



In This Together

Collaboration and Communication During the Marquette Interchange Project

JOSEPH SCHMIDT, TOBY PETERS, LORI BYSONG, AND JIM KOSTER

The authors are with Marquette University, Milwaukee, Wisconsin: Schmidt is a civil engineering student, College of Engineering; Peters is Associate Vice President, Office of Administration; Bysong is a former Communications Specialist; and Koster is Consulting Engineer. (Note: Schmidt now has graduated from Marquette and is working as a project engineer for a general contractor in Milwaukee.)

During the \$810 million reconstruction of the Marquette Interchange, the largest road project in Wisconsin's history, the Wisconsin Department of Transportation (DOT) developed processes to communicate and collaborate effectively with area businesses, local communities, and stakeholders, including Marquette University, to minimize disruptions. The interchange, in the heart of downtown Milwaukee, is the meeting point of three major freeways—Interstates 94, 43, and 794—and serves as the travel hub of southeastern Wisconsin.

The original interchange was completed in 1968 and was designed to support 150,000 vehicles per day. By the early 2000s, the interchange was handling 300,000 vehicles per day, or twice the design volume

(1). A project was launched to improve the facility's traffic-handling capabilities, increase driver safety, and accommodate the growth and other changes in Milwaukee and southeastern Wisconsin. The project would require the total reconstruction of the Marquette Interchange.

Local and University Concerns

Although necessary and beneficial to the community as a whole, the reconstruction raised concerns for the city of Milwaukee and key stakeholders—area businesses, residents, and travelers on the interchange. These travelers included not only commuters to and from downtown Milwaukee, but also motorists passing through. Much of the traffic that moves through Wisconsin traverses the Marquette Interchange at some point. In the

PHOTO: WISCONSIN DOT AND MILWAUKEE TRANSPORTATION PARTNERS



Aerial view of the Marquette Interchange; a portion of the Marquette University campus is visible in the lower quadrant.

early 2000s, the interchange provided access to “7 million visitors annually to downtown festivals and attractions” (1). The interchange also provides access to tourist destinations in northeastern Wisconsin, such as Door County and Green Bay.

Marquette University, a major stakeholder in downtown Milwaukee, was the only entity affected on three sides by the interchange. Because of this location and the round-the-clock, seven-days-a-week activities on the campus, university officials viewed the reconstruction project with concern.

Residence halls on either side of I-43 house 1,200 students. Pedestrian safety, noise, access, land loss, and dust would present challenges for student recruitment and retention. Moreover, the four-year interchange project would last the entire experience of at least one class of Marquette students; the university administration resolved that the project would not define the Marquette experience for that class.

Despite the disruptions and inconveniences of the construction, university enrollment did not decline during the interchange project. Instead, the university experienced record numbers of applications each year that the project was under way. University officials attribute this to the lack of negative impact, to proactive communication, and to effective collaboration between Marquette University, Wisconsin DOT, and

the contractors involved in the reconstruction.

Wisconsin DOT sought to involve the university from the beginning, at the design phase. Through constant communication, the university has been able to work with Wisconsin DOT to address the concerns of the university and its constituents.

Developing Communication

To collaborate with parties affected by the interchange project, Wisconsin DOT developed a variety of communication methods and mechanisms. Marquette University representatives assisted in the development of these procedures and in the distribution of state-produced informational materials.

Wisconsin DOT teamed with HNTB Corp. and CH2M Hill—which together created Milwaukee Transportation Partners—to develop a website devoted to the Marquette Interchange Project, mchange.org. The website served as a public forum offering traffic information, publications, and photos online. The public could submit complaints and suggestions via the website, and the e-mails received prompt responses.

The website featured many interactive functions. For example, one web page displayed a drawing of the new interchange with points of interest that could be highlighted and selected to reveal related information.

Marquette Interchange Project at a Glance

The Marquette Interchange was completed October 2, 2008—three months ahead of schedule and \$15 million under budget. Located in downtown Milwaukee, the interchange links I-94, I-43, and I-794, providing a vital route for commuters and commercial traffic.

