimates (PS&E)*
- *Contract Administration*
- *Construction Supervision and Inspection*
- *Technical Assistance to the Highway Community*

Our engineering and technical expertise includes:

- *Highway and Bridge Design*
- *Survey and Mapping*
- *Hydraulics*
- *Geotechnical*
- *Traffic*
- *Safety*
- *Intelligent Transportation Systems*
- *Design Visualization*
- *Materials*
- *Consultant and Construction Contract Acquisition*
- *Road and Bridge Inventory and Inspection*
- *Asset Management*

We employ practices and techniques of the FHWA Every Day Counts Innovations (EDC), designed to shorten project delivery, enhance durability and safety, improve environmental sustainability and increase efficiency through technology and collaboration in our daily business.



St. Croix National Scenic Riverway, Wisconsin

The Federal Lands Programs

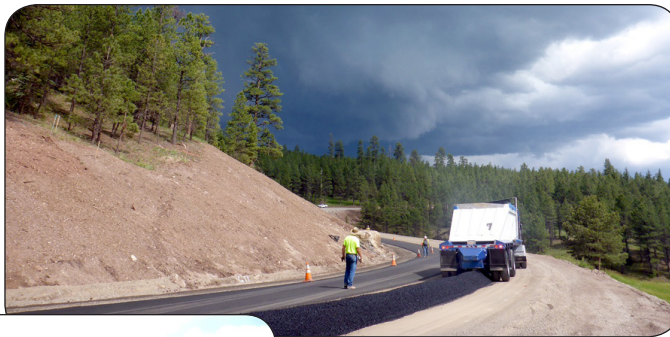
Federal Lands and Tribal Transportation Program (FLTTP)

The FLTTP established under the Moving Ahead for Progress in the 21st Century Act (MAP-21) authorizes annual funding through three primary programs: the Federal Lands Access Program (FLAP), the Federal Lands Transportation Program (FLTP), and the Tribal Transportation Program (TTP). Through these programs, FLH works with numerous Federal agencies and Indian Tribes as well as State and Territorial partners to deliver projects. The main purpose of the FLTTP is to provide financial resources and technical assistance to service FLMA transportation needs.

Federal Lands Access Program (FLAP)

The FLAP provides flexibility for a wide range of transportation projects in the 50 States, the District of Columbia, and Puerto Rico. FLAP was established to improve state and county transportation facilities that provide access to, are adjacent to, or are located within Federal lands. FLAP supplements State and Local Agency resources for public roads, transit systems, and other transportation facilities, with an emphasis on Federal high-use recreation sites and economic generators.

Improvements may include safety enhancements, and environmental mitigation. The flexibility of the program allows for support of unique federal lands access in a multi-modal approach.



FLAP road reconstruction and installation of Aquatic Organism Passage and Animal Crossings, New Mexico State Highway 126, Jemez Mountain Trail National Scenic Byway, New Mexico

Federal Lands Transportation Program (FLTP)

The FLTP, authorized at \$300 million, provides funding for the management and upkeep of approximately 50,000 miles of federal public roads and other assets comprising partners' Federal lands transportation facility inventory, under the jurisdiction of the NPS, the FS, FWS, BLM, and the USACE. Of the three programs that comprise the FLTTP, the FLTP incorporates the performance based management principles outlined in MAP-21. These principles transform the business framework of the entire transportation industry by shifting to a data-driven results approach that involves establishing performance measures, setting performance targets, and annually assessing whether targets are met.

The NPS' transportation system is supported annually by funds from the FLTP at \$240 million. These funds are apportioned by formula among the seven NPS Regions. Most of these funds are used to pay for the work required to keep existing assets in good condition. There are some projects, within the NPS system, as well as within other FLMA systems, where the project needs are so great that the normal program funding within the region or even the national program are not sufficient. These projects may be of such magnitude and of nationally historic or regional significance, that additional means of funding must be found.

The recently approved Fixing America's Surface Transportation (FAST) Act, has addressed the need for "Nationally Significant Federal Lands and Tribal Transportation Projects" which is intended to provide a reliable source of funding for priority projects like the Arlington Memorial Bridge for all FLMAs.



Ongoing emergency repairs under the FLTP, Arlington Memorial Bridge, Washington, DC

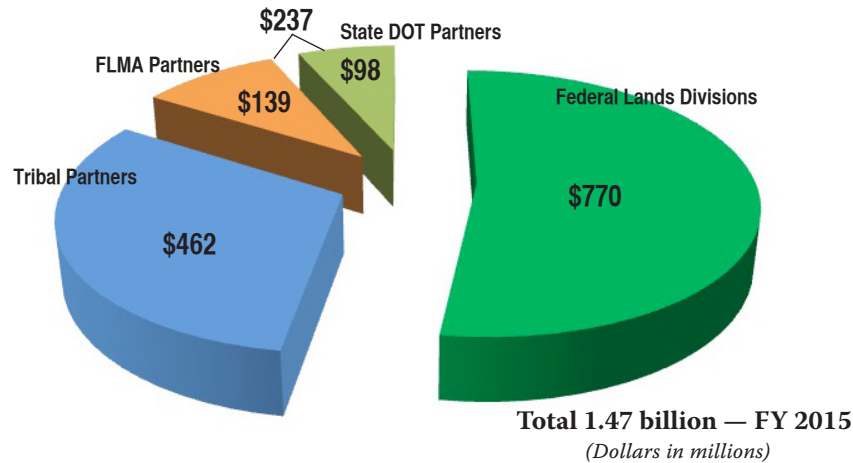


The Federal Lands Programs

Overall Funds Obligated

In 2015, \$1.47 billion in Federal funds were obligated by Federal Lands and its partners. Of this amount, \$770 million was obligated at our Division Offices. Another \$462 million was delivered by Federally Recognized Indian Tribes through the BIA and FHWA. The remaining \$237 million was transferred to our partners at various FLMAs and State Departments of Transportation (DOTs) for use on their projects and in administration of the Federal Lands Programs.

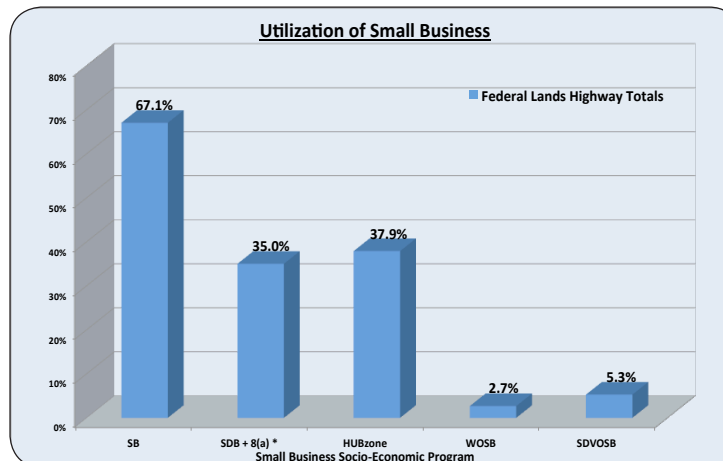
Program Funds Obligated by Executing Agent



Meeting Small Business Goals

There are a number of contracting and procurement opportunities to support the FLH program to include engineering services, construction contracts, technical and professional services, data analysis, information systems, and laboratory equipment to name a few. FLH also runs a simplified acquisition program to purchase supplies, support services, information technology, and other equipment.

FLH is committed to supporting small businesses and small business concerns. In FY 15, we surpassed the goals established by the Small Business Administration and the DOT in almost all socio-economic categories. We strive to build upon this success in FY 16 as we continue to look for opportunities to contract with small businesses.



MAP-21 FY 15 PROGRAM FUNDING

\$300 million FLTP

\$250 million FLAP

\$450 million TTP

PROGRAM DELIVERY SUCCESS

90.1%

of the MAP-21 FY 15 Programs were expended

1,300

Lane Miles (Completed Construction)

1,262

Lane Miles (Awarded)

82

Bridges (Completed Construction)

65

Bridges (Awarded)

Tribal Transportation Program (TTP)

The TTP, funded at \$450 million, provides funds to the 567 federally recognized tribes to improve the transportation systems that are located within or provide access to Indian Country. These roads, bridges, and transit systems most often provide basic access to community services and help to enhance the quality of life of tribal members.

Federal Lands co-administers the TTP with the BIA and is responsible for the primary stewardship and oversight of program funds. More than 130 of the tribal governments operate their TTP directly through Program Funding Agreements with FHWA.

