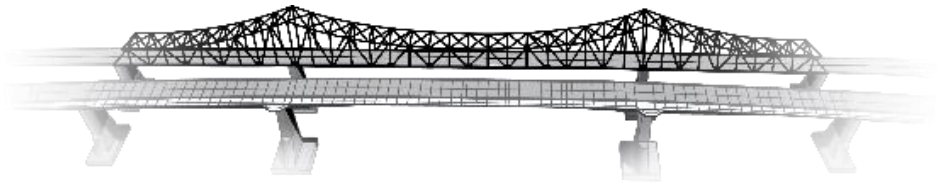

Winona Bridge Project

Community Outreach Report

by
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Sept. 24, 2014

EXECUTIVE SUMMARY OF COMMUNITY OUTREACH MEETINGS
Held on March 27, 2014 and June 19, 2014

The purpose of the community outreach meetings was to seek project goals from the Winona community through a series of public meetings and then tailor the project delivery to meet the noted goals.

March 27, 2014

The first community goal setting meeting was held Thursday, March 27th from 5:00 pm–6:00 pm at the Winona Armory. The meeting began with an introduction from Mayor Mark Peterson and a project overview from Terry Ward providing an overview of the MnDOT construction goals. Kay Wais introduced the planned process flow and facilitated the interactive discussion that was held to collect community goals for the project.

The meeting was announced through the media, public postings, and the Chamber of Commerce. There were about 54 attendees.

June 19, 2014

The second community meeting was held at the Winona County History Center on Thursday, June 19, 2014 from 4:00 pm–5:30 pm. Mayor Mark Peterson provided the introduction, Terry Ward provided a brief project update, and Kay Wais reviewed the actions that had been taken towards meeting the community goals, and discussed future planned actions.

Community Outreach

Community outreach efforts are ongoing and important because the project is being undertaken to be of benefit to the community. Therefore communication and engagement of the various community stakeholder groups is critical to the project's success. This document provides on overview on the community meetings, the community goals identified and also is a status update on actions taken to work towards the previously identified Winona community goals.

The majority of the community goals, as identified in the community meetings, have been focused around the topic of communication. Therefore the majority of our efforts focus on communication management. We originally had anticipated more of a risk management mindset. However well-managed community communication also has significant risk management benefits.

The community goals are intrinsically tied with the construction project goals, which are:

1. Start construction on the new Mississippi River Bridge as expeditiously as possible.
2. Move traffic to the new bridge as expeditiously as possible to minimize the likelihood of detours related to bridge maintenance work on the existing structure.
3. Keep the river crossing open during construction.
4. Meet the overall project funding cap of $162 million.
5. Stay within construction funding of $125 million.
6. Stay within Engineering and ROW funding of $37 million additional.

We are in the process of creating a Winona Bridge project goal-related performance report card to rank how we are doing. Although that is not yet created, this document helps in laying the groundwork and strategizing to accomplish the right things.

Following are the community goals identified during the public meetings:

Communication Goals

1. Communicate project information to those inside and outside of the Winona community.

WHAT WE LEARNED

The community expressed interest in a photo/video library, communication through media and other communication channels, exploring a safe viewing area for the project, and exploring a webcam.

WHAT HAS BEEN ACCOMPLISHED

On June 25 we reported that we were working on creating a Winona Bridge project photo/video library (aka the documentation project). It includes the collection of photo, video, maps, and newspaper articles and other document scans. We have collected “before” project photos, new construction photos, and historic photos and articles. Many new and old photos have also been shared, as we go along, via the Facebook page. They are being organizing as a digital library, which will be produced into an informational kiosk program expected to be on display at the Winona County History Center in May of 2015. Ultimately the documentation program is planned to also be available on DVD upon completion of the project.

Right of Way (ROW) Buildings

WHAT WE LEARNED

The Winona County Historical Center requested documentation of the buildings that MnDOT has acquired. The deadline for acquisition of all buildings (properties) is January 1, 2015. The buildings have been photographed inside. All acquired buildings need to be assessed for hazardous and regulated wastes "cleaned" before the buildings are turned over to the Contractor for removal, which is planned for as early as March of 2015.

The Winona Fire department and Winona County Sheriff have requested use of the buildings for training exercises.

WHAT HAS BEEN ACCOMPLISHED

MnDOT is currently looking into the policies, permissions, and insurance liability required to allow the ROW buildings be to be able to be used for training exercises.

