

US-131 Grand Rapids: S-Curve Replacement

Context

The S-Curve Replacement improved the safety and efficiency of a one-mile highway segment in Grand Rapids, Michigan's second largest city. Built in the 1960s, the S-Curve is a series of six bridges that carry more than 100,000 vehicles daily through the heart of the city. The original S-Curve divided Grand Rapids – having been erected with little thought to pedestrians, non-motorized travel, or aesthetics. The timing of the S-Curve's reconstruction coincided with a new interest in developing the neighborhood.



Purpose and Description

The purpose of the project was to improve the safety and efficiency of the nearly 40-year-old S-Curve. The project called for the replacement of the existing structure which had six 11-foot lanes without shoulders, short ramps, and five steel beam structures that required continuous maintenance. Through intensive planning and coordination with stakeholders, the S-Curve replacement was planned, designed, and constructed in less than two years. Construction began in January 2000 and the S-Curve was open to traffic in October that same year. A context sensitive approach allowed MDOT to complete the project ahead of schedule while minimizing disruption to the community, addressing cultural and natural resources, and incorporating aesthetic treatments.

Challenges to the Social & Natural Environment:

The project presented challenges to the social environment including minimizing impacts to commuter, commercial, and tourist traffic and related economic impacts. Other challenges included the expeditious recovery of archaeological resources, mitigating the total take of the historic Star Building, and the avoidance of impacts to fish reproduction.