The four-year reconstruction project replaced and modernized a four-level interchange with a five-level interchange. At a glance, the Marquette Interchange

- ◆ Serves 300,000 vehicles a day;
- ◆ Encompasses 12 miles of urban freeways and more than 180 structures;
- ◆ Contains more than 38,000 tons of structural and reinforcing steel and 2.1 million square feet of bridge deck;
- ◆ Includes 5 miles of retaining wall, 30 ramps, and 56 bridges;
- ◆ Issued 10,254 plan sheets for major contracts and award-



PHOTO: MILWAUKEE TRANSPORTATION PARTNERS

Construction under way in May 2006; 27 percent of the Marquette Interchange project work was completed by Disadvantaged Business Enterprises, part of the community-sensitive design approach adopted throughout by Wisconsin DOT.

ed \$120 million in Disadvantaged Business Enterprise contracts for design and construction;

- ◆ Attracted 135 million visits to the project website; and
- ◆ Achieved \$100 million cost savings in design.

The project has received several major recognitions, including the American Road and Transportation Builders Association Pride Award, the Wisconsin Department of Transportation Golden Shovel Award, and the American Association of State Highway and Transportation Officials Large Project “On Time” Award. Working for the Wisconsin Department of Transportation,

Milwaukee Transportation Partners—a joint venture between HNTB Corporation and CH2M Hill—were responsible for the bridge, roadway, and retaining wall design; maintaining traffic during construction; plan preparation; and public involvement.



PHOTO: ROBERT WAZNIAK, WISCONSIN DOT

A view of the construction on the Marquette Interchange project, looking south.

Photographs and a diagram of the original interchange offered a look at its construction and highlighted the improvements of the new design.

Community Sensitivity

Wisconsin DOT implemented a community-sensitive design (CSD) approach to involve citizens and stakeholders in the project design before major decisions were made. This partnership approach ensured the consideration of community concerns and sensibilities in the design plans.

CSD allowed Milwaukeeans to have a voice in the project; Wisconsin DOT, however, did not employ CSD only as a preproject endeavor but applied the approach throughout the project. To maintain public involvement, Wisconsin DOT kept the public informed, in part through the mchange.org website, but also through community meetings.

Both Marquette Constructors and Walsh Construction—the two major contractors for the Marquette Interchange Project—needed subcontractors to help with the construction. Two programs provided equal opportunity for all members of the Milwaukee community to be involved in the construction. The Milwaukee Transportation Alliance for New Solutions (M-TrANS), which trains people in the construction trades, was expanded, and a commitment was made to hire Disadvantaged Business Enterprises (DBEs) to bring equal opportunities and new jobs to the community. Wisconsin DOT required that a certain percentage of the subcontractors consist of DBEs—either female- or minority-owned companies. DBEs have contributed to 27 percent of the completed work on the project.

Collaboration extended beyond direct work on the road construction to other opportunities. Decorative artwork was incorporated into the bridge abutments and parapet walls of the bridges, which display the history and culture of the surrounding neighborhood. A mural on the Fond du Lac Avenue corridor depicts the city's role in the Underground Railroad, the route that conducted American slaves to freedom in the 1800s. The project included murals and statues of people who played a major role in the abolitionist movement.

Wisconsin DOT collaborated with representatives of the local African-American, Hispanic, and Hmong communities on the choices for the artwork. The decorative

The community-sensitive design process produced a series of murals about Milwaukee's role in the Underground Railroad and the abolitionist movement. The mural on the northern abutment of I-43 at Fond du Lac Avenue depicts the rescue of runaway slave Joshua Glover from jail in 1854.

