



Ride Glenwood Springs Transit Expansion Study

March 2024



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I. Introduction

The City of Glenwood Springs is uniquely situated along the I-70 intermountain corridor and provides a gateway to world-class outdoor recreation, shopping, and cultural sites. A robust transit system numbers among the City of Glenwood's and the Roaring Fork Valley's strongest assets, with RFTA providing high-quality fixed-route service up and down the Roaring Fork Valley and west to Garfield County/ Rifle, and Ride Glenwood Springs (RGS) providing fixed-route service throughout the downtown Highway 6 and Grand Avenue/ Highway 82 corridors . RGS currently provides service seven days a week for approximately 13 hours on 30-minute headways. In addition, the city is served by CDOT's Bustang, Greyhound Bus Lines, Amtrak national rail service and paratransit service. Continued economic growth has surged Ride Glenwood Springs ridership above pre-COVID levels, and recent strategic planning efforts call for evaluating the feasibility of expanding the Ride Glenwood service coverage area and service hours.

Building on recommendations in the recently completed MOVES study, this study presents a transit service analysis to study expanded service route concepts and hours for demand and costs. The analysis addresses key underserved destinations, potential new routes, intermodal connections and operating hours through a detailed transit market analysis and focused stakeholder outreach. Increased transit service and ridership will provide many benefits including more equitable mobility options for residents, more sustainable transportation for visitors, and reduced traffic congestion and emissions particularly during peak seasons.

The study presents an evaluation of the existing fixed route transit system and several potential extensions to the north and south to identify optimal routing, stops, and service patterns.

The report is organized as follows:

- Existing transit conditions, gap and market analysis
- Summary of public input
- Service Expansion Alternatives
- Service Expansion Costs and Ridership

II. Existing Conditions, Gap and Market Analysis

Study Area Characteristics

The study area includes the entire City of Glenwood Springs, plus an additional ½ mile buffer. The study area encompasses all current Ride Glenwood Springs (RGS) routes and stops, as shown in Figures 1 and 2. The existing RGS route primarily runs along Highway 6 and Grand Avenue (Highway 82), from the West Glenwood Springs Mall to the Roaring Fork Marketplace. Additional information on bus stop locations, bus stop infrastructure and overlap with Roaring Fork Transportation Authority (RFTA) routes and stops can be found here on the ArcGIS storymap for this project.

[Glenwood Springs Transit Expansion Analysis \(arcgis.com\)](#)

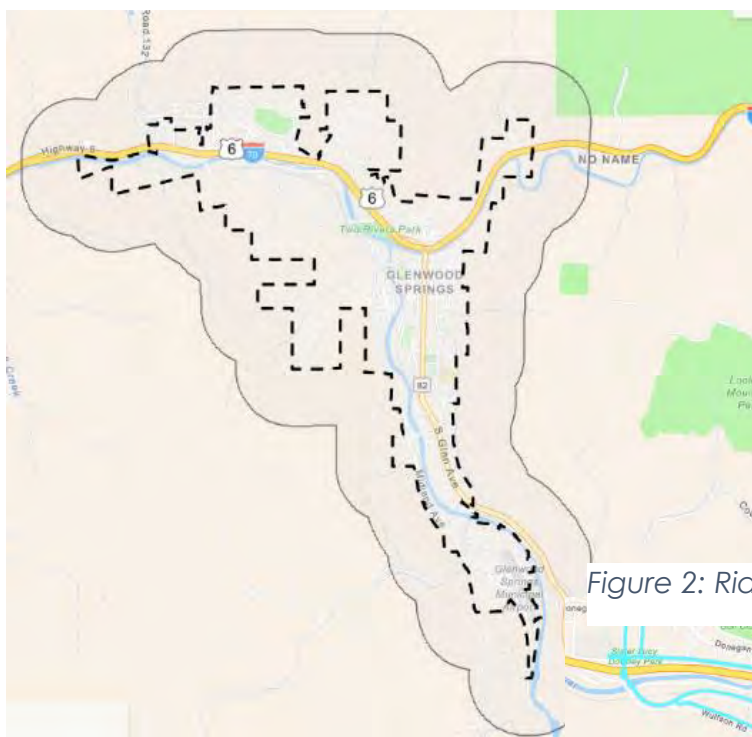


Figure 1: Glenwood Springs Transit Expansion Study Area

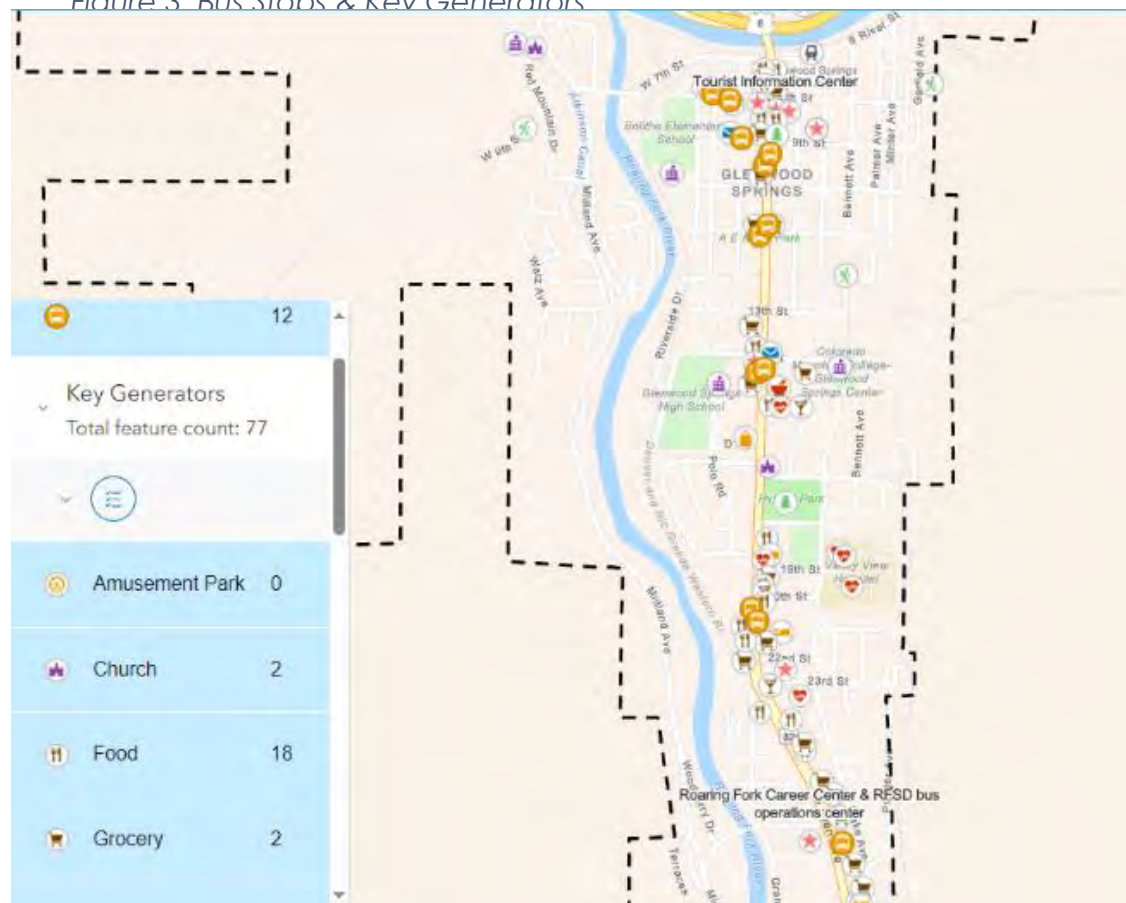
There are approximately 30 bus stops within the City served by RFTA and/ or RGS. These bus stops serve over 200 unique destinations including restaurants, grocery stores, religious institutions, community facilities, trailheads, schools, parks, hotels,

Figure 2: Ride Glenwood Springs Existing Route



and retail stores. The storymap interactive feature can create a tally of destinations by type around each bus stop or stops as show in Figure 3.

Figure 3: Bus Stops & Key Generators



Existing Ridership and Service Patterns

Existing stop and line ridership data was provided by RFTA for 2021 and 2022 and are shown below in Figures 4 and 5. Ridership levels for all routes, including RGS, recovered rapidly from COVID lows, and also vary seasonally with ridership levels peaking in the summer and winter tourist seasons. RGS line ridership peaked at nearly 20,000 monthly riders in the summer of 2022, outperforming RFTA Express, Hogback, Local Valley, Snowmass Valley and VelociRTA routes.

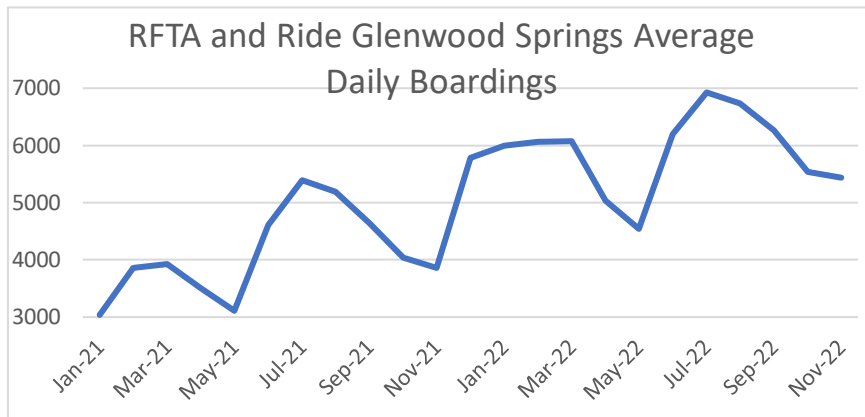


Figure 4: Average Daily Boardings

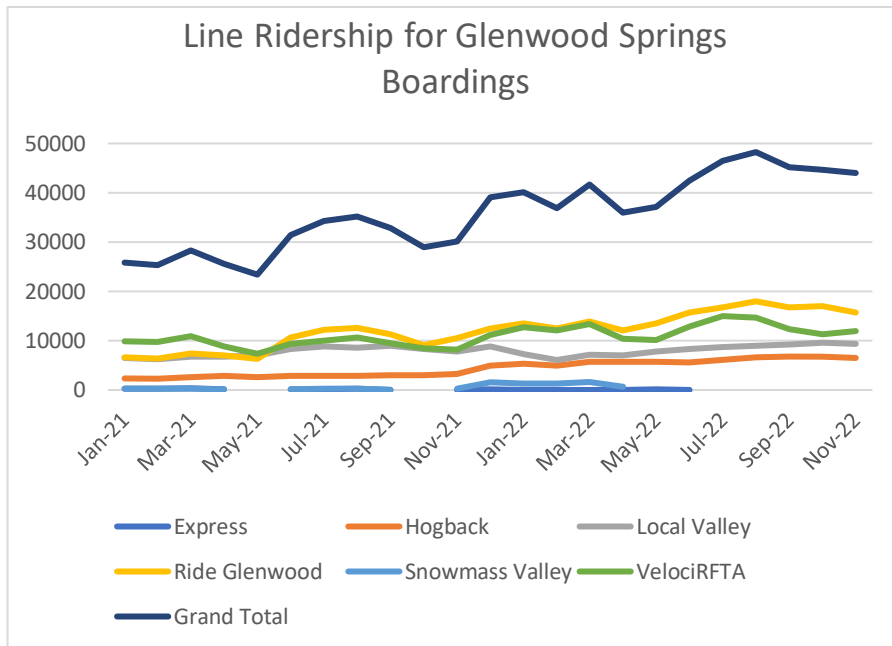


Figure 5: Average Line Ridership

Based on data provided by RFTA/ RGS for the most recent full year (2022) the following service characteristics are notable:

- The most used Ride Glenwood Springs bus stop: 27th St. Station
- The bus stop served by Ride Glenwood Springs with greatest percentage of non-Glenwood Springs boardings: West Glenwood Park & Ride 27th St. Station
- The bus stop with highest boardings that serves only Ride Glenwood Springs: Grand Ave. and 9th St. (Down Valley)
- The bus stop with highest alightings that serves only Ride Glenwood Springs: Highway 6 and Soccer Field Rd. (Up Valley)
- The bus stop with highest growth in boardings: Grand Ave. and 11th St. (Up Valley) with 162% increase from 2021 to 2022

Tale 1 summarizes the service characteristics of RGS in comparison to other RFTA services. The current service span is 13 hours, 7 days a week at 30-minute headways. Detailed stop-by-stop timetables can be found here:

<https://www.rfta.com/routes/ride-glenwood/>

Table 1: Summary of RFTA/ RGS Service Characteristics

Routes	Span in Glenwood Springs (7 Days a Week)	Frequency
Ride Glenwood Springs	6:53 a.m. – 7:53 p.m.	30 minutes
Hogback	5:54 a.m. – 9:17 p.m.	30 minutes (peak), 60 minutes (rest of the day)
VelociRFTA (in Glenwood Springs)	4:35 a.m. – 1:32 a.m.	15 minutes, 30 minutes (late night)
Roaring Fork Valley Local	4:00 a.m. – 12:15 a.m. (Up Valley), 7:21 a.m. – 3:43 a.m. (Down Valley)	30 minutes
Snowmass Village-Valley	5:08 a.m. – 7:23 a.m. (Up Valley), 4:09 p.m. – 7:00 p.m. (Down Valley)	Twice hourly

Annual stop level boardings alightings are shown for 2021 and 2022 in Tables 2 and 3. Note boardings are not disaggregated by route. Total boardings increased from 355,000 in 2021 to 485,000 in 2022. The highest ridership stops were 27th and Main followed by the West Glenwood Park and Ride. Figure 6 illustrates graphically the bus stop ridership totals. In the storymap feature, month by month boarding attribute pop-up tables can be accessed for each stop.



