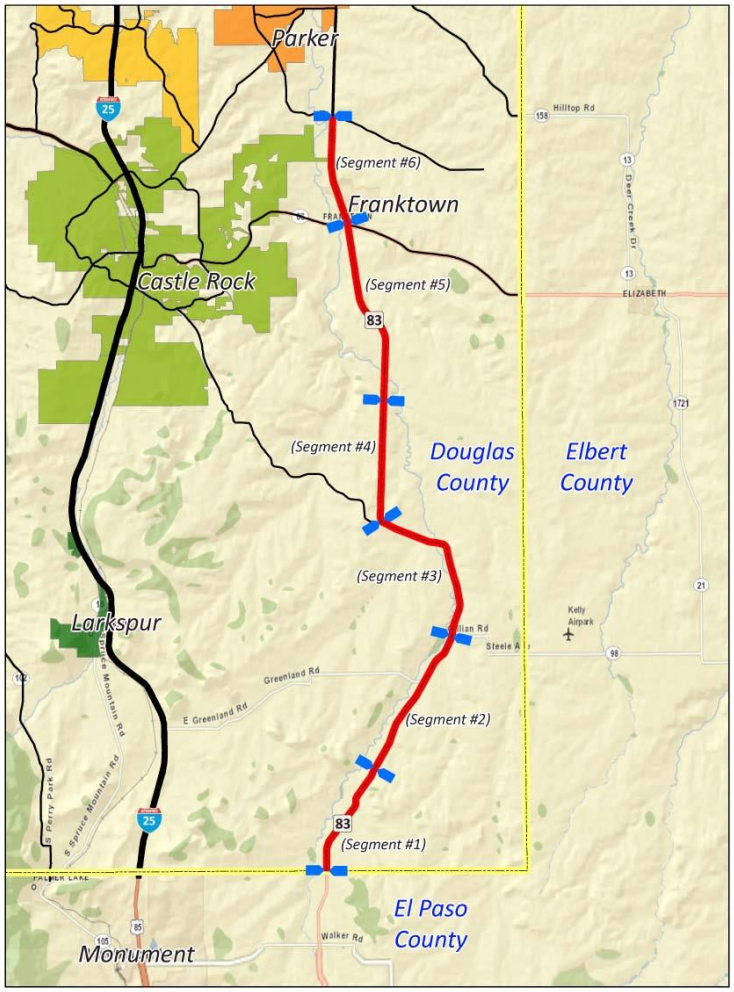
Part 1	Base Information
1. Project Title	**SH 83 Safety Improvements (Bayou Gulch Road to El Paso County)** Note: project includes environmental, design, right-of-way acquisition, utility relocations and construction; however, we are only requesting federal funding for construction of to be identified top priority improvements within funding constraints.
2. Project *Start/End* points or Geographic Area *Provide a map with submittal, as appropriate*	**SH 83 (Parker Road) Safety Improvements Bayou Gulch Rd. to El Paso County Northern Boarder** *(Highlighted red)* 
3. Project Sponsor *(entity that will construct/ complete and be financially responsible for the project)*	Douglas County
4. Project Contact Person, Title, Phone Number, and Email	Art Griffith, Capital Improvements Projects Manager, 303-660-7490, AGriffit@douglas.co.us
5. Does this project touch CDOT Right-of-Way, involve a CDOT roadway, access RTD property, or request RTD involvement to operate service?	☒ Yes ☐ No *If yes, provide applicable concurrence documentation with submittal*

6. What planning document(s) identifies this project?	☐	
	☒ Local plan:	Safety Assessment Report SH 83A MP 30.20-53.88 El Paso/Douglas County Line – North, Douglas County Department of Public Works (DiExSys, Jan. 2019) Douglas County 2030 Transportation Plan (Nov. 9, 2009), Widening pg. 47, Transit (Parker to Franktown) pg. 67, Bike pg. 70, Implementation pg. 83-86 SH83-86 Corridor Optimization Plan (Sept. 2004)
	☐ Other(s):	
	Provide link to document/s and referenced page number if possible, or provide documentation with submittal	

7. Identify the project's **key elements**.

- ☐ Rapid Transit Capacity (2040 FCRTP)
- ☐ Transit Other:
- ☐ Bicycle Facility (if possible)
- ☐ Pedestrian Facility
- ☒ Safety Improvements
- ☐ Roadway Capacity or Managed Lanes (2040 FCRTP)
- ☒ Roadway Operational

Grade Separation

- ☐ Roadway
- ☐ Railway
- ☐ Bicycle
- ☐ Pedestrian

- ☐ Roadway Pavement Reconstruction/Rehab
- ☐ Bridge Replace/Reconstruct/Rehab
- ☒ Study
- ☒ Design
- ☐ Transportation Technology Components
- ☒ Other: Improvement priorities may include passing lanes, increase shoulder width, and intersections

8. **Problem Statement** What specific Metro Vision-related subregional problem/issue will the transportation project address?

The SH 83 Safety Improvements (Bayou Gulch Road to El Paso County) project is targeted to address each of the Metro Vision themes of in manner consistent with the principles of thinking regionally and working collaboratively to address imperative needs in realizing the aspirational targets for the region. SH 83 is a unique transportation facility within the region and as a vital connection to adjoining destinations. As a regional arterial and also serving as a rural highway, it connects multiple communities, provides access to natural resources and agricultural areas of southeast Douglas County, and allows rural DRCOG region residents with timely access to health care, emergency services, schools, businesses, and the opportunities of the regional economy. This highway is also the only other significant route parallel to I-25, connecting Douglas and El Paso counties; and the two largest MPO's in Colorado. Maintaining a safe, efficient, and all-weather operation is critical to the resiliency of the region's transportation system and the health of its residents, to preserve a high quality of life.

This project will construct identified high priority projects that will address safety and resiliency needs in the SH 83 corridor. Improvements will be identified through a corridor planning process being funded locally independent of this application. Douglas County has completed an initial assessment of the corridor to quantify the significant safety issues (prepared by DiExSys, January 2019 – full report available upon request). Beginning in 2019, Douglas County will continue to fund additional analysis to identify specific improvements for safety and other measures of performance of this critical transportation facility within the limits of the construction budget. They have requested and obtained CDOT concurrence on the purpose and need for the project.

The safety analysis preliminarily identified multiple locations and strategies where constructed improvements would provide a high benefit to cost return on investment. It is anticipated that the Total Project Cost shown in Section A.1 below could provide significant performance enhancement for the corridor in safety and resiliency.

The efficient and responsible investment of resources in addressing safety problems presents challenges within the limitations of available budgets and the aspirations captured by CDOT's Moving Towards Zero Deaths initiative. Going even further, it is Douglas County's objective to maximize crash reduction within the limitations of available budgets by making road safety improvements at locations where it provides the greatest crash reduction and meets or exceeds HSIP required cost-benefit thresholds.