PHOTO: JAMES KOSTER, MARQUETTE UNIVERSITY



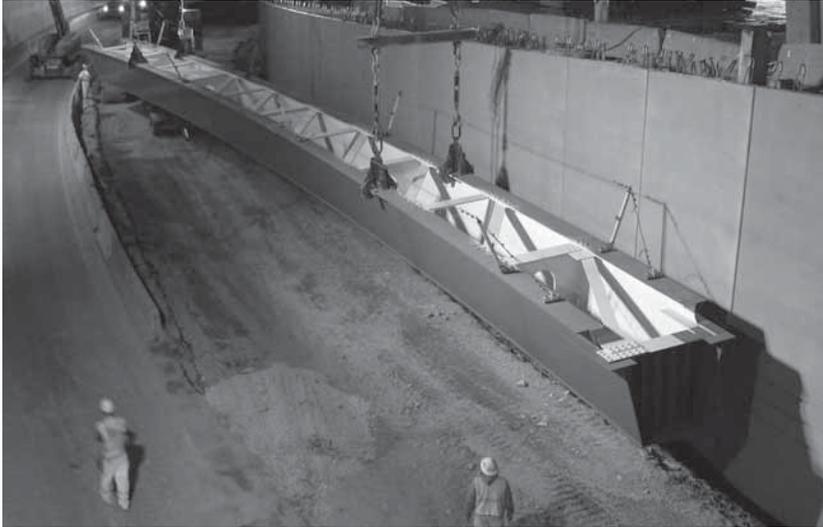


PHOTO: ROBERT WAZNIAK, WISCONSIN DOT

Contractor lifts a tub girder into place for the connector ramp between I-94 Westbound and I-43 Northbound, one of several innovative construction methods employed to ensure rapid completion of the interchange project.

murals provide more than aesthetic appeal—they demonstrate Milwaukee’s diversity and the unifying pride of recognition by the greater community.

Construction Methods

The project used a variety of construction methods and resources. Wisconsin DOT constructed temporary ramps and quickly opened new roads to traffic with asphalt pavement. The life span of the asphalt in the Marquette Interchange is 75 years.

The use of trapezoidal tub girders instead of steel I-beams for the curved entrance and exit ramps was another innovation. The tub girders required fewer supports and could span longer distances, reducing the construction time for the ramps.

Walsh Construction was awarded the project contract for the North Leg, the first major phase of the interchange reconstruction, which involved the demolition and reconstruction of several bridges and road-

The overnight demolition of the Wisconsin Avenue Bridge, December 2006.

ways on or near the Marquette University campus. Marquette Constructors, LLC, a conglomerate of three local construction companies—Edward Kraemer & Sons Inc., Lunda Construction Co., and Zenith Tech Inc.—won the contracts for the West Leg Project and for the Core and South Leg Projects, locations for the majority of the work. Both contractors communicated and collaborated with Wisconsin DOT and Marquette University throughout the project.

Milwaukee Microcosm

Marquette University’s location, size, and makeup served as a microcosm for Milwaukee. If the university was able to manage around the construction and if its various constituencies were able to maintain a positive—or at least neutral—attitude toward the project, then the downtown Milwaukee community was likely to do the same.

The general public was concerned that the Marquette Interchange project would require burdensome changes to normal driving routines. Downtown businesses worried that customers would view the project as an obstacle to travel into downtown Milwaukee.

In cooperation with Wisconsin DOT, Marquette University worked to keep the campus community and visitors informed about the reconstruction. The Office of Public Affairs and other university units facilitated efforts to work with downtown stakeholders and the state to advance the project and minimize the negative effects. In this way, businesses and organizations in proximity to the project were able to share concerns with the university.

The theme of the communication efforts was to assure visitors and residents that the downtown was still open for business. As the tagline for the project suggested, motorists should “change their approach, *not* their destination.”

University Constituencies

Marquette students who lived on or around campus and employees who worked at the university had to deal daily with the noise and inconveniences of construction. Pile driving, sheet driving, demolition work, and general construction noise were heard in university residential buildings, offices, and classrooms. The Wisconsin Avenue Bridge, connecting the main campus with a residence hall and with students who lived off campus, was demolished and reconstructed over the period of one year. Commuter students, faculty, and staff had to deal with route changes. Day-to-day closings and traffic changes were expected, and a way was needed to keep drivers up to date.

Visitors to Marquette also faced unique challenges. Frequent visitors faced problems similar to those of



PHOTO: ROBERT WAZNIAK, WISCONSIN DOT

daily commuters. Occasional visitors would find that routes had changed between trips. Providing revised directions for each new visit to a group already adept at navigating previously used routes was a challenge. All visitors needed assurances that the activities of Marquette University would not be disrupted.

Communications Team

To address these concerns, Marquette University became involved in the project design in 2000. Toby Peters, Associate Vice President for Administration, served as the university's primary liaison with Wisconsin DOT for the project. With a group of university stakeholders, he negotiated with Wisconsin DOT about design issues related to pedestrian safety and access to the university.

