Title
Preserving a spirit of place: U.S. Highway 93 on the Flathead Indian Reservation

Permalink
https://escholarship.org/uc/item/51f1h0df

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Publication Date
2001-09-24
Abstract:

US Highway 93 traverses the Flathead Indian Reservation, which is located on the west side of the Rocky Mountains in western Montana. Picturesque mountains and mountain valleys, with the broad Flathead Valley to the North and the majestic Mission Mountains to the East, characterize this part of Montana. The area is home to a wide variety of wildlife, including grizzly bear, white-tailed deer, mule deer, pronghorn, elk, painted turtles, bighorn sheep, and a number of fish and bird species. It is also home to the Confederated Salish and Kootenai Tribes of the Flathead Nation (CSKT).

Project History

Joel Marshik, Montana Department of Transportation

We are all very proud to be here today and tell you our story of US 93 from Evaro to Polson, the agreement that was reached, and what it will mean to wildlife. We believe this is a very unique project and over time will prove to be the beginning of new understanding regarding wildlife and highways, along with others aspects of the agreement that are unique to how governments can work together.

This story began in the early 80’s when the MDT recognized the need to improve US 93 on the Flathead Reservation. Traffic was increasing significantly and the traveling public and traffic engineers were looking for some fixes. In response to the concerns four projects were proposed: Evaro to Missoula Co. Line, Missoula Co. Line to Ravalli, Ravalli North and Roan to Polson. Each of the four was set up to have individual environmental assessments (EAs).

I was not with the MDT at the time these four projects began. But, I was told that when the time came to coordinate with the Tribes on these four projects, the Tribes called for a time out. The total impact of four separate projects drew their attention. Even though they supported some of the projects, the Tribes were concerned that cumulatively the projects were going to have an impact on their home, their Reservation, and the impacts would not be analyzed properly unless tied together as one analysis. After much discussion between the governments (Federal, Tribal and State), the four projects were pulled and an EIS was started for the entire corridor length from Evaro to Polson, the logical termini for a corridor analysis (Reserve boundary to Polson, significant change in traffic.)

A consulting firm, Morrison-Maierle Engineering, from Helena was selected and the process begun. The NOI for the entire corridor was sent on August 8, 1991. I joined the department in 1994 and at that time the process was moving very slowly, mostly because the position I took had been vacant for a year. One of my initial assignments was to get the EIS moving again and completed. The EIS and associated analysis was focusing on a four lane. At that time, two lanes were not given much thought. MDT and the consultant felt very strongly that
the road should be a four lane to accommodate present and future traffic needs based on standard design criteria being used at MDT. The traffic and safety studies completed on this road corridor would take up our entire hour plus some if we went into all of the details, but the purpose of our meeting today is to discuss how this project became a major wildlife connectivity project. Suffice it to say that traffic and safety studies were a big part of this effort, and played a key role in establishing MDT’s early position for this corridor.

A draft EIS was prepared in the fall of 1995. The Tribes continued to throw up a red flag and express concern for the project as a four-lane. In the spring of 1996 serious discussion began with the Tribes regarding the state’s and FHWA’s preferred alternative, four-lane, and the Tribes preferred alternative, 2-lane. Several issues came into play that made this an interesting discussion, but the most significant dealt with a clash of cultures: tribal culture versus DOT culture. Other issues were safety, traffic operation, commuter related population growth, access management, Ninepipe Wildlife Refuge, and bypasses of local communities. The time had come for the final EIS and a record of decision, the ROD.

The discussion moved into Tribal Council Chambers. The Tribal elders were against MDT’s preferred alternative of a four lane for the entire length from Evaro to Polson. They just did not like the project and what it would do to the homes of the member and future generations: seven generations. The Tribes believe that they must look forward seven generations and make decision today for the future. Allowing a four lane through the Reservation was not in keeping with this need to consider the future. The Tribal elders spoke and the Tribal Council voted to not support MDT’s preferred alternative: a unanimous vote against.

That was a shock to MDT. Also, the fact that MDT needed the Tribes to support their decision was also a shock: a cultural DOT shock!! What to do?? All three governments got together and decided to salvage as much of the EIS as possible and write a ROD that recognized the similarities and differences. That ROD came out from FHWA in August 1996.

The ROD was written such that it recognized no decision was made to construct a highway: “This decision does not provide for the physical construction of highway projects with Federal-aid funds until CSKT, MDT and FHWA agree on the appropriate design and a project level environmental document is completed that addresses social, economic, and environmental impacts” (August 12, 1996).

It did not take long for everyone who used US93 to recognize it was not getting any more pleasant to drive. Traffic was increasing and the overall situation was not improving. A mild attempt to get back together with the Tribes was made in the fall of 1996, but the general feeling was a period of time was necessary for all parties to digest the circumstances and exactly what had taken place the previous five years: August 1991 to August 1996, NOI to ROD.

In mid-1997 internal discussions began between MDT and FHWA on the ROD and questions were asked regarding exactly what activities it did allow. This led to an amendment to the ROD by FHWA in February 1998 that allowed access control and row to proceed on non-Tribal lands for “… acquisition of rights-of-way that does not preclude future options....” A consulting firm, Skillings and Connolly located in Lacy, Washington, was hired to do the access control study and access control plan. This contract was expanded to include purchase of access and rights-of-way.

