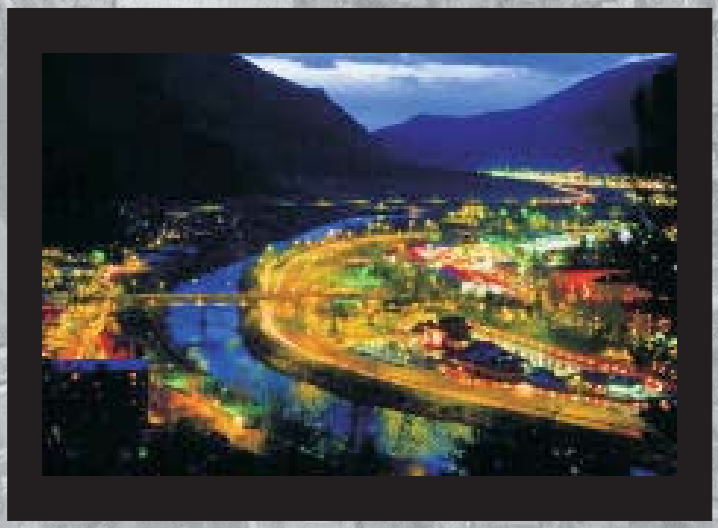
SH 82 Corridor Optimization Study



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Final Report
March 2007

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List of Acronyms

ADT – average daily traffic
BRT – bus rapid transit
CCA – corridor conditions assessment
CDOT – Colorado Department of Transportation
City – City of Glenwood Springs
COP – corridor optimization plan
COR – corridor optimization report
COS – corridor optimization study
County – Garfield County
FHWA – Federal Highway Administration
HOV – high occupancy vehicle
I-70 – Interstate 70
ITS – intelligent transportation systems
LOS – level of service
NEPA – National Environmental Policy Act
RFTA – Roaring Fork Transportation Authority
ROW – right of way
SH – state highway
STIP – Statewide Transportation Improvement Program
TDM – transportation demand management
TIP – Transportation Improvement Program
TMC – turning movement count
TNM 2.5 – Traffic Noise Model Version 2.5
TSM – transportation systems management
US – United States Highway
vpd – vehicles per day

1.0 INTRODUCTION

State Highway (SH) 82 is the primary east-west regional transportation facility serving the Roaring Fork Valley. SH 82 extends from Interstate 70 (I-70) through the City of Glenwood Springs (City) to serve the communities south of the City. Within the City, SH 82 runs in the north-south direction and is also know as Grand Avenue. It serves as the City's main street and an important component of the local transportation network. For purposes of this report, SH 82 is referred to as a north-south facility. As a result of the dual role SH 82 currently serves, both regional travel and local mobility are impacted.

The City, the Colorado Department of Transportation (CDOT) and Garfield County (County) identified the need for improvements to SH 82 to properly accommodate regional travel demand and local mobility. However, a variety of alternatives have been identified that could be made to improve the corridor. All of the alternatives have benefits and consequences and must be assessed to determine which of the alternatives provide the proper balance based on both the regional and local demands on SH 82.

The corridor optimization process was designed to identify and assess alternatives ultimately resulting in the selection of a solution that meets the desired goals for a corridor. For SH 82, the goal is to improve both regional travel and local mobility while balancing community, environmental, safety, and financial demands. The corridor optimization process involves several steps which will be described in Chapter 2, Corridor Optimization Process. This document, the Corridor Optimization Study (COS), is the second step of the corridor optimization process. The SH 82 COS will provide an assessment of alternatives to accommodate and balance future regional travel demands and local mobility along SH 82 through the City. The COS does not identify a preferred alternative, but rather simply identifies reasonable alternatives and how they compare to each other. This document summarizes the findings of the COS, including the process, procedures, and results of analyses.

1.1 PURPOSE

The corridor optimization process was designed to support and provide input to the overall regional and statewide transportation planning process. The first step in the corridor optimization process, identifying the problem, was accomplished in the SH 82 Corridor Conditions Assessment (CCA) completed by CDOT and the City in 2004. The SH 82 COS addresses the next part of the process: identifying and evaluating potential solutions for the SH 82 corridor. The final step in the corridor optimization process will be completed by the Corridor Optimization Plan (COP), which will evaluate the top alternatives and provide the opportunity for public involvement and ultimately result in selection of a corridor strategy during the National Environmental Policy Act (NEPA) process. The final decision regarding which alternative will be implemented does not occur until the end of the NEPA process.

The purpose of the SH 82 COS is to identify feasible alternatives for addressing the regional travel and local mobility needs of SH 82 through the City. The study evaluates environmental concerns, capacity, mobility, safety, cost of improvements, and potential funding options for each alternative. The study does not identify a preferred alternative. Selection of preferred alternatives will occur during the next step of the corridor optimization process. The result of the SH 82 COS is a list of potential solutions that will improve regional travel and local mobility on

SH 82 through Glenwood Springs. Tradeoffs for each of the solutions have been analyzed to determine the benefits and consequences of each.

1.2 PROJECT LIMITS

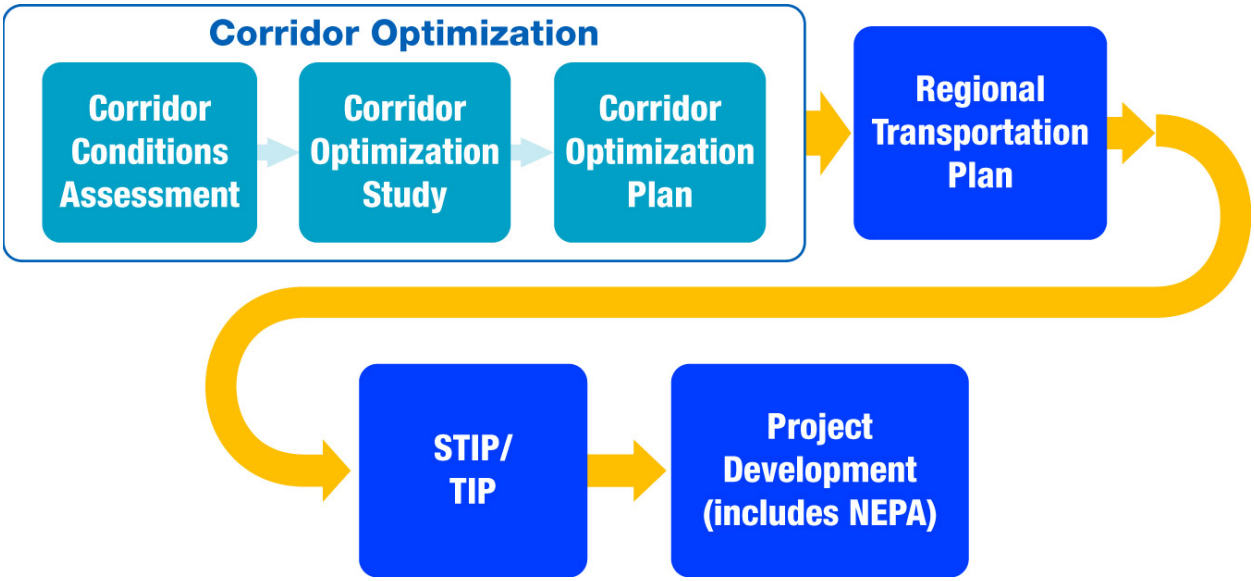
The project limits for this study extend from United States Highway (US) 6 to the north, just beyond the Glenwood Springs Airport to the south, Midland Avenue to the west, and the edge of the valley to the east. The project limits do not extend significantly east or west beyond the City limits because CDOT has a state directive to not add significant highway miles to its system. Any alternative outside of the above defined study area would add significant miles to the state highway system and therefore cannot be considered. The limits developed for the SH 82 COS were designed to focus on the different routes that traffic can use to move through and/or around the Glenwood Springs area. The identified roadways within the study limits are shown in Figure 1.

Figure 1
Identified Roadways

2.0 CORRIDOR OPTIMIZATION PROCESS

The corridor optimization process is intended to provide an assessment of how best to meet future travel demands for SH 82. This process must answer fundamental questions regarding modal mix, capacity, access, land use mix, density, cost, and potential funding options. The end product of the process is a document that defines the vision of alternatives for SH 82. The corridor optimization process is designed to support and provide input to the overall regional and statewide transportation planning process as illustrated in Figure 2.

Figure 2
Corridor Optimization Process



Note: National Environmental Policy Act (NEPA)
Statewide Transportation Improvement Program (STIP)
Transportation Improvement Program (TIP)

The overall optimization process consists of six key steps.

1. Problem definition (CCA)
2. Alternatives development (COS)
3. Alternatives analysis (COS, COP)
4. Corridor optimization plan development (COP)
5. Business/financial plan development (COS, COP)
6. Plan adoption (NEPA)

The first step in conducting a corridor optimization study is to define the problem relative to travel demand. This problem statement requires an understanding of the transportation system and the travel markets (regional and local) that use the system under both existing and future conditions. Other considerations taken into account include the identification of specific traffic patterns that are currently or will later be inadequately served. The SH 82 CCA, completed by CDOT and the City in 2004, provided much of the groundwork for defining a clear problem statement for the SH 82 corridor.

The second step is to identify feasible alternatives that might address identified travel issues along the SH 82 corridor. These alternatives respond to the problem statement and are structured

to provide a variety of options that illustrate the trade-offs among costs, transportation benefits, and other impacts. For the SH 82 COS, the first step in identifying alternatives was to compile alternatives proposed by recently completed studies. The project team then defined constraints that might limit what potential solutions could be developed. One constraint identified early on is a state directive not to add significant miles to the CDOTs highway system. This constraint eliminated the evaluation of alternatives that connect to I-70 east or west of the City from this study. The project team brainstormed additional alternatives, which did not violate the defined constraint, to complete the alternative development process. Among the alternatives considered were improvements such as the widening of existing facilities, reversible lane facilities, one-way couplets, and new alignments. Operational strategies such as tolling new capacity were identified, but were not analyzed as part of this study.

The third step is to evaluate each alternative by assessing the alternative's effectiveness, land use consequences, potential environmental impacts, and economic feasibility. The project team developed four major goals to be analyzed, and within each goal a set of objectives. Each objective was given a performance measure for which the alternatives should be evaluated. In some cases it was necessary to develop separate local and regional performance measures. The purpose of this assessment was not to rank each alternative, but rather to identify measures by which each alternative could be compared to each other. It was decided by the project team that weights would not be assigned to each performance measure at this time.

The fourth step is to develop the COP. The COP identifies and further evaluates the alternatives from the COS preferred by the corridor stakeholders. The COP defines the role of highway, transit, the surrounding roadway network, and other alternatives such as high-occupancy vehicle (HOV) lanes, transportation demand management (TDM), transportation systems management (TSM), and intelligent transportation systems (ITS) in meeting the overall demands for SH 82. Additionally, the COP will also assess public opinion regarding the preferred alternatives. In the event that the preferred alternative is not consistent with local and regional plans as identified in the evaluation process, potential adjustments should be identified in the plan. The COP portion of the corridor optimization process will be completed as part of a future study.

The fifth step includes development of a business/financial plan. The development of the business/financial plan will occur concurrently with the COP. The business/financial plan will identify additional actions that are necessary to implement the identified alternatives, as well as clearly defining the financial responsibilities of the City, CDOT, the County, and other local, regional, and national agencies. The basic components of the business/financial plan are identified in this study, but will be expanded upon once the alternatives are narrowed down and studied in more detail in the COP.

The sixth, and final, step is plan adoption. The study is documented in a Corridor Optimization Report (COR) that includes the findings of the CCA, COS, COP, and the business/financial plan. Other items, such as the selection of preferred alternatives are also included in the COR.

To complete the planning process, the COR is submitted to the State Transportation Commission for approval and inclusion in the Regional Transportation Plan, Statewide Transportation Improvement Program (STIP) and Transportation Improvement Program (TIP). The alternatives that are selected in the COP will be evaluated through the NEPA process, ultimately resulting in a selected alternative to address travel demand along the SH 82 corridor through the City.

3.0 PROJECT DEVELOPMENT

The first step in the corridor optimization process was to define the problem relating to travel demands and capacities. The SH 82 CCA completed by CDOT and the City in 2004 provided the groundwork for defining a clear problem statement. The CCA indicates both regional and local traffic place a high demand on SH 82 under existing conditions. Under forecast future conditions the CCA indicates that, unless mitigation strategies are implemented, the increase in both local and regional traffic demand will cause operational failures along several sections of the SH 82 corridor. Other studies conducted in the region were evaluated and used to further elaborate on the problems identified in the CCA. These additional studies provide supplemental information regarding travel markets using the transportation system currently and in the future.

3.1 PROJECT PROBLEM STATEMENT

Based on the analysis and discussions with the project team, a problem statement was developed:

> *SH 82 is the major north-south transportation facility within the Roaring Fork Valley. The corridor serves as a connection between Glenwood Springs and Aspen as well as other adjacent communities. Much of the corridor is designed for high-speed traffic with limited access. However, within the City, SH 82 is defined as a non-rural arterial which provides service to through traffic movements but also allows for more direct access to adjacent properties. Continuing growth in the Roaring Fork Valley will continue to increase travel demand along the SH 82 corridor. The COS is being conducted to provide proper planning and to ensure that SH 82 through Glenwood Springs balances regional mobility with local connectivity needs.*
>
> *This planning should consider interchange locations, capacity improvements, and parallel arterial roads. Each aspect has a potential role to ensure that the SH 82 corridor provides a high level of mobility while balancing the environmental and social needs of the City.*

The goal of this problem statement is to provide a study that lays the groundwork to ensure that SH 82 will serve the current and future north-south mobility needs within the Roaring Fork Valley while balancing the local mobility needs and quality of life of the Glenwood Springs community.

3.2 TRAFFIC VOLUMES

In order to begin traffic modeling for the key transportation network in Glenwood Springs, peak hour turning movement counts (TMC) and average daily traffic (ADT) counts were collected in April of 2006. New data was not collected at a few intersections (SH 82 at 14th Street, 15th Street, and 20th Street). For these intersections, the turning volumes identified in the SH 82 CCA were used, along with new traffic count data at adjacent intersections, to estimate current traffic volumes.

Currently, SH 82 carries 29,200 vehicles per day (vpd) across the bridge between US 6 and 7th Street. The traffic volume drops to 26,700 vpd south of 9th Street but increases to 31,700 vpd between 20th and 22nd Streets. Midland Avenue currently carries 10,000 vpd just south of the I-

70 Exit 114 roundabouts, but south of the 8th Street connection this volume drops to 6,300 vpd. The 27th Street connection between Midland and Grand Avenue carries 11,900 vpd. The existing traffic volumes are displayed in Figure 3 and Figure 4, and can be found in Appendix A.

The year 2030 traffic projections are shown in Figure 5 and Figure 6 and were calculated using a two percent annual growth rate (growth factor of 1.64) based on the findings of the SH 82 CCA and historical CDOT data. The two percent annual growth rate represents the average growth rate experienced for the traffic on SH 82 through Glenwood Springs. Some years SH 82 traffic growth is higher than two percent, others it is lower (sometimes it even declines). However, over time this rate has been shown to accurately represent long-term corridor traffic growth. Also, it is important to note this figure represents SH 82 corridor traffic growth and not City traffic growth. There are certainly areas within the City that will experience both higher and lower traffic growth over the study period than is forecast for SH 82. The two percent annual growth rate will result in future 2030 volumes on SH 82 across the bridge of 47,900 vpd and between 20th and 22nd Streets of 52,000 vpd.

3.3 TRAVEL MARKETS

As determined in the SH 82 CCA, alternate modes of transportation along the SH 82 corridor are used by a relatively small portion of the total users of SH 82. Therefore, automobile traffic volumes along SH 82 are the primary concern for this study. There are primarily two types of trips: local and regional trips. Regional trips (or pass-through trips) consist of vehicles that enter the SH 82 network at a point along I-70 and continue through Glenwood Springs south of 32nd Street in a given period of time. Local trips are considered to be all other trips within Glenwood Springs.