In 2004, Peters assembled a team to work on the interchange project: consulting engineer Jim Koster, a Marquette alumnus with 37 years of experience in the City of Milwaukee Department of Public Works; and communication specialist Lori Bysong, a graduate of Marquette's Diederich College of Communication. The team managed the communications between all concerned parties, both within the university and outside. The goal was to ensure that the Marquette community would be informed and would have a voice in the project.

Communications Efforts

The interchange team worked to ensure that the community maintained a positive or neutral attitude about the reconstruction. The team sought to minimize access difficulties and noise concerns for students, faculty, and staff, as well as hazards to pedestrians in the construction area.

The interchange team analyzed, condensed, and presented to the campus community the information gained from weekly meetings and personal contacts with Wisconsin DOT and the contractors. The team also established a network of campus building contacts who would receive updates and pass the information along to colleagues. A weekly e-mail update was distributed to all students, faculty, and staff, and the updates were posted on flat-screen monitors in high-traffic campus areas.

The interchange team met regularly with stakeholder groups on campus and every other week with a steering committee of employees and students. The team convened monthly with representatives from the state and the contractors for an external steering committee meeting and held biweekly meetings internally and externally to plan communication efforts.

In addition to these regularly scheduled meetings, the team planned other communication and opinion-gathering events. Focus groups of students were con-



vened at key points in the project, and student government representatives met with the interchange team regularly to discuss the project's progress and to share concerns.

Creative Approaches

When the Wells Street Bridge, 300 feet from two Marquette residence halls, was scheduled for demolition while students were on campus, students' opinions were solicited about how to minimize the disruption. The two halls that were most affected by the nighttime demolition received advance notice of when and how the demolition would take place. The interchange team collaborated with the Office of Residence Life and Sodexo Food Services to provide refreshments and earplugs to students in the two dorms. These accommodations created a festive atmosphere on the night of the bridge demolition.

To keep the campus community upbeat about the project, the interchange team often took a lighthearted approach to sharing information. For example, the "Where's Jim?" contest invited members of the Marquette community to view a photo of the project site and identify via e-mail where Jim Koster was in the picture; all who responded were entered in a prize drawing. The contest not only entertained but informed the community by showing project developments and progress.

In another creative communication, members of the Marquette community received stress toys. Intended to keep the campus mood light, the tokens were distributed each year to students, employees, and visitors. The toys related to the project through catchy inscriptions along with the project website address. Examples included a miniature construction barrel, a hard hat, a

A late 2005 scene from the "Where's Jim?" contest series, used to build awareness of project developments and progress. (Answer: see photo on next page.)



Annual souvenir stress toys for the Marquette University community featured morale-building wit: a construction barrel, "The Funstruction Begins"; a hard hat, "Hard hats. Cool heads"; a brick, "Bridging the Gap"; an apple, "Getting to the Core of the Project"; and a light bulb, "The light at the end of the tunnel."



Temporary pedestrian route along Tory Hill assured safe connections for students and staff walking from a residence hall, an office building, and off-campus housing to the main campus during the reconstruction of the Wisconsin Avenue Bridge.

In an early interchange design, North 11th Street would have carried additional traffic between two Marquette University residence halls; concerned about safety, university officials worked with Wisconsin DOT to devise the “wobble,” rerouting the street around the buildings.

The former 11th Street space between the residence halls was converted to a pedestrian mall ahead of schedule, thanks to open and regular communication between the contractor, Wisconsin DOT, and the university.

brick, and an apple inscribed, “Getting to the Core of the Project”—a reference to the Core Project, the focus of most of the interchange work. A recent addition to the collection was a lightbulb with the words, “The light at the end of the tunnel.”

Wiggles and Walkways

The most stunning example of the collaborative relationship between Marquette University, Wisconsin DOT, and the contractors was the “wobble,” a relocation of a segment of 11th Street that ran directly between two residence halls on campus. The street would have carried a significant increase in freeway-



bound traffic. As an urban campus, the university gives special attention to the safety of students, employees, and guests and noted that the initial design would compromise pedestrian safety.

The state returned to the drawing board and proposed the wobble—rerouting the street to the east of the residence halls. The university has converted the former street space that was vacated between the two residence halls into much-needed green space. The rerouting exemplifies the state’s responsiveness to the university’s concerns; the cost-effective solution not only helped Marquette but enhanced the interchange design.