We have photographed the outside of the buildings for “before” documentation and also have created a ROW building map (thumbnail to the right):

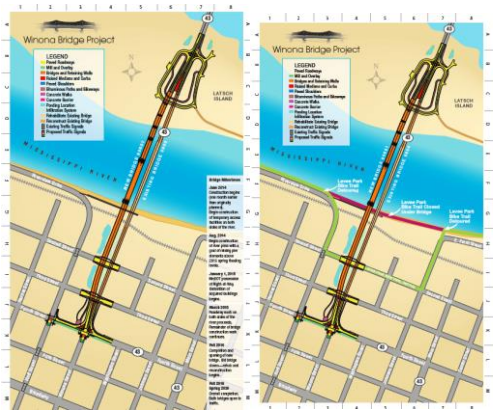
Construction Area Maps

WHAT WE LEARNED

Visuals are an important communication tool for construction and detours to be accurately understood.

WHAT HAS BEEN ACCOMPLISHED

We have designed and started the distribution of project construction maps showing the construction area in general and the bike detour (as seen in the thumbnails below).



We have shared the construction map with the Winona Post upon request, and we expect we will help other media and businesses customize this map to indicate information to their patrons when the detours are planned.

We are also in the process of creating a pier completion construction map development is in progress.

Case Studies

WHAT WE LEARNED

The community wants to understand the decision making process and what is innovative and interesting about this project.

WHAT HAS BEEN ACCOMPLISHED

Terry Ward has written eight project case studies that explain project management aspects of the contract manager/general manager (CMGC) approach and various schedule, cost, and quality outcomes that are being experienced as work packages are completed. They have been posted to the web (see http://www.dot.state.mn.us/winonabridge/documents.html).

Winona Daily News Bridge Section

WHAT WE LEARNED

The Winona Daily News (WDN) expressed an interest in working with MnDOT on hosting a special section about the bridge project on their web site. WDN has an advanced web content management system and the ability to create a project timeline of articles.

WHAT HAS BEEN ACCOMPLISHED

Since then the section has deployed at http://www.winonadailynews.com/special-section/winona-bridge-project/. This includes a project article timeline, photos, and a Q&A section where Terry Ward responds to readers' questions.

The Winona Daily News is also helping to add a light-hearted, educational twist to the project, by working with our communications team in trivia-style contest using project videos and photos. Inexpensive Winona-oriented prizes, such as Winona t-shirts and commemorative buttons, are planned to be awarded to "winning" participants.

Tesla Rodriquez from the WDN toured the Dresbach Interchange project with Terry Ward to learn about what is coming up for the Winona community.

Official Website

WHAT WE LEARNED

The MnDOT Web site project page at www.mndot.gov/WinonaBridge remains the formal, organized source for public project information. This is updated with current news releases and all pertinent project information.

WHAT HAS BEEN ACCOMPLISHED

We are currently planning on expanding the updates and newsroom sections and adding a section for businesses.

Winona State University, Cal Fremling Boat Tours

WHAT WE LEARNED

Winona State University (WSU) was obtaining a new classroom boat, the Cal Fremling, and they were interested in hosting boat-based tours. Community members had asked for a place for project information as well as a safe viewing area, and this seemed to present an opportunity to meet this goal.

WHAT HAS BEEN ACCOMPLISHED

We have worked with WSU and Captain Aaron Repinski, to plan a beta run of a boat-based project tour Oct. 29 from 4:30 pm to 6:00 pm. Tickets prices are being determined by WSU and they will be for sale soon at the Winona County History Center.

On these tours Terry Ward will be the presenter/tour guide. In addition to the general public tour this fall, we are planning frequent tours in the summer of 2015, when there will be interesting things to see in new pier and bridge development. Also during the general, non-bridge-related public boat tours, the Cal Fremling Captain is planning to share project information and display an informational video about the project on their large boat monitor.

A special summer 2015 6-hour tour is being proposed for the LaCrosse-Rochester PMI Chapter to host a Winona Bridge/Dresbach Interchange Bridge event. This will be a tour on the Cal Fremling boat - starting in Winona with a presentation about the Winona Bridge project, touring to the Dresbach Interchange project, and returning back in Winona again around dinnertime.

Outdoor Informational Kiosks

WHAT WE LEARNED

The boathouse association requested informational postings. The YMCA is willing to have a kiosk posted on their property and the property on the east end of the bridge is MnDOT right-of-way property. So the locations were not a problem.

WHAT HAS BEEN ACCOMPLISHED

Building and Remodeling of Winona has been contracted to build and install two outdoor information kiosks where we will post all relevant public information to help achieve the goal to "Explore the opportunity to establish a safe, construction observation area, where project information is posted". In addition, there is an electronic kiosk plan for deployment at the Winona History Center in May 2015, as previously mentioned.

Construction Webcams

WHAT WE LEARNED

On June 25th we announced our intent to explore the viability of a site webcam due to community requests. Up-And-Running, a Winona small business, was way ahead of us on this. They already deployed a publically accessible bridge web cam at http://cameras.up-n-running.com:1001/view/viewer_index.shtml?id=1038. In addition, the project team is considering installation of a webcam in early 2015.

Notify the community of detours and street closures well in advance.

