

# CONSTRUCTION COSTS CASE STUDY



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## Complete Streets Construction Cost Case Study: Resurfacing and Reconstruction of MN 28, MN 29, and MN 104 in Glenwood, MN

**Location:** City of Glenwood, MN (45.65 N, 95.39 W)

**Project Length:** 4.2 mi

**Project Duration:** January 2016–October 2018 (33 mo)<sup>1</sup>






### Problem Statement

Officials identified safety, mobility, and accessibility challenges for the three roadways in the Glenwood city center (MN 28 at Minnesota Avenue, MN 29 at Glacial Ridge Trail, and MN 104 at Franklin Street). Deficiencies included gaps in the network of bicycle lanes, absent or poorly visible crosswalks, inadequate street lighting, and challenges for persons with physical limitations as defined in the Americans with Disabilities Act (ADA)<sup>(1)</sup> such as curb ramps with steep grades and cracked and uneven sidewalks.

The intersection of MN 28 with MN 29 and MN 104 had no pedestrian signal heads, and the crash rate was twice that of the State average. Large delivery vehicles had difficulty turning into and out of downtown shops and eateries on MN 29 and MN 104. MN 28 was designed to accommodate large trucks, which made navigation easier for freight providers but increased the potential for challenges to nonmotorized users.

The roadway pavement, utility, and drainage infrastructure were in poor condition, and the community wanted additional landscaping and amenities. Near the Pope County Fairgrounds, close to downtown, MN 28 experienced flooding because side ditches and culverts were in poor condition. The existing lighting facilities were inadequate (insufficient illumination and incomplete coverage across the project area).

### Modal Focus (check all that apply):

- |   |   |
|---|---|
| <input checked="" type="checkbox"/>  Pedestrians | <input type="checkbox"/>  Transit users                |
| <input checked="" type="checkbox"/>  Bicyclists  | <input checked="" type="checkbox"/>  Freight providers |
| <input type="checkbox"/>  Micromobility users    | <input checked="" type="checkbox"/>  Motorists         |

<sup>1</sup> Includes initial planning, project development, and 6 mo of construction.

## Project Context

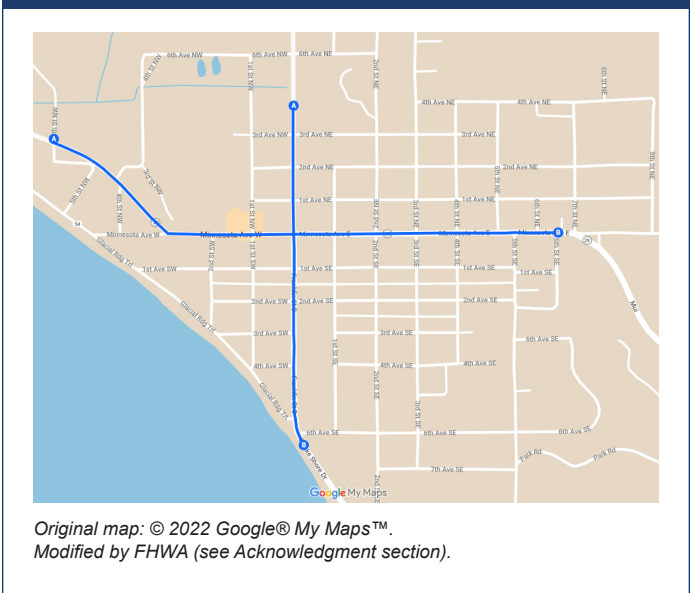
Context refers to the built environment within which the roadway is located. The American Association of State Highway and Transportation Officials (AASHTO) *A Policy on Geometric Design of Highways and Streets: The Green Book*, 7th Edition provides information about traditional functional classifications for roadways as well as context classifications.<sup>(2)</sup> For all three roadways in this project, the roadway context is suburban, and the functional classification is arterial. In addition, MN 28 is a designated freight route.

Three roadways (six blocks of MN 28 and eight blocks of MN 29 and MN 104) provide access to the Glenwood city center, which has shops, eateries, and a hotel. The city center is approximately 3 mi from Lake Minnewaska, a water-sports location. The annual average daily traffic in 2017 for MN 28, MN 29, and MN 104 was 7,900, 5,400, and 4,400 vehicles per day, respectively. MN 28 had four 12-ft travel lanes (two in each direction) and onstreet parallel parking on both sides. MN 29 and MN 104 had two 12-ft travel lanes (one in each direction) and onstreet parallel parking on both sides. The total right-of-way for all three roadways ranged from approximately 100 to 110 ft. Figure 1 presents the project location.

## Community Engagement

The city held public meetings to discuss improvements to MN 28, MN 29, and MN 104. Meeting formats included brown-bag lunches, short presentations, and open houses. The city used direct mail, press releases, and emails to notify participants. During the initial meetings, community members and stakeholders—business

**Figure 1. Map. Glenwood city center project location.<sup>(3)</sup>**



owners and the Minnesota Department of Transportation (MnDOT)—discussed freight traffic restrictions and safety, mobility, and accessibility challenges. The city incorporated feedback from attendees into project conceptual layouts and plans to enhance the streetscape, add bicycle lanes, and implement a road diet.<sup>(4)</sup> As the project progressed, the city used additional feedback to revise initial designs as much as possible.

## Project Improvements

Table 1 presents a detailed summary of the project improvements. Figure 2 and figure 3 present the before and after improvement photos from a segment of MN 28.

