AGENDA
CITY OF GLENWOOD SPRINGS
SPECIAL CITY COUNCIL MEETING
FEBRUARY 25, 2021
101 W. 8TH STREET
5:00 PM

The agenda is subject to *change, including the addition of items 24 hours in advance or the deletion of items at any time.*
The order and times of agenda items listed are approximate and intended as a guideline for the City Council.

TIME	ITEM	**ZOOM**	ACTION

1. You are invited to a Zoom webinar.

When: Feb 25, 2021 05:00 PM Mountain Time (US and Canada)

Topic: 2021/02/25 Special Council Meeting

Please click the link below to join the webinar:

https://us02web.zoom.us/j/82230703799

Or iPhone one-tap :

US: +13462487799,,82230703799# or +16699006833,,82230703799#

Or Telephone:

Dial(for higher quality, dial a number based on your current location):

US: +1 346 248 7799 or +1 669 900 6833 or +1 253 215 8782 or +1 312 626 6799 or +1 929 205 6099 or +1 301 715 8592

Webinar ID: 822 3070 3799

International numbers available: https://us02web.zoom.us/u/kxfgtPUuy

TIME	ITEM	**SPECIAL CITY COUNCIL MEETING**	ACTION
5:00 pm	2.	Roll Call	
	3.	Pledge of Allegiance	
	4.	Citizens Appearing Before Council (for items not on the Agenda-comments limited to 3 minutes)	
		ACTIONS AND/OR PRESENTATIONS	
5:00 pm	5.	South Bridge Evacuation Route Presentation	Presentation
6:30 pm	6.	South Bridge Design Options Impacting the Glenwood Springs Airport	Discussion and/or Action
8:00 pm	7.	Adjournment	

City Council
STAFF REPORT
City of Glenwood Springs
February 25, 2021

Agenda Item: South Bridge Evacuation Route Presentation

Action Requested: None - For Information Only

Department: Engineering

Presented By: Terri Partch, City Engineer

Background Info: The City has been planning and designing a second southern bridge connection for the evacuation of South Glenwood since 2007. This presentation presents the cost benefit model for the project developed for the FEMA Building Resilient Infrastructure and Communities Grant.

Staff will walk on this presentation.

Issues: None.

Staff Recommendation: None.

SOUTH BRIDGE

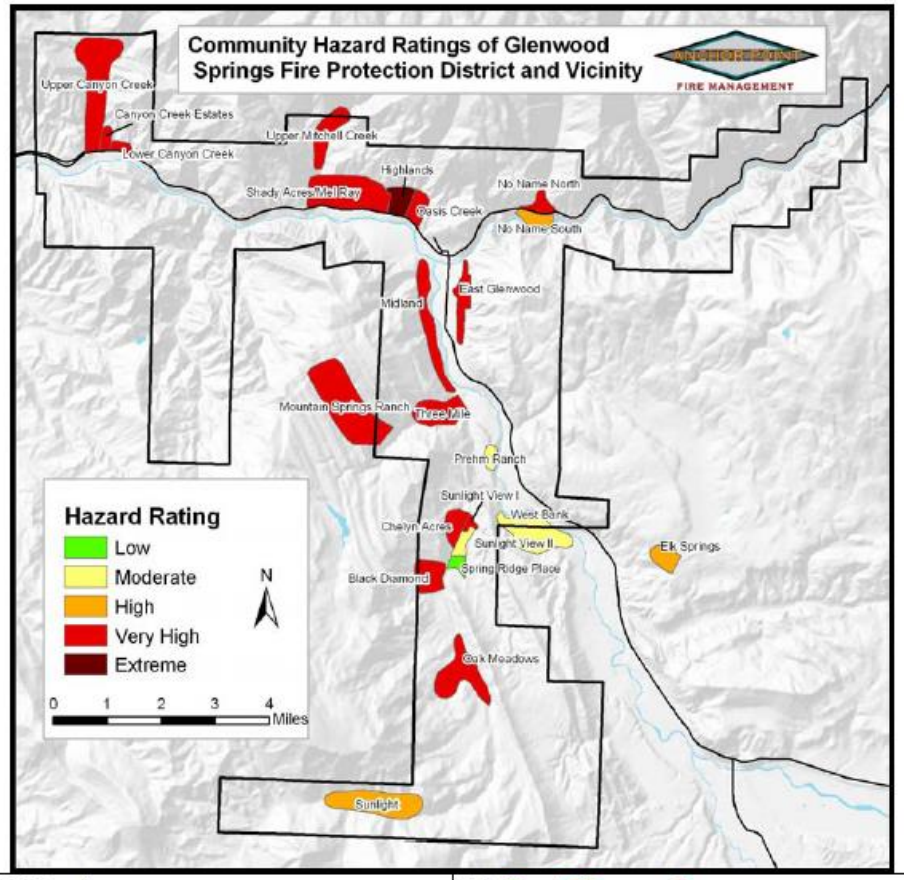
FEMA Cost Benefit Analysis - Evacuation Route Modeling

Council Presentation 2-25-2021

Recent Fire History Within the District

Year	Size in acres	Name	Community Impact
1994	2115	Storm King/South Canyon	14 fire fighters lost
2002	12,209	Coal Seam	29 structures were destroyed.
2003	50	Dry Park	
2013	390	Red Canyon Fire	
2018	44	Oak Meadows Fire	
2019	20	Sunrise Court Fire	
2020	0.63	Oak Meadows	
2020	32,431	Grizzly Creek	3 structures destroyed, ¾ of the City watershed destroyed
2020	40	Red Canyon Fire	
2020	40	MM 11 South Canyon Fire	
2020	2	Three Mile Fire	1 structure lost

Figure 2: Hazard Ranking of Communities in the Study Area



1. Highlands	13. East Glenwood
2. North No Name	14. Three Mile
3. Midland	15. Oak Meadows
4. Canyon Creek Estates	16. Lower Canyon Creek
5. Mel Ray/Shady Acres	17. Sunlight
6. Chelyn Acres	18. South No Name
7. Upper Canyon Creek	19. Elk Springs
8. Upper Mitchell Creek	20. Sunlight View II
9. Oasis Creek	21. Prem Ranch
10. Sunlight View I	22. West Bank
11. Black Diamond	23. Spring Ridge Place
12. Mountain Springs Ranch	

Extreme Very High High Moderate Low

Packet P

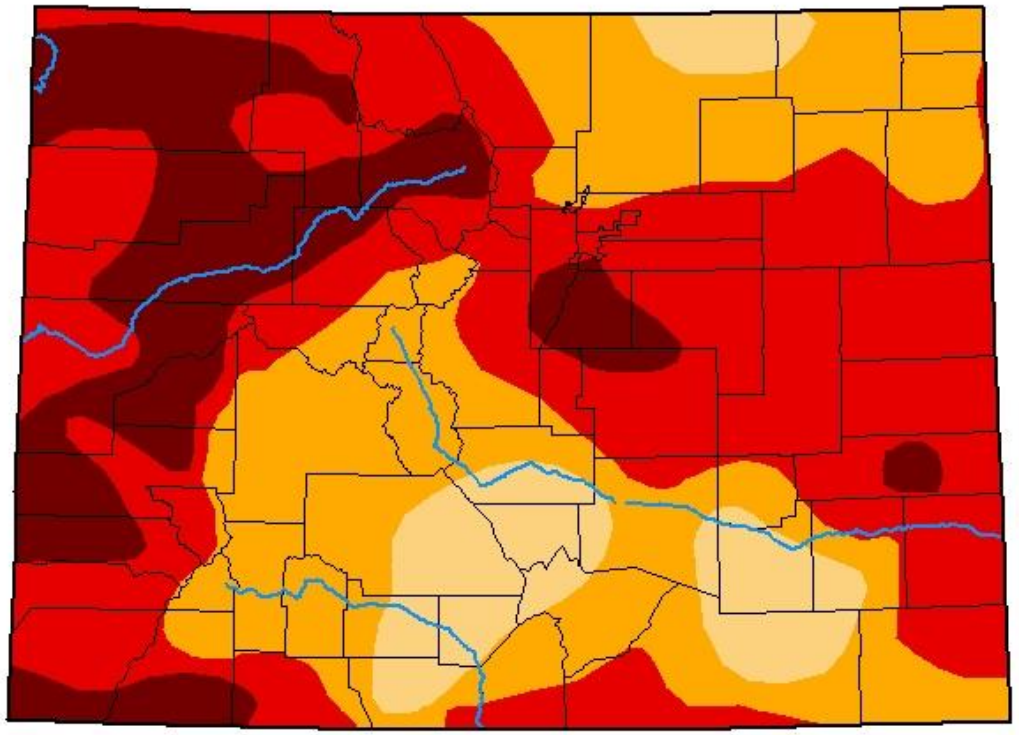
2007 Glenwood Springs Fire Protection District Wildland Urban Interface Community Wildfire Protection Plan.

The plan was developed in 2007 by the Glenwood Springs Fire Protection District (GSFPD), the Bureau of Land Management (BLM) and the Colorado State Forest Service (CSFS)

Fire behavior potential within the project area (average conditions to extreme weather)

- Flame height from 8-12’
- Rate of spread greater than 60 chains per hour (0.75 miles per hour) under the extreme fire condition
- Crown fire activity from torching to active crowning

U.S. Drought Monitor
Colorado



February 16, 2021
(Released Thursday, Feb. 18, 2021)
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	90.24	58.91	17.78
Last Week *02-09-2021*	0.00	100.00	100.00	90.24	70.11	24.79
3 Months Ago *11-17-2020*	0.00	100.00	100.00	93.71	74.08	27.22
Start of Calendar Year *12-29-2020*	0.00	100.00	100.00	93.73	76.17	27.60
Start of Water Year *09-29-2020*	0.00	100.00	99.29	89.35	52.88	2.64
One Year Ago *02-18-2020*	28.74	71.26	43.82	3.30	0.00	0.00

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

Author:
David Miskus
NOAA/NWS/NCEP/CPC

droughtmonitor.unl.edu

In a normal year, Colorado would have accumulated about 45% of its "normal" snowpack by now. Right now, the state has about 35% of its expected snowpack for the year, according to Karl Wetlaufer, hydrologist with the National Resources Conservation Service. Some areas are faring better than others, but across the board, the state is into month four of a concerningly dry water year.

Colorado Sun, January 8, 2021

Colorado Largest Fires by Acreage

Rank	Fire Name	Acres	Year
1	Cameron Peak	208,663	2020
2	East Troublesome	193,804	2020
3	Pine Gulch	139,007	2020
4	Hayman	137,760	2002
5	Spring Creek	108,045	2018
6	High Park	87,284	2012
7	Missionary Ridge	70,485	2002
8	West Fork	58,570	2013
9	416 Fire	54,129	2018
10	Papoose	49,628	2013
11	Bridger	45,800	2008
12	Last Chance	45,000	2012
13	Bear Springs	44,662	2001
14	MM 117	42,795	2018
15	Beaver Creek	38,380	2016
16	Bull Draw	36,549	2018
17	Badger Hole	33,421	2018
18	Logan	32,546	2017
19	Grizzly Creek	32,431	2020
20	Burn Canyon	31,300	2002

It's not just that the state isn't getting much precipitation now; Colorado hasn't had good precipitation for a long time. Nearly half of the NRCS snow telemetry sites saw their record lowest or second lowest precipitation measures on record from May to October last year, Wetlaufer said. The telemetry sites have collected data for three to four decades, depending on the location.

"The drought situation now is pretty dire," Wetlaufer said.

Colorado Sun, January 8, 2021

Evacuation Model Development

Sunrise Court Fire – 8/2019

Fire Frequency

- **Fire frequency based on local historical events.**
  - Most extreme frequency: 26-year occurrence – Loss of life- Storm King Fire
  - Middle frequency: 18-year occurrence – Loss of significant number of structures- Coal Seam Fire
  - Common frequency: 2-year occurrence – Loss of a small number of structures –Three Mile Fire

Evacuation Model Development

2 Year and 18 Year Model -Fire Intensity- Fire Rate of Spread

Fire Intensity and Rate of Spread for the 2-Year Model is based on local frequency and events. (Seven events in two years with neighborhood evacuations, structure loss and significant burnt acreage).

Fire Intensity and Rate of Spread for the 18-Year Model is based on the 2007 professional assessment of the entire fire protection district. It does not recognize recent acceleration in drought fire frequency and severity.

- Flame height from 8-12’
- Rate of spread greater than 60 chains per hour (0.75 miles per hour) under the extreme fire condition
- Crown fire activity from torching to active crowning

Evacuation Model Development

26 Year Model -Fire Intensity-Fire Rate of Spread

Fire Intensity and Fire Rate of Spread for the 26-year model is based on the State's three largest fires in State history, all of which occurred in 2020. The following information is from the Federal Inciweb site.

The Cameron Peak Fire

The Cameron Peak Fire ignited on August 13th . From August 13th through November 1st, 2020 the fire grew to 208,913 acres in 81 days at an average rate of 2,579 acres per day. Its largest day of growth was on October 16th, where it grew by 20,384 acres, or **849 acres/hour**

The East Troublesome Fire

The East Troublesome Fire started on October 14th and grew to over 10,000 acres in three days. The peak fire spread occurred between October 21st and 22nd and consumed 87,093 acres in a day (**3,629 acres/hour**). On October 24th snow fell within the fire area, containing it to its maximum size of 193,812 acres. Average fire growth over the ten-day period was 19,381 acres per day.