WHAT WE LEARNED

The Winona community is very concerned about minimizing the inconveniences in the downtown area. The Winona Chamber of Commerce has a Transportation Committee that has served in an advisory role for other projects.

WHAT HAS BEEN ACCOMPLISHED

Staying layouts are under final development and will be shared with the Winona community in the coming weeks – possibly including a formal public meeting.

In addition to planning and communicating the detours publically, we have plans to try to help impacted Winona businesses to communicate this information via the creation and distribution of a media kit.

Road Signage

WHAT WE LEARNED

MnDOT has a protocol for signage. They have already begun using both standard signage in the early construction, and they have posted a variety of special request signs. The need for special signs will often become evident as community members suggest it or the project manager and workers notice a need.

WHAT HAS BEEN ACCOMPLISHED

We will monitor this on our upcoming report card.

To aid drivers, MnDOT will post detour signage as forewarning prior to encountering detours, upon detour approaches, and throughout the detour route. We will also facilitate extensive public outreach to help get feedback on the signage.

2. Ensure that the Winona community has email and phone numbers from the MnDOT Project Management Team.

Project Manager Access

WHAT WE LEARNED

Terry Ward is the public contact for all project-related information. His phone and email are listed on the web sites, all news releases, and most published information. Terry responds to all email and phone inquiries. Communication is one of his primary responsibilities.

Terry and the rest of the MnDOT communication team have also hosted public events where the community has the opportunity to meet and talk with the people involved, to media, to businesses and organizations, and regular community presentations.

WHAT HAS BEEN ACCOMPLISHED

We will monitor this on our upcoming project report card.

Other Project Contacts

WHAT WE LEARNED

City manager Judy Bodway, and law enforcement officers have been provided with the direct phone numbers for the Ames contractor contacts for emergency or traffic control maintenance However to help steer communications to the correct person in all situations, large lists of various contacts are not being provided publically or to the media because job titles cannot adequately direct inquires to the right contacts.

WHAT HAS BEEN ACCOMPLISHED

We will monitor this on our upcoming project report card.

3. Utilize traditional media and not just the Internet, for project announcements.

Traditional Media

WHAT WE LEARNED

Winona Bridge project information is regularly distributed to all traditional media, including newspaper, television, radio, and signage via the MnDOT District 6 Public Affairs department.

WHAT HAS BEEN ACCOMPLISHED

Outdoor kiosks, which were mentioned earlier, are also associated with this goal. As the construction becomes more active in town, there are plans to post information with the Winona public library and for distribution at the Winona Kwik Trips.

4. Continue outreach with boathouse owners/users.

Boathouse Association

WHAT WE LEARNED

Terry met with Tom Nelson, president of the boathouse association, for recommendations on how best to engage with this group of stakeholders. Terry has also been communicating personally with Dick's Marine, and other local stakeholders who are located near the project site.

WHAT HAS BEEN ACCOMPLISHED

Terry offered to continue have meetings with them upon their request and he has been building good communications on an individual level, so that they know they can bring concerns to him.

Dick's Marine

WHAT WE LEARNED

There was an August report that some customers of Dick's Marine were hearing rumors of bridge closures and that some boaters may move their boats due to this. The management discussed the issue with Terry Ward.

WHAT HAS BEEN ACCOMPLISHED

MnDOT responded by providing a customized letter to business owners, providing information to the media, and providing signs for posting – which the manager used and greatly appreciated. This has helped escalate our "Winona is Open for Business" media kit development that will be discussed later in this report.

Economic Goals

1. Protect the strength and viability of businesses within a several block radius of the construction zone. Maximize the economic benefits of the project to as many local businesses as possible. Advertise to surrounding communities that Winona is "Open for Business" during the construction.

Advertise that Winona is Open for Business

WHAT WE LEARNED

We are meeting with Della Schmidt, Executive Director of the Winona Chamber of Commerce, in early September to learn about how we can best work with the business owners and the Chamber to help them in their project-related messaging.

WHAT HAS BEEN ACCOMPLISHED

Most of the actions that are planned to achieve this goal will occur in the future. They include plans to develop an eye-catching "Winona is Open for Business" media kit that all can utilize. The kit will be

influenced by the media, Chamber, and other stakeholders, but it may include an audio jingle/tag and a visual graphic.

We plan to collaborate with the Winona Chamber to assist construction-impacted businesses in their advertising - especially during the most challenging construction and detour times. We also plan to add a "For Business" section to the project website.