SH 83 is one of the top three most traveled north-south corridor in Douglas County. Travelers using the corridor navigate a facility that lacks safety features including passing lanes, many intersections without turn lanes, and inadequate or non-existent shoulders abutting non-recoverable slopes. The corridor also traverses some of the highest and windiest terrain in the southern front range and driving in winter weather events is challenged by blowing and drifting snow, lack of delineators or shoulder rumble strips, and none of the traveler aids including remote weather information stations (RWIS), cameras, or message signs that could make travel smarter. There are significant populations of elk and deer that cross the highway, especially at dusk or dawn to water in Cherry Creek or other smaller drainages that generally parallel the route.

The Safety Analysis recently completed by Douglas County indicates that this corridor has a significant number of crashes every year and this number has grown from 54 in 2012 to 90 in 2016. Fatalities in this period were 11 people killed. Ten of those were in non-intersection locations which indicates the dangerous conditions of the roadway itself. This problem will be addressed through a mix of corridor wide and site-specific improvement identified through a corridor study and programmed within the requested construction budget.

When considering safety improvements, the supplemental analysis will evaluate resiliency, system preservation, mobility, and other measures to identify short term investments appropriate for the budget of this request and longer-term investments that will require future funding. For example, our project team will evaluate/consider utilizing innovative long-term solutions such as Swedish 2+1 as a pilot project, as depicted later in this application.

9. Define the **scope** and **specific elements** of the project.

The scope of improvements and specific elements are being identified in a planning phase. This phase will conclude with the selection of cost effective and valued engineering solutions for final design and implementation. The planning phase will determine which segments of SH83 will be improved to maximize available funding in the construction of these safety improvements. Strategies to be considered include passing lane sections, intersection improvements, turn lanes, and clear zone protections in spot locations where crashes are occurring. Corridor wide strategies including delineators, rumble strips, driver alerts and conflict warning systems. Replacement of guardrail with cable rail and other improvements to mitigate blowing and drifting snow may also be determined to have positive benefit cost ratios for improving safety.

10. What is the status of the proposed project?

2019-2021 – advance the Safety Assessment Report for US 83, El Paso-Douglas County Line – North to the selelection of options available to continue the completion of the NEPA enviromental clearance document and preparing preliminary plans / final construction documents.

2022-2023 – Advance the project to constrcution completion.

11. Would a smaller DRCOG-allocated funding amount than requested be acceptable, while maintaining the original intent of the project?	☒ Yes ☐ No

If yes, define smaller meaningful limits, size, service level, phases, or scopes, along with the cost for each.

Though the analysis already completed by the applicant, the Total Project Cost was determined to be the minimum investment necessary to affect any meaningful performance improvement in this 23.8-mile-long corridor; however, the applicant would be willing to consider accepting $5.5M in lieu of $6.0M.

A. Project Financial Information and Funding Request

1. Total Project Cost		**$12,000,000**
2. Total amount of DRCOG Subregional Share Funding Request	**$6,000,000**	**50%** of total project cost
3. Outside Funding Partners ***(other than DRCOG Subregional Share funds)*** List each funding partner and contribution amount.	**$$ Contribution Amount**	**% of Contribution to Overall Total Project Cost**
Applicant Contribution	3,000,000	25%
CDOT Funding Request	3,000,000	25%
	$	
	$	
	$	
	$	
Total amount of funding provided by other funding partners *(private, local, state, Regional, or federal)*	**$6,000,000**	

Funding Breakdown (year by year)*

**The proposed funding plan is not guaranteed if the project is selected for funding. While DRCOG will do everything it can to accommodate the applicants' request, final funding will be assigned at DRCOG's discretion within fiscal constraint. Funding amounts must be provided in year of expenditure dollars using an inflation factor of 3% per year from 2019.*

	FY 2020	FY 2021	FY 2022	FY 2023	Total
Federal Funds	$0	$0	$3,000,000	$3,000,000	**$6,000,000**
State Funds	$0	$0	$3,000,000	$ 0	**$3,000,000**
Local Funds	$0	$0	$3,000,000	$0	**$3,000,000**
Total Funding	$0	$0	$9,000,000	$3,000,000	**$12,000,000**
4. Phase to be Initiated *Choose from Design, ENV, ROW, CON, Study, Service, Equip. Purchase, Other*			**Construction**		

5. By checking this box, the applicant's Chief Elected Official (Mayor or County Commission Chair) or City/County Manager for local governments or Agency Director or equivalent for others, has certified it allows this project request to be submitted for DRCOG-allocated funding and will follow all DRCOG policies and state and federal regulations when completing this project, if funded. ☒

Part 2 Evaluation Criteria, Questions, and Scoring

A. Subregional significance of proposed project

WEIGHT **40%**

*Provide **qualitative and quantitative** (derived from Part 3 of the application) responses to the following questions on the subregional significance of the proposed project.*

1. Why is this project important to your subregion?

SH 83 is one of the top three most north-south traveled corridors in Douglas County with 2018 Average Daily Traffic (ADT) exceeding 17,000. 2040 volumes are projected to range from 14,000 to 28,000 ADT throughout the corridor. On average, over the last five years total crashes have increased by 14% per year, intersection related crashes have increased by 9% per year, and non-intersection crashes have increased by 18% per year.

Continued growth in the region is expected to increase traffic volumes and the current trend of increasing crashes. Improvement are needed to improve the safety of this heavily traveled corridor.

Improvements on SH 83 will also provide a reliability and redundancy in the transportation system for commuters and residents within Douglas County and regionally to and from Arapahoe County, El Paso County, and Elbert County. Additionally, SH83 serves as a secondary alternative route to I-25 between the Denver Metro area and Colorado Springs. This redundancy will improve reliability for the workforce and users. These improvements will also resolve many safety issues found in the current planning

2. Does the proposed project cross and/or benefit multiple **municipalities**? If yes, which ones and how?

SH 83 is the primary access route for several municipalities in Douglas County and serves as a secondary travel route between the Denver Metropolitan Area and municipalities in Douglas County, Elbert County, and El Paso County.

- SH83 benefits and crosses directly through Franktown, the Town of Parker, and the Town of Castle Rock's eastern boundary at Castle Oaks Drive.
- SH83 further benefits several municipalities by providing secondary access from southern Colorado and City of Colorado Springs to the City and County Denver, City of Centennial, City of Aurora, Town of Elizabeth through the junction of SH86, Town of Monument, by providing additional options and an alternative route to I-25.

The SH83 project improves safety and significantly increases the reliability of the corridor for residents in these municipalities. It also provides a reliable local alternative to I-25 ensuring access for area residents during incidents on I-25.

The project further benefits these municipalities by connecting these communities to open space and recreational trails along SH83. Improved shoulders can also provide bicyclists a safer connection to regional trails within the corridor.

3. Does the proposed project cross and/or benefit another **subregion(s)**? If yes, which ones and how?

SH 83 provides significant benefits to the Douglas County, Arapahoe County, and City and County of Denver subregions. SH 83 additionally provides benefits to El Paso County and Elbert County as part of a larger transportation network.

