

## MEETING ENVIRONMENTAL REQUIREMENTS AFTER A BRIDGE COLLAPSE

AUGUST 2008



Prepared for:  
Office of Project Development and Environmental Review  
Federal Highway Administration  
U.S. Department of Transportation



Prepared by:  
John A. Volpe National Transportation Systems Center  
Research and Innovative Technology Administration  
U.S. Department of Transportation

## Table of Contents

ABBREVIATIONS .....	3
ABSTRACT .....	1
INTRODUCTION .....	1
AN EMERGENCY CAN RESOLVE MAJOR CAUSES OF DELAY .....	2
GOOD PRACTICES FOR STAYING PREPARED FOR AN EMERGENCY .....	7
CASE STUDIES .....	8
Florida I-10 Bridge over Escambia Bay .....	9
Minnesota I-35W Bridge Collapse, Minneapolis .....	11
Mississippi U.S. 90 Biloxi Bay Bridge and Bay St. Louis Bridge .....	15
Oklahoma I-40 Bridge Crossing the Arkansas River.....	17

## **ABBREVIATIONS**

CE – Categorical Exclusion  
CFR – Code of Federal Regulations  
CRU – Cultural Resources Unit  
DOT – Department of Transportation  
ESA – Endangered Species Act  
EA – Environmental Assessment  
FONSI – Finding of No Significant Impact  
FDEP – Florida Department of Environmental Protection  
FDOT – Florida Department of Transportation  
FEMA – Federal Emergency Management Administration  
FHWA – Federal Highway Administration  
MnDNR – Minnesota Department of Natural Resources  
MDOT – Mississippi Department of Transportation  
MnDOT – Minnesota Department of Transportation  
MOA – Memorandum of Agreement  
MOU – Memorandum of Understanding  
MnPCA – Minnesota Pollution Control Agency  
NEPA – National Environmental Policy Act  
NMFS – National Marine Fisheries Service  
NOAA – National Oceanic and Atmospheric Administration  
NPDES – National Pollutant Discharge Elimination System  
NPS – National Park Service  
SDOT – State Department of Transportation  
SHPO – State Historic Preservation Officer  
USC – United States Code  
USCG – United States Coast Guard  
USACE – United States Army Corps of Engineers  
USFWS – United States Fish and Wildlife Service

## ABSTRACT

This report is intended to assist transportation and environmental professionals in the event of a bridge collapse or similar emergency. It analyzes the environmental review process in five cases of bridge reconstruction following collapse in Florida, Minnesota, Mississippi, and Oklahoma. The report describes how the key elements of the environmental review process in the cases reviewed were completed comparatively quickly. It finds that when emergencies occur they create a sense of urgency on the part of all stakeholders that leads to a consensus on the prioritization of the project. This report identifies several effective practices that allowed sponsor agencies to expedite the environmental review process. They include:

- Implementing processes and agreements that lead to regular dialogue among state and federal transportation and resource agencies and establish strong working relationships before emergencies occur;
- Limiting the scope of projects to reduce the potential for new environmental impacts or disagreements;
- Using contracting mechanisms that offer opportunities to quickly respond to emergency situations;
- Maintaining up-to-date inventories of historic, cultural and natural resources to quickly identify the potential impacts of proposed designs;
- Establishing formal and informal emergency procedures that clearly identify roles and responsibilities helps to expedite the environmental review process; and,
- Networking with peers from other states.

## INTRODUCTION

Two short months after the collapse of Minnesota's Interstate 35 West (I-35W) Bridge, the Minnesota Department of Transportation (MnDOT) entered into a contract for bridge design and construction. During those two months, MnDOT was able to complete the entire environmental review process while holding this project to the same standards required of any project similar in scope and scale. The startling speed of the environmental review process demonstrated that, in emergencies, the timeframe necessary for environmental review can be reduced drastically from several years to several months or several weeks.

Since 2002, five bridges have collapsed in the United States:

1. I-35W Bridge over the Mississippi River in Minneapolis, Minnesota; collapsed in August, 2007, cause not yet determined
2. I-10 Bridge over Escambia Bay, Florida; destroyed by Hurricane Ivan in September, 2004
3. I-40 Bridge over the Arkansas River near Webbers Falls, Oklahoma; partially collapsed after being struck by a barge in May, 2002
4. U.S. 90 Bridge over Biloxi Bay in Mississippi; destroyed by Hurricane Katrina in August, 2005
5. U.S. 90 Bridge over St. Louis Bay in Mississippi; destroyed by Hurricane Katrina in August, 2005

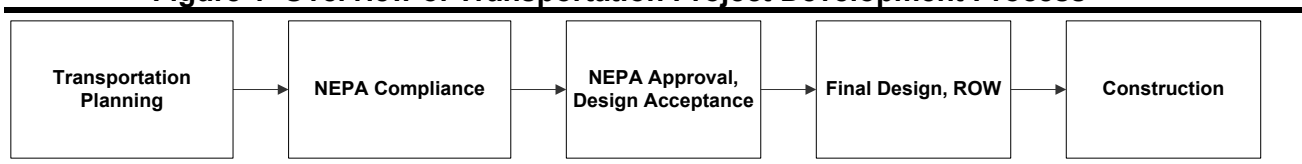
This report describes how the key elements of the environmental review process in the cases reviewed were completed comparatively quickly. This report is intended to assist transportation and environmental professionals in the event of a bridge collapse or similar emergency.

The next section of this report provides an overview of the transportation project development process and identifies the major causes of project delay. The third section describes “lessons learned” for expediting environmental review processes after a catastrophic failure of an infrastructure element. The final section presents four case studies of the five bridge collapses occurring since 2002.<sup>1</sup>

## AN EMERGENCY CAN RESOLVE MAJOR CAUSES OF DELAY

The project development process requires defining the purpose and need for a proposed project; determining its scope and location; and, identifying measures to recognize, avoid, minimize, and mitigate its environmental impact. Decisions made during the project development, summarized in Figure 1, help to determine the major features of the process.

**Figure 1 Overview of Transportation Project Development Process**



Extensive research has been completed regarding where and why delays in the project development process occur and how they can be alleviated. Research studies, including a 2000 FHWA nationwide inquiry,<sup>2</sup> point to several factors that frequently cause significant project development delays. The table below presents the major causes of delay and indicates which apply to non-emergency situations and which apply to emergency situations.

**Table 1 Major Causes of Delay**

Major Causes of Delay	Non-Emergency	Emergency
Lack of funding or low priority	√	
Local controversy	√	
Stakeholder and/or local opposition	√	
Insufficient political support	√	
Project complexity	√	√
Poor consultant work	√	√
Environmental review	√	√

In the cases described in this report the first four factors listed in Table 1 did not cause delay because the urgency of the projects created consensus on the need for prompt action. In each case, rebuilding the collapsed bridge was clearly a high priority for the public, transportation and resource agencies, and high-level decision-makers. The prioritization of the project by all stakeholders was the most important factor contributing to expedited project development.