Figure 6: Total Boardings by Stop

Table 2: Boardings by Stop

Stop Code	Stop Name	2021 Total	2022 Total
73	Grand Ave + 20th St (UV)	6537	7926
74	Grand Ave + 20th St (UV)	11605	15865
75	Grand Ave + 14th St (UV)	11338	19521
76	Grand Ave + 14th St (DV)	18290	24068
77	Grand Ave + 9th St (DV)	4662	6823
78	Grand Ave + 9th St (UV)	17580	23359
81	West Glenwood Mall	19113	29059
85	Roaring Fork Marketplace (UV)	4399	4548
96	West Glenwood Park & Ride	32063	33684
117	Glenwood Rec Center (DV)	1938	2474
169	Glenwood Meadows (DV)	9442	11701
183	Grand Ave + 11th St (DV)	1355	2968
185	W 6th St (DV)	4538	5679
186	Hwy 6 + Traver Trail (DV)	1322	1975
187	Elks Lodge (DV)	4365	3922
188	Hwy 6 + 135 Rd (DV)	1780	2471
197	Hwy 6 + Traver Trail (UV)	1674	2640
198	W 6th St (UV)	4690	8322
199	Grand Ave + 11th St (UV)	825	2163
200	27th St Station	152626	204140
208	Roaring Fork Marketplace (DV)	5167	10880
214	Glenwood Meadows (UV)	12020	17404
215	Glenwood Rec Center (UV)	2604	4025
301	Hwy 6 + 135 Rd (DV)	8165	14321
313	Hwy 6 + Soccer Field Rd (DV)	3895	7292
314	Hwy 6 + Soccer Field Rd (UV)	898	1101
320	9th St + Colorado Ave (DV)	1016	1625
325	8th St + Pitkin Ave (DV)	4971	7060
326	8th St + Colorado Ave (UV)	6652	7377
Grand Total		355530	484393

Table 3: Alightings by Stop

Stop Code	Stop Name	2021 Total	2022 Total
73	Grand Ave + 20th St (UV)	9185	13753
74	Grand Ave + 20th St (UV)	7861	9350
75	Grand Ave + 14th St (UV)	10672	17150
76	Grand Ave + 14th St (DV)	14042	19594
77	Grand Ave + 9th St (DV)	4456	6554
78	Grand Ave + 9th St (UV)	5331	9176
81	West Glenwood Mall	15746	24039
85	Roaring Fork Marketplace (UV)	2512	1943
96	West Glenwood Park & Ride	48691	48314
117	Glenwood Rec Center (DV)	7815	9713
169	Glenwood Meadows (DV)	27432	32943
183	Grand Ave + 11th St (DV)	1583	2505
185	W 6th St (DV)	4978	7131
186	Hwy 6 + Traver Trail (DV)	1542	3234
187	Elks Lodge (DV)	4835	4201
188	Hwy 6 + 135 Rd (DV)	5090	6903
197	Hwy 6 + Traver Trail (UV)	1384	2194
198	W 6th St (UV)	3447	5143
199	Grand Ave + 11th St (UV)	609	1741
200	27th St Station	145943	214967
208	Roaring Fork Marketplace (DV)	6326	14243
214	Glenwood Meadows (UV)	2767	4120
215	Glenwood Rec Center (UV)	516	632
301	Hwy 6 + 135 Rd (DV)	1009	1377
313	Hwy 6 + Soccer Field Rd (DV)	363	634
314	Hwy 6 + Soccer Field Rd (UV)	5585	8948
320	9th St + Colorado Ave (DV)	13630	15464
325	8th St + Pitkin Ave (DV)	5456	6238
326	8th St + Colorado Ave (UV)	4775	7049
Grand Total		363581	499253

Transit Market and Gap Analysis

Prior to soliciting public input and developing service expansion alternatives, a transit market and gap analysis was performed. This includes evaluating commute trends (employment locations, inbound and outbound commuting trends), underserved destinations, and overall city demographics to identify potential transit service needs.

Using Longitudinal Employer-Household Dynamics (LEHD) from pre-COVID, it is estimated that 7,627 employees working within Glenwood Springs commute into Glenwood Springs, 2,128 workers within Glenwood Springs live within Glenwood Springs, and 3,519 residents of Glenwood Springs work outside of Glenwood Springs. LEHD numbers are illustrated in Figure 7 and Table 4.

Table 3: Glenwood Springs LEHD Data Summary

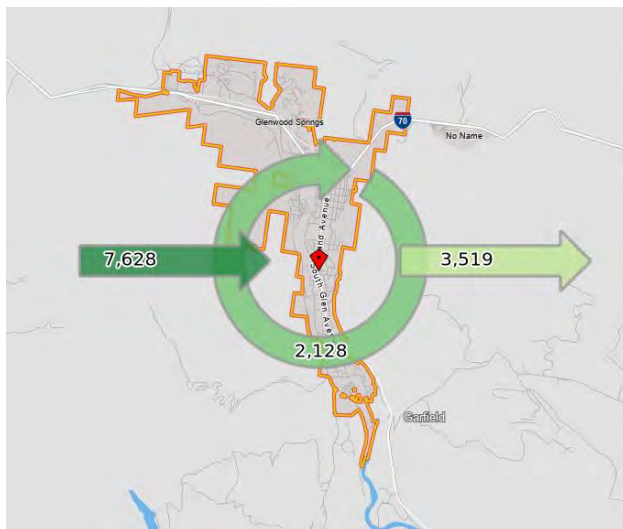


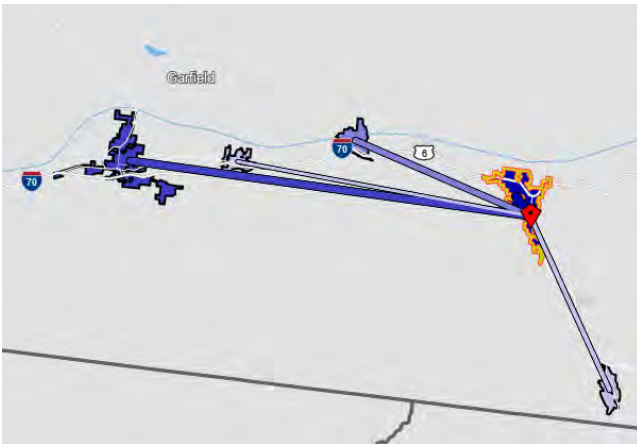
Figure 7: Glenwood Springs Inbound & Outbound Employment Data

In-Area Labor Force Efficiency (All Jobs) 2019	
	Count Share
Living in the Selection Area	5,647 100.0%
Living and Employed in the Selection Area	2,128 37.7%
Living in the Selection Area but Employed Outside	3,519 62.3%

Probing deeper, the data was disaggregated to explore where workers in Glenwood Springs commute from. Approximately 22% of workers in Glenwood Springs live in Glenwood Springs. Other locations of origin for Glenwood Springs workers include Rifle and New Castle as shown in Figure 8 and Table 5.

Table 4: Glenwood Springs Worker Origins

Figure 8: Where Glenwood Springs Workers Live



Place	Count	Share
Glenwood Springs	2,128	21.80%
Rifle	793	8.10%
New Castle	728	7.50%
Carbondale	385	3.90%
Silt	385	3.90%
All Other Locations	5,337	54.70%

Similarly, the data was disaggregated to explore where residents in Glenwood Springs commute to. Approximately 37% of working age residents in Glenwood Springs work in Glenwood Springs. Other destination locations for Glenwood Springs residents include Aspen and Carbondale as shown in Figure 9 and Table 6.

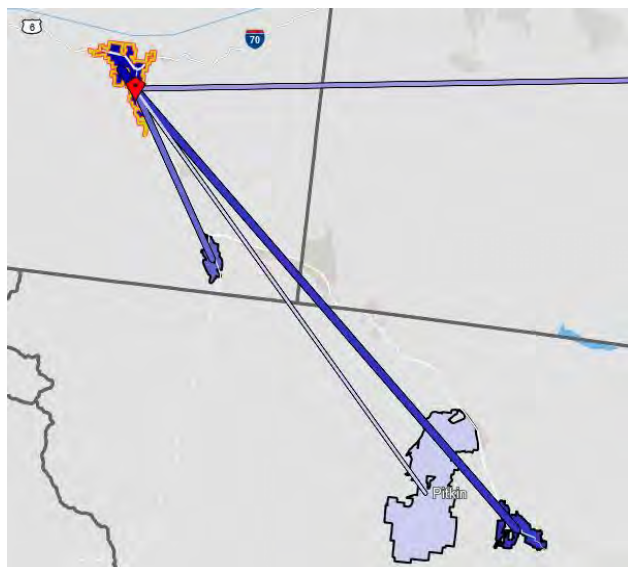


Figure 9: Where Glenwood Springs Workers Live

Table 5: Glenwood Spring Employee Work Destinations

Place	Count	Share
Glenwood Springs	2,128	37.7%
Aspen	430	7.6%
Carbondale	256	4.5%
Denver city	216	3.8%
Snowmass Village	141	2.5%
All Other Locations	2,476	43.8%

In summary, based on the LEHD data:

- More people commute to work in Glenwood Springs than leave Glenwood Springs to work
- Generally, people are commuting to Glenwood Springs from Down Valley
- Glenwood Springs residents are commuting Up Valley

Looking more closely at overlapping transit services, all five routes (RFTA/RGS) follow Highway 82 throughout much of Glenwood Springs, as shown in Figure 10. In order to distinguish Ride Glenwood Springs from more regional service provided by RFTA, a new or realigned route for Ride Glenwood that serves neighborhoods more directly could be considered, while providing connections to RFTA regional service. Potential transfer locations between Ride Glenwood and RFTA include the following stops with high ridership and easy transfer opportunities as shown in Figure 11:

- West Glenwood Mall (or West Glenwood Park & Ride) on the northwest side of Glenwood Springs
- Grand Ave & 9th St which serves downtown Glenwood Springs
- 27th St Station which serves the south side of Glenwood Springs

Existing RFTA and RGS routes lack some key generators including Valley View Hospital and schools in the residential areas as shown in Figure 12.

