3 Existing Transportation System

CHAPTER CONTENTS

Introduction
Overall Network Description
Existing Bicycle Facilities
Existing Pedestrian Facilities
Existing Vehicular Facilities
Bridges
Circulation Conditions

EXISTING TRANSPORTATION SYSTEM

Introduction

The existing transportation conditions were assessed though review of related plans, meetings with city staff, Parks and Recreation, River and Transportation Commissions, stakeholders, data collection, field work, and the public involvement process. The following summarizes the current transportation network within Glenwood Springs city limits and is divided into the following sections:

- Overall Network Description
- Existing Bicycle Facilities
- Existing Off-Street Shared-Use Paths
- Existing Pedestrian Facilities
- Existing Vehicular Conditions
- Bridges
- Circulation Conditions
- Needs Assessment

A more extensive review of Glenwood's existing transportation conditions is found in Appendix A and includes the following:

- **Overall Network Description**- Analyzes the transportation network as a whole.
- **Existing Bicycle Facilities** - Provides an outline of existing bicycle facilities in Glenwood Springs with descriptions of facility types and local examples.
- **Existing Pedestrian Facilities** - Identifies existing pedestrian facilities and describes typical sidewalk design, connectivity, and the use of crosswalks.
- **Existing Vehicular Conditions** - Discusses existing vehicular conditions.
- **Bridges** - Reviews existing bridges and the access they offer.
- **Circulation Conditions** - Summarizes a circulation report used to identify vehicular, bicycle and pedestrian counts at key intersections in Glenwood Springs.
- **Needs Assessment** - Highlights a list of needs and concerns in the City.

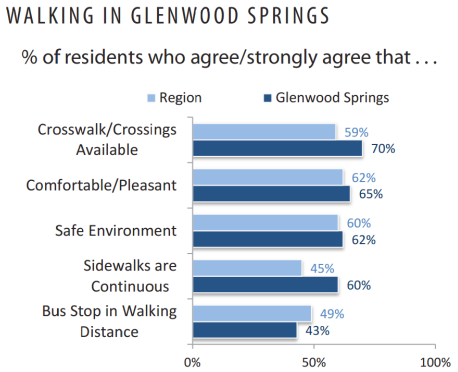
Overall Network Description

Glenwood Springs' vehicular, bicycle and pedestrian networks are part of a larger transportation network that includes communities within and beyond the Roaring Fork Valley. The City's transportation network generally offers convenient and safe connections to other communities and neighborhoods and destinations within the city.

While the existing street network works well, the main north-south highway through Glenwood Springs, SH-82, is becoming increasingly congested with vehicles. Additionally, the city's most important southern arterial, South Midland from 27th Street to Four Mile Road faces its own challenges of access and increasing congestion.

The city's internal bicycle and pedestrian infrastructure generally allows convenient and safe access throughout the city. Regional paths draw tourists to Glenwood Springs and connect the city south to Aspen and east to the eastern entrance of Glenwood Canyon. However, on-street network gaps and multi-use conflict zones exist and need to be addressed.

The completeness of a transportation network is judged on its ability to facilitate different modes of transport to result in higher individual mobility than networks that serve mainly one mode. A complete network is also one that strengthens connections between those different modes making travel more convenient for users at all levels of service.



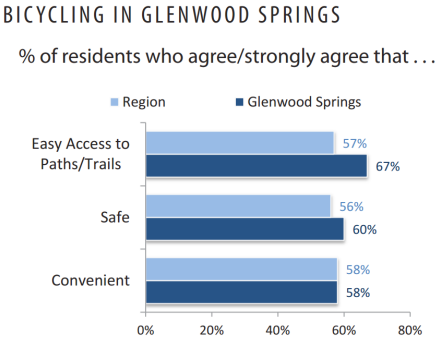


Figure 3.1: Glenwood Springs Travel Patterns
The RFTA 2014 Regional Travel Patterns Update study examined current and future multi-modal needs. Residents largely responded that crosswalks, sidewalks, paths and trails are convenient and safe.

Glenwood Springs has a highly functional bus system served by two different service providers. Operated by RFTA, Ride Glenwood Springs (RGS) is a year-round public bus service with stops along Grand Avenue, 6th Street, Highway 6 and Midland Avenue. RGS offers connections to regional Roaring Fork Transportation Authority (RFTA) transit services, Greyhound Bus Lines, Amtrak and two free Park-'n-Ride locations within Glenwood Springs. Presently, Ride Glenwood Springs does not allow bikes on their busses nor does it offer exterior bike racks. RFTA busses are equipped during the summer season with external bicycle storage. Two types of external bike racks can hold either two or four bikes.