The immediate impact of the bridge collapses on everyday travel in each region contributed to the urgency felt by those involved in the project development process. To paraphrase many

<sup>1</sup> The Mississippi case study involves two bridge collapses.

<sup>2</sup> FHWA. *Reasons for EIS Project Delays*. September 2000. [www.environment.fhwa.dot.gov/strmlng/eisdelay.asp](http://www.environment.fhwa.dot.gov/strmlng/eisdelay.asp)

case study interviewees, “we knew that bridge reconstruction had to get done, so we did it.” In the first days and weeks following the bridge collapses, media coverage was immediate and constant. In most cases, the staff from relevant agencies quickly identified their role in the project development process and took the initiative to begin their work immediately without waiting for instructions from FHWA or the State Departments of Transportation (SDOT). This urgency extended to the public and high-level government officials. Several interviewees said that no one involved with the project wanted to be seen as obstructing the bridge reconstruction.

The Mississippi case was an exception, as the project development process was marked by some delay and controversy. Since Katrina’s destruction was thorough and widespread in Mississippi, residents and government agencies had to tackle the life and death issues of providing food, shelter, and other services to area residents before they could attend to reconstruction of damaged infrastructure. Pressure to change the alignment of the U.S. 90 bridge and pre-existing tensions between top officials in the state government and the Mississippi Department of Transportation (MDOT) led to political controversy that was absent in the other cases studied.

The last three causes of delay listed in Table 1—project complexity, poor consultant performance, and the environmental review process—could have delayed progress on bridge reconstruction. Fortunately, in each case, those involved in the process of bridge reconstruction were able to avoid these pitfalls so that they did not delay project development.

**Project complexity** was managed by limiting the scope of the project. Determining project scope can be the most controversial and time-consuming activity in the project development process. In the cases studied for this report, the states set strict limits on project scope early on—rebuilding the bridge from pier to pier without considering capacity expansions, realignment, changes to bridge approaches, etc. This eliminated controversy and the need for more extensive environmental review. Generally, there was little controversy around this decision because all stakeholders understood the importance of reconstructing the bridge and did not want to impede its progress.

One of the Minnesota Department of Transportation’s (MnDOT) earliest policy decisions was to place strict limits on the scope of the project. The project would reconstruct the bridge from pier to pier on roughly the same alignment. No operational changes were considered other than adding an auxiliary lane in each direction. However, the bridge was designed to provide the width necessary to accommodate future transit options such as Bus Rapid Transit, High Occupancy Vehicle lanes, managed lanes, Light Rail Transit, etc.

In Florida, the Florida Department of Transportation (FDOT) was considering widening the Escambia Bay bridge before Hurricane Ivan destroyed it. FDOT took advantage of bridge reconstruction to add a lane in each direction, although the capacity of the bridge remained limited by the capacity of the approaches. To limit the scope of the bridge construction project FDOT did not consider expanding the approach capacities as part of bridge reconstruction; FDOT may consider capacity expansion in the future.

Federal regulations regarding emergency relief funding (23CFR 668-Emergency Relief Program) limit which elements of bridge reconstruction are eligible for federal emergency funds. Limiting project scope helps to minimize the risk that the SDOT will include project elements not eligible for emergency funds. FHWA’s early involvement in the project development process ensured that eligibility requirements were met.

**Poor consultant work** had the potential to delay bridge reconstruction. However, the SDOTs took steps to mitigate the risk for delays (e.g., contract changes, lawsuits, etc.) caused by poor consultant work. For example, FDOT issued a fixed-price design-build contract that required the contractor to take all steps necessary to obtain the environmental permits. This meant that the consultant's work would be judged by the agencies responsible for issuing permits and would be required to meet the permitting standards. For the I-35W Bridge, MnDOT and FHWA staff wrote the environmental document and coordinated with the appropriate regulatory agencies.

**The National Environmental Policy Act (NEPA) Process**, the final potential cause of delay listed in Table 1 was managed by implementing streamlined processes for each of the six major steps in the NEPA process.

#### 1. Purpose and Need

The purpose and need of a project must be demonstrated to establish a basis for developing the range of reasonable alternatives required to meet environmental regulations. Since the projects in this study involved rebuilding pre-existing infrastructure, the purpose and need for all of the projects were obvious and non-controversial.

#### 2. Alternatives

The identification, consideration, and analysis of alternatives is necessary to make objective decisions about how best to address environmental concerns. In most of the cases, there were no significant environmental concerns that required evaluation of alternatives because the bridges were to be reconstructed along the same alignment as the collapsed bridge. The documentation required for the NEPA analysis was kept simple since new alternatives were not being considered.

#### 3. Mitigation of Environmental Impact

The NEPA process helps public officials make decisions based on an understanding of environmental consequences and take actions that protect, restore, and enhance the environment.<sup>3</sup> A prescriptive sequenced approach – avoid, minimize, repair or restore, reduce over time, and compensate – requires understanding the affected environment and assessing transportation effects throughout project development. For the cases included in this study, SDOTs were able to reach agreement very quickly with regulatory agencies concerning mitigation due to the limited magnitude of environmental impacts.

In Oklahoma, the primary impacts of the reconstruction project were along the Cherokee Nation owned banks of the Arkansas River. Following the bridge collapse, the Cherokee leaders notified ODOT and the FHWA that they would need to coordinate with the Cherokee Nation if the project might disturb the river banks. ODOT wanted to use a river bank as a staging area to store equipment and materials. The Cherokee Nation approved this use with the proviso that the river banks be returned to their previous state after construction.

#### 4. Interagency Coordination

The combined requirements of the NEPA of 1969 and Title 23 United States Code (USC) create stewardship responsibilities for the FHWA in carrying out its transportation mission. Title 23 restricts federal funding to those projects that meet certain engineering, environmental, and safety requirements. Under NEPA, as the lead federal agency and "owner" of the resultant environmental document, FHWA assumes responsibility for the integrity of the NEPA process.

---

<sup>3</sup> 40 CFR § 1500.1(b): Purpose

As lead federal agency in the NEPA process, FHWA is responsible for scoping projects, involving relevant agencies, developing consensus among a wide range of stakeholders with diverse interests, resolving conflict, and ensuring that quality transportation decisions are fully explained in the environmental document. These responsibilities require the FHWA to balance transportation needs, costs, environmental resources, safety, and public input to arrive at objective and responsible transportation decisions.

The four SDOTs interviewed for this report coordinated effectively among relevant agencies to fulfill the requirements of multiple environmental regulations as described below. Before the emergency situation, many of the agencies had been building strong working relationships and coordinating business processes that became invaluable during the emergency situation.

*Threatened and Endangered Species Section 7 Consultation* – The Endangered Species Act (ESA) Section 7 requires each bridge project to identify any threatened or endangered species that could be negatively impacted by bridge reconstruction. The I-35W, I-10, and Mississippi bridges all had threatened or endangered species near or on the bridge site. In each case, the United States Fish and Wildlife Service (USFWS) consultation indicated that any negative effect on these endangered species would be minimal and therefore would not require special mitigation activities.