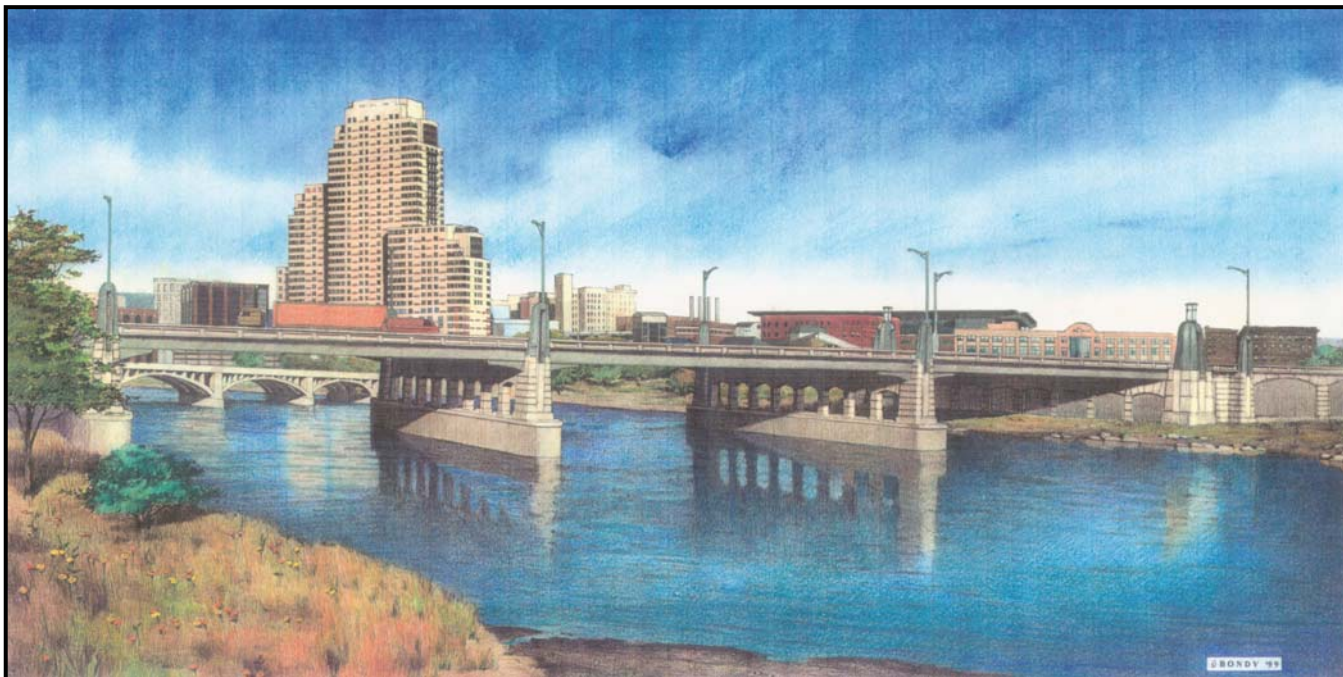
Public Engagement

Stakeholder involvement began in 1998 after the bridge required shoring up due to the collapse of limestone formations beneath its piers. The critical situation warranted an expedited solution to ensure the public safety. Other problems included 11-foot lanes without shoulders, short ramps, awkward interchanges, and deteriorating bridges. Discussions with the city of Grand Rapids and the Metropolitan Planning Organization (MPO) explored how to best address the S-Curve structural problems, long-term traffic needs, local street access, maintaining traffic during construction, and redevelopment efforts.

In 1999, after multiple meetings with neighborhood groups, the business community, Grand Valley State University (GVSU), and city and local officials, a plan was developed to totally reconstruct this elevated freeway segment. The plan for the S-Curve included interchange reconfiguration, as well as adding lanes and full shoulders to improve traffic operation, safety, and access to downtown. MDOT strove for design upgrades that would improve freeway function and respond to local desires to revitalize adjoining neighborhoods.

The community responded unfavorably at first. Residents and businesses worried about impacts to commerce, and commuter, commercial, and tourist traffic. An effective public relations campaign allayed community

concerns. MDOT communications staff and public involvement staff developed strategies to involve and inform stakeholders. MDOT faced the challenge of how to convey the seriousness of the S-Curve's condition without causing undue alarm. The public involvement process was critical to gaining the agreement of the community to use a total closure and detour, rather than partial closure during construction. The decision to use a total closure allowed for faster completion of the project, resulting in a significant cost savings and reduced total impacts to the users, and the adjacent public and businesses directly affected by the project. A public relations firm was used to help MDOT staff arrange and prepare materials for stakeholder meetings throughout the project.



Communication Tools

PowerPoint presentation – MDOT developed a PowerPoint presentation that explained the problems with the Grand River Bridge and possible solutions. The MDOT team members shared the presentation with stakeholders.

Visualization - Although the city is split by the Grand River, a series of more recent and historic bridges span the river bringing the community together and contributing significantly to its identity. The appearance of the new Grand River bridge was very important. An architect facilitated discussions about the look of the project, using PowerPoint presentations showing detailed hand rendered images of possible bridge treatments

Public Relations Campaign – MDOT launched an extensive public awareness campaign that included a program called *Ask the Expert*. The live program provided stakeholders an opportunity to call in their questions and receive immediate responses.

Flyers / Brochures – MDOT developed and distributed printed materials to explain the project as well as to inform public transit users of the bus routes that were available during construction.

Newsletter – The newsletter, *S-Curve Update*, was distributed to city government and business owners to keep them informed of the project's progress.

Project web site – MDOT launched a public web site to keep the community informed. The site received more than 20,000 hits each month.

Toll-free number – MDOT instituted a toll-free number to provide project updates.

Addressing Community Values

Community values regarding the importance of maintaining an economically viable downtown, the importance of aesthetics, and potential impacts to natural and cultural resources were assessed through ongoing intensive involvement with key stakeholder groups as well as meetings with the public, before and during the project. Meetings were held with the mayor and city commission early in the process. The MPO planning process was also used to help identify long-term traffic needs. In addition to upgrading the S-Curve, the following improvements were made within and adjacent to the structure:

Providing additional parking for a major downtown restaurant area from excess state owned property

- Realigning the US-131 BR interchange to more effectively serve the Van Andel Arena and adjacent development
- Connecting two city streets under the S-Curve to connect the modified interchange ramps and improve city street network circulation
- Constructing a walkway to accommodate pedestrian movement and a transit stop between both sides of the GVSU campus
- Landscaping and sidewalk improvements with the city and GSVU
- Enhanced signal system operations along detour routes
- Documentation of archaeological and Native American resources impacted by the project, in coordination with the city, GSVU, and the local tribe.

Addressing Aesthetic, Cultural, and Natural Resource Values

Aesthetic, cultural, and natural resource values were assessed through ongoing intensive involvement with key stakeholder groups as well as public meetings. Several structural enhancements helped the S-Curve blend into the downtown area, complementing this part of Grand Rapids. Aesthetic treatments included formed/textured concrete elements, arches and lighting on the segment over the Grand River following the architectural theme of several other downtown bridges. At the request of GVSU, MDOT agreed to leave the textured aesthetic treatment off of part of the S-Curve structure. The smooth surface will provide a smooth canvas for future artwork to be created by students of the university's art department.