By late 1998 the access control effort was working out very well and all three governments were satisfied with the process, and, as a result, discussion expanded to construction. At the beginning of 1999 discussion between the governments began for real and meetings were schedule to see what could be done to reach an agreement on lane configuration. The Tribal chairman at that time, Mickey Pablo personally became involved, as did the director for MDT, Marv Dye. In August 1999, the night before a meeting of the three governments, Mickey Pablo died suddenly. This was a truly tragic event, and it took four months to get the governments back together at the table. But in December of 1999, discussions on how to deal with the ROD and the needs for US93 began in earnest.

During the renewed talks the three governments agreed that they all wanted a third party consultant to facilitate an agreement that would result in a plan for US 93. Because of the success Skillings-Connolly was having with the access management plan, their familiarity with all three governments and their acceptance by
all three governments, they were selected to facilitate the effort. In March 2000, a contract with Skillings-Connolly was signed and the process began.

**Collaborative Process**
Lyle Renz, Skillings and Connolly Inc., Consulting Engineers

In 1998, the Montana Department of Transportation advertised a request for proposals targeted to consulting firms requesting preparation of an Access Control and Corridor Preservation Plan for Highway US 93 from Evaro to Polson, Montana. This highway covers a distance of approximately 56 miles.

There was a common theme in preparation of this proposal. The three governments felt that something needed to be done in the area of safety. They found that there were too many fatalities occurring on this state highway.

Skillings-Connolly's proposal preparation was based upon an extensive public involvement plan, which would create a collaborative process, guided by a steering committee, all of which would be facilitated by the engineering consultant firm of Skillings-Connolly, Inc. We were awarded the contract in late 1998, and immediately initiated a partnering session. The goal was to enlist all the appropriate and involved public groups in this project.

As a part of this partnering session, we set goals and objectives for the process and established a steering committee. This steering committee was composed of the Montana Department of Transportation, Confederated Salish and Kootenai Tribes of the Flathead Reservation, the Federal Highway Administration, Lake and Missoula Counties, and the incorporated cities within the corridor: Polson, Ravalli and St. Ignatius.

As we started the process, we held public meetings throughout the corridor. The key here was that we asked our steering committee, not just the consulting team, to participate in these open houses to enable the various partners to buy-into the process. We then held monthly steering committee meetings. These meetings were facilitated in such a manner that all decisions were by consensus. We felt the need to have full consensus before we moved onto the next item.

We developed an Access Control Plan for the corridor, again with participation by the steering committee and by the public at large. A key factor in designing the Access Control Plan was that the process was led by our sub-consultant, Robert Felsburg, of Felsburg, Holt & Ullvig (Denver, Colorado). Mr. Felsburg is a noted nationwide expert in access management. Another key in getting an Access Control Plan developed was that we held one-on-one meetings with every affected property owner in the corridor. By affected property owner, I mean those property owners from whom we would have to obtain an access, move an access, or purchase property. The property purchases would be necessary for the corridor preservation aspect of the project.

The corridor preservation aspect would preserve a corridor in which to build a roadway at a future date. The corridor needed to be wide enough to build within it the widest alternative discussed in the final EIS, which was a four-lane divided highway.

By October 1999, we had developed an Access Control Plan for the entire corridor. This plan included provisions for eliminating approximately 50 percent of the accesses within the corridor. This elimination was brought about by combining accesses; for example, many accesses that served individual properties were combined at the property line so that one access would serve both properties. We also put in frontage roads that gathered up accesses in close proximity, and served them through frontage roads with an access only at perhaps the end or middle of a frontage road; combining them into one or two accesses. In addition, outright closure of unneeded accesses was planned. Folks that had unused, extra, or field accesses were willing to give them up on the basis that something needed to be done, and someone would need to give up something to allow this improvement to be accomplished in this corridor.

Right-of-way plans were then put together for acquiring the right-of-way, and contracts negotiated with MDT for Skillings-Connolly to begin right-of-way acquisitions. This was accomplished late in 1999, and acquisitions began immediately thereafter.
As the corridor preservation project waned down and the right-of-way acquisition process had begun, the three governments met to discuss resuming the design discussion negotiating process, and to arrive at needed design issue decisions prior to building the highway. These issues dealt with lane configuration, specifically the kind of highway to be built, whether a four-lane highway or a two-lane highway. Other issues that were addressed had to do with design consideration and environmental impacts that would need to be mitigated.

After meeting for some time, the three governments again approached Skillings-Connolly to see if our firm would be interested in utilizing a process similar to the collaborative process used to design the Access Control and Corridor Preservation project. Skillings-Connolly agreed to provide a proposal to accomplish this. Through discussions it was decided that some additional elements should be brought into the process.

All of the governments had knowledge or experience with using the Midwest Research Institute (MRI) in previous traffic studies involving two-lane highways. As such, we were asked to contact Midwest Research Institute and bring them in as a sub-consultant to analyze this highway from the standpoint of making a two-lane highway with passing lanes.