For the SH 82 CCA, a license plate survey was conducted to quantify the number of pass-through trips versus local trips. The license plate study was conducted using video cameras with synchronized time clocks to record vehicle license plate data for vehicles entering and exiting the City of Glenwood Springs at specific cordon locations:

- Southbound entry points
  - Midland Avenue south of I-70
  - US 6 west of Laurel Street
  - I-70 westbound Exit 116 ramp
  - I-70 eastbound Exit 116 ramp
- Southbound exit point
  - SH 82 south of 27th Street
- Northbound entry point
  - SH 82 south of 27th Street
- Northbound exit points
  - I-70 westbound entrance ramp at Exit 116
  - I-70 eastbound entrance ramp at Exit 116
  - Midland Avenue south of I-70
  - US 6 west of Laurel Street

These cordon locations represent all locations at which pass-through traffic could enter and exit the City. In order to separate pass-through trips from destination trips, a minimum travel time

Figure 3
Existing Traffic Volumes (North of 13th Street)

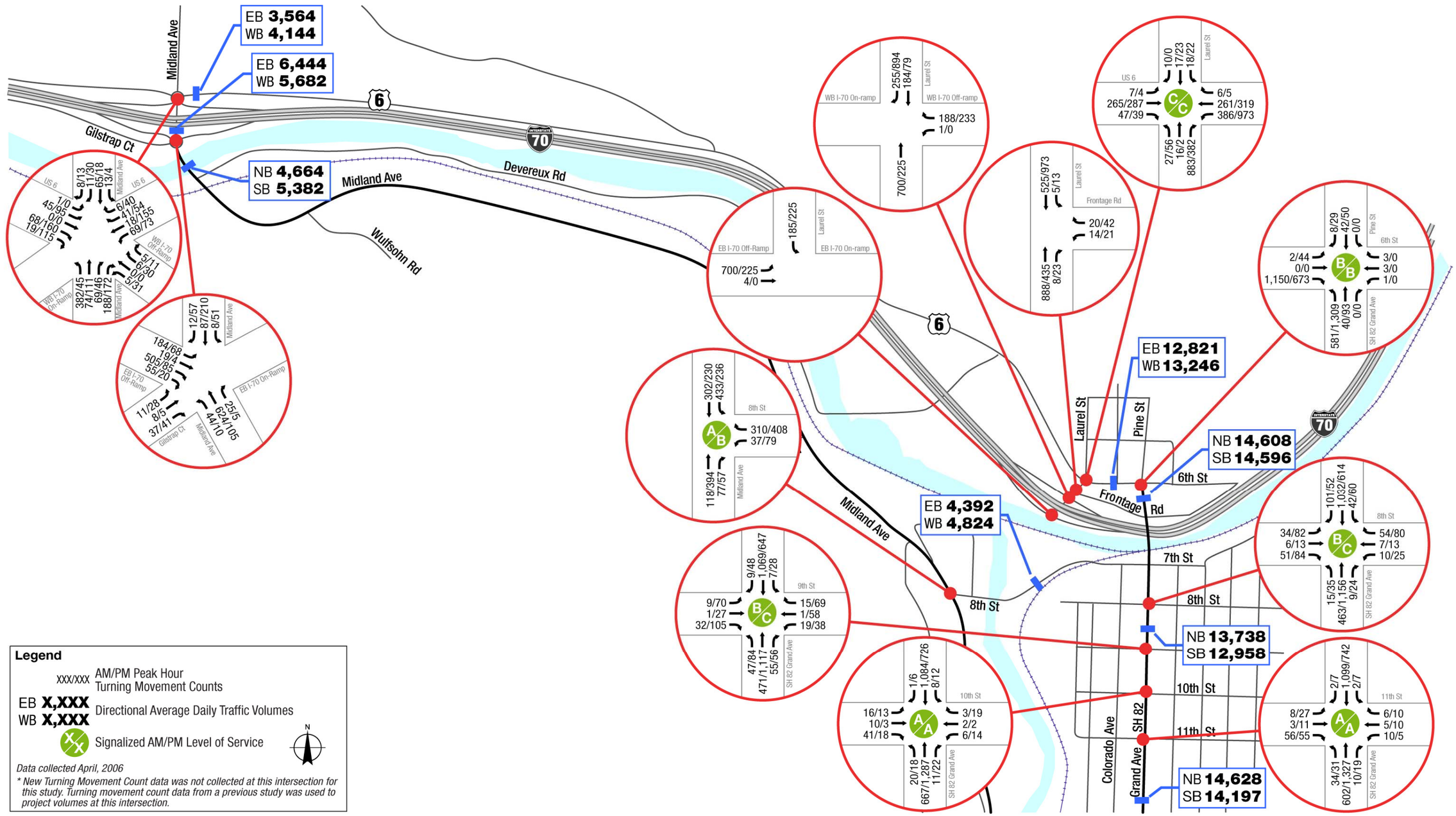


Figure 4
Existing Traffic Volumes (South of 13th Street)

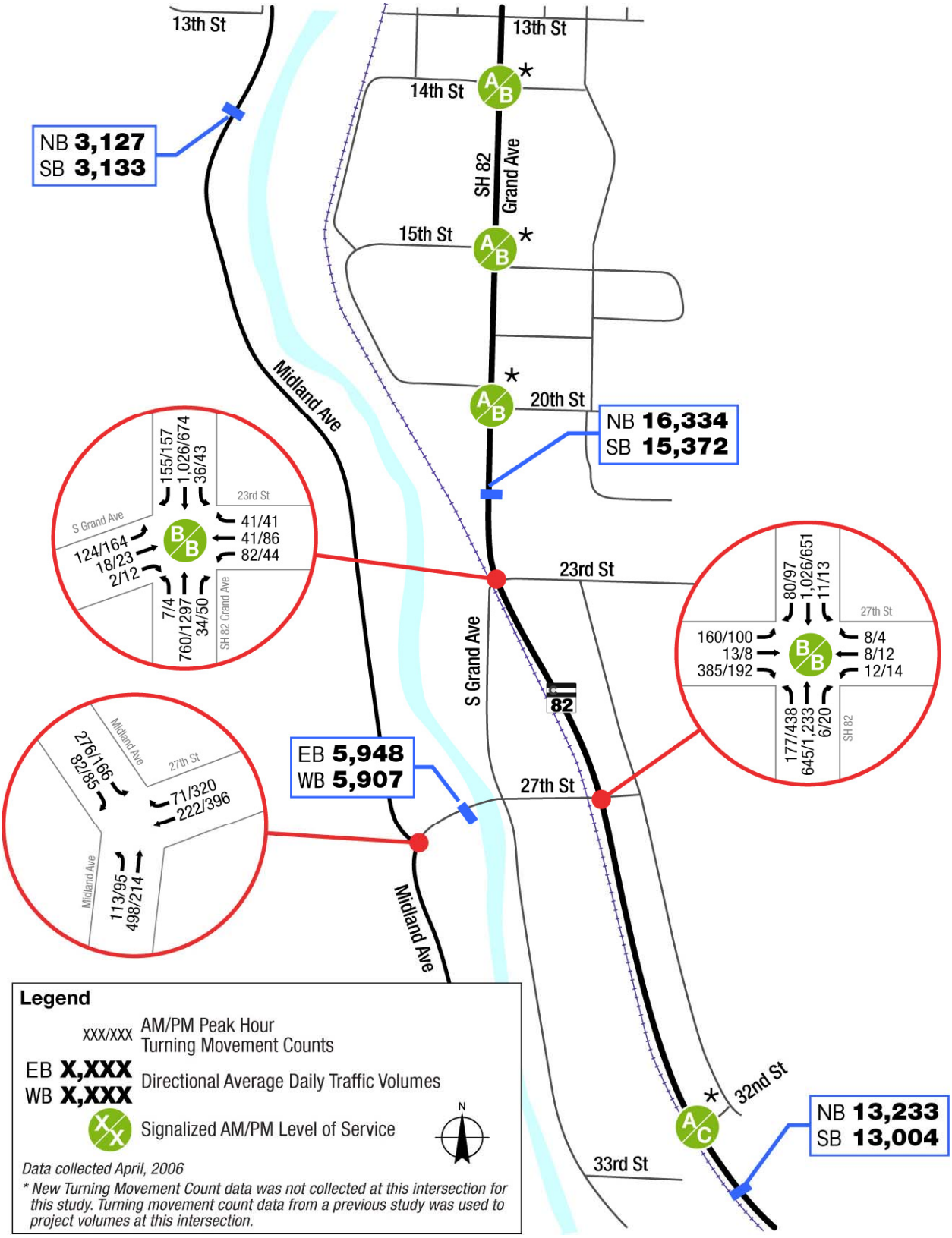


Figure 5
Future Traffic Volumes (North of 13th Street)

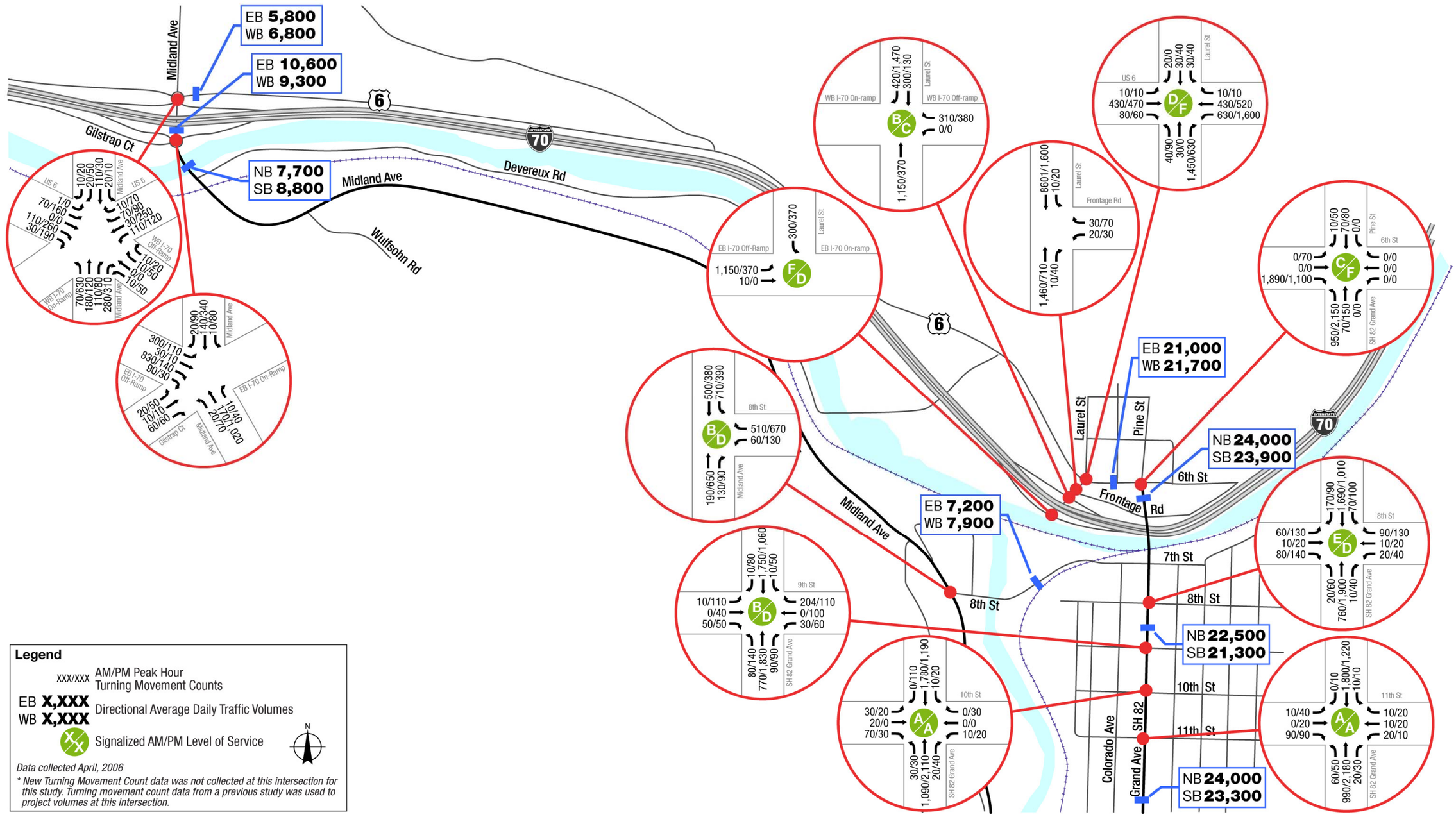
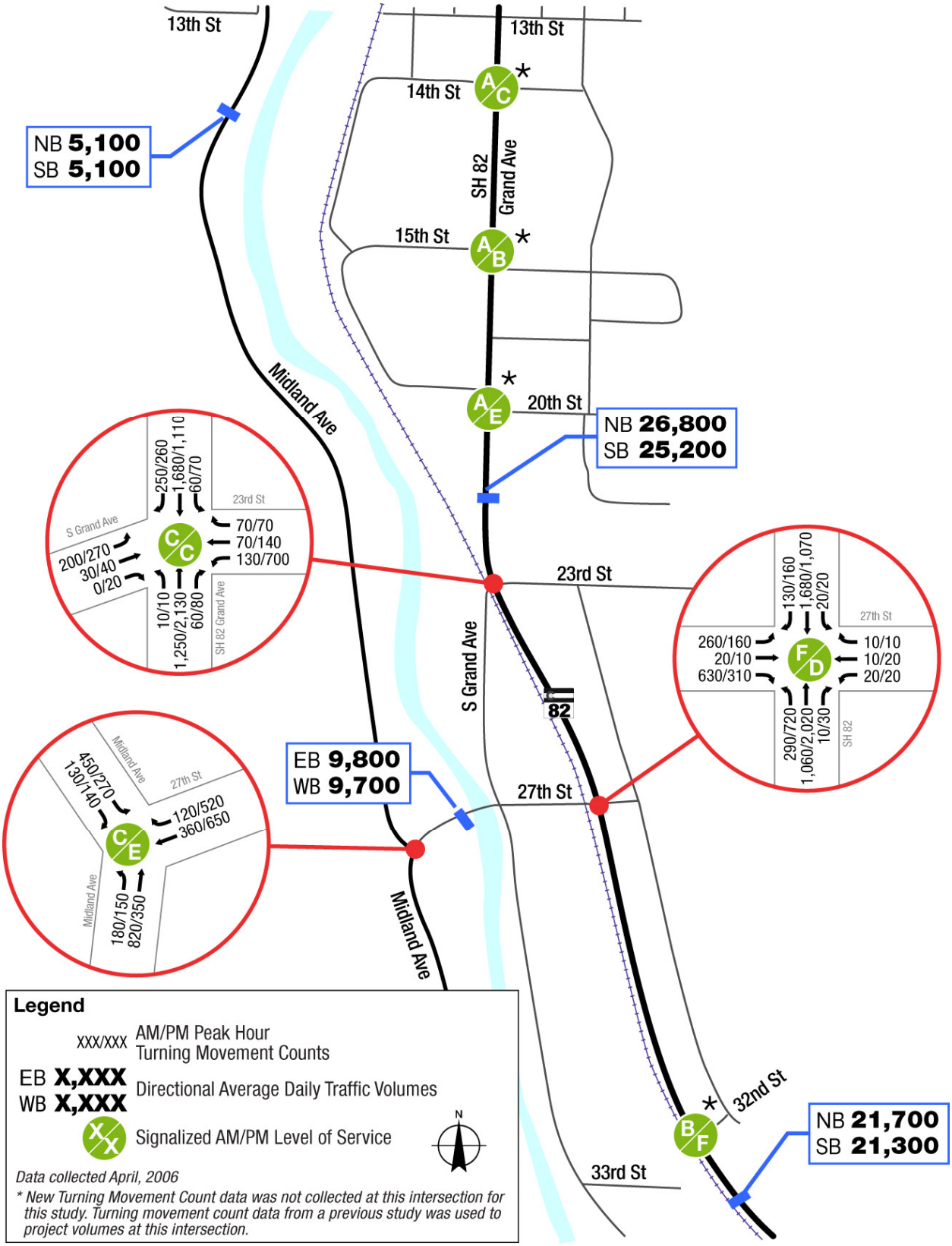


Figure 6
Future Traffic Volumes (South of 13th Street)



window of ten minutes was determined. Based on additional analysis completed by the CCA, a travel time window of 20 minutes was used to include most of the pass-through trips. Twenty minutes gives drivers time to stop for gas or to pick up fast food and still be counted as pass-through traffic. Vehicles taking longer than 20 minutes were considered to be making longer stops in Glenwood Springs for shopping, dining, or other purposes and were therefore considered to have a destination within the City and were not truly pass-through traffic. The percentages of pass-through trips from the CCA were used to calculate the existing number of pass-through trips in the Glenwood Springs network for the COS. Trips were assigned based on existing travel patterns and the routes available for each alternative.

Based on the license plate survey conducted for the SH 82 CCA, 27 percent of the vehicles that use SH 82 on a typical weekday are pass-through vehicles. Breaking this down by peak hour, the weekday AM peak period has 19 percent pass-through vehicles, the weekday noon peak period has 24 percent pass-through vehicles, and the weekday PM peak period has 34 percent pass-through vehicles. The results of the license plate survey conducted for the CCA indicate the importance of SH 82 to both regional travel and local mobility.

3.4 EXISTING TRANSPORTATION INVENTORY

In addition to existing traffic volumes and travel patterns, it is important to identify what parallel arterial roadways and transit alternatives exist that may alleviate the traffic on SH 82.

3.4.1 Other Existing Roadways

The location of SH 82 within the narrow Roaring Fork Valley results in a few existing parallel roadways that were considered for use in the future: Midland Avenue, Cooper Avenue, and Colorado Avenue. Midland Avenue is a north-south roadway that parallels SH 82 but is located to the west of the Roaring Fork River. Midland Avenue accesses I-70 at Exit 114 and has access to SH 82 using the 8th Street or 27th Street connections. No other connections currently exist. Cooper Avenue and Colorado Avenue are north-south roadways that parallel SH 82 through the core downtown area.

3.4.2 Existing Transit Services

Currently there are several transit options available to the users of SH 82. Local transit service is provided by Ride Glenwood Springs and regional transit service is provided by the Roaring Fork Transportation Authority (RFTA). RFTA provides service between Glenwood Springs and Aspen/Snowmass Village every 30 minutes. Service from Glenwood Springs to Rifle, with stops at New Castle and Silt, is less frequent, with nine runs provided daily in each direction. Ridership of RFTA and the Ride Glenwood Springs circulator has increased in the last several years. In addition to bus service, there are also several park-and-rides located from Rifle to Aspen providing additional options to regional commuters.

In addition to operating regional transit services, RFTA owns and manages the Denver – Rio Grande Rail Corridor from 8th Street near City Hall, south to Woody Creek in Pitkin County. The RFTA Board has established policies governing actions related to the rail corridor in its *Corridor Comprehensive Plan* with a focus on preserving the corridor for a fixed rail system in the long term. Until this fixed rail is implemented, RFTA is constructing a regional trail to be completed

by 2010. The width of the rail corridor right-of-way (ROW) ranges from 50 to 200 feet by location.

RFTA has existing plans to implement a regional Bus Rapid Transit (BRT) project by 2017, as recommended by the Corridor Investment Study and endorsed by the Board of Directors. The BRT system would include the provision of new facilities, such as stations at the West Glenwood park-and-ride and the RFTA-owned parcel at 8th Street near City Hall.

4.0 ALTERNATIVES DEVELOPMENT

Several alternatives for the SH 82 corridor were developed by other studies and were used as a starting point for developing alternatives for this study. In addition to the previously developed alternatives, several additional alternatives were developed which include new alignments, expansion of parallel roadways in the transportation network, and enhancing the current system. The new alternatives were developed through a cooperative effort with the City, CDOT, and the County.

A total of 22 alternatives were developed for this study. The first seven alternatives include improvements to the existing SH 82 alignment.

1. Signal Timing – This alternative is the no-build alternative and looks at adding additional traffic signals and coordinating the network to favor the peak direction traffic. The alignment for this alternative is displayed in Figure 7.

2. Limited Turns (One Ways) – This alternative utilizes the existing SH 82 corridor but requires modifications to some east-west streets in downtown Glenwood Springs. The conversion of 8th, 9th, 10th, and 11th Streets to one-way pairs would limit the movements at the intersections of these streets with SH 82. This would allow for more green time to be designated to the north-south movement. The alignment for this alternative is displayed in Figure 8.

3. Limited Turns (Restricted Lefts) – This alternative is the same as the Limited Turns (One Ways) Alternative except that it limits the left turns off of SH 82 onto the downtown street network. The alignment for this alternative is displayed in Figure 9.

4. Limited Turns (Right-In, Right-Out) – This alternative is the same as the Limited Turns (Restricted Lefts) Alternative, but it converts the intersections of 8th Street and SH 82 and 9th Street at SH 82 to right-in, right-out intersections. Only right turns will be allowed onto 8th and 9th Streets from SH 82 and only right turns can be made onto SH 82 from 8th and 9th Streets. The alignment for this alternative is displayed in Figure 10.