Another challenge was the Wisconsin Avenue Bridge demolition, which cut off a university residence hall and office building from the main path of campus travel. To ensure the safety of Marquette students and employees walking from the building on the east side of the interchange, the state created a temporary walkway on the southern edge of campus that was well lit, unobstructed, and safe for pedestrian passage to and from the main campus.

The temporary walkway was constructed with asphalt pavement, and temporary bollards and chains separated the walkway from the street. The lighting was brighter than that of the old Wisconsin Avenue Bridge and contained security cameras and blue-light phones, which connected directly to the university’s Department of Public Safety. The walkway was maintained throughout the full year required for the bridge construction.

Noise Management

When university officials expressed the need for quiet periods during the weeks of exams, Wisconsin DOT wrote limitations on noise into the contracts for bidding. If the noise limits had to be exceeded, the state would work in advance with the university and the contractors to ensure that students were prepared and informed.

Collaboration was critical in the scheduling of major construction events, including noisy and disruptive operations, such as pile driving operations, the movement of equipment, the erection of bridge structures, and the pouring of bridge decks. The 11th Street wobble, for example, was not scheduled for construction until 2008, but because the contractors were pile driving in the area, they changed the plan and continued the operations, completing this part of the project earlier.

The schedule change for the wobble also minimized the noise impact, because students were away from campus; the operation took place only 12 feet from a residence hall. Marquette University benefited from the reduction in noise disturbances and from the earlier construction of the pedestrian mall.

These and other schedule changes and work adjustments contributed to the project’s success from the Mar-

quette University perspective. The Wisconsin Avenue Bridge was completed ahead of schedule because the contractors worked weeknight hours and on Saturdays. The new 11th Street was completed ahead of schedule, because of contractor cooperation and willingness to complete the work in conjunction with other work in the same area—a cost-reducing initiative.

Academic Laboratory

The reconstruction project served as an outdoor, living laboratory for the university's Department of Civil Engineering. The contractors scheduled student tours of the different phases of the project, and members of the design and construction teams spoke with students to share their experiences and the challenges presented by the project.

Associate Professor James Crovetti was the principal investigator for a project that instrumented the Marquette Interchange. The goal was to assemble real-time data measuring the stresses and strains that the pavement structure would endure throughout its service life. Pavement sensors were installed in the subgrade and aggregate base to measure subgrade moisture levels, subgrade temperatures, and subgrade and base pressures. Strain sensors were installed on the underside of the asphalt pavement to monitor the effects of traffic loads on the pavement structure. Temperature and wheel-load position sensors were installed in the surface course of the asphalt.

The data from these instruments were transmitted to a control panel and then to a computer at Marquette University's Transportation Research Center. The findings from the research will assist engineers in designing better, longer-lasting pavements, ultimately reducing construction delays and taxpayer expenses.

Survey Results

The Marquette University interchange team measured the results of its communication efforts via the annual Interchange Communication Survey, conducted with assistance from the Department of Information Technology Services. The survey ran for approximately 10 days during each of the spring semesters of 2005, 2006, 2007, and 2008, to gauge student, faculty, and staff reactions to the interchange information they had received.

The survey results are summarized in the table on page 10. Three questions yielded responses that were most descriptive of the community's attitude to the project:

◆ “To what extent has the Marquette Interchange project been disruptive to you?” Almost 77 percent responded that at least some disruption occurred.

◆ “To what extent have you made changes to



manage the Marquette Interchange reconstruction?” More than 98 percent of the respondents indicated that they had made changes to manage around the disruption from the project. This indicated that the communication efforts were having the desired effect—community members were able to cope with the disruptions.

◆ The third question addressed the adequacy of the information received about the project. Throughout the Marquette Interchange Project, less than 6 percent of respondents said they had a need for more information.

Additional Roles

More than six years ago, when Wisconsin sought federal funding for the Marquette Interchange project, Marquette University representatives, including Vice President for Public Affairs Rana Altenburg, traveled to Washington, D.C., at the invitation of Wisconsin DOT Secretary Frank Busalacchi to meet with legislators. This established the groundwork for the collaborative relationship between Wisconsin DOT, the Milwaukee community, and Marquette University.