Pine Gulch Fire

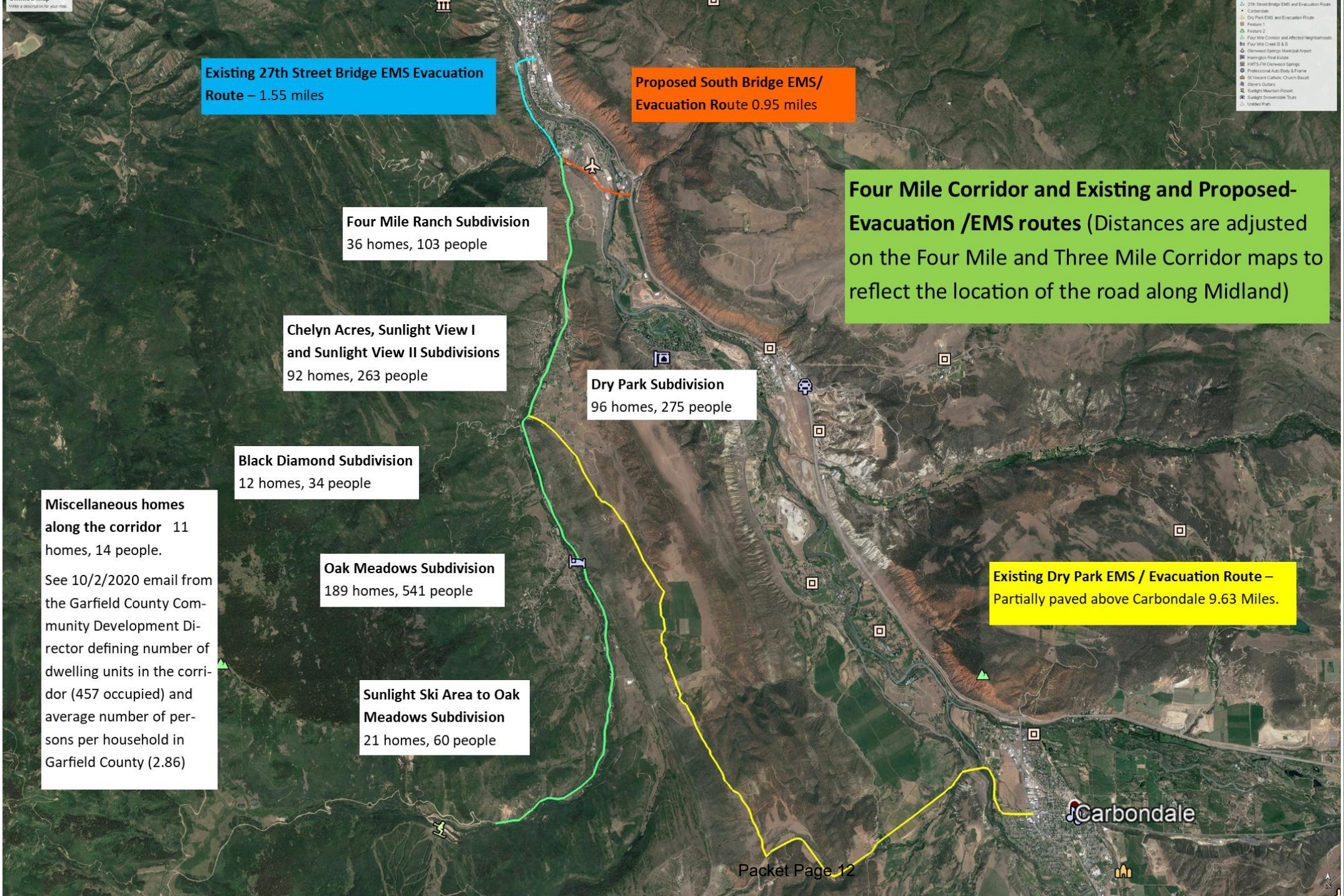
This fire was started by a lightning strike on July 31st, 2020. Its largest growth occurred over the evening of August 18th, where it grew 30,000 acres in three to four hours (**7500 acres/hour**). It was determined to be contained on September 15th at a maximum size of 139,007 acres and had an average growth rate of 3,757 acres per day.

Evacuation Model Assumptions

Red Canyon Fire 2020

How People Will Evacuate- Fire Behavior

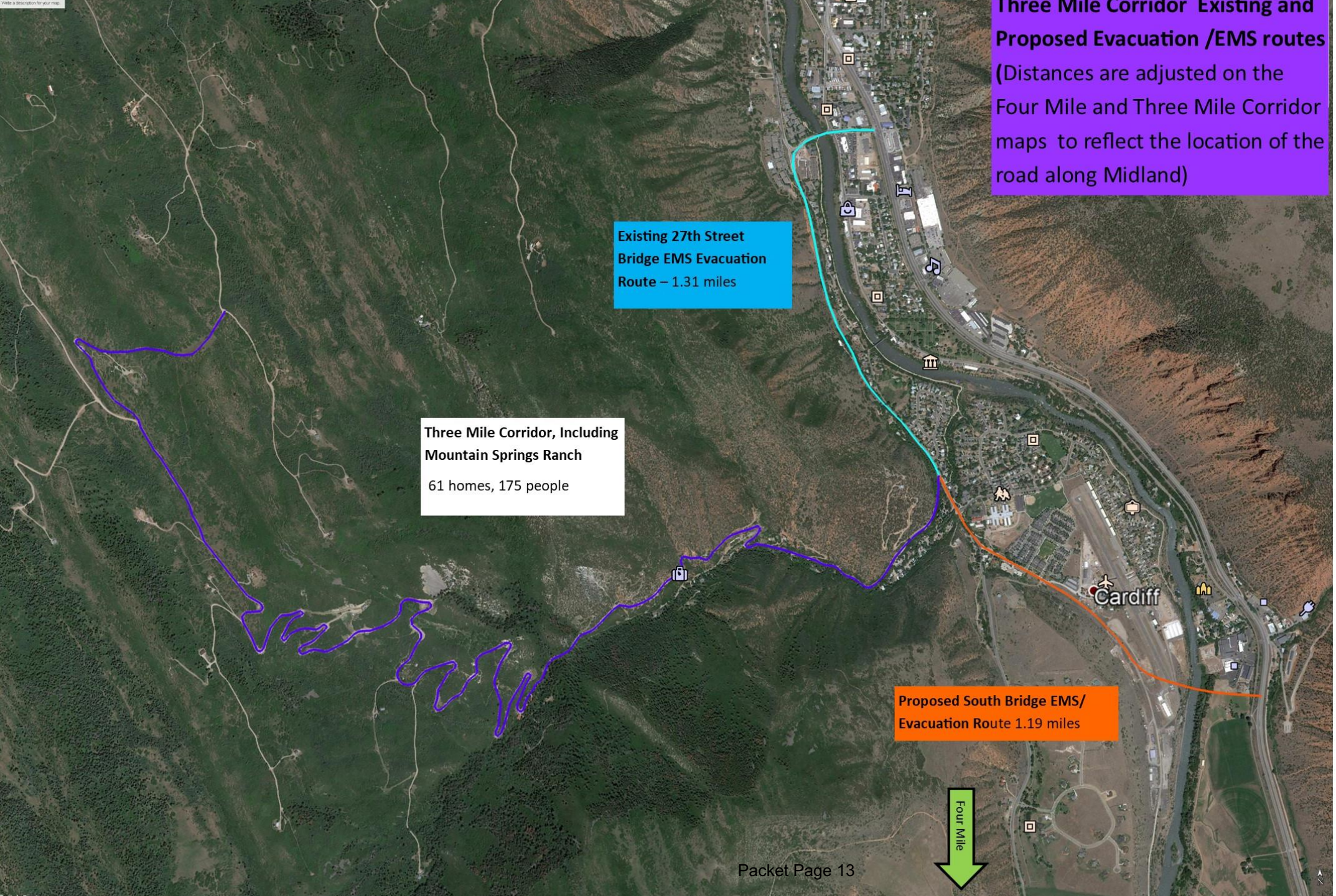
- **Fire Behavior**
  - The fire starts and advances from above the Oak Meadows subdivision (Two fire starts/evacuations within the last three years)
  - In the middle and worst case scenarios, it is assumed that the fire in the Four Mile corridor spots over the narrow ridge to Dry Park, cutting off the Dry Park access.
  - The fire blows down the canyon, burning through an area approximately 1.5 miles wide (eastern ridgeline to bench on the west)
  - It is late in the summer season. Air support cannot be quickly obtained.
- **Residents hurry to leave home**
  - The evacuation order is issued for all residents at the same time. All residents are within their homes and begin evacuation within 15 minutes from the order. They evacuate with two personal vehicles.
- **Residents evacuate by vehicle**
  - A single lane evacuation is assumed to allow for ground EMS and potential accidents.
  - FHWA free flow capacity for one lane is 1,490 vehicles/hour. Due to panic, stop controls throughout the corridor, poor sight distance, 1,000 vehicles/hour is used in the model.



Four Mile Corridor

457 total homes

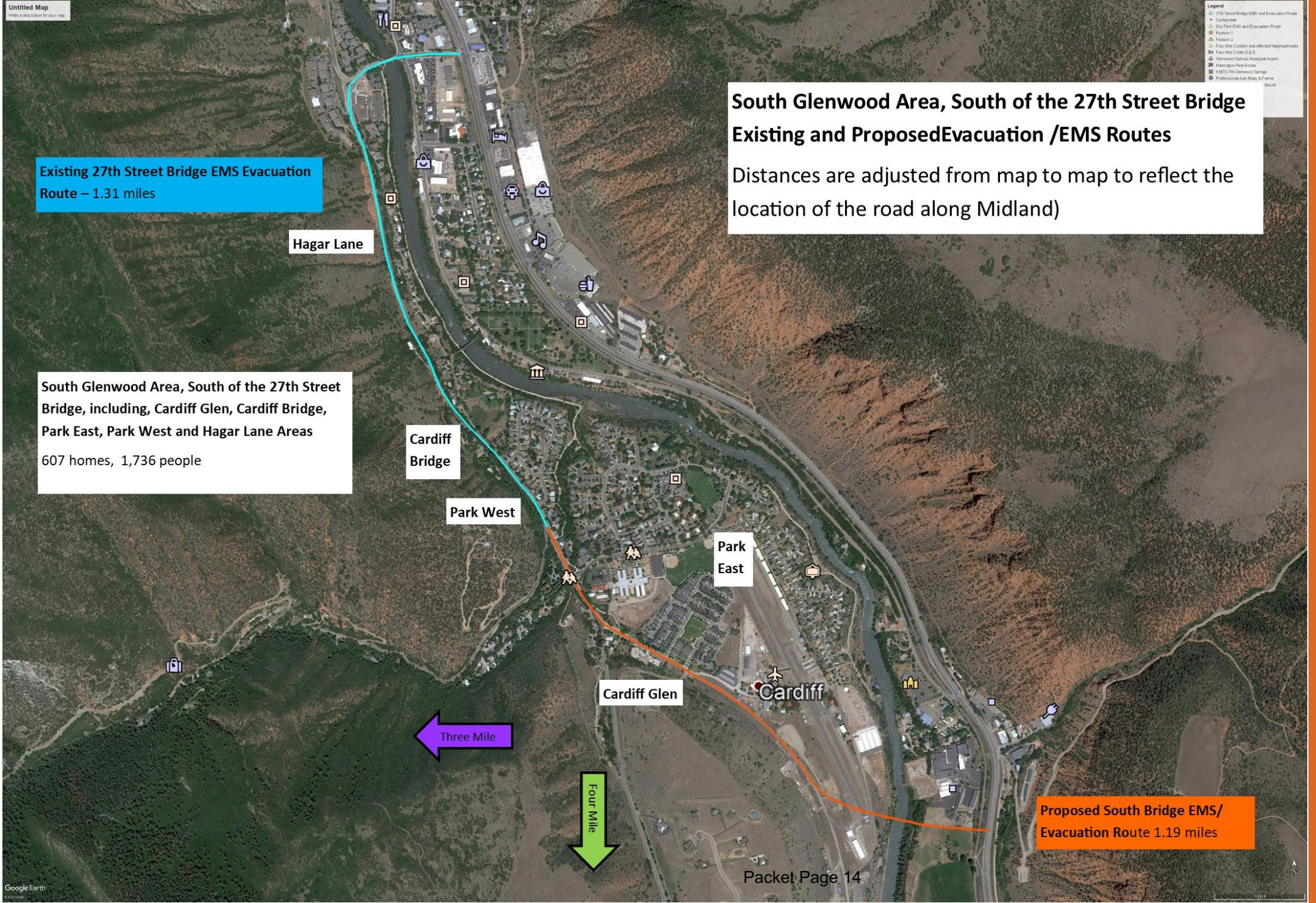
Estimated 1,307 people



Three Mile Corridor/ Mountain Springs Ranch

Estimated 61 homes

Estimated 175 people



South Glenwood Area (south of the 27th Street Bridge

607 homes

Estimated 1,736 people

Evacuation Model Conclusions

18 Year Model without South Bridge

18 Year Model – 2007 GSFPD Professional Assessment Fire Rate of Spread -0.75-1.0 MPH.

- Overall it takes approximately 1.8 hours to clear the Four Mile corridor for ground emergency operations to reach the fire from the Midland corridor.
- EMS and Fire response are hampered by the evacuation order. The personnel in the fire station at the bottom of Four Mile focus on getting people out of their homes in Oak Meadows. All other Fire and EMS assistance must approach from Dry Park Road. Dry Park Road is twisting and unpaved and subject to accidents in a high stress/low visibility situation.
- Additional support from other departments in the Roaring Fork Valley and stations within Glenwood Springs take one hour to approach through Carbondale on Dry Park.
- Oak Meadows is roughly 1.24 miles wide from the top of the subdivision to Four Mile Road. If the fire travels one mile while additional support arrives to the area from Dry Park, 80% of the 189 homes in Oak Meadows are lost. (152 homes)

Evacuation Model Conclusions

26 Year Model without South Bridge

The Cameron Peak Fire Rate of Spread

- At **849 acres/hour,** the fire covers the four-mile corridor in 7.9 hours, or approximately 1.1 miles per hour. It takes approximately 2.3 hours to clear the residents and get additional ground support to the area. In this scenario, the fire moves through Oak Meadows and Black Diamond Subdivisions. 201 homes are lost, no lives are lost.

The East Troublesome Fire Rate of Spread (This scenario is used in the FEMA Benefit Cost Analysis)

- At **3,629 acres/hour,** the fire covers the Four Mile corridor in 1.85 hours, or approximately 3.8 miles per hour. It takes 1.6 hours to clear the residents of South Glenwood through the 27th Street roundabout. 914 cars are backed up 3.8 miles on Four Mile Road waiting to enter traffic heading north. Four Mile traffic moves for approximately 1/3 of an hour before the fire catches the line of traffic. 270 cars make it off of the road, 644 cars are trapped, 921 people are lost. All homes in the corridor are destroyed.