MRI had designed a computer program, “TwoPas,” which was a simulation model. This simulated drivers on a two-lane road who were looking for passing opportunities. Generally, these opportunities would need to occur at a minimum of every two miles to train drivers to wait for passing opportunities, when the passing lanes were available. MRI had perfected the model in this regard, and it was thought that this would prove helpful to utilize this model in analyses, and in negotiating a lane configuration solution.

Other well-thought-of sub-consultants were Jones and Jones, Architects and Landscape Architects, Inc., from Seattle, WA. They were brought in since they played a big role in solving a long-standing highway dispute issue in Kentucky, referred to as the Paris Pike issue.

In addition, Herrera Environmental Consultants was brought in to deal with the environmental issues. Herrera has extensive experience in dealing with a wide-range of environmental impacts associated with highway projects throughout the Northwest and has done environmental analysis on projects in unique settings for National Forests and Parks for the Federal Highway Administration. For the next year, throughout the year 2000, the group met monthly to discuss the direction in which to proceed.

The highway sections were analyzed segment by segment. Again, the key being that the process was a collaborative one, and all three governments were seated at the table. The consultant team fulfilled the roles of facilitators, technical experts, and resource analysts. The negotiating group included the top-level officials from the three governments. These officials were the Secretary and Deputy Secretary and the Missoula District Administrator from the Montana Department of Transportation, from the Federal Highway Administration, the Division Administrator and Assistant Division Administrator and Environmental Coordinator, and representing the Confederated Salish and Kootenai Tribes were the three Council Members, their lead Attorney and Transportation Planner, as well as other staff members with cultural and natural resources responsibilities.

The collaborative process continued to work very well, and brought about the outcome of negotiating the Memorandum of Agreement (MOA). The Memorandum of Agreement, which was signed December 20, 2000, is an agreement between the Federal Highway Administration (FHWA), the Montana Department of Transportation (MDT), and the Confederated Salish and Kootenai Tribes (CSKT) on how to improve US Highway 93 from Evaro to Polson, Montana. All but a one-half mile segment of the project is located within the Flathead Indian Reservation, the homeland of the CSKT.

The three governments reached agreement on all major design decisions regarding conceptual roadway improvements, including land configurations, design features, and mitigation measures for the highway. This agreement covered 41.4 miles of the 56.3-mile road section; the Ninepipe wetlands complex and the town of Ronan, which is located on the northern edge of the wetlands, were excluded from the discussions and a supplemental EIS was implemented for these areas.

The MOA include five major sections:
- Landscape Architects Design and Alignment Concepts
The three governments agreed to continue to work together in order to implement the concepts and philosophy established in the MOA.

**Spirit of Place – Understanding the Meaning of a Place**

Jim Sipes, Jones and Jones, Architects and Landscape Architects

In order to be respectful of the land, the people, and the wildlife, six initial goals were established for the US 93 project:

- Develop an understanding of the land and the relationship the Salish and Kootenai people have with the land.
- Find ways the land can shape or influence the road.
- Develop concepts that respect the integrity and character of the place, people, and wildlife.
- Restore habitat areas that have been fragmented by the road and surrounding development.
- Respect and restore the way of life in small communities along the road.
- Create a better visitor understanding of the place that the Salish and Kootenai people call their homeland.

One of the first steps was a review of reports, studies, surveys, photographs, and other documents related to the highway corridor and the natural resources. In addition, an initial reconnaissance of the highway corridor was conducted to identify scenic, aesthetic, and cultural resources. This review and reconnaissance helped build a strong base of knowledge that served as the foundation for subsequent design discussions and decisions.

**Spirit of Place**

Before any design concepts for the road were conceived, it was essential to get a better understanding of the land, what makes it unique, and how the Salish and Kootenai people relate to the land. The design of the reconstructed highway is premised on the idea that the road is a visitor and that it should respond to and be respectful of the land and the Spirit of Place. Understanding the Spirit of Place — the whole continuum of what is seen, touched, felt, and traveled through — provides inspiration and guidance, and leads to design solutions uniquely suited to the special qualities of the place. The Spirit of Place includes more than just the road and adjacent areas; it consists of the surrounding mountains, plains, hills, forest, valley, and sky, and the paths of waters, glaciers, winds, plants, animals, and native peoples. The Spirit of Place encompasses the entire Mission Valley, Mission and Salish Mountains, Jocko Valley, and Rattlesnake Divide. This broader environmental continuum has distinct landscapes like large outdoor rooms, which the existing road bisects.

**Landscapes**

By examining the Flathead Reservation’s big “rooms,” we were able to define 14 landscapes, each with its own unique visual and physical characteristics. These landscapes have visual and ecological qualities that the road must respond to and respect. The informal landscape place references used in the graphic are derived from a dominant landscape feature or characteristic, and from design team and committee input. By looking at these individual landscapes, ideas began to form of how the road should be influenced by, and respond to, the land.

The Pablo Pines landscape, for example, is characterized by pine-covered sand hills that were formed when winds blew down off the glaciers that created Flathead Lake. In this area, a responsive design approach would maintain and restore the pines and rolling character of the sandy hills close to the road. This would also increase the perception that the road is integrated with the land rather than slicing through it. In contrast, the Ronan Spring Creek landscape consists of gently rolling low hills of pasture and cropland, and the road should reflect this rolling, undulating character.