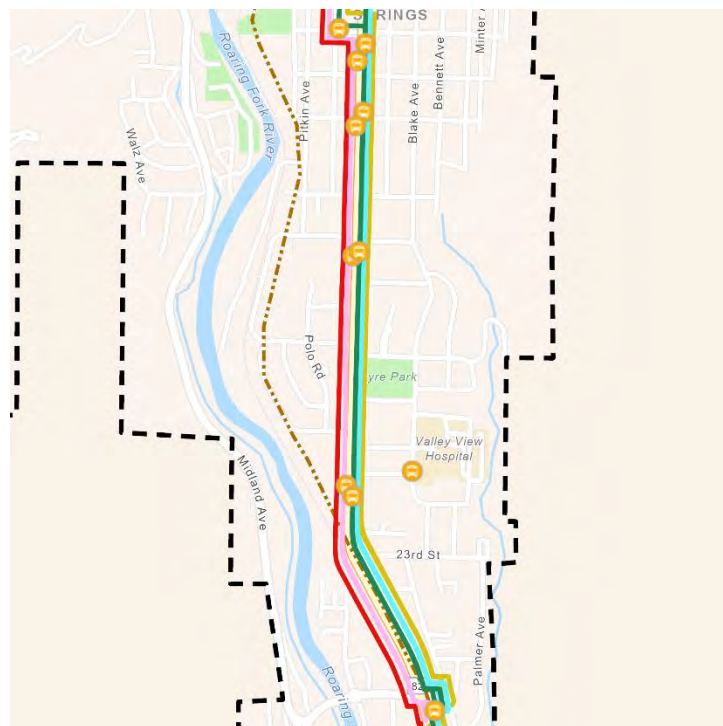


Figure 10: Bus Route Density on Grand Avenue and Potential Transfer Locations between RGS & RFTA



Figure 11: Potential Transfer Locations with RFTA Routes



Figure 12: Underserved Key Generators

Examining median household income, there are several areas of the City in the northwest, east and west sides that are lower income that are underserved by transit. Figure 13 shows those areas circled in red below, where the lighter green represents areas of lower median household income per Census Block Group.

Examining median age, there are several areas that are above average age shown in Figure 14 that may include senior citizens that are not currently well served by transit. Note that there is currently service provided by The Travelers that provides service for seniors and people with disabilities. Examining race/ ethnicity, there are areas shown in Figure 15 that are high non-white populations that are currently underserved by transit. Enhanced connections from RGS to regional RFTA routes may benefit those who need to travel to another community for employment.

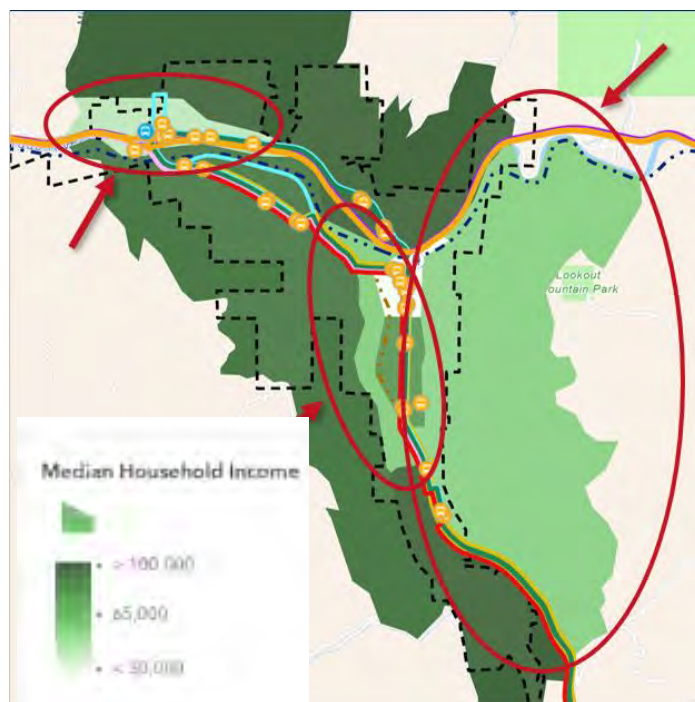


Figure 13: Underserved Transit Areas Based on Household Income

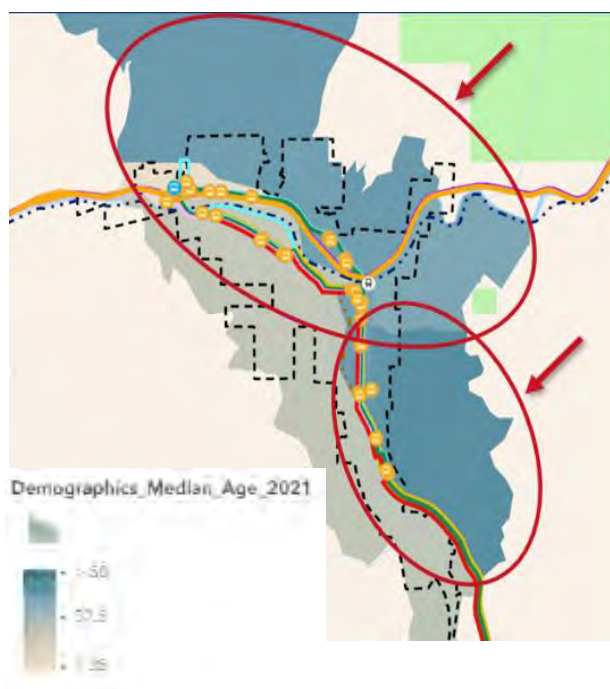


Figure 14: Underserved Transit Areas Based On Age

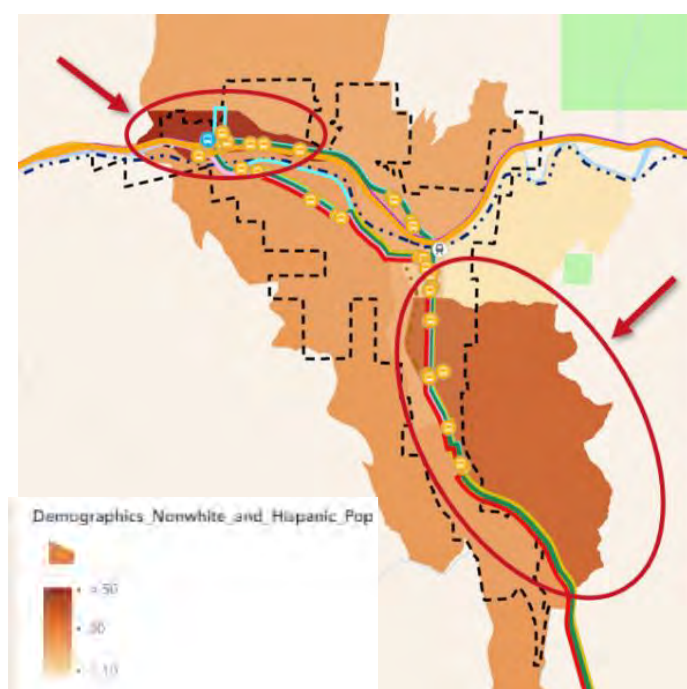


Figure 15: Underserved Transit Areas Based on Race/Ethnicity

Transit ridership is more likely along routes that serve higher land use densities. Examining density for a fixed route, Figures 16 and 17 show the total households and population per Census Block. Areas circled in red below areas with >600 households per square mile and population with >3,000 people per block, which fall outside the current transit service area also partially outside of the City's boundary.

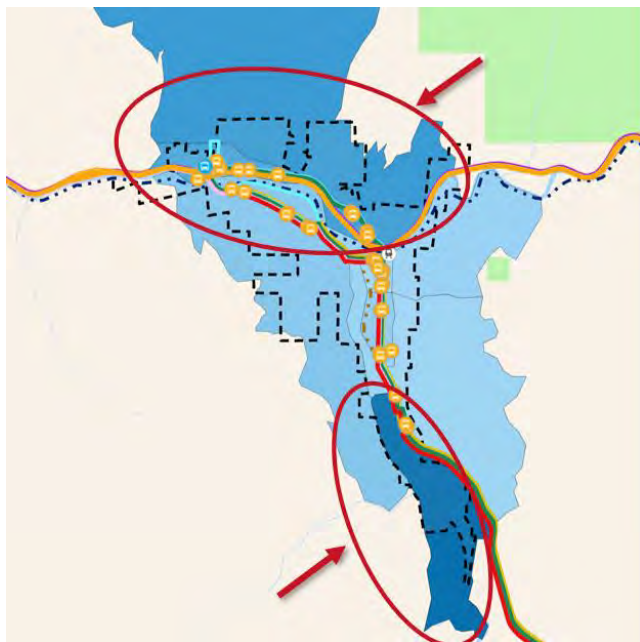


Figure 16: Underserved Transit Areas Based on Household Density



Figure 17: Underserved Transit Areas Based on Population Density

III. **Public Outreach and Engagement**

As part of identifying transit markets, gaps in existing service and developing ideas for expanded transit service, public outreach and engagement was conducted for this study. Public engagement efforts included both reviewing and extracting feedback from recent studies specifically related to transit service, as well as conducting new survey efforts for this study. The previous studies reviewed and new engagement efforts are noted below:

- RFTA Rider Survey Results Presentation, May 2022
- MOVE TDM Final Report Appendices A & B, August 2021
- On-Demand Transit Study, 2019
- Pop-Up outreach activities, August 2023 at the Farmers Market and Walmart
- Communitywide survey, Fall 2023

At the pop-up events, the public was asked to draw lines for new route ideas and place colored dots for new stop ideas.

Notable findings regarding the need for transit expansion from previous studies include:

- Locations mentioned where respondents want additional stops include West Glenwood, CMC, South Glenwood, Marble, Sunlight, South Midland, Bustang, Four Mile, Iron Bridge, and 6th Street. The word cloud indicates the frequency of the comment for each new stop requested.



Figure 18: Pop-Up Booth at Farmer's Market, August 1, 2023



Figure 19: Additional suggested RGS stop locations

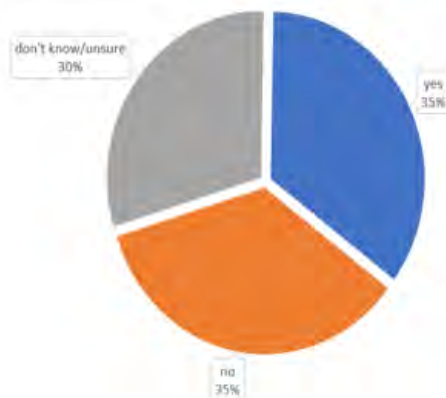


Figure 20: Stated preference of use of RFTA direct service downtown from 27th Street

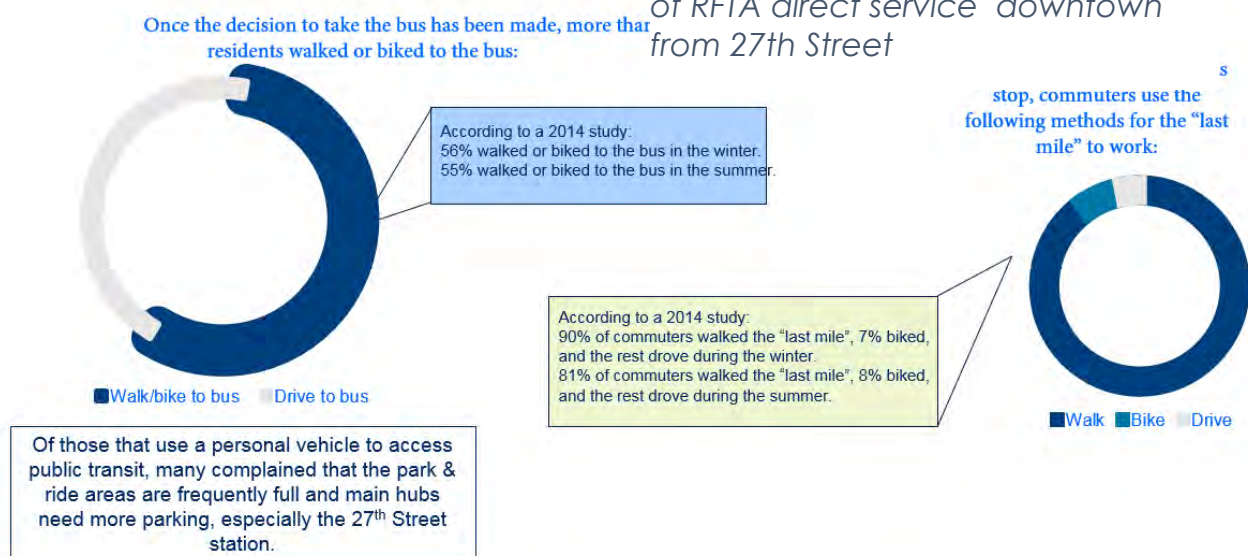


Figure 21: Garfield County Bus Stop Mode of Access

- When asked "If RFTA's VelociRFTA service went direct to/from 27th Street to downtown Glenwood Springs would you use it more?", out of 108 survey responses, 35% said yes, 35% said no, and the rest said don't know/unsure.