The Tribal Safety Funding set-aside provided \$8.6 million in funding to 82 tribes for 94 safety-related projects. The Tribal Bridge Program set-aside provided \$8.6 million for the design and/or construction of 29 bridge projects in Indian Country. Technical assistance and capacity building continued to be of primary importance for the FLH TTP Team. In collaboration with the Tribes and FLMAs, various workshops and training sessions aimed at Tribal Transportation issues and opportunities, including policy, planning, funding, and technical training took place throughout the year. Overall FLH's commitment to improve the outreach and delivery of the TTP has resulted in a program that is making a difference to the tribal communities.



Adam Larsen, TTP Coordinator presenting on Tribal Safety Management Programs



Bob Sparrow, Federal Lands TTP Director addressed the audience at the 18th Annual National Tribal Transportation Conference



Heavy equipment operation training took place at the Annual Conference

TTP Operations Manual Updates

Terry Schumann, TTP Environmental Specialist, led the development of the Tribal Transportation Program Operations Manual environmental chapter, which brought much needed consistency and streamlining to the TTP environmental process among FHWA and the twelve BIA regions.



Terry Schumann conducting a training session at the FHWA/TTP Eastern Region Tribes Workshop in Oklahoma

Tribal Transportation Program (TTP)

Ohkay Owingeh White Swan Bridge Ribbon Cutting Pueblo, New Mexico

The Ohkay Owingeh can now construct bridges using Geosynthetic Reinforced Soil Integrated Bridge System (GRS-IBS). On August 12, 2015, Ohkay Owingeh workers delivered their replacement of a 60-foot span White Swan Road bridge using TTP funds and a \$200,000 Accelerated Innovation Deployment Demonstration grant.

Working with FLH, the Ohkay Owingeh staff carefully prepared for this EDC deployment by immersing themselves in the FHWA's GRS-IBS guidance, and attending training provided by FLH. FLH also provided staff to assist the Pueblo with their problematic hydraulic assessment and scour analysis. Then to ensure the project launched successfully, a FLH Technology Coordinator worked side-by-side with the Pueblo workers to provide on-site advice and guidance as they constructed their first GRS abutment.

By using in-house force account staff to rebuild the bridge as a GRS-IBS, the Pueblo saved 2-1/2 months of road closure time compared to the 4 months closure estimated for a conventional design-bid-build concrete structure. The detour used for the project routed local residents an additional 3 miles, thus the impact to them was minimized. Then, a project of similar size and scope delivered under traditional design and construction methods was estimated at \$1,000,000. By using their own staff, the Pueblo replaced the four box culvert system with a single-span GRS-IBS for \$419,331 saving an estimated \$580,668. Within this amount, the estimated labor costs for an outside contractor to build the GRS-IBS would have been \$105,000. The actual labor costs reinvested into the tribal community by using local force account labor was \$52,103.

With their newly learned construction skills, the Ohkay Owingeh are now at the cutting edge of technology for replacing their small structures across the Pueblo. The community and the Tribal Council have expressed pride and pleasure with the outcome of the project. This project demonstrates how Tribal nations can rebuild their own bridges, maximize their limited funds, while employing members of their own communities.



Setting last girder into place and view of completed bridge



Members of the Ohkay Owingeh Road Crew were presented with certificates to acknowledge their accomplishment



Tribal Transportation Program (TTP)

Sacaton Road Bridge Replacement Gila River Indian Community Phoenix, Arizona

Recipient of the 2015 Engineering News Record Best Projects Award in the Highways/Bridges Southwest Category

The Sacaton Road Bridge is the main outlet to the Phoenix area from the Gila River Indian Community. The old bridge, built in 1961, was frequently overtopped during heavy rain, roadway safety and hydraulic capacity were also factors of concern. The project was originally slated as a traditional design-bid-build project. However, insufficient funding and concerns over how long the road would have to be closed during new bridge construction stalled the project. What brought it back to fruition was funding the community received from the FHWA Tribal Transportation Bridge Program and additional support from the Strategic Highway Research Program (SHRP2). The Gila River Indian Community DOT replaced the bridge using the Every Day Counts (EDC) Construction Manager/General Contractor (CM/GC) delivery method, pre-fabricated bridge elements and slide-in bridge construction.

During construction of the \$2.7 million bridge, the older span remained open to traffic up until the final slide-in of new bridge sections occurred. The project featured the first lateral bridge slide in Arizona. The CM/GC delivery method created a collaborative, transparent, and trust-filled environment that reduced construction time from an originally proposed 6-month closure to just 10 days! Even with unexpected flooding of the project site during construction, the project was delivered under budget and without change orders.



The construction team educated other industry professionals on accelerated bridge construction at seven different presentations, including inviting more than 100 people to the bridge slide.

Eek Community Street Improvements Native Village of Eek, Alaska

This project is a TTP funded replacement project of most of the boardwalks and boardroads in the Village of Eek. The project was developed by the Association of Village Council Presidents (AVCP) tribal consortium who provide social, economic and educational services to 56 federally recognized Native Alaskan tribes in the Yukon-Kuskokwim Delta, along the Southwestern region.

The work is performed by AVCP Force Account crews. Force Account construction crews may be used to build TTP funded projects instead of construction contractors. The Force Account crews consist of people from local villages who are trained and hired by the local tribe or tribal consortium. Training may include welding and construction equipment operation. Using Force Account crews to build construction projects provides much needed economic development and jobs to tribal villages and reservations. Funding for training is generally an allowable use of TTP funds. Several TTP projects administered by Alaska Tribes or Tribal consortiums have been successfully constructed using force account crews in the last few years.



Board installation on steel framing



Aerial view of the Native Village of Eek

Tribal Transportation Program (TTP)



Welding and assembly of boardroad framing



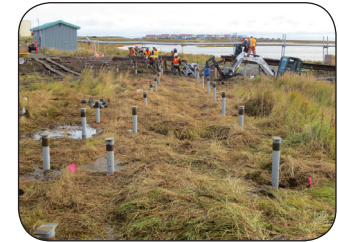
Old Boardroad adjacent to the new replacement

Kongiganak Boardroad Replacement Native Village of Kongiganak, Alaska

This project was also developed by the AVCP tribal consortium, and constructed by AVCP Force Account crews.



Installation of helical piers



Local welder



Framing in preparation for welding

Project Delivery

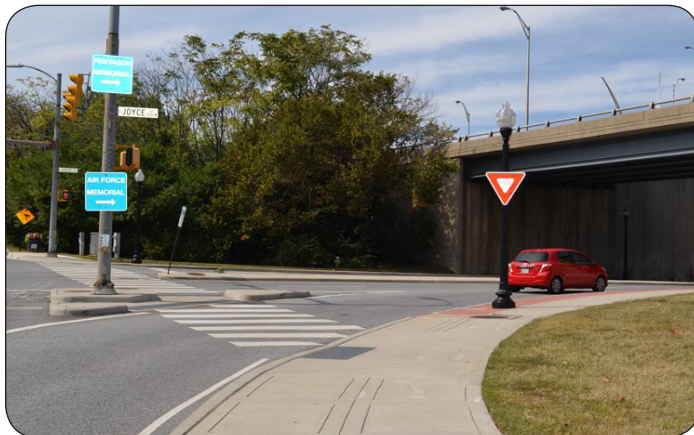
Humpback Bridge Replacement and Joyce Street Safety Improvements George Washington Memorial Bridge, Virginia

Recipients of the 2015 Environmental Excellence Awards, Nonmotorized and Multimodal Transportation: Humpback Bridge Replacement and Joyce Street Improvements

Humpback Bridge and Joyce Street projects in the heavily traveled I-395 corridor of Northern Virginia advance the state of the practice in pedestrian and bicycle accommodations. In collaboration with the Virginia Department of Transportation (VDOT), the NPS, and Arlington County, FLH enhanced access for pedestrians and cyclists to destinations within our Nation's capital, including the Pentagon, Arlington National Cemetery, and the Mount Vernon Trail. The George Washington Memorial Parkway Humpback Bridge replaced an historic bridge and filled missing links in the pedestrian and bicycle networks by incorporating two pedestrian/bicycle underpasses and adding a barrier-separated, 10-foot-wide, multi-use trail on the Bridge. The Joyce Street project widened sidewalks and trails and provided additional lighting to improve safety for nonmotorized transportation users as well as for accommodating a new street car line installation and access to nearby subway stations and bus stops. The success of the Humpback Bridge and Joyce Street projects demonstrates the value of incorporating bicycle and pedestrian accommodations in bridge and street reconstruction work.