5. Devereux Interchange 3 – This alternative would require the addition of a new I-70 interchange at the existing Devereux Road Bridge and removal of the existing I-70 Exit 116 Interchange. The route would then continue from Devereux Road to existing eastbound US 6 (widened to four lanes) and utilize the existing SH 82 corridor. The alignment for this alternative is displayed in Figure 11.

6. Split Diamond – This alternative is similar to the Devereux Interchange 3 Alternative, but the existing I-70 Exit 116 would not be abandoned altogether. The construction of a new interchange at Devereux Road would consist of an eastbound I-70 traffic off-ramp and a westbound I-70 on-ramp. The existing I-70 Exit 116 would be modified to only allow for a westbound I-70 off-ramp and an eastbound I-70 on-ramp. This alternative would utilize US 6 (widened to four lanes) and the existing SH 82 alignment. The alignment for this alternative is displayed in Figure 12.

7. One-Way Couplet (Existing Streets) – This alternative utilizes Colorado Avenue and Cooper Avenue to create a one-way couplet through downtown Glenwood Springs. This alternative would require the removal of Exit 116 and constructing a new I-70 exit that would involve flyovers connecting directly to Colorado Avenue and Cooper Avenue. The one-way couplet of Colorado Avenue and Cooper Avenue would connect to the existing SH 82 alignment between 11th Street and 14th Street. The alignment for this alternative is displayed in Figure 13.

The next two alternatives include the addition of a bridge south of the Glenwood Springs Airport.

8. South Glenwood Bridge – This alternative was identified in the *Glenwood Springs Alternate Route and Four Mile Road Connection to SH 82* report. This alternative would require a new bridge over the Roaring Fork River that would connect Midland Avenue to SH 82 south of the Glenwood Springs Airport. This alternative would provide a second access location to homes and businesses along Midland Avenue south of 27th Street. The alignment for this alternative is displayed in Figure 14.

9. Midland Corridor with South Bridge – This alternative was identified in the *State Highway 82 Relocation Alternative Analysis* report. This alternative would utilize the existing Midland Avenue corridor from I-70 Exit 114 to south of Four Mile Road. This alternative would require the construction of a new bridge across the Roaring Fork River south of the Glenwood Springs Airport. Portions of Midland Avenue would be widened to four lanes and other portions would only require a three lane cross-section. The alignment for this alternative is displayed in Figure 15.

The next two alternatives include Midland Avenue alternatives.

10. Shortened Midland Corridor – This alternative was identified in the *State Highway 82 Relocation Alternative Analysis* report. This route would follow the existing Midland Avenue alignment from I-70 Exit 114 and connect to SH 82 at 27th Street. Midland Avenue would be widened to a four-lane section north of 27th Street. The alignment for this alternative is displayed in Figure 16.

11. Midland Corridor with Connection at 23rd Street – This alternative is similar to the Shortened Midland Corridor Alternative except that the connection to SH 82 occurs at a new river crossing and flyover at the existing 23rd Street intersection. The alignment would be four lanes from I-70 Exit 114 to 8th Street, three lanes from 8th Street to the Midland connection, and two lanes from the Midland connection to the SH 82 flyover. The alignment for this alternative is displayed in Figure 17.

The final twelve alternatives utilize new alignments.

12. East Alignment – This alternative consists of a new SH 82 alignment following the eastern edge of the Roaring Fork Valley. This alternative would require a new I-70 interchange east of Exit 116, a new alignment along the edge of the valley including some tunneled portions, and a new connection to SH 82 south of 32nd Street. The alignment for this alternative is displayed in Figure 18.

13. East River Corridor – This alternative was identified in the *State Highway 82 Relocation Alternative Analysis* report and was referred to as the "Railroad Right-of-Way Corridor." This route would follow the Roaring Fork River from I-70 and connect to SH 82 near 23rd Street. This would require the reconstruction of the I-70 Exit 116 Interchange to cross the Colorado River and the main line of the Denver – Rio Grande Railroad. The alignment for this alternative is displayed in Figure 19.

14. Traffic Calming – This alternative was identified in the *Grand Avenue Traffic Calming Plan*. It would involve the addition of the East River corridor which is to be used by SH 82 traffic. Existing SH 82 through downtown Glenwood Springs would include traffic calming measures that would create a more walkable community. This would include the addition of a median, pavement treatments, and roundabouts. The alignment for this alternative is displayed in Figure 20.

15. Devereux Interchange 1 – This alternative was identified in the *State Highway 82 Relocation Alternative Analysis* report and was referred to as the "Bragdon Route." This route would require the addition of a new I-70 interchange at the existing Devereux Road Bridge and cross the Colorado River and the main line of the Denver – Rio Grande Railroad to connect to Midland Avenue. The route would follow Midland Avenue, cross the Roaring Fork River near 7th Street, and follow the East River corridor to connect to SH 82 at 23rd Street. The alignment for this alternative is displayed in Figure 21.

16. Devereux Interchange 2 – This alternative is similar to the Devereux Interchange 1 Alternative, but instead of connecting into Midland Avenue, it would cross the Colorado River, the mainline of the Denver – Rio Grande Railroad, and the Roaring Fork River and connect to the East River corridor near 7th Street. This alignment would require the construction of two new bridges. The alignment for this alternative is displayed in Figure 21.

17. Midland/East River Corridor – This alternative is similar to the East River corridor, but would utilize Midland Avenue from I-70 Exit 114 to 8th Street, cross the Roaring Fork River at 8th Street, connect to the East River corridor at 8th Street, and connect to SH 82 at 23rd Street. The alignment for this alternative is displayed in Figure 22.

18. Reversible Lanes 1 – This alternative is similar to the East River Corridor Alternative, but would use the East River corridor as a two-lane reversible lanes facility. This would require the expansion of the existing Exit 116 Interchange and would connect to the existing SH 82 alignment at 23rd Street. The alignment for this alternative is displayed in Figure 23.

19. Reversible Lanes 2 – This alternative is similar to the Reversible Lanes 1 Alternative with the exception of the connection to I-70. This alternative would require creating a new I-70 interchange at the Devereux Road Bridge and connection to the existing SH 82 alignment at 23rd Street. The alignment for this alternative is displayed in Figure 24.

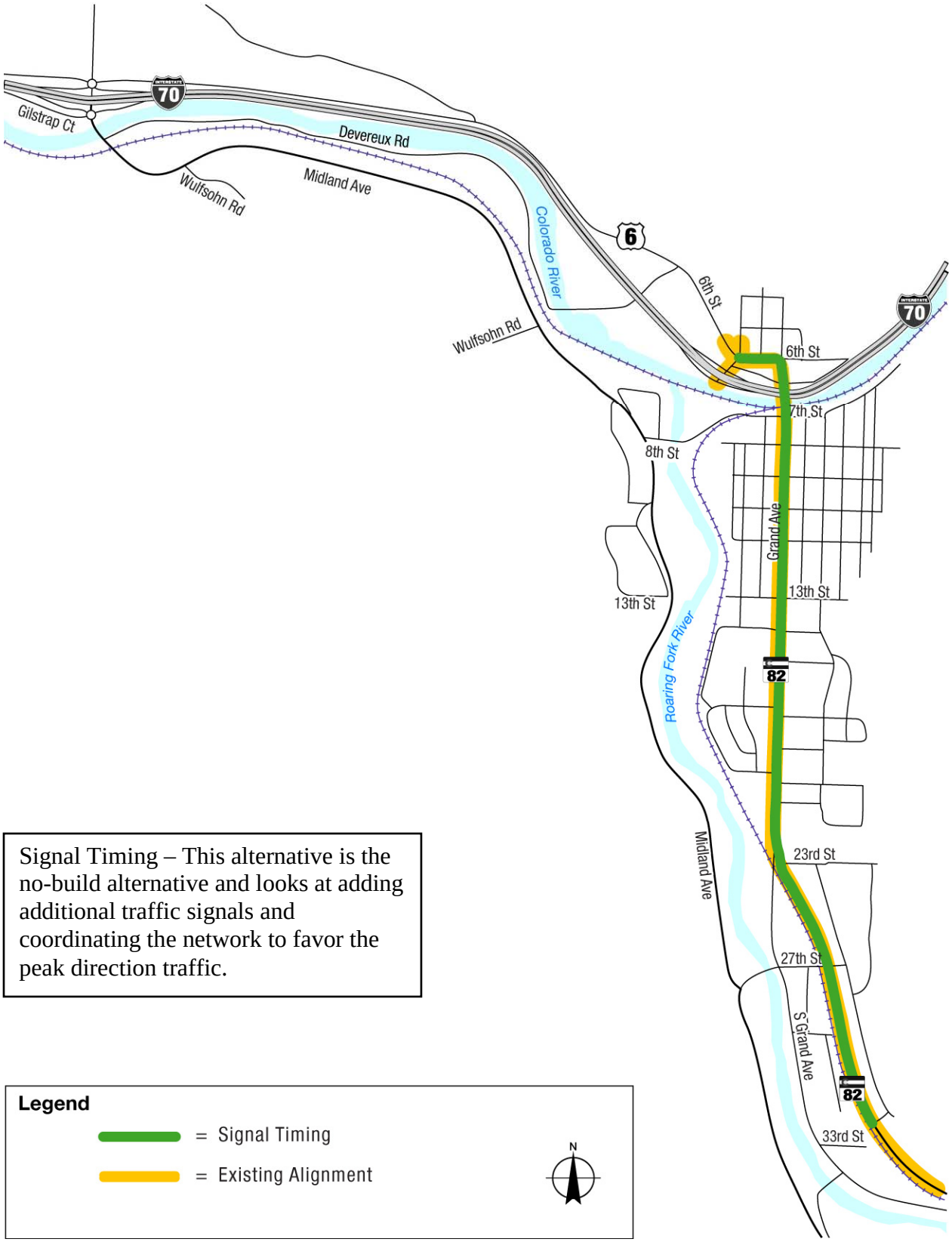
20. One-Way Couplet (Expanded Exit 116) – This alternative would utilize existing SH 82 and the East River corridor to create a one-way couplet for SH 82 traffic. It would require

an expanded I-70 Exit 116 Interchange to cross the Colorado River and the mainline of the Denver – Rio Grande Railroad to connect to the East River corridor. The one-way split of SH 82 would occur at 23rd Street. The alignment for this alternative is displayed in Figure 25.

21. One-Way Couplet (New Exit 116) – This alternative is similar to the One-Way Couplet (Expanded 116) Alternative, but instead of expanding I-70 Exit 116, the alternative would connect to I-70 at a new Devereux Road Interchange. The existing I-70 Exit 116 would be removed. The alignment for this alternative is displayed in Figure 26.

22. One-Way Couplet (Split Diamond) – This alternative would use the East River corridor and Midland Avenue as one-way couplets for SH 82 traffic. The southbound SH 82 traffic would exit I-70 at a new interchange at Devereux Road, cross the Colorado River and the mainline of the Denver – Rio Grande railroad, connect to Midland Avenue, and connect to existing SH 82 at 23rd Street. The northbound SH 82 traffic would use a flyover at 23rd Street to connect to the East River corridor, cross the Colorado River and the mainline of the railroad, and connect to an expanded Exit 116 where they would then access I-70. The alignment for this alternative is displayed in Figure 27.

Figure 7
Signal Timing



Signal Timing – This alternative is the no-build alternative and looks at adding additional traffic signals and coordinating the network to favor the peak direction traffic.

Figure 8
Limited Turns (One Ways)

Limited Turns (One Ways) – This alternative utilizes the existing SH 82 corridor but requires modifications to some east-west streets in downtown Glenwood Springs. The conversion of 8th, 9th, 10th, and 11th Streets to one-way pairs would limit the movements at the intersections of these streets with SH 82. This would allow for more green time to be designated to the north-south movement.

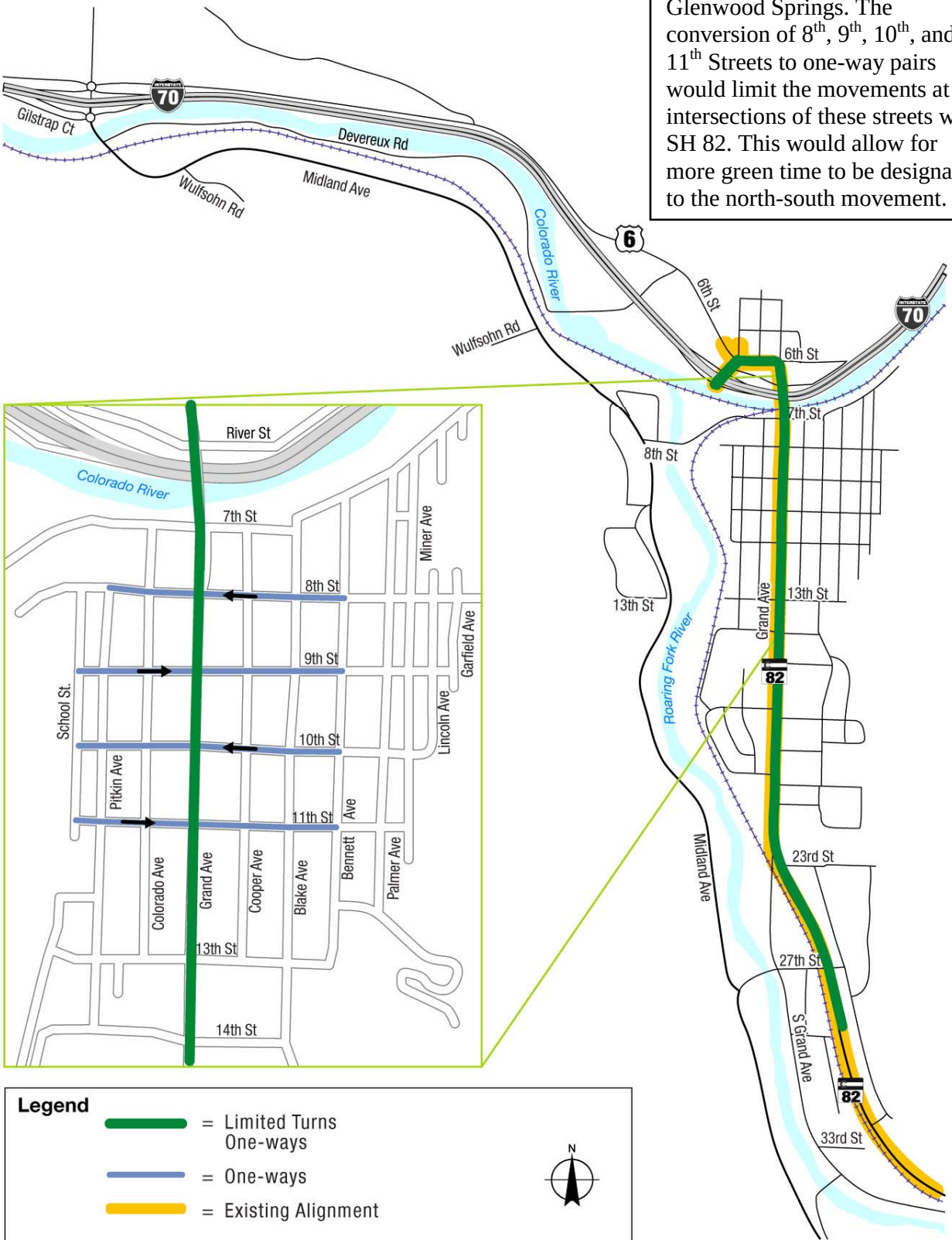


Figure 9
Limited Turns (Restricted Lefts)

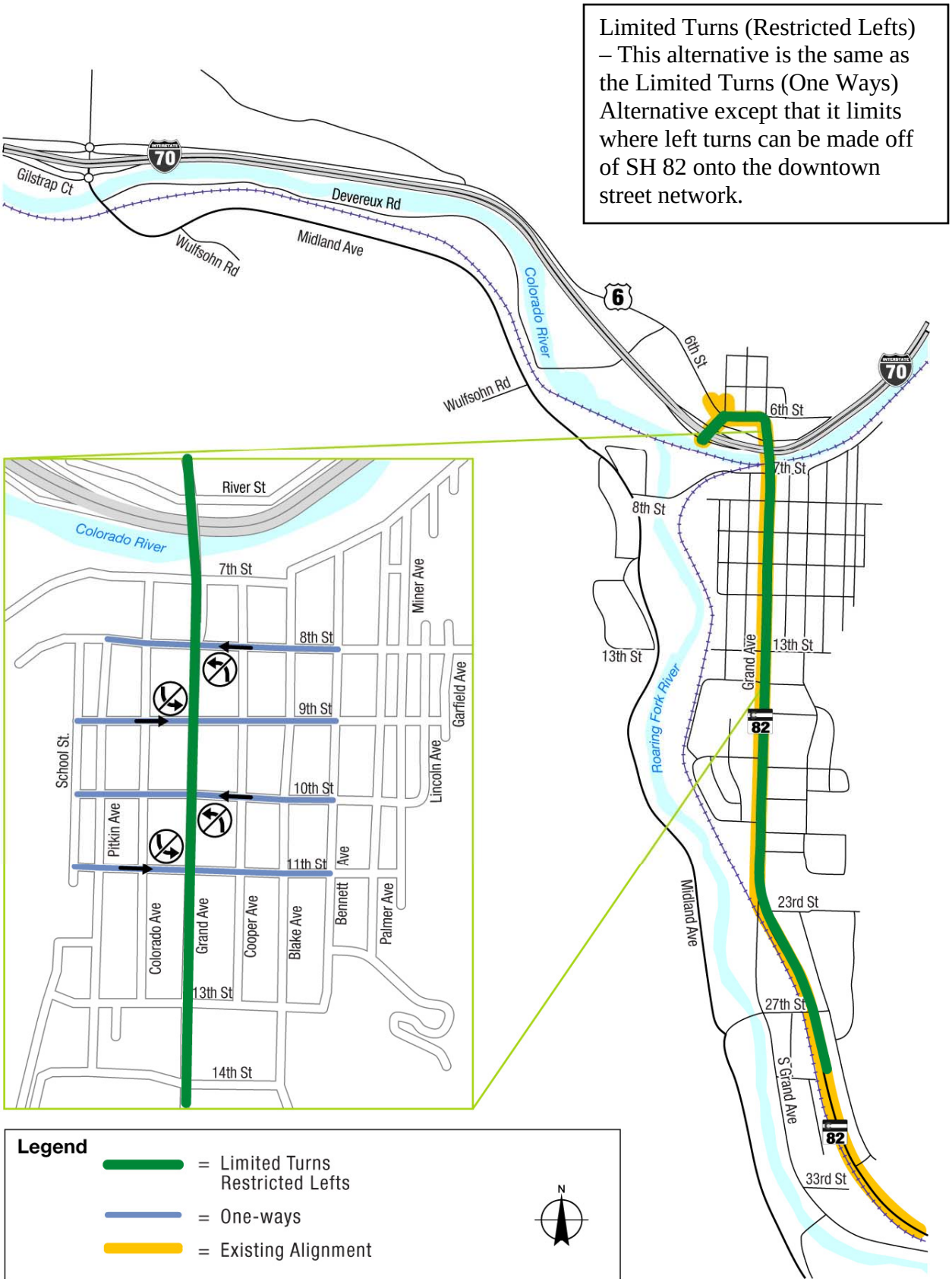


Figure 10
Limited Turns (Right-In, Right-Out)

