FHWA Awards Highway Design Excellence

By their very nature, the design of highways is dictated by the lay of the land that the right-of-way traverses. How well the design of a roadway or structure is conceived, then built, determines the effective utilization of the right-of-way. In turn, the acquisition of the right-of-way determines the parameters within which each design and finished project can be developed.

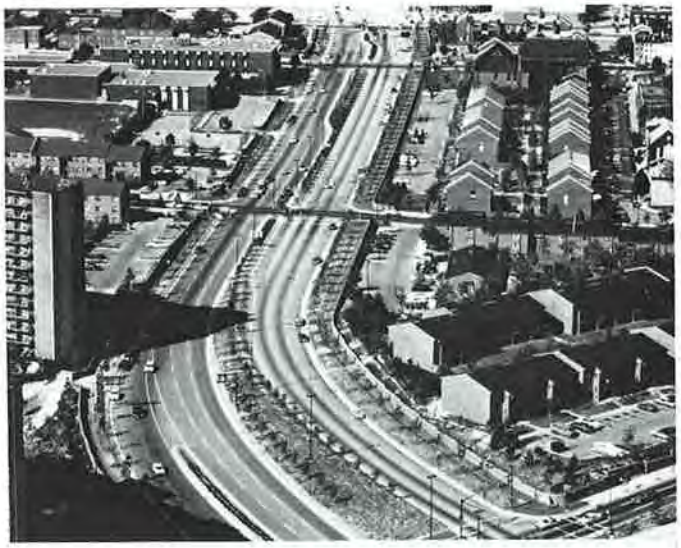
Every two years the Federal Highway Administration, U.S. Department of Transportation, recognizes excellence in design of highways and highway-related facilities. Awards were given in 1982 to those projects that met a variety of criteria which included the compatibility or adaption to surrounding environment, visual appeal safety factors, functional efficiency, and pleasing user experience.

The FHWA had nine different categories for 1982. This article features four of the nine categories. They are urban highway, rural highway, historic preservation and cultural enhancement, and highway improvements in federally owned lands. Each outstanding example had to meet specific criteria and were evaluated by a panel of judges who had extensive experience in the categories evaluated.

The Urban Highway

. . . . awards are given to the transportation projects whose design evidenced excellence in signing and graphic information, enhancement of the transportation system, landscaping, and its relationship to the environment.

First Award
Harbor City Blvd.
Baltimore City, Maryland
"Urban Revitalization"



The Harbor City Boulevard is a six to eight lane, median divided, collector-distributor roadway which rings the western side of downtown Baltimore City, linking major Interstates such as I-395 and I-170, and primary Routes such as Maryland 295 and U.S. Route 40 to local downtown streets. The challenge in its design was to produce a roadway capable of carrying high volumes of traffic through an area undergoing considerable revitalization. The roadway was designed with special attention to curbside and median landscaping, brick splashblocks, sidewalks, and screening walls, and the architectural quality of lighting fixtures.

The Harbor City Boulevard project was designed under the Federal Aid Urban System (FAUS) program. Development of the project was coordinated there through the Maryland Historic Trust and effected communities, including the City of Baltimore.

Second Award
Tower Drive
Green Bay, Wisconsin
"Wetlands Restoration"

When the Tower Drive segment of I-43 in the city of Green Bay was built, wetlands that had to be destroyed in the process were replaced by new wildlife habitat that more than meets federal requirements for wetland preservation.

The Wisconsin department of transportation worked with the state department of natural resources and the U.S. fish and wildlife service in constructing unique ponds, open water areas and special seedings that actually improve the wildlife habitat over what had been available before. In addition, other wetlands within the highway right-of-way were permanently preserved, and thus kept out of danger of being gobbled up by future development.

In the loop of the interchanges, ponds were built to certain depths to provide nesting and cover for specific types of waterfowl, including several endangered species. Various types of ducks, geese, cormorants and other waterfowl, as well as muskrats have been seen in considerable numbers in the newly created marshland area.

Tower Drive, which was opened to traffic in the fall of 1980, runs through a highly industrialized area, skirting the edge of the Green Bay Wildlife Sanctuary. An 8-ft. deer fence was constructed to keep the 15 to 20 deer that frequent the area from being killed on the freeway.

This urban freeway project not only offers travelers a safe, efficient transportation corridor along the state's eastern coastline, it offers them a glimpse of the beauties of nature not often seen within a city limits.