Pine Gulch Fire Rate of Spread- Worst Case Scenario

- At **7,500 acres/hour,** the entire Four Mile corridor of 6,720 acres is consumed in 54 minutes. All of the Oak Meadows residents, and most of Black Diamond residents are trapped in their homes. The other residents within the Four Mile Corridor are able to leave their homes, but are trapped on Four Mile Road by the fire. The fire reaches the southern boundary of the city in 54 minutes. In that time 900 cars from south Glenwood have reached SH 82. 432 cars still remain on Midland and extend 1.8 miles down the corridor. The fire moves through south Glenwood in 11.9 minutes. An additional 199 cars escape. All residential areas south of the bridge are lost. Total lives lost from the two corridors: 1,258. Total homes lost from the two corridors: 1,032.

Evacuation Model Conclusions

18 and 26 Year Model with South Bridge

18 Year Model – 2007 GSFPD Professional Assessment Fire Rate of Spread -0.75-1.0 MPH.

In the unmitigated scenario it takes approximately 1.8 hours to clear the corridor for emergency services. In the mitigated scenario, full EMS ground response occurs roughly 39 minutes sooner. However, if Dry Park Road remains open, the fastest EMS response is still from Dry Park, estimated at one hour. In one hour, 80% of the homes in Oak Meadows are lost, estimated at 152 homes.

26 Year Model - The East Troublesome Fire Rate of Spread (This scenario is used in the FEMA Benefit Cost Analysis)

At **3,629 acres/hour,** the fire moves through the entire corridor in 1.85 hours. It takes approximately 1.4 hours for vehicles to be cleared from the lower corridor with both evacuation routes in place. Ground based EMS is able to access the corridor before it reaches south Glenwood. If the fire is moving at 3.8 miles /hour, EMS is able to access the corridor approximately ½ hour before it reaches south Glenwood, or 1.8 miles up the corridor, saving the Four Mile Ranch subdivision (36 homes) and 921 people from the unmitigated scenario. (389 homes are destroyed. No lives are lost)

Evacuation Model Conclusions

Pine Gulch Fire with South Bridge

Pine Gulch Fire Rate of Spread

At **7,500 acres/hour,** the entire Four Mile corridor of 6,720 acres is consumed in 54 minutes. It takes 55 minutes to clear Midland of traffic from South Glenwood and the Three Mile corridor with residents splitting between both South Bridge and 27th Street Bridge. In 28.5 minutes (13.5 minutes plus 15 minutes to get out of the house) residents below Black Diamond (640 residents, 448 cars-extending 1.87 miles up the corridor) reach the intersection of Four Mile Road. The evacuation of the Cardiff Glen, Midland and Three Mile residents has been in progress for 13.5 minutes. 225 cars are able to enter the Midland corridor and split between South Bridge and 27th Street before the fire reaches the southern boundary of the City. 225 cars are split between the route to the north and the route to the south (roughly 112 cars in each direction). They add approximately 7 minutes to the evacuation time on each route. Altogether it takes 61.8 minutes in each direction to clear the routes for emergency services.

The fire is moving at 7.8 miles /hour and consumes the distance between Four Mile and 27th Street Bridge in 11.9 minutes. All cars from the Four Mile corridor that make it to the Four Mile intersection escape. All property in both corridors is lost. 575 people in Oak Meadows and Black Diamond are lost.

This model does not predict what will happen, but what could happen. It is based on local fire history, professional studies and recent fires in the State of Colorado.

Fires, weather and the behavior of people are often erratic and unpredictable

Chief Tillotson and Mina Bolton will add to the information about fire behavior, GSFPD response and fire season preparation

Photos of the East Troublesome Fire

Courtesy of Mina Bolton, Executive Assistant PIO for the Fire Department

East Troublesome Fire

Evacuation from Estes Park

End –Slides Below are for Council Questions Only

Project status and current estimate

NEPA EA process is complete on 10/28. Finding of no significant impact has been signed

60% design is complete. Reviewed with CDOT on November 19th.

Proceeding to final design with anticipated completion June 2021.

Current total estimate including and airport tunnel, ROW acquisition, construction management is $56.7 million

The total estimate without an airport tunnel (including ROW and construction management from above) is $50.7 million

60% Estimate element break down (Including right of way and construction management):

- *Airport Road, CR 163 and Airport Center Road Improvements: 12.8 M*
- *Holy Cross/Lazy H/11 Ranch Crossing: 5.5 M*
- *SH 82 and CR154 Intersection : 17.1 M*
- *Airport Cut and Cover Tunnel : 6.0 M*
- *Roaring Fork River Bridge : 15.3 M*

Current Funding Sources:

- City of Glenwood Springs A&I Sales Tax Measure : 20M
- RFTA Destination 2040 Property Tax Measure: 4M

Grant Applications and Funding Requests:

- 2020 FEMA Building Resistant Infrastructure and Communities Grant (BRIC) - Request for 31 M. Submitted for State review and prioritization on 12-16.
- Colorado Department of Transportation
- Garfield County- Letter of Support for the BRIC application and Request for Funding Support

Ms. Partch, Mr. Smith, it is my understanding that you have responsibility for city transportation matters. I have several comments and questions, if you please, that I trust you will entertain. In addition to answering my questions, I hope that you will forward this letter to the City Council for their consideration on Thursday evening 25 February. I am sorry that I am not able to commute from my home in Colorado Springs on that day to attend in person, however I today received a link to a zoom meeting so I shall endeavor to attend in that manner.

1. Please update the email address for the airport on your website. It is still said to be Amy Helm, who, if I understand correctly, is no longer the airport manager.

2. May I please know the outcome of the recent land use study? I recall that you had three options, only one of which involved retaining the airport.

3. I have heard that the town is considering shortening the airport's only runway. I have found that at least as recently as 2006 the airport has received federal funding for improvements to the airport. Presuming that is the case I do not believe it is legal for the airport to shorten the runway until 25 years have elapsed since the last instance of federal funding, i.e. 2006+25 = 2031 at the earliest.

And why would the city shorten an already short runway anyhow? Would you convert a paved road serving some of your residents back into a dirt road? Would you intentionally make a public road less safe and less accessible to your city residents, as you are contemplating with your runway that also services the city? Why would any city treat its residents and businesses this way?

4. I hope I do not need to remind anyone on the City Council how important the airport was shown to be in the fires last summer. Shortening the runway would have an adverse impact on the businesses at the airport, its capability to perform in emergencies, and therefore on the efficacy of the airport as a whole. I just don't understand why the city appears to be attacking an important asset that it owns. The city's responsibility is to further its assets for the benefit of the city and its residents.

5. I am Regional Director of an association of owner-pilots who have previously held a fly-in event at the Glenwood Springs airport and would do so again, bringing the city business at the airport and business in town associated with lodging, food and ground transportation. We are far less interested in doing so, however, if it is going to involve giving business to a city that has attacked and crippled its major aviation asset.

6. I have tried to find out more about the South Bridge Connection that I have recently been made aware of, and I found this: https://www.cogs.us/449/South-Bridge . I find it unconscionable that the city would create a project for the purpose of facilitating emergency evacuation and emergency service access, and do so by impairing the critical emergency and fire services that your airport provides today. That seems a very poor trade. This is your airport, and you certainly should be much more proud of and aware of it than that. May I recommend that a way be found to provide both solutions/capabilities, so that the one does not impair the other. Surely there is a way to do that at reasonable cost. Indeed, in your Appendix D it is mentioned that a gentleman named Craig affirms that their are alternatives that do not adversely affect the airport.

I did peruse your appendices as referenced in the main URL I mentioned above and find them deficient and incomplete.

1. Your safety assessment does not mention any impairment to the airport as is proposed, and therefore does not consider impairments to safety due to the changes proposed at the airport.

2. There is a traffic analysis for vehicular traffic on roads, but no traffic analysis for airport/aviation traffic, and therefore no way for your residents, businesses, or the City Council to properly assess what the proposal will do to the services and capabilities provided by your/their airport.
3. The Agency Coordination appendix may be deficient on at least two counts. First, it states that the airport is not federally funded. However, I do not believe this is relevant exactly; rather, the concern the Federal Airport Improvement Program will have is whether funds have previously been provided, and when. I found online readily that federal funding was provided for airport improvements as recently as 2006, resulting in my statement 3. (i.e. 2031) above. ($68,000+ was allocated to the airport for the acquisition of snow removal equipment.) Secondly, this document fails to mention the Federal Aviation Administration, which will have an extremely active interest in the specifics of your desire to alter and diminish airport capability.

In conclusion, I hope the city will find it appropriate to treat your airport as the valuable asset it has proven to be, and be proud of this facility and the business and well-being it generates. Thank you. Sincerely,

-- **Jim Densmore** - N6555A
-- Regional Director, Int'l Cessna 180/185 Club . skywagons.org
-- jim@densmore.org | +1 719-339-6757 mobile/SMS.text

City Council
STAFF REPORT
City of Glenwood Springs
February 25, 2021

Agenda Item: South Bridge Design Options Impacting the Glenwood Springs Airport

Action Requested:

1. Council decision to include a tunnel under the municipal airport in the South Bridge project or not.

2. Council decision to shorten the runway, or not. If so, which option is preferred, Option 1 or 2 in the presentation?

Department: Engineering

Presented By: Terri Partch, City Engineer

Background Info: In November the Council asked that staff and the consultant evaluate options to remove the tunnel to lower the overall project cost.

If the Council chooses to remove the tunnel, the runway would need to be altered to continue to function. Two options to keep the runway open have been preliminarily developed:

- Option 1- Removing 423 feet of runway from the south end. The final runway length would be 2,882 feet. The southern runway threshold would be reconstructed, papi lights would be moved and the runway would be restriped

- Option 2 - Remove part of the runway from the southern end of the runway and add length to the northern end. Move the southern runway threshold to the north, displace the northern runway threshold. Relocate runway lights and restripe the runway. The final runway length would be 3,262 feet.

Issues: Removing the airport tunnel does further limit the functional operations of the airport, and removes access to the maintenance business/hangar on the southern end of the airport.

Preliminary costs to shorten the runway have been developed for construction and design. Additional evaluation is required to determine if either option is feasible (an airspace study). The consultant also recommends an economic analysis to determine the viability of a shortened runway over time.

Staff Recommendation: Staff recommends eliminating the tunnel and evaluating a shortened runway.

Glenwood Springs Municipal Airport

Runway Length Analysis


AIRPORT CENTER ROAD
CUT WALL
LIMITS OF GRADING
CUT & COVER
TUNNEL
AIRPORT ROAD/SOUTH BRIDGE


AIRPORT CENTER ROAD
LIMITS OF GRADING
AIRPORT ROAD/SOUTH BRIDGE

Agenda

- CDOT Aviation System Plan (GWS Role)
- GWS Runway Length Benchmarking
- Previous Documentation (EA/Land Use Study)
- GWS Based A/C Runway Length Required
- GWS Emergency A/C Runway Length Required
- Surrounding Land Constraints
- Alternatives to shorten runway
- Costs

CDOT Aviation System Plan

- Role of GWS in CDOT Aviation System
  - General Aviation - Local

CURRENT R/W LENGTH	3,305’
CDOT AVIATION SYSTEM PLAN OBJECTIVE FOR GWS	7,200’
FAA RUNWAY LENGTH OBJECTIVE	7,200’

Glenwood Springs Municipal (GWS)

Colorado Aviation System Plan and Economic Impact Study

Airport Report Card

Facility and service objectives (FSOs) were developed for each of the six airport classifications in the 2020 CASP. The following table details the FSOs and corresponding performance of Glenwood Springs Municipal. These objectives were analyzed in conjunction with the other performance measures (PMs) to determine the airport's project needs and associated costs.

Objective Category	GA-Local Objective	Current Condition	Meets 2020 Objective?
Airfield			
ARC	B-II	B-II	Yes
Runway Length	Accommodate 100% of small aircraft adjusted for elevation and mean maximum daily temp during hottest month	3,305 feet (7,200 feet)	No
Runway Width	75 feet	50 feet	No
Runway Strength	30,000 pounds	15,000 lbs SW	No
Taxiway	Partial parallel	Full parallel	Yes
Runway Markings	Non-precision	Visual	No
Lighting/NAVAIDS			
Approach	Non-precision	Visual	No
Visual Aids	Rotating beacon, lighted wind cone. REILs. VGSIs	VGSIs, wind cone	No
Runway Lighting	MIRL	None	No
Weather Reporting	On-site ASOS, AWOS, or Automated Unicom	Automated UNICOM	Yes
Airport Facilities			
Terminal (CS and/or GA)	Facility with restrooms, pilot-lounge, and Wi-Fi	None	No
Apron Tie-Downs	Tie-downs for 50% of based aircraft fleet plus 25% of weekly average overnight transient storage during peak season	50% of based aircraft fleet plus 25% transient aircraft fleet: 35 — Total tie-down spaces: 30	No
Hangars	Hangars for 50% of based aircraft fleet and 25% of weekly average overnight transient storage	50% of based aircraft fleet: 35 — Number of based aircraft hangar spaces: 64 25% of transient aircraft fleet: 1 — Number of transient aircraft hangar spaces: 0	No
Dedicated Maintenance/SRE Storage Building	Yes	No	No
Electric Vehicle Charging Stations	Yes	No	No
Perimeter Security	AOA 3-wire fencing with appropriate signage	AOA 3-wire fencing with appropriate signage	Yes
Services/Other			
Jet A Fuel	24/7 (Self-Serve or Call Out)	24/7 (Self-Serve or Call Out)	Yes
AvGas Fuel	24/7 (Self-Serve or Call-Out)	24/7 (Self-Serve or Call Out)	Yes
Aircraft De-icing	Based on community need	None	Based on community need
Courtesy Car	Yes	Yes	Yes
Sustainability Plan	Based on community need	No	Based on community need
Minimums for All Airports			
Restroom (24-hr accessible) ✓	Cell Phone Service ✓	Airport Layout Plan (ALP) ✓	Wi-Fi Service ✗

Runway Length Benchmark

- 66 Primary Runways in the Colorado Airport System

- The shortest public-use primary runways in the system are:
  - Glenwood Springs Municipal (GWS) – 3,305 feet
  - Haxtun Municipal (17V) - 3,860 feet