SH 83 serves as a major north-south corridor for the subregions of Douglas County and Arapahoe County, and is a secondary route to the City and County of Denver to the north and El Paso County to the south. SH 83 also serves as a primary collector for Elbert County to access the Denver Metro area. Frequent crashes create congestion and

unpredictable travel times in the subregions. The planned improvements will improve safety and provide a reliable route that supports the subregional transportation network.

SH 83 also provides an alternative subregional route to I-25 for improved incident management within Douglas, Arapahoe, and El Paso County. All three subregions will greatly benefit by having SH 83 improved to better accommodate rerouted traffic and incidents on the I-25 corridor.

4. How will the proposed project address the specific transportation problem described in the **Problem Statement** *(as submitted in Part 1, #8)*?

The SH 83 Safety Project is needed to address the significant safety issues on this 23.8 mile long corridor and to provide a more resilient regional network. Douglas County has already funded a preliminary safety assessment of the corridor to confirm the need and to identify a range of likely strategies to meet these safety needs. The assessment provided a quantitative analysis of crash data from 2012 through 2016. The following information related to safety is excerpted from the January 2019 report.

SH 83 is classified as a Rural Principal Arterial throughout the study section. It is primarily a 2-lane undivided facility except near some of the more prominent intersections, where turn lanes and divided median have been provided, and through a short section from MP 45.03 to 45.55, where additional outer lanes have been provided for Port-of-Entry processing. Table 1 summarizes the locations of the sections where SH 83 is not a 2-lane undivided highway.

The travel lanes are 12 feet wide. Paved shoulders are typically 2 feet or less in width except in widened areas for guardrail and intersections. There do not appear to be either shoulder or centerline rumble strips anywhere within the study limits.

The Average Annual Daily Traffic (AADT) varies considerably through the corridor and has been tallied in Table 2 below.

Year	30.20-42.34	42.34-50.76	50.76-53.88
2012	3,200	5,700	12,000
2013	3,300	7,000	13,000
2014	3,400	7,300	13,000
2015	3,700	6,600	15,000
2016	3,800	7,700	15,000
Average	**3,480**	**6,460**	**13,600**

Table 2: Summary of AADT, SH 83, MP 30.20 to 53.88

The posted speed limit is 65 mph south of Franktown with one 50 mph (when flashing) school speed zone near MP 38. The speed limit north of Franktown is 55 mph. Both directions step down to 35 mph entering Franktown. For detailed information on speed zone signing see Table 3 in the report.

SUMMARY OF CRASH HISTORY

The crash history for the period of 1/1/2012 through 12/31/16 was examined. Three hundred forty-two (342) crashes were reported in the 5 year period with 198 Property Damage Only (PDO), 135 Injury, and 9 Fatal crashes. A total of 229 people were injured and 11 were killed.

Table 5 – 7 summarize the crash history for SH 83 over the 5-year period from 1/1/2012 – 12/31/2016. **Table 5** summarizes all crashes, and **Tables 6 and 7** summarize intersection related crashes and non-intersection related crashes separately. Numbers of people injured or killed are shown in parenthesis.

Year	PDO	Injury	Fatal	Total
2012	30	22 (40)	2 (2)	54
2013	38	22 (52)	0 (0)	60
2014	37	31 (45)	4 (4)	72
2015	41	24 (31)	1 (2)	66
2016	52	36 (65)	2 (3)	90
Total	198	135 (229)	9 (11)	342

Table 5: Summary of Crash History (All Crashes), SH 83 MP 30.20 to 53.88

Year	PDO	Injury	Fatal	Total
2012	21	13 (16)	1 (1)	35
2013	29	13 (20)	0 (0)	42
2014	25	20 (31)	4 (4)	49
2015	30	12 (17)	1 (2)	43
2016	39	22 (35)	2 (3)	63
Total	144	80 (119)	8 (10)	232

Table 6: Summary of Crash History (Non-Intersection Crashes including At Driveway Access), SH 83 MP 30.20 to 53.88

Year	PDO	Injury	Fatal	Total
2012	9	9 (24)	1 (1)	18
2013	9	9 (32)	0 (0)	17
2014	12	11 (14)	0 (0)	23
2015	11	12 (14)	0 (0)	21
2016	13	14 (26)	0 (0)	25
Total	54	55 (110)	1 (1)	110

Table 7: Summary of Crash History (Intersection Related Crashes), SH 83 MP 30.20 to 53.88

Table from Safety Assessment Report

Figure 2 plots the crashes that occurred in the study section by year. It shows total crashes and breaks our intersection related crashes and non-intersection related crashes. The chart shows a strong trend of increasing crashes over the recent 5-year period in all three categories. On average, total crashes have increased by 14% per year, Intersection related crashes have increased by 9% per year, and Non-intersection crashes have increased by 18% per year. By contract, the ADTs through the study section have only increased by an average of 6% per year, suggesting that the safety performance on the facility has been in recent decline.

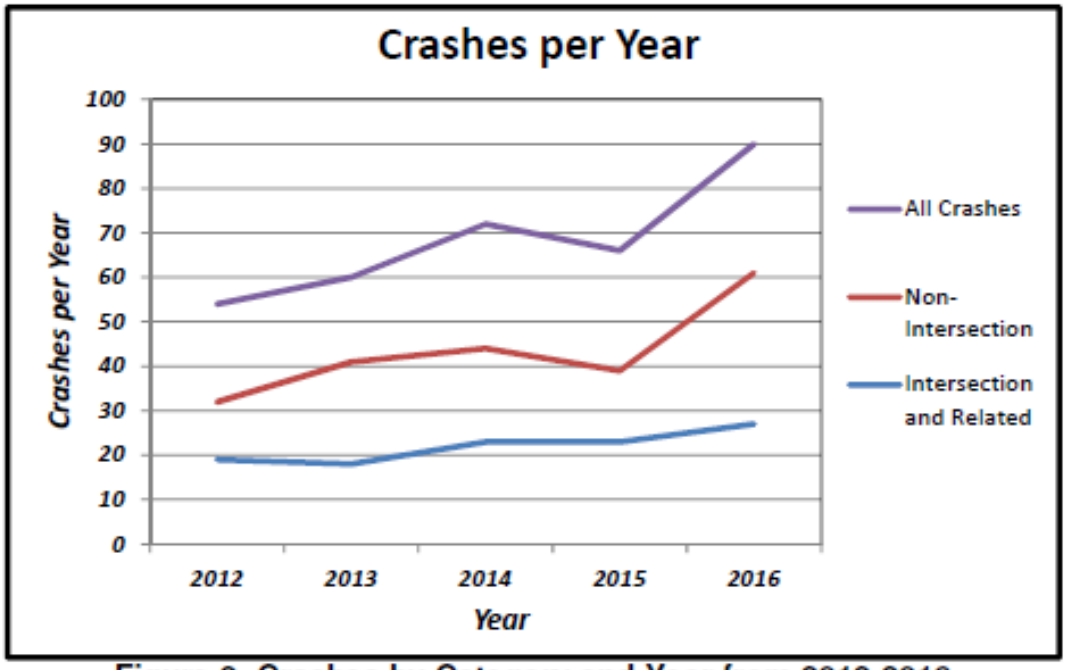


Figure 2: Crashes by Category and Year from 2012-2016

Crashes were divided between non-intersection and access related (Intersection / intersection related / driveway access) as illustrated in **Figure 3**. As shown, 217 (63.5%) were non-intersection related, while 108 (32.3%) were at intersections or intersection related. The remaining 15 (4.4%) crashes occurred at driveway accesses.