Quick processing of the ESA Section 7 consultation was made possible by limiting the changes to the proposed new bridges so that they were similar to the collapsed bridges in terms of alignment and traffic volume. This meant that the new bridges' impacts on threatened or endangered species would not be substantially different from the impacts of the collapsed bridges. In some cases, there were ESA concerns regarding the demolition and removal of debris. In those cases, the agencies involved coordinated with each other to expedite permitting and issue recommendations to reduce the impacts to sensitive habitats. In Florida, for example, the contractor for the Escambia Bay Bridge decided late in the project development process to use explosives to remove the old bridge piers instead of removing them mechanically as originally intended. The explosions had the potential to negatively affect manatees and gulf sturgeon, both protected species. At the request of the resource agencies, the contractor was required to conduct the explosions in late summer and to use several techniques to monitor and avoid negative impacts. These included using "lookouts" to identify problems with the endangered species during the explosion and putting nets in the water to keep sea creatures from swimming into the explosion zone.

*Clean Water Act Section 403* – The National Pollutant Discharge Elimination System (NPDES) requires a SDOT to obtain a permit to discharge untreated storm water into a body of water. For the I-35W, I-40, and Mississippi bridges, general permits were issued under existing state/NPDES rules. In Florida, the Florida State Department of Environmental Protection (FDEP) required the Florida Department of Transportation (FDOT) to develop a storm water management plan for the bridge. Since it was impractical to install gutters on the bridge, FDEP allowed the FDOT to undertake a separate storm water treatment project to offset the untreated storm water from the bridge. FDOT, its contractor, and FDEP worked with the City of Pensacola to enhance an existing storm water retention pond that provided compensation commensurate with the discharge of untreated storm water from the bridge into the bay.

*Clean Water Act Section 404* – A Department of the Army permit pursuant to Section 404 of the Clean Water Act is required for the discharge of dredged or fill material into waters of the United States associated with bridges and causeways. A General Permit (Nationwide Permit) may be



issued for discharges that are incidental to the construction of bridges, provided the discharges were authorized by the U.S. Coast Guard (USCG) as part of the bridge permit. For all of the bridges in this study except the Biloxi Bay Bridge, United States Army Corps of Engineers (USACE) determined that disruption of silt would be incidental to construction activities and issued “general permits” without further analysis. The Biloxi Bay Bridge required a Standard Permit from USACE because construction of the bridge required dredging a channel and temporary filling of open waters for the construction of work platforms.

*Historic and Cultural Preservation “Section 106” Review* – Section 106 of the National Historic Preservation Act (16 USC 470f) requires federal agency officials to consider the effects of their actions on properties listed in or eligible for listing in the National Register of Historic Places. To receive federal funding, the SDOT is required to identify historically significant resources – “historic properties” that could be affected by the project. If historic properties might be impacted, the FHWA and the SDOT must consult with the State Historic Preservation Officer (SHPO) and other parties to seek ways to avoid, minimize, or mitigate adverse effects. The Section 106 review process may be concluded with a letter from the SHPO concurring that the project will have either “no effect” or “no adverse effect” on historic properties, or with a signed Memorandum of Agreement (MOA) among the FHWA, SDOT, SHPO, and if participating, the Advisory Council on Historic Preservation.

The Minnesota I-35W Bridge is near a historic rail yard that enabled Minneapolis to become a major grain processor in the 1800s. MnDOT agreed to measures that would minimize the negative impacts to the rail yard and several other historic properties. These measures were incorporated into a MOA signed by FHWA, MnDOT, SHPO, and the Minneapolis Heritage Preservation Commission. All parties expedited their review and signing of the MOA to allow construction to begin as quickly as possible. The MOA, which typically takes one month to negotiate, took only four days to complete.

*Coastal Resource Management Act* – Because the Florida and Mississippi bridges spanned the coastal zone of the northern Gulf of Mexico, they were required to comply with the Coastal Zone Management Act. Under this act, staff from the Office of Ocean and Coastal Resource Management of the National Oceanic and Atmospheric Administration (NOAA) reviews various activities that affect the coastal zone. This review ensures that the activities demonstrate “federal consistency” in that they represent a coherent set of activities aimed at improving coastal zone management consistent with federal regulations. The Coastal Resources Management Office has a consultant role in environmental regulations, to ensure that all regulations are met. Neither the Florida nor Mississippi projects created negative consequences for the coastal zone and therefore were not required to undertake any mitigation activities.

## 5. Public Involvement

Public involvement and a systematic interdisciplinary approach are essential parts of the development process for proposed actions.<sup>4</sup> State agencies must provide early and continuing opportunities during project development for the public to be involved in the identification of social, economic, and environmental impacts, as well as impacts associated with relocation of individuals, groups, or institutions. As agencies work to respond quickly to emergencies, it can be challenging to provide reasonable notice of public involvement activities and hearings.

Due to the urgency of events, the usual SDOT public involvement process was largely not followed in these cases. SDOTs exercised flexibility to keep the public apprised of agency

---

<sup>4</sup> 23CFR § 771.105(c)

activities. In many cases, SDOTs identified spokespeople to communicate information about the project to the media and stakeholders. In one case, staff responded to media and stakeholder inquiries 24 hours a day for up to one week after the event. The intense media coverage motivated all stakeholders to work together to return life to normal. No one wanted to be viewed as the deterrent to completing work in a timely manner. In Minnesota, however, there was a substantial amount of public involvement during project development. This included a series of open houses and public meetings in August and September 2007. MnDOT representatives reached out to federal, state, county, city and neighborhood groups to receive input on their concerns and vision for the reconstruction of the I-35W Bridge. In addition, the design consultant held a full-day Bridge Design Charette in late October 2007 to bring a balance of stakeholders together from area residential communities, businesses, government officials, civic groups, education interests and cultural institutions to make choices on aesthetic features for the project. The public involvement process continues through “sidewalk talks,” weekly informal meetings held at the construction site that allow the public to view bridge construction and ask questions of MnDOT staff.

#### 6. Documentation and Disclosure

Documentation and disclosure support and complement public involvement and interagency coordination. NEPA requires that federal agencies disclose the results of their analyses and the effects of project implementation on the environment. They must also solicit comments on the proposals from interested parties. Documenting the NEPA process provides for complete disclosure to the public; allows others an opportunity to provide input and comment on proposals, alternatives, and environmental impacts; and provides the appropriate information for the decision makers to make a reasoned choice among alternatives.

The FHWA deemed all but the Biloxi Bay Bridge in Mississippi a Categorical Exclusion (CE). MDOT conducted an Environmental Assessment of the project and later issued a Finding of No Significant Impact (FONSI) in November, 2005.