Third Award
Route 209 and 52
Ellenville, New York
"Rehabilitation and Preservation"

The Village of Ellenville is located at the intersection of Routes 209 and 52 in southeastern corner of Ulster County. Both routes had deteriorated to the point that rehabilitation and preservation projects were implemented. Inadequate drainage, poor road alignment, unsafe intersections, and broken sidewalks and curbs were some of the problems encountered.

It was decided to divide the project into more manageable parts. The Route 209 section was designed and constructed first, and Route 52 on Center and Canal Streets next. A bridge replacement on Canal Street over Sandburg Creek and a new eastern approach to the Village on Route 52 constituted the impacting a historic Delaware and Hudson Canal site and museum. Also, a new eastern section of Route 52 removed the hazards of a narrow, poorly aligned approach to the Village.

The Rural Highway

. . . is an award given to the projects of excellence that meet the criteria in design, alignment and location, cross section, preservation of natural areas, and reestablishment of natural vegatation.

First Award
Lake Pleasant Access Road
Maricopa County, Arizona
"Desert Preservation"

Lake Pleasant Road, located 35 miles from downtown Phoenix, is a popular year-round recreational area. Weekend traffic volumes exceed 5,000 vehicles per day. The old road had washed out three times in three successive years because of excessively high volume water releases from Waddell Dam, which forms the lake.

The Maricopa County Highway Department decided to relocate the road, thus eliminating the chance of future costly washout repairs. The relocation alignment in the mountainous terrain was difficult to determine. Coupled with this, the fragile desert soil and delicate cacti and arid vegetation demanded special consideration for maximum preservation. The combination of these factors established the design parameters that proved to be most challenging.

The end product is an asphaltic concrete road that winds gracefully through the desert foothills in a safe easy and pleasing manner, with the ultimate of preservation of the beautiful, natural environment. Spectacular rock formations and majestic saguaro cactus greet the traveler and enhance the visual awareness and appreciation of the deep blue waters of Lake Pleasant as it breaks into view.

Second Award
Wisconsin Highway 70
Oneida County, Wisconsin
"Rebuilt Roadway"

An 8.5 mile segment of state highway 70 in northern Oneida county was reconstructed to meet the mobility, safety, recreational, environmental and freight-haul needs of this northern Wisconsin territory.

The project is located in an area of glacial topography, where the land varies from level to gently rolling, with winding streams broken by swamps and lakes and the predominent soil is sand with silt seams. The area is sparsely populated, comprised almost entirely of lakes, marsh and timberlands full of aspen, birch, scattered pines and oak.

The existing road, which was constructed in the 1920s, had outlived its usefulness. Alignment was sub-standard and the road structure was not able to carry modern day trucks. Reconstruction was necessary to provide the area with a highway that could meet daily traffic needs, safety for the traveling public, and still complement the surrounding forestland and recreational area. Construction of a new alignment on a different location was discounted because of the proximity of numerous lakes, streams and natural impoundments.

Since the natural beauty, wetlands, forests and wild-

life habitat of the area is so precious to the people of the area, the department worked closely with the state department of natural resources to minimize damage to either wetlands or wildlife. Wildlife habitat protection includes special protection for eagle nesting areas. Also a crossing had to be built over a twenty-foot deep marsh. This construction problem was solved with minimal environmental disruption.

Approximately 75 per cent of the existing alignment was able to be incorporated into the design of the new facility, minimizing scars on the landscape and reducing costs. A technique called "slope streamlining" was used, which consists of varying the backslope in cut sections to give the appearance of natural slopes.

Third Award
T.H. 23,
Granite Falls, Minnesota
"Geological Uniqueness"

T.H. 23, south of Granite Falls, winds gracefully up and out of the Minnesota River Valley among granite rock outcroppings reaching towards the prairie country of southwestern Minnesota. The early corridor planning studies for this highway identified a very sensitive setting, including special geoloical formations, archeological sitings and unusual dry land plant community vegetation. The designers, in an attempt to develop a highway which was compatible with these environmental concerns, skillfully meandered the highway alignment through the river valley, carefully avoiding the archeological sites and the geological granite formations, which contain some of the oldest rock outcroppings in the United States. The use of wide medians and independent vertical alignments nicely blend the roadway into the existing terrain, enhancing its location and preserving the natural qualities of the area,

including the vegetation adjacent to the highway.

The success of this highway project was determined in the early planning stages when the Minnesota Department of Transportation, Willmar District, selected departmental interdisciplanary expertise to document all of the environmental concerns involved. The results were an award-winning Environmental Impact Statement (EIS) which provided the direction for the final highway design development.