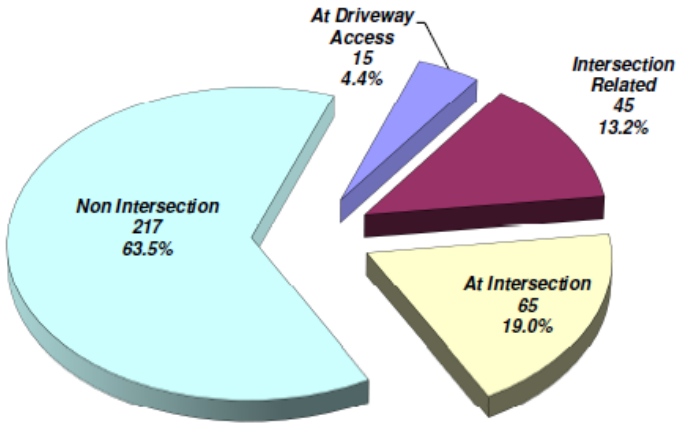


Figure 3: Distribution of SH 83 Crashes by Type of Location

Figure 5 provides the distribution of crash types within the study corridor. As shown, the most common crash types were rear end with 76 crashes, followed by fixed object crashes with 71 crashes, wild animals with 57 crashes and overturning with 35 crashes.

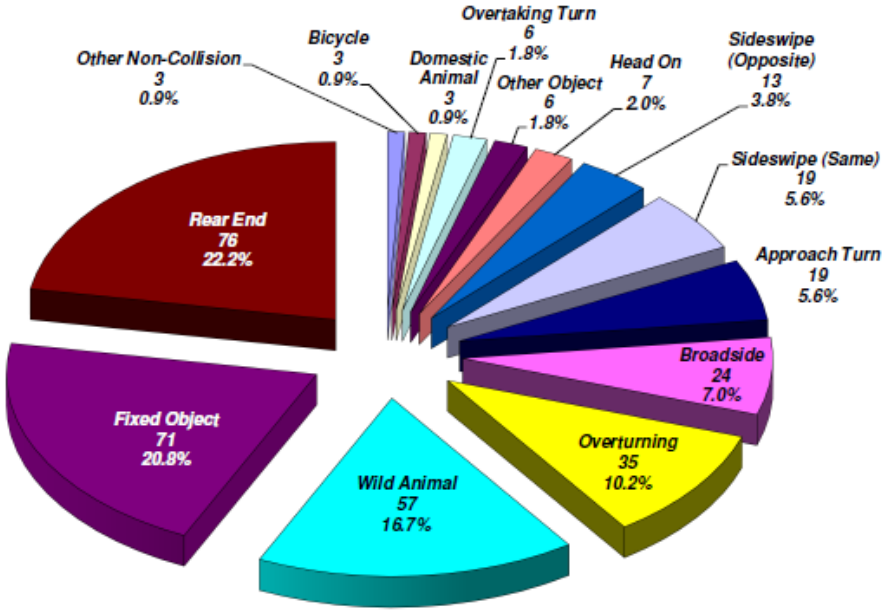


Figure 5: SH 83 Crash Distribution by Type, All Crashes

Non-Intersection Crashes

There were 217 Non-Intersection crashes in the study section. Of these 219 non-intersection crashes 137 (63.1%) were PDO 73 (33.6%) were injury crashes and 7 (3.2%) were fatal. A total of 108 people were injured and nine (9) were killed.

Figure 6 shows the distribution of non-intersection crashes within the study, by type of crash. As shown the most common non-intersection crash types were fixed objects with 60 crashes, followed by wild animals with 56 crashes overturning with 29, and rear-end with 23 crashes.

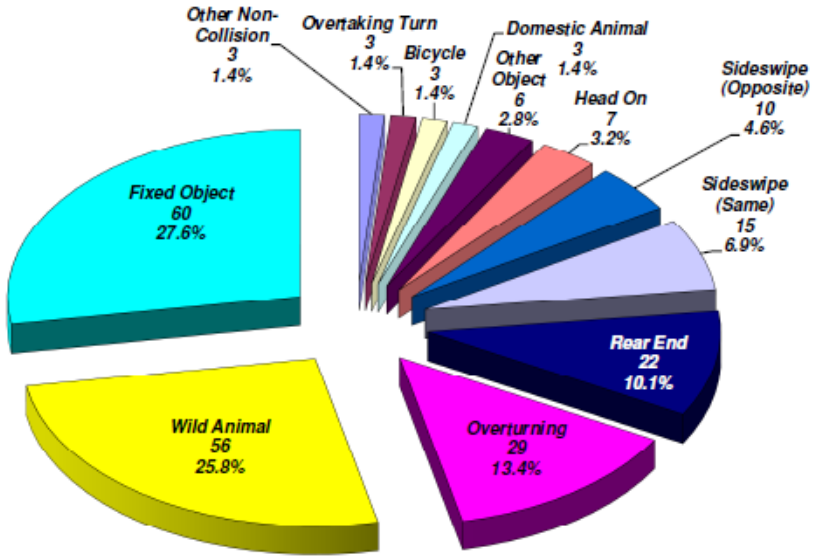


Figure 6: SH 83 Crash Distribution by Type, Non-Intersection Crashes

The concept of level of service uses quantitative measures and qualitative description that characterize safety of a roadway segment in reference to its expected frequency and severity. The degree of deviation from the norm can be stratified to represent specific levels of safety. The various LOSS are thus defined:

LOSS I - Indicates low potential for crash reduction
LOSS II - Indicates low to moderate potential for crash reduction
LOSS III - Indicates moderate to high potential for crash reduction
LOSS IV - Indicates high potential for crash reduction

Figure 7 shows the continuous safety performance profile along the SH 83 corridor, corrected for the RTM bias using EB method. It shows changes in safety performance related to non-intersection related crashes by milepost.

In terms of both crash frequency and severity, SH 83 performs at LOSS-II and LOSS-III through most of the corridor, reflecting mostly *low to moderate and moderate to high potential* for crash reduction. However, there are intermittent sections where the graph shows the corridor performing at LOSS-IV which reflects a *high potential* for crash reduction. The graph shows the severity plot extends into the LOSS-IV range of the function more frequently than the frequency plot, suggesting that the most potential lies in reducing the severity of crashes.