### **GOOD PRACTICES FOR STAYING PREPARED FOR AN EMERGENCY**

The cases studies provided many examples of effective environmental streamlining and stewardship practices that are useful and applicable in both emergency and non-emergency situations.

***Establish and maintain good working relationships between the SDOT, FHWA and other federal and state agencies.*** Interviewees stated that one of the most important factors in expediting the environmental review process was existing good relationships between their agency and other relevant federal and state agencies. With the foundation of good relationships, the SDOT staff was able to contact counterparts in other federal and state agencies and quickly reach agreement on how to move forward. These relationships created trust between agency staff that allowed the agencies to work together largely without conflict.

Those involved in the environmental review process understood the role of their agency and of the SDOT and FHWA. In most cases, staffs from the federal and state agencies were comfortable moving ahead without negotiations and instructions because of the trust and understanding developed through years of efforts to establish good working relationships between agencies. In some cases verbal agreements were accepted without waiting for written correspondence. Since developing the written agreements can take weeks, this saved time.

In the Minnesota and Florida cases, there was a long history of collaboration between the relevant environmental protection agencies. In Minnesota, an employee of the Minnesota Department of Natural Resources (MnDNR) worked in MnDOT's environmental division. This interagency relationship helped agencies to collaborate and move quickly on environmental reviews. Also, a USFWS staff member contacted the FHWA immediately to report that there were no threatened and endangered species issues in the area of the collapsed bridge.

In Florida, a long-standing committee composed of staff from FDOT and other state agencies met quarterly to address transportation-related issues. After the bridge collapse, these existing relationships played a significant role in environmental review. The trust and familiarity established by years of committee meetings allowed quick and transparent interactions during the I-10 bridge crisis.

In Oklahoma, staff from resource and transportation agencies spent a lot of time at the bridge site. This allowed them to meet several times a day in "circle meetings" to update each other and address problems. These "circle meetings" involved high-level agency staff who could make important decisions without consulting with their agency's headquarters.

***Network with peers from other SDOTs.*** Following the Oklahoma's I-40 bridge collapse, ODOT staff consulted with their Texas counterparts for suggestions and advice on how to approach debris removal and bridge reconstruction. Following the I-35W bridge collapse, MnDOT staff looked to ODOT to share their "lessons learned." Getting to know counterparts in other SDOTs and understanding their roles in the agency can facilitate "peer to peer" learning.

***Maintain up-to-date inventories of historic, cultural, and natural resources.*** In the MnDOT and ODOT cases, several state agencies maintained current and accurate databases of potentially sensitive historic, cultural, and natural resource locations and conditions. These inventories eliminated the need to conduct the sometimes time consuming studies required to identify sensitive locations and conditions. In addition to the inventories maintained by the SDOT, the states' historic preservation and natural resource agencies provided databases of potentially sensitive locations and conditions under their purview. Immediately after the bridge collapse, these agencies provided their information to the SDOTs, who quickly issued decisions concerning the scope and scale of necessary environmental review processes. These inventories were extremely important in expediting the environmental review process.

## **CASE STUDIES**

This section provides more detailed information about how Florida, Minnesota, Mississippi, and Oklahoma responded to bridge collapses. The Volpe Center conducted semi-structured telephone interviews (30-60 minutes long) with key staff from the various state and federal agencies involved (6-8 people per case) in the environmental review process for each bridge reconstruction effort. Interviewees were selected based on recommendations from FHWA field office staff and from recommendations made by interviewees.

These case studies provide background information about each emergency, followed by summaries of the environmental review and permitting processes. Each case study concludes with lessons learned in responding to the emergencies.

## ***Florida I-10 Bridge over Escambia Bay***

On September 16, 2004, Hurricane Ivan struck the Gulf Coast of Florida as a Category 3 hurricane. During the storm, a section of the Interstate 10 (I-10) Bridge crossing Escambia Bay collapsed into the water. The storm's high waters washed over the bridge's low vertical clearance and destroyed the bridge.

Built in March of 1968, the I-10 bridge across Escambia Bay was a twin fixed span structure with two lanes in each direction. The bridge was 2.7 miles long and stood 50 feet above sea level at its highest point and 12 feet above sea level at its lowest point. The bridge connected Escambia and Santa Rosa counties from west to east, serving daily commuter traffic to the City of Pensacola and Interstate travelers.

The alignment of the new bridge shifted slightly to accommodate height and width changes. It has three 12-foot lanes in each direction. The highest point on the new bridge is 125 feet above sea level. The lowest point is 25 feet above sea level.

### Environmental Issues

The new I-10 Bridge will lie mainly within the footprint of the previous bridge, significantly reducing the environmental impacts of the rebuilding project. After a review of the primary environmental factors and the proposed design, FHWA designated the rebuilding project a Type 2 Categorical Exclusion (CE).

Obstacles to the environmental review process included the presence of the endangered gulf sturgeon and West Indian manatee and the need for stormwater run-off compensation. A series of environmental permits granted by both state and federal agencies addressed these and other environmental concerns.

*Water Quality Certification* –This permit, issued by the FDEP, addresses stormwater management. Chapter 62-25.040(3) of the Florida Administrative Code, passed on February 1, 1982, dictates that any new structure that discharges stormwater must treat the runoff of the entire new structure.

The length of the I-10 Bridge rendered traditional methods of stormwater collection and discharge infeasible. In accordance with the regulation, FDEP and FDOT agreed on a compensatory treatment that improved stormwater treatment for an equivalent amount of stormwater discharged from a different source in the area. This mitigation project involved an overhaul of a retention pond called Long Hollow, owned by the City of Pensacola. This pond serves a 1900-acre run-off area and more than satisfies the requirements of the Water Quality Certification Permit.

### **Figure 3 I-10 Bridge Reconstruction**

**Figure 2 Map of Escambia Bay Area**





Aerial  
Photo  
772.520.8881  
www.aerophoto.com

Escambia Bridge

Negative # 70802\_0278  
Date 08.02.07

**Coastal Zone Management** – The FDEP issued the Consolidated Wetland Resource Permit on August 19, 2005. This permit addressed water quality standards on such characteristics as turbidity, heavy metals, and organic compounds. The primary wetland consideration for the I-10 Bridge reconstruction was turbidity resulting from the dredging and filling activities associated with the removal of the old bridge and the location of the construction equipment.

Good communication between FDEP, FDOT, and the contractor allowed the process to move forward smoothly and assured that the necessary actions were undertaken to prevent an increase in turbidity in the waters surrounding the bridge. Under the design-build contract for bridge reconstruction, the contractor was required to take the necessary steps for obtaining relevant permits.

**Wetlands** – After the issuance of the FDEP Coastal Zone Management permit, USACE issued a permit on May 18, 2005 stating that a permit required under Section 404 of the Clean Water Act was not required for this project. FDEP required that all dredged or debris materials be disposed of off-site or contributed to an artificial reef.