Humpback Bridge carries the Mount Vernon Trail system over Boundary Channel along the Virginia side of the Potomac River



Joyce Street provides multimodal access to the Pentagon 9-11 Memorial, Arlington National Cemetery and the Air Force Memorial in Arlington, Virginia

Project Delivery

Isa Lake Bridge Replacement Project Yellowstone National Park, Wyoming

The new Isa Lake Bridge spans a section of road connecting West Thumb and Old Faithful in Yellowstone National Park replacing a historic timber log stringer bridge. In an effort to match the historic look of the previous structure several aesthetic features were added, including: 29" diameter half-round fascia logs attached to the outside faces of the concrete slabs, simulated timber cast in place concrete rail posts and pier cap extensions, and 14" diameter round log bridge rails.

The 70-year-old Isa Lake Bridge is located atop Craig Pass at an elevation of 8,262 feet. Isa Lake, which actually is more pond than lake, sits within Craig Pass, and is famous because it drains to two different oceans. This is a special location as spring runoff empties into Isa Lake, the waters swell and overflow its tiny borders. When this happens, the Lake does something extraordinary. Not only does it empty into two oceans, but it does it backwards! The east drainage flows into the Pacific, while the west drainage makes the long trek to the Gulf of Mexico.

A previous inspection found the bridge to be in poor condition and replacement was recommended. An environmental assessment of the bridge reconstruction project resulted in a Finding of No Significant Impact, allowing the existing Isa Lake Bridge to be removed and a bridge of similar appearance to be built on the existing alignment. The main objective of the replacement was to reestablish a historic structure within the Park.

The new bridge was designed and constructed to replicate the historic one with modern means, methods and materials. It was constructed using steel pipe piles, concrete piers with simulated log caps, precast, pre-stressed concrete slab beams, a concrete deck covered with hot asphalt concrete pavement, simulated log safety post (concrete), timber safety rails and large timber fascia logs to cover the sides of the concrete curb, deck and beams.



Painting the concrete (simulated wood) pier caps



Installing the first fascia logs to the bridge deck



Project Delivery

Cattle Point Road San Juan Island National Historical Park, Washington

Cattle Point Road, part of the San Juan Islands Scenic Byway provides sole access to residents who live on the southeast tip of San Juan Islands and also accommodates more than 250,000 visitors annually to the San Juan Island National Historical Park, Cattle Point Lighthouse and the Interpretative Center for Washington State Department of Natural Resources. That number includes hikers, bicyclists, beach walkers and site-seers. Years of coastal erosion at the base of the bluff that supports Cattle Point Road threatened collapse of about 500 feet of the roadway, jeopardizing the adjacent telecommunication and power utilities. The persistent erosion and threat of potential road collapse prompted San Juan County officials to begin planning for relocation of the stretch of roadway back in 2001. The project was selected through a competitive application process for Fiscal Year 2013 to receive about \$4 million in FLAP funding combined with about \$1 million of local match to deliver the project.

In partnership with the NPS San Juan Island National Historical Park, Washington State Department of Natural Resources, and San Juan County, FLH designed a project to realign a 4,950-foot section of the road and make improvements to the two scenic vistas located at each end of the project along with the Mount Finlayson's eastern trailhead. The realignment is expected to prolong the life of the roadway by more than 70 years and also allow for upgrade of the many utilities that lie within the road corridor, serving the south end of the island.

At its south end, Cattle Point Road connects the neighborhoods of Cape San Juan and Cattle Point Estates to other areas of the island, and provides access to a historic lighthouse and a popular viewpoint overlooking Cattle Pass and the Olympic Mountain Range beyond. Cattle Point Road essentially provides the only roadway leading to and from the south. The realignment moved the road 300 feet uphill, the scar of its original location will soon be barely visible with the regrowth of native vegetation. In celebration of the completion of the Project, a ribbon cutting ceremony, was held on Thursday, October 15, 2015.



Views of the realignment, the original road location will soon be filled in with native vegetation leaving the scar barely visible

Project Delivery

Blue Ridge Parkway, Ice Rock and Alligator Back Alleghany County, North Carolina

Chosen as the first CM/GC contract for EFL, this project is within the oldest and most historic section of the Parkway. The Ice Rock and Alligator Back curves are high-accident locations because of the water and ice on the roadway emitting from the rock cut slopes. The project called for slide stabilization utilizing soil nails and Geosynthetic Reinforced Soils (GRS), reconstruction of settled and deteriorated stone masonry retaining walls, and the construction of new concrete corewall. The NPS requirement to maintain the appearance and character of the existing historic walls along the Blue Ridge Parkway was critical. The historic stone walls, contributing elements to the historical significance of the Parkway, are comprised of large native boulders and had to be salvaged for re-use in the replacement walls. One of the deliverables from the CM/GC firm was a constructability report to identify cost, schedule risk elements, and evaluate innovative approaches to deliver the project. The CM/GC participated in a Value Analysis workshop, and provided input into advantages/disadvantages of several alternatives. As a result, the government determined that the best and most cost-effective retaining wall reconstruction alternative would reuse existing historical stone in combination with GRS construction. The goal of maintaining the visual and historic character of the walls was met.



Views of the stone masonry walls



Though not as prevalent in other federal land units, stone paved waterways are common drainage features along the Parkway



Project Delivery

Steinwehr Avenue Improvements — Road Diet Gettysburg, Pennsylvania

Steinwehr Avenue is an historic battle roadway through the Borough of Gettysburg, surrounded by visitor service-oriented businesses and the neighboring Gettysburg National Military Park Visitor Center. When the original Park Visitor Center was moved further away, businesses along Steinwehr Avenue suffered significant loss in revenue and tourist traffic. In alliance, the Borough, the Business Improvement District, the NPS, pedestrian groups and Pennsylvania DOT partnered to develop a revitalization plan to refresh the Steinwehr corridor. This project applied the principles of a “road diet” to complete the second and final phase of Steinwehr from Baltimore Avenue to the Park Entrance near Long Lane. Several key improvements were recommended to retain and improve on-street parking, streetscape furniture and landscaping, pedestrian sidewalks, and separated bicycle lanes. The road diet, a safety-focused EDC initiative, is a low-cost strategy that reallocates a roadway cross-section to safely accommodate all users, increase mobility and access, reduce crashes and improve a community’s quality of life.



View of bike lanes looking north toward Baltimore Avenue (after)



Looking north toward Baltimore Avenue (before)



View of widened brick-paved sidewalks and landscaping looking north across from Park



Looking south toward Park Entrance (on left) note drainage improvements

Project Delivery

Tuolumne Grove Trailhead and Parking Area Enhancements Tioga Road Corridor Improvements Yosemite National Park, California

This project, located near the Tuolumne Grove of Giant Sequoias, provided improved traffic flow and general access improvements, new interpretive signs, additional parking, improved restrooms, and an enhanced picnic area.



*Views of roadway, parking
and facility improvements*

Devil's Courthouse Tunnel Rehabilitation Blue Ridge Parkway, North Carolina

Devil's Courthouse Tunnel was originally constructed in 1941. This project made repairs to the aging drainage system and concrete lining inside the tunnel requiring a full road closure, in the interest of visitor safety the tunnel was sealed and inaccessible to any traffic during this project

The Blue Ridge Parkway is recognized internationally as an example of landscape design achievement and Parkway tunnels are a significant design feature along the historic route. Twenty-five of the twenty-six tunnels along the Parkway are in North Carolina, with all Parkway tunnels representing 36% of the entire NPS tunnel inventory. Tunnels along the Parkway were often constructed to reduce excessive scarring that open cuts would entail, enabling the Parkway to cross through ridges in the interest of maintaining the most desirable route location. The distinctive stone masonry portals on most Parkway tunnels were generally not part of the original construction, but added later in the 1950s and 1960s.



*Devil's Courthouse Tunnel
stone portal entrance and
inside look at the new
concrete lining*



Project Delivery

Picture Rocks and Sandario Roads Saguaro National Park, Arizona

Recognized by the National Park Service Traffic Safety Coalition as the recipient of the 2015 Safety Engineering of the Year Award

The Saguaro National Park project implemented recommendations from a Road Safety Assessment conducted in 2012. At that time, and for the past five years a total of nine fatal crashes occurred, of which five occurred in 2012. Picture Rocks Road has more than ten times the daily traffic volume of other park interior roads and is open year round. The 35 mph and 40 mph speed limits were often exceeded by an average of 10 mph. The roadway alignment had never been engineered for motor vehicle traffic as it had once been a winding stock trail. Conversely, Sandario Road is wide and straight with sight distance issues in many areas. The assessment recommendations included improving sight distance, striping width, road edge fill and warning signs; raising pavement markers, installing rumble strips along curves and trail crossing areas.