Buying Local

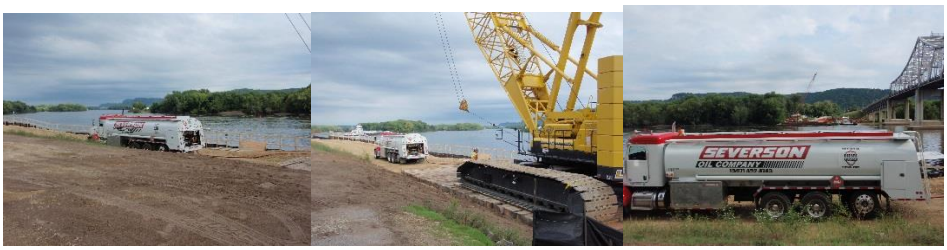
WHAT WE LEARNED

MnDOT has a project policy of considering local Winona suppliers for project procurement. At the Dresbach Interchange project, we have learned many of the project workers are viewing the project Facebook page.

WHAT HAS BEEN ACCOMPLISHED

Efforts are being made to buy services and materials local in Winona when possible. MnDOT has already hosted one public meeting that invited Winona area businesses to meet with the Ames Contractor and discuss project-related business opportunities. Another October 2014 meeting is scheduled to continue this effort, and to help reach businesses that may not have been at the first meeting.

Here is one example:



As part of our media kit, we plan to provide messaging assets to help attract customers during construction and to help jump-start the customizing of advertising campaigns to recognize the construction project in a positive and proactive way. Elements that are currently being considered include a graphic with the bridge, an audio jingle that "Winona is Open for Business", and other elements that will help them with their messaging.

In addition, in the kit we will make it easy for Winona businesses to post links to detailed information about the project and to encourage Winona businesses to post advertisements for the project workers through social media channels such as our Facebook page.

Hosting Events

WHAT WE LEARNED

Public events tend to be good for the local business economy – especially when they bring travelers into the community.

WHAT HAS BEEN ACCOMPLISHED

We have plans to collaborate with city stakeholders to host a bridge dedication event to celebrate the completion of the new bridge and at the overall completion of the entire project. One goal for this event is to maximize the local businesses exposure and increase tourism for the event and invite tourist to come to Winona during and after the event – and to work with Visit Winona to inspire many return visits.

Boat tours, including bringing in events for professional associations such as PMI & Society of Professional Engineers, also help increase business in the Winona downtown area.

Detours and Traffic Goals

1. A shared goal of the community and MnDOT is to keep bridge 5900 open and to minimize traffic delays crossing the river.

WHAT WE LEARNED

This is a shared goal between the community outreach and the construction projects.

WHAT HAS BEEN ACCOMPLISHED

MnDOT has repeatedly and publically stated that they will strive to keep Winona "open for business." As requested during our community outreach efforts, there are also discussions with Winona City staff regarding a backup plan should for some unforeseen reason the existing bridge does need to be closed during the next couple of years. If by chance it does, everyone wants to be as prepared as we possibly can be. MnDOT is in early discussions with Ames Construction and the Cal Fremling boat regarding possible boat ferry service.

2. Plan temporary road-blocking delays to avoid peak traffic hours.

WHAT WE LEARNED

MnDOT will work around timing of peak traffic hours and special events. The peak traffic hours are generally considered the morning and evening work commuting time. The latest traffic delays were Aug 26 and 27, which closed down one lane of the bridge. We asked a local business owner how the reduction down to one lane was for them over these days. She said “It wasn’t bad. We are all used to it because the bridge has needed a lot of work over the past years. As long as delays don’t get worse than what we are used to, we will be happy.”

WHAT HAS BEEN ACCOMPLISHED

We will monitor this on our upcoming project report card.

3. Minimize detour inconveniences.

WHAT WE LEARNED

As requested, MnDOT is working to strategically plan the detours to minimize the inconvenience to businesses and travelers. While closures of 2nd and 3rd Streets under the bridges will likely be required, we are committed to not close 2nd Street and 3rd Street AT THE SAME TIME. We are also keenly aware of the use of 2nd Street as a truck route and the truck movements that take place within the Winona community on a daily basis through the project corridor.