**Air Quality Certification** – A June 9, 2005 FDEP letter stated that the entire State of Florida, including the Escambia Bay area, met all ambient air quality standards for the six criteria pollutants as required by the United States Environmental Protection Agency. This letter satisfied the requirements of the Air Quality Certification permit.

**USCG Categorical Exclusion/Navigable Waters** – With a CE, the USCG must examine the body of water affected by new bridge construction and determine its impact on navigability. A major delay occurred when Hurricane Katrina struck days before FDOT representatives were to obtain the permit from the USCG. The New Orleans USCG office, which normally serves northwestern Florida, closed due to the storm and the staff telecommuted or relocated to the St. Louis USCG office. Faced with a tremendous Katrina-induced workload, it took the USCG several months to issue the Escambia Bay permit.

**Florida Department of Environmental Protection Sovereign and Submerged Lands** – The state of Florida owns the submerged land under Escambia Bay and must authorize an easement for any agency to build there. The I-10 Bridge project utilized a clause in the regulations that allowed a one-year period following work commencement to obtain an easement, allowing the project to proceed without delay.

**Endangered Species Considerations** – Escambia Bay has two protected species: the gulf sturgeon and the West Indian manatee and their habitats. To take the necessary precautions to protect these species, the bridge permit included a condition which stated: “In accordance with Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1536), the permittee shall coordinate methods and schedule of construction of the bridge project with the USFWS, for protection of the West Indian manatee and the gulf sturgeon during construction.” Throughout the construction and demolition process, the contractor fulfilled this condition to the satisfaction of the resource agencies.

**Cultural and Historic Issues** – The I-10 Bridge is not located on or near any historic or culturally significant properties. In a letter dated November 18, 2004, the Florida SHPO agreed that the

proposed bridge project would have no negative impacts on any historic sites or properties found in the National Register of Historic Places. This concurrence signified the completion of Section 106 requirements for this project.

### Lessons Learned

***Good working relationships and open lines of communication are critical during an emergency.*** Historically the FDEP and the FDOT in the 16-county region from Tallahassee to the Alabama border have had a strained working relationship due to their different agency missions and methodologies. To improve their relationship, the two agencies held quarterly meetings where representatives from both agencies could discuss their concerns and resolve issues surrounding specific projects. These meetings built a new level of trust between the agencies.

**Figure 4 New I-10- Bridge**



In the aftermath of Hurricane Ivan, the ongoing interagency dialogue facilitated communication between FDEP and FDOT. FDEP informed FDOT of the specific requirements for this environmental permit application so that FDOT was able to tailor the environmental permit application to suit the environmental conditions of Escambia Bay. This allowed the state level environmental permits to be quickly processed.

***Limiting the project scope reduces complexity and expedites the process.*** Prior to the bridge collapse, FDOT planned to widen the I-10 Bridge within a 20-year period. When Florida received emergency relief funding<sup>5</sup> after the hurricane, FDOT determined that expanding the bridge's width at this time for future capacity increases would be the most prudent use of this money. By adding new capacity – on the bridge, but not on the approaches to bridge – FDOT minimized the environmental impacts that would result from two separate projects.

***Shared priorities help to expedite the environmental review process.*** Both the FDEP and FDOT made environmental issues a top priority during the I-10 Bridge project. By focusing on the environmental review process during the early phases of project planning, these agencies and associated contractors reduced the time necessary for the environmental review process.

***Contracting mechanisms offer opportunities to quickly respond to emergency situations.*** FDOT selected a design-build contract for the reconstruction of the I-10 Bridge. The contract required the contractor to obtain all environmental permits, and set a fixed cost for the entire project. This allowed the design process to proceed before the environmental review process was complete and allowed the contractor to creatively determine mitigation projects.

### ***Minnesota I-35W Bridge Collapse, Minneapolis***

August 1, 2007 was a typical hot, muggy August day in the Twin Cities of Minneapolis-St. Paul. At 6:05 p.m., without warning, the I-35W Bridge spanning the Mississippi River near downtown

<sup>5</sup> Phase I used 100 percent ER federal funding. Phase II used ER funding with a 90:10 ratio of federal and state funding.



Minneapolis collapsed into the river. The collapse killed thirteen people and injured approximately 147 others.

The I-35W Bridge connected downtown Minneapolis with the city's northeastern suburbs. The collapsed bridge, built in 1964, had three lanes in each direction and was the fourth-busiest bridge in the state.

The replacement bridge will be constructed on the same alignment as the previous bridge. It will be wider than the fallen bridge, but its capacity will not increase. This extra width will create an auxiliary lane in each direction and wide shoulders on the new bridge which will allow for the future accommodation of transit options, such as bus rapid transit, high occupancy vehicle lanes, light rail transit, etc.,

### Environmental Issues

This bridge reconstruction project required the same environmental permits that are required of typical transportation projects in similar scope and scale. Despite the urgency of the project and the State of Minnesota's emergency declaration, there was no waiver of or exemption from environmental review or permits. MnDOT met all environmental regulations and agencies issued most of the required environmental approvals and permits within three weeks.

Within hours of the bridge collapse, many of the government agencies with responsibilities related to the bridge collapse and reconstruction took the initiative to begin to address their responsibilities. The next day, MnDOT held a meeting for all local, state, and federal regulatory agencies. This meeting established a full understanding of environmental requirements, approvals, and lines of communication.

MnDOT decided that the new bridge would have the same capacity and alignment as the old bridge. As a result, its effects on the surrounding natural environment would be largely the same as those of the collapsed bridge and have no new significant impacts on the environment. MnDOT and FHWA determined that this project could be classified as a CE in accordance with federal and state regulations. In addition, the I-35 reconstruction project required several approvals and permits from federal and state agencies.

*Dredge and Fill Permits* – The USACE must issue permits when projects involve the discharge of dredged or fill material into jurisdictional waters or wetlands. The river bed was disturbed when the bridge collapsed into the river; and, a fill access road was proposed in order to remove debris. However, the USACE determined that the effects of the debris removal operation and new bridge construction would be minimal. Under such conditions, the USACE authorization for work can be granted by a Nationwide General permit. This authorization from the USACE requires the receipt of a permit from the USCG.

### *Construction in Navigable Waters*

– Since the Mississippi River is a navigable waterway, MnDOT has to receive a permit from the USCG stating that the new bridge will not negatively influence navigation. The USCG issued the permit in October 2008.

**Figure 5 Drawing of New I-35W Bridge**



Drawing courtesy of MnDOT

*Endangered and Threatened Species* – The Mississippi River contains a federally-listed endangered mussel species. Given the emergency status of the project, the FHWA, MnDOT and USFWS formed an active consultation team, to remain current on project related impacts. The USFWS determined that there are no federally-listed species, proposed species, or listed critical habitat in the immediate project area. That precluded further action under Section 7 of the Endangered Species Act, unless new information becomes available. Also, under a current agreement between FHWA, USACE and USFWS, the FHWA acts as the lead federal agency for Section 7 consultation on projects involving both FHWA and USACE approvals.