- Close to 60% of the survey respondents rated getting buses to be able to move between 27th St and downtown quicker as a 1 or 2 on a scale from 1 to 5 (where 1 is “yes, improve this right away”).

5.) Adding a RFTA VelociRFTA stop downtown

(the bus would go direct to/from 27th Street station to downtown with no stops in between)

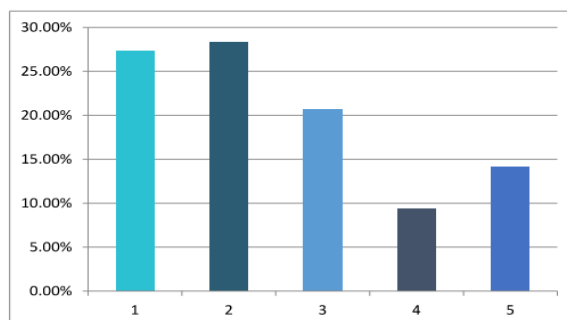


Figure 22: Increased Bus Service/Frequency through Downtown

6.) Getting buses to be able to move between 27th Street and downtown quicker

(examples include in an exclusive lane, semi-exclusive lane, and/or by having the traffic signals turn to green for them as they approach)

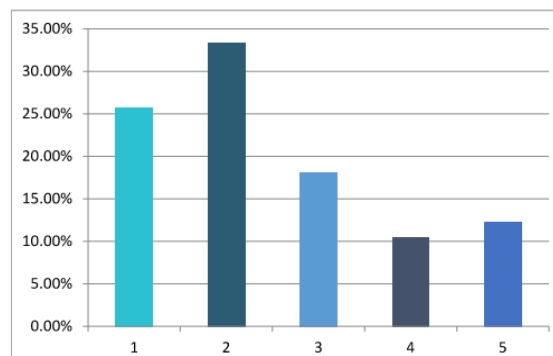


Figure 23: Added VelociRFTA Stops in Downtown

- Over half the survey respondents rated adding a RFTA VelociRFTA stop downtown as a 1 or 2 on a scale of 1 to 5 (where 1 is “yes, improve this right away”)

Out of 75 survey responses about support for transit center location options, the most common answer for all three options (RFTA property South of 8th St, 7th and Colorado Ave site, and Highway 6 Area site) was not supportive. Of the three, 8th St was most popular, and 7th/Colorado was least popular.

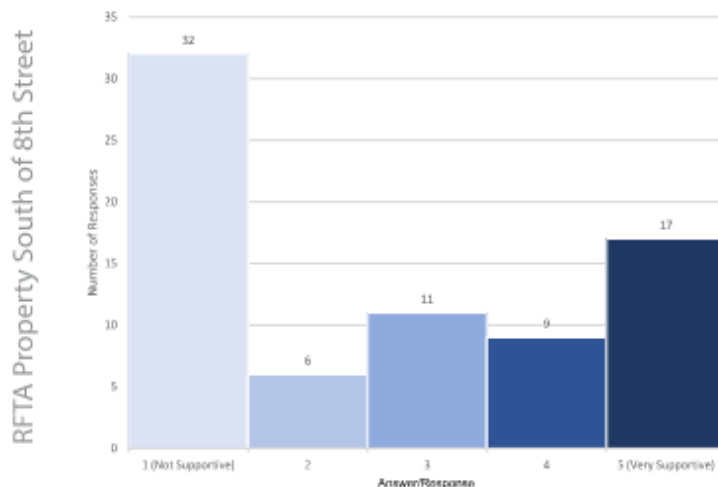


Figure 24: Preferred Transit Center Locations

Table 6 below summarizes the profile of RGS riders and trip characteristics. Approximately 63% of riders were from a minority demographic, and 53% of trips were for commuting purposes.

	Ride Glenwood
Fares charged to ride?	No
Share of RFTA winter boardings	3%
Commuter trips	53%
Ski/rec trips (to/from home/lodging)	27%
Boardings by full-time residents	
Hispanic or Latino	63%
Household incomes > \$150,000	0%
Household incomes < \$25,000	33%

Table 6: Ride Glenwood Springs Rider Profiles

Additionally, winter commuting by bus was about 35% mode share in the Roaring Fork Valley in 2014.

Reasons for not using the bus

When public transit is used within Glenwood Springs, it is primarily for social and/or recreational purposes. Top reasons that people do not use Ride Glenwood Springs include proximity to desired destinations, not knowing which bus to take, duration of travel time, or preferring alternative modes (car, walk, bike). The word cloud below was made from comments about what issues prevent riders from using the services more frequently or at all. Common themes include proximity to bus stops, cost, safety/COVID-19, connections between parts of town, unreliable wait times and long intervals between buses, availability of parking, wanting more routes/stops, transferring, and inconvenient stops/schedules.



Ride Glenwood Springs Satisfaction Level

When rating attributes of Ride Glenwood Springs convenience and free / low fares were rated highest, while limited operating hours and low operating frequency was rated lowest.

Figure 25: Ride Glenwood Springs Attribute Rating



Fall 2023 Community Transit Survey Results

For this study, a community wide survey questionnaire was developed and shared using online a survey platform. The survey was promoted through several city social media and email distribution means and ran from August through October of 2023. Approximately 40 people completed the survey. Questions asked included:

- What is your primary mode of transportation during a typical week?
- How often do you ride the bus?
- For what purposes do you ride the bus?
- To where do you typically need transportation?
- What time of day do you typically need transportation?
- How satisfied are you with the public bus service in Glenwood Springs?
- Is the bus going where you need it to go?
- If you answered "No" to the previous question, where does the bus need to go?
- What bus improvements would make the most difference to you?
- Are there any other changes that would make Ride Glenwood Springs a better travel option for you?
- Which group do you identify with?

The survey results are summarized below.

Question 1: What is your primary mode of transportation during a typical week?

- Unsurprisingly, 64% of respondents say Driving alone is their primary form of transportation during a typical week, followed by walking, bicycle and bus.

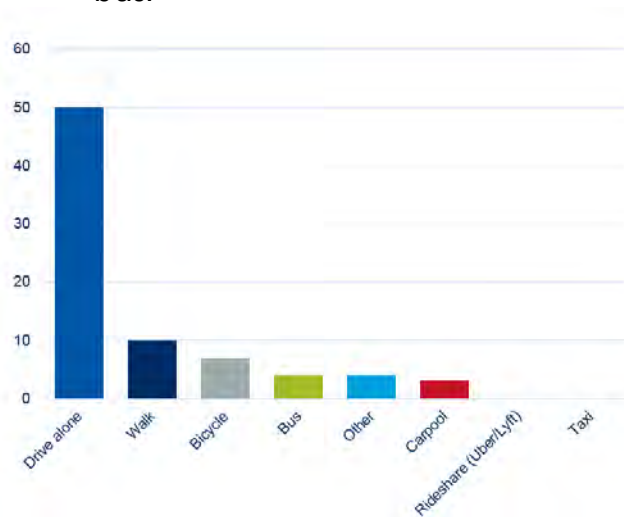


Figure 26: Primary Mode of Transportation

Question 2: How often do you ride the bus?

- Most respondents ride the bus Once or twice a year or Never ride the bus
- 21% of respondents ride the bus once or twice a month

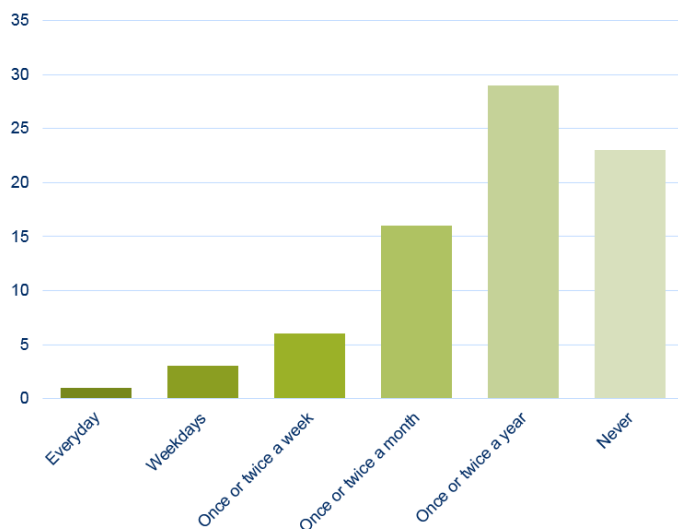


Figure 27: Bus Use Frequency

Question 3: For what purposes do you ride the bus?

- Ride Glenwood users predominantly utilize the bus service to access recreational activities (such as trails or skiing) or they do not ride the bus, followed by shopping, other and commuting.

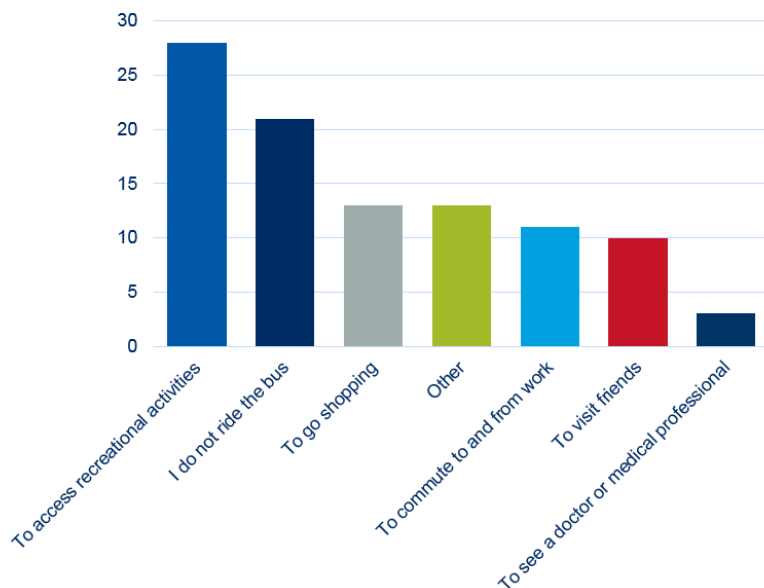


Figure 28: Bus Ride Purpose

Question 4: To where do you typically need transportation?

- Ride Glenwood users predominantly need transportation within Glenwood Springs and then to Communities Up-Valley (Carbondale, Aspen)
- Next, transportation to Communities West of Glenwood Springs (Grand Junction, Parachute, Rifle, New Castle) is almost even with transportation to Communities East of Glenwood Springs (Vail, Silverthorne, Denver)

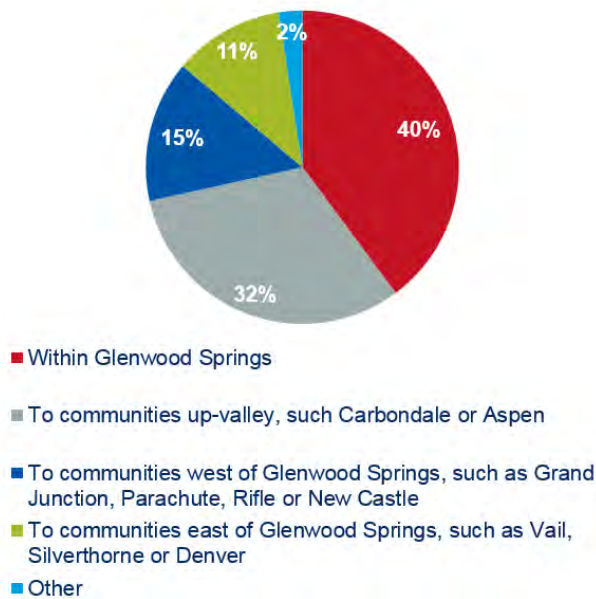


Figure 29: Bus Ride Destinations

Question 5: What time of day do you typically need transportation?