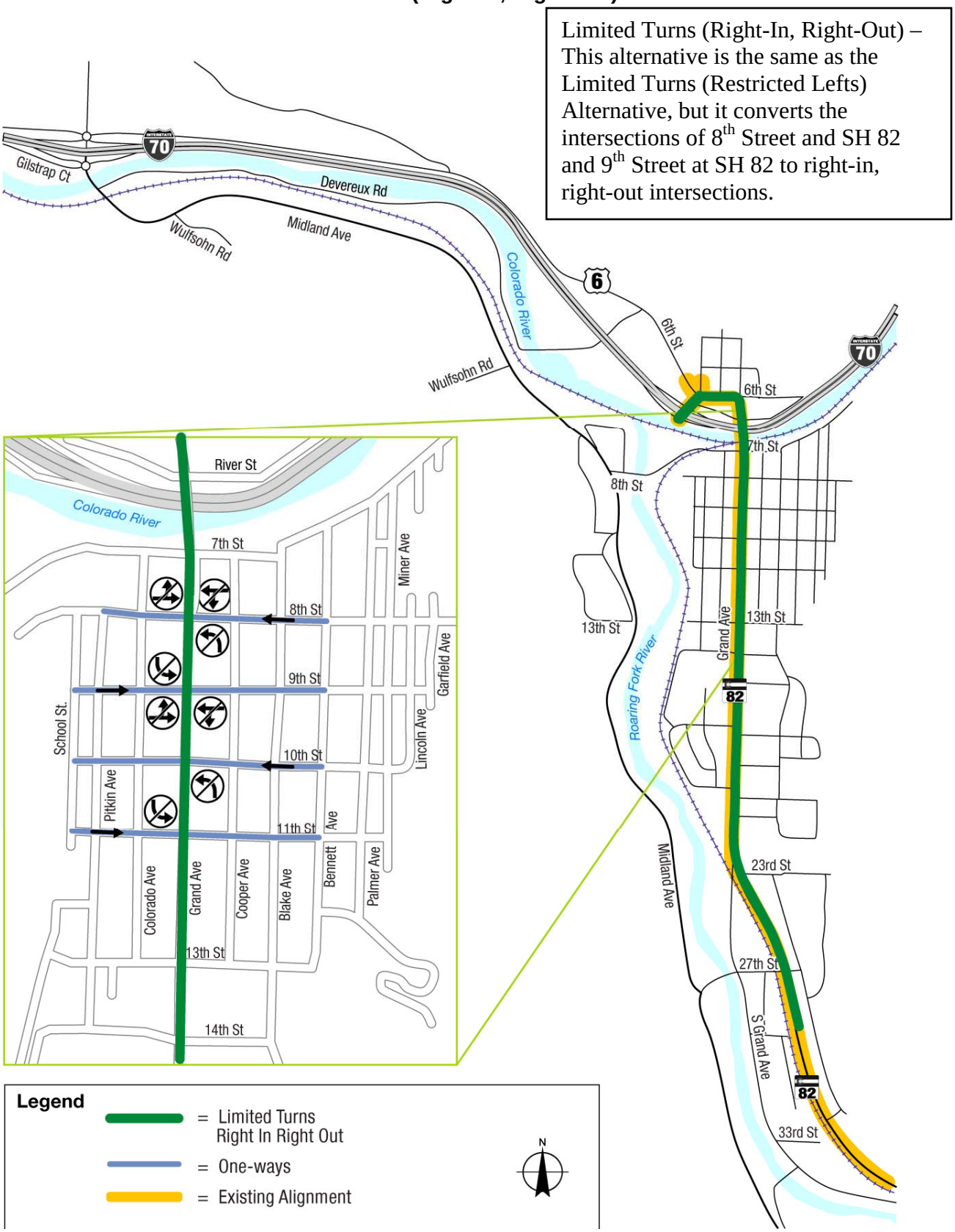
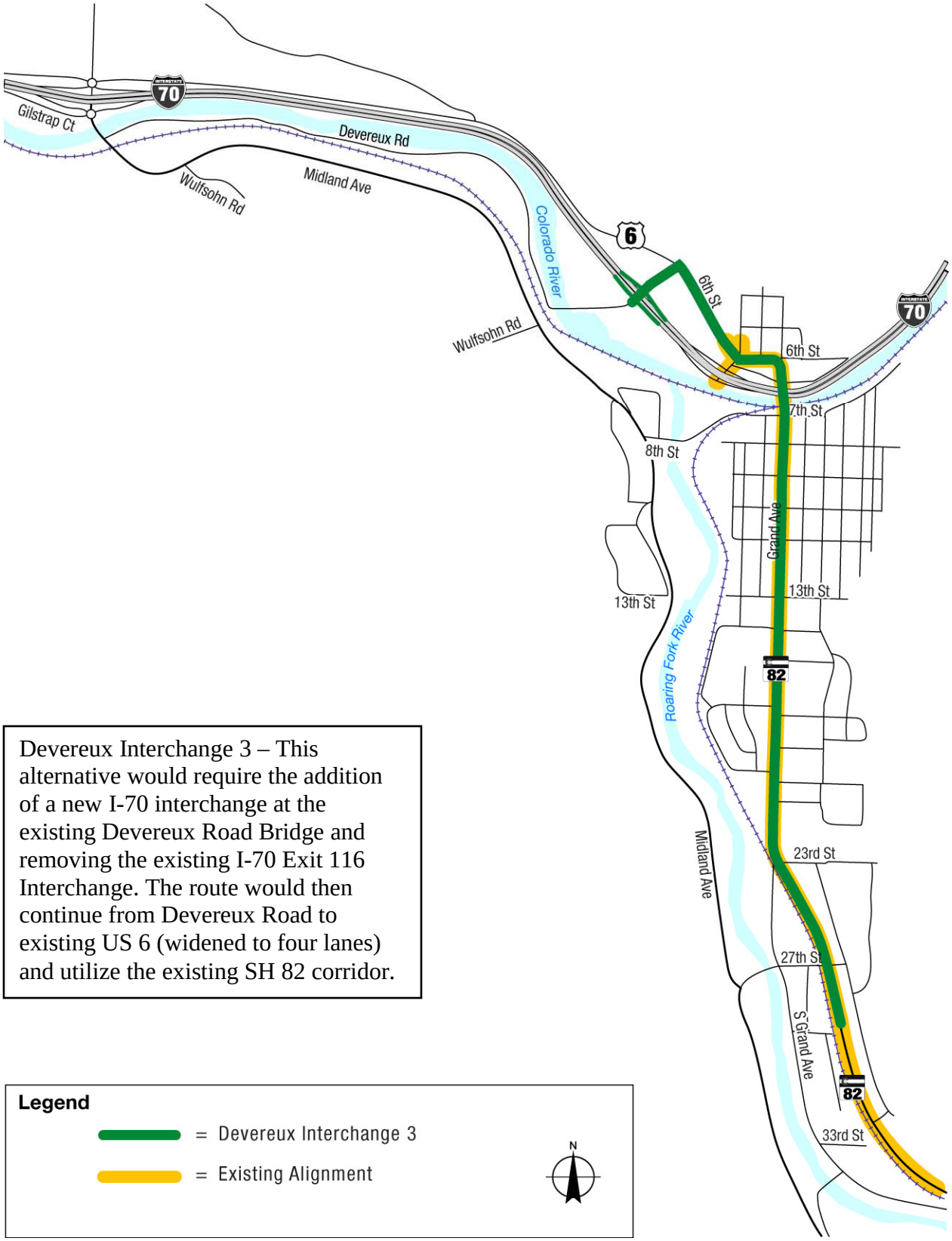
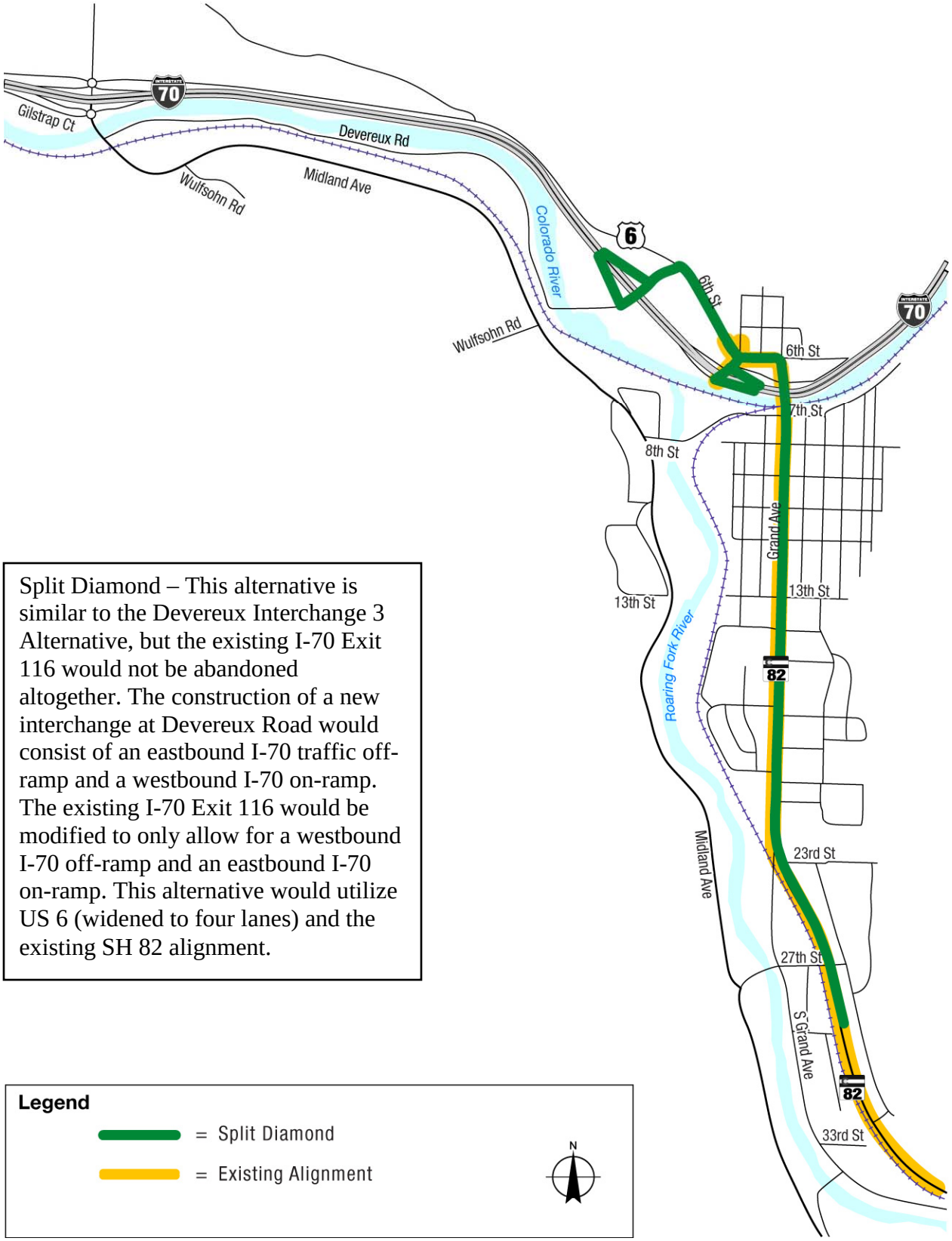


Figure 11
Devereux Interchange 3



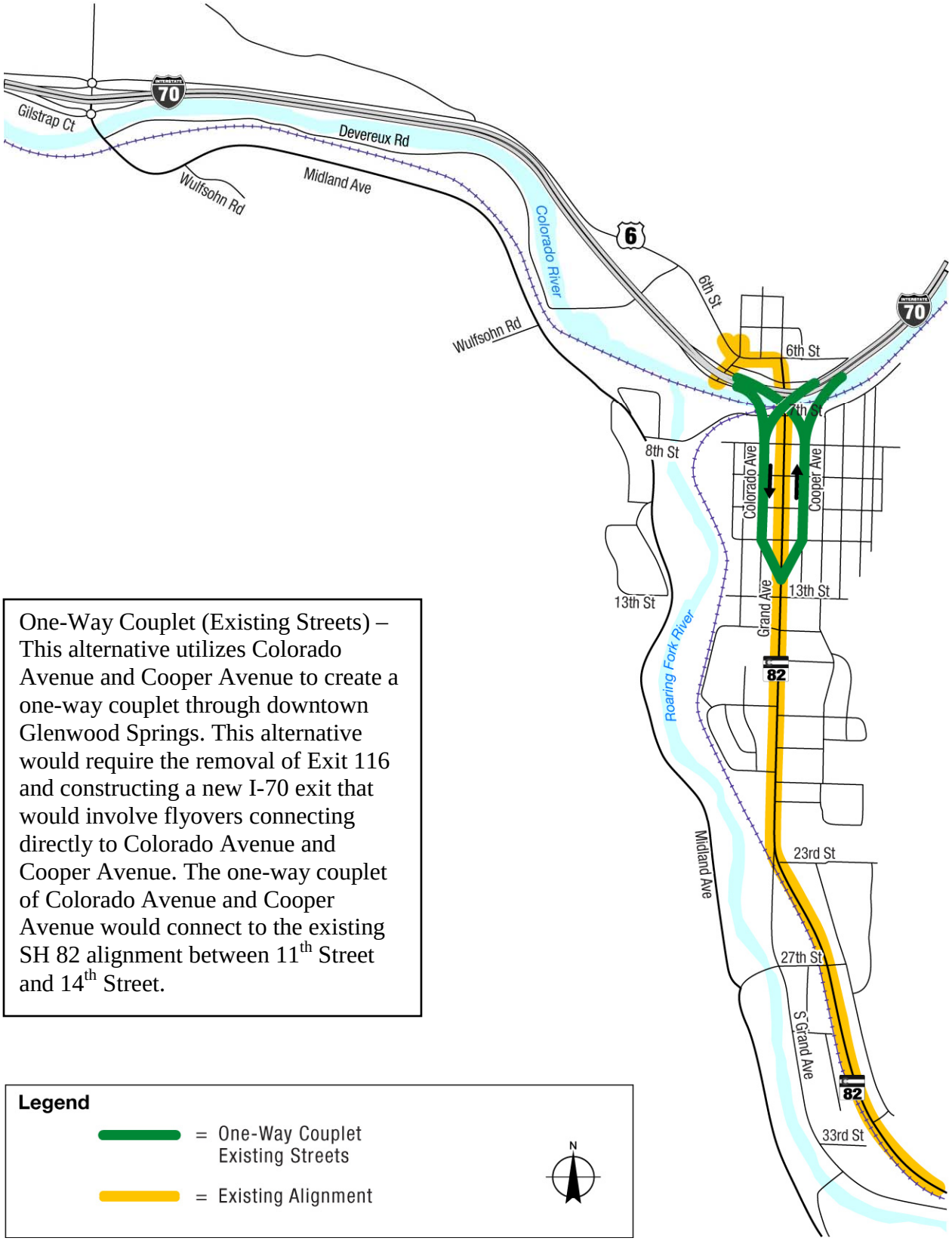
Devereux Interchange 3 – This alternative would require the addition of a new I-70 interchange at the existing Devereux Road Bridge and removing the existing I-70 Exit 116 Interchange. The route would then continue from Devereux Road to existing US 6 (widened to four lanes) and utilize the existing SH 82 corridor.

Figure 12
Split Diamond



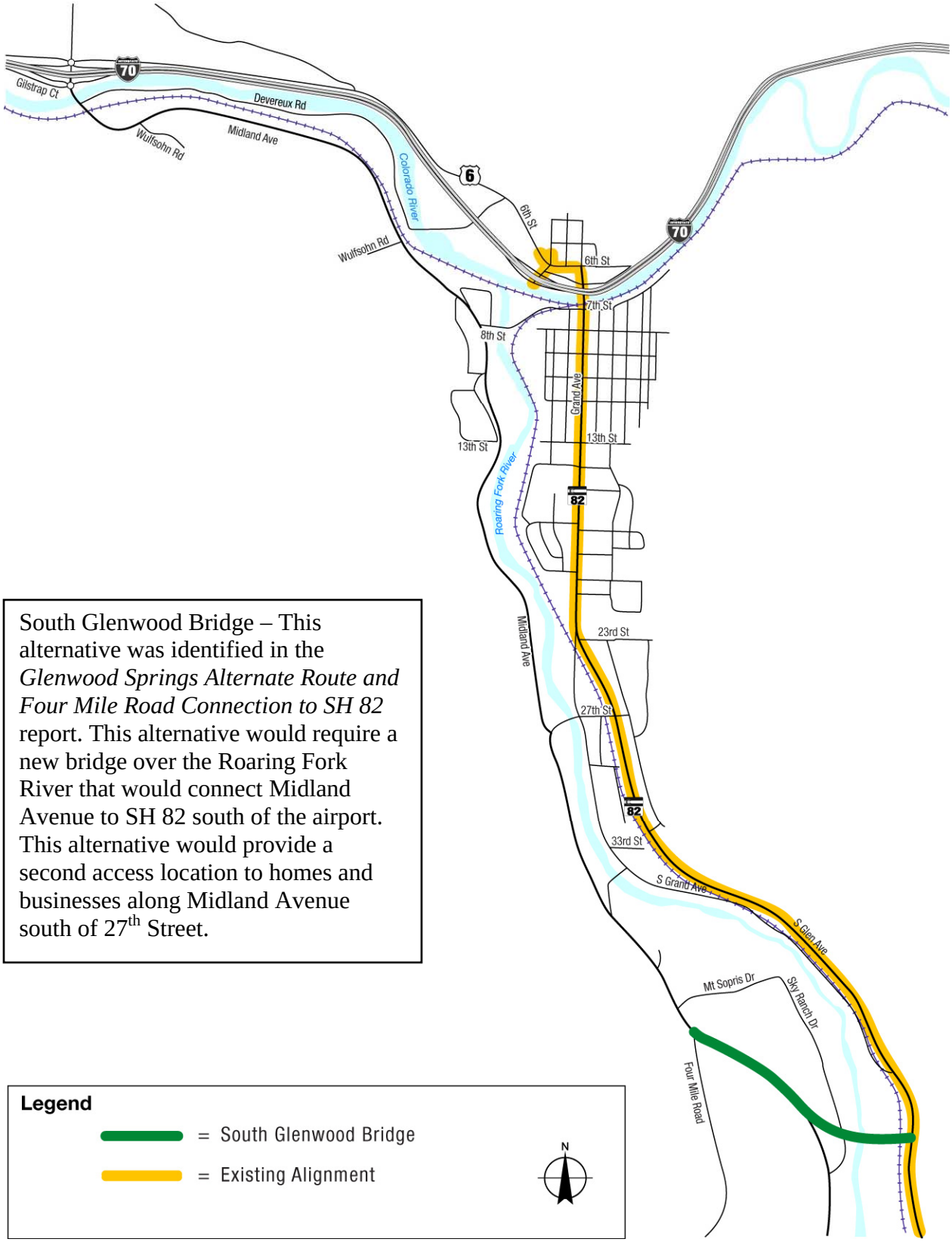
Split Diamond – This alternative is similar to the Devereux Interchange 3 Alternative, but the existing I-70 Exit 116 would not be abandoned altogether. The construction of a new interchange at Devereux Road would consist of an eastbound I-70 traffic off-ramp and a westbound I-70 on-ramp. The existing I-70 Exit 116 would be modified to only allow for a westbound I-70 off-ramp and an eastbound I-70 on-ramp. This alternative would utilize US 6 (widened to four lanes) and the existing SH 82 alignment.