- Fifty-one runways measure at least 5,000 feet in length
  - Generic minimum length considered as a potential indicator of an airport's ability to accommodate many corporate aircraft

Based and Emergency A/C – Runway Length Required

GLENWOOD SPRINGS MUNICIPAL AIRPORT - RUNWAY LENGTH ANALYSIS		
	Aircraft/Agency	**Runway Length (Feet)**
Based A/C	C-172	3,585'
	C-150	2,870'
	Beechcraft Bonanza	3,800'
	Cirrus SR22	3,100'
Typical Emergency Services A/C	Pilatus PC-12	4,500'
	Beechcraft King Air 200	5,100'
Agency Guidance	FAA Design A/C* Runway Length Guidance	7,200'
	Colorado State Aviation System Plan**	7,200'
Existing Runway Length* **		**3,305'**

Notes:

Airport Elevation - 5,916'

Mean Max Temp. Hottest Month - 87.6° F

A/C specific lengths are based on clearance of a 50' obstacle. Lengths are from manufacturer published performance charts and are intended to be indicative only. These runway lengths are not to be utilized for flight

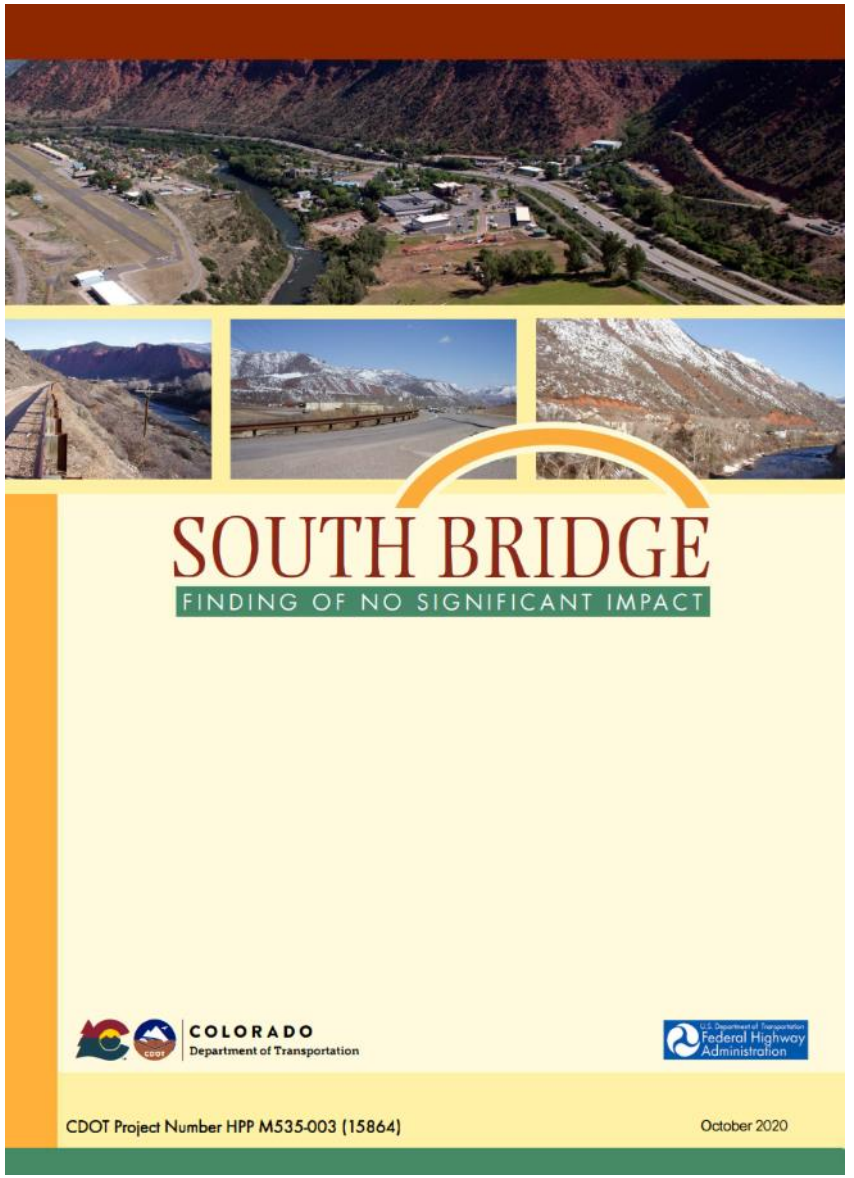
*FAA Advisory Circular 150/5325 - 4B, Runway Length Requirements for Airport Design

**2020 Colorado Aviation Sytem Plan and Economic Study

*** FAA 5010 Form

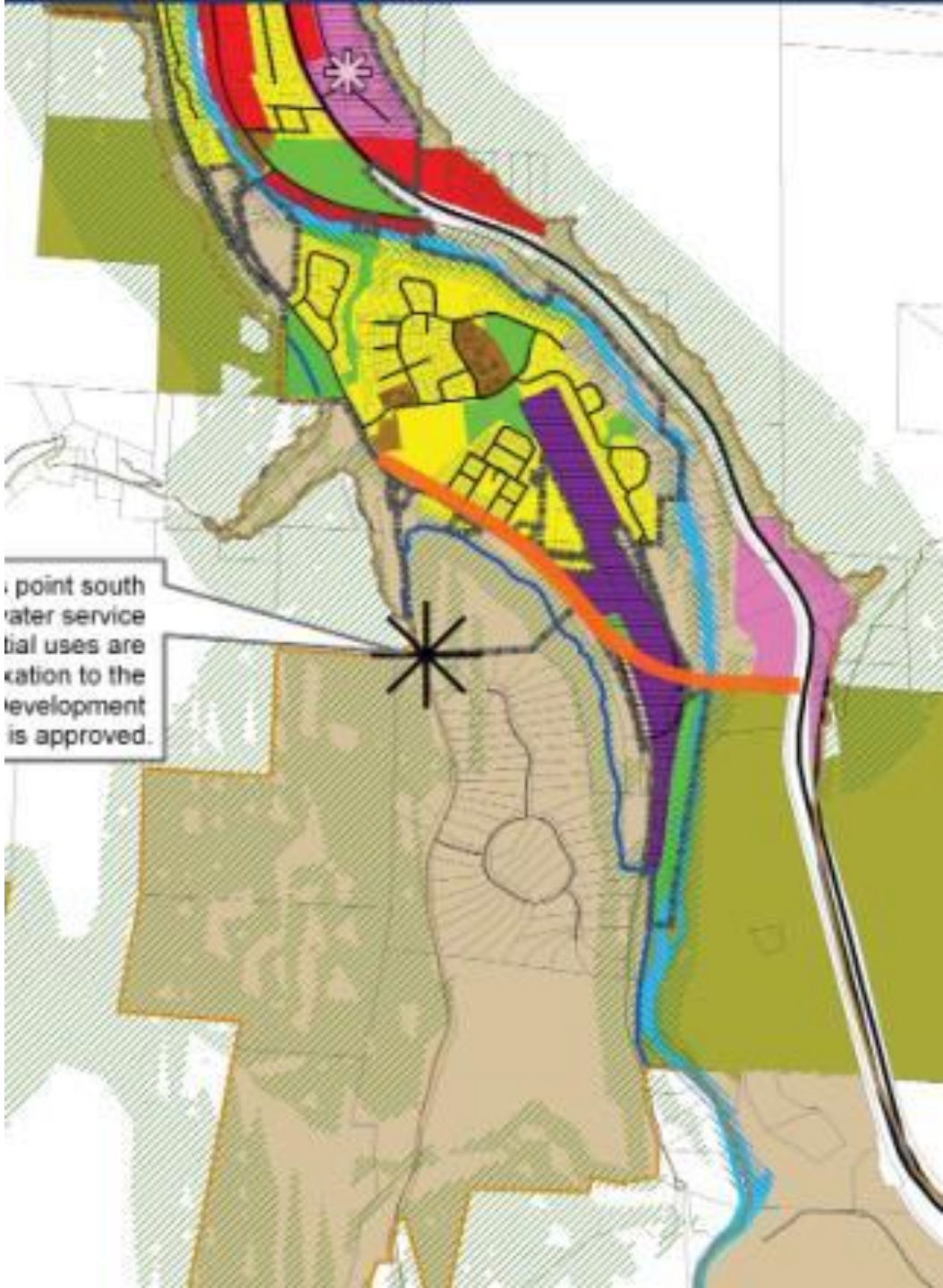
Previous Documentation

- **South Bridge Environmental Assessment/October 2020 FONSI**
  - Does not contemplate or include an impact to the shorter GWS Airport runway .
- **August 2019 Land Use Scenario Planning Study for GWS Airport**
  - Does not include an analysis of GWS runway shortening scenario or impacts resulting from runway shortening scenarios.
  - Analyses includes expanded aviation use or airport closure only
- **1999 Airport Layout Plan**
  - Does not include and analysis of a shorter runway length
  - Does include a displaced threshold (shorter landing distance)



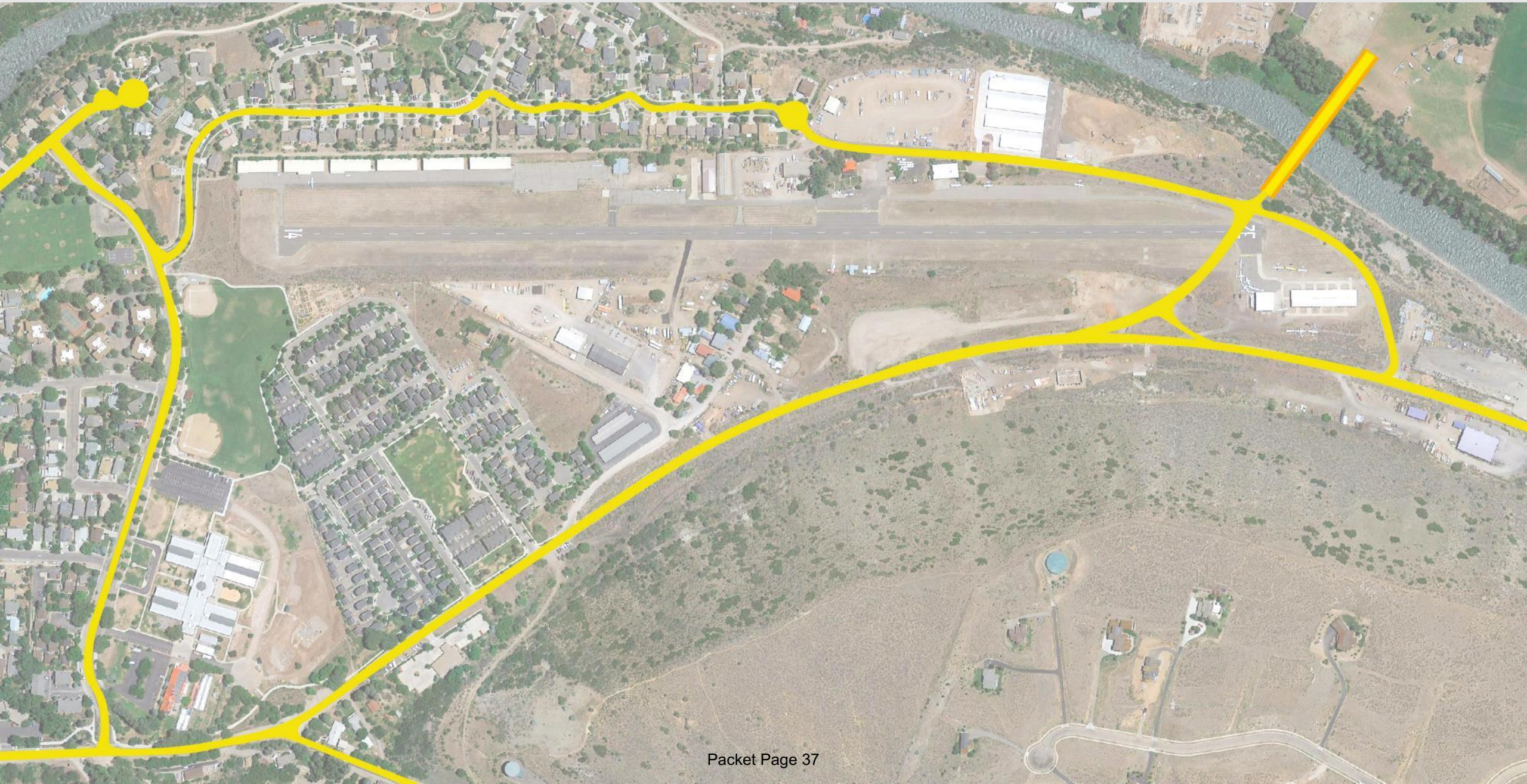
Land Use Constraints

- North
  - Residential land use
  - Airspace impacts (rapidly rising terrain across the river, to the north)
  - Noise impacts on residential areas
  - Terrain difference between potential expansion area and existing runway end.
- South
  - Existing roadway access and the Roaring Fork River limit runway extensions or shift to the south
- East
  - Roaring Fork River and Existing Residential limit runway shifts to the East
- West
  - Airport Road and rising terrain limit runway shifts to the West