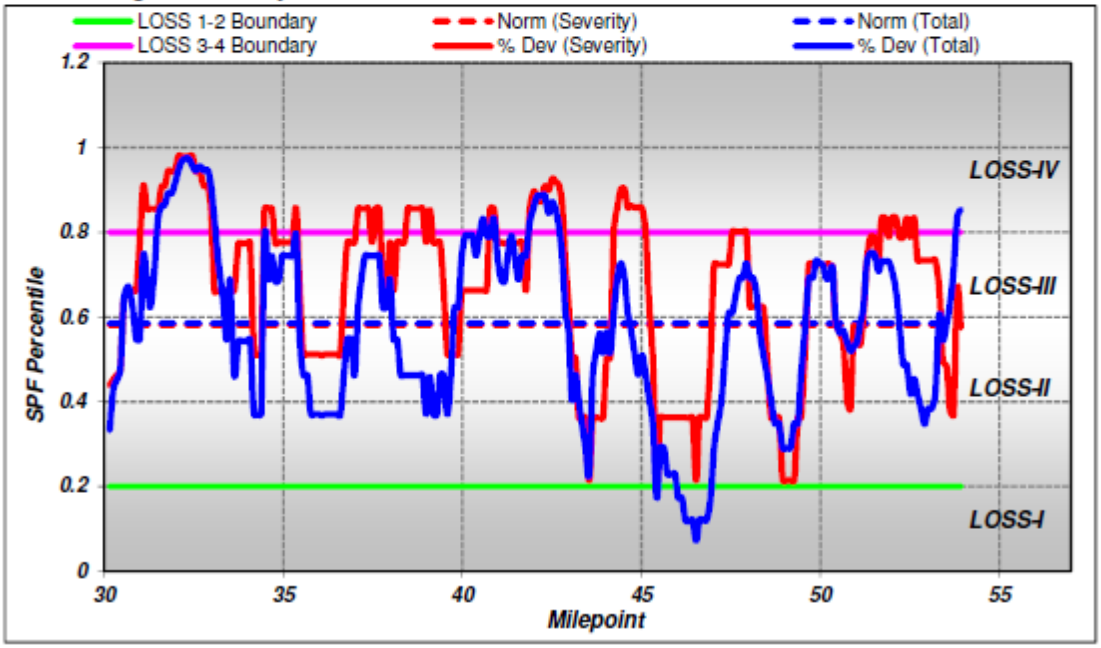


Figure 7: SH 83 MP 30.20 – 53.88) Safety Performance Profile

The results of the safety assessment confirm that the corridor exhibits a significantly high frequency of crashes and that this number is trending higher at an increasing pace.

The assessment also concludes that there is opportunity for significant potential crash reduction through modest investments. Potential investments were evaluated for benefit and cost within the assessment. Corridor segment and intersection options were selected in the table below to maximize the cost benefit ratios.

Segment Location	Improvement	Cost of Implementation	Service Life Benefit	B/C	Category	Select
MP 42.34 - 45.30	Convert to Swedish 2+1 Lane Section with Cable Barrier	$ 2,960,000	$ 10,419,200	**3.52**	4. Swedish 2+1	x
MP 50.76 - 53.88	Widen to add TWLTL and 8' Shoulders with Rumble Strips	$ 1,925,000	$ 6,949,250	**3.61**	3. Widening	x
MP 30.20 - 33.50	Cable Rail - Spot Location (MP 32.15 - 32.61)	$ 125,000	$ 673,750	**5.39**	2. Cable	x
MP 33.51 - 37.82	Cable Rail - Full Segment	$ 850,000	$ 569,500	**0.67**	2. Cable	x
MP 37.83 - 42.33	Cable Rail - Full Segment	$ 900,000	$ 891,000	**0.99**	2. Cable	x
MP 42.34 - 45.30	Cable Rail - Full Segment	$ 592,000	$ 787,360	**1.33**	2. Cable	x
MP 45.31 - 50.75	Cable Rail - Spot Location (MP 47.30 - 48.20)	$ 180,000	$ 3,155,400	**17.53**	2. Cable	x
MP 30.20 - 33.50	*Centerline Rumble Strips (W/O Widening)	$ 6,600	$ 6,600	**1.00**	1b. Rumble (Center)	x
MP 45.31 - 50.75	Centerline Rumble Strips (ONLY)	$ 11,000	$ 863,060	**78.46**	1b. Rumble (Center)	x
MP 33.51 - 37.82	Centerline and Shoulder Rumble Strips (W/O Widening)	$ 25,800	$ 573,276	**22.22**	1a. Rumble (Both)	x
Intersection Location	**Improvement**	**Cost of Implementation**	**Service Life Benefit**	**B/C**	**Category**	**Select**
Gillian Avenue	Southbound Left Turn Lane	$ 315,000	$ 2,305,800	**7.32**	3. Auxiliary	x
Russellville Road (North)	Widening to 8' Shoulders 600' N and S of Intersection	$ 170,000	$ 1,519,800	**8.94**	3. Auxiliary	x
Park Drive	Southbound Left Turn Lane	$ 220,500	$ 855,540	**3.88**	3. Auxiliary	x
Palmer Divide Road	Conflict Warning System	$ 20,000	$ 1,586,200	**79.31**	2. CWS	x
Russellville Road (South)	Conflict Warning System	$ 20,000	$ 114,200	**5.71**	2. CWS	x
Lake Gulch Road	Conflict Warning System	$ 20,000	$ 100,000	**5.00**	2. CWS	x
Russellville Road (North)	Conflict Warning System	$ 20,000	$ 718,800	**35.94**	2. CWS	x
Hwy 86	Fully Protected Left Turns, Northbound and Southbound	$ 5,000	$ 1,345,550	**269.11**	1. Signal Mod	x

Segment Selection Cost: $7,575,400	**Service Life Benefit: $24,888,396**	**B/C= 3.3**
Intersection Selection Cost: $790,500	**Service Life Benefit: $8,545,890**	**B/C= 10.8**
Total Selection Cost: $8,365,900	**Service Life Benefit: $33,434,286**	**B/C= 4.**

One of the strategies considered in the evaluation is the Swedish 2+1 roadway as illustrated below. This innovative approach proves effective in providing crash reduction. SH 83 could be used as a pilot project for similar two-lane roadways through rolling terrain where safety needs are identified.

Some of the crash characteristics in the segment analyzed are among those that have been shown to respond well to the introduction of the Swedish 2+1 cross section. This configuration consists of three traffic lanes, one for each direction of travel, plus a third lane, which alternately provides an additional lane for one direction of travel and then the other, with the opposing lanes of traffic are separated by cable rail.