**Cultural and Historic Resources**

One aspect of this project that makes it so unique is that the highway is located entirely within the Flathead Indian Reservation. As a consequence, much of our research focused on the cultural and historic resources of
the area. The CSKT wanted to ensure cultural concerns were addressed in the design alternatives without having to identify individual ritual and sacred sites. After considering several options on how to communicate the cultural importance, the decision was made to associate cultural information with wildlife issues. As a result, discussions about wildlife habitat, wildlife migration, and habitat restoration imparted cultural issues and concerns as well.

Wildlife Crossing Research
In the United States, an estimated one million vertebrates-amphibians, reptiles, birds, and mammals are killed on roads and highways each day. In short, roads have a tremendous impact upon wildlife. American Indians are particularly sensitive to this issue. Since the CSKT recognize the Flathead / Mission / Jocko Valleys are their homeland as well as the homeland for a variety of wildlife, it was important that any new road design allow wildlife to cross the road safely. Roads disrupt natural migration patterns, destroying habitat areas and connections between habitat patches. Due to the impacts of roads, populations of some species have declined dramatically, ecological balance has been changed, and wildlife is being forced into more developed areas where human-wildlife encounters have increased considerably.

By working with scientists and wildlife specialists, we were able to identify habitat areas and migration patterns for specific wildlife. In particular, we looked at road-kill data, tracking information, and sightings to determine where wildlife currently crosses the US 93 corridor. We also were interested in identifying historic migration patterns that have been interrupted by the current US 93. Perhaps it would be possible to restore those traditional wildlife movement patterns if the road was not such a barrier.

We also analyzed current construction techniques for wildlife crossings in order to determine an approach that would work best for US 93. In particular, we studied the wildlife crossings that have been developed for several different highway projects, including the Linn Cove Viaduct (Blue Ridge Parkway, North Carolina), Interstate 70 (Glen Canyon, Colorado), Interstate 75 (Florida), Trans-Canada Highway (Banff, Canada), US Highway 2 (Montana), and State Highway 58 (San Bernadino County, California). (Fish and Wildlife Crossings – Examples of crossing structures, pp.13-17) Various types of crossing structures were evaluated as to their size, cost, design intent, types of animals they are suitable for, the effectiveness of a specific type of crossing, and what animals use the crossings. In doing this evaluation, we could begin to make determinations about which types of crossings are best suited for specific situations along US 93.

Cultural and Historic Resources Wildlife Crossing Research Landscapes
All of this research was incorporated into the design and alignment concepts, and the result was a series of proposed wildlife crossing structures for the entire length of the project. Each individual crossing is presented in greater detail in the Wildlife Crossings Workbook. For many of the wildlife crossing structures to function properly, it will be necessary to use some type of fencing to help control movement and funnel wildlife toward the crossing structure. Eight-foot high page wire fencing designed specifically for wildlife control is recommended for segments of the reconstructed US 93. This fencing is similar to that used for the Trans-Canada Highway in Banff.

Opportunities and Constraints
The inventory and analysis phases of the project lead to the delineation of “Opportunities and Constraints” areas based on the landscape and cultural context. The opportunities and constraints mapping identified zones of opportunity where natural, cultural, and scenic resources can be dodged or only minimally affected by potential highway improvements, and areas of constraint where resources would be adversely affected by highway improvements. This information was used as the basis for developing initial design concepts for the reconstructed road and roadside improvements and visitor amenities.

In order to make the project more manageable, the 14 landscapes were combined into five separate design segments. The five segments are as follows:

- Evaro Design and Alignment Concept
- Arlee to Ravalli Design and Alignment Concept
- St. Ignatius Design and Alignment Concept
- Ninepipe Design and Alignment Concept
- Ronan to Polson Design and Alignment Concept
Design and Alignment Concepts
For each design segment, we explored a wide range of design concepts and recommendations for the reconstructed road. The three governments agreed that all design concepts should be considered unless there was consensus to remove one from consideration. An iterative process was developed for each design segment that consisted of generating the conceptual ideas, reviewing those concepts with the three governments – Federal Highway Administration (FHWA), Montana Department of Transportation (MDT), and the Confederated Salish and Kootenai Tribes (CSKT) – and then refining the design concept.

In formulating the design concepts over the length of the road corridor, a decision was made to start on the south end of the reservation at the community of Evaro and proceed north with the concept development. For each of the five design segments, ideas and concepts were generated for road alignment, lane configuration, fish and wildlife crossing structures, wildlife fencing locations, interpretive opportunities, community entry signs, and other roadway features.

In addition to the general recommendations for the five design segments, detailed concepts were developed for specific areas along the corridor where there were special concern. Following is a brief overview of the places where additional focus was needed to address the unique conditions and issues associated with that place.