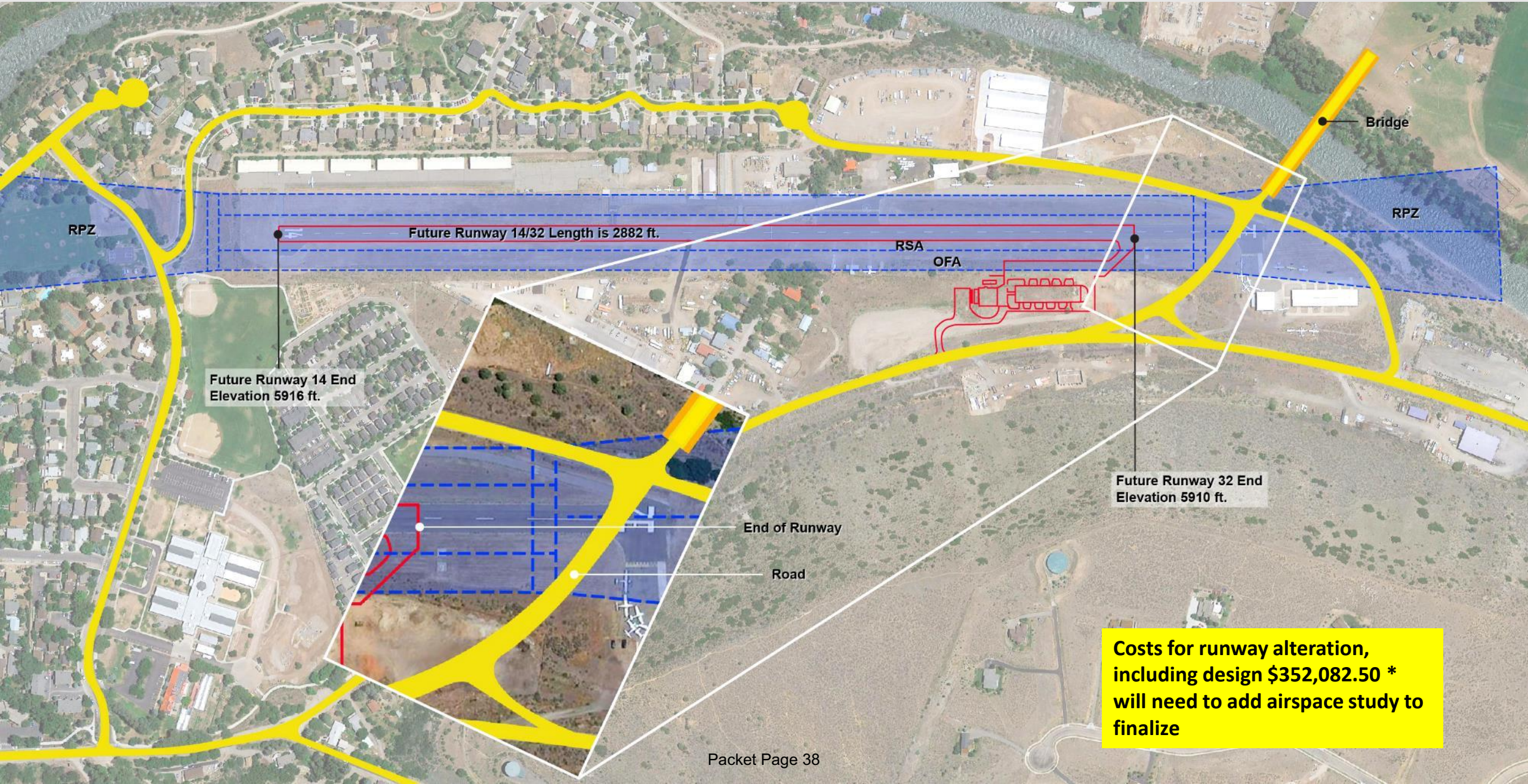


Option 1

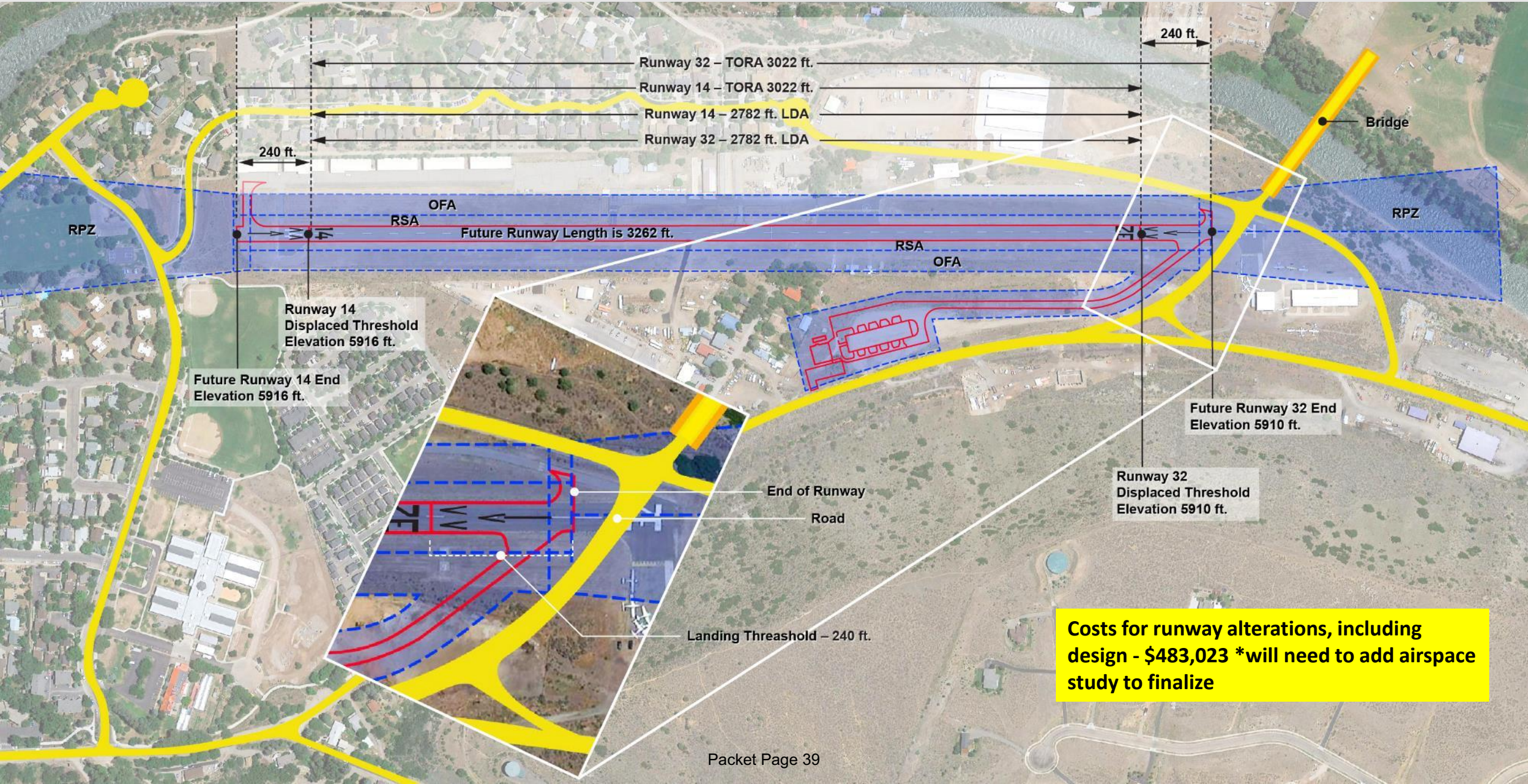
Option 1

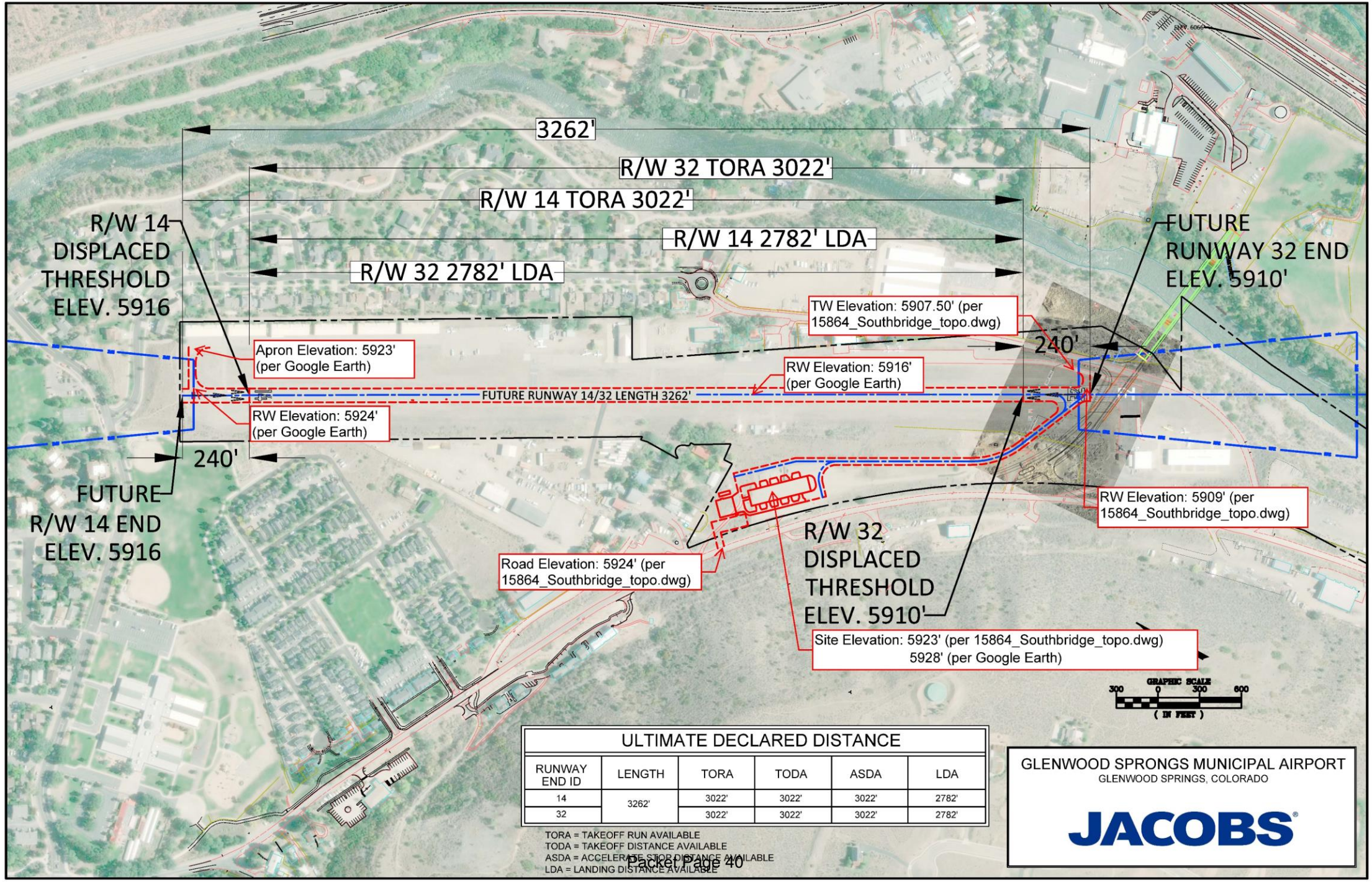


Option 1


Bridge
RPZ
RPZ
Future Runway 14/32 Length is 2882 ft.
RSA
OFA
Future Runway 14 End
Elevation 5916 ft.
Future Runway 32 End
Elevation 5910 ft.
End of Runway
Road
Costs for runway alteration, including design $352,082.50 * will need to add airspace study to finalize

Option 2


Runway 32 – TORA 3022 ft.
Runway 14 – TORA 3022 ft.
Runway 14 – 2782 ft. LDA
Runway 32 – 2782 ft. LDA
240 ft.
240 ft.
Bridge
RPZ
RPZ
OFA
RSA
Future Runway Length is 3262 ft.
RSA
OFA
14
32
Runway 14
Displaced Threshold
Elevation 5916 ft.
Future Runway 14 End
Elevation 5916 ft.
Future Runway 32 End
Elevation 5910 ft.
Runway 32
Displaced Threshold
Elevation 5910 ft.
End of Runway
Road
Landing Threashold – 240 ft.
Costs for runway alterations, including design - $483,023 *will need to add airspace study to finalize



ULTIMATE DECLARED DISTANCE

RUNWAY END ID	LENGTH	TORA	TODA	ASDA	LDA
14	3262'	3022'	3022'	3022'	2782'
32		3022'	3022'	3022'	2782'

TORA = TAKEOFF RUN AVAILABLE
TODA = TAKEOFF DISTANCE AVAILABLE
ASDA = ACCELERATE STOP DISTANCE AVAILABLE
LDA = LANDING DISTANCE AVAILABLE

GLENWOOD SPRONGS MUNICIPAL AIRPORT
GLENWOOD SPRINGS, COLORADO

JACOBS®

Project status and current estimate

NEPA EA process is complete on 10/28. Finding of no significant impact has been signed

60% design is complete. Reviewed with CDOT on November 19th.

Proceeding to final design with anticipated completion June 2021.