- Respondents most need transportation from 4:00pm to 7:00pm
- The second highest response showed a need for bus service from 9:00am to 12:00pm
- Then 5:00am to 9:00am and 12:00pm to 4:00pm followed with about the same amount of responses

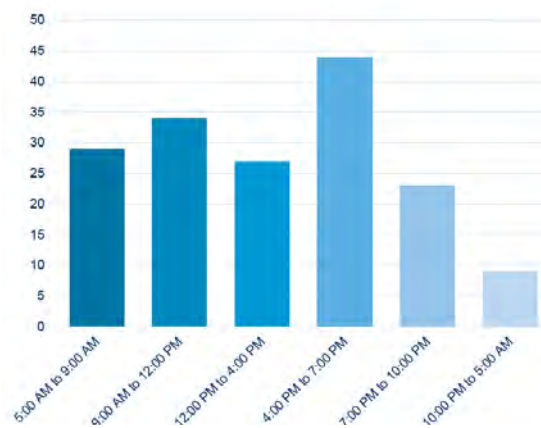


Figure 30: Bus Ride Times of Day

Question 6: How satisfied are you with the public bus service in Glenwood Springs?

- Respondents were evenly divided amongst this question's 5 options

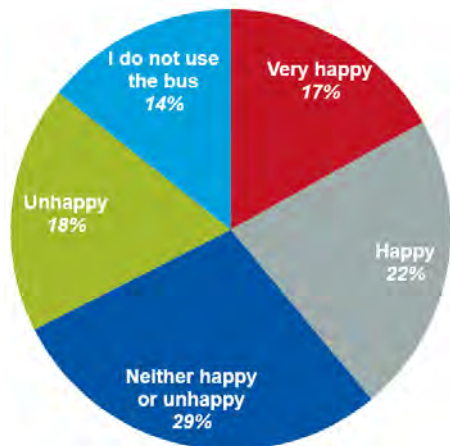


Figure 311: Ride Glenwood Springs Satisfaction

Question 7: Is the bus going where you need to go?

- The responses were evenly split on whether Ride Glenwood goes where residents need it to go

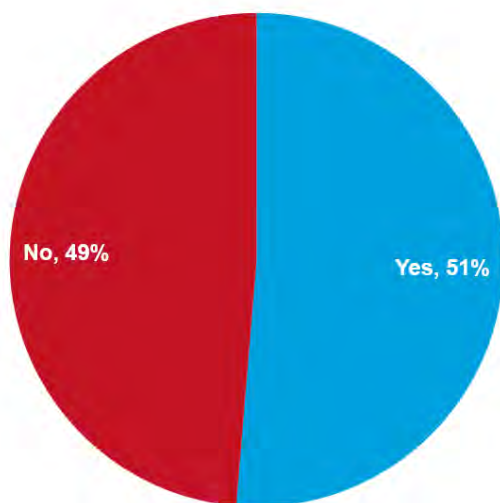


Figure 32: Ride Glenwood Springs Bus Service Area Coverage

Question 8: Where does the bus need to go?

- 26% of respondents answered Glenwood Park for this question
- 17% of respondents answered Midland and South Glenwood, respectively for this question



Figure 32: Additional Ride Glenwood Springs Bus Stop/ Service Locations Word Cloud

Question 9: What bus improvements would make the most difference to you?

- Bus service closer to where I live was the top response regarding improvement to Ride Glenwood's service, closely followed by More frequent service
- Bus service closer to where I want to go and Longer service hours were the next most frequent responses for this question

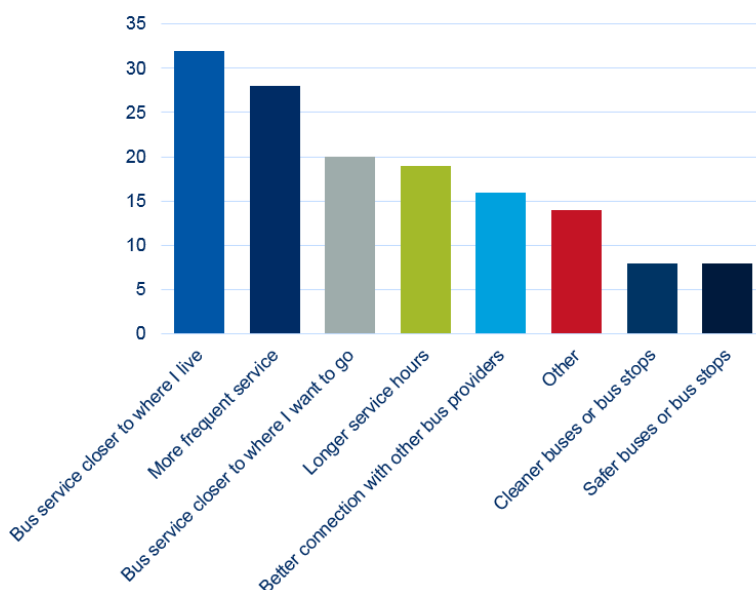


Figure 33: Desired Ride Glenwood Springs Service Improvements

Question 10: Are there any other changes that would make Ride Glenwood Springs a better travel option for you?

Top responses included extended service hours, increased frequency, increased use by tourists, improved connections to RFTA and improved bus stops/ shelters.

- Extend service hours (x3)
- Increase frequency (x3)
- Improve circulation of tourists to decrease parking demand (x2)
- Better connections with other transit systems, RFTA (x2)
- Improve bus stops and shelters (x2)
- Continue no fare bus service
- Improve bike carrying capacity
- Add buses for concerts/special events
- Expand on demand service
- Increase accessibility
- Going through the canyon
- More stops along Hwy 6
- Stop at Glenwood Park
- Stop at the Hot Springs Pool
- Eliminate Walmart bus stop and off-route special stops

Question 11: Do you identify with any of these groups?

- The most respondents answered Glenwood resident to this question, while only 5 answered visitor/tourist
- Following that, Bus riders and business owners were the next most represented user groups

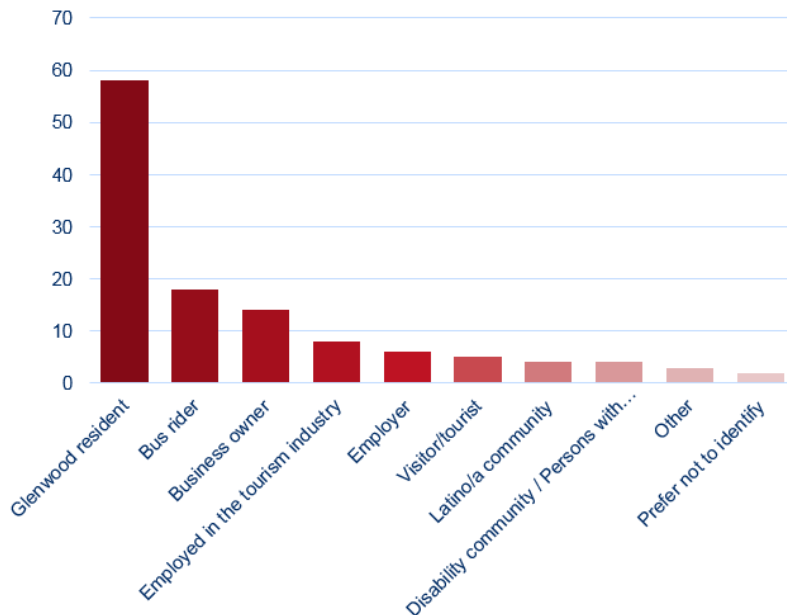


Figure 34: Rider Profiles

Question 12: Do you have any other comments to improve transit in Glenwood Springs?

This last question was open ended, with the top responses being expanded routes and stops, expanded service hours and increase frequency.

- Expand routes and stops where they are needed/wanted (x6)
- Expand service hours (x3)
- Increase bus frequency (x2)
- Improve ease of boarding/de-boarding
- Allow for easier bicycle transportation on buses
- Add an amenities (hotel/restaurants/attractions) loop
- Continue to provide free service
- Ensure bus reliability
- Add a designated ski bus
- Create designated bus stops with protective shelters
- Increase service awareness through better marketing

IV. Summary of Transit Gaps, Barriers and Public Input

The following notable conclusions were drawn from the analysis of transit gaps, barriers and public input.

- Several citizens were not aware of the distinction between RFTA and RGS, or that RGS service was free within the City. Increase Ride Glenwood Springs transit branding and marketing to address customer understanding regarding:
 - o Fare free service
 - o Print or web-based map of service distinctions between RGS and RFTA
- Current span of service starts too late for hospitality workers and ends too early for tourists. Consider service hour extensions and increased service frequency during high demand hours.
- RGS overlaps significantly with RFTA along Highways 6 and 82, while offering limited coverage on local streets. Consider a new route that is different from RFTA designed to provide service for locals, with a few locations that connect to the regional RFTA service
 - o Address areas currently not served/outside of City limits with high transit ridership propensity including lower income areas, higher median age areas, and higher density areas.
 - o Alternative bus routes could be fixed alignment/stops, on-demand (resident focused) or shuttle service (tourist focused) between park and rides and major key tourist generators (train station, hot springs, hotels)
 - o Consider a zone-based system for RFTA to allow local riders to integrate with RGS within Glenwood (not regional routes) and keep fare free local service
- Ensure bus stops are well connected to bike routes and sidewalks to enhance first/last mile connections.

V. Development of Service Expansion Concepts

Previous Ridge Glenwood Springs Transit Service Plans/Expansion Concepts

Prior to developing new or expanded service plans for this study, a brief discussion of previous transit studies is summarized. Two prior studies presented potential transit service plans and expansion concepts - the 2019 *On Demand Transit Study* by Via Mobility and the 2018 *Ride Glenwood Springs Transit Operations Plan*, by IBI. Key highlights of these studies included:

- Evaluated feasibility of on-demand transit and existing RFTA service to replace a portion or all of Ride Glenwood Springs (RGS)
- Both studies suggest more flexible stopping locations with an on-demand service
- The 2018 *Transit Operations Plan* proposed three scenarios: local fixed route consolidation, flex route supplemented with local ride hailing, and a citywide ride hail subsidy.
 - o It should be noted that the study proposed a longer service span for the proposed on-demand flex RGS service/ e-Ride of 6am to 10pm
- The 2019 *On-Demand Transit Study* proposed three scenarios: replacing RGS entirely, replacing a portion of RGS, or offering both an on-demand and current RGS service
 - o The scenario replacing a portion of RGS would shorten its route, increase its headway from 30 to 40 minutes, and use one vehicle instead of two vehicles for service
 - o On-Demand service hours included a scenario from 6am to midnight

Additionally, the MOVES study recommended a long-term phased plan that was focused on the extension of the BRT service through the City, additional stations, a transit center/layover.

Based on the previous studies, gaps and barriers identified and public input gathered for this effort, the following three Ride Glenwood Springs transit service expansion alternatives were developed.

Service Expansion Concept #1 – Maintain Existing Route and Stops, and Extend Span of Service

Ride Glenwood's span is much shorter than other RFTA routes that travel through Glenwood Springs that generally run at least an hour earlier and an hour later (e.g. RFTA Local route serves West Glenwood Park & Ride in at least one direction 24 hours a day) . Improving the span of service for Ride Glenwood is

particularly important for low-income employees of Glenwood Springs' service industries and their customers. While the West Glenwood Mall closes at 7, the last Southbound stop is at 6:53pm, which is not enough time for customers or employees. Additionally most restaurants in Glenwood Springs open as early as 6am and some remain open past 9pm. In order to accommodate employees in the service industry, there should be stops running in each direction at least before 5:30 AM and after 9:30 AM. One of the largest businesses in Glenwood Springs, Walmart, is open daily from 6 AM to 11 PM. To accommodate Walmart shoppers and employees, bus service on Ride Glenwood Springs should have stops running in each direction before 5:30 AM and after 11:30 PM with 30-minute headways during peak periods.

Service Expansion Plan Concept #2 – New Ride Glenwood Springs Route (West Glenwood Springs Valley View Hospital – Cardiff) with Extended Service Span and Increased Service Frequency

There are several key locations/ generators that are greater than a 10-minute walk from the nearest Ride Glenwood Stops and there is demand for an alternate route that serves areas not well covered by the current route. The furthest west stop on Ride Glenwood is at the Glenwood Springs Mall, which doesn't serve the well-populated residential areas to the north and west of the mall. A new route would compliment current service and wind around Ride Glenwood's route and serve some of Ride Glenwood stops but serve neighborhoods in western and northern Glenwood Springs, Blake Street downtown, Valley View Hospital, and Cardiff. These new areas outside of downtown have higher rates of minority and low-income populations. The route would run from 5 AM to 10 PM with every half hour from 5 AM to 7 PM and hourly from 7 PM to 10 PM.