One of the Ride Glenwood Springs bus stop along Hwy 6

Existing Bicycle Facilities

Glenwood Springs' existing bicycle facilities generally allow for convenient and safe access throughout the city. Bicycle facilities include approximately 2.5 miles of on-street bike lanes, 13 miles of bike routes, 4 miles of on-sidewalk bike routes, 7.5 miles of paved and 10 miles of unpaved off-street trails.

While bike routes represent a large proportion of the existing bike facilities, most of the bike routes in the City are not designated with wayfinding signage or route information.

Blake Street bike lanes

Existing Off-Street Shared-Use Paths

Glenwood Springs' network of paved and unpaved shared-use paths allow movement across the city and to neighboring towns and cities. The most popular shared-use paths include the Glenwood Canyon Recreation Trail and the Rio Grande Trail/River Trail which connects commuter and recreational bicyclists and pedestrians to destinations throughout the Valley.

While the Rio Grande Trail/River Trail traverses the city, there are limited access points from the existing roadway network.

River Trail shared-use path

Existing Pedestrian Facilities

Although recognized as a pedestrian friendly and walkable city, Glenwood Springs has an incomplete sidewalk network. Sidewalks are present on the majority of the Glenwood Spring's downtown streets but are less common in residential areas. Where present, sidewalks range from 3 to 10 feet in width and are part of a hierarchical system of crosswalks throughout the city.

Existing Vehicular Facilities

The City's street system is comprised of over 135 roads of various lengths and widths and has five functional classifications for its streets. In the neighborhoods in and around downtown, local streets form a grid system, which is traditional for an historic urban area, and encourages more pedestrian and bicycle usage. In the newer areas of Glenwood Springs residential developments reflect more of a suburban form due to the steep canyon topography and two major rivers. As a result, streets in these areas are typically curvilinear and connectivity is more circuitous.

Much of the City's congestion is caused by the lack of a grid network outside the downtown area which typically helps disperse traffic throughout the system. Consequently, there is more reliance on the limited number of major streets such as SH-82, 7th Street, and 27th Street, which contributes to the congestion along these facilities.

Currently, there are three congested corridors where traffic volumes are either at or over the capacity. SH-82, the primary north – south street, accommodates both travel passing through the City and local traffic. SH-82 operates at capacity with significant delays at select intersections. The City, in conjunction with the Colorado Department of Transportation, completed the 2010 Corridor Optimization Plan that identified improvements intended to strike a balance between mobility and access so the functional intent of the state highway is maintained but access is adequate to accommodate both existing land uses and potential development opportunities.

The other congested corridors include 7th Street, 27th Street and South Midland Ave. 7th Street and 27th Street provide the only two east/west vehicular connections across the Roaring Fork River. Seventh Street is currently operating at close to capacity and 27th Street at South Midland Ave is operating over capacity during peak periods.

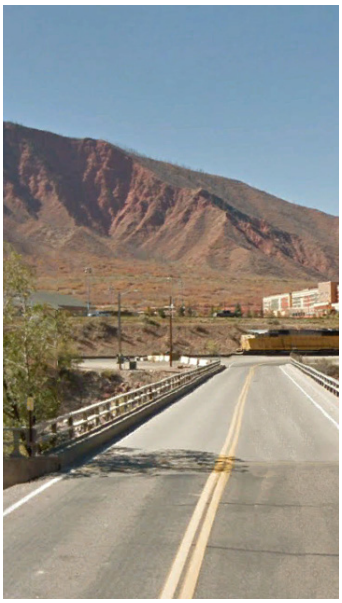
Streetscape on 7th Street (installed 2014)

Incomplete sidewalk at Glenwood Hot Springs, along N. River Street

High visibility crosswalk

Bridges

There are ten bridges in Glenwood Springs. Five bridges cross the Colorado River, three cross the Roaring Fork River, and two cross I-70 via Devereux Rd. Five of the ten total bridges are exclusively dedicated for bicycle and pedestrian use. The busiest vehicular bridges are the Grand Avenue Bridge with an AADT (Annual Average Daily Traffic) of 25,000 vpd (vehicles per day), the 27th Street Bridge with 9,500 vpd and the 7th Street Bridge with 8,300 vpd. The busiest pedestrian bridge, the Grand Avenue Pedestrian and Bicycle Bridge has combined bicycle and pedestrian volumes that can reach approximately 4,000 users per day during seasonal peaks (CDOT).