Environmental staff worked with state agency professionals to identify archeological and natural resources. Archeological investigations uncovered prehistoric artifacts. MDOT worked with the Grand River bands of Ottawa Indians and the state archaeologist to expedite an archaeological excavation. The excavation, which uncovered 42,000 artifacts from Indian groups and early settlers, began in mid-November 1999 and was completed in less than two months. Under agreements between the state and the Ottawa Tribe, the area was fenced and guarded around the clock. Tribal members used the dig as an opportunity to educate younger generations about their history. MDOT worked with the city to provide a marker recognizing the Native American presence in the area.

The project required the demolition of the historic Star Building, the first all concrete commercial building in Grand Rapids. The building's removal became even more complicated after MDOT discovered that the Public Museum of Grand Rapids was using the building to store nearly one million historic artifacts. MDOT's \$8.6 million in compensation for the loss of the Star Building allowed the museum to expedite its plans to build the Community Archives and Research Center. The four-floor, 150,000-square-foot facility features state-of-the-art preservation techniques.

MDOT coordinated with the Michigan Department of Environmental Quality and Department of Natural Resources to avoid impacts to fish reproduction. The plan included measures to minimize impacts to salmon, steelhead, bass, sturgeon, and other fish species. The construction site along the river was kept clean and free of gravel and other debris. The contractor built two haul roads, one on each side of the Grand River, before spawning began in March. The construction pads provided an open channel to allow constant river flow.

In addition to the previously mentioned environmental benefits of the project, the S-Curve project contributes to air quality improvement by reducing congestion and also represents a remarkable recycling effort. Ninety-five percent of the original material was recycled, including 175,000 tons of concrete crushed into lemon and pea-sized pieces. A total of 7,000 tons of structural steel were recycled. The recycled materials were used throughout reconstruction.

Efforts to Minimize Community Disruption

MDOT selected an alternative that balanced the need for improved highway efficiency with the community's desire to maintain the urban landscape. A lower design speed resulted in a structure that integrates well with the neighborhood. MDOT and stakeholders agreed to a total road closure to allow for faster project completion and less overall inconvenience to motorists. Two traffic detours rerouted traffic. To keep residents, businesses, and visitors informed, MDOT developed a motorist information plan and adopted the motto, "Road Closed, City Open." MDOT used the services of a local towing company to remove stalled vehicles from the detour route to help maintain an unobstructed traffic flow. The department and the Interurban Transit Partnership also set up two temporary commuter parking lots to provide motorists with access to public transportation. MDOT provided funding for the ITP to provide express bus service from the commuter lots into downtown. MDOT also procured funding to provide emergency rides for people using public transportation.

Outcome

The S-Curve replacement resulted in a safer and more efficient roadway that will serve the community for decades. The new S-Curve is aesthetically compatible with downtown Grand Rapids and has spurred further community improvement. For example, after the S-Curve was completed, the city of Grand Rapids developed a park and non-motorized path adjacent to the S-Curve and installed landscaping along the US-131 BR ramps. The non-motorized path and ramp landscaping were funded, in part, through the Transportation Enhancement Program.

City street connections were added under the S-curve, in part with a state Economic Development grant, to improve circulation and freeway access. In addition, a permanent city street, enhanced pedestrian access, and protected transit stop were included in an abandoned railroad underpass to connect GVSU buildings on either side of the freeway. Additional design considerations included providing space for a future trail along the river and under the S-Curve as well as providing improved parking areas for the city, the Van Andel Arena, and the Interurban Transit Partnership (ITP) under the bridges, as well as permanent signal improvements for the detour route. In 2005 this S-Curve project received an AASHTO CSS Award for Notable Practice as part of a nationwide CSS competition.



Funding

The total project cost was \$145 million dollars. After the project was completed, the city of Grand Rapids developed a park and non-motorized path adjacent to the S-Curve and installed landscaping along the US-131 BR ramps. The non-motorized path was funded in part through the Transportation Enhancement Program.

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