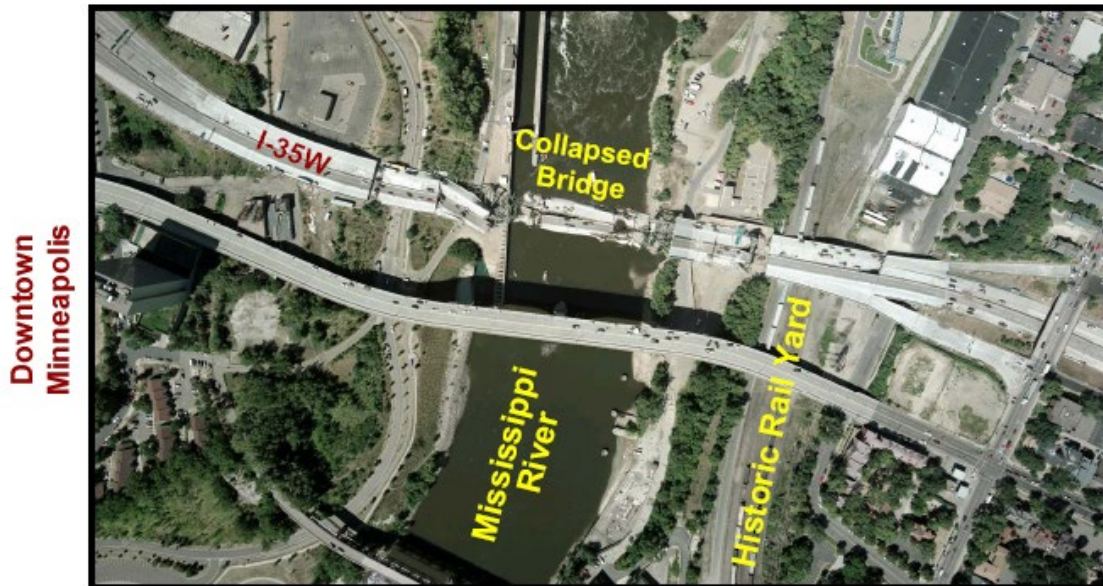
*NPDES Permit* – The Minnesota Pollution Control Agency quickly determined that there were no NPDES issues and issued a general permit certifying NPDES compliance.

*Cultural and Historic Issues* – MnDOT's Cultural Resources Unit (CRU) acts on behalf of FHWA to ensure compliance with the Section 106 review. Immediately after the collapse, the CRU began an accelerated Section 106 review, as per 36 CFR 800.12. CRU's previously completed streamlining efforts helped to expedite the review. Streamlining efforts included a GIS-based predictive model for identifying locations likely to have intact archeological sites; a GIS-based map of known archeological sites; and a geomorphologic analysis of the Upper Mississippi River, used to determine that the bridge site had no potential for deeply buried archaeological resources. In addition, programmatic agreements with the Minnesota SHPO (including the USACE recognizing FHWA as the lead federal agency for Section 106 review on projects involving approvals from both agencies) and tribes interested in reviewing projects in Minnesota, along with solid relationships between MnDOT and FHWA and these groups helped speed up the review process. All comments were received within one day of submittal.

As the project is a design-build contract, new areas of review have emerged since the initial review. During these subsequent reviews, it was determined that the East Side Milling Railroad Corridor Historic District—through-lines and spurs and an abutment from a past railroad bridge—would be adversely affected by the removal of the extant railroad tracks. Figure 6 shows the affected historic rail yard. An MOA was quickly signed (fully executed within three weeks) agreeing that the Railroad District would be documented to the Minnesota Historic Property Record (MHPR) as mitigation for the adverse effects.



Figure 6 Aerial Photo of Bridge Area<sup>6</sup>



Aerial Photo Courtesy of MnDOT, August 14, 2007

*Section 4(f) Issues* – The new bridge required the acquisition of parkland (approximately 1.2 acres) owned by the Minneapolis Park and Recreation Board for permanent land acquisition and a temporary construction easement (approximately 0.3 acre) for placement of the bridge piers. The two parties reached a verbal agreement concerning this acquisition one week after the bridge collapse. The City of Minneapolis Park and Recreation Board approved MnDOT’s plans to use the property. To compensate for using this land, MnDOT agreed to provide the park with amenities such as new lighting and maintenance of a bike path. Both the City of Minneapolis and MnDOT agreed that MnDOT could begin using the easement without a written agreement in place, eliminating the wait of a week or more for the written agreement to be executed.

With the determination that the project would have an adverse effect on the East Side Milling Railroad Corridor Historic District, a full Section 4(f) Evaluation was required to be completed. The entire process was concluded in approximately three weeks, compared to the average time of several months.

*Visual and Aesthetic Issues* – The I-35W Bridge is located within the U.S. National Park Service’s (NPS) Mississippi National River and Recreation Area. The NPS initially reviewed and commented on their concerns, including the bridge’s aesthetic quality, in five days. In addition, a Visual Quality Advisory Team consisting of NPS, SHPO, City of Minneapolis, Minneapolis Park & Recreation Board and other non-governmental groups have met throughout the design-build contract to make decisions concerning aesthetic treatments such as railing, lighting, color, gateway monuments, etc.

<sup>6</sup> The Historic Rail Yard extends from Cedar Avenue Bridge up north to the Pillsbury A Mill.

## Lessons Learned

***Good working relationships and open lines of communication are critical during an emergency.*** Staff from state and federal agencies involved in the environmental review process worked collaboratively on past projects. They established lines of communication and understood the tasks and concerns of each other's agencies. These pre-existing formal and informal relationships allowed for coordination and communication between agencies, leading to quick responses to the bridge disaster. Trust between staff sped up decision-making as verbal agreements were sometimes sufficient to move ahead while a written agreement was executed.

***Limiting the project scope reduces complexity and expedites the process.*** MnDOT and FHWA limited the scope of the bridge replacement project early in the process. They limited the project to bridge reconstruction only and would not consider revisions to approaches or nearby interchanges until bridge construction was complete. This limited scope was one of the most important factors in expediting the environmental review process because it eliminated the expanded environmental review and possible controversies that are typical for large construction projects.

***Good data facilitate quicker decisions.*** MnDOT and other agencies had recently inventoried the natural, cultural, and historic resources in the area of the bridge. When the bridge collapsed, agencies used these recent inventories to quickly identify potential natural and historic issues.

***Clear roles and responsibilities help to expedite the environmental review process.*** Staff from each of the state and federal agencies involved in the NEPA process understood their role in the process and acted quickly to begin their work. Previously established agreements facilitated the decision-making process.

***Contracting mechanisms offer opportunities to quickly respond to emergency situations.*** MnDOT issued a design-build contract for bridge design and construction. FHWA recently issued a final rule that allows contracting agencies to issue design-build request for proposals, award contracts, and issue notices to proceed with preliminary design work prior to the conclusion of the NEPA process. Although this new rule was not used for the I-35W Bridge, it could help to expedite the overall project timeline of other projects.