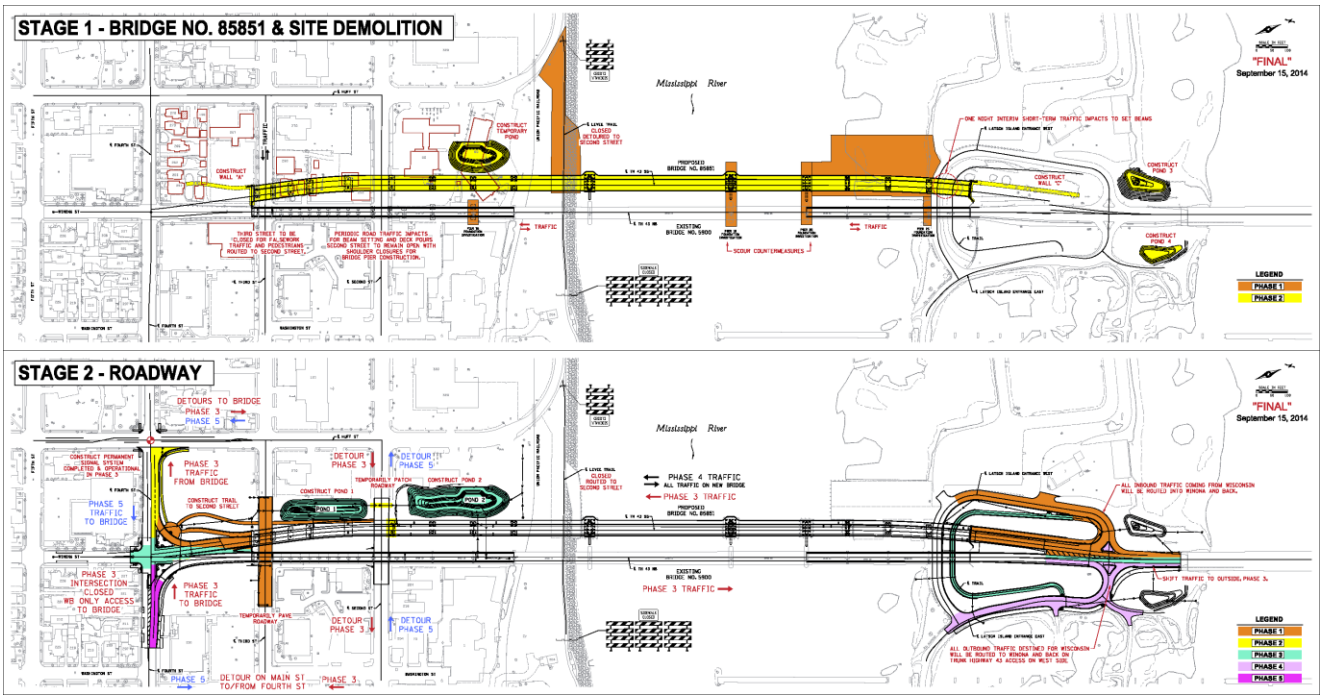
In addition, while there likely will be some inconveniences, pedestrian movements from Winona to the Latsch Island area will continue to be accommodated during the project.

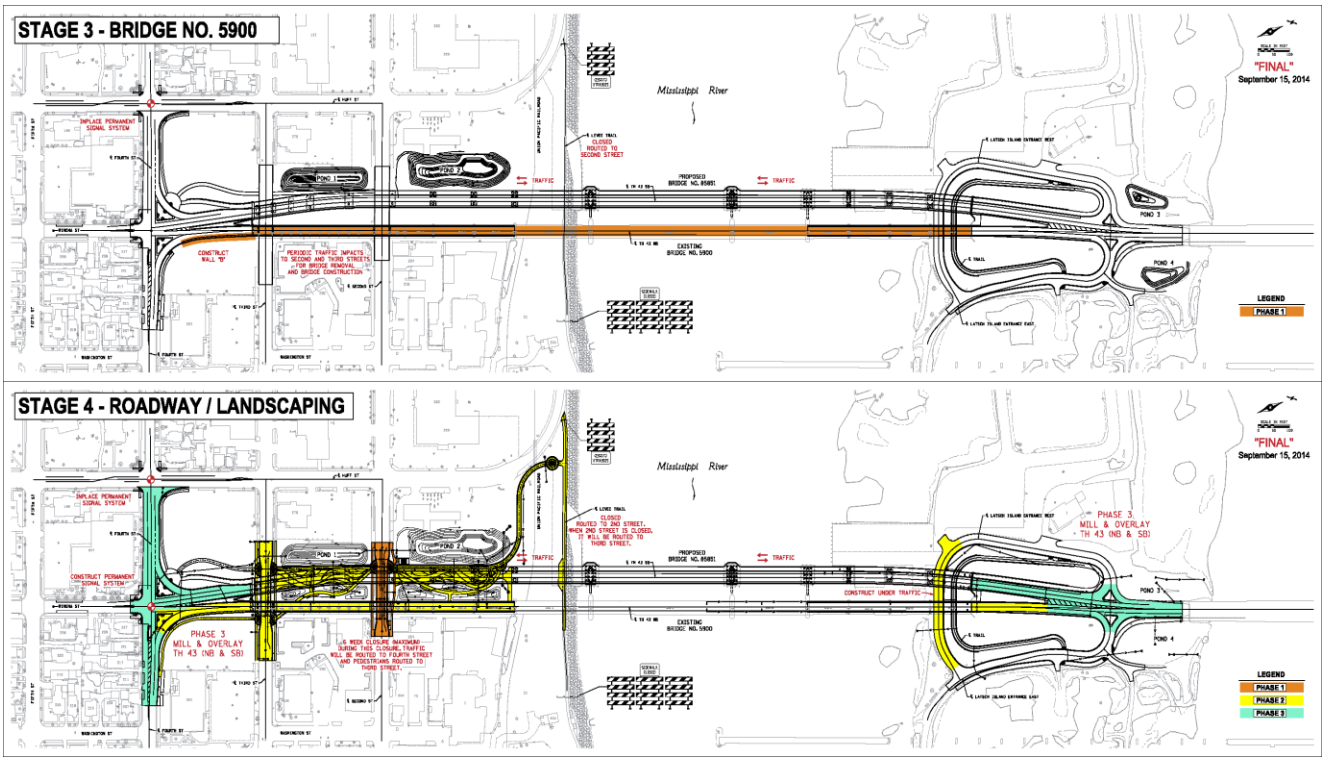
So far, MnDOT plans to reconstruct a portion of 4th Street between Winona and Huff Streets and install a traffic signal at the 4th-Huff intersection to facilitate project maintenance of traffic needs.

