

Context-Sensitive Design Case Study No. 14 Arkansas Route 215 - Ozark National Forest

Location:

Route 215 (approximately 15 miles in length) beginning at the junction with Route 23 (near Cass) to Oark in the Ozark National Forest (also designated as U.S. Forest Highway 65). The route is north of I-40, with Arkansas Route 23 as the western terminus, in NW Arkansas' Franklin and Johnson Counties (generally 45 miles East-NE of Fort Smith and 35 miles South-SE of Fayetteville).

Project Description:

Route 215 is an improved 2-lane facility of approximately 15 miles in length following along the Mulberry River (providing a scenic overlook) with its steep slopes and providing access to the Redding and Wolfpen Campgrounds in the White Rock Wildlife Management Area of the Ozark National Forest.

Purpose and Need Summary: *(abstracted from the project's 1994 Environmental Assessment)*

The previously existing route was not adequate for the current or anticipated future traffic. The travel lane was too narrow, the surface rough (gravel), and an unnecessary amount of dust and siltation were being produced, all of which detracted from the personal experience and water quality of the streams and river in the area. The road provides access to the Mulberry River Valley for local residents, recreationists, and other forest users. The road provides access to campgrounds, hiking trails, and scenic views of the Mulberry River. The Mulberry River is very popular among canoeists and it is highly regarded as a smallmouth bass river. Hunters also heavily use the National Forest during hunting season. The reconstructed roadway is meant to reduce dust and siltation thereby enhancing the personal experience and improving the water quality of the area.

History of the Project:

The intended project's environmental assessment was completed in 1994 based on a route to be constructed on existing alignment. The improvement was specified to be two 10' paved travel lanes with 2' shoulders where possible, or curb and gutter where necessary. The route was split into five project segments (beginning near Cass and extending eastward). The first two segments were the design responsibility of the Arkansas Highway and Transportation Department and they were open to traffic in 1997 and 1998, respectively. The last three segments are the design responsibility of the Eastern Federal Lands Highway Division (FHWA). The third segment is near completion and the fourth is under construction. It is anticipated that the final segment will be let in 2003. Once all five segments are complete the entire roadway is to be incorporated into the state's highway system. The upgrading of the corridor is part of the Forest Service's master plan to provide a scenic drive across the Ozark National Forest.

Context-Sensitive Factors:

Several principles were established for erosion and sediment control during and after construction. The visual environment of the forest, the viewscape from the Mulberry River, and the vistas overlooking the river were deemed extremely important to maintain and enhance. Improvement measures include: revegetation of cut and fill slopes; location of borrow and waste areas so as to not be visible from the river; and use of native stone to the largest extent possible for retaining walls, gabion walls, riprap and ditch lining. Because of the potential instability of the mountain, cuts were kept to a minimum. An additional requirement was to leave in place stone retaining walls at culverts and even a rock box culvert with large stone slabs (it has been covered over by the new roadway and its sides have been extended with pipe). The roadway alignment closely tracks the existing land contours to minimize both cuts and fills.

Highway Agency (Partnerships):

*Arkansas State Highway and Transportation Department
Federal Highway Administration (specifically the Eastern Federal Lands Highway Division)*

Resource Agencies Involved:

*U.S. Forest Service
National Park Service
U.S. Army Corps of Engineers
Arkansas Natural Heritage Commission
Arkansas Dept. of Environmental Quality
Arkansas Natural and Scenic River Commission*

Significant Environmental Issues:

Natural Environment:

The major issues include the fact that the road is in a national forest and follows a river. Concerns were for preserving and enhancing scenic quality as well as water quality. Design principles included following the terrain and creating as little disturbance as possible with the alignment and using natural materials to the largest extent possible. The roadway provides improved access to forest uses and an improved view from the roadway, while also protecting the viewshed of the Mulberry River below.

Design Issues and Special Features:

Design Speed:

A 20 mph design speed was used to minimize changes to the existing alignment and 40 mph used elsewhere, when possible.

Right-of-Way:

There were no recorded existing right-of way limits. The roadway project was mandated to be on the existing alignment with minimal changes to the existing landscape.

Clear Zones:

Various combinations of components were used including barrier walls, curb and gutter, and guardrail

Number of Lanes:

2-lanes with discontinuous 2' paved shoulders

Lane Width:

10' paved travel lanes

Special Features:

Design speed chosen to allow use of much of the existing gravel road alignment. Retaining structures were used adjacent to cuts and fills in lieu of slope flattening. Native stone was used extensively for veneer on crash worthy walls, riprap/gabion retaining walls and ditch lining. Controlling erosion and sediment during and after construction has been a major concern. The design maintains the visual quality of the viewscape from the Mulberry River and provides for scenic overlooks of the forest and river for the roadway traveler.

Adjacent land use:

Primarily forest (hunting and hiking), river (fishing and canoeing), and campgrounds. The Mulberry River falls under the protection of the federal Wild and Scenic Rivers Act and is listed in the Arkansas Natural and Scenic Rivers Registry.

Project Development Schedule and Costs:

Design: *(Design costs are not available.)*

Construction:

<i>Segment 1</i>	<i>\$3,822,144</i>	<i>completed 7/97</i>
<i>Segment 2</i>	<i>\$3,167,260</i>	<i>completed 10/98</i>
<i>Segment 3</i>	<i>\$1,803,888</i>	<i>under construction (near complete)</i>
<i>Segment 4</i>	<i>\$4,497,577</i>	<i>under construction (let 9/01)</i>
<i>Segment 5</i>	<i>\$3,750,000</i>	<i>to be let 2003</i>

Project Outcome and Lessons Learned:

The Arkansas State Highway and Transportation Department is knowledgeable of context-sensitive design practices. However, this project extended the parameters of past initiatives/experience especially for the design of a secondary road. The 'client' certainly 'did not want a flat straight road'. The preliminary design for the first segment underwent significant revision as the designers began to appreciate the full extent of the client's requirements. In order to preserve and protect the natural environment and create a built roadway environment that was to be esthetically pleasing design speed, roadway geometric features and natural materials were brought together. Some of the built features that look simple are made possible by using geotechnical design methods and special materials that cannot be seen. The photographs that accompany this case study show the results of this extraordinary roadway development effort.

Route Diagram and Photographs: (see attached)

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