### ***Mississippi U.S. 90 Biloxi Bay Bridge and Bay St. Louis Bridge***

In late August of 2005, Hurricane Katrina destroyed approximately 90 percent of all structures located within one-half mile of the Mississippi coast. The 30-foot storm surge washed away the Bay St. Louis and the Biloxi Bay Bridges in Mississippi. In spite of the widespread emergency, regulations required both bridge reconstruction projects to comply with the standard environmental review process.

Built in 1962 the original U.S. 90 Biloxi Bay Bridge connected Biloxi and Ocean Springs, Mississippi. It replaced the War Memorial Bridge built in 1930. The 1962 bridge featured two side-by-side structures, each with two lanes in each direction and a vertical clearance of 21 feet at its highest point. The new Biloxi Bay Bridge is two side-by-side structures rising 95 feet above Biloxi Bay. Each span holds 6 lanes of traffic and the eastbound span has a 12-foot wide bike and pedestrian path.

The U.S. 90 Bay St. Louis Bridge stretches along the bay connecting the cities of Bay St. Louis and Pass Christian. The reconstruction project concluded in February of 2008. The new bridge has four 12-foot lanes, two in each direction. It offers an 8-foot-wide inside median, a 10-foot-wide outside median, and a 12-foot-wide pedestrian and cycling path on the east bound side. The new bridge has an 85-foot-high vertical clearance, making it significantly taller than the previous bridge.

The environmental review process was similar for both bridges and involved many of the same actors. In both cases, FHWA allowed the use of emergency action procedures (23 CFR 770.131). This case study examines both bridge projects.

### Environmental Issues

Reconstructing the destroyed bridges was MDOT's top priority. However, because of the widespread devastation Katrina caused, it was not able to begin considering reconstruction of these bridges until two weeks after their collapse. In hopes of a rapid reconstruction, the FHWA Mississippi Division Office requested that both projects be ruled CEs. FHWA granted a CE for the Bay St. Louis Bridge. However, FHWA required an Environmental Assessment (EA) for the Biloxi Bay Bridge. The EA resulted in a FONSI. These determinations both required certain permits.

*Endangered Species Act* –The gulf sturgeon was the primary endangered species of concern for both the Bay St. Louis and Biloxi Bay Bridges. To ensure that the projects complied with the ESA, regulations required MDOT to solicit comments from USFWS or NOAA National Marine Fisheries Service (NMFS) on the effect that the project would have on endangered or threatened species. USFWS and NMFS worked together with MDOT to fulfill their traditional responsibilities.

Although there are protected species and habitats near the bridges, (gulf sturgeon, sea turtles, and marine mammals) both USFWS and the NMFS issued findings that bridge-related activities would not have a negative impact on these marine resources if MDOT complied with a set of “effective practice” activities.

*Magnuson Stevens Act Compliance* – The Magnuson Stevens Fishery Conservation and Management Act addresses federally managed fish and shellfish species and essential fish habitat. NMFS must be consulted under the Magnuson-Stevens Act if essential fish habitat may be affected. The entire Mississippi Sound is considered essential fish habitat.

*Endangered Species Act* – Under the Endangered Species Act NMFS must be consulted if threatened or endangered species or their critical may be affected. Most of the Mississippi Sound is designated as critical habitat for the Gulf Sturgeon.

NMFS determined that both bridges met requirements for emergency consultation under Section 7 of the ESA. NMFS issued guidance, stating that if any dredging occurred, the fill must be returned to its original location after construction.

*Dredge and Fill Permits* – When a construction project involves dredging and filling materials that are considered “more than incidental,” the project requires a permit from USACE, whose jurisdiction is the “waters of the United States.” In the case of the Biloxi Bay Bridge, USACE operated under emergency procedures. The public notice timeframe was significantly reduced from 30 days to 48 hours; and, the time necessary to issue a permit for construction was reduced from 6 months to 6 weeks.

There are often unknown variables during the environmental review stage, which must later be addressed. The design-build contract must offer the flexibility to make required changes as new information is collected. During the demolition and construction project, MDOT successfully requested changes to the USACE permit.

*Cultural and Historic Issues* – Most historic properties near both the Biloxi Bay Bridge and the Bay St. Louis Bridge were destroyed by Hurricane Katrina. As a result, the SHPO concurred that no historic properties would be impacted by either project.

### Lessons Learned

**Formal and informal emergency procedures may be necessary under certain situations.** Hurricane Katrina led agencies to enact a series of formal and informal emergency procedures. These expedited the reconstruction of both bridges. In addition to enacting ESA Section 7 emergency consultations, under the directive of the FHWA Mississippi division office, agencies opened their lines of communication and allowed some verbal agreements instead of standard written agreements.

**Contracting mechanisms offer opportunities to quickly respond to emergency situations.** Use of design-build contracts expedited the environmental review process for the Mississippi bridges. By allowing the contractor to proceed with the projects before receiving all the necessary permits, reconstruction began quickly. However, some agencies expressed significant concern that the use of design-build prevented them from adequately assessing and protecting wildlife or critical habitat. The emphasis on moving forward quickly often took priority over potential environmental considerations.

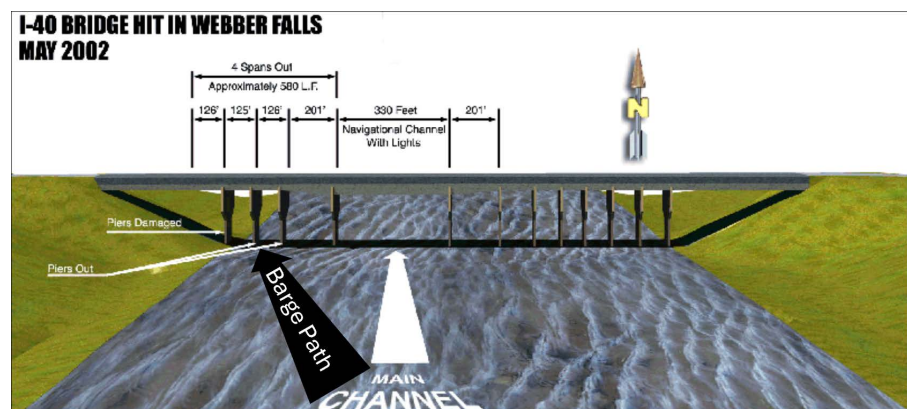
**Network with peers from other SDOTs.** With little to no experience with issuing design-build contracts, MDOT staff sought assistance from their counterparts at FDOT, who had experience issuing design-build contracts.

**Good data facilitate quicker decisions.** Several resource agencies reported that they did not receive enough information to offer adequate guidance or make necessary determinations. Many stakeholders involved in both environmental reviews suggested that information should be delivered in one complete package to eliminate the time and confusion associated with gathering information piecemeal.