Current total estimate including and airport tunnel, ROW acquisition, construction management is $56.7 million

The total estimate without an airport tunnel (including ROW and construction management from above) is $50.7 million

60% Estimate element break down (Including right of way and construction management):

- *Airport Road, CR 163 and Airport Center Road Improvements: 12.8 M*
- *Holy Cross/Lazy H/11 Ranch Crossing: 5.5 M*
- *SH 82 and CR154 Intersection : 17.1 M*
- *Airport Cut and Cover Tunnel : 6.0 M*
- *Roaring Fork River Bridge : 15.3 M*

Current Funding Sources:

- City of Glenwood Springs A&I Sales Tax Measure : 20M
- RFTA Destination 2040 Property Tax Measure: 4M

Grant Applications and Funding Requests:

- 2020 FEMA Building Resistant Infrastructure and Communities Grant (BRIC) - Request for 31 M. Ranked as the second highest priority in the State. Going now to a Federal evaluation.
- Colorado Department of Transportation
- Garfield County- Letter of Support for the BRIC application and Request for Funding Support

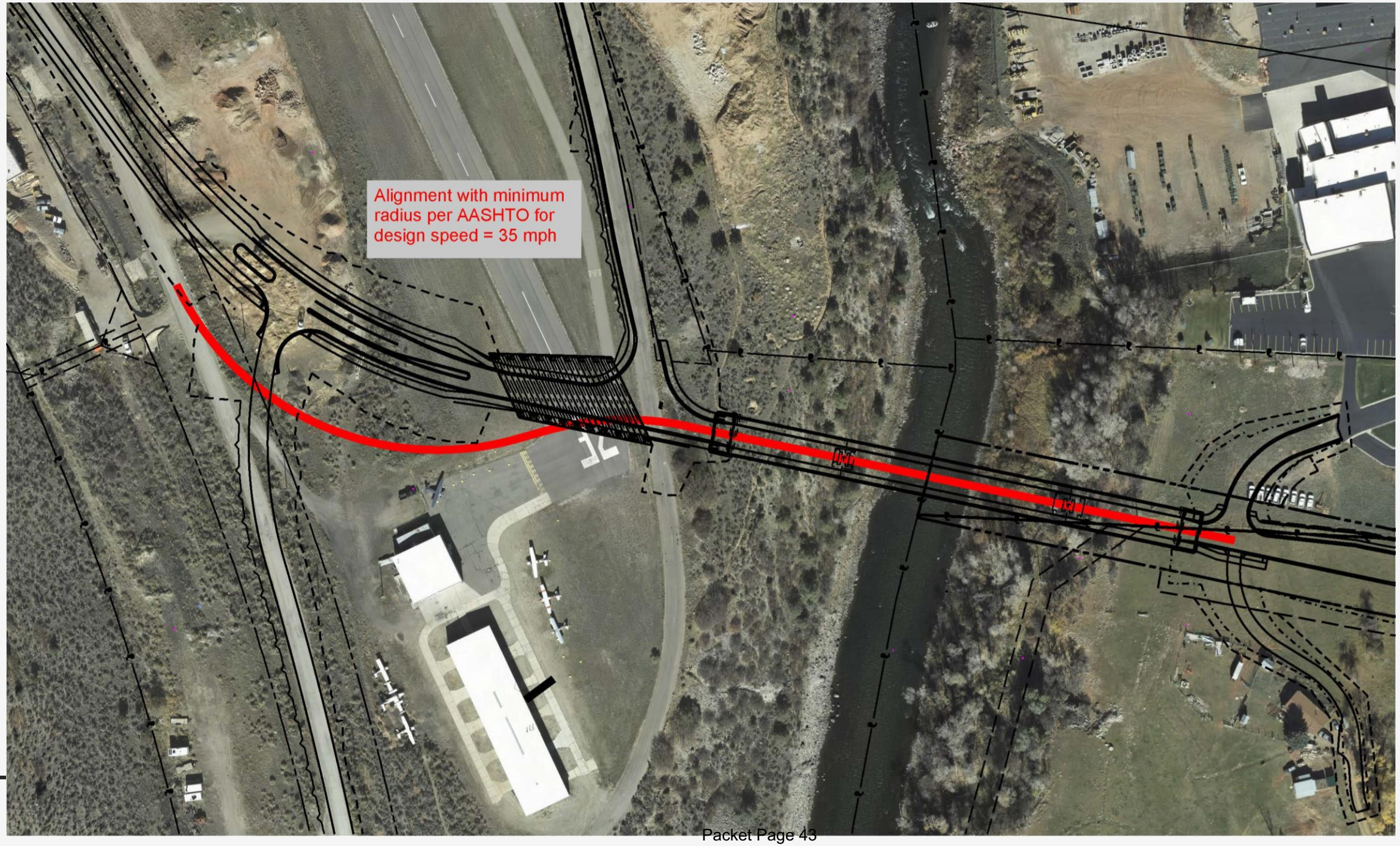
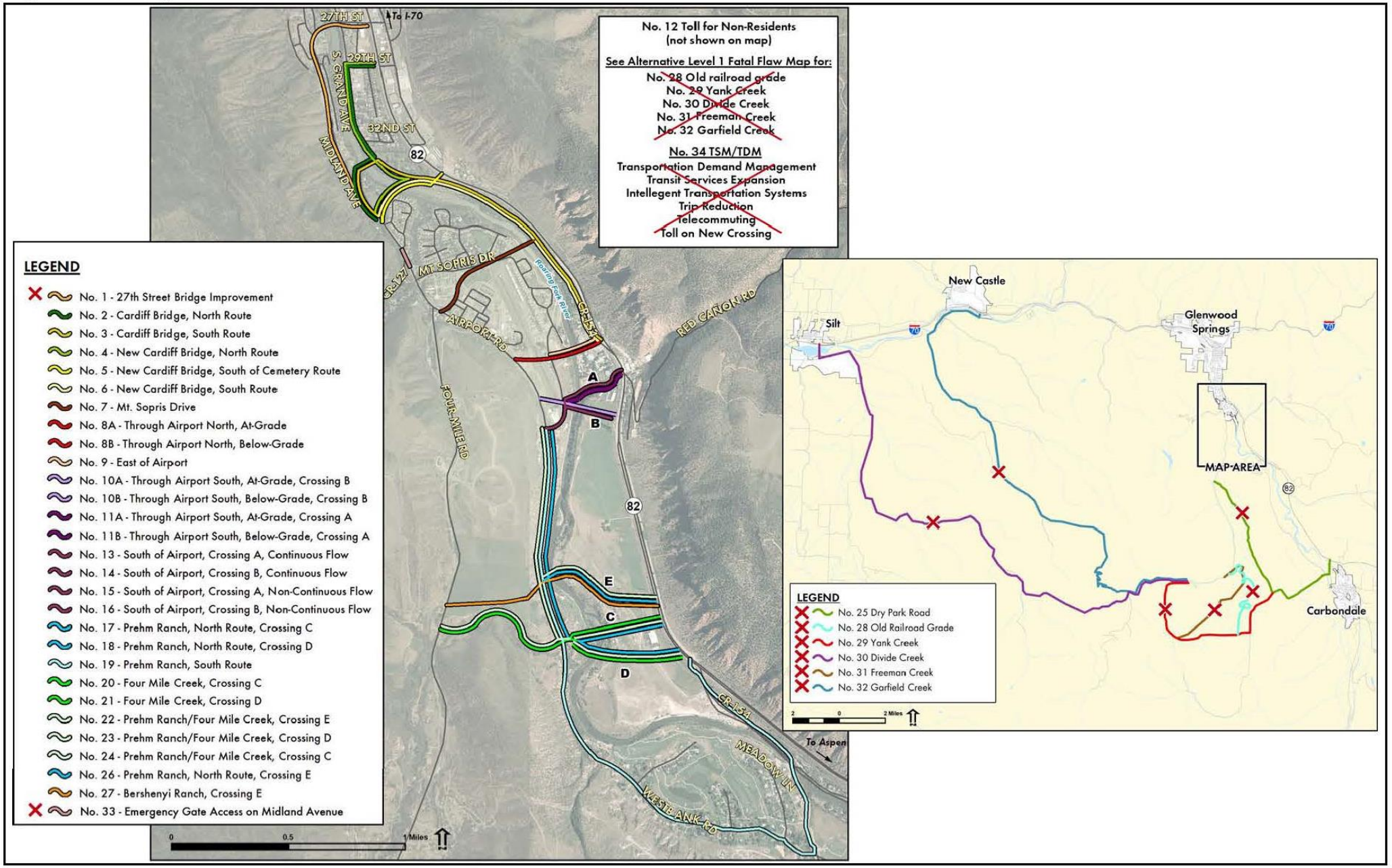

Alignment with minimum radius per AASHTO for design speed = 35 mph

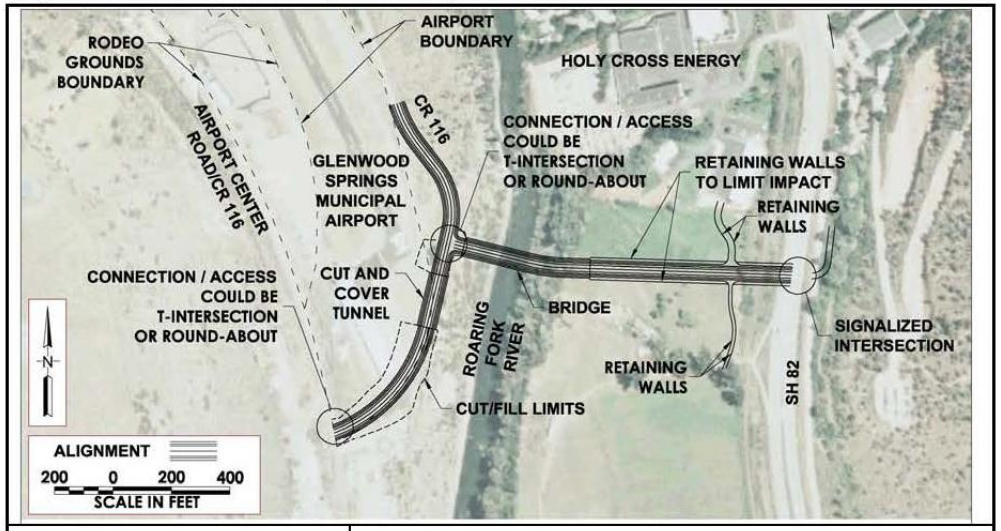
Figure 2. Full Range of Alternatives Considered and Level 1 Screening Results



8.15 Alternative No. 16, South of Airport

Alternative No. 16 would follow Airport Center Road around the southern end of the Glenwood Springs Municipal Airport, crossing the Roaring Fork River and following the property line between Holy Cross Energy and adjacent agricultural lands to reach SH 82. The roadway would be below grade at the southern end of the Glenwood Springs Municipal Airport to avoid the Federal Aviation Administration Safety Area. This alternative is shown on **Figure 11.**

Figure 11. Alternative No. 16, South of Airport



Benefits	Issues
▪ Airport would remain open. ▪ Limited number of private property impacts.	▪ Perceived out of direction travel may cause motorists to cut through neighborhoods to the north. This affects this alternative's ability to meet Purpose and Need. ▪ Comparatively increased travel times. ▪ Approximately 0.32 acre of impact to potential wetland and/or riparian habitat. ▪ Crosses the northern boundary of an existing conservation easement.

Eliminated: Alternative No. 16 was eliminated based on increased travel times due to perceived out of direction travel, potentially causing motorists to cut through the Park East neighborhood, adding traffic to a residential area with public parks and Sopris Elementary School. This decreases overall access efficiency and may cause motorists to cut through the Park East neighborhood. This would add traffic to a residential street where public parks and Sopris Elementary School are located.

Table 4. Results of Level 2 Screening

Alternative	Primary Reasons for Screening
No. 2 Cardiff Bridge, North Route	Reduced ability to meet the Purpose and Need because of limited redundancy due to the shared use of Midland Avenue by this alternative and the existing 27th Street bridge. This alternative would be impacted by the same traffic patterns at the existing 27th Street bridge/Grand Avenue intersection. Compares less favorably than Alternative 5 in terms of accessing SH 82.
No. 3 Cardiff Bridge, South Route	Reduced ability to meet the Purpose and Need because of limited redundancy due the shared use of Midland Avenue by this alternative and the existing 27th Street bridge. Compares less favorably than Alternative 5 in terms of accessing SH 82.
No. 4 New Cardiff Bridge, North Route	Reduced ability to meet the Purpose and Need because of limited redundancy due the shared use of Midland Avenue by this alternative and the existing 27th Street bridge. This alternative would be impacted by the same traffic patterns at the existing 27th Street bridge/Grand Avenue intersection. Compares less favorably than Alternative 5 in terms of accessing SH 82.
No. 6 New Cardiff Bridge, South Route	Reduced ability to meet the Purpose and Need because of limited redundancy due the shared use of Midland Avenue by this alternative and the existing 27th Street bridge. Compares less favorably than Alternative 5 in terms of accessing SH 82.
No. 7 Mt. Sopris Drive	Greater community, right of way and environmental impacts. Developing an alternative with a similar cross section to the Preferred Alternative along this narrow residential street which is surrounded by dense single family residential parcels would result in direct impact to residential properties, much greater noise impacts (more receptors), safety concerns especially because of the adjacency of Sopris Elementary School, and impacts to two parks, the Sopris Ball Field and Glenwood Park.
No. 9 East of Airport	Greater community, right of way and environmental impacts. Developing an alternative with a similar cross section to the Preferred Alternative along this narrow residential street which is surrounded by dense single family residential parcels would result in direct impact to residential properties, much greater noise impacts (more receptors), safety concerns especially because of the adjacency of Sopris Elementary School, and impacts to three parks, the Sopris Ball Field, Conservancy Park and Glenwood Park.
No. 11A Through Airport South, At-Grade, Crossing A	These alignments crossed through the center of the Holy Cross Energy parcel, incurring impacts to a

Table 4. Results of Level 2 Screening

Alternative	Primary Reasons for Screening
No. 11B Through Airport South, Below-Grade, Crossing A	major regional employer. A prohibitively steep grade would be required to travel from the west side of the parcel to SH 82. The connection to SH 82 would not meet CDOT safety and spacing standards.
No. 13 South of Airport, Crossing A, Continuous Flow	
No. 14 South of Airport, Crossing B, Continuous Flow	This alternative, and alternative 16, were similar in nature, and were merged and analyzed as Alternative 16 during Level 3 screening.
No. 15 South of Airport, Crossing A, Non-Continuous Flow	The alignment crossed through the center of the Holy Cross Energy parcel, incurring impacts to a major regional employer. A prohibitively steep grade would be required to travel from the west side of the parcel to SH 82. The connection to SH 82 would not meet CDOT safety and spacing standards.
No. 17 Prehm Ranch, North Route, Crossing C	On a comparative basis to Crossing D, Crossing C directly impacted active ranch land and a potential historic resource. The SH 82 connection would not meet CDOT safety and spacing standards.
No. 18 Prehm Ranch, North Route, Crossing D	Low ability to meet the Purpose and Need because of significant out of direction travel, especially for those traveling from Four Mile Road.
No. 19 Prehm Ranch, South Route	
No. 20 Four Mile Creek, Crossing C	On a comparative basis to Crossing D, Crossing C directly impacted active ranch land and a potential historic resource. The SH 82 connection would not meet CDOT safety and spacing safety standards.
No. 22 Prehm Ranch/ Four Mile Creek, Crossing E	High cost and out of direction travel for those coming from Four Mile Road meant that this alternative compared poorly against the Prehm Ranch/Four Mile Creek, Crossing D. Would cross an existing conservation easement.
No. 24 Prehm Ranch/ Four Mile Creek, Crossing C	On a comparative basis to Crossing D, Crossing C directly impacted active ranch land and a potential historic resource. The SH 82 connection would not meet CDOT safety and spacing standards.

1
2
3

PINEDALE
Natural Gas

February 18, 2021

Terri Partch
City Engineer
Glenwood Springs, CO

Re: South Bridge Plan 2.B

The Airport Board this morning discussed the current Options 1 and 2 for the South Bridge road alignment. The overriding concern among pilots is preservation of the runway length – at 3305 ft already the shortest of all Colorado public airports. The second priority is to keep our excellent aircraft maintenance facility.