In addition, actions are planned to communicate detours and business access changes with temporary signage that is updated quickly. MnDOT aims to minimize the construction-related traffic problems during large community events, and too maintain access to frequented places such as all businesses, Latsch Island Park and boathouses.

WHAT HAS BEEN ACCOMPLISHED

The project detours have not yet begun, but we are planning them carefully with community and city staff input. The latest traffic plans are included in construction staging and traffic plans are shown here:





The project manager is committed to minimize detour inconveniences and this goal will be monitored in the project report card.

4. Reconstruct the walk/bike path along the river and communicate with the walking/biking community.

The Plans for Under the Bridge

WHAT WE LEARNED

The walk and bike path is part of the reconstruction plan. Details are still being discussed. An action that we think will target communicating with the walking and biking community is to locate one of our informational kiosks at the YMCA, where some of these groups meet.

WHAT HAS BEEN ACCOMPLISHED

The current plan is to continue to review the path reconstruction plans with city leadership and staff, to include the bike shops, biking/running clubs, fitness centers/gyms, and race organizers who may be impacted, as important stakeholders in this planning, and to consider trailheads as places to post information about the walking/bike trail changes.

Below is an illustration of the latest site plan (subject to change):

Noise

1. Minimize construction noise and take extra care at sensitive times.

WHAT WE LEARNED

The noise hasn't really begun yet, but MnDOT has been taking action already to try to ensure it will be minimized.

WHAT HAS BEEN ACCOMPLISHED

Terry Ward has reported that the majority of the new bridge piers on land in Winona will not require pile driving operations, so MnDOT has already mitigated a large noise producing operation at the project level.

We are planning to work with the city leaders and Chamber of Commerce in helping to understand what business hours are most sensitive in the construction area. For residential stakeholders the assumption is that noise at night is generally more problematic than noise during the daytimes. We also will work with the neighborhood representatives to survey the neighborhood for any special residential situations that might be different than assumed.

Major events will be taken into consideration.

When construction noise is especially loud, such as during pile driving work, we will communicate about this to set the expectations in advance and as accurately as possible. We will also put noise examples on

the web site and in the electronic kiosk program, so that people can "identify that noise" when they hear it.

We will let people know who to call to complain about noise, if it becomes a serious problem for them, and continue to address noise with stakeholders near the construction zones. We will monitor this on our upcoming project report card.

Waterway and Latsch Island Goals

WHAT WE LEARNED

The community identified the following goals in this category:

1. Protect the integrity of the water quality during construction, including minimizing the impact of runoff and debris caused by the project.
2. Minimize the impact on river navigation, the recreational value of the river, and commercial river traffic.
3. Work with local environmental groups to address special environmental needs, such as those involving Latsch Island.

The environmental impact study is available at http://www.dot.state.mn.us/winonabridge/docs/ea.pdf

WHAT HAS BEEN ACCOMPLISHED

MnDOT has obtained all the environmental permits required for the project and are continuing to coordinate closely with all permitting agencies. The Waterway will be open to commercial and recreational boating traffic at all times. Latsch Island residents will have access at all times.

Safety Goals

WHAT WE LEARNED

The community identified the goal of maintaining traveler and worker safety during construction.

Safety is MnDOT's top priority. All workers attend safety training, wear safety gear and are prepared for the work going on. But workers have witnessed members of the general public in the work zone, which is dangerous. So 'no trespassing' signs were posted and new releases to stay out of the work zone were distributed.

Community members also asked if Riverview Drive safety could be improved as part of this project. This curve is a City of Winona street and is not slated for improvement under the bridge project.

WHAT HAS BEEN ACCOMPLISHED

This project will include close collaboration with MNDOT safety personnel and Ames safety personnel to share information, tips, and safety resources with the public. The topic of safety will continue to be proactively managed and prioritized in all project decisions.

Terry Ward asked Winona City Engineer, Brian DeFrang, about the city's plans for improving the safety of Riverview Drive and Mr. DeFrang said this project is currently under design to provide a steel plate beam guardrail along the curve area. As of now this cannot be constructed due to this area being a construction entrance for the bridge project. The project has installed concrete barriers to protect this area and included an orange curtain to further enhance visibility.