Historic Preservation and Cultural Enhancement

. . . awards have been given to those projects that enhance, restore and preserve historical, archaeological, cultural, and natural sites.

First Award
Sherars Bridge
Deschutes River, Oregon
"Historical Site"

The fast-flowing Deschutes River has cut a channel 80 feet deep and 40 feet wide through volcanic rock at the bridge site. The site has stood as a landmark of great significance for centuries—long before the arrival of white settlers. Several tribes used this area for fishing and as a site to cross the river. The first bridge constructed here was in 1860. In 1915, a steel truss bridge was installed and remained in service until this replacement. John Sherar, an enterprising settler, built a 13-room hotel in 1868, and improved a toll road on each side of the bridge. The site became a stage stop. Since ancient times, Indians have used this location to catch salmon as they attempt to jump a waterfall. In recognition of the importance of the site to Indians, special architectural treatment was considered desirable. Designs based on Indian pictographs carved in a nearby cliff were formed into the sides of the exterior deck slabs and the pedestrian rail posts.

The acceptability of the designs were cleared with the Council of the Confederated Tribes of Warm Springs. The concrete abutments and wing walls were faced with native stone, and the metal bridge rail was painted a bronze color so that the structure would blend in with the surroundings. The site is in an area which has been designated as a Scenic Waterway, which strictly limits construction activity,

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Second Award
Pulp Mill Bridge
Middlebury and Weybridge, Vermont
"Historical Restoration"

The Pulp Mill Bridge over Otter Creek, on a town highway connecting Middlebury and Weybridge, Vermont, was built about 1820 and is the oldest covered bridge in Vermont for which the construction date has been determined. The "double barrel" design is extremely rare, as there are only 6 two-lane covered bridges left in the United States and the Pulp Mill Bridge is one of the only two which still carry traffic.

An inspection by The Vermont Agency of Transportation in 1978 indicated immediate repairs were necessary if the Pulp Mill Bridge were to be saved. The structure was sagging badly between the piers, the arches had developed a reverse curve, the ends of the bottom chords had rotted and broken, and the timber cribbing above the piers was rotten. The vertical truss members had split where the floor system was supported.

Restoration plans were developed under a special covered bridge program approved by the Vermont legislature. The program was a joint effort of The Vermont Agency of Transportation, The Division for Historic Preservation, and the towns in which the bridges were located.

In the restoration of the Pulp Mill Bridge, the use of steel beams or a concrete deck was ruled out, as the intent was to maintain its integrity as an authentic timber covered bridge. The design contemplated reuse of as much of the original timber as possible, but the extent of rot was far greater than apparent at the start of reconstruction, and much more new material was used.

It was intended, for instance, to reshape the existing arches to a true parabolic curve, but this proved infeasible, and new laminated timber arches were installed. Also, the existing siding, when removed to permit jacking to remove the sag, proved too badly deteriorated for re-use and much of the floor system either was damaged in removal or found to be rotten.

The original trusses were able to be retained as originally built; however, new support beams were added next to the bottom chords and attached to the arches by steel rods, which took the load off the split vertical members and transferred it to the arches.

The existing concrete-faced abutments had to be replaced, due to deterioration. The piers were repaired with new concrete, and new treated timber cribbing installed between the tops of the piers and the bottom of the bridge. Although design calcuations indicate that with the new arches the bridge will function as a single span, it was decided to retain the piers as an added safety feature.

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Third Award
1918 Third Avenue Bridge
Minneapolis, Minnesota
"Structural Restoration"

The 1918 Third Avenue Bridge, an S-curved, multi-arched concrete structure, is located in the Saint Anthony Falls Historic District at the northeast edge of downtown Minneapolis and provides a stimulating visual entry into downtown.

During 1976, the City of Minneapolis began planning a park facility along the Missisippi River adjacent to and under the east approach spans. Because the bridge had obvious historic and aesthetic values, the City and MN/DOT decided to restore the structure, preserving the bridge as a transportation facility and as an aesthetic asset to the City.