Figure 13
One-Way Couplet (Existing Streets)



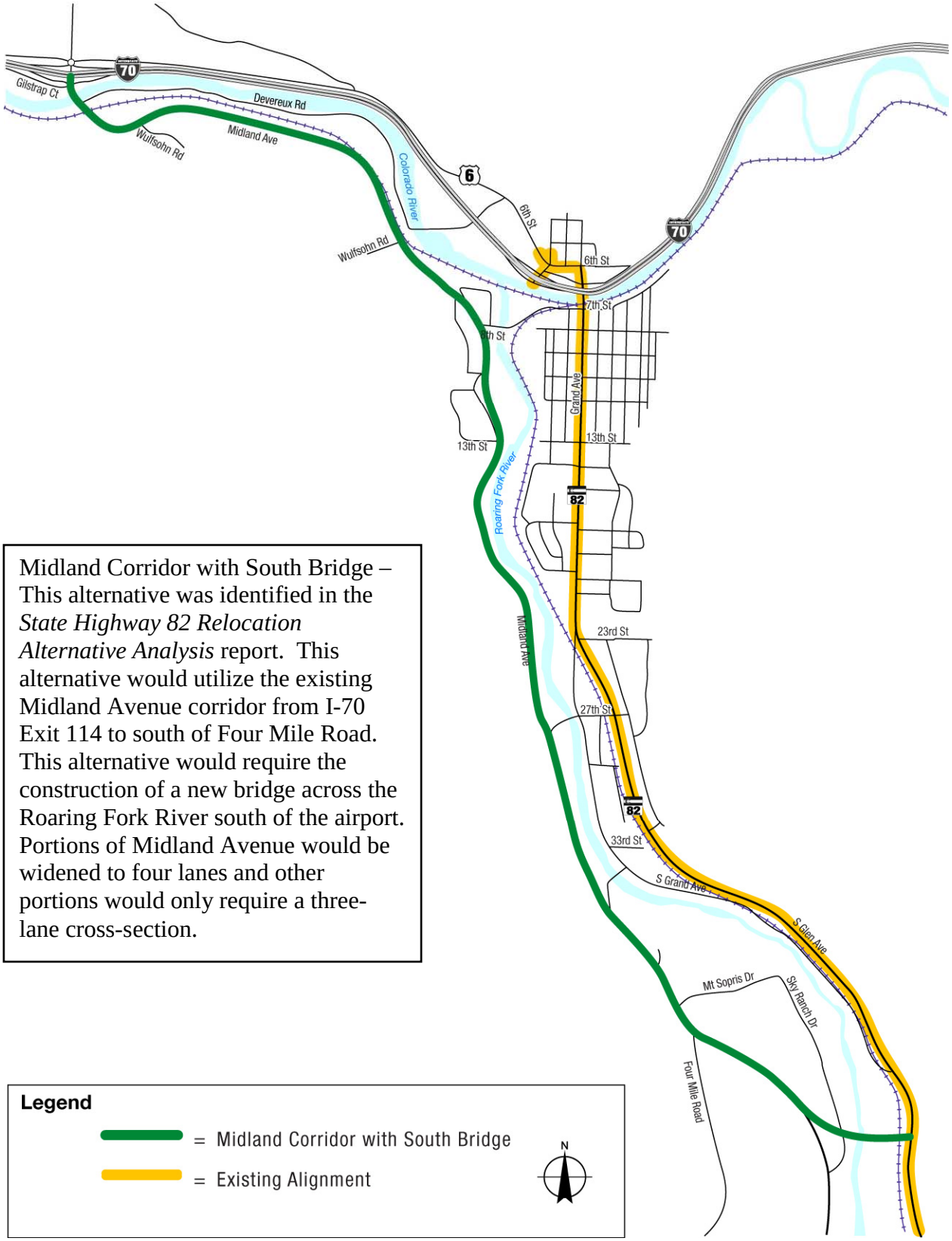
One-Way Couplet (Existing Streets) – This alternative utilizes Colorado Avenue and Cooper Avenue to create a one-way couplet through downtown Glenwood Springs. This alternative would require the removal of Exit 116 and constructing a new I-70 exit that would involve flyovers connecting directly to Colorado Avenue and Cooper Avenue. The one-way couplet of Colorado Avenue and Cooper Avenue would connect to the existing SH 82 alignment between 11th Street and 14th Street.

Figure 14
South Glenwood Bridge



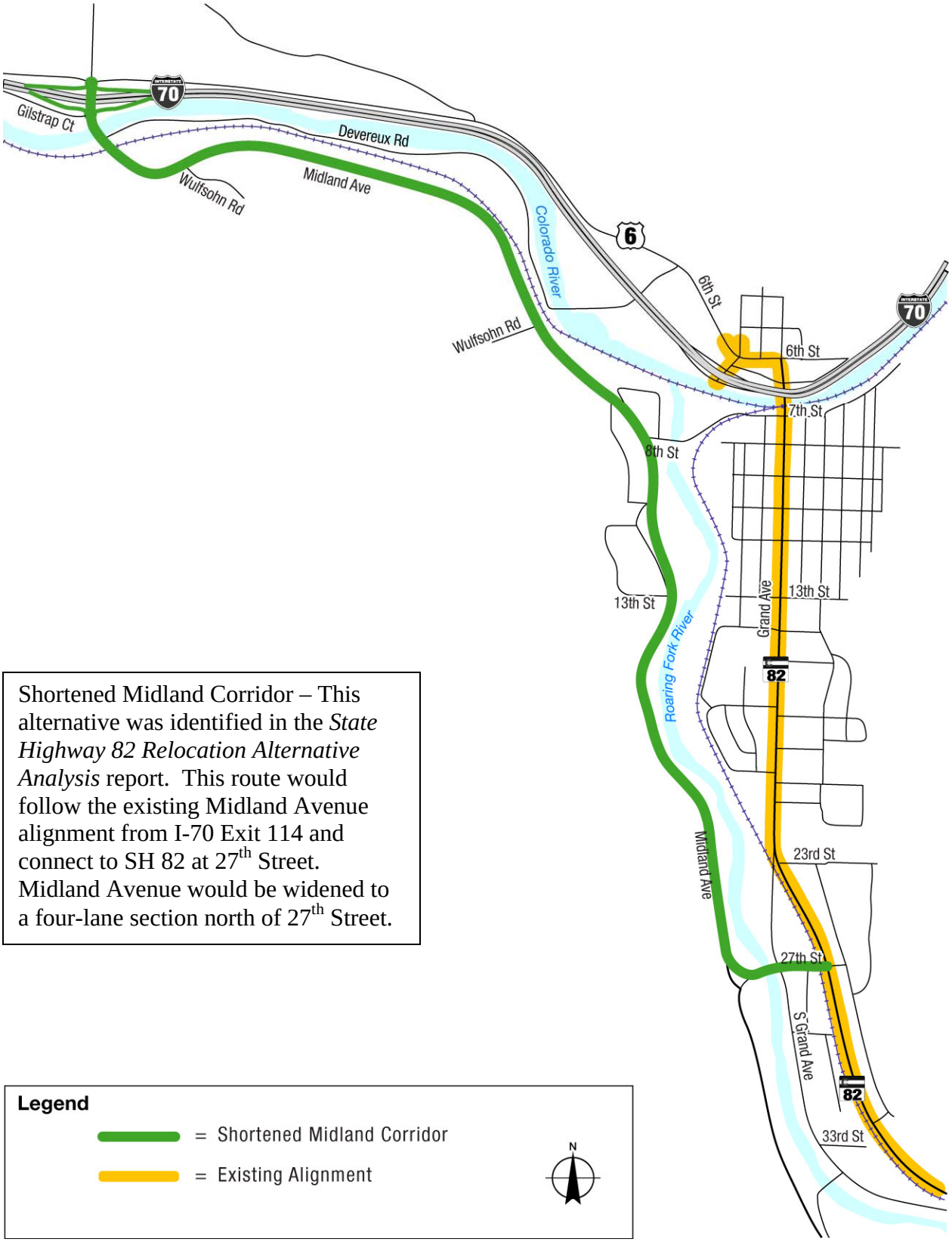
South Glenwood Bridge – This alternative was identified in the *Glenwood Springs Alternate Route and Four Mile Road Connection to SH 82* report. This alternative would require a new bridge over the Roaring Fork River that would connect Midland Avenue to SH 82 south of the airport. This alternative would provide a second access location to homes and businesses along Midland Avenue south of 27th Street.

Figure 15
Midland Corridor with South Bridge



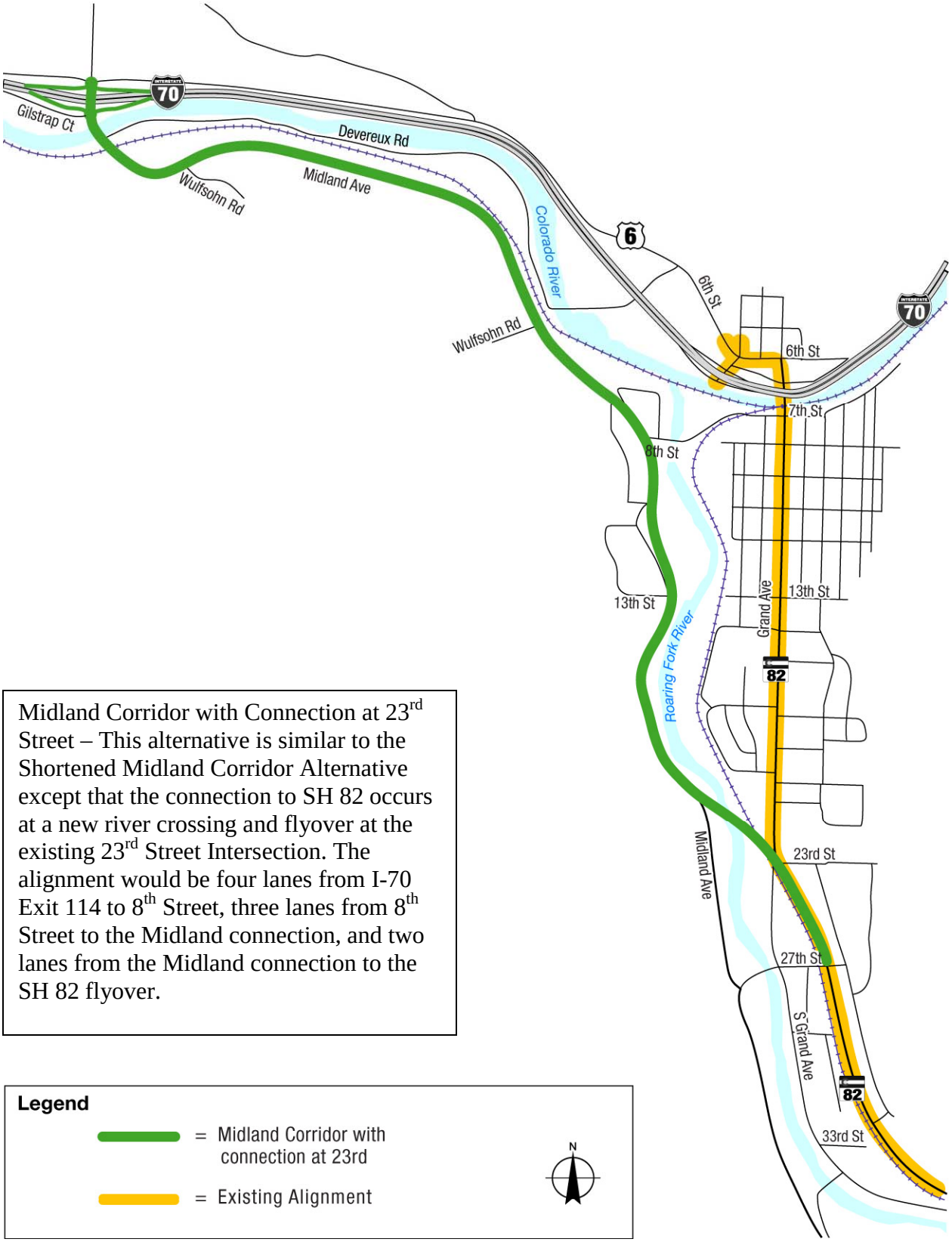
Midland Corridor with South Bridge – This alternative was identified in the *State Highway 82 Relocation Alternative Analysis* report. This alternative would utilize the existing Midland Avenue corridor from I-70 Exit 114 to south of Four Mile Road. This alternative would require the construction of a new bridge across the Roaring Fork River south of the airport. Portions of Midland Avenue would be widened to four lanes and other portions would only require a three-lane cross-section.

Figure 16
Shortened Midland Corridor



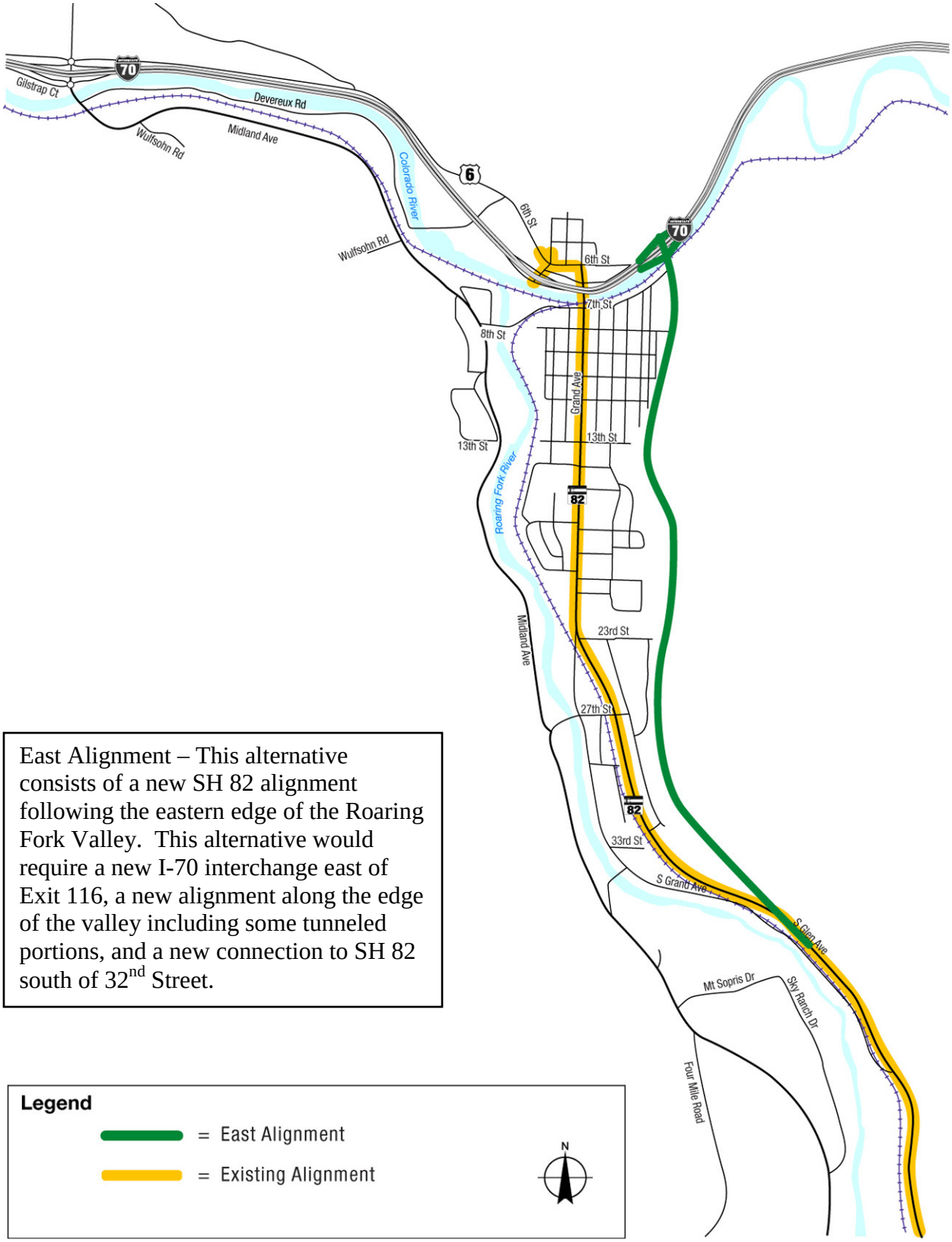
Shortened Midland Corridor – This alternative was identified in the *State Highway 82 Relocation Alternative Analysis* report. This route would follow the existing Midland Avenue alignment from I-70 Exit 114 and connect to SH 82 at 27th Street. Midland Avenue would be widened to a four-lane section north of 27th Street.

