



2016 APWA Public Works Project of the Year



# Bayfield

*Historic Streets Reconstruction*

Small Cities/Rural Communities  
Category: Historical Restoration/Preservation



**Historic Street Restoration – Bayfield, WI**  
**Public Works Project of the Year Award for Small Cities/Rural Communities**  
**Category: 4 - Historical Restoration/Preservation**

**1. *Development of the project to meet a perceived need of the community.***

Situated on the shores of pristine Lake Superior, the City of Bayfield, with a population of only 487, depends on local tourism to support the community’s economy. Since 2000, the City has invested millions of dollars in local utility and street infrastructure improvements in an effort to restore the original character of the streets. The Historic Bayfield Streets Reconstruction project serves as the crowning achievement of this effort.

The project, which included the key tourist areas of S. Broad Street, N. Broad Street and S. Second Street, contained the last remnants of the c. 1920 clay brick pavers, which were once prevalent throughout the City’s Historic Downtown and Waterfront District. However, years of traffic loading warped the existing road profiles, and numerous utility reconstruction projects left the streets as a patchwork of brick and asphalt. In addition, minimal street lighting and antiquated pedestrian features limited the district’s appeal to visitors.



**Nestled along the shores of Lake Superior, Bayfield, Wisconsin, with its charming character and an inviting old-world feel, is a coveted destination for tourists.**

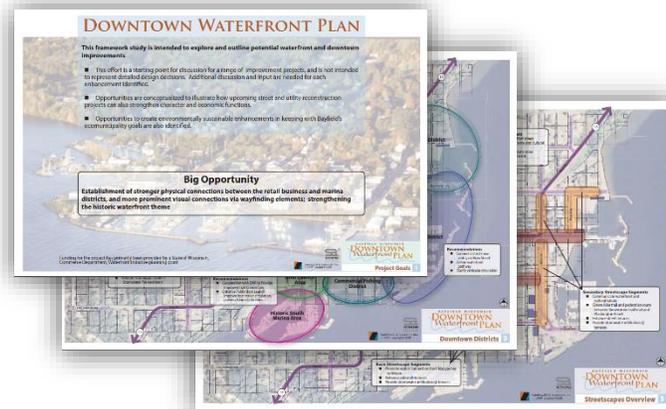


**Before construction: South Broad Street.**



**Before construction: South Second Street.**

In 2008, the City began the planning process for the district that culminated in the Downtown Waterfront Plan, which Vandewalle & Associates, Inc. assisted with in 2009. Plan development included meetings with local business owners and residents to identify the community's goals and priorities for the district. The plan outlined pedestrian and bicycle circulation routes, developed streetscaping concepts for the district, and identified the need for renovation of the existing brick roadways.



The focus of the project was to address the condition of the brick pavement. During the project, all the brick pavers were removed manually by hand, sorted for quality, cleaned with wire brushes and chisels, and then stacked on pallets for reuse. The pallets were wrapped for additional protection and then stored in a secure location with other pallets of pavers that had been removed during a utility replacement project in 2010 and saved in anticipation of this full pavement rehabilitation. Once the bricks were removed, the remaining existing curb and gutter and sidewalks were removed and the roadbed excavated to the new subgrade depth. An aggregate base course layer was placed over the compacted subgrade and a new concrete base layer placed above that. Finally, a sand leveling course was placed over the concrete base and the original brick pavers reset to finished grade.



**Modern subbase and drainage facilities were installed to filter sediment and reduce the pollutant burden on nearby Lake Superior.**

Modern stormwater drainage was installed, including nearly 2,000 feet of perforated polyvinyl chloride (PVC) underdrain, which promoted infiltration to reduce the downstream sediment discharge that previously ran into Lake Superior. Weeper holes coupled with a geotextile fabric layer to provide drainage from the sand setting bed into the underdrain were also set into the concrete base layer at regular intervals to protect the bricks from potential frost damage. This cross section, while substantial, was chosen in order to maximize the design life of the roadways while providing the greatest support structure to the nearly 100-year-old brick pavers.



**A concrete base layer with weeper holes was constructed to support and prevent potential frost damage to the vintage brick surface.**

Full-depth colored concrete was used in the parking areas to emulate the look of the vintage brick pavers. New street lighting was installed, with poles and fixtures matching 1940-era lighting noted in archival photos of the district from that decade. In addition, great care was taken to improve the street terraces during the design and construction to protect existing trees that lined the corridors, a vital component of the district's charming character. In particular, variations to the curb and sidewalk locations were made to protect and preserve a 175-year-old oak tree in the terrace on S. Second Street. These efforts, along with the preservation of the vintage brick pavers, sought to protect the rich historic character of the project corridor.

In addition to historic preservation, improvements to the pedestrian facilities and a street lighting system were undertaken to improve access and visibility along the project corridor in an effort to encourage visitors to venture farther from the "main street" corridor along Rittenhouse Avenue. These improvements provide an expanded radius for viable business development, helping to invigorate private investment in the City's local economy.