As a result of a \$1.4 million traffic safety improvement plan, state of the art traffic signs, radar speed limit signs and several other road engineering features were constructed and installed on park roadways. The improvements brought an approximate 80% reduction in overall collisions and an approximate 89% reduction in injury and fatal collisions.

Traffic collisions are now relatively rare on Picture Rocks and Sandario Roads garnering the appreciation of local citizens and community members.

This project has resulted in greatly improved traffic safety for all road users, park visitors, park employees, and thousands of daily commuters. And has also greatly reduced the natural resource damage associated with “off-roadway” crashes.



The completed roadway, trail and pulloff

Improvements near the Park Visitor Center

Motor Nature Trail Bridge Replacement Great Smoky Mountains National Park, Tennessee

The Roaring Fork Motor Nature Trail invites you to slow down and enjoy the forest, this project replaced the eight bridges along the route. The 5.5 mile long, one-way, loop road is a very popular route that allows for views of rushing mountain streams, old-growth forest, and a number of well-preserved log cabins, grist mills, and other historic buildings from the comfort of a vehicle. The motor trail also leads to several popular hiking trails and foot paths.



Views of the replacement bridges along one of the most narrow roads in Great Smoky Mountains National Park



Project Delivery

Province Lands Bicycle Trail Bridge Replacement Cape Cod National Seashore, Massachusetts

The Province Lands Bike Trails original underpasses were arch constructions with low vertical clearances. The low clearance presented a safety hazard for cyclists passing through the concrete portals. To eliminate the safety hazard, NPS requested assistance with replacement of the existing arches with larger structures providing more adequate clearance.

The best solution to suit the needs for the project was GRS-IBS construction. This method for replacement cost effectively eliminated the safety hazard, accelerated construction during the peak visitation season, and minimized ground disturbance to the wetland area. Overall, this method provided the best solution for the NPS.



Before



After

Mooney Road Lassen Volcanic National Park, California

Recipient of the 2015 Roads & Bridges Asphalt Recycling and Reclaiming Association (ARRA) Award

By the beginning of 2014, Mooney Road through California's Sierra Nevada Mountains was showing considerable wear and rutting. The road gets lots of heavy truck traffic for logging, plus lots of snow and ice build-up in the winter. In addition to logging traffic, Mooney Road serves as a cutoff between Highways 36 and 44, carrying vacationers through Lassen Volcanic National Park to Lake Almanor in the summer.

The road had deteriorated to the point where an overlay was not going to be sufficient. Cold in-place recycling (CIR) had been used successfully on another portion of Mooney Road, so the design team opted to try it again. This time around, the result was chosen as a 2015 Roads & Bridges/ARRA Recycling Award winner.

While fairly remote, Mooney Road generates enough traffic that the project team had to keep the connector open throughout the duration of construction. In the end, any concerns about the short project window were unfounded, the project was wrapped up by early September, a full six weeks ahead of schedule!

Recycling and revitalizing the existing pavement also saved the project team from having to haul materials in and out of the jobsite — a perk considering the site's remote, mountainous location. When the elimination of cost to remove and replace the existing pavement was factored in, it was calculated that a total of \$785,000 was saved by using CIR.



The completed roadway

One of two cold mills tackling the 7-mile stretch of Mooney Road

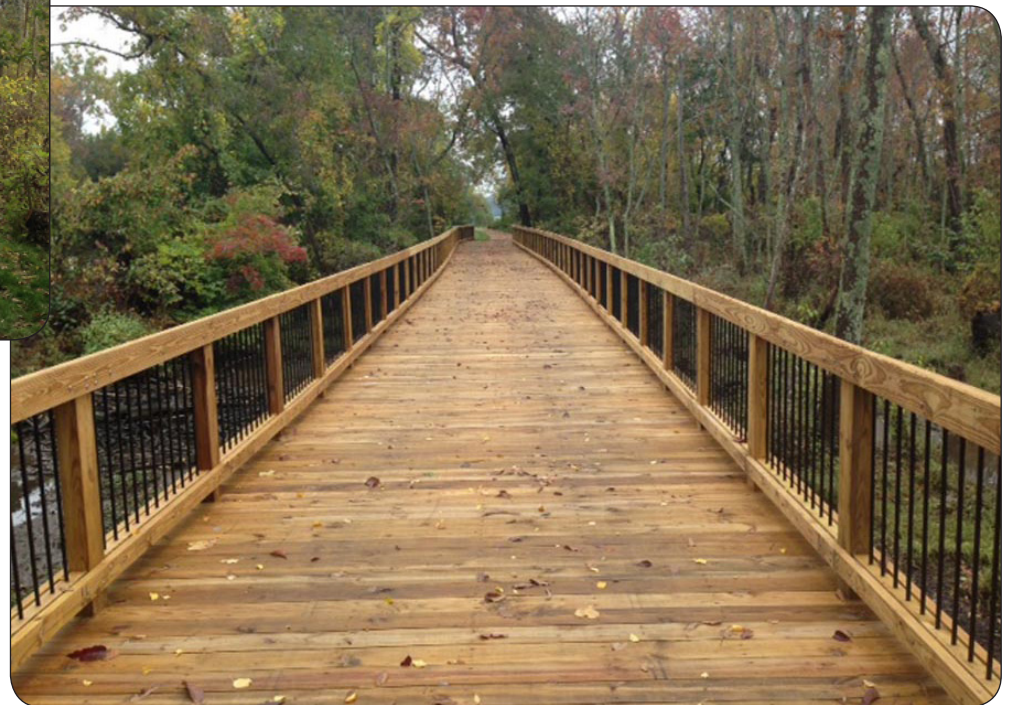
Project Delivery

Mount Vernon Trail Bridge Potomac Heritage National Scenic Trail George Washington Memorial Parkway, Virginia

This project replaced a 278 foot long, 10 foot wide pedestrian/bicyclist timber bridge located on the Mount Vernon Trail, a part of the Potomac Heritage Trail, of the George Washington Memorial Parkway. The trail is an 18-mile long multi-use trail located next to the George Washington Memorial Parkway. Helical piles were placed at the exact location of the existing timber piles, so there would be minimal disturbance to the existing wetlands. For additional environmental protection construction access was limited to the footprint of the existing bridge and the contractor used timber matting over separation geotextile to protect the existing ground and vegetation. The acquisition documents included pass/fail selection criteria for experience with helical piles and timber bridge construction, ensuring selection of a capable contractor. The Park was extremely satisfied with the contractor's ability and the finished project. Construction of the project took just three months to complete.



Views of the completed trail bridge emphasize the care taken to minimize impact on the environment



Project Delivery

Guanella Pass Road Denver, Colorado

This project included approximately 9 miles of reconstruction and was the 3rd and final construction phase for Guanella Pass Road (Forest Road 80). Guanella Pass Road consisted of over 23 miles of full reconstruction and realignment major grading, drainage, aggregate base, superpave asphalt pavement, form liner concrete retaining walls, mechanically stabilized earth walls, rockery walls, and bridge construction totaling nearly \$80 million in total construction costs.

Guanella Pass Road provides critical connectivity between the I-70 corridor and US-285 and maintains access to many year-round recreational activities. The surrounding area provides habitat for many forest species. The inception of the project, in the late 1980s, resulted in a multi-agency effort in cooperation with Clear Creek County, Park County, the City of Georgetown, the Pike National Forest, and the State of Colorado to complete one of the most challenging projects the CFL has delivered.

This project was developed across environmental boundaries, technical engineering challenges, and multiple highway bills, resulting in long lasting positive partnerships. It is a profound testament to our commitment to program delivery and providing valuable context sensitive solutions to our stake holders and the public. This concludes one of the great Forest Highway Legacy Routes and is the culmination of nearly 30 years of development activities that provided critical safety upgrades to one of Colorado's most popular high mountain passes.