Figure 17
Midland Corridor with Connection at 23rd Street



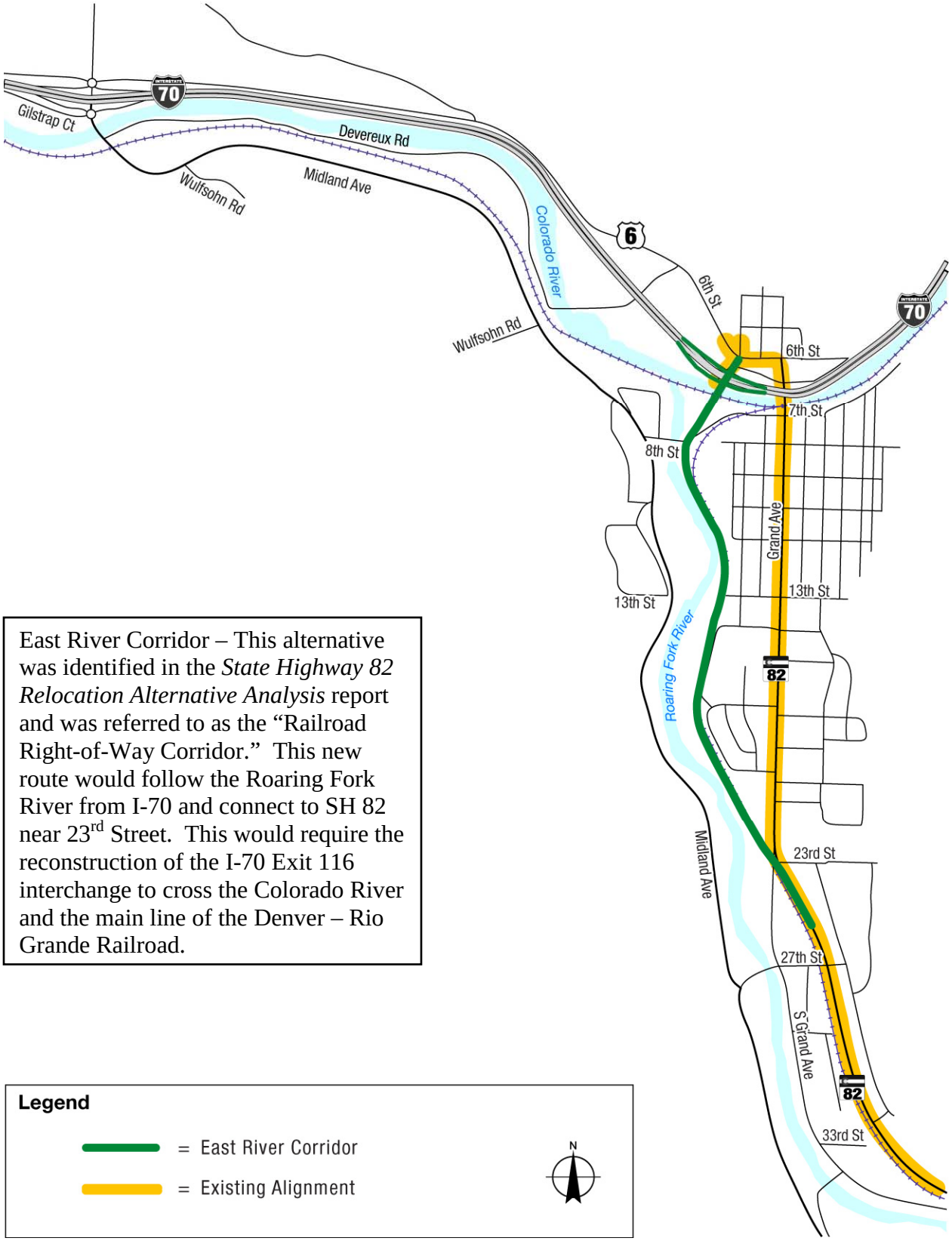
Midland Corridor with Connection at 23rd Street – This alternative is similar to the Shortened Midland Corridor Alternative except that the connection to SH 82 occurs at a new river crossing and flyover at the existing 23rd Street Intersection. The alignment would be four lanes from I-70 Exit 114 to 8th Street, three lanes from 8th Street to the Midland connection, and two lanes from the Midland connection to the SH 82 flyover.

Figure 18
East Alignment



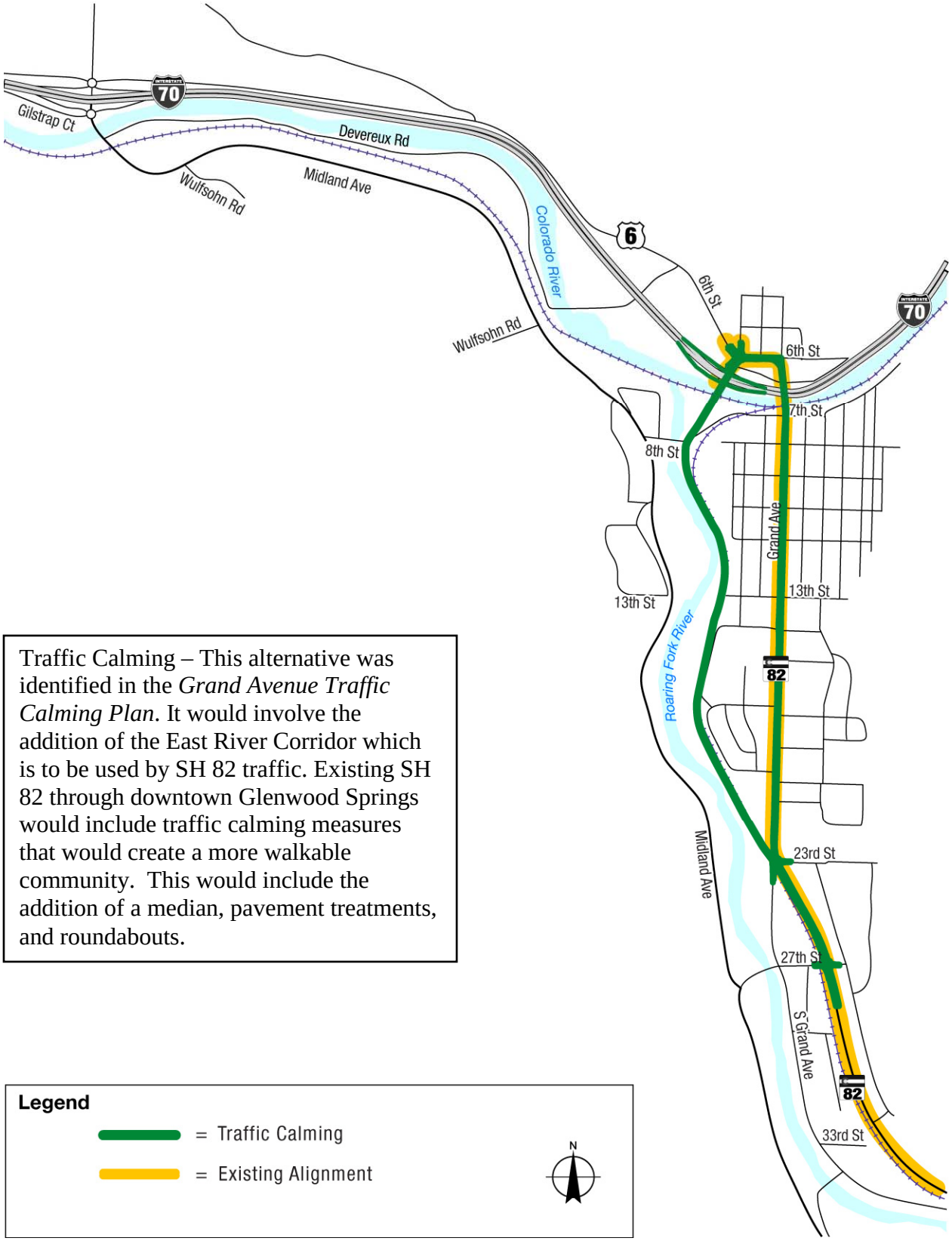
East Alignment – This alternative consists of a new SH 82 alignment following the eastern edge of the Roaring Fork Valley. This alternative would require a new I-70 interchange east of Exit 116, a new alignment along the edge of the valley including some tunneled portions, and a new connection to SH 82 south of 32nd Street.

Figure 19
East River Corridor



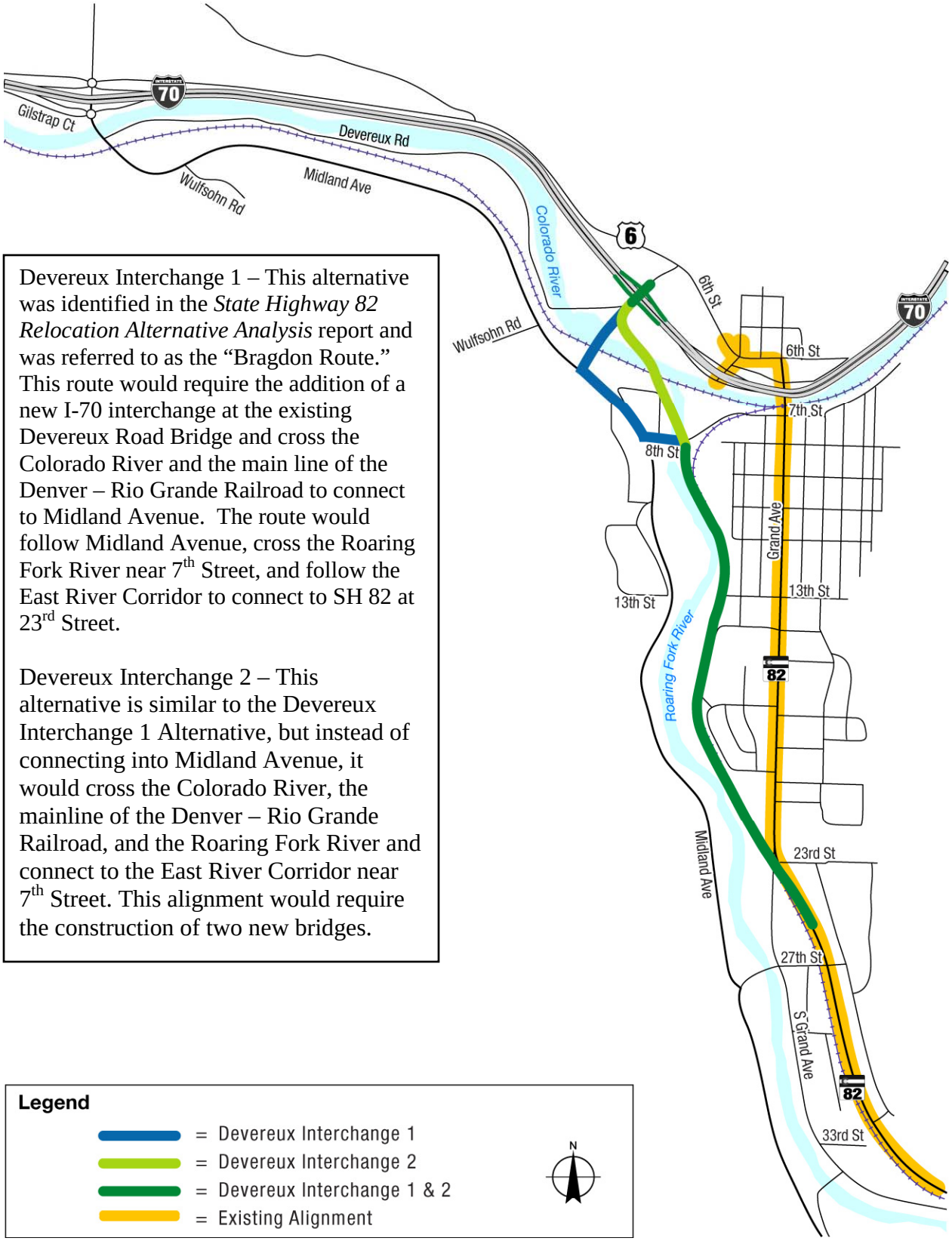
East River Corridor – This alternative was identified in the *State Highway 82 Relocation Alternative Analysis* report and was referred to as the "Railroad Right-of-Way Corridor." This new route would follow the Roaring Fork River from I-70 and connect to SH 82 near 23rd Street. This would require the reconstruction of the I-70 Exit 116 interchange to cross the Colorado River and the main line of the Denver – Rio Grande Railroad.

Figure 20
Traffic Calming



Traffic Calming – This alternative was identified in the *Grand Avenue Traffic Calming Plan*. It would involve the addition of the East River Corridor which is to be used by SH 82 traffic. Existing SH 82 through downtown Glenwood Springs would include traffic calming measures that would create a more walkable community. This would include the addition of a median, pavement treatments, and roundabouts.

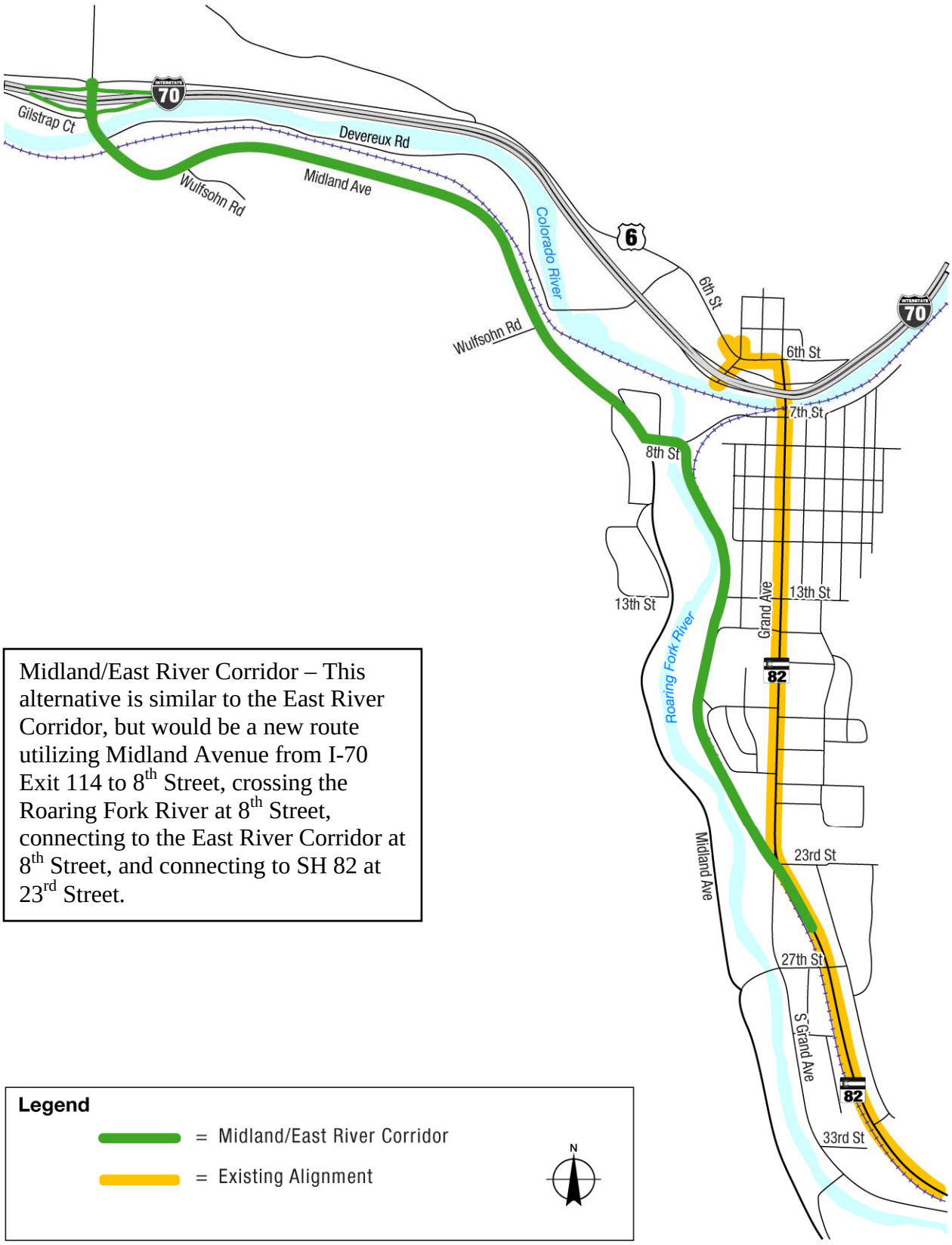
Figure 21
Devereux Interchange 1 and 2



Devereux Interchange 1 – This alternative was identified in the *State Highway 82 Relocation Alternative Analysis* report and was referred to as the "Bragdon Route." This route would require the addition of a new I-70 interchange at the existing Devereux Road Bridge and cross the Colorado River and the main line of the Denver – Rio Grande Railroad to connect to Midland Avenue. The route would follow Midland Avenue, cross the Roaring Fork River near 7th Street, and follow the East River Corridor to connect to SH 82 at 23rd Street.