I'm a pilot for 45 years and served on the airport commission for 10 years. We were involved in South Bridge since Rep. Scott McInnis announced it in Apr04. As chairman during the first Environmental Assessment in 2008, I and other commission members participated in the public comment sessions. We gave input in public settings but never had a meeting or any significant voice with principals of Jacobs or the City. The Tunnel was offered as a compromise in the sense of *This or nothin'*.

I'm also an engineer and utility owner, and fly mostly for business in CO-WY-NV-CA-KY. I'm not a road or bridge specialist, but have built a thousand miles of gas pipelines and have some sense of dirt moving, environmental permitting and public processes.

The plans for the South Bridge & connecting roads from the very first drafts have avoided the most obvious, practical plan to build South Bridge and keep the Airport. Instead,

- The CO-82 east end of the bridge was moved over onto Holy Cross, with a curved approach, solely to shave a few square feet off Jacksons;
- That aligns the bridge across the river through the south "32" end of the runway; then
- Makes a gentle 200 mph curve into Airport Rd, cutting off all south hangars, wasting land and maximizing impact on the Airport & its commerce;
- (but immediately thereafter has a "traffic calming" roundabout at Cardiff Glen); and
- Requires either an expensive Tunnel or a large cut through the runway that will shorten it by 300-400 ft, if not close it forever.

This plan always seemed to intentionally point a gun at the head of the Airport, with the intent of closing it. The oblique angle was an illogical mystery, that took up much more land than necessary. Out of a couple dozen routes evaluated, the only other EA alternative nearby was to tie the bridge into the existing, tortured Airport Center Rd around the hangars and City Boneyard. The more obvious, straight connection to Airport Rd was never analyzed.

Pinedale Natural Gas, Inc.
PO Box 1054 ✠ Glenwood Springs, CO 81602 ✠ 970-928-9208 *steve@pinedalegas.com*

Trench vs Tunnel. Instead of a Tunnel, the west end of the bridge can swing south to angle the connecting road about 100 ft south of the runway. The west abutment would be moved south about 80 ft along the same bench. The east approach on Jacksons and abutment on Holy Cross would be mostly unchanged. This adjustment should be well within the area of the EA.

One or both hangars will still have to relocate north of the new road, but there are many benefits:

- Tie squarely into Airport Ctr Rd for now, until funding is complete for Midland South;
- No Tunnel, open cut Trench; roadway is 10 ft below runway, with stemwall sides;
- Connector comes above grade and makes a 55 mph curve into Airport South Rd;
- Remaining land parcels are more squared off, not pointy & wasted.

The bridge is projected at $15 million. With abutments each end and 2 pillars on the river banks, the 600 ft bridge deck is aprx $10-11M of that. Using over-simplistic math & trig, swinging the west end about 80 ft or 7.7° south, would lengthen the bridge deck by 6 ft or $120k. You correctly noted that a re-design will cost some of the Tunnel savings, but any change to the runway for Option 1 or 2 would also require some design work.

FAA airspace considerations are better for this alignment than #1 or 2 that cut through the runway. This airport is already far outside of FAA airspace compliance for all but VFR daytime flight, and this alternative is actually better than today, with above-grade road traffic.

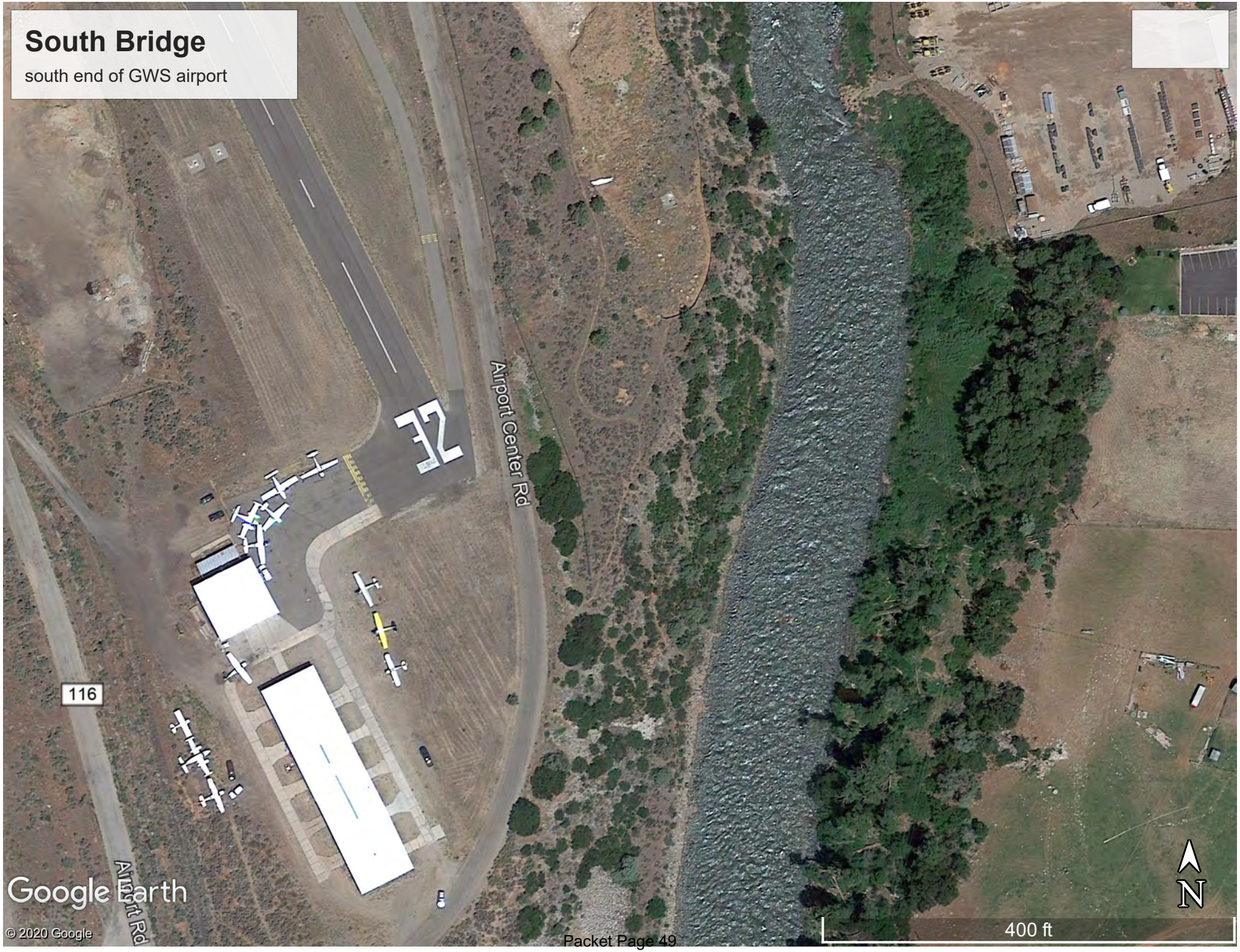
Most regular car-truck-SUV traffic will pass below-grade through the runway centerline. Delivery trucks (UPS-FedEx type) will appear to pilots to be at grade or 1-2 ft above. More sporadic semi-truck trailers would pass through the runway centerline at 4-5 ft above grade, well below the climb-out or glideslope gradients of the small aircraft that actually use GWS.

For added safety, the tops of the trench walls could be scalloped back 3-4 ft, with arrestment fences on each side of the road cut. For visiting, unfamiliar pilots, clicking the Super Unicom for landing conditions could also trigger radio-controlled, hooded strobe lights (1 blink /sec) pointed north & south on the runway centerline. Like the height alarms for Eisenhower tunnels, monitors could be set up at Cardiff roundabout and CO-82 to trigger fast-blink strobes for 45 seconds if a high truck is detected. These lights would be timed off after dusk.

In short, this long expensive process has missed the obvious, all-win solution for traffic and aircraft. With all the machinations over Tunnel design & cost, the airport users didn't seem to have much voice. The 2.B. Trench alignment would preserve far more options for keeping the Airport viable.

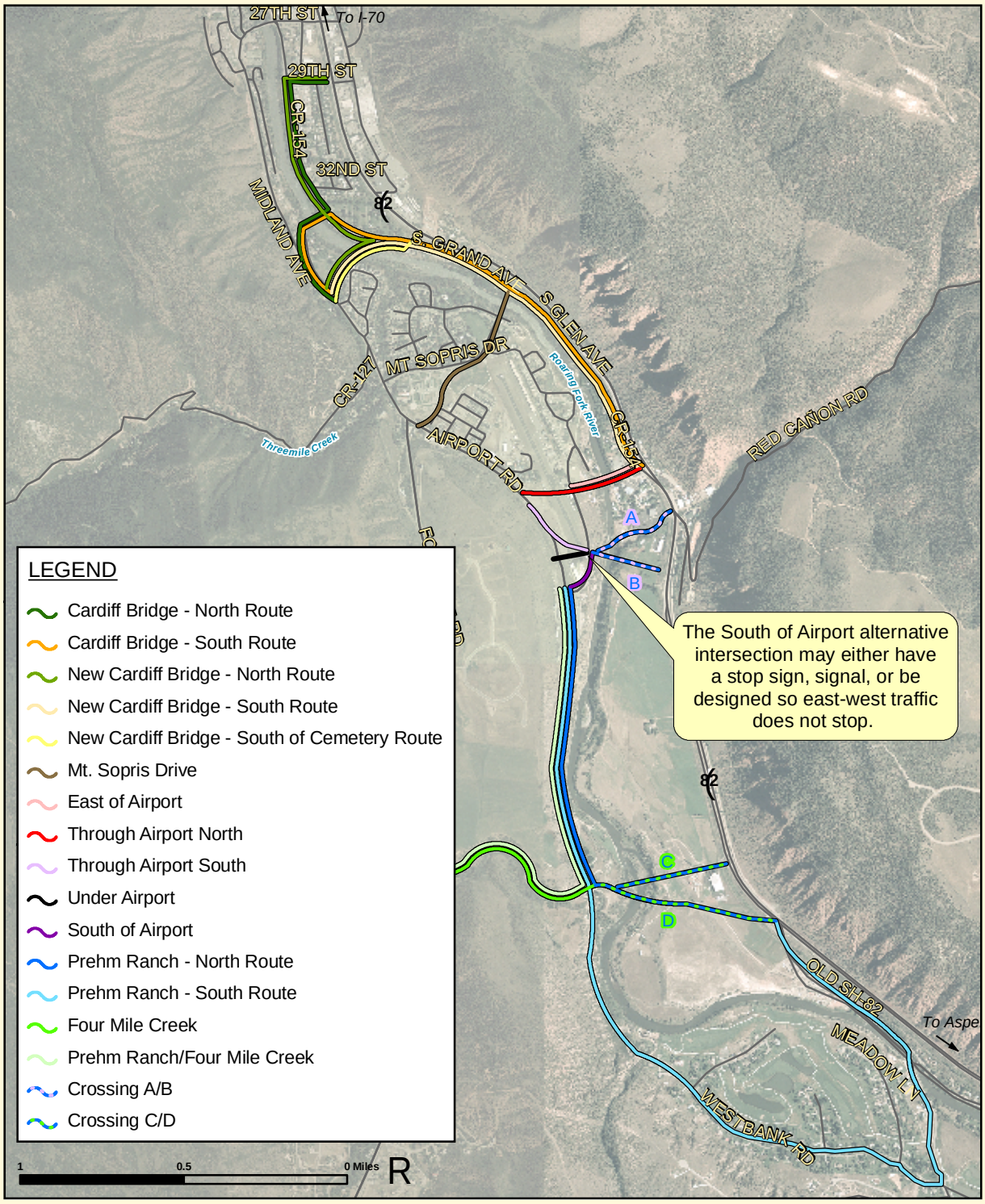
Sincerely,

Steven Shute, PE


South Bridge
south end of GWS airport
Airport Center Rd
116
Airport Rd
Google Earth
© 2020 Google
N
400 ft

Alternatives - Level 2

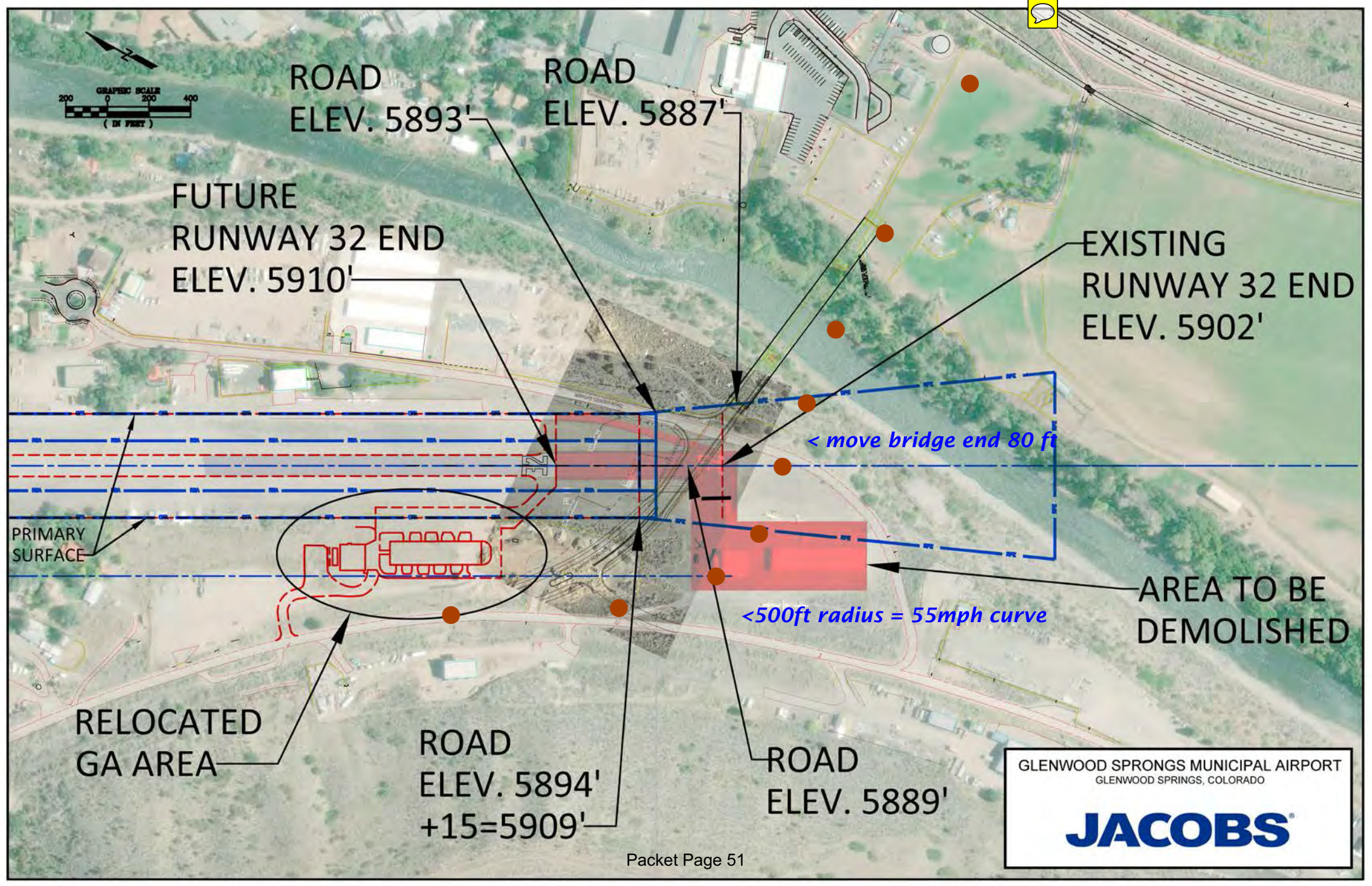
Original EA



The South of Airport alternative intersection may either have a stop sign, signal, or be designed so east-west traffic does not stop.