The following is the street-by-street route segments and list of proposed stops for Concept #2

Direction: West

Glenwood Park & Ride <
Wulfson < Midland < Hwy
6 < Center < Storm King <
Donegan < Ponderosa <
Mountain Shadow < Mel
Rey < Donegan < Hwy 6
and 24 < W 6th < Grand <
8th < Blake < 23rd < Glen
< RFTA Park & Ride < 27th
< Midland < Mt Sopris <
Mountain < Mt Sopris <
Midland < same roads in
reverse to West
Glenwood Park & Ride

Stops (both ways unless mentioned, new
stop with asterisk):

- West Glenwood Park & Ride
- Glenwood Meadows
- Glenwood Rec Center
- West Glenwood Mall
- Hwy 6 at Center Dr*
- Center Dr at Bighorn Toyota*
- Two Rivers Community School*
- Ponderosa Dr at Ponderosa Cir*
- Ponderosa Dr at Mountain Shadow Dr*
- Mountain Shadow Dr (midblock stop)*
- Mel Rey at Chapparral*
- Donegan at Adult Disability Services*
- Donegan at Valley View Apartments*
- Donegan at Six Canyon Apartments*
- Hwy 6 at Traver Trail
- W 6th St
- 8th at Cooper*
- Blake at 11th*
- Blake at 15th*
- Valley View Hospital*
- 23rd at Blake*
- RFTA Park & Ride*
- Midland at Roaring Fork Senior Living*
- Midland at Park W*
- Midland at Mt Sopris*
- Mt Sopris at Old Lodge (one-way)*
- Mountain at Old Lodge (one-way)*
- Mountain at Parkwood*

Transit Service Expansion Plan Concept #3 –Modified Ride Glenwood Springs Route (Valley View Hospital) with Extended Service Span and Increased Service Frequency

To provide faster transfers to those coming from West Glenwood Park and Ride and the 27th Street Park and Ride and less wait times all around, Ride Glenwood would run every 15 minutes from 6am to 6pm. Ride Glenwood would also travel through Downtown on Blake instead of Grand between 8th and 23rd to serve Valley View Hospital and not duplicate RFTA service as much. The Grand Avenue stops at 9th, 11th, 14/15th, and 20th would not be served and instead have stops at: 8th at Cooper, Blake at 11th, Blake at 15th, Valley View Hospital, and 23rd at Blake. The current span of service would also be expanded from the current 6:53 AM to 7:26 PM to having first trips start at 5 AM and last trips leaving at 11 PM to provide one last trip from Walmart. Trips would run every half hour from 5 AM to 7 PM and then hourly from 7 PM to 11 PM.

The three service expansion concepts are illustrated in Figures 36, 37 and 38.