Great care was taken to preserve the rich historic character the City embodies.



Improved pedestrian facilities such as LED lighting and ADA compliant sidewalks allow visitors to venture out farther from the "main street" corridor.

## *2. Use of alternative materials, practices, or funding that demonstrates a commitment to sustainability.*

The City is proud to be part of the green-tier legacy charter in Wisconsin, which is a unique program that collaborates with other communities throughout the state to move farther and faster toward their sustainability goals. With a strong commitment to sustainable building practices, the diligence taken during the Historic Bayfield Streets Renovation project allowed the salvage and reuse of as many of the vintage brick pavers as possible. Efforts included hand removal and cleaning of the bricks and protected storage to ensure safekeeping until placement. This effort began in 2010 when the City completed utility upgrades to the project streets. With plans underway for the Historic Streets project, the City included provisions in the utility work to have the contractor salvage and store the bricks from that project for future use.

Sustainability also played a role in the lighting design for the project. The City elected to install LED fixtures on all the lights in the corridor to maximize energy efficiency and fixture life-span.



Vintage bricks were placed by hand.

As plans for the project came into focus, it became apparent that the total project cost of nearly \$1.8 million would present a substantial burden on the City's limited tax base. With assistance from Strand Associates, Inc.<sup>®</sup>, the City applied for and won a Wisconsin Department of Transportation (WisDOT) grant totaling \$706,000. The grant, issued through the Transportation Enhancement (TE) program, provides funding for projects dedicated to the preservation of historic structures and places. Without this grant, the reconstruction of the iconic brick streets would not have been possible.

### *3. Unique or unusual accomplishments under adverse conditions that dictated the defined action.*

This project featured a number of unique characteristics and challenges. Coordination was extremely critical to the success of the project; not only did it have to meet the design and environmental impact standards of the state and federal environmental funding source, but because of its location within a National Register Historic District and a number of adjacent affected structures, it also had to adhere to regulations set forth by the National Register of Historic Places.

As such, design and construction needed to meet WisDOT's facility design criteria, meet the needs of the corridor, and minimize negative effects on the character of the district. Early in the process, the State Historic Preservation Office (SHPO) issued a finding of adverse effect on the district as the result of adjusting the current roadway width. Since the proposed width was necessary to meet WisDOT design standards as well as to provide improved terrace width for the existing street trees, the design standard was eventually approved. To mitigate the adverse effect, the City worked with SHPO to develop a memorandum that outlined an acceptable solution. The solution included SHPO approval of all surface materials used in the roadway construction as well as the completion of archival photo documentation of historic structures, which contribute to the Historic District in and around the corridor.

In addition to the historic implications, contemporary community needs also influenced the final project design. Specifically, parking was a very sensitive issue to local residents, and mandated federal pedestrian and bicycle requirements needed to be addressed while maintaining the road width necessary to avoid impacting the street trees that were essential to the character of the district. To meet these goals, the design revised existing angled parking along S. Broad Street to a parallel arrangement and provided necessary width for on-street parking for the rest of the project corridor as well. S. Broad Street also serves as a primary bike route into the downtown from the community Brownstone Trail; therefore, bike lanes were also provided on that block. Pedestrian facilities were widened throughout all project streets and improved to meet Americans with Disabilities Act (ADA) standards.



**North Broad Street preconstruction.**



**North Broad Street postconstruction.**

#### *4. Economic challenges that the community faced and the rationale of the option chosen.*

As a quaint northern Wisconsin community with a population under 500, Bayfield faced the difficult decision of how best to address its failing infrastructure with a limited tax base. Rather than patching together short-term solutions, the City decided to undertake this ambitious project that would stand as an investment for the community's future. As such, the street design cross section selected maximized the design life of the project, ensuring that the project legacy would endure for generations to come. In addition, the City completed full reconstruction of all the utilities underneath the project streets prior to beginning this project, minimizing the amount of maintenance and repair work needed in the foreseeable future. Each of these projects was coordinated heavily with the WisDOT-led construction projects on STH 13/Rittenhouse Avenue, which is the main arterial roadway through the City and the project corridor. In each case, the City made every effort to fully leverage design and construction dollars to maximize the total value of the project.

#### *5. Creative use of municipal resources, equipment, labor, or funds that produced measurable benefits to the community.*

The City of Bayfield took a very active role as the lead interface between the project and local businesses and stakeholders. Throughout design, the City communicated design intent and requirements to residents so that they understood the requirements of the project and could prepare for the upcoming tourism season. Once construction was underway, the City provided constant communication to inform stakeholders of construction activities, access requirements, and provide short-term schedule updates. In addition, the City posted real-time updates to its website to keep local residents and tourists current on the status of the project. As a result of this significant effort, the City had a very successful tourist season and exceeded its rental and resort sales projections!