We will monitor this on our upcoming project report card.

Bridge and Area Design Goals

WHAT WE LEARNED

A community member requested that parking be designed into the area under the bridge. Others asked to make the area underneath the bridge as attractive as possible and to coordinate efforts with the project underway to improve river park downtown (Levee Park).

This meeting was attended by approximately 10 (ten) community members. One attendee who went to both meetings was a truck driver who disliked the stop lights that are planned for the bottom of the bridge coming into the city (at the intersection of 4th and Winona Street). MnDOT followed up by sending him, and publically posting, a report by SRF Consulting which is attached to this document as Addendum A.

Truckers requested to minimize sudden downhill stops that are difficult for truckers and to keep two lanes available for traffic flow as much as possible. MnDOT understands the goal, but had to balance the design decisions with safety concerns. The addendum document, written by Adrian Potter, PE, PTOE, Senior Associate and Craig Hass, PE, Senior Associate with SRF Consulting Group provided a thorough explanation for the decision to install traffic lights.

WHAT HAS BEEN ACCOMPLISHED

MnDOT's project team has been working closely with Winona City staff on potential site development plans for under the bridges. These plans, along with all other local cost and aesthetic features of the project will be incorporated into a Cost Participation Agreement between MnDOT and Winona. The final agreement requires Winona City Council approval (see the site plan on page 13).

Financial Goals

WHAT WE LEARNED

The community identified the goal of keep the city's costs as low as possible for the project, while also optimizing all of the other goals. One action that assists in minimizing city's costs is to introduce reminders at meetings. These reminders influence decisions, recommendations, and priority alignment that reduces gold plating. Win-win solutions with all project partners will continuously be explored by the project team.

WHAT HAS BEEN ACCOMPLISHED

Financially, the stakeholders are urged to favor creative and innovative problem solving approaches over costly solutions. We will monitor this on our upcoming project report card.

Visual Quality Committee (VQC) Input

WHAT WE LEARNED

Continue having the project manager communicate with representatives from the VQC – especially as cost and quality prioritization decisions are made.

WHAT HAS BEEN ACCOMPLISHED

The VQC is winding down their efforts. Ten meetings have already been held, and at least one more meeting is likely to be held in September. This active and passionate group of Winona community members have worked hard at leaving a "Winona" mark on the project. However they have generally been making aesthetic and quality recommendations without financial information. As more information on tradeoffs becomes available, it may be helpful to go back to the committee for further prioritization guidance. Ultimately, the final decisions rest with the Winona City Council.

Summary

We welcome your feedback and guidance. We will seek your input in grading how we are doing through the upcoming goal "report card". But please don't wait for the report card to contact us with your observations and/or recommendations.

Kay Wais

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(608)780-0781 kwais@successfulprojects.com.

Addendum A: Reasoning for the Decision to have traffic signal control at the intersection of Winona Street and 4th Street

SRF Consulting Group, Inc. | Engineers Planners Designers

Memorandum

SRF No. 6802

To: Terry Ward, PE, MSISE, PMP
MnDOT District 6

From: Adrian Potter, PE, PTOE, Senior Associate Craig Hass, PE, Senior Associate

Date: June 30, 2014

Subject: Winona Street and 4th Street Intersection Concerns Memo

Introduction

As requested, SRF has prepared this memo which documents design elements related to the Winona Street and 4th Street intersection near the Winona Bridge, focusing on the operation and safety of southbound motorists entering the intersection from the bridge.

As stated in the *Intersection Control Evaluation* (ICE) *for Winona Street at 4th Street* (SRF, April 2014), there are currently multiple safety and operations issues at the Winona Street and 4th Street intersection. The subject intersection presently operates under three-way stop control, which is a non-typical form of intersection control. Motorists currently coming from the bridge are not required to stop, while motorists on all other approaches have a stop condition. This situation can generate driver confusion over right-of-way, which may result in safety and operational issues.

Though the current configuration operates at an acceptable level, three-way stop control is not a conventional choice of intersection control at new or reconstructed intersections. On public roadways, the most common forms of multi-way stop control are two-way and all-way stop control, while three-way stop control is most commonly used in shopping mall parking lots and private developments. Additionally, the proposed geometric design will provide additional approach lanes at the intersection, causing concern that three-way stop control could lead to even more driver confusion and accidents. Therefore, three-way stop control would not represent a viable intersection control alternative for the reconstructed Winona Street/4th Street intersection.

Based on the findings of the ICE, traffic signal control was recommended at the intersection. Installation of a traffic signal at the subject intersection was determined to create a net public benefit at this location by being able to provide safe gaps for turning vehicles, increase pedestrian safety at the intersection, and better accommodate heavy vehicle movements.