- The Evaro Hill area is a major wildlife corridor that links the grizzly populations of the Mission Range / Bob Marshall to the Bitterroot grizzly bear recovery zone to the west. How wildlife crossings are incorporated into the road design is critical if wildlife is going to be able to move safely through the area.
- In the community of Arlee, we looked at how a “couplet” could improve traffic flow and safety while maintaining the visual and physical character of the community.
- Ravalli Hill was identified as a possible site for a new visitor center; our concept was to relocate the visitor center to the west of the existing road in order to take advantage of views of the mountains and valley, and to have closer proximity to the Bison Range.
- The Ninepipe area is significant from both a cultural and ecological standpoint. Because of the sensitivity and complexity of the thousands of potholes that make up this rich and diverse habitat, it was imperative to look at the highway within the context of the surrounding landscape. Due to the ecological importance of the wetland complex, the appropriateness of mitigating problems caused by the current alignment came into question. As a result, an alignment that would swing westward around the wetland complex was also considered. Both of these concepts were explored on a conceptual level in order to determine the most appropriate actions for the Ninepipe area, and to see if additional research was needed before final design decisions could be made.

For the community of Ronan, alignment concepts were evaluated for a full range of alternatives, including keeping the new road on existing alignment with some improvements to providing a bypass around the community. In Pablo, a cross-section was developed to accommodate four lanes of traffic while still maintaining the character and identity of the community. For the highway segment between Caffery Road and Route 35, we were concerned with integrating the horizontal and vertical alignment of the reconstructed road with the hilly terrain and maintaining views of Flathead Lake.

Use of Design and Alignment Concepts
These Landscape Architects Design and Alignment Concepts represent a consensus among the three governments – FHWA, MDT, and CSKT – regarding the design direction and standards for the reconstruction of US 93 from Evaro to Polson. What are not shown are the dozens of ideas and concepts that were explored and evaluated. Some of these concepts were quickly discarded, others were revised, discussed, and then rejected, and finally some evolved into the design and alignment concepts contained in this document.

Since it was important that the entire project setting be seen as a whole (Sense of Place Continuum), decision-making was never broken into increments. Final consensus was not sought until design and alignment concepts had been developed for the entire corridor.
A Design Components Workbook was completed to record the spatial location of the components (as recommended in the Landscape Architects Design and Alignment Concepts herein) as well as specific areas for land use control and environmental mitigation identified by the CSKT. Design Guidelines and Recommendations build upon the ideas established in the Landscape Architects Design and Alignment Concepts and are intended to provide landscape architects, designers, planners, engineers, and others involved with transportation-related activities on the Flathead Indian Reservation with a consistent design philosophy and design style.

The Design Guidelines and Recommendations define a collective vision of how the US 93 corridor from Evaro to Polson, Montana will be experienced by both locals and visitors. This document is intended to provide a foundation for the development of a unified and unique identity for U.S. Highway 93 on the Flathead Indian Reservation from Evaro to Polson, MT. The document primarily gives guidance at a conceptual level. It is a starting point for the development of final design details. Although safety and design standards will change over time, every reasonable effort should be made to assure that the spirit of the concepts presented here are manifest in the final design.

The intent of these guidelines is to provide designers, planners, engineers, and others involved with transportation-related activities on the Flathead Indian Reservation with a consistent design philosophy and design style. If the guidelines are used appropriately and follow the design philosophy established for the project, then the result will be that Sense of Place encompasses everything from the basic alignment of the road to the smallest detail of a bridge structure, habitat area, place name sign, or wildlife crossing.

**Wildlife Issues Related to the Reconstruction of US Highway 93 on the Flathead Indian Reservation**

Dale Becker, Confederated Salish and Kootenai Tribes

The ancestors of the current members of the Confederated Salish and Kootenai Tribes have lived in what is today the northern intermountain region since time immemorial. The day-to-day existence of these people was tied inextricably to the natural resources of this area (Fahey 1974). The abundant wildlife resources provided for subsistence, cultural and spiritual needs of the people. As a result, their lives were intertwined with those of the animals native to the area, and their activities, movements, lifestyle and health depended upon the animals. As a result, wildlife resources play dual roles, being considered as both natural and cultural resources by the Tribes. Even though the Tribes make the Flathead Indian Reservation their homeland today, they also continue to care deeply about their aboriginal territory and the animal inhabitants there. Tribal members also continue to rely heavily upon the wildlife resources, both on and off of the Flathead Indian Reservation.

The proposal for the reconstruction of a 57-mile portion of U.S. Highway 93 located on the Flathead Indian Reservation resulted in consideration of a wide variety of issues and concerns related to wildlife and wildlife habitat (Becker et al. 1993, Becker 1996; Federal Highway Administration and the Montana Department of Transportation 1995). The proposals for various alternative alignments of the highway right-of-way each passed through a diverse array of habitats. As a result, numerous concerns about potential adverse impacts of highway reconstruction related to direct mortality of wildlife, habitat loss and degradation, habitat fragmentation and cultural erosion. The cultural perspective had a direct link to the wildlife issues due to the strong role that wildlife has always played in tribal culture.

The other panel members discussed the technical and design factors from the perspectives of highway design and construction engineering. The details of this project that relate to wildlife and habitat concerns involved with planning for the project are the subject of this paper. The process involved with Highway 93 reconstruction provides excellent examples of some potential pitfalls, problem-solving, innovative thinking, and hopefully useful ideas for other similar projects elsewhere.