Table 1. Project improvements.	
Problem	Description of Improvements
Nonexistent or poorly visible crosswalks. Curb ramps at crosswalks not compliant with the ADA	<ul style="list-style-type: none"> <li>High-visibility crosswalks with curb extensions at each intersection in the downtown area.</li> <li>ADA-compliant curb ramps.</li> </ul>
Sidewalks in poor condition and not compliant with the ADA	Improved, ADA-compliant sidewalks on both sides of the roadway.
Absence of pedestrian and bicycle signals at the intersection	Pedestrian and bicycle signals at existing signalized intersections.
Need for speed mitigation and shorter crossing distances	MN 28 roadway reduced from four 12-ft travel lanes to two (one in each direction), and space reallocated to include a center left-turn lane.
Freight mobility maintenance	<ul style="list-style-type: none"> <li>Travel and center left-turn lanes on MN 28 retained a width of 12 ft to maintain freight movement.</li> <li>Raised bicycle lanes were lowered to grade at intersections, allowing large delivery vehicles to turn</li> </ul>
Gap in bicycle network	Raised, 7-ft, one-way bicycle lanes on both sides of the roadway. Reduced parking lane width on both sides of MN 28 (from 12 to 10 ft) and eliminated a travel lane, which freed 14 ft of space for bicycle lanes.

**Table 1. Project improvements (continued).**

Problem	Description of Improvements
Inadequate landscaping infrastructure	Landscaping and amenities improved user comfort in the 7-ft buffer zone between the bicycle lane and the sidewalk and enhanced environmental and aesthetic quality.
Inadequate existing lighting facilities (i.e., insufficient illumination and incomplete coverage across the project area)	<ul style="list-style-type: none"> <li>• Ecofriendly, energy-saving LED (light-emitting diode) street lighting covering a wider area replaced existing halogen streetlights.</li> <li>• Separate pedestrian lights for sidewalks and bicycle trails.</li> </ul>

**Figure 2. Photo. A roadway segment on MN 28 before improvement.**



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These images are intended to be examples of real-world, existing conditions; the conditions shown in the photos are not limited to best practices, approved designs, or approved behaviors, and may reflect conditions that are not recommended.

**Figure 3. Photo. A roadway segment on MN 28 after improvement.**



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These images are intended to be examples of real-world, existing conditions; the conditions shown in the photos are not limited to best practices, approved designs, or approved behaviors, and may reflect conditions that are not recommended.

## Project Results

Upgrading sidewalks, closing the gap in the bicycle lane network, and reducing the crossing distance by at least 14 ft on MN 28 improved mobility for pedestrians and bicyclists. The city received no reports of disruption to freight traffic. Users and community members have increased their physical activity and appreciate having an inviting street environment and a cohesive downtown character.

## Project Funding Sources

- Federal:
  - Surface Transportation Block Grant (STBG) program.<sup>(5)</sup>
  - U.S. Department of Housing and Urban Development (HUD) Transportation Revolving Loan Fund (TRLF) (administered by the city of Glenwood).<sup>(6)</sup>
  - HUD Department of Employment and Economic Development (DEED) program (administered by the city of Glenwood).<sup>(6)</sup>
  - Minnesota Public Facilities Authority (PFA) Federal funds.<sup>(7)</sup>
- State:
  - Trunk Highway funds.<sup>(8)</sup>
  - ADA funds.<sup>(1)</sup>
  - Chapter 152 Federal bond funds.<sup>(9)</sup>
  - Transportation Alternatives program.<sup>(10)</sup>
- Local: Pope County and city of Glenwood.

## Project Delivery Mechanism

- |   |  |
|---|--|
| <input type="checkbox"/> Alliance contracting/integrated project delivery (IPD) | <input type="checkbox"/> Construction manager/general contractor (CM/GC) |
| <input type="checkbox"/> Progressive design-build (PBD)                         | <input type="checkbox"/> Public-private partnership (P3)                 |
| <input type="checkbox"/> Design-build (D-B)                                     | <input type="checkbox"/> Project bundling                                |
| <input checked="" type="checkbox"/> Design-bid-build (D-B-B)                    | <input type="checkbox"/> Indefinite delivery/indefinite quantity (IDIQ)  |
| <input checked="" type="checkbox"/> Other: <u>Cooperative agreement</u>         |  |



## Project Costs\*

**Total Project Costs – \$10,450,275**

**Construction – \$9,070,275**

- Mobilization – \$187,000
- Traffic control (upgrade signal and detection) – \$230,584
- Roadway construction and related activities – \$4,644,317
- Lighting (general street LED (light-emitting diode) lighting) – \$988,406 (\$14,120 each)
- Concrete sidewalk – \$776,790 (\$11 per sq ft)
- Curb ramps (with detectable warning surface) – \$49,099 (\$42 per sq ft)

**Utility Adjustments**

\$0

**Right-of-Way**

\$130,000

**Project Website**

<https://www.dot.state.mn.us/d4/projects.html><sup>(4)</sup>

- Pedestrian crossing improvements (lane striping and markings) – \$115,507 (\$11,551 each)
- Road diet (lane striping and markings) – \$76,070
- Concrete bicycle lane (raised and colored) and bicycle parking – \$768,959 (\$11 per sq ft)
- Drainage – \$187,268
- Landscaping and amenities (e.g., waste receptacles, metal benches, irrigation systems, trees) – \$1,046,275

**Preliminary Engineering**

\$1,250,000

\*Project costs include improvements that benefit mobility in general and may have been necessary regardless of any safety improvements.

## Acknowledgment

The map in figure 1 was modified by the authors to mark the path of the Glenwood city center project location. The original map is the copyright property of Google® My Maps™ and can be accessed at <https://www.google.com/maps/place/45%C2%B039'00.0%22N+95%C2%B023'24.0%22W/@45.6504312,-95.3868672,16z/>.<sup>(3)</sup>

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