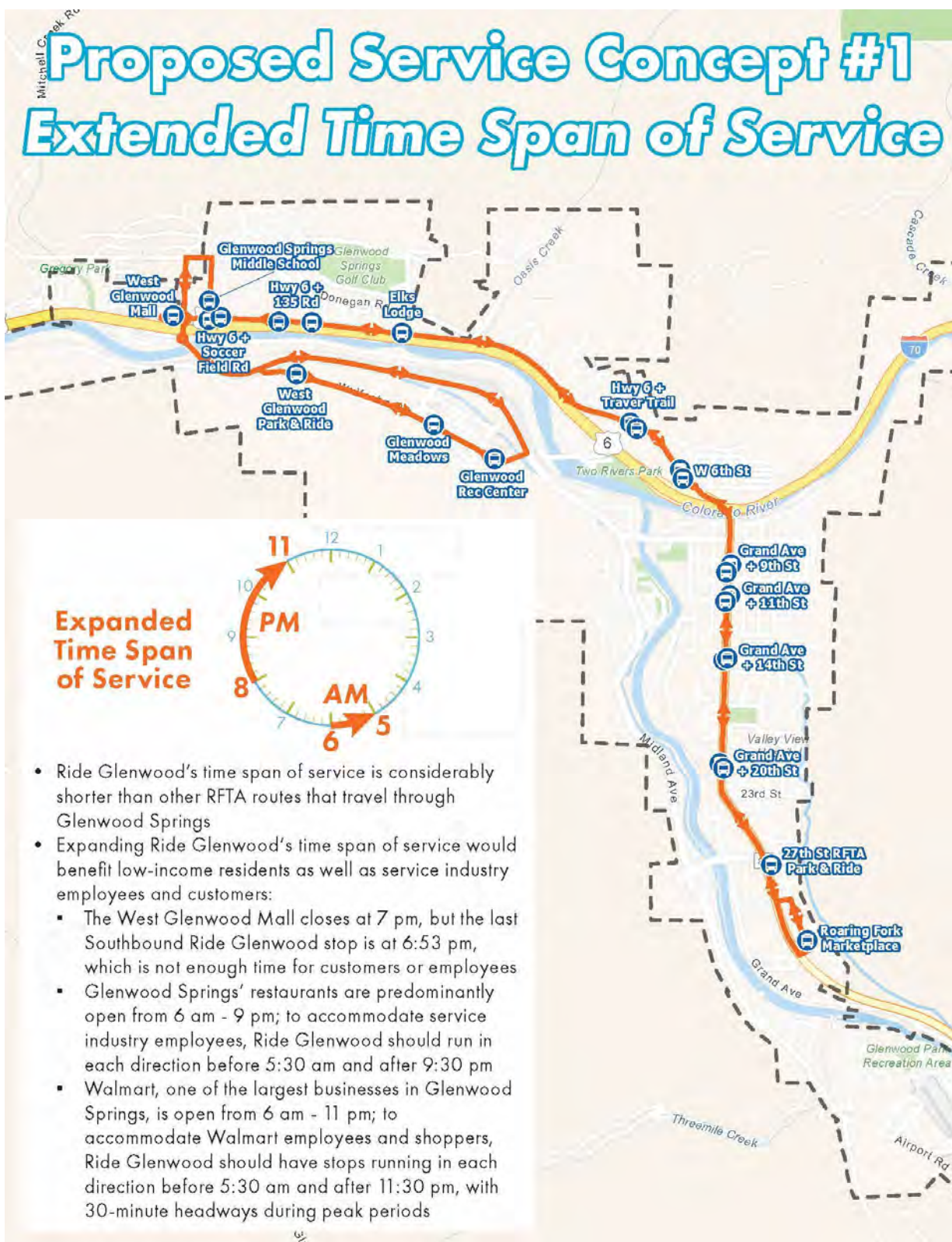


Figure 35: Service Expansion Concept #1

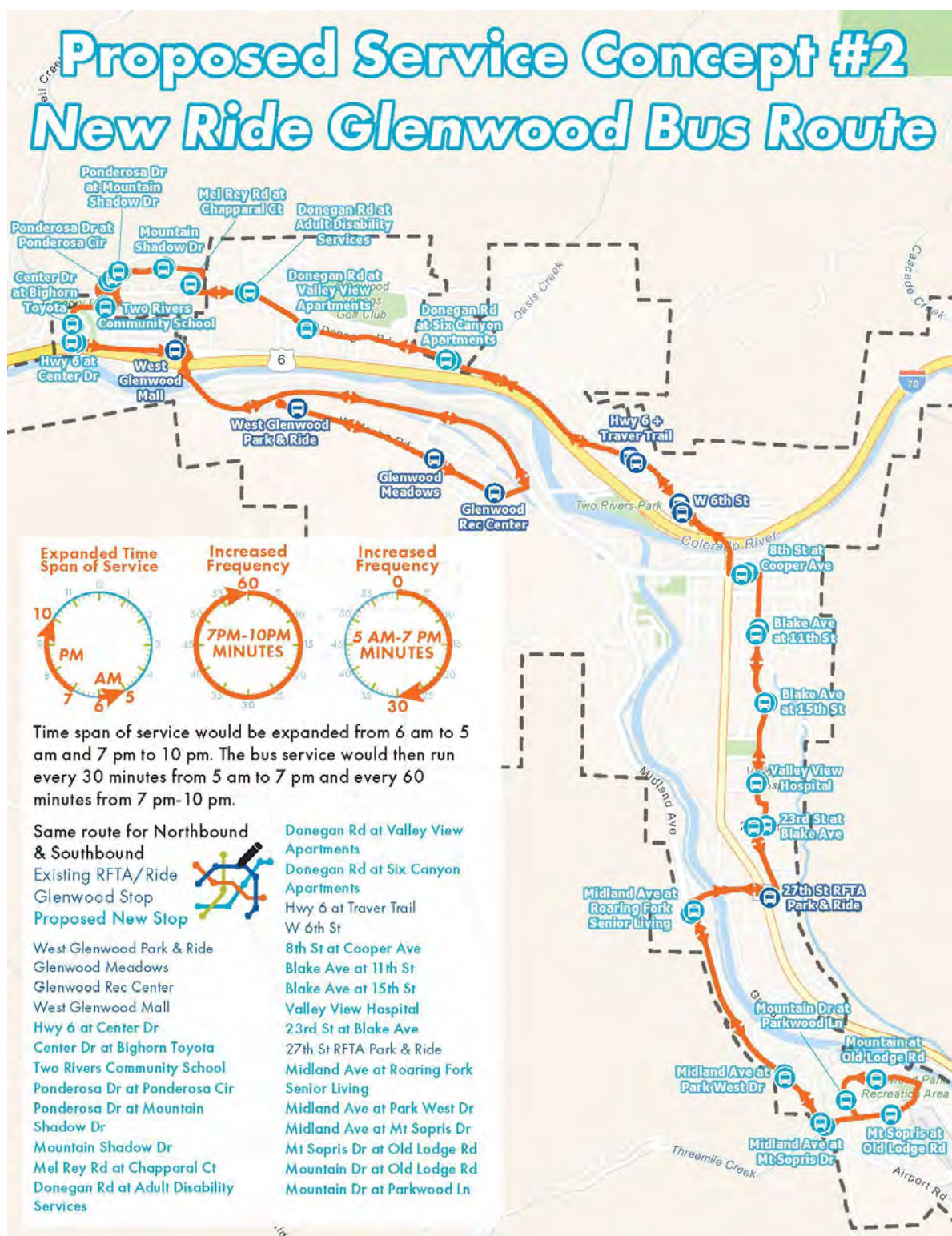


Figure 36: Service Expansion Concept #2

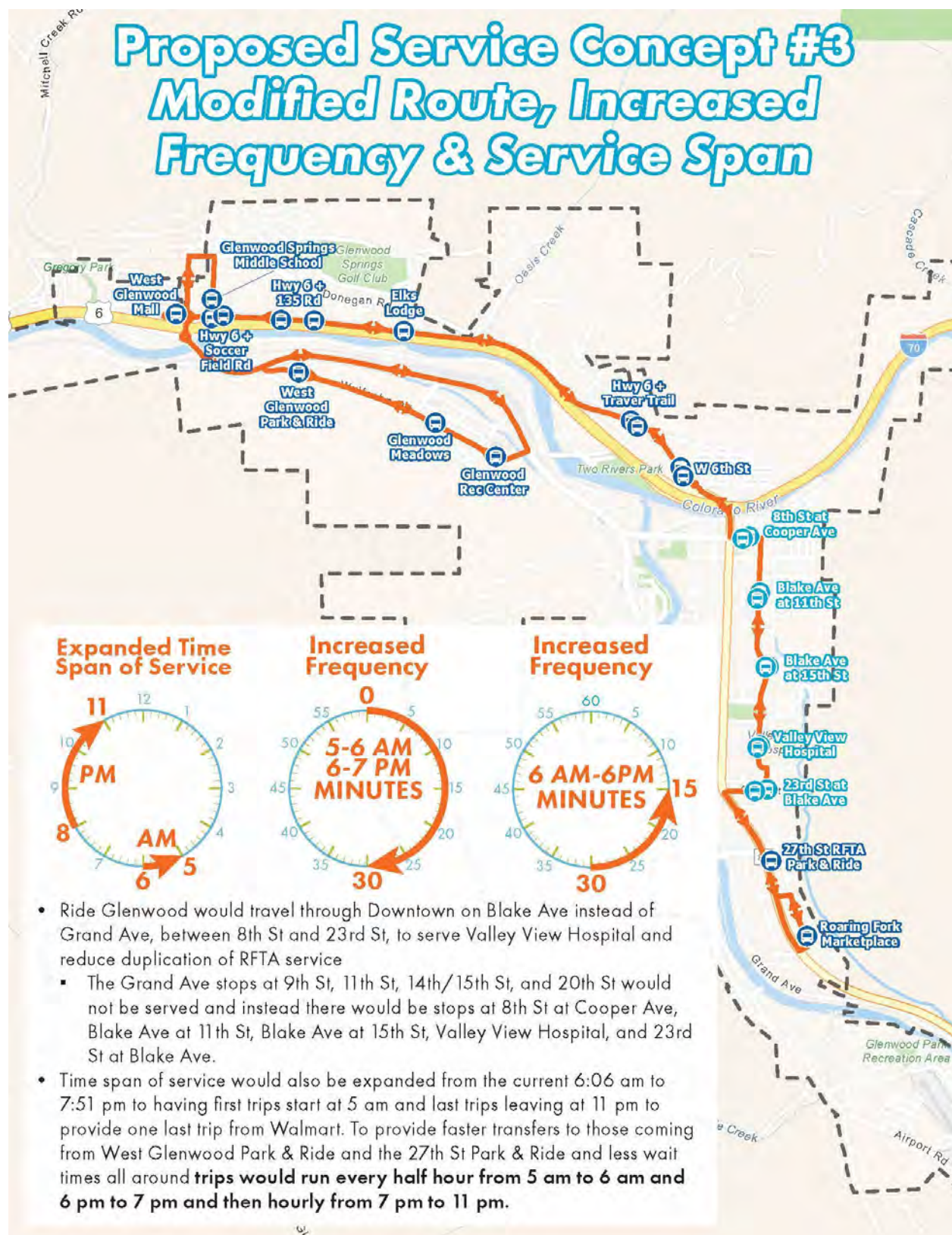


Figure 37: Service Expansion Concept #3

VI. Transit Service Expansion Costs and Ridership

In order to evaluate the advantages and disadvantages of each transit service expansion concept, an analysis of accessibility, capital, operating and maintenance costs and estimates of ridership levels was conducted.

Accessibility Analysis

Accessibility analysis was conducted using GIS to create a quarter mile walkshed around each existing or proposed RGS bus stop and evaluate the population and workers served within that walkshed, and then aggregate that total for the full route length. As shown below in Table 8 and Figures 37, 38 and 39, Alternative 2 (New RGS Route) provides a 38% increase in accessibility to city residents and workers over existing conditions. Darker shades indicate higher population density and employment densities.

Table 8: Ride Glenwood Springs Alternatives Accessibility Comparison

	Current	Alt 1	Alt 2	Alt 3
Population	3,340	3,340	7,210	3,760
Workers	5,200	5,200	4,560	4,000
Population + Workers	8,540	8,540	11,770	7,760
Percent Change		0%	37.8%	9.1%