The Flathead Indian Reservation

Under the terms of the Treaty of the Hellgate of 1855, the Flathead Indian Reservation was created as a permanent homeland for the Salish, Kootenai and Pend O’Reille people. Under that treaty, the Tribes relinquished ownership to most of Montana lying west of the Continental Divide, as well as portions of eastern Idaho and Washington in return for exclusive use of the lands encompassed within the reservation boundaries to the United States government. Later, allotment of Indian lands, government withdrawals, and finally...
opening of the Reservation to settlement resulted in substantial permanent changes to the environment of the Reservation. Those changes continue today, and they relate directly to the Highway 93 reconstruction project.

The Flathead Indian Reservation encompasses approximately 1.25 million acres (505,875 ha.) within its exterior boundaries. The land base is comprised of a wide variety of habitats ranging from semi-arid shrub-grasslands, agricultural lands, diverse wetlands, riparian habitats, and sub-alpine habitats. It consists of four distinct valley complexes bounded by mountains. The primary subject of this discussion is the eastern side of the Reservation, where the exiting and proposed alignments are located. A dominant feature forming the eastern boundary of the Reservation is the Mission Mountain Range, which ranges up to 9,820 feet (2,994 m) above sea level and the Rattlesnake Range to the south.

The dominant land use of the valleys to the west of these mountain ranges is agriculture, predominantly irrigated and dry land farming and livestock production. A significant geological feature is the extensive wetland complex centered around Ninepipe and Kicking Horse Reservoirs. Several small rivers and streams drain into the Flathead River, which bisects the Reservation.

The Reservation provides a diverse array of habitats for a large number of wildlife species. This fauna includes 309 species of birds, 66 species of mammals, 9 species of amphibians, and 9 species of reptiles (Tribal Wildlife Management Program, unpublished data).

Direct Wildlife Mortality Issues
Wildlife utilize the entire Highway 93 corridor on the Reservation, as indicated by observations and by the number of road-killed deer, bears, turtles, small mammals, non-game and game birds and other species that one observes within the right-of-way each day. There are, however, a number of areas that receive higher levels of wildlife use than others and exhibit a corresponding increase in vehicle-related wildlife mortality. To analyze the severity of mortality, logs of Tribal conservation officers and Montana Department of Transportation maintenance personnel were reviewed. In addition, incidental observations of Tribal Wildlife Management Program staff members were reviewed. Pertinent observations of Tribal Elders and other local people were also sought.

This effort assisted with the preparation of maps of the entire highway route with areas of high and repeated wildlife mortality problems designated. In addition, an analysis of habitat features, such as vegetative cover and hiding cover indicated where animals might be expected to attempt to cross the highway. As an example, at one section of the highway, the Evaro area, these factors in addition to winter tracking data and other wildlife survey results assisted with the determination of areas most likely to be used as wildlife crossings by wildlife. In addition, remote-sensing cameras placed near wildlife trails provided added insight about the numbers and species of animals using the trails (Becker et al. 1993). Collectively, the information provided by these methodologies assisted in indicating where animal use was occurring and the degree of that use.

Big game mortality was somewhat random, but tended to be linked closely to the habitat features adjacent to the right-of-way. Most deer and bear mortality was linked to adjacent riparian areas or other forested cover types. Deer were also killed in open agricultural habitats, but this mortality generally occurred near adjacent cover.

The Flathead Indian Reservation hosts four terrestrial species listed as endangered or threatened by the U.S. Fish and Wildlife Service – the grizzly bear (Ursus arctos horribilis), the northern gray wolf (Canis lupus), the bald eagle (Haliaeetus leucocephalus), and the Canada lynx (Lynx canadensis). At the time of the onset of the environmental analysis for this project, the peregrine falcon (Falco peregrinus) was also listed. Additionally, during the period since the analysis began, the bull trout (Salvelinus confluentus) has been listed.

Although Highway 93 passes through habitats used by each of these species, the only known mortality of a listed species known were a sub-adult female grizzly bears, killed by an automobile in the Ninepipe Reservoir area in 1999, and a sub-adult female grizzly bear killed in 2001 near the same area. Other mortality of listed species may have occurred, but no records of these exist.

The Ninepipe-Kicking Horse Wetland Complex exhibited a high level of wildlife mortality of wildlife, with nearly every local species represented as a road-kill at least once. Of particular significance was the high mortality
rate of western painted turtles each summer. Conservative estimates of this mortality were a minimum of 300 per year, based upon direct counts of road-killed animals (Tribal Wildlife Management Program, unpublished data). Numbers of some avian species, particularly passerines, waterfowl, shorebirds and raptors, which inhabit the natural and borrow pit wetland habitats adjacent to the highway, was also a concern. Several species of small to medium-sized mammals were also regularly killed by traffic on the highway in this area. The segment of the planned reconstruction project in this area is still undergoing study due to continuing unresolved issues among the three governments – the Confederated Salish and Kootenai Tribes, Montana Department of Transportation and Federal Highway Administration - on alignment of the highway through the area.