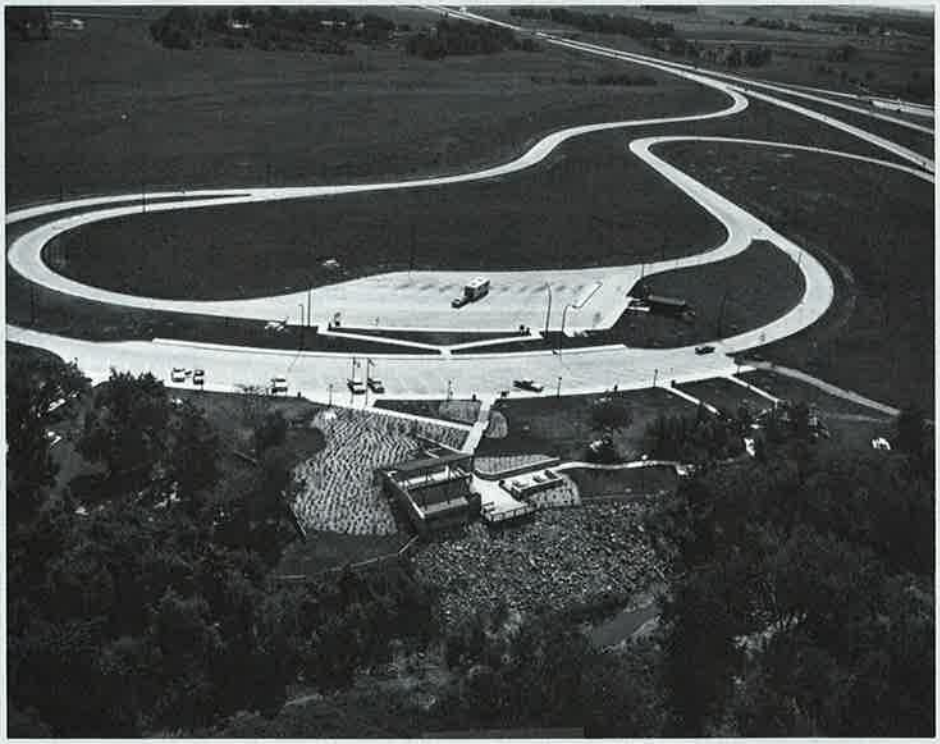
Three areas presented special challenges in the restoration process: the art-deco railings, the spiral stairs and the lighting. The railing was carefully removed, restored and reinstalled; the spiral stairs were removed and a poured concrete stair structure was designed, retaining much of the sculptural value of the original spiral; and 20-foot lights were installed which delineate the bridge, combining efficiency and aesthetics. Restoration work also consisted of patching and refinishing piers and arches; spandrels were repaired; both approaches were completely replaced; and the deck, sidewalks and traffic barriers were replaced.

The restoration and preservation of this 1864-foot structure was coordinated by the Minnesota Department of Transportation in cooperation with the City of Minneapolis, the Minnesota Historical Society and the Minneapolis Preservation Commission.

Blue Earth Rest Areas

by Dennis J. Adams

Dennis Adams is the Landscape Architect for the Site Development Unit - Minnesota Department of Transportation. Adams was responsible for organizing this project and seeing its successful completion from the hearing process to actual construction.



The design solution for the Blue Earth Rest Areas adjacent to the Blue Earth River successfully solves a variety of unusual problems. Each rest area serves one direction of Interstate 90. The travel lanes and bridges are separated by up to 500 feet to take advantage of the wide valley of this meandering mid-western river.

The acreage involved, in this combined rest area and wide median amounts to a bit over 130 acres. This is an unusually large acreage for two rest areas and assembling the right of way became an interesting process.

The rest area sites were very diverse. Each was situated on the edge of a southerly facing bluff overlooking the river. This location offered the opportunity to tuck the restroom buildings into the bluffs. This earth sheltered design is very energy efficient especially when combined with use of sunlight to naturally warm the buildings during the winter. The picnic tables, benches, overlooks, play areas, and trails are situated along the bluff edges. A walking trail was constructed to connect the two

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Highway Improvements in Federally-Owned Lands

. . . is a new category that recognizes projects that incorporate excellence in design for the preservation of natural areas, signing and graphic information, and are built to the appropriate configurations.

First Award
Shenandoah and High Streets, Harper's Ferry, West Virginia "Historical Reconstruction"

The purpose of this project was to approximate the historic appearance and configuration of Shenandoah and High Streets and sidewalks, provide adequate drainage for the historic buildings, and to provide better access for visitors and the handicapped.

NPS archeologists conducted excavations, examined photographs and records in an attempt to establish the original 19th century locations of the two streets.