The support demonstrated by the state's collaboration with stakeholders communicated a strong message to the Wisconsin congressional delegation that all of the parties involved were ready to work together, that money for the project would be well spent, and that the business community, Marquette University, and the state would collaborate to ensure the best results for the project.

Throughout the reconstruction, Marquette University has participated actively, often in a decision-making capacity. Altenburg has served on several committees that have had communitywide impact; she chaired the committee that chose the colors of the

Temperature and pressure sensors are placed in the pavement subgrade on I-43 Northbound, near Fond du Lac Avenue, for data monitoring and analysis by Marquette University researchers.

TABLE 1 Marquette Interchange Reconstruction Communication Survey: Comparison of Results for Three Questions, 2005–2008

	2005		2006		2007		2008	
To what extent has the Marquette Interchange project been disruptive to you?								
Very disruptive	309	23.64%	210	26.89%	116	14.48%	133	9.79%
Somewhat disruptive	871	66.64%	492	63.00%	561	70.04%	910	67.01%
Not at all disruptive	127	9.27%	79	10.12%	124	15.48%	315	23.20%
<i>Total respondents</i>	1,207		781		801		1,358	
To what extent have you made changes to manage the Marquette Interchange reconstruction?								
No changes required	181	13.85%	96	12.29%	124	15.48%	405	29.82%
I have experienced disruption, but have made changes to manage around it	1,080	82.83%	652	83.48%	664	82.90%	935	68.89%
I have been unable to manage the disruption	46	3.52%	33	4.23%	13	1.62%	18	1.33%
<i>Total respondents</i>	1,307		781		801		1,358	
In general, I have received adequate information about the activities associated with the Marquette Interchange project.								
Strongly agree; agree	1,076	82.08%	583	71.45%	602	75.15%	1,025	75.09%
Neutral	177	13.50%	170	21.57%	156	19.48%	256	18.75%
Strongly disagree; disagree	58	4.38%	55	6.98%	43	5.36%	84	6.15%
<i>Total respondents</i>	1,311		788		801		1,365	

concrete and steel for the project—denim and wheat—close to Marquette University’s colors of blue and gold.

Megaproject Lessons

The Marquette Interchange reconstruction was a major project that ran smoothly and successfully by promoting collaboration. The CSD approach expressed the inclusive character of the project. Involving as many constituencies as possible created attachments to the project and a commitment to collaboration. The physical construction was monumental in scale, but the public involvement renewed the sense of community between Marquette University, the City of Milwaukee, and the state of Wisconsin.

Some major lessons were learned. First, with a large urban project, such as the Marquette Interchange reconstruction, Wisconsin DOT must assess early and thoroughly the people in the area who will be affected, what kinds of disruptions they will experience, and whether or not they could be helpful partners in the project.

Second, the affected constituents should be instrumental in the design and execution of the project. Frequent meetings with constituents are essential; building trust is critical. Trust is the key to achieving a collaborative relationship like that between Marquette University and Wisconsin DOT.

Third, during and after the planning phase, communicating about the project early, often, and accurately is important. Throughout the Marquette

Interchange reconstruction project, groups that were informed earlier and accurately reported less disruption and were happier with the project in general.

Finally, successful project management involves maintaining a positive attitude throughout the process—from planning to completion. Five years ago, Marquette University had genuine concerns about the massive reconstruction of the Marquette Interchange. The positive impact of collaboration and teamwork changed this. Wisconsin DOT, under the leadership of Secretary Busalacchi, and Marquette University were able to create a teamwork environment for the efficient and successful completion of the reconstruction.

Acknowledgments

Also contributing to this article were Don Reinbold, Project Manager; David Nguyen, Project Construction Supervisor; and Barbara Mikolajczyk, Public Information Officer, Marquette Interchange, Wisconsin Department of Transportation; Rana Altenburg, Vice President, Office of Public Affairs; James Crovetti, Associate Professor, College of Engineering; Caitlin West, public relations student, Diederich College of Communication; and Mary Pat Pfeil, Senior Director of University Communication, Office of Marketing and Communication, Marquette University; and Steve Lunde, Structural Engineer, R.A. Smith and Associates.

Reference

1. *Project Guide Introduction*. Wisconsin Department of Transportation, 2007. <http://mchange.org/page.jsp?key=pjg&>. Accessed Jan. 30, 2007.