Devereux Bridge

Grand Ave. Pedestrian Bridge

Cardiff Bicycle and Pedestrian Bridge

Two Rivers Park Trail Bridge

Circulation Conditions

Four studies were considered in the development of circulation conditions data. The studies included:

- *Downtown Vehicular and Pedestrian Circulation Study* (Draft) - The draft study captured traffic patterns related to vehicular, bicycle and pedestrian volumes and was helpful in evaluating the existing and future circulation opportunities and challenges within the transportation network. While the study area was limited to the downtown area, the findings at key intersections are significant to the City's transportation network as a whole.
- SH-82 Access Control Plan (2013) - Adopted by City of Glenwood Springs in 2013, the plan identifies future property access points along the SH-82 corridor.
- Glenwood Ridge Traffic Impact Study (March, 2014) - The study analyzed the traffic impacts associated with the Glenwood Ridge Development on Four Mile Road to make recommendations to the road system.
- Traffic Assessment State Highway Access Permit Application for Iron Mountain Hot Springs (July, 2014) - The study estimated peak hour traffic generation for the Iron Mountain Hot Springs and examined existing movements on turn lanes along US 6 to determine whether or not they meet CDOT requirements under future conditions.

Twenty-seven intersections were analyzed for vehicular, bicycle, pedestrian and trail count volumes during the peak hours (see Figure 3.2). Trail count information was considered alongside vehicular, pedestrian and bicycle data as major Glenwood Springs trails are considered a significant part of the City's overall transportation network. Trail counts were collected by the Glenwood Springs Parks and Cemetery Department in 2013-2014 from automatic counters placed at each trail.

Vehicular Conditions: Existing Traffic Operations

The City's twenty-seven significant intersections were broken down into signalized and unsignalized groups for the sake of comparison as each condition presents its own issues. Table 3.1 describes each signalized intersection's LOS as well as its deficiency condition. Table 3.2 describes each unsignalized intersection through AM, PM, overall LOS, and volume-to-capacity ratio (v/c) for the worst performing movement (typically this is the left-turn approach at the stop-sign controlled intersection.) The prioritization of vehicular travel on Grand Avenue at some intersections results in longer green times on Grand Avenue and less on east-west travel. This reduced green time allocated to side streets increases vehicular (and pedestrian) wait time if crossing Grand Avenue.

27. US Highway 6 and Devereux St

26. Four Mile Rd and Midland/Airport

25. Mount Sopris Dr and Midland Ave

21. CR 115 and Hwy 82

22. Orrison d/w and Hwy 82

Figure 3.2: Downtown Intersections Key Map

Note: The above key map is a graphical reference for Tables 3.1 and 3.2

Table 3.1: Vehicular Level of Service: Signalized Intersections

Intersection	Level Of Service (LOS)			
	Control	Period	Overall	Deficient Approaches
1. 8th St. and Grand Ave.	Signal	AM	B	EB - E, WB - E
		PM	C	EB - F, WB - E
		Sat	B	EB - D, WB - D
2. 9th St. and Grand Ave.	Signal	AM	A	WB - E
		PM	B	EB - E, WB - F
		Sat	B	WB - E
3. 10th St. and Grand Ave.	Signal	AM	A	EB - D, WB - D
		PM	A	EB - E, WB - E
		Sat	A	EB - D, WB - D
4. 11th St. and Grand Ave.	Signal	AM	A	EB - D, WB - D
		PM	A	EB - E, WB - E
		Sat	A	EB - D, WB - D
5. 14th St. and Grand Ave.	Signal	AM	A	EB - D, WB - D
		PM	B	EB - E, WB - F
		Sat	A	EB - D, WB - D
7. 27th St. and Hwy 82	Signal	AM	C	N/A
		PM	B	N/A
23. 27th St. and Grand Ave	Signal	AM	A	N/A
		PM	A	N/A

Table 3.2: Vehicular Level of Service: Unsignalized Intersections

Intersection	Level Of Service (LOS)			
	Control	Period	Overall	(v/c)
6. 7th Street and Colorado Ave	Side-Street Stop	AM PM Sat	A B B	N/A
8. 7th Street and Cooper Ave	4-way stop sign	AM PM Sat	A A A	N/A
9. 8th Street and Cooper Ave	4-way stop sign	AM PM Sat	A A A	N/A
10. 9th Street and Cooper Ave	Side-Street Stop	AM PM Sat	A B B	N/A
11. Maple Street and Hwy 82	Side-Street Stop	AM PM	F C	0.05 0.04
12. 13th Street and Hwy 82	Side-Street Stop	AM PM	E F	0.27 0.39
13. D Street and Hwy 82	Side-Street Stop	AM PM	F F	0.54 0.41
14. Park Drive North and Hwy 82	Side-Street Stop	AM PM	C F	0.05 0.02

Table 3.2: Vehicular Level of Service: Unsignalized Intersections (continued)