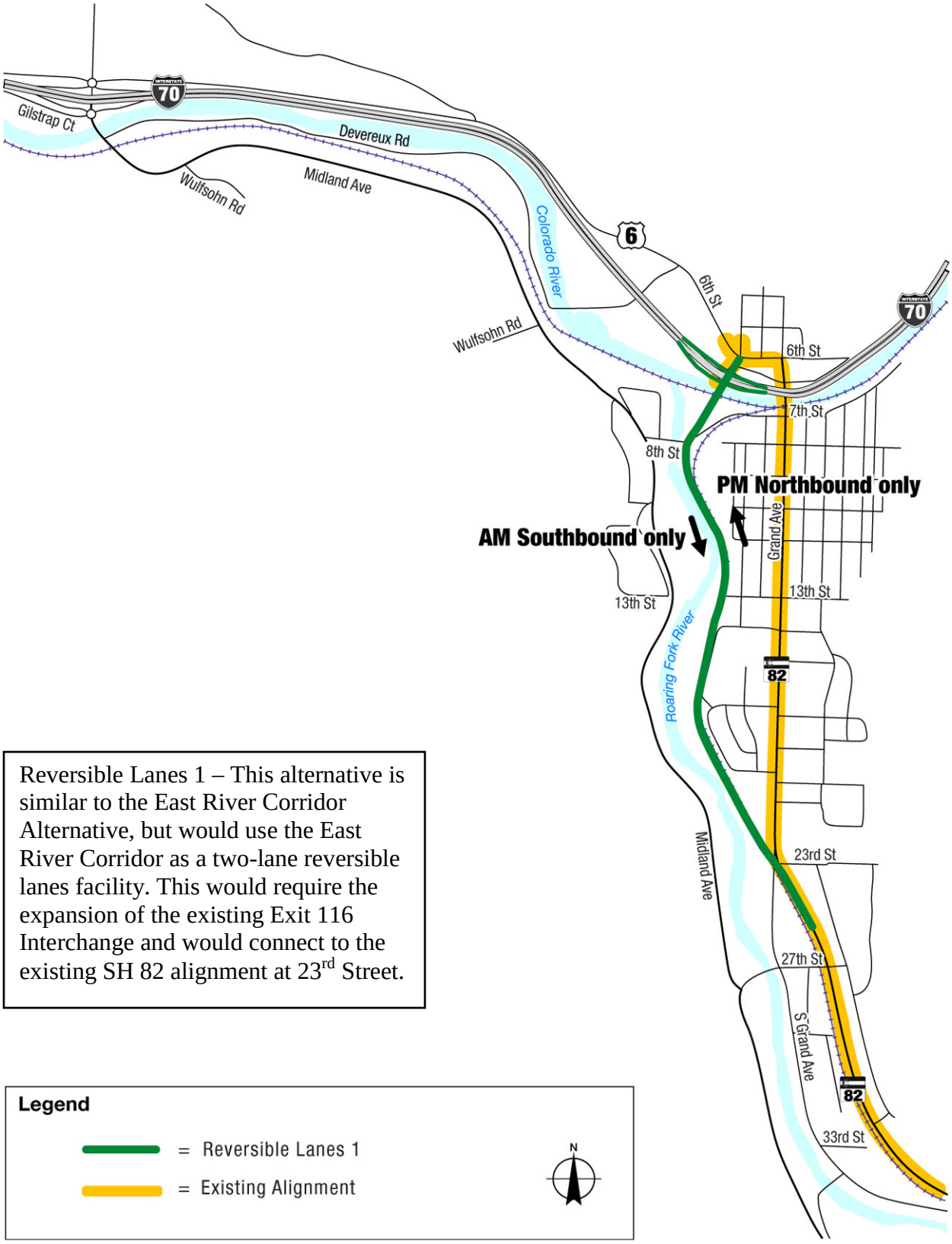
Devereux Interchange 2 – This alternative is similar to the Devereux Interchange 1 Alternative, but instead of connecting into Midland Avenue, it would cross the Colorado River, the mainline of the Denver – Rio Grande Railroad, and the Roaring Fork River and connect to the East River Corridor near 7th Street. This alignment would require the construction of two new bridges.

Figure 22
Midland/East River Corridor



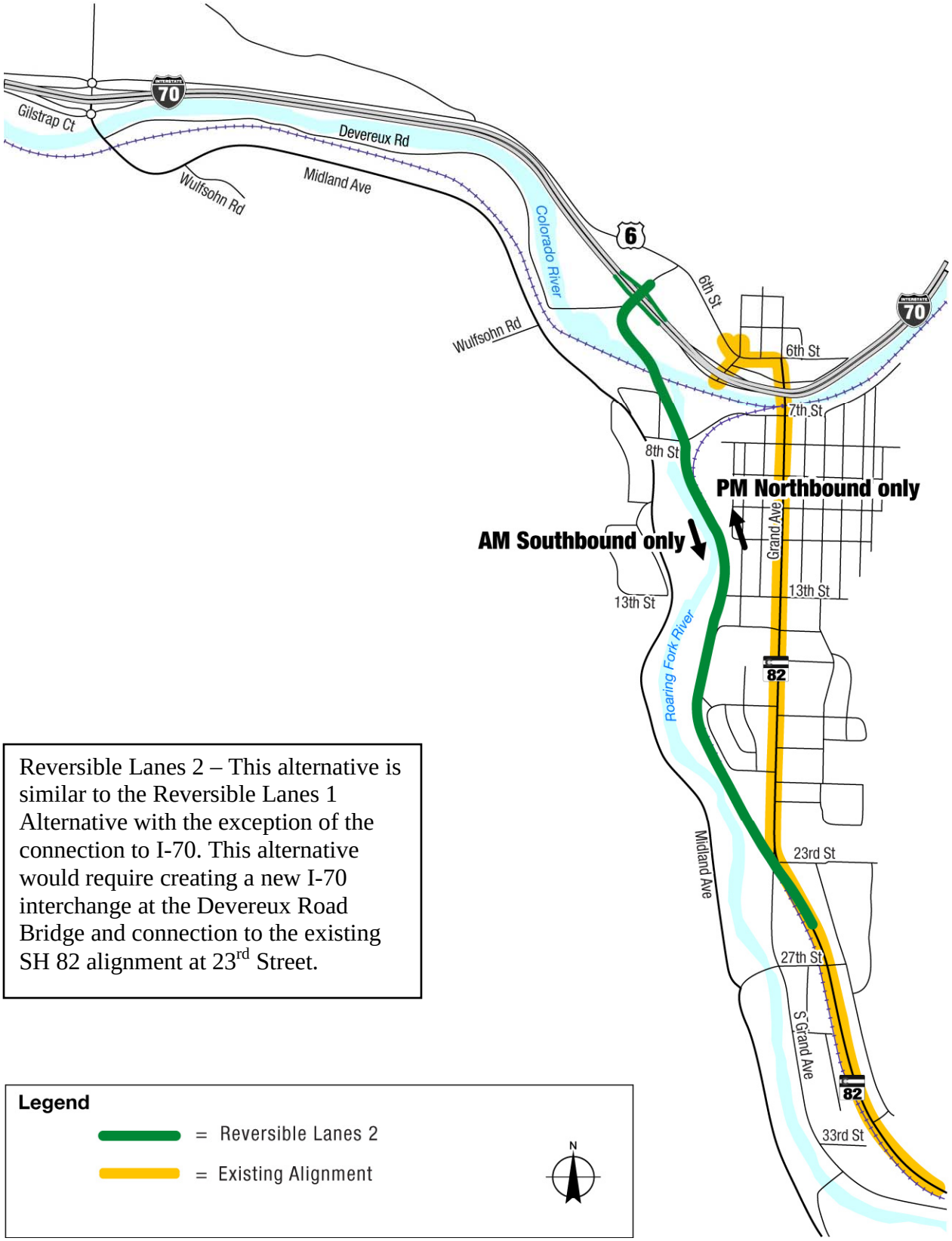
Midland/East River Corridor – This alternative is similar to the East River Corridor, but would be a new route utilizing Midland Avenue from I-70 Exit 114 to 8th Street, crossing the Roaring Fork River at 8th Street, connecting to the East River Corridor at 8th Street, and connecting to SH 82 at 23rd Street.

Figure 23
Reversible Lanes 1



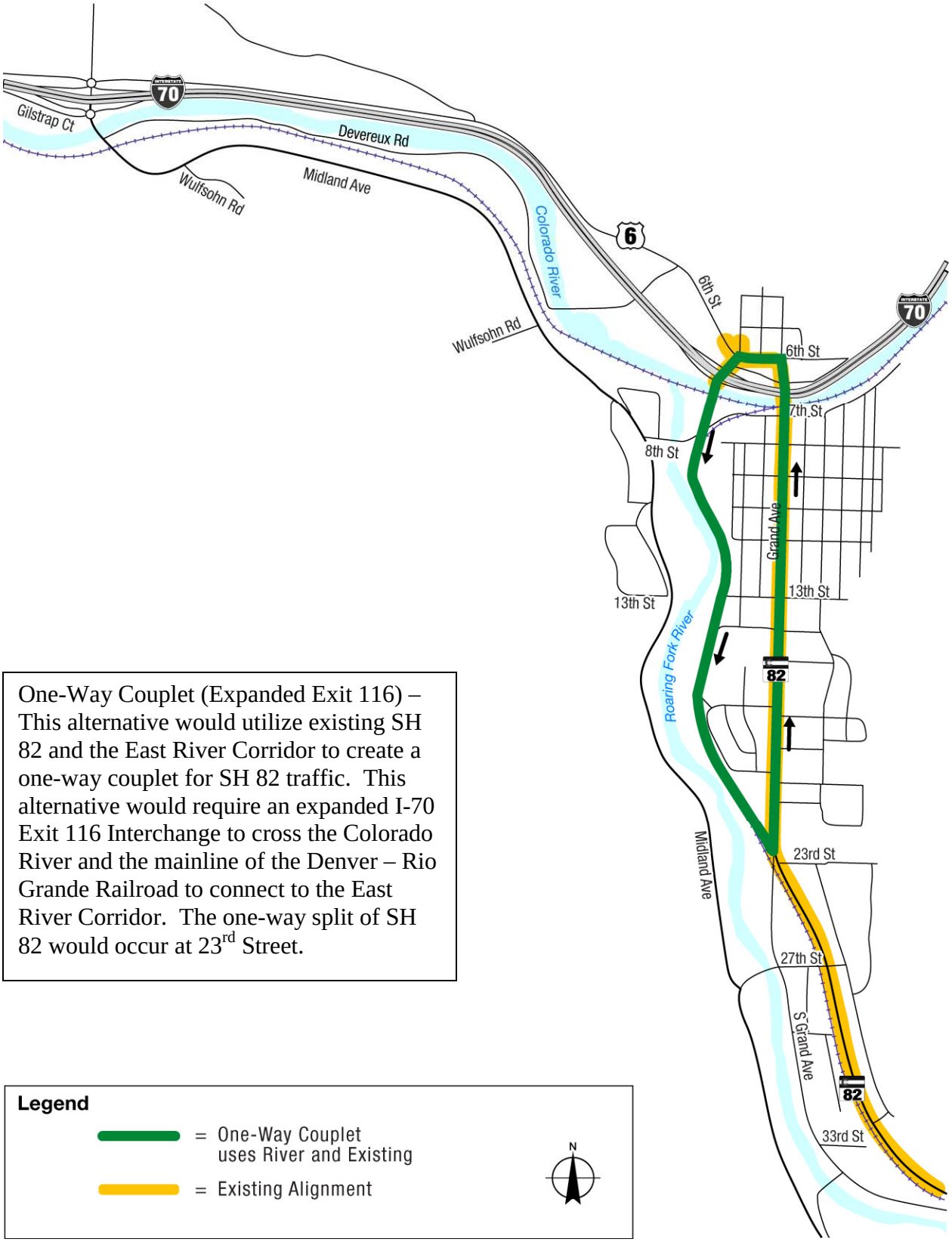
Reversible Lanes 1 – This alternative is similar to the East River Corridor Alternative, but would use the East River Corridor as a two-lane reversible lanes facility. This would require the expansion of the existing Exit 116 Interchange and would connect to the existing SH 82 alignment at 23rd Street.

Figure 24
Reversible Lanes 2



Reversible Lanes 2 – This alternative is similar to the Reversible Lanes 1 Alternative with the exception of the connection to I-70. This alternative would require creating a new I-70 interchange at the Devereux Road Bridge and connection to the existing SH 82 alignment at 23rd Street.

Figure 25
One-Way Couplet (Expanded Exit 116)

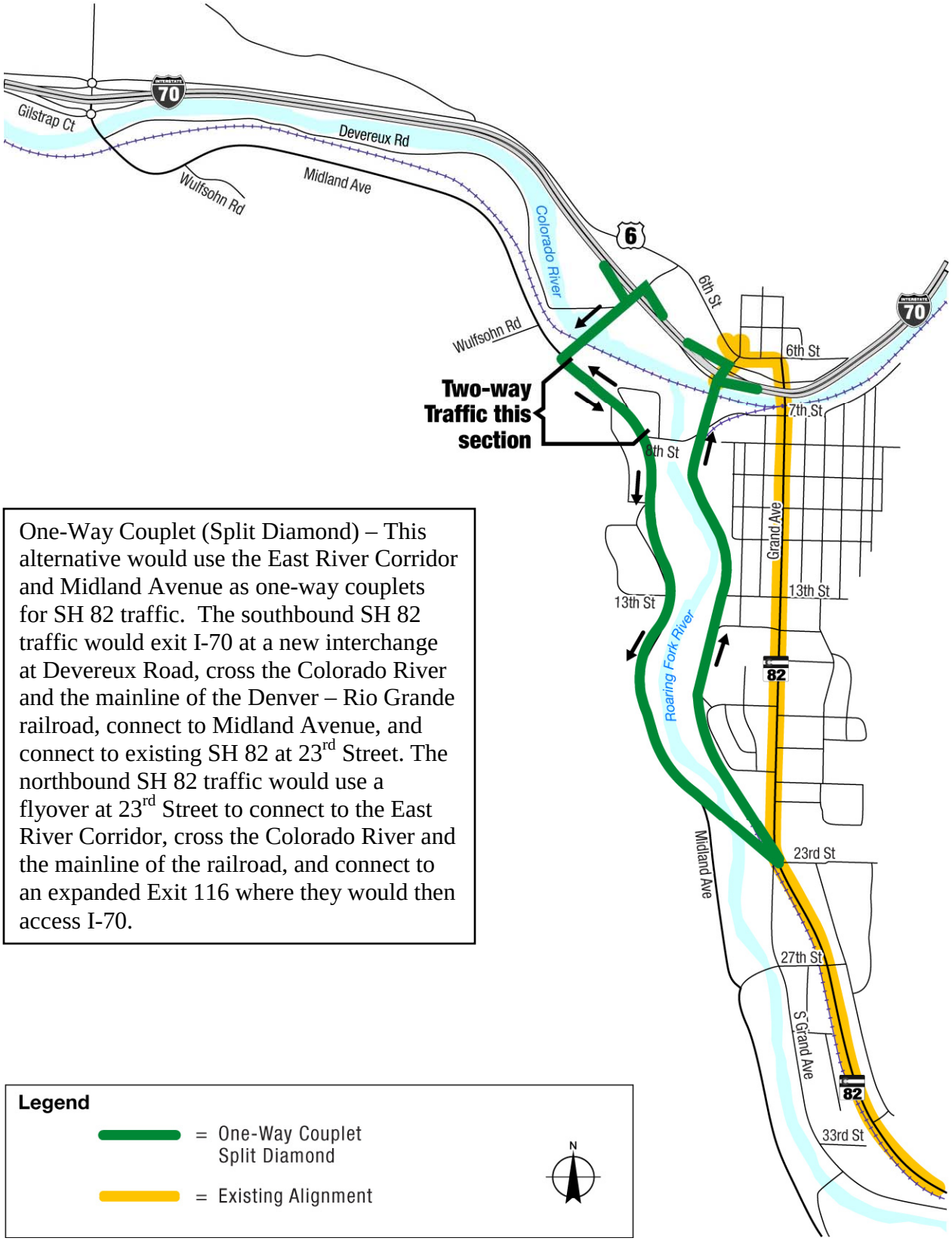


One-Way Couplet (Expanded Exit 116) – This alternative would utilize existing SH 82 and the East River Corridor to create a one-way couplet for SH 82 traffic. This alternative would require an expanded I-70 Exit 116 Interchange to cross the Colorado River and the mainline of the Denver – Rio Grande Railroad to connect to the East River Corridor. The one-way split of SH 82 would occur at 23rd Street.

Figure 26
One-Way Couplet (New Exit 116)

One-Way Couplet (New Exit 116) – This alternative is similar to the One-Way Couplet (Expanded 116) Alternative, but instead of expanding I-70 Exit 116, the alternative would connect to I-70 at a new Devereux Road Interchange. The existing I-70 Exit 116 would be removed.

Figure 27
One-Way Couplet (Split Diamond)



One-Way Couplet (Split Diamond) – This alternative would use the East River Corridor and Midland Avenue as one-way couplets for SH 82 traffic. The southbound SH 82 traffic would exit I-70 at a new interchange at Devereux Road, cross the Colorado River and the mainline of the Denver – Rio Grande railroad, connect to Midland Avenue, and connect to existing SH 82 at 23rd Street. The northbound SH 82 traffic would use a flyover at 23rd Street to connect to the East River Corridor, cross the Colorado River and the mainline of the railroad, and connect to an expanded Exit 116 where they would then access I-70.

5.0 ALTERNATIVES ANALYSIS

A total of 22 alternatives were identified as possible solutions for the SH 82 corridor. Each was then evaluated in order to identify the trade-offs for each alternative.

5.1 EVALUATION CRITERIA

Four goals were developed to support the problem statement presented in Section 3.1, Project Problem Statement. These goals are listed below:

- Mobility – Provide transportation solutions that meet local and regional mobility needs for 2030 and beyond.
- Environment – Provide transportation solutions that minimize impacts to the natural, cultural, and social environment of Glenwood Springs.
- Safety – Provide for the safe movement of people and goods.
- Cost – Provide a solution that is cost effective.

Objectives were developed that supported each of the goals. Both local and regional points of view were considered in the development of these objectives, and in some cases, separate local and regional objectives were created. The alternatives were evaluated to determine how well they met the objectives. Table 1 identifies the objectives and performance measures used to evaluate each alternative.

5.1.1 Provide Adequate Mobility

The mobility goal was to provide transportation solutions that meet local and regional mobility needs for the SH 82 corridor. Four objectives were identified to support this goal: providing adequate local and regional connectivity, minimizing vehicular congestion and delays, accommodating alternate modes of transportation, and providing adequate access. The data for these objectives can be found in Appendix D.

5.1.1.1 Provide Adequate Local and Regional Connectivity

The first mobility objective was to provide adequate local and regional connectivity. The regional objective specifies providing north/south connectivity between I-70 and the Roaring Fork Valley. This measure consisted of comparing the travel times of the regional route through Glenwood Springs from I-70 (Exit 114) to the end of the study area. In some alternatives, the regional route had a new alignment that differed from the existing SH 82 alignment. In those cases, the new regional alignment travel times were used to assess regional connectivity.

The local objective was to provide adequate north-south and east-west connectivity within Glenwood Springs and was measured by comparing the number of street approaches at all signals within the network that were at level of service (LOS) E or F. The LOS of street approaches indicates the ease of travel throughout the network. If there are more approaches with poor levels of service, it will be more difficult (take longer) to travel through the network.

5.1.1.2 Minimize Vehicular Congestion and Delays

The second mobility objective was to minimize vehicular congestion and delays. The regional performance measure is based on a comparison of the number of signalized intersections along

the primary route that have LOS E or F. The local performance measure is based on a comparison of the number of signalized intersections within Glenwood Springs at LOS E or F.

5.1.1.3 Accommodate Alternate Modes of Transportation

The next mobility objective was to accommodate alternate modes of transportation. The performance measure is to determine whether the alternative improves or degrades alternate modes of transportation. This is a qualitative measure, so the evaluation was based on discussions with the project team regarding opportunities for alternate modes of transportation.