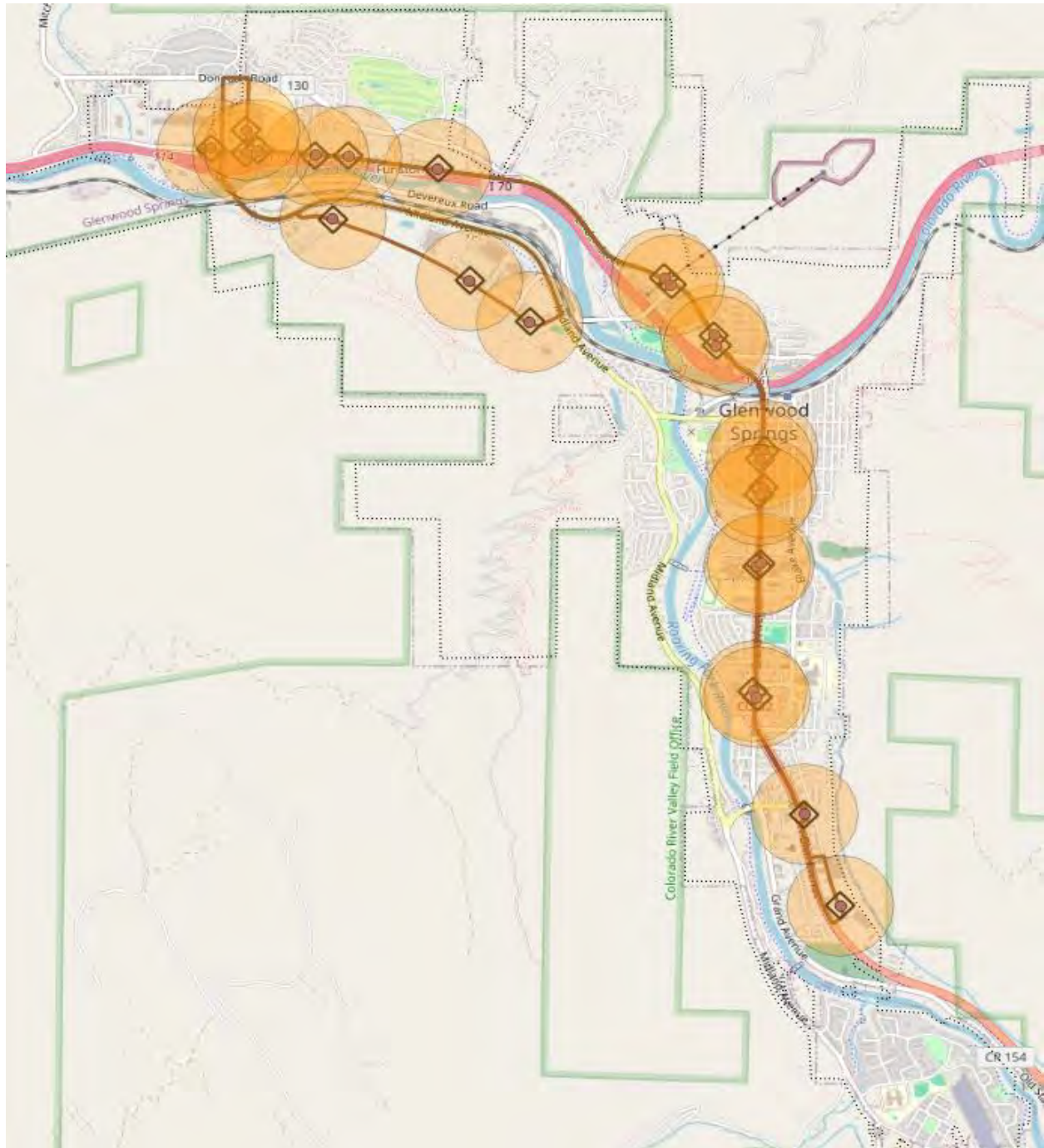


Figure 38: Concept Alternative #1 Accessibility

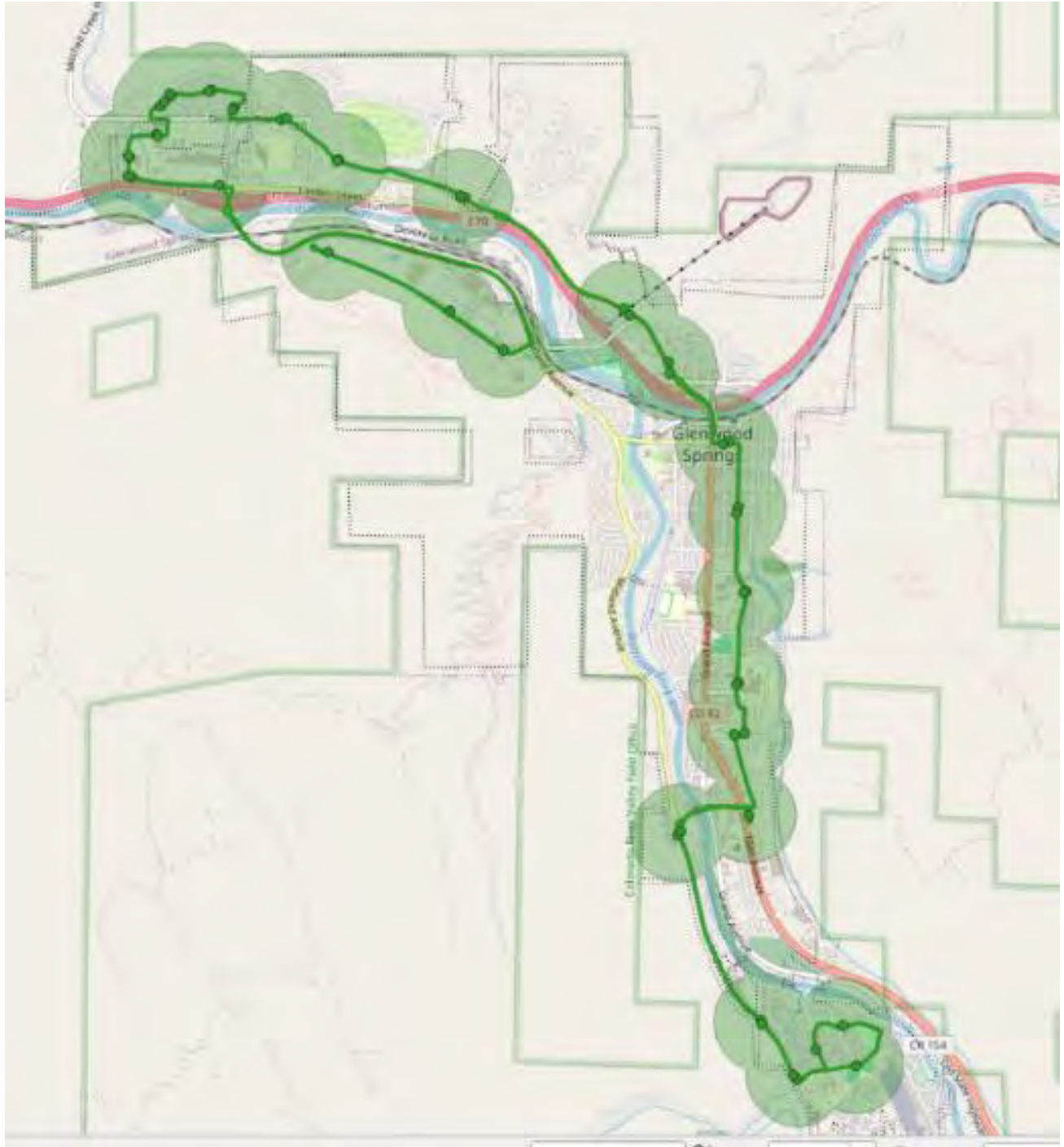


Figure 391: Concept Alternative #2 Accessibility

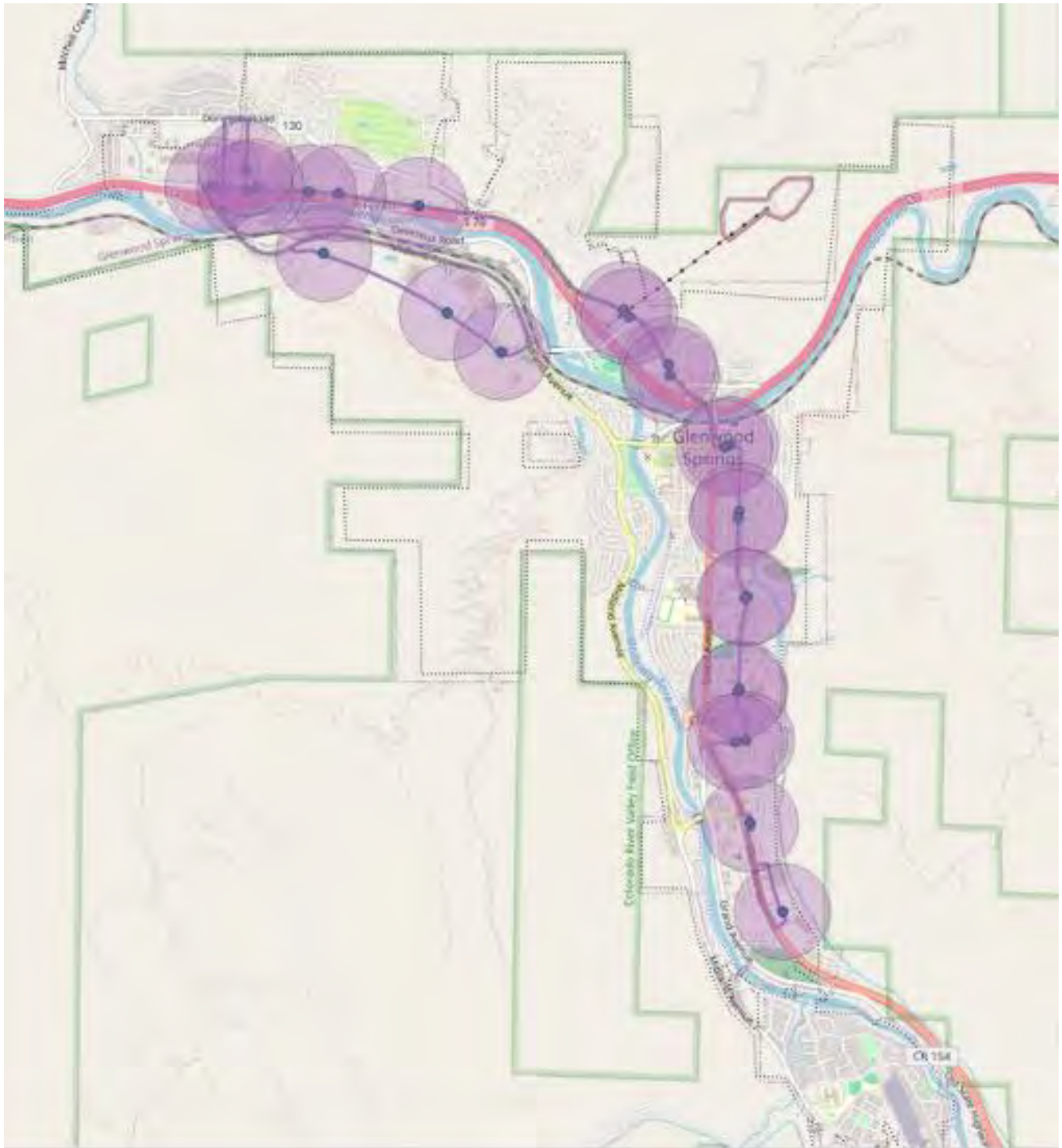


Figure 40: Concept Alternative #3 Accessibility

To develop cost comparisons, a summary of service characteristics of current and alternative transit service plans are presented in Table 9. Alternative 3 and 4 require additional vehicles. Alternative 3 requires approximately 39 new bus stops. Alternative 3 would more than double the number of daily trips in each direction from existing conditions, while similarly doubling miles per day.

Table 7: Service Characteristics Comparison

		Current (2023-2024)	Alternative 1	Alternative 2	Alternative 3
Vehicles		2	2	3	4
Stops					
	RGS Only (Current)	11	11	2	6
	RGS Shared (Current)	13	13	7	10
	RGS New	0	0	39	10
	Total	24	24	48	26
	w Shelters			14	6
Trips					
	NB	25	36	32	53
	SB	25	36	32	53
Miles/Trip					
	NB	7.7	7.7	8.3	8.1
	SB	4.8	4.8	10.9	5.2
Trip Time (min)					
	NB	23	23	24.7	25
	SB	15	15	29.3	17
Miles/Day					
	Revenue Miles	312.2	449.6	612.2	704.3
	Other	2.8	4.0	5.4	6.3
	Total	315	453.6	617.7	710.6
Hours/Day					
	Revenue Hours	25.0	36.0	29.2	37.5
	Other	2.2	3.1	2.6	3.3
	Total	27.2	39.1	31.8	40.7

Based on the service characteristics for each alternative, capital costs were estimated for new bus stop infrastructure and rolling stock. The assumptions for stop infrastructure are as follows:

- New Stops – Alternative 2: 39 new stops, 14 with new shelters, Alternative 3: 10 new stops, 6 with new shelters
- New bench - \$15,000 each
- New bench, sidewalk pad, and sign - \$5,000 each

As summarized in Table 10, Alternative 2 (new Ride Glenwood Springs Route) has the highest capital costs for new bus stops at \$335,000.

Table 8: Capital Cost Comparison – Bus Stops

Service Concept Alternative	Shelters	Stops	Total
1	\$0	\$0	\$0
2	\$210,000	\$125,000	\$335,000
3	\$90,000	\$130,000	\$220,000

The assumptions for rolling stock are as follows:

- \$550,000 per new diesel 40-foot bus (hybrids and electrics would be \$750,000 - \$1,000,000)
- 2 existing RGS buses
- Additional vehicles based on route mileage and headways
- Alt 2 – 1 new bus
- Alt 3 – 2 new buses

As summarized in Table 11, Alternative 3 (Modified Ride Glenwood Springs Route) has the highest capital costs for new rolling stock at \$1,100,000.

Table 9: Capital Cost Comparison New Rolling Stock

Service Concept Alternative	New Vehicles	Costs
1	0	\$0
2	1	\$550,000
3	2	\$1,100,000

Operating and Maintenance Costs were developed on the RFTA Service Contract Formula methodology, and the costs allocated to the Ride Glenwood Springs service. These reflect the actual costs incurred by RFTA in providing the

Ride Glenwood Springs service. The formula used incorporates Direct Hours, Direct Mileage, and fixed costs as:

$$\text{Operating Costs} = \text{Fixed Costs per hour} \times \text{Hours} + \text{Direct Hours Costs per hour} \times \text{Hours} + \text{Direct Miles Costs per mile} \times \text{Miles}$$

These each cover:

- Direct Hours Costs: Driver, Dispatch, Road Supervisors Compensation (wages, benefits, health insurance)
- Direct Mileage Costs: Fuel, mechanic compensation, vehicle parts, supplies, tires, repairs, oils, lubricants
- Fixed Costs: Facilities, other department costs

Table 10 provides the Ride Glenwood Springs service characteristics and costs from RFTA for the 2024 Budget Allocation.

Table 10: Glenwood Springs 2024 Budget Allocation Services Measures and Cost Allocation

GLENWOOD SPRINGS MUNICIPAL				Cost per
COST CATEGORY	Est. Cost	Est. Hours	Est. Miles	Mile/Hr.
Total Fixed Costs	16,518,941	331,491	N/A	49.83
Total Direct Hours Costs	22,095,258	331,491	N/A	66.65
Total Direct Mileage Costs	11,881,517	N/A	5,305,529	2.24
Total	50,495,717			

The Direct hours and miles for the current 2023 Ride Glenwood Springs service are:

- Ride Glenwood Springs Hours: 9,959
- Ride Glenwood Springs Mileage: 115,321

The Annual Hours and Miles for each alternative were estimated from their service plans (routing, segment speeds, span of service, frequency) and the formula applied. The results are shown in Table 11. Alternative 2 has the lowest operating costs (+ 32%), followed by Alternative 1 (+ 44%), with the largest increase over current costs for Alternative 3 (+ 64%).

Table 11: Comparison of Operating Costs

Service Concept Alternative	Current	Alternative 1	Alternative 2	Alternative 3
Annual Hours	9,959	14,341	11,636	14,925
Annual Miles	115,321	166,062	226,126	260,141
Annual Operating Costs	\$1,418,543	\$2,042,701	\$1,862,097	\$2,321,504

Ridership Estimates

Changes in ridership due to the proposed alternatives may be due to:

- Changes to when the service is provided (Span)
- Changes in coverage due to route and stop changes (coverage)
- Changes in travel time due to frequency (headway) and speed

Since there was no short-range ridership model for RFTA overall or at a subarea/route level, different approaches for estimating new ridership were reviewed and explored. Direct demand formulas using revenue hours and miles such as proposed in the TCRP 161: Methods for Forecasting Demand and Quantifying need for Rural Passenger Service have been developed at the system wide level, but turned out not to be transferable to Glenwood Springs as they are too dependent on local conditions, percentage of transit dependents using the service, and other factors, and when tested produced unrealistic over estimation of new ridership. Consequently, the change in ridership from existing conditions to each of the alternatives was based on a pivot point sketch method using elasticities for changes in the span, and headway/Time, and assumed effectiveness of service in attracting riders in the new coverage areas.

As shown in Figure 42, elasticity rates are calculated based upon the observed percent change in demand (e.g., ridership) divided by the percent change in user cost (e.g. span, coverage, headways, travel time). Other characteristics such as stop locations, frequency, routing, and span of service were adjusted for each alternative.

A literature search was carried out to identify similar case studies and recommended elasticities to use for the effort. Examples found include:

- In Las Vegas, Nevada bus routes that received a span of service increase experienced a 12.4 % increase in ridership during the unaltered hours (Jacob Simmons, 2014)

$$\text{Price Elasticity Of Demand} = \frac{\text{Percentage Change In Quantity Demanded}}{\text{Percentage Change In Price}}$$

Figure 41: Elasticity Formula

- In Australia, elasticities of more than 0.8 were experienced on weekend services, generally above previous experience. Analysis found that where services were extended into evening hours, about half the ridership growth occurred during the daytime when no changes to services were implemented (Currie, 2009)
- A seminal study "Patronage Impacts of Changes in Transit Fares and Services" found a headway elasticity of -.47 across the United States (Maywork and Lago, 1980)
- Santa Clarita, California experiment a 1.14 elasticity due to service hour changes (TCRP 95: Chapter 9 Transit Scheduling and Frequency 2004 & 2013)
- The Transit Capacity and Quality of Service Handbook (2013) recommends a transit travel time elasticity of -0.4% (or a 10 percent decrease in transit travel time causes a 4 percent increase in transit ridership)

The ridership estimation process was therefore to

- Estimate the change in ridership due to span using an increase of 12.4% for Alternative 1 and Alternative 3 (with same span) and adjusting for a slight reduction in span in Alternative 2.
- Add to that the change in ridership due to coverage (population and workers within ¼ mile of stops). It was assumed that the additional coverage the edges of Glenwood Springs with overlapping RFTA service will be 1/3 as effective in new areas as existing service for Alternative 2, and the slight reduction in coverage in the central business district in Alternatives 2 and 3 will be ¼ as effective.
- Add to that change in ridership due to headway/travel time using an elasticity of -0.47 %. Alternative 3 has a change in headway of -50%.

The analysis used as a foundation the 2023 Annual Ridership for the Ride Glenwood Springs service provided by RFTA of 250,279 passengers.

The results of these calculations are summarized in Table 14.

Table 12: Comparison of Estimated Ridership Level

Alternative	New Boardings	Total Annual Boardings	Percent Change
Existing 2023	0	250,279	0%
Alternative 1	31,035	281,314	12.4%
Alternative 2	56,485	309,764	23.4%
Alternative 3	84,135	334,414	33.4%

Alternative 3 provides the highest estimated increase in ridership (33.4%) followed by Alternative 2 (23.4%) and Alternative 1 (12.4%)

VII. Summary and Next Steps

In summary, there are documented gaps and barriers with current Ride Glenwood Springs local bus routes and services patterns. Public input was supportive of enhanced local transit service span, coverage and frequency. Three unique transit expansion alternatives were developed in this report. The transit expansion alternatives ranged in capital costs between \$0 to \$1.3 million and between \$1.9 and \$2.3 in operating costs. Estimated ridership increases ranged between 12% to 33% (up to 85,000 new annual boardings).

It is recommended that the City of Glenwood Springs should proceed with the following steps.

- 1) Share findings: Share the final results of this study with all stakeholders including the Council, RFTA, and community groups.
- 2) Select Alternative: Select a preferred transit expansion alternative
- 3) Secure additional funding: Work with internal City budgets, RFTA, 5310 and seek other grants
- 4) Determine Service Delivery: Assess RFTA operation, City operation or 3rd party concessionaire
- 5) Obtain Rolling Stock: Assess optimal vehicle size (seating capacity vs. peak loads), power (diesel versus electric) and purchase new fleet vehicles
- 6) Construct new bus stop infrastructure: Finalize new bus stop locations, including impacts to curbside parking, Construct new landing pads, shelters and signage.
- 7) Marketing: Communicate new service to new and existing riders
- 8) Monitor: Following launch, continue to monitor and adjust the service based on performance, rider feedback, demand patterns, and budget.