Geometric Considerations

The existing Winona Street/4th Street intersection has some geometric deficiencies. As the intersection is currently designed, certain truck turning maneuvers are difficult to complete without impacting adjacent travel lanes. This has a significant impact to safety and operations. In addition, the current intersection has a limited landing area length. The landing area is defined as the area between opposing cross traffic and the location where the grade exceeds 2%.

The geometric design of the new intersection will be compliant with State and Federal design standards and will address the existing issues with truck turning maneuvers. Special emphasis will be made to provide a safe intersection design for all users, including pedestrians, bicyclists, and motorists (including trucks).

During preliminary design, the profile of proposed southbound TH 43 on the Winona Bridge was constrained by several factors, including:

- The Coast Guard clearance envelope over the Mississippi River
- The vertical clearance over 3rd Street
- The avoidance of right-of-way impacts to the YMCA property

As a result, the approach profile grade was increased from 4.5% to 5.0%. The increase in profile grade was mitigated by providing a more generous landing area, increasing sight distance at the intersection, and providing additional guide signing in advance of the intersection. In addition, the proposed landing area was maximized by using a post tensioned slab bridge over 3rd Street to maintain adequate clearance.

Profile curves were developed to allow for the appropriate sight distance for the design speed. The geometric changes take into account truck turning movements and stopping sight distance. A southbound truck driver should have adequate visibility to react to a traffic signal downstream.

The revised intersection will provide left and right turn bays for the southbound approach, which is a significant capacity improvement from the current single shared left-through-right turn lane configuration.

Safety Considerations

As stated in the ICE, the Minnesota Department of Transportation (MnDOT) provided crash data for the five-year period from January 1, 2003 through December 31, 2007 for the intersection of Winona Street

and 4th Street. Based on this data, 17 crashes occurred at this intersection during the analysis period. The breakdown of the crashes is as follows:

- 6 right-angle
- 4 left-turn
- 3 sideswipe
- 1 rear-end
- 1 right-turn
- 2 other/uncategorized

As stated previously, the non-typical three-way stop control at this intersection can create driver confusion over right-of-way, which may result in safety and operational issues. Since three-way stops are uncommon, there really is not a basis of comparison for the crash data at this intersection.

Improper or unjustified traffic control signals can result in increases in rear-end collisions. However, the proposed signal at the Winona Street and 4th Street intersection was determined to operate at an acceptable level of service in the ICE, which used Synchro/SimTraffic modeling software to assess operations. In part because of this analysis, the ICE deemed a signal at this location as justified. A traffic signal should provide for the orderly movement of traffic at the intersection, and also reduce the frequency and severity of certain types of crashes, especially right-angle collisions.

Traffic Considerations

The operations analysis within the ICE shows a traffic signal should operate at an acceptable level of service on opening day of the project. A well-timed traffic signal at Winona Street and 4th Street should efficiently assign right-of-way to the various traffic movements at the intersection based on vehicular demand. For example, if southbound traffic volumes are the heaviest movements at the intersection during peak hours, then southbound traffic should be provided with a bulk of the green time in order to satisfy traffic demands.

The preliminary design called for overhead guide signs on the southbound approach to clearly denote to drivers which lane they should be in in order to remain straight on Winona Street, turn left onto eastbound TH 43, or right onto westbound 4th Street. This signing should help mitigate driver confusion and provide the most efficient operations possible.

A number of signalized intersections with steep approach grades exist in Minnesota. The grades are a design consideration, but they are not necessarily a deterrent from installing a signal if an engineering study deems signalization as the preferred intersection control alternative. For example, several signals in downtown Duluth along Superior Street have steep grades comparable to the Winona Street/4th Street intersection (see picture below of Superior Street and 2nd Avenue E). A designer must keep in mind sight distance and phasing when designing signals at intersections like these, but a signal can operate safely and efficiently at such locations despite steep grades. Agencies should keep in mind the importance of maintenance activities along the approaches of such intersections. Snow and ice removal are vital to maintaining adequate stopping conditions along steep grade roads approaching signals.

Source: Google Maps

Recommendations

Even though visibility is sufficient along the southbound approach to provide stopping sight distance to drivers, Signal Ahead (W3-3) signs should be installed along the southbound approach of the intersection to provide advanced warning for the signal at Winona Street and 4th Street. This will help to provide additional emphasis to the signal.

Additional warning could be provided by installing advanced warning flashers for the southbound approach. This would consist of installing “Prepare to Stop When Flashing” (W3-X4) signs upstream of the Signal Ahead signs. The “Prepare to Stop When Flashing” signs could be installed with warning beacons that would be interconnected with the traffic control signal system. When the southbound approach is red or about to turn red, the warning beacons would flash and provide additional notice to drivers that they will likely have to stop. This could provide a more active approach to warning southbound drivers (especially trucks) that they will be required to stop at the upcoming signal.

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