Views of the completed roadway and the surrounding scenery



Project Delivery

Convict Lake Road and Trail Improvements Inyo National Forest, California



Roadway rehabilitation and widening to improve safety and provide for shared vehicular, pedestrian, and bicycle use along the corridor



Nature trail reconstructed and rehabilitated to improve accessibility provides easy access to the east side of Convict lake at the base of Mt. Morrison

Project Delivery

Sevenmile-Gooseberry Road Fishlake National Forest, Utah

This project completes full reconstruction of almost 10 miles of roadway to improve the alignment, grade, and width of the road to current standards. At the south end of the project, over 1 mile of the roadway was completely realigned and shifted to the opposite side of Sevenmile Creek to avoid continued impacts due to the proximity of the road to the waterway, which resulted in bank erosion and roadway sediment polluting the creek. To mitigate for unavoidable impacts, a 6.2 acre wetland mitigation site was constructed to create a palustrine emergent marsh, scrub/shrub, and forested wetland habitat. This final phase of the project transformed a rough gravel road, not wide enough along much of its length for two vehicles to safely pass, into a roadway that meets modern design and safety standards. The completed project has created better highway continuity and greatly improved access to one of the most beautiful areas of Fishlake National Forest, benefitting local economies, reducing dust and erosion impacts, addressing the negative effects the original roadway had on the environment.



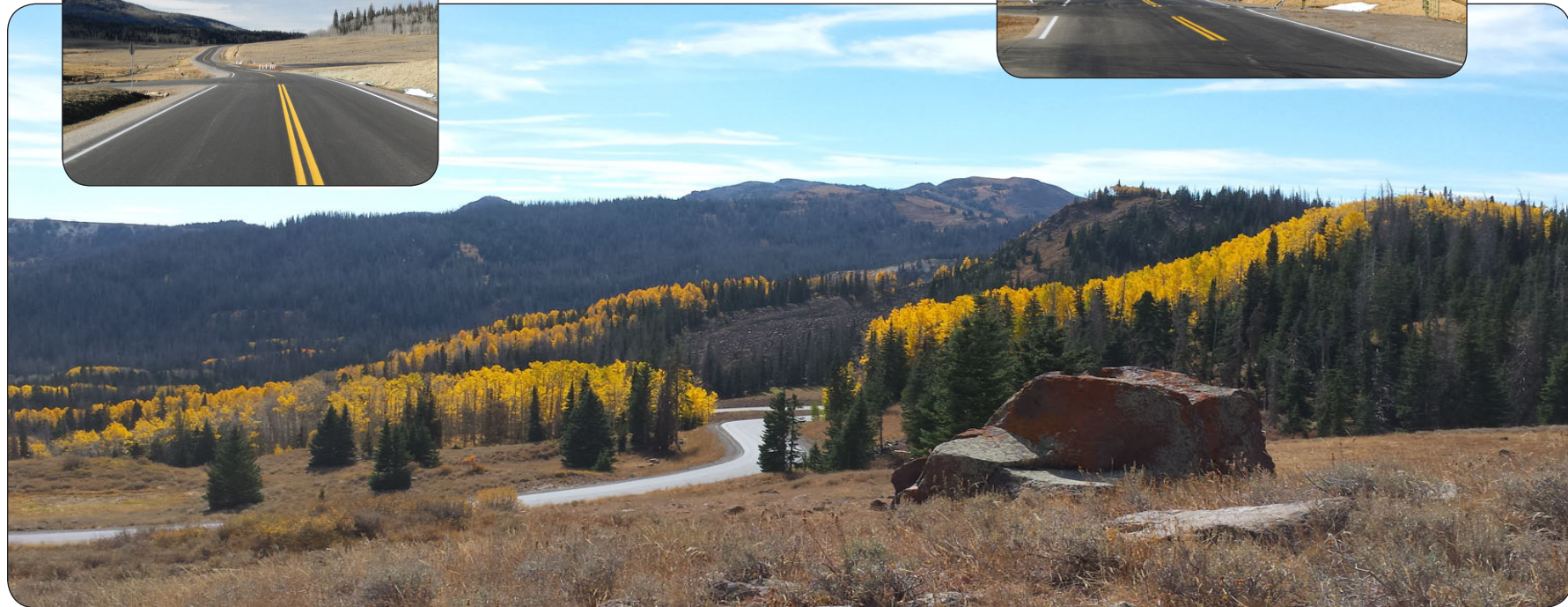
*Completed roadway
view toward Johnson
Reservoir*



*Wetland mitigation area, with
new plantings*



Completed roadway view looking north of the Sevenmile Valley

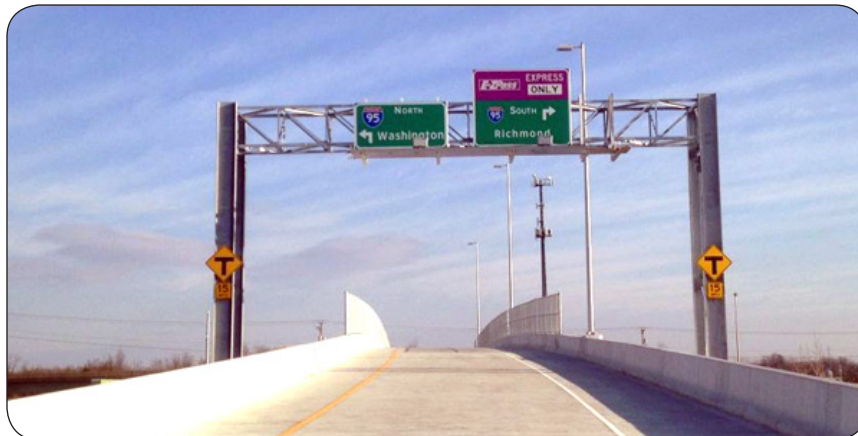


View of the completed roadway facing Fishlake Mountains and Fishlake National Forest

Project Delivery

I-95 South Ramp at Fort Belvoir North Springfield, Virginia

The Fort Belvoir North Defense Access Road Project provides new access to I-95 South via this High Occupancy Vehicle/High Occupancy Traffic (HOV/HOT) Ramp. The ramp is a one-lane reversible access road that initially will provide PM access from Fort Belvoir North to I-95 southbound HOV/HOT lanes and I-95 northbound general purpose lanes, but is configured to allow for AM access to Fort Belvoir North from the northbound HOV/HOT lanes in the future. The ramp tied in perpendicular to an existing flyover structure which required the use of a unique joint to allow for horizontal and vertical movement.



New ramp providing access to I-95 South HOV/HOT lanes and I-95 North general purpose lanes from the National Geospatial-Intelligence Agency Parking Lots, Fort Belvoir North, Springfield, Virginia

Wallops Island Causeway Bridge, Access to Wallops Flight Facility Chincoteague, Virginia

Recognized by the Baltimore-Washington DC Chapter of the International Concrete Repair Institute (ICRI BWDC) 2015 Outstanding Repair Project Award — 3rd place

The Wallops Island Causeway Bridge rehabilitation was Federal Lands first large scale project using Fiber Reinforced Polymer (FRP). This method proved best to deal with section loss and the load demand that NASA requires to transport its space launch equipment to the Flight Facility. The bridge required a solution that would restore the girders back to their original load carrying capacity as well as protect the internal steel pre-stressing strands from further corrosion.

Close-up of beams after repairs were completed and the finish coat was applied



Causeway Bridge



Carbon Fiber Wrap being installed after repair of beam surface

Project Delivery

J to H Spillway Bridge Replacement Seney National Wildlife Refuge, Michigan

This project consisted of the replacement of the J to H spillway bridge on Fishing Access Road within the Seney National Wildlife Refuge. The work included removal of the existing one lane, ten span timber bridge, abutments, and piers, followed with construction of a one lane, three span, prestressed concrete box girder bridge, and reconstruction of the aggregate roadway. The most important point being that this Accelerating Bridge Construction (ABC) with Prefabricated Bridge Elements & Systems (PBES) project was fully constructed during the winter months in Michigan!

before and after



Visitor Center Access Road and Parking Browns Park National Wildlife Refuge, Colorado

The Browns Park National Wildlife Refuge is located along the Green River in northwest Colorado. The 12,150 acre valley provides sanctuary for migratory birds, and endangered and threatened species. The existing entrance and headquarters roads were gravel and in poor condition due to heavy rain events and erosion. The roads to the Visitor Center required frequent maintenance in order to maintain safe driving conditions and prevent flooding.