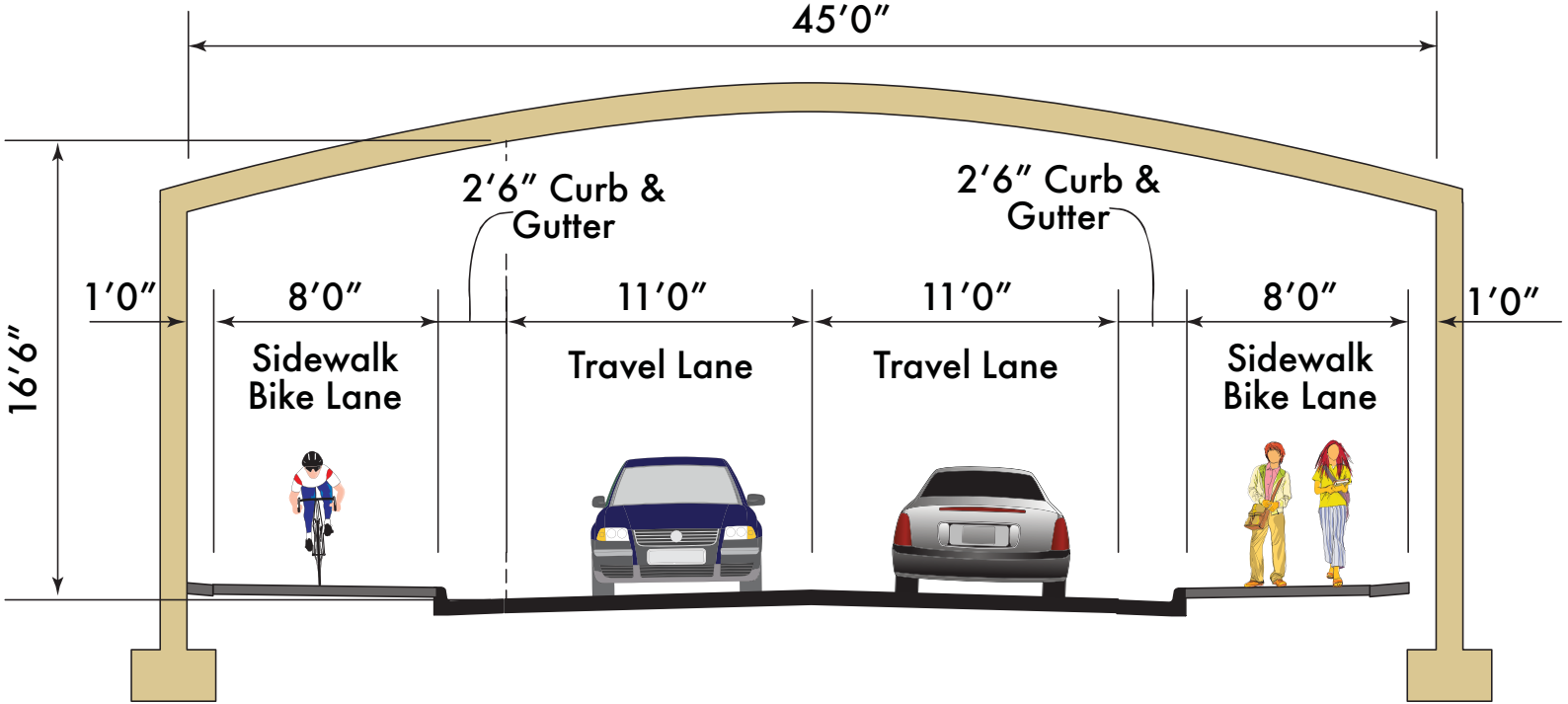
City of Glenwood Springs
SOUTH BRIDGE
ENVIRONMENTAL ASSESSMENT

Thursday, March 27, 2008
Q:\Jobs\GlenwoodSprings\mxd\GlenwoodSprings_Level2_Screening_Alternatives.mxd

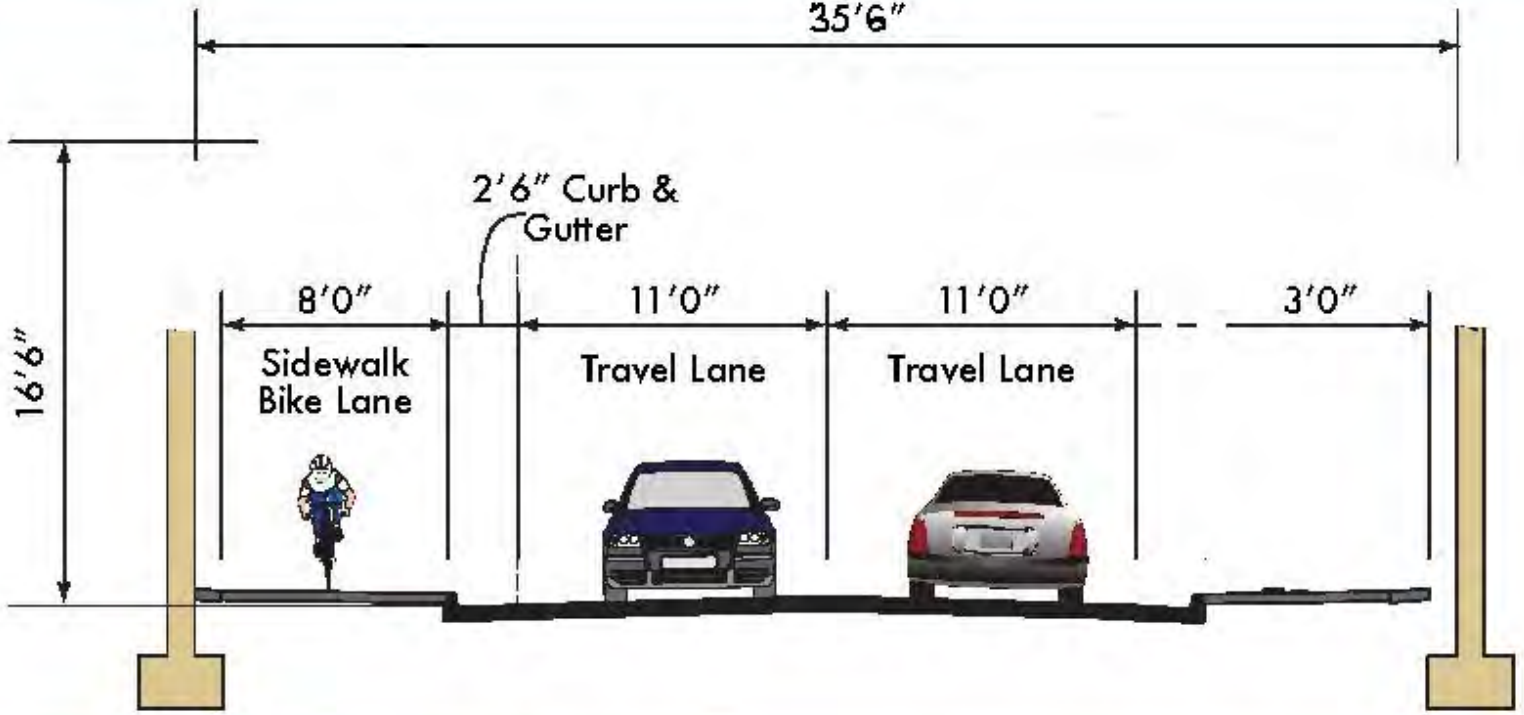

GRAPHIC SCALE
200 0 200 400
(IN FEET)
ROAD
ELEV. 5893'
ROAD
ELEV. 5887'
FUTURE
RUNWAY 32 END
ELEV. 5910'
EXISTING
RUNWAY 32 END
ELEV. 5902'
< move bridge end 80 ft
PRIMARY
SURFACE
<500ft radius = 55mph curve
AREA TO BE
DEMOLISHED
RELOCATED
GA AREA
ROAD
ELEV. 5894'
+15=5909'
ROAD
ELEV. 5889'
GLENWOOD SPRONGS MUNICIPAL AIRPORT
GLENWOOD SPRINGS, COLORADO
JACOBS


Airport Center
Rd (CR 116)
6019+00
6020+00
6021+00
6022+00
6023+00
6024+00
6025+00
6026+00
6027+00
6028+00
6029+00
6030+00
6031+00
6032+00
6033+00
6034+00
6035+00
6036+00
6037+00
6038+00
Existing
ROW
Airport Road
Improvements

Tunnel Section



Trench Section



PIPELINE SOLUTIONS, INC.
GLENWOOD SPRINGS, CO
(970) 928-9208

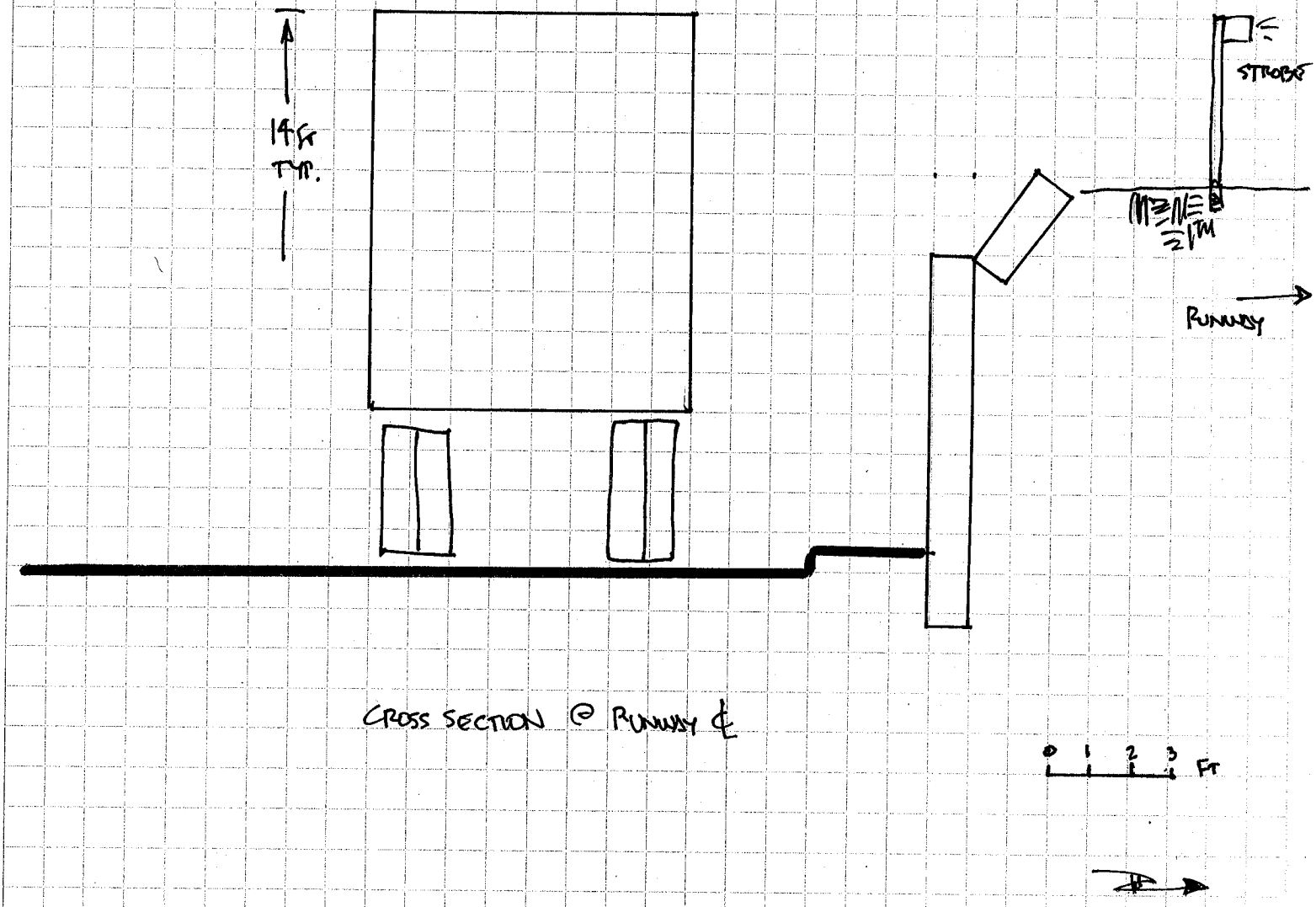
DATE Feb 21

ENGR S

COMPANY GCWS APT

SHEET ____ OF ____

PROJECT SO PARACHE "TRENCH" SECTION



CROSS SECTION @ RUNWAY ℄

0 1 2 3 FT