Observational before and after studies conducted in Sweden over the last 20 years or so showed that 75% crash reduction in fatalities and 50% reduction in injuries can be expected. In addition to reducing head-on and sideswipe-opposite crashes Swedish 2+1 Section with Barrier is also effective in reducing severity of the roadway departure crashes such as overturning and fixed object collisions. Since this segment of SH 83 exhibits a higher than expected frequency of crashes involving bodily injury, this may be an effective location to use the Swedish 2+1 configuration.

While such an improvement is beyond the scope of the current request, it will be considered in the planning phase being continued by Douglas County in 2019. Such long-term solutions will be considered and identified as part of a program for short and long-term implementation.

Both short and long-term improvements will also be evaluated for enhancing the reliability of SH 83 as part of a resilient transportation network. Manu of the considered safety improvements provide a reliability benefit as well including shoulder improvements. Additional short-term improvements that may provide reliability benefit include:

- Blowing and drifting snow mitigation
- Driver information systems including RWIS, speed indication signs ahead of sharp curves, and animal crossings
- Web accessible cameras for inclusion in CDOT's COTrip traveler information website
- Variable message signs coordinated with I-25 systems to alert drivers to alternate routes during incidents

While this request is for an initial project that will provide immediate benefit with a moderate investment, Douglas County is leading the way to identify long-term, regionally-beneficial solutions by undertaking a more comprehensive planning phase prior to project identification, design, and this construction request.

5. One foundation of a sustainable and resilient economy is physical infrastructure and transportation. How will the **completed** project allow people and businesses to thrive and prosper?

Enhancing the safety and reliability of this critical link in the regional transportation system will increase opportunities for people and business to share in a vibrant economy. In its current condition, the SH 83 corridor is unreliable at best and dangerous at times. Frequent crashes in a constrained corridor cause road closures without available detours. Weather events, car vs animal crashes, and limited opportunities to pass safely create risk and delay that inhibits business opportunities. For smaller communities like Franktown, SH 83 is both a main street for local business and a critical connection to regional commerce, health care, schools, and employment.

The vast open space amenities available in this part of the region are a tremendous asset for attracting employers and provide a benefit to employees' quality of life. An improved SH 83 provides safe and reliable access and allows for an increase in public health and recreation benefits. These improvements will positively impact the business sectors of Castle Rock, Parker, Franktown, Denver, Centennial, Arapahoe County, and their connectivity to the economic opportunities in El Paso County.

6. How will connectivity to different travel modes be improved by the proposed project?

Safety and resiliency improvements on SH 83 will benefit multiple travel modes within the corridor and provide connectivity to the trails systems adjacent to the corridor. The planning phase will identify beneficial and cost-effective safety improvements for the corridor that are likely to include construction of shoulders where none currently exist. Any shoulders will provide a more comfortable location for bicyclists to ride, and shoulders also provide space to pull over in emergency and other benefits. RTD's P route currently comes to just north of the project, which could benefit from improved first/last mile connectivity.

7. Describe funding and/or project partnerships *(other subregions, regional agencies, municipalities, private, etc.)* established in association with this project.

Project funding will be a partnership from Federal Highway Administration (50%), Colorado Department of Transportation (25%) and Douglas County (25%) – This pertains to construction only. Douglas County anticipates incurring additional cost during the design phase which are not part of this grant application request.

B. DRCOG Board-approved Metro Vision TIP Focus Areas

WEIGHT **30%**

*Provide **qualitative and quantitative** (derived from Part 3 of the application) responses to the following questions on how the proposed project addresses the three DRCOG Board-approved Focus Areas (in bold).*

1. Describe how the project will **improve mobility infrastructure and services for vulnerable populations (including improved transportation access to health services).**

This project will improve safety for school children attending schools located on the roadway including Cherry Valley Elementary, Franktown Elementary, Trinity Lutheran School and Ponderosa High School on the north end. An improved SH 83 will also improve access to health care providers in the Parker and Denver Metro areas for residents of southeast Douglas County, and Elbert County. This corridor is the primary transportation artery for a significant geography and growing population. Alternative routes are few and far between when SH 83 is closed due to accident or weather event.

2. Describe how the project will **increase reliability of existing multimodal transportation network.**

A reliable and safe SH 83 complements and supports the much larger investment of I-25 as part of a resilient transportation network. Inter-regional bus service such as Bustang service between El Paso County and the Denver Metro area rely on a functional connection. SH 83 provides the only realistic alternative should incidents

on I-25 force a closure. Emergency response for natural disasters and the large scale management of such events also depend on functioning parallel routes. Besides I-25, SH 83 is the only continous connection from the Denver Metro area to the Pikes Peak region.

3. Describe how the project will **improve transportation safety and security.**

One of the main project goals is to improve user safety and regional reliability. This will occur through improved cross sections, safety devices, and roadside enhancements. The following graphic, Figure 7 from the safety study, shows the current crash rates on the corridor compared to the national average. This project will seek to improve, at the very least, the locations where the roadway sees LOSS-IV rates.

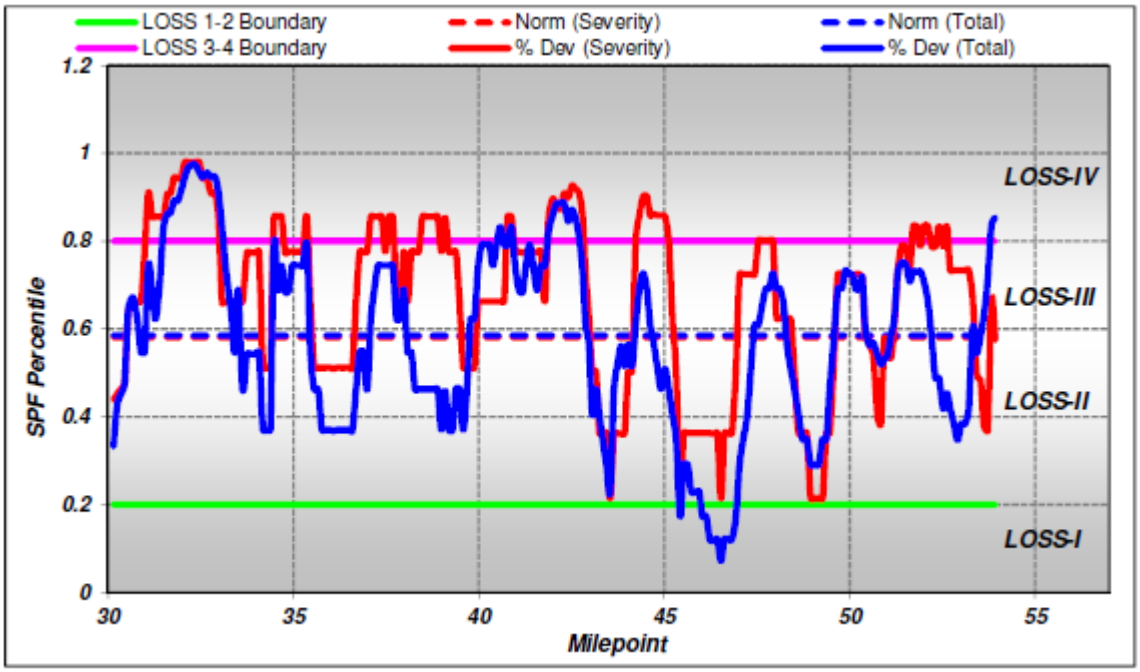


Figure 7: SH 83 MP 30.20 – 53.88) Safety Performance Profile

C. Consistency & Contributions to Transportation-focused Metro Vision Objectives

WEIGHT 15%

*Provide **qualitative and quantitative** responses (derived from Part 3 of the application) to the following items on how the proposed project contributes to Transportation-focused Objectives (in bold) in the adopted Metro Vision plan. Refer to the expanded Metro Vision Objective by clicking on links.*

MV objective 2	**Contain urban development in locations designated for urban growth and services**.