After assembling the historical data the NPS found that the original roads dated back to 1834. The FHWA, in cooperation with archeologists who analyzed all available information, prepared working drawings for a modern day road sympathetic to the original historic appearance. In order to accomodate the large volume of visitor traffic the road surface was constructed of exposed aggregate concrete to simulate the original road material, which was a shale macadam. Cobblestone gutters were constructed and

Harpers Ferry shale was used for sidewalk material. Due to the lack of enough shale, brick was used to fill in areas where Harpers Ferry shale should have been. Signs of modern utilities such as man-holes and overhead electrical wires were hidden beneath the street.

The final product more closely resembles the original streetscape of the 1800's and provides a safe, functional, appealing visitor experience.

Blue Earth (cont.)

buildings.

Assembling the land package from five different landowners was a difficult process. The major landowner initially was opposed to the project. He had allowed local schools and groups to use the hardwood forest as an educational exhibit and had been actively managing the woods for preservation. The project generated considerable public interest. Public reaction was almost universally against construction.

While one owner didn't want to sell, two landowners were landlocked by interstate construction and wanted to sell their property. Many public meetings and a lively public hearing resulted in shifts in the design which satisfied most concerns. The departmental staff of engineers, landscape architects, right of way specialists and other professionals responded to public concerns by developing a plan which kept the roadways and construction out of environmentally sensitive areas.

Eventually, the major landowner became more convinced that Mn/DOT was really interested in preserving the qualities that made the site unique. He agreed to sell the 70 acre hardwood tract, allowing it to become a part of the public domain available for all to use.

In addition to an award from the Federal Highway Administration, this project has been recognized by professional engineering and landscape architectural associations. Traveler and local acceptance of the rest areas has been very positive. The areas have generated positive comments from the public in part because of the preservation and management of the existing wooded area and improved wildlife habitat.

Mn/DOT foresters, wildlife specialists and landscape architects developed a comprehensive management plan which guides our care of the total acreage. Wildlife habitat is promoted by management techniques and planting seed crops. Several duck ponds were dug in the floodplain to create more interest. Local groups provided wood duck houses to supplement natural tree cavities.

Second Award
Stewart Point—Skaggs Springs Road
Sonoma County, California
"Roadway Relocation"

The Stewarts Point — Skaggs Springs Road is one of the relocated roads of the US Army Corps of Engineers' Dry Creek Warm Springs Dam and Lake Sonoma Project, in Sonoma County, California. It is a through road which connects Highway U.S. 101 in the Russian River Valley with State Route 1 on the coast. The road has been designated in the Sonoma County General Plan as a Rural Scenic Highway. Approximately 12 miles of road were relocated to replace the portion that will be inundated by the lake. The road was designed and constructed by the US Army Corps of Engineers, San Francisco District. It will ultimately be transferred to the County of Sonoma as part of the County road network.

The road is situated in rugged terrain in the coastal range of California. The varying topography created special problems in the selection of routes to serve for relocation of the existing road as well as to meet the needs for access for future project recreational developments. The design and location of the road has been accomplished with sensitivity to the view of the driver and how the road fits into the landscape. Using a combination of vertical and horizontal curves, a pleasing relationship of road and terrain was achieved by setting maximum sight distances and using combinations of horizontal and vertical curvatures which restrict long distance views of the road segments.

There are various vegetation types that exist in the area where the road was constructed, including grassland, mixed evergreen forest type, and northern oak woodland. The route of the road was selected to preserve as many trees as possible. In order to preserve the natural beauty of the area, excessive cuts and fills were avoided wherever possible. Where a cut slope was required, the top of cut was rounded off to form a smooth transition from the natural slope of the cut slope. All exposed areas of cut and fill slopes and disposal areas were seeded and hydromulched to harmonize with the existing ground and to reduce erosion of the slopes.

Third Award
Natchez Trace Parkway
Jackson Falls, Tennessee
Yesterday's Path is Today's Road

This project was for construction of a segment of the Natchez Trace Parkway, Section 1D2, near Jackson Falls, Tennessee. The project consisted of six grade separation structures, grading, drainage, base, and hot bituminous concrete pavement on a 6.1-mile section of the Natchez Trace Parkway. When the Natchez Trace Parkway is completed, it will extend 447 miles and will roughly follow the original Trace through the States of Mississippi, Alabama, and Tennessee from Natchez, Mississippi, to a point southwest of Nashville, Tennessee.

It has been important throughout the construction of the Parkway to provide a roadway that preserved the natural environment as much as possible by utilizing geometrics that minimized earth-work and consequently scar on the land. This requirement was even more important on this section in Tennessee since the terrain is rolling and hilly. A curvilinear alignment was chosen and a number of rock embankments were incorporated to ensure a minimum requirement for large fills and cuts.