**Opening ceremony to kick off the new completed reconstruction project.**

In addition to communications effort with the community throughout the project, the City provided access at the wastewater treatment facility for secure storage of the palletized brick pavers. This storage allowed the salvaged bricks from the earlier utility projects in 2010 to be stored rather than resetting, thus ensuring they would remain usable for the Historic Streets Renovation project. The savings realized by providing this service totaled nearly \$120,000!

#### *6. Construction processes that minimize the impact to the community and its residents during construction.*

Each summer, the City relies on its tourism as its lifeblood to sustain the local economy. A substantial portion of this business is from returning annual visitors, both to enjoy the City itself and also to serve as home base for accessing the wide range of adventures across the coveted Chequamegon Bay region. As such, it is vital to the City that each construction project begin as early as possible and be completed prior to the critical July 4th weekend, which serves as the traditional kick-off to the tourism season.



To accomplish the scope of work while meeting these firm deadlines, an expedited construction schedule was implemented that allowed for closure of project streets to allow the contractor to optimize construction and material sequencing. This meant the contractor was able to justify the use of a slip form paver to expedite curb and gutter and base slab construction and minimized the number of mobilizations necessary for the brick layers throughout removal and replacement.

To accommodate affected businesses, storefront access was supplemented in the short-term by utilizing mid-block service alleys. The contract required temporary pedestrian routes to all storefronts where rear entry was not accessible. Being a tourist-friendly area, many businesses were affected by this project, such as the City's only post office; therefore, effectively managing and maintaining access during construction to all businesses throughout the project corridor was not only critical to the success of the project but also the vitality of the local economy.

### *7. Demonstrate awareness of opportunities for environmental preservation during the project and how they were incorporated in the project design and construction.*

Historic and environmental preservation was a central design thesis for the Historic Bayfield Streets Renovation Project. Listed on the National Register of Historic Places, any improvements to the district needed to avoid or minimize impacts to the setting and character of the district and its contributing resources. The street trees throughout the project corridor required significant consideration during design and construction. Existing grass terraces were relatively small in size, limiting the trees ability to flourish. In addition, the 175-year-old oak tree on S. Second Street was impacting the existing curb line and roadway itself. The design team consulted with the City Arborist throughout the project to determine a plan that would protect all the trees and enhance the terrace space while meeting WisDOT design requirements. To provide the appropriate clearances for the street trees, the terraces were widened by moving the curb lines toward the centerline of the road and still meeting WisDOT minimum roadway width for drive lanes with on-street parking. Additional clearance was provided for the historic large oak tree by offsetting the curb line at that location to protect the root system that was relatively shallow near the trunk.

The proximity to the popular waters of Lake Superior and the steep grades of the surrounding watershed required added priority and attention to erosion control throughout construction. Collaborating almost daily with the Wisconsin Department of Natural Resources (WDNR), erosion control best management practices were created and adapted to meet specific project conditions so that construction waste and drainage of sediment to Lake Superior was minimized.



**Additional clearance was provided for the historic 175-year-old oak tree by offsetting the curb line to protect the root system that was relatively shallow.**

In addition to the protection of the street trees and the water quality of Lake Superior, the City extended its historic preservation efforts to include additional existing structures along the project corridor. This effort included assembling sets of archival photographs to be housed with SHPO and the Bayfield Historical Association and included documentation of all structures along the corridor, whether listed as contributing or not by the National Register of Historic Places. These efforts aid in the continued preservation of the charming district features.

**8. Additional conditions deemed of importance to the public works agency, such as exceptional efforts to maintain quality control and, if value engineering is used, construction innovations as evidenced by time and/or money-saving techniques developed and/or successfully utilized.**

The City of Bayfield put forth an exceptional effort to inform and involve the local business owners about the Historic Streets Project during the preconstruction and construction phases. This process began with planning-level interviews nearly 7 years before construction and included several updates in the years leading up to the project so that the businesses could inform their clientele and make other necessary preparations for the project. This thorough public relations preparation allowed for full road closure during construction, which simplified construction sequences and processes, saving the contractor time and money and, thus, passing those savings on to the City.

In addition to the proper planning and advanced notification of affected stakeholders, the City employed full-time, on-site public works and engineering staff to assist with construction management efforts. Weekly progress meetings were held with representatives from the City, engineering staff, and contractors. This allowed engineering and City staff to be proactive in addressing potential problems with construction conflicts and project sequencing, as well as providing a conduit for agency and public interaction to address any unforeseen needs in real-time. These efforts helped the contractor meet the expedited project schedule and allowed the streets to be opened in time for the kick-off to the busy tourism season, saving the community and its businesses thousands of dollars in otherwise lost revenue.



**Historic streets celebration was well attended by locals, surrounding community members, and loyal Bayfield enthusiasts.**



**South Broad Street c. 1920.**



**South Broad Street c. 2015.**