1. Will this project help focus and facilitate future growth in locations where urban-level infrastructure already exists or areas where plans for infrastructure and service expansion are in place? ☒ Yes ☐ No

This project is not a capacity increasing project. By providing a safer and more reliable connection to the existing urban area of Parker, an improved SH 83 serves to enhance its role as an area hub and attraction.

MV objective 3	**Increase housing and employment in urban centers**.

2. Will this project help establish a network of clear and direct multimodal connections within and between urban centers, or other key destinations? ☒ Yes ☐ No

A safer and more reliable SH 83 enhances the connections between the urban centers of Parker and the larger Denver Metro Area to the open spaces and agricultural areas of southeast Douglas County. It also provides a very direct connection to El Paso county and the urban area and economic hub of the Pikes Peak region east of I-25. Without SH 83 this portion of the region is underserved with primiary routes for transportion.

MV objective 4	**Improve or expand the region's multimodal transportation system, services, and connections**.

3. Will this project help increase mobility choices within and beyond your subregion for people, goods, or services? ☒ Yes ☐ No

Increasing safety and dependability of the SH 83 corridor will improve the interconnections of the multimodal transportation system within and beyond the region for people and freight. SH 83 along with SH85 and I25 are the only north south entrances into the southern portion of the Denver Metro area. Maintaining these options in a safe and efficient manner will expand and improve the regions multimodal transportation system. In addition, the September 2004 - SH83-86 Corridor Optimization Plan outlines a business plan that has been used to encourage integrated land use and transportation planning among state and regional agencies, local governments, and the development community.

MV objective 6a	**Improve air quality and reduce greenhouse gas emissions**.

4. Will this project help reduce ground-level ozone, greenhouse gas emissions, carbon monoxide, particulate matter, or other air pollutants? ☒ Yes ☐ No

A more reliable SH 83 will reduce the congestion cause by frequent accidents and the resulting full or partial closures. Many segments of the corridor offer little room to bypass traffic around accidents. Detour routes are long and cause additional VMT. Improved operations of SH 83 could reduce congestion on I-25 during peak demand by providing transportation network choices.

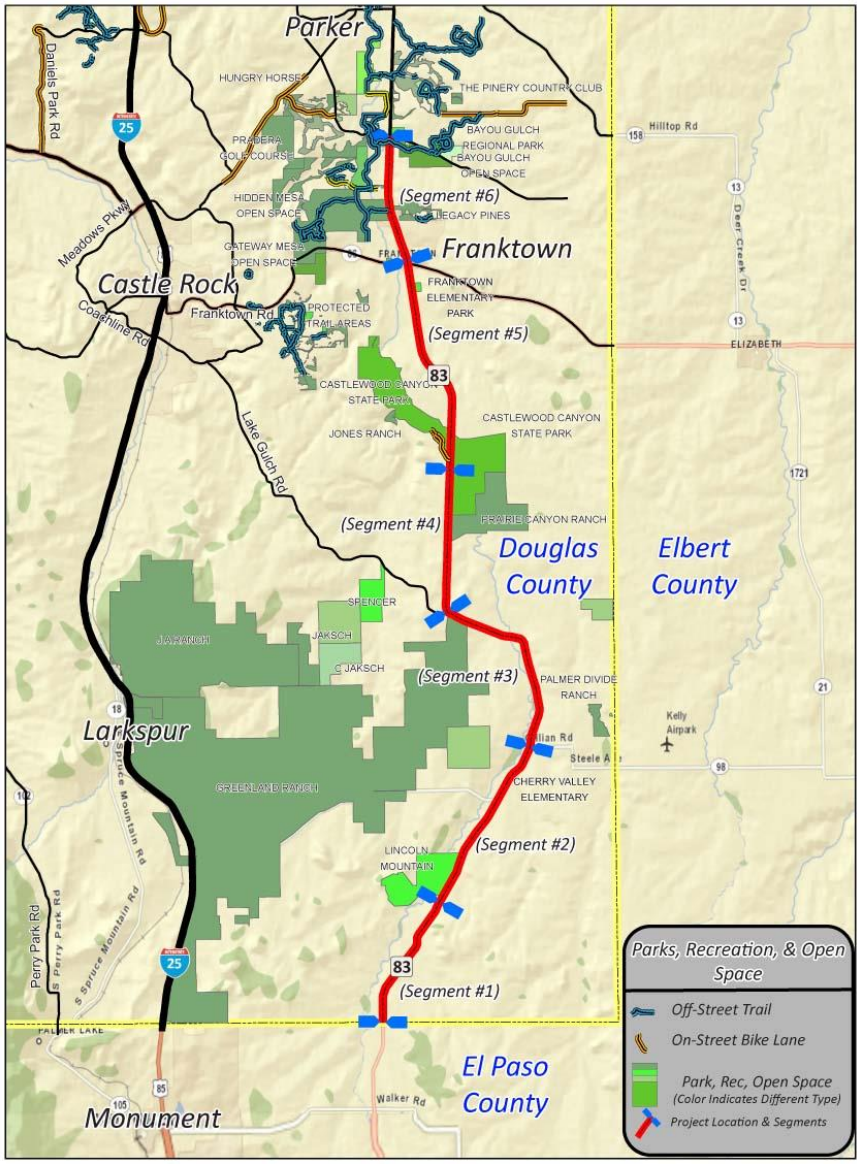
MV objective 7b	**Connect people to natural resource or recreational areas**.

5. Will this project help complete missing links in the regional trail and greenways network or improve other multimodal connections that increase accessibility to our region's open space assets? ☒ Yes ☐ No

There are numerous open space and recreational areas located on this stretch of road including:

- Castlewood Canyon State Park
- Hidden Mesa Open Space
- Lincoln Mountain Open Space
- Colorado Front Range Trail
- Palmer Ranch Divide Trail
- Multiple Reservoirs
- Entrance to Black Forest
- Multiple Open Space Ranches

Some of the largest open space resources in the area are accessed via SH 83. Safety improvements to the roadway will improve multimodal access to these resources.