Wildlife Habitat Issues
Wildlife habitat issues were grouped into two categories – habitat loss or degradation and habitat fragmentation. Habitat loss was anticipated within the right of way and immediately adjacent to it in areas where construction activities are planned. Habitat degradation is more subtle and harder to document. The fact that the highway will largely follow the existing right-of-way will limit habitat loss to some degree, although wider rights-of-way will result in some additional loss of adjacent habitats. With regard to wetland and riparian habitats, the Tribes’ Wetland Conservation Plan (Confederated Salish and Kootenai Tribes 2000) requires that impacts be avoided whenever possible. If these impacts are unavoidable, mitigation will be undertaken to replace or restore a given amount of wetland habitat.

Habitat fragmentation has already occurred with the existence of the highway in its present configuration and alignment. The amount of traffic on the highway and the lack of any substantial existing wildlife crossing structures results in fragmentation of adjacent habitats, be they grassland, wetlands, riparian or forest habitat. This fragmentation is indicated by the fact that wildlife is being killed on the highway as animals attempt to cross the right-of-way.

Mitigation Proposals

Mitigation for Wildlife Mortality
The sites of documented wildlife mortality, especially multiple recurring mortality, indicate the location of many, if not most wildlife passage problems. To alleviate these problems to the greatest extent possible, a number of different design features are being included in the reconstruction plans for Highway 93. Collectively, these design features will be utilized to both decrease the amount of wildlife mortality caused by traffic on the highway, as well as to mitigate for the habitat loss, degradation and fragmentation that currently exists.

Crossing Structures
The plans for the reconstruction of the highway will include construction of 42 metal pipe culverts or concrete box culverts of a design that will facilitate wildlife crossing the highway. Seven bridges, ranging from 40 to 400 feet (12-120 m) in length and a minimum 12 feet (3.5m) of height clearance to facilitate wildlife passage and re-vegetation will be constructed across the larger rivers and streams that bisect the highway. Finally, one over-crossing structure with a width of 150 to 200 feet (45-60m) will also be constructed. These plans were developed under the Memorandum of Agreement between the Tribes, the State of Montana and the Federal government (Montana Department of Transportation, Confederated Salish and Kootenai Tribes and the Federal Highway Administration 2000). Each of these structures will be designed and placed to ensure wildlife passage opportunities across the highway right-of-way by a variety of the local wildlife species. Many of the concepts for these structures and those discussed below were originally developed elsewhere, but the specific locations and concerns locally, in addition to more recent ideas and data from similar structures will likely dictate some changes in design features.

Drift Fencing
Plans for mitigation of wildlife mortality also include construction of 8-foot (2.5 m) high page mill wire fencing with wing fencing at terminal locations to accompany the crossing structures described above. The fencing will be placed to encourage wildlife movement toward the crossing structures. In areas in which burrowing or digging animals are a concern, extension on the lower sides of the fencing will be added and buried to discourage breaching of the fencing.
Signing

Informative signing will take two forms – signs to warn motorists of potential wildlife hazards and signing to inform motorists of wildlife crossings. Warning signs will alert motorists regarding potential wildlife hazards in the highway right-of-way. Informative signing will assist motorists in learning about the presence of wildlife crossing structures, as well as the rationale for their construction.

Wildlife Escape Structures

Regardless of the presence of wildlife crossing structures, it is inevitable that wildlife will occasionally enter the right-of-way. To deal with such situations, wildlife fencing will be constructed to assist wildlife in moving away from the highway toward jump-out structures that will allow them to exit through the fencing and leave the right-of-way. These types of structures have been installed elsewhere and have exhibited use and success by big game animals.

Monitoring and Research – Because of the number and types of wildlife crossing structures anticipated for this project and the need to evaluate the utility and degree of use of the various designs an extensive monitoring effort is being developed. Several opportunities for research to assess the use of the structures by wildlife and their impact upon wildlife use will be possible. The three governments, academic institutions and other entities to achieve the greatest degree of knowledge possible will coordinate research and monitoring efforts.

Mitigation for Habitat Loss or Degradation

The primary habitat mitigation associated with the proposals for the reconstruction of Highway 93 is associated with anticipated loses of wetland habitat due to construction activities. The Confederated Salish and Kootenai Tribes' Wetlands Conservation Plan (Confederated Salish and Kootenai Tribes 2000) outlines an approach that preserves and mitigates for adverse impacts to wetland and riparian habitats. This plan established a goal of halting the loss of the remaining wetland and riparian habitats and the decline in wetland and riparian quality on the Reservation. The long-term goal of the plan is to increase the acreage of wetlands and riparian areas and improve the quality of these habitat resources. It outlines a strategy for conservation and mitigation of adverse impacts upon wetland and riparian habitats, as well as procedures to address these issues.

Habitat fragmentation is a constant concern on the Flathead Indian Reservation, and fragmentation due to land uses, highway and road construction and subdivision activities are major issues (Confederated Salish and Kootenai Tribes 1994, 1996). The Tribes’ concerns related to these issues have a direct bearing on the Highway 93 Reconstruction project. As a result, the Tribes utilize a variety of policies and planning tools on Tribal lands manage human growth pressures, habitat degradation issues and highway construction impacts and subdivision pressures. Because much of the Reservation consists of non-Tribal lands, the Tribes also work closely with other appropriate governmental agencies at the local, county, state and federal levels in an attempt to decrease the adverse impacts of some of these activities upon Tribal resources.