The purpose of the project was to improve overall public access within the Refuge and reduce maintenance. The project provided a 0.45 mile paved driving surface, paved parking area, and improved ditch capacity and drainage culverts throughout the entrance and headquarters roads. Construction began in mid-August 2015 and was complete in less than 30 working days! The Browns Park Wildlife Refuge is very thankful and pleased with the project, the upgraded facility will make for improved visitor experience.



before and after

Project Delivery

Heli Pad Construction Swain & Graham Counties, North Carolina

A ribbon-cutting ceremony was held on Friday, October 30, 2015, in celebration of the completion of a new helipad near Tsali Recreation Area, a perfect example of the flexibility of the FLAP. This helipad will improve emergency response access and provides the Mountain Area Medical Airlift with a safe area to land and take-off when transporting accident victims, or patients in emergency situations to nearby medical facilities. With the completion of this helipad both Swain and Graham County's EMS can provide quick emergency response to areas like the Nantahala National Forest, Tsali Recreation Area, and Nantahala Gorge. Just five and a half hours after the ribbon cutting, the new landing site was put to use in response to a medical emergency.



Helipad is quickly put to use in an emergency just hours after the ribbon cutting



Frenchman's Bay Road Widening and Reconstruction Project St. Thomas, US Virgin Islands

The Frenchman's Bay Road corridor is the first impression visitors arriving via cruise ship have of St. Thomas. This road links one of the world's top cruise destinations to one of the best shopping districts (Charlotte Amalie) in the US Virgin Islands. The Virgin Islands Department of Public Works recognized this and, in cooperation with EFL, initiated the planning, design and construction improvements of Frenchman's Bay Road. In addition to roadway reconstruction and widening, the project included utility upgrades, sidewalk construction, traffic signals, and landscaping.



Views of reconstructed and widened roadway that now allows for safer pedestrian passage from cruise ship docks



Project Delivery

West Side Truck Escape Ramp Daniel K. Inouye Highway (Saddle Road), Hawaii

Improvements along the Daniel K. Inouye Highway included roadside drainage, the construction of a parallel truck escape ramp, and the installation of intersection lighting as the highway approaches the State Route 190 (Mamalahoa Highway) intersection.



Butte Creek Bridge Replacement West Branch Feather River Bridge Rehabilitation Butte County, California

On April 3, 2015, CFL celebrated completion of this BLM project with a ribbon cutting. The original bridges, constructed in the 1930s, had deteriorated and their load ratings had been reduced to three tons because of safety concerns. The Butte Creek Bridge now meets federal highway load standards, and the rehabilitated West Branch Feather River Bridge, is now rated to carry 17 tons. Access to the area is vastly improved to include crucial access for firefighting equipment and providing residents with an upgraded wildfire escape route. The bridges not only provide access into the BLM's Forks of Butte Recreation Area, which are popular for camping and gold panning, but also provide access for many homes in the area. The road improvements also greatly benefitted local fish habitats by reducing the amount of sediment flowing into Butte Creek and the West Branch Feather River.



Project Delivery

Ketchum-Challis Highway Sawtooth National Recreation Area, Idaho

The Ketchum-Challis Highway runs along the Salmon River in the Sawtooth National Recreation Area. Western was tasked to reconstruct a 1 mile section where the highway is pinched between the Salmon River and a steep mountainside. The section of highway was plagued with instability and continuous rockfall. There were multiple visual quality objectives (VQOs) for the area that had to be achieved during design. The major project features that were affected by the VQOs included the retaining walls and the rockfall mitigation elements.

Scaling, rock bolting, rock doweling, draped contoured mesh, and attenuator fences were used to mitigate the rockfall hazard. A context sensitive innovation used in the design included the “contoured” mesh, whereby rock pins were used to pull the mesh tight against the slope to prevent an unsightly waterfall effect. In addition, all of the steel materials used in the rockfall mitigation elements were galvanized for corrosion protection but treated with a product that provided a weathered appearance on the surface of the galvanization so that the steel materials visually disappear into the native scenery. A rock stain was also applied to the limits of the original cut slope to provide a natural patina to the rock so it would blend with the native rock outcroppings above.

The retaining walls achieved the widening needed for guardrail installation and to stabilize the outside roadway shoulder. The walls were broken up as much as possible through the corridor to prevent continuous linear features viewable from the river. Sculpted and stained shotcrete facing was used so that the walls would blend with the rock in the cut above the road.



View of the stained shotcrete facing above the roadway



Stained stone retaining walls and guardrails



Contoured mesh and rock pins barely visible on the slopes

Project Delivery

Milner Loop Road Reconstruction Milner Historic Recreation Area, Idaho

The purpose of the project was to improve safety and address storm water drainage. Work included realignment of two sections; one constructed a new intersection with Trout Point Road to improve sight distance and the second addressed safe passage of larger vehicles under the railroad trestle. The project also included reconstruction of a railroad grade crossing, installation of approximately five-hundred feet of new culverts, new cattle guards, placing new aggregate base and paving the roadway and the site center parking area.

Before



After, from both directions



Before

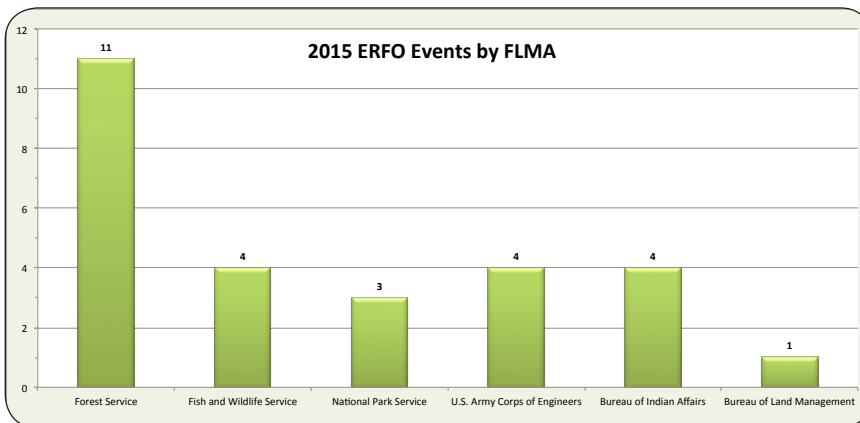
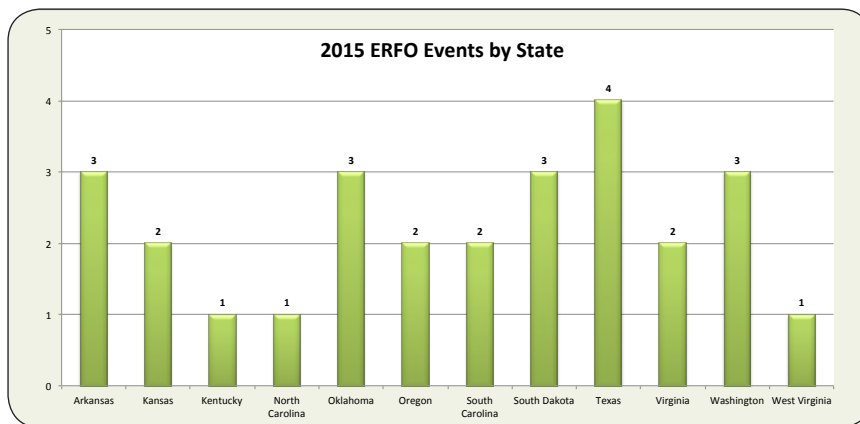


After



Emergency Relief for Federally Owned Roads (ERFO)

In May of 2015, heavy rains inundated several facilities in five states (Arkansas, Kansas, Montana, Oklahoma, Texas) resulting in an estimated \$30 million in damage. The event reached across 2 Federal Lands Highway Divisions and affected 4 FLMAs: FS; NPS; USACE; FWS. All Federal Lands ERFO personnel responded to this disaster and arranged an emergency training session in Dallas, Texas that involved the entire USACE South Western District as well as personnel from the NPS. Dozens of damage sites were identified and documented. In addition to this consolidated rain event there were also several other emergency situations within our Federal lands this year.



View of flood damage at Hugo Lake, Oklahoma



View of washout at Shawnee Creek, State Highway 91, Texas

Emergency Relief for Federally Owned Roads (ERFO)

Jamaica Bay Wildlife Refuge North Channel East and West Parking Areas Gateway National Recreation Area, New York

The two parking areas were damaged during Hurricane Sandy and restored in July of 2015. The work involved removing damaged portions of the existing parking areas to reduce the overall dimensions of the lots, and stabilizing the embankment to prevent further undermining of the parking areas. The project location is a favorite nesting spot for horseshoe crabs so straw bales were used to prevent them from entering the site during construction. The slope protection was constructed of a layer of riprap and a layer of landscape stone which were then choked with sand.