Intersection	Level Of Service (LOS)			
	Control	Period	Overall	(v/c)
15. Park Drive South and Hwy 82	Side-Street Stop	AM PM	F F	0.02 0.06
16. 19th Street and Hwy 82	Side-Street Stop	AM PM	F F	0.16 0.76
17. Bradley d/w and Hwy 82	Driveway	AM PM	B F	0.04 0.30
18. 22nd Street and Hwy 82	Side-Street Stop	AM PM	E F	0.32 0.80
19. 24th Street and Hwy 82	Side-Street Stop	AM PM	D F	0.05 0.07
20. 29th Street and Hwy 82	Side-Street Stop	AM PM	F F	0.02 0.21
21. CR 115 and Hwy 82	Side-Street Stop	AM PM	E F	0.18 0.33
22. Orrison d/w and Hwy 82	Driveway	AM PM	E F	0.01 0.06
24. 27th Street and Midland Ave	Round-a-bout	AM PM	A A	N/A
25. Mount Sopris Drive and Midland Ave	Side-Street Stop	AM PM	C C	N/A
26. Four Mile Road and Midland/Airport	Side-Street Stop	AM PM	A A	N/A
27. US Highway 6 and Devereux St*	Side-Street Stop	AM PM	B C	N/A

*Overall LOS grade for US Highway 6 and Devereux Street intersection data is sourced from the Traffic Assessment State Highway Access Permit Application. The numbers here reflect future projection of volumes based on Synchro and SimTraffic traffic analysis software used to analyze year 2035 traffic volumes per Option #3 suggesting the installation of a signal, the relocation and widening of Traver Trail and the restriping of Devereux Road

Corridors were also evaluated in the *Downtown Vehicular and Pedestrian Circulation Study* for their performance as a whole using delay per vehicle, number of unserved vehicles, and the average speed along the highway (compared to posted speed limits). Segments along SH-82 were considered in the study and included I-70 to Pine Street, 8th Street to 13th Street, 14th Street to Blake Avenue and CR 154 to Orrison. The study of those highway segments revealed that drivers experience the greatest delays between I-70 and 14th Street. The study also showed that traffic demands exceeded capacity for some specific movements between 14th Street and Blake Ave. However, no intersection included in that segment has a calculated volume-to-capacity ratio greater than 1, suggesting that there may be an opportunity to improve signal operations for those specific delays. Traffic speed summaries showed that of the studied corridor segments along SH-82, drivers in the I-70 to Pine Street and 8th Street to 13th Street areas drove an average of almost 9 miles below the posted speed limit of 25 miles per hour. This is typical for urbanized areas with closely spaced traffic signals.

Bicycle and Pedestrian Conditions

Bicycle and pedestrian count data from the non-peak month of October 2012 was analyzed to identify downtown intersections that experience the most significant levels of bicycle and foot traffic. While most downtown intersections count less than six bicycle movements during any peak hour, increased bicycle traffic was observed at 8th and Cooper and 9th and Cooper during PM peak and Saturday.

Saturday midday generally has the highest pedestrian volume with many of the intersections counting over 100 pedestrians per hour. The intersections with the largest pedestrian volumes are 8th Street and Grand Avenue, 9th Street and Grand Avenue and 7th Street and Cooper Avenue (see Table 3.3).

Table 3.3: Pedestrian and Bicycle Counts

Intersection	Control	Ped Peak Period			Bike Peak Period		
		AM	PM	Sat	AM	PM	Sat
1. 8th St. and Grand Ave.	*Signal*	*55*	*134*	*373*	*0*	*2*	*0*
2. 9th St. and Grand Ave.	*Signal*	*35*	*57*	*173*	*0*	*0*	*0*
3. 10th St. and Grand Ave.	*Signal*	*18*	*40*	*70*	*0*	*0*	*0*
4. 11th St. and Grand Ave.	*Signal*	*7*	*13*	*30*	*0*	*1*	*1*
5. 14th St. and Grand Ave.	*Signal*	*22*	*25*	*24*	*0*	*2*	*3*
6. 7th St. and Cooper Ave.	*Stop*	*17*	*75*	*176*	*1*	*6*	*2*
7. 8th St. and Cooper Ave.	*4-Stop*	*38*	*105*	*130*	*1*	*5*	*7*
8. 9th St. and Cooper Ave.	*Stop*	*22*	*62*	*60*	*1*	*3*	*5*

Trail count data was collected by Glenwood Springs Parks Department with infrared trail counters at all major trails. This data reflects both pedestrian and bicycle numbers and is displayed in Table 3.4 in weekly and monthly amounts. The full trail count report includes hourly, daily, weekly, monthly and yearly numbers.

Table 3.4: Trail Counts - Average Bicycle and Pedestrian

Trail	Weekly	Monthly
1. Linwood Cemetery	*863*	*3,746*
2. Red Mountain - Golay Trail	*604*	*2,620*
3. Atkinson Trail - North	*653*	*2,775*
4. Atkinson Trail - South	*350*	*1,503*
5. River Trail at Two Rivers	*2,164*	*-*
6. Wulfsohn Trail - East	*662*	*2,873*