Conclusions

The planning effort for the reconstruction of U.S. Highway 93 through the Flathead Indian Reservation has been a long and arduous task that continues toward resolution. The insistence of the Tribes that the highway be designed as a safe and environmentally friendly road instead of other potential alternatives sets the stage for a new vision for future highway designs. Ongoing activities occurring elsewhere indicate that the ability and innovation to actually do something positive for wildlife and habitat in designing a highway is both possible and practical. These activities are certainly preferable to merely paving a sterile right-of-way over the shortest route between two points and allowing the impacts of such an approach to occur. As a result, possibilities for designing and building a highway that lays well on the land and assists in solving many of the attendant environmental issues seem to be at hand with regard to the U.S. Highway 93 reconstruction project.

MOA and Context Sensitive Design

Dale Paulson, Federal Highway Administration

You have now heard our story of US 93 and the wildlife protection measures designed into what we hope will be a successful project. For those of you who would like more information of the Memorandum of Agreement (MOA), it can be found at www.skillings.com; go to Current Projects, click on Montana, then select US 93 MOA.
Where do we go from here??
Starting right now, with the completion of the reevaluation of the EIS, designs are beginning. We hope to have designs complete by the end of next year and rights-of-way done so construction can begin in the spring of 2004, two-and-one-half years from now. As for the wildlife protection measures, we hope to start some baseline monitoring this coming year. Funding for that is still up in the air, but Western Transportation Institute (WTI) has taken the lead. They have put together a very good plan on the possibilities for a complete study. Our hopes are that this monitoring effort will lead to some BMP’s that can be used elsewhere in Montana and the nation. I hope that at future conferences we will be able to report on the knowledge that we have gained from this joint effort.

ICOET (The MOA and Context-Sensitive Design)
The previous speakers have discussed cultural, technical and design features of the US 93 project, now let’s discuss how the MOA ties the process together to develop a project that will be sensitive to the context of the area. Cooperation between FHWA, MDT and the Confederated Salish & Kootenai Tribes resulted in an MOA that sets forth concepts that will facilitate streamlining the development and construction of US 93 through the Flathead Indian Reservation.

A major element for success was developing a project that benefits all of the stakeholders. The improvements in the US 93 corridor include measures that increase vehicular safety, reduce congestion, respect culturally significant areas, allow wildlife passage and maintain the nature and spirit of place. In engineering language this is context-sensitive design. Context-sensitive design (CSD) has gained broad acceptance in the transportation community. It involves understanding the “context” through which the transportation facility travels, and developing a design that responds to that context.

The MOA’s context-sensitive design approach resulted in guiding principles for developing a carefully and imaginatively designed project that serves traffic demand, is safe, respects the natural environment and is viewed as an asset by those that use it. On January 14, 2001, shortly after the MOA was signed, the Missoulian, a local paper carried a feature story headlined as “US Highway 93 Expansion” - “Kinder gentler project.” This headline illustrates that the context-sensitive design objectives envisioned by the MOA are well on their way to being achieved.

The MOA is just the beginning of the process. From here, the process will include environmental analysis, design, public involvement, resolution of right-of-way issues, funding procurement and construction of the project.

A re-evaluation of the EIS, which includes public involvement, will soon be completed and a supplementary EIS is underway for the section of the corridor that includes the Ninepipes wetland complex. The Supplemental EIS will address significant issues that include the listing of additional endangered species and a heightened awareness of extensive cultural and environmental issues unique to the Ninepipes area. The SEIS will specifically explore alternatives to the current alignment that could skirt the most densely populated pothole portion of the Ninepipe glacial pothole wetland complex. The document will also address the social and economic impacts that will result from proposed new alignments. The SEIS scoping process quickly revealed that changing the alignment would be controversial.

Nine consultant design contracts are planned for the portions of the corridor covered by the EIS re-evaluation. The three governments established a Technical Design Committee (TDC) to oversee the work of the consultants. The TDC consists of three permanent representatives, one appointed by each government, and of temporary representatives that may from time to time be invited to participate by the TDC’s permanent representatives. The TDC may invite other representatives from Missoula County, Lake County, the City of St. Ignatius, the City of Ronan, the City of Polson, the Montana Department of Fish, Wildlife, and Parks, or the U.S. Fish and Wildlife Service, to join the TDC when US 93 improvements are within their jurisdictional area. The TDC’s purpose is to oversee the development of the project to insure that it is developed in accordance with the MOA.
Research is also an essential element of this project. If approaches to wildlife crossings along US 93 are found to be effective the results may have a broad application and could result in a toolbox of best practices for many projects in the Northern Rockies. The US 93 corridor is an excellent laboratory for implementing wildlife strategies because of the ecosystem and the 56-mile length of the corridor. This project is similar in context to many other locations and lessons learned will be easily adapted to other projects.

In order to accelerate the actual construction of improvements to the corridor, MDT intends to use its existing bonding authority to generate $125 million to be repaid with future Federal-aid apportionments through use of the Garvee bonding provisions. Using this innovative financing tool, MDT hopes to proceed as quickly as possible into construction on this extremely important corridor.

Finally, remember that context-sensitive design is a collaborative interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic, cultural and environmental resources while maintaining safety and mobility. CSD is an approach that considers the total context within which a transportation project exists.

References