Examples of damaged parking areas



Stabilization



View of the completed project



Completed Flood Repairs, Galinas Canyon Forest Road, Santa Fe National Forest, New Mexico



Drainage Repairs (Before & After), Figueroa Road, Los Padres National Forest, California

Emergency Relief for Federally Owned Roads (ERFO)

Emergency Evacuation Access Route Pahoa, Hawaii

When lava began flowing from Kilauea Volcano's Pu'u O'o vent towards the community of Pahoa, on the Big Island of Hawaii officials were concerned the area would be cut off from all access. Based on the flow location, direction and advancement, it was expected to cross State Highway 130, where approximately 10,000 cars traveling through Pāhoā daily on the way to school or work have only makeshift, one-lane gravel and dirt road access in the lava flow's probable path. Once access is blocked, the residents in the southeast corner of the Island would not have a viable route over land to connect them with the rest of the island. In response to the impending need, the Hawaii Volcanoes National Park authorized construction of an emergency evacuation route along the Chain of Craters Road, previously closed in the 1980s due to lava flow. The route would connect to the southern section of State Route 130 and maintain emergency evacuation access.

The long standing partnership between the NPS and FLH, in cooperation with the FHWA Hawaii Division office, resulted in the NPS requesting assistance to provide technical support to the County of Hawaii during construction of the evacuation route. CFL staff quickly mobilized on-site to perform geophysics investigations to identify lava tubes and hot spots, mitigating risk of delay or injury while construction engineering representation was made available to provide guidance, coordination and monitoring, to ensure the best interests of the stakeholders were met.

Ground breaking of the 7.7 mile emergency project within the Park began October 24, 2014, the same day the Governor of Hawaii requested a Presidential Disaster Declaration. Construction was completed April 9, 2015.



Bulldozer as it begins to cut through the lava for the new roadway alignment



Extreme care was taken to minimize the disturbance and complement the adjacent lava features and surrounding environment

Lava flows in the 1980's closed the Chain of Craters Road



The new alignment will remain closed, but ready to serve as an emergency evacuation route



Emergency Relief for Federally Owned Roads (ERFO)

Fire Island Lighthouse Dock Fire Island, New York

The Fire Island Lighthouse ferry/water taxi dock was completely destroyed during Hurricane Sandy eliminating a key entry point into the Seashore. Somewhat different than traditional FLH projects, the site was almost entirely in-water construction with demolition and pile driving work requiring the use of construction barges.



Lighthouse dock after Hurricane Sandy



Pile driving from construction barge



Reconstructing water taxi dock



Views of the completed dock



Transportation Asset Management

Pavement Preservation Program National Park Service Southeast Region (NPS SER)

Pavement preservation involves applying a series of low-cost treatments every few years to a road segment, that is at a minimum in good condition, to halt further deterioration. If the pavement surface and substrate have not significantly deteriorated, relatively inexpensive treatments can keep water out of the pavement, prevent oxidation of the asphalt, and maintain good skid resistance. In addition, the road surface can also be kept looking attractive. All of which are important factors for national park roads.

A more efficient and cost-effective approach is needed to maintain park roads and meet expectations for safety, ride quality, and optimum traffic flow, while protecting investments made in the park transportation networks.

The NPS SER program covers all SER Parks Paved Roads (not including roads within the Blue Ridge Parkway, Great Smoky Mountains National Park, or Natchez Trace Parkway) and establishes a strategic plan to place a seal coat or other asphalt surface treatments on paved roads and parking areas in the SER on a seven to ten-year cycle. In order to achieve maximum efficiency, the SER Parks are split into seven sub-districts, and each sub-district's parks will be bundled into a single contract each year. The single contract will provide the project size necessary to maximize the cost-effectiveness of the pavement preservation treatments (i.e., to gain economy of scale). Only one district will be treated per year, so the Highway Pavement Management Application (HPMA) was used to develop the order in which the sub-districts would be treated to maximize the life-cycle benefits to the region overall. The first FY 16 project was recently advertised.



View of a stretch of roadway condition showing visible cracks, a condition suitable for pavement preservation treatment as a low cost alternative to extend the life of the pavement at Canaveral National Seashore, Florida

Road Safety Audit (RSA) Program USDA Forest Service (FS) Transportation Safety Program

In support of the USDA Forest Service Transportation Safety Program, FLH is conducting a series of Road Safety Audits (RSAs) in all nine regions of the FS. Eastern, serving as program manager and project coordinator will select one high priority FS unit in each region based on crash data, traffic volumes, roadway alignment and anecdotal information. Work is progressing to evaluate existing infrastructure and operational conditions of selected high priority need locations. RSAs are presently being conducted and a comprehensive report will be developed with safety improvement suggestions. This effort is a significant accomplishment to meet MAP-21 national goals and performance management measures for safety.



Road Safety Audits in process

Transportation Asset Management

Road Inventory Program Data Collection Methods



The FLH NPS Paved Road Inventory Program Team gathers data both manually and with the use of the Data Collection Vehicle at Fort Vancouver National Historic Site before moving on to Mount Ranier National Park. The team also assembled for an annual training meeting for procedural review, and discussion on NPS data collection needs for the remainder of Cycle 6 (current NPS cycle starting in 2014).



FLH Road Inventory Program Coordinator shares information on the use of an iPad software program for road data collection to representatives from the BLM at a trip to Nestucca River, Oregon. This software is under development for use in FWS, BLM and BOR road data collection and is intended to streamline the field process and provide immediate updates to each partner's maintenance management system.

Transportation Asset Management

Two key components needed to support a performance-based FLTP include defining one's official Federal Lands Transportation inventory followed by collecting condition data on roads and bridges to establish baselines. Most FLTP partners possess condition data. A notable project led by FLH with partners, was an assessment of partners' existing methodologies for collecting and reporting road condition data. One objective of the assessment was to ascertain if a single method could be identified and cross-walked with partners current practices to promote consistency in performance reporting. The Road Condition Crosswalk Assessment took place this year, with ground verification exercises in Nevada and New Mexico. The field assessments were an important step in developing standard reporting metrics for paved, native and gravel roads. At least one field assessment was attended by representatives from the NPS, FWS, BLM, FS, USACE, and the BIA. Following the conclusion of the effort, it was determined that a crosswalk approach from multiple methodologies to one approach was too difficult and resource intensive. The assessment did unveil opportunities to reduce the current list of methodologies to two, namely the use of the Pavement Surface Evaluation and Rating (PASER) tool for asphalt, native and gravel roads and Pavement Condition Rating (PCR). Moving multiple partners to a common set of road condition data collection methodologies will take time. This effort was instrumental in providing the long-term vision to support a performance-based program.



Field assessment involving representatives from various FLMAs — New Mexico

Transportation Asset Management



Discussing data collection methods and findings



Collecting condition data

Transportation Asset Management

FLH Bridge Inspection Program

The Bridge Inspection Program is responsible for the safety inspection and structural rating of approximately 2,700 structures owned by various FLMAs in accordance with the National Bridge Inspection Standards (NBIS).

The scope of the program includes risk-based condition assessments for safety and structural adequacy, evaluations for serviceability and functional obsolescence, and calculation of safe load capacities. The program goals are accomplished through a data-driven performance management approach as outlined under MAP-21, and by utilizing tools such as Under Bridge Inspection Vehicle (UBIV) equipment, rigging and climbing inspection techniques, and underwater inspections. Other aspects of the program scope include emergency damage inspections, overload permit evaluations, bridge deck studies, and Non-Destructive Evaluation (NDE) of structures.

In the past year, the Bridge Inspection Program has reduced costs by implementing inspection trips of two-week duration, thus minimizing travel costs while prioritizing available resources. In addition, the percentage of inspections performed by in-house personnel has increased substantially in recent years, from 21% in 2011 to 54% in 2015. The office continues to meet or exceed the required 120 day turnaround time goal for delivery of inspection reports to the NPS. With expenditures of approximately \$2.9 million for 2015, the office completed inspections for 31 parks, and delivered 100% of the inspection reports within the 120 day period.

In order to meet requirements outlined in the recent NBIS compliance review, the program has made significant strides in updating load rating calculations, with load ratings for several hundred structures currently in progress. Other ongoing action items include the refinement of Fracture Critical member inspection plans, updating the Bridge Inspection Manual to fully address NBIS requirements, and measures to ensure full compliance with Scour Critical response metrics.