5.1.1.4 Provide Adequate Access

The next mobility objective was to provide adequate access along SH 82 to and from businesses and residences. The objective was evaluated by determining the number of access points per mile for the proposed alternative. In terms of mobility, the fewer access locations per mile, the better traffic will flow because of the decrease in friction caused by more access locations. However, it is important to balance the desire to decrease the number of access points with the access needs of businesses and residences. Residents and business patrons should not have any significant out of direction travel when trying to reach their destinations.

5.1.2 Minimize Environmental Impacts

The environmental goal is to provide transportation solutions that minimize impacts to the natural, cultural, and social environment of the surrounding communities. There are seven objectives that support the environmental goal: minimize noise impacts to the built environment, minimize ROW impacts, ensure compatibility with transportation plans, ensure conformity to air quality standards, minimize impacts to critical water sources, provide facilities to accommodate cyclists and pedestrians, and ensure community cohesiveness. The data for these objectives can be found in Appendix E.

5.1.2.1 Minimize Noise Impacts

The first environmental objective was to minimize noise impacts to the built environment. This objective was evaluated by comparing the number of receptors that exceed the threshold for CDOT noise criteria in the year 2030. The Federal Highway Administration's (FHWA) Traffic Noise Model, Version 2.5 (TNM 2.5) was used to determine basic contours. The contours do not consider any shielding of noise provided by structures or topographic features between the receptor and the roadway. Additionally, the noise contours do not account for traffic noise from roadways other than the proposed alignment for each alternative, and is therefore not applicable near the interchanges.

5.1.2.2 Minimize Right-of-Way Impacts

Another environmental objective was to minimize ROW impacts to existing properties. This was evaluated by counting the number of potentially affected properties. Since there was not a design component for each alternative, it could not be determined what side of the existing alignment would be used to accommodate any potential widening. Therefore, when counting the number of potentially affected properties, properties on both sides of the road were included.

5.1.2.3 Compatibility with Transportation Plans

The next objective was to ensure that each alternative was compatible with local and regional transportation plans. The following transportation plans were used to determine whether or not each alternative was compatible: *Garfield County 2030 Transportation Strategies*, *City of Glenwood Springs, CO Long Range Transportation Plan 2003-2030*, *Roaring Fork Transportation Authority Corridor Investment Study*, and the *2030 Intermountain Regional Transportation Plan*.

5.1.2.4 Air Quality Standards

Another environmental objective was to ensure conformity with regional air quality standards. The performance measure for both the regional and local objective was to identify the total amount of emissions for the network. This was accomplished by running each alternative (for AM and PM peak periods) in SimTraffic and using the total network emissions output to assess relative performance.

5.1.2.5 Water Quality

Another objective was to minimize the impacts to critical water sources that degrade surface and ground water quality. The objective was measured by identifying the number of acres of new impervious surface area for each alternative because new impervious cover is likely to have the biggest impact on water quality, both locally and regionally.

5.1.2.6 Cyclist & Pedestrian Accommodation

The next environmental objective was to ensure that the alternative provides facilities to accommodate cyclists and pedestrians. The objective is to provide facilities and connections to sustain a cyclist and pedestrian friendly community. The performance measure for both the regional and local objectives is the same: determine whether the alternative improves or degrades cyclist and pedestrian facilities.

5.1.2.7 Community Cohesiveness

Another objective that was important to the City was to ensure community cohesiveness. This was measured by identifying whether or not the alternatives allow for pedestrian, cyclist, and motor vehicle circulation within Glenwood Springs. This objective is a qualitative measure and evaluations were determined by discussing each alternative with the project team. It was decided that the evaluations would be assigned by the location of the basic alignment. For example, any alternative using the existing alignment was given the worst evaluation because it splits the city in half. At the other end of the spectrum, any alternative using the River Corridor was evaluated better because it moves much of the traffic from the downtown area while still providing good connectivity for the rest of the city. Additionally, alternatives using alignments other than the existing alignment will provide opportunities for traffic calming along Grand Avenue through downtown.

5.1.3 Ensure Safety

The third goal was to provide for the safe movement of people and goods. Within this goal, three supporting objectives were developed: minimize traffic near pedestrian generators, minimize

impacts to recreational facilities, and optimize safety and minimize accidents across all modes. The data for these objectives can be found in Appendix F.

5.1.3.1 Minimize Traffic near Pedestrian Generators

The first safety objective was to minimize the amount of traffic near pedestrian generators. This objective was the same for both regional and local concerns. Local parks, schools, and other public facilities were located and the peak hour volumes were calculated near each of these pedestrian generators. These volumes were then weighted based on the amount of pedestrian traffic at each location. The relative total weighted volume of automobile traffic near the pedestrian areas was used to evaluate the alternatives.

5.1.3.2 Minimize Impacts to Recreational Facilities

The next safety objective was to minimize impacts to recreational facilities. The regional and local performance measure for this criterion was to measure the amount of traffic near recreational facilities such as parks and the downtown area. This measure also provides an indication of the amount of commercial truck traffic near these areas. A similar approach to that used for the previous criterion was applied to this measure. The recreational facilities were assigned a weight based on the amount of use each facility receives. That weight was applied to the peak hourly volumes passing by the location.

5.1.3.3 Optimize Safety and Minimize Accidents

The final safety objective was to optimize safety and minimize crashes across all modes. The total number of vehicles entering intersections within the network was used as the performance measure for both regional and local concerns. Theoretically, if there are fewer vehicles entering an intersection, there will be fewer crashes.

5.1.4 Cost Effectiveness

The fourth goal was to provide a cost-effective alternative. The three supporting objectives that were developed for this goal were to minimize implementation cost, minimize life-cycle cost, and evaluate the potential funding sources. The data for these objectives can be found in Appendix G.

5.1.4.1 Minimize Implementation Cost

The first objective was to minimize implementation cost. In order to evaluate the alternatives a construction cost was developed to allow the alignments to be compared to each other. The assumptions used to create the cost estimate for each item and unit costs were generalized and applied to each alignment. The construction costs were primarily based on new pavement area and alignment length. Also included are the structure costs which were based on conceptual profiles generated from City topographic data.

5.1.4.2 Minimize Life-Cycle Costs

The next objective was to minimize the alternatives based on life-cycle cost. In order to evaluate the alternatives a maintenance cost was developed to allow the alignments to be compared. The maintenance cost was primarily based on pavement area and alignment length. The tunnel cost and cut and cover costs were based on previous records at the Hanging Lake tunnel.

5.1.4.3 Potential Funding Sources

The final objective evaluated the number of potential funding sources for each alternative. The evaluation criteria were the same for both the regional and local assessment. To evaluate the alternatives, potential funding sources, such as local, state, or federal agencies, were identified. Alternatives with more potential funding sources evaluated better than alternatives with fewer potential funding sources.

5.2 EVALUATION TABLE

After evaluating each alternative, the results were tabulated and are displayed in Table 2. The individual evaluation criteria including charts displaying the results of each analysis can be found in Appendices D through G.

Table 1
Evaluation Criteria

Goals	Objectives		Performance Measures	
	Regional	Local	Regional	Local
Mobility: Provide transportation solutions that meet local and regional mobility needs for 2030 and beyond.	Provide adequate north/south connection between I-70 and the Roaring Fork Valley	Provide adequate north/south and east/west connection within Glenwood Springs	Travel time through Glenwood Springs from I-70 Exit 114 to the end of the study area	Number of street approaches (for signalized intersections) at LOS E or F
	Minimize congestion and delays (vehicular)	Minimize congestion and delays (vehicular)	Number of signalized intersections with LOS E or F (along Grand Avenue or other primary route)	Number of intersections (within Glenwood) at LOS E or F
	Accommodate alternate modes of transportation	Accommodate alternate modes of transportation	Improves/degrades alternate modes of transportation	Improves/degrades alternate modes of transportation
	Provide adequate access to SH 82	Provide adequate access to local businesses and residences	Number of access points per mile	Number of access points per mile
Environment: Provide transportation solutions that minimize impacts to the natural, cultural, and social environment of Glenwood Springs.	Minimize noise impacts to the built environment	Minimize noise impacts to the built environment	Number of receptors that exceed the threshold in the year 2030	Number of receptors that exceed the threshold in the year 2030
	Minimize ROW impacts to property	Minimize ROW impacts to property	Number of potentially affected adjacent residential and commercial properties	Number of potentially affected adjacent residential and commercial properties
	Compatibility of transportation solution with regional transportation plans	Compatibility of transportation solution with local land use, TDM, and transportation plans	Does the alternative support transportation solutions that are compatible with regional (CDOT, Roaring Fork Transportation Authority, Garfield County) transportation plans	Does the alternative support land use patterns and transportation solutions that are compatible with local (City) land use patterns, traffic demand model, and transportation plans
	Ensure conformity with regional air quality standards	Ensure conformity with local air quality standards	Total amount of network emissions (from SimTraffic model)	Total amount of network emissions (from SimTraffic model)
	Minimize impacts to surface and ground water quality	Minimize impacts to surface and ground water quality	Acres of impervious surface area added	Acres of impervious surface area added
	Provide facilities to accommodate cyclists and pedestrians	Provide facilities and connections to sustain a bike/pedestrian friendly community	Does the alternative improve/degrade cyclist and pedestrian facilities	Does the alternative improve/degrade cyclist and pedestrian facilities
	Ensure community cohesiveness	Ensure community cohesiveness	Does the alternative allow for pedestrian, cyclist, and motorist circulation within Glenwood Springs	Does the alternative allow for pedestrian, cyclist, and motorist circulation within Glenwood Springs
Safety: Provide for the safe movement of people and goods.	Minimize the amount of traffic near pedestrian generators	Minimize the amount of traffic near pedestrian generators	Weighted traffic volume near schools, parks, etc.	Weighted traffic volume near schools, parks, etc.
	Minimize the impacts to recreational facilities	Minimize the impacts to recreational facilities	Weighted traffic volume near recreational facilities	Weighted traffic volume near recreational facilities
	Optimize safety and minimize accidents across all modes	Optimize safety and minimize accidents across all modes	Volumes of vehicles entering intersections	Volumes of vehicles entering intersections
Cost: Provide a solution that is cost effective.	Minimize implementation cost	Minimize implementation cost	Construction cost	Construction cost
	Minimize life-cycle cost	Minimize life-cycle cost	Maintenance cost/ease of maintenance	Maintenance cost/ease of maintenance
	Potential funding sources	Potential funding sources	Number of possible funding sources	Number of possible funding sources

Table 2
Master Evaluation Table

Alternative	Evaluation Criteria																			
	Regional Connectivity	Local Connectivity	Regional Congestion	Local Congestion	Alternate Modes of Transportation	Adequate Access	Noise Impacts	ROW Impacts	Compatibility with RTP	Air Quality Standards	Water Quality	Regional Impact to Ped/Bike	Local Impact to Ped/Bike	Community Cohesiveness	Traffic Near Pedestrians Generators	Traffic Near Recreational Facilities	Safety	Implementation Cost	Life-Cycle Cost	Funding Sources
Signal Timing	●	●	●	●	◑	●	◔	○	◕	◑	○	○	●	●	●	●	◕	○	○	◕
Limited Turns (One Ways)	●	●	◕	◕	◔	●	◔	○	◑	◔	○	○	●	●	●	●	◕	○	○	◕
Limited Turns (Restricted Lefts)	◕	●	●	◕	◔	●	◔	○	◑	◔	○	○	●	●	●	●	◕	○	○	◕
Limited Turns (Right-In, Right-Out)	●	●	●	●	◔	●	◔	○	◑	◔	○	○	●	●	●	●	◕	○	○	◕
Devereux Interchange 3	◑	●	◑	◑	◑	●	◑	◔	◕	◑	◔	○	●	●	◕	◑	●	○	◔	◕
Split Diamond	◑	●	◕	◕	◑	●	◔	◔	◕	◔	◔	○	●	●	◕	◕	●	○	◔	●
One Way Couplet (Existing Streets)	◔	◔	◑	◔	◑	●	◔	◔	◕	◔	◔	○	●	●	○	◔	●	○	◔	◔
South Glenwood Bridge	●	●	●	◕	◑	●	◔	○	◔	●	◔	○	○	●	●	●	●	○	◔	◔
Midland Corridor with South Bridge	◕	◔	○	○	◕	◑	●	●	◑	●	●	○	◑	●	◑	◕	◑	○	◑	◔
Shortened Midland Corridor	◑	◔	◔	○	◕	◑	●	◕	◑	◕	◕	○	◑	◕	◑	◕	◔	◔	◑	◔
Midland Corridor with Connection at 23rd	◕	◕	○	○	◕	◑	◕	◕	◑	◕	◕	○	◑	◕	◑	◕	◔	◔	◑	◔
East Alignment	○	◕	○	○	◔	○	◕	◔	◑	◕	●	○	○	○	◑	◕	○	●	●	◔
East River Corridor	○	◑	◔	○	◔	◔	◔	◑	◑	◔	◕	◕	◑	◔	◑	◕	○	◔	◑	◔
Traffic Calming	◑	◔	○	○	◔	◔	◔	◑	◔	◑	◑	◔	◔	◔	◑	◕	◑	○	◔	◔
Devereux Interchange 1	◔	◑	○	○	◑	◔	◑	◕	◑	◕	◕	◕	◑	◔	◔	◑	◑	◑	◑	◔
Devereux Interchange 2	○	◕	◔	○	◕	○	◔	◕	◑	◕	●	◕	◔	◔	◔	◑	◔	◕	◑	◔
Midland/East River Corridor	◑	◔	◑	○	◕	◔	◑	◕	◑	◑	●	◕	◑	◔	◑	◕	○	◔	◑	◔
Reversible Lanes 1	○	◑	◔	◔	◑	○	○	◑	◑	◑	◑	◕	◑	◔	◕	◕	◔	◔	◔	◔
Reversible Lanes 2	○	○	◔	○	◕	○	○	◕	◑	◕	◕	◕	◔	◔	◑	◑	◑	◑	◑	◔
One-Way Couplet (Expanded Exit 116)	◔	◑	○	○	◑	◕	◔	◑	◑	◔	◑	◕	●	◔	◔	◑	○	○	◔	◔
One-Way Couplet (New Exit 116)	◔	◑	○	○	◕	◕	◔	◕	◑	◑	◕	◕	●	◔	○	◔	○	◑	◑	◔
One Way Couplet (Split Diamond)	◔	◔	○	○	◕	◑	◕	◕	◕	◑	●	●	◑	●	◑	◑	◑	○	◑	◔

Evaluation System: Best – ○ *Worst* – ●

6.0 NEXT STEPS

The City, CDOT, and the County identified the need for improvements to SH 82 to properly accommodate regional travel demand and local mobility. The goal of the corridor optimization process is to identify an alternative that meets the regional and local mobility demands and balances safety, environmental, social, and economic factors. The COP is intended to ensure that the SH 82 corridor will adequately serve both regional and local transportation needs in the future. As described in Chapter 2, Corridor Optimization Process, this COS summarizes the second step of the corridor optimization process.

6.1 SH 82 CORRIDOR OPTIMIZATION PLAN

The goal of this study was to identify and evaluate potential alternatives to improve regional travel and local mobility for SH 82 through Glenwood Springs. This study does not recommend preferred alternatives, but provides the information necessary to compare alternatives to each other. This study and the SH 82 CCA before it have defined the existing and projected future regional and local transportation demands of SH 82 through the City and identified potential alternatives to accommodate the transportation demand. The next study, the COP, will further evaluate the alternatives preferred by the corridor stakeholders. The COP will also assess public opinion regarding the preferred alternatives. Finally, the alternatives that are selected in the COP will be evaluated through the NEPA process, ultimately resulting in a selected alternative to address travel demand along the SH 82 corridor through the City.

7.0 BUSINESS PLAN

In order to implement the corridor optimization plan, several agencies will need to work together, and various funding sources will need to be utilized. The purpose of the business plan is to identify the key agencies responsible for implementing improvements and potential sources to fund the improvements.

This document identified and analyzed 22 alternatives for SH 82. The purpose of this document was not to select a specific solution for the corridor; therefore, the business plan component looks at all of the identified alternatives. As a result, the business plan included in this document takes a broad view of the alternatives to identify likely lead agencies and funding sources. During the COP, the business plan will be further refined to more specifically identify lead agencies and funding sources based on the preferred alternatives.

Table 3 outlines key components for each alternative identified in the SH 82 COS. Lead agencies and potential funding sources are included for each of the project components identified.

Table 3
Business Plan

Optimization Plan Element	Alternative(s) Including Element	Estimated Capital Cost (2007 $ in Millions)	Lead Agency(ies)	Potential Funding Sources
Widen Midland Avenue	• Shortened Midland Corridor • Midland Corridor with Connection at 23rd • Midland Corridor with South Bridge • Midland/East River Corridor	$45-60	City/County/CDOT	State, County, City, Development, Federal
Construct East River Corridor	• East River Corridor • Midland/East River Corridor • Devereux Interchange 1 • Devereux Interchange 2 • One-Way Couplet (Expanded Exit 116) • One-Way Couplet (New Exit 116) • Reversible Lanes 1 • Reversible Lanes 2 • Traffic Calming	$25-95	CDOT/City	State, Tolling, County, City, Federal
Construct East Alignment	• East Alignment	$600-$620	CDOT/City/County	State, Tolling, County, City, Federal
Construct new interchange at Devereux Road	• Devereux Interchange 1 • Devereux Interchange 2 • Devereux Interchange 3 • One-Way Couplet (New Exit 116) • One-Way Couplet (Split Diamond) • Reversible Lanes 2 • Split Diamond	$7-95	CDOT/City	State, County, City, Federal
Expand Existing Exit 116	• East River Corridor • One-Way Couplet (Expanded Exit 116) • Reversible Lanes 1 • Traffic Calming	$25-50	City/CDOT	State, County, City, Federal
Construct Bridge across Roaring Fork River	• South Glenwood Bridge • Midland Corridor with Connection at 23rd • Midland Corridor with South Bridge	$35-50	City/County/CDOT	State, County, City, Development, Federal
Construct Flyover at 23rd Street	• Midland Corridor with Connection at 23rd • East River Corridor • Devereux Interchange 1 • Devereux Interchange 2 • Reversible Lanes 1 • Reversible Lanes 2	$45-95	CDOT/City	State, County, City, Federal
Construct Roundabout	• Traffic Calming	$1-2 EA	City/CDOT	State, County, City, Federal
Signals/Intersection Improvements	• Limited Turns (One-Ways) • Limited Turns (Restricted Lefts) • Limited Turns (Right-in/Right-out) • Signal Timing	N/A*	CDOT/City	State, City

***** *Note: Costs based on new pavement area. These are minor operational improvements with minimal costs.*