## **Oklahoma I-40 Bridge Crossing the Arkansas River**

On Sunday, May 26, 2002, a barge veered several hundred feet off course and struck the Interstate 40 (I-40) Bridge crossing the Arkansas River in Webbers Falls, Oklahoma. The collision compromised almost one third of the bridge, which plunged into

**Figure 7 Schematic of I-40 Bridge Collapse**



the Arkansas River. Fourteen people died in the accident.

Drawing Courtesy of ODOT

The I-40 Bridge is on a major east-west transportation corridor connecting Memphis, Tennessee, Oklahoma City, Oklahoma, and Albuquerque, New Mexico. On average 22,000 vehicles per day travel the 1,988 foot-long, four-lane bridge. Built in 1967, the bridge is surrounded by a mixture of farmland and forest area.

Land ownership at both ends of the bridge is complex. It includes a parcel owned by the Cherokee Nation and a parcel owned by USACE, but managed as a wildlife refuge by USFWS.

The new portion of the bridge consists of three piers, four spans, an abutment, a 30 foot-long concrete approach slab, and a 40 foot-long roadway section. Although the replacement piers are wider than the existing piers to meet current design criteria, the bridge's capacity did not increase. The new section lies along the same alignment as the previous span and is now part of the entire four-lane structure. The bridge reopened to traffic on Monday, July 29, 2002, only 65 days after the accident.

### Environmental Issues

Virtually all agencies with environmental protection authority had senior representatives present at the project site within hours of the accident. Agency representatives with the authority to make decisions conferred in periodic "circle meetings" on the riverbank for several days following the bridge collapse. In some cases, permit requirements or public comment periods were temporarily waived due to the emergency. The scope of work was very clear, and all stakeholders were highly motivated to expedite the repair of the bridge in the prevailing context of emergency.

### **Figure 8 I-40 Bridge Reconstruction**

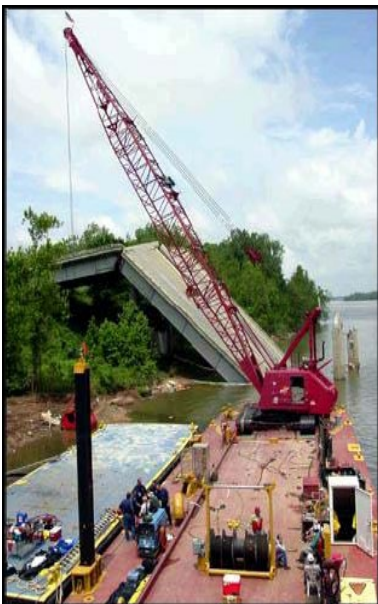


Photo Courtesy of ODOT

As the project was a replacement of a previously existing structure, the only potential impacts of this project were the impacts of reconstruction, consisting of the creation and use of a riverside staging area and actual construction in the river channel.

On the first day following the accident, FHWA, ODOT, and USACE representatives at the site immediately determined that the replacement project would have no significant impact on the construction area and its surrounding natural environment. FHWA classified this project as a Type 1 CE, as defined in the 1995 ODOT/FHWA MOA, which gave ODOT authority to complete an expedited NEPA process with no further review or approval by FHWA.

*Construction in Navigable Waters* – Construction in the Arkansas River requires a USACE permit stating that the construction would not negatively impact navigation along the channel. In this emergency, USACE determined that the permitting requirements would be waived.

*Discharge into Wetlands* – The dredging involved in replacing the damaged portion of the bridge made ODOT's project subject to the



Clean Water Act Section 404. To expedite the process and avoid the usual extended permit review and approval procedures, ODOT submitted, with USACE's consent, the Section 404 permit request after the recovery and complete demolition of the bridge. As an interim measure, ODOT requested an Emergency Authorization from USACE, which it granted.

*Endangered and Threatened Species* –The project area contained several endangered and threatened species. However only the American Burying Beetle and its habitat required protection during the time of year when bridge construction occurred. The USFWS, which is responsible for protecting threatened or endangered species, consulted with the USACE in accordance with Section 7 of the Endangered Species Act to ensure the protection of the beetle. As a result, USACE added the condition to minimize the impact to beetle's habitat to the USACE permit. Subsequently, USFWS provided a verbal approval of the project. ODOT adhered to these conditions throughout the reconstruction of the bridge.

*Cultural and Historic Resources* – The Deputy SHPO immediately researched cultural and historic resources at the bridge site. ODOT's Cultural Resources Program researched the Oklahoma Archaeological Survey to identify potential cultural and historic sites of concern within the construction area.

The I-40 Bridge project is within lands owned by the Cherokee Nation of Oklahoma (the Nation). ODOT's Cultural Resources Program consulted with the SHPO and the Cherokee Historic Preservation Office, stating that the bridge project would have no negative impacts on historic or cultural areas along the riverbank. The Nation responded to ODOT's plans two days later and waived its normal consultation requirements pertaining to cultural resources. They concurred that the project would not affect cultural resources important to the Nation. However, as the owners of the riverbank, the Nation allowed ODOT to disturb the riverbank during construction on the condition that the riverbanks be returned to its original condition. The SHPO, after reviewing the Oklahoma Landmarks Inventory (a database of historic sites) concurred that no historically significant properties would be affected by the project. To expedite the concurrence, the SHPO waived its mandatory 30-day minimum review period of ODOT's plans and concurred within one day.

### Lessons Learned

***Good data facilitate quicker decisions.*** ODOT, the SHPO, and the State's Archeologist took inventories of natural, cultural, and historic resources in the project area over the past several years. When the bridge accident occurred, these

agencies were able to immediately identify potential natural and historic issues, eliminating the need for additional investigation and studies to identify and understand any potential problems.

***Good working relationships and open lines of communication are critical during an emergency.*** ODOT's existing relationships with state and federal agencies created an element of mutual trust, allowing the environmental review process to move expeditiously. Because these agencies worked together in the past, their collaboration and communication with one another fostered quick and

**Figure 9 New I-40 Bridge**



Photo Courtesy of ODOT

efficient responses. These existing relationships helped the agencies involved better understand their roles and responsibilities and led to quicker decision-making.

***Streamlined processes facilitate quicker decisions during emergency and non-emergency situations.*** Prior to 1995, ODOT and FHWA utilized formal agreements and extensive review processes to designate construction projects as CEs. The ODOT/FHWA MOA established in 1995 aided ODOT in fulfilling the NEPA obligations while expediting the reconstruction of the I-40 Bridge.

***Formal and informal emergency procedures may be necessary under certain situations.*** Obtaining a Section 404 permit from the USACE can be a drawn out process. To expedite the process, ODOT applied for the Section 404 permit after the completion of the I-40 Bridge project. ODOT and USACE's recognized that the lengthy process could significantly delay the project. USACE determined that, given the emergency situation, ODOT could submit their application for a Section 404 permit after construction was complete. The permit was issued in September 2002, two months after construction was completed.