The office has also been engaged in the re-evaluation of load ratings for the Minuteman transportation network of the U.S. Air Force Global Strike (OMAD) Program. This effort has required substantial research, as well as coordination with several State DOTs .

To meet the requirements of the new National Tunnel Inspection Standards (NTIS), the Bridge Inspection Program has expanded the structure database. In addition, the tunnel inventory data has been submitted in accordance with the NTIS, and office personnel have received the necessary training.



Bridge Inspection staff drilling concrete test core samples from bridge abutment for in-depth investigation at Pentagon Reservation, Arlington, Virginia



Bridge Inspection staff conducting routine inspection of concrete box girder at Smithsonian National Zoo, Washington, DC



Under Bridge Inspection Vehicle (UBIV), Foothills Parkway, Tennessee

Transportation Asset Management

National Bridge Inspection Standards (NBIS) Compliance

The FLH Office of Bridges and Structures (FLH Bridge) was delegated to provide oversight of the 19 Federal bridge inspection programs nationwide to ensure public safety is provided on all federally owned bridges. The oversight is conducted at the Intermediate level through a FHWA risk-based, data driven approach. This approach assesses an agency's National Bridge Inspection Program (NBIP) level of compliance in 23 metrics defined in 5 categories: Bridge Inspection Organization; Qualifications of Personnel; Inspection Frequency; Inspection Procedures; and Inventory.

As part of the assessment, development of an FHWA approved Plan of Corrective Action (PCA) is required for improvement if any deficiencies are identified. FLH Bridge also conducts annual assessments at the Minimum level to follow up on PCA implementation progress.

Within three years, the FLH Bridge Office has successfully completed the Intermediate level assessment of all 19 Federal bridge inspection programs, two years ahead of schedule! Assessment of the program was based on a statistically-based random sampling. Items reviewed included: bridge files, National Bridge Inventory (NBI) submittal data, agency's inspection policy, procedures and guidance, inspection manuals, Bridge QA\QC Checklist, protocols, and other inspection related documents. Additional steps included in the review were interviews with inspection personnel, qualification review, and bridge site visits.

As a result of the assessments, follow-ups and the assistance of FLH Bridge, all 19 Federal bridge inspection programs significantly improved. As an example of this success, the FS developed PCAs, which were approved by FLH Bridge, that resulted in having 74% of the 23 Metrics for the NBIP either "satisfactory or substantially compliant" status within a 3 year cycle. Next summer, FLH will initiate an additional "Intermediate Review" to identify any additional areas of improvement. As all other federal agencies are also working with FLH Bridge to improve their Bridge Inspection Programs, their level of compliance is tracked annually. Measured data is showing that all agencies have improved in their Bridge Inspection Programs. The assessments not only provide guidance to Federal bridge owners on achieving and maintaining compliance with NBIS regulations, but also present the opportunity for the FLH Bridge to ensure that public safety is provided on all federally owned bridges.



View of the Great Smoky Mountains from the deck of Bridge 2, Foothills Parkway, Tennessee

Technical Assistance

NPS Northeast Region Forensic Pavement Investigation Flight 93 National Memorial Ring Road, Pennsylvania

At the request of the NPS, FLH was asked to evaluate and recommend solutions to apparent pavement distress (shoving, potholes, settlement and rutting) along the newly constructed Ring Road providing access to the Flight 93 Memorial. Pavement corings, soil borings, material samples and Falling Weight Deflectometer (non-destructive) tests were taken to evaluate subgrade support. Both short and long term recommendations were offered. The NPS praised the team for their responsiveness, detailed reporting and sound recommendations.



Sean O'Brien, FLH Pavement Engineer capturing field measurements of asphalt pavement rut depth Flight 93 National Memorial Ring Road, Pennsylvania



Intelligent Compaction (IC) Data Management Workshop Beckwourth-Genesee Road Project, California

FLH hosted a workshop on May 27, 2015, for one of the most diverse turnouts yet for this workshop. This is an indication of the growing interest in the EDC Initiative — Intelligent Compaction. The following government agencies were represented: CalTrans, Forest Service, Plumas County, and Lassen County. In addition, 11 companies sent representatives to the workshop. The objectives of the workshop included familiarizing attendees with IC technologies and software; informing attendees of the advantages and pitfalls of analyzing and interpreting IC data; and providing hands-on software training.

American Samoa Peer-to-Peer Materials Laboratory Training

At the request of the FHWA Hawaii Division, the CFL Materials Laboratory provided three days of training to the American Samoa Department of Public Works Laboratory Manager from May 20 to 22, 2015. Hands-on training was provided in the asphalt mixtures area related to: ignition furnace burn-offs for asphalt content and gradation; ignition furnace asphalt content and aggregate corrections; field core density; maximum theoretical density; aggregate bulk specific gravity; moisture induced damage; and sand equivalent. American Samoa is in the final stages of fully equipping its Laboratory to independently perform construction materials testing.

Cold-in-Place Recycling (CIR) & Cold Central Plant Recycling (CCPR) Information Transfer with China

FLH hosted two contractor representatives from Beijing Saint Ground Highway Tech Company and two representatives from MeadWestVaco Corporation (China Holding) on May 19, 2015, for a 90 minute roundtable discussion. Their primary interest was cold in-place recycling (CIR) and cold central plant recycling (CCPR). The delegation wanted to learn our perspective and hear success stories with CIR and CCPR. FLH was one of four public agencies that they chose to visit. The delegation also planned to visit Colorado DOT, Utah DOT, and the city/county of Los Angeles.

FLH Hosts Research Scholar

Kanghyun “Kang” Seo, an engineer from the Korean Expressway Corporation in South Korea was chosen to come to the US to learn about Asset Management. Kang spent six months at DOT Headquarters and the remaining year in FLH shadowing several colleagues in different disciplines, as well as our partners in the NPS, FS and USFWS. The main objective of his US visit was to research the Highway Performance Monitoring System (HPMS) and to gain understanding of procedures for collecting, analyzing, maintaining, and reporting pavement data.

Technical Assistance

GRS-IBS CalTrans Meeting

FLH engineers met with CalTrans engineers and policy makers in April 2015 to discuss the EDC initiative, GRS-IBS. The meeting also included National Forest and County engineers from nearby regions. The purpose of the meeting was specifically to provide CalTrans with a fundamental understanding of the GRS-IBS and allow their engineers to have technical one-on-one discussions with FLH engineers and also for FLH engineers to better understand the basis behind the seismic design guidelines required by CalTrans for implementation on the FLAP projects in California.

Several topics were discussed in detail including scour/drainage, abutment geometry, construction specifications and procedures, short- and long-term settlement, maintenance requirements, guard rails and barriers considerations, and heavy traffic loading effects for GRS-IBS bridges. Differences between Mechanically Stabilized Earth (MSE) Walls and GRS abutments and a comparison of the design methodology for each method were also discussed in detail. Seismic performance including; lateral restraint, shear keys, backwall break, and GRS abutment stiffness were discussed in details. An example calculation was provided to CalTrans for their review and comments to assure full understanding of the procedures and limitations used by CalTrans on this type of bridge.

The meeting was exceptionally interactive and informative. Both parties benefited from the discussions and CalTrans agreed to implement a small GRS-IBS bridge within their right of way and use it to develop new guidelines specifically for GRS Bridges.

Puerto Rico Highway & Transportation Authority (PRHTA) Design and PS&E Development Workshop

At the request of the Puerto Rico Division, three FLH engineers developed, tailored, and presented in Spanish a “Design and PS&E Development Workshop” specialized to the needs of the Puerto Rico Highway & Transportation Authority (PRHTA). Their presentation far exceeded the expectations of the Division and PRHTA. Their work demonstrated and reflected a strong focus for their partner, a passion for their own work, an appreciation to share what they have learned, and to represent all of FHWA. As a result of the workshop the PRHTA Director immediately implemented several recommendations to improve the efficiency and quality of PS&Es.



Course instructors left to right: Katerina Roman-Gonzalez, Highway Design Engineer; Josue Pluguez-Figueroa, Highway Design Engineer; and Isbel Ramos-Reyes, Highway Safety Engineer



Puerto Rico Highway & Transportation Authority Course Participants and Instructors



U.S. Department of Transportation
Federal Highway Administration

fh.fhwa.dot.gov