Bayou Gulch Open Space and Connector Trail:

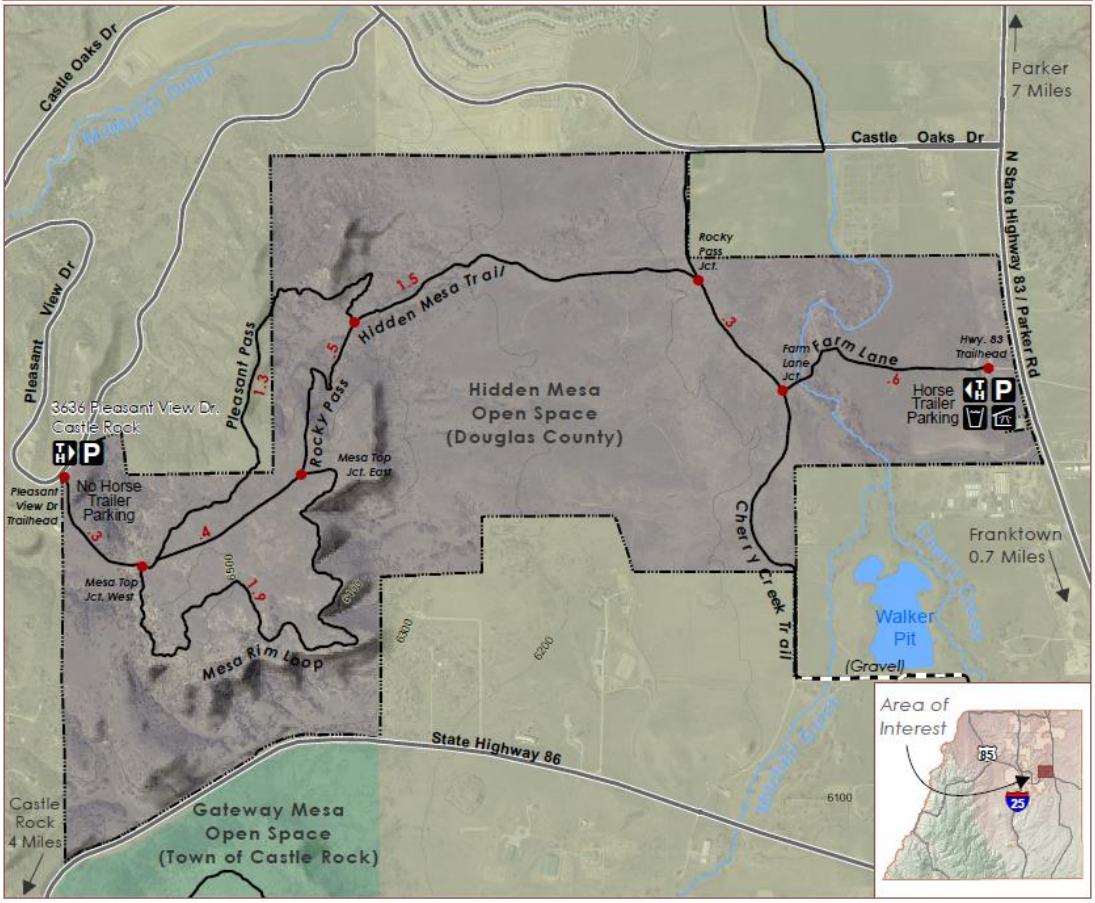
The connector that runs west under SH 83 to the Cherry Creek Regional Trail is open to pedestrians, equestrians, and bicyclists. The peripheral trail may be closed occasionally to accommodate equestrian events associated with the Colorado Horse Park. Horse jumps and pathways leading to the jumps are not open to the public as they are privately owned by the Colorado Horse Park.

Hidden Mesa Open Space Trail (located 1-mile north of SH 86):

Of the over 1300 accessible acres, approximately over 30,000 access the open space and approximately 21,000 users access the open space from SH83. There is currently no west bound turn left lane from northbound SH83.

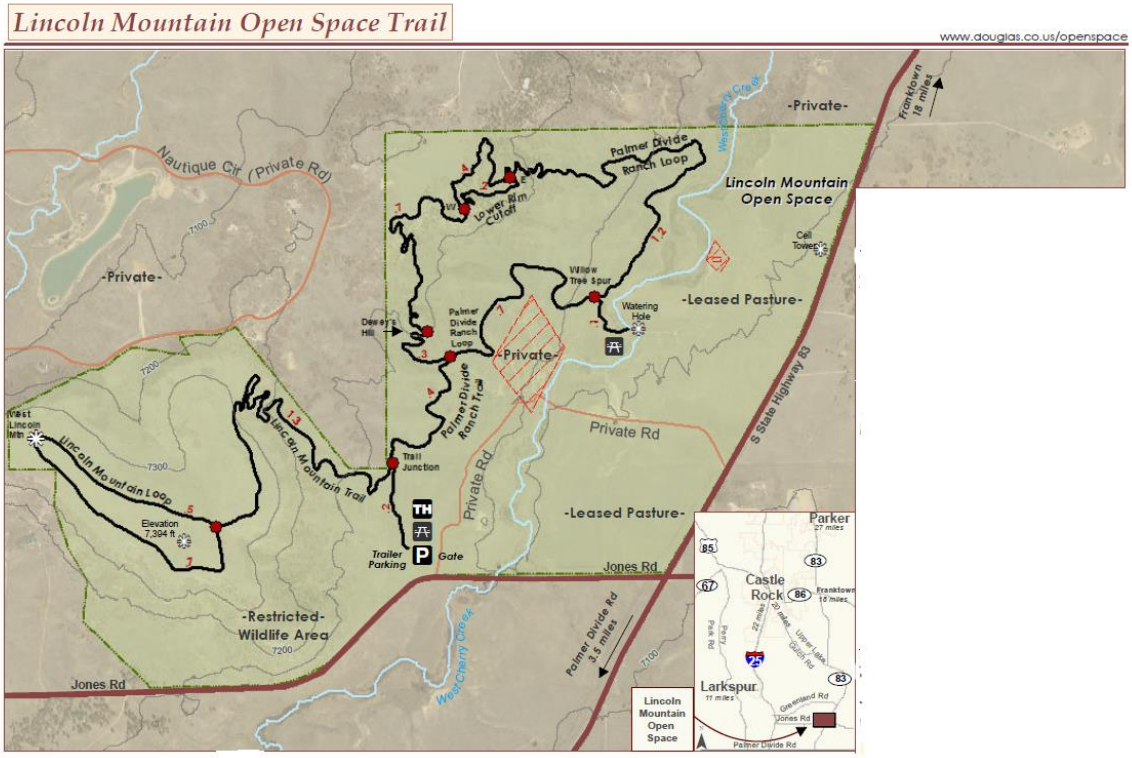
Douglas County's Hidden Mesa Open Space opened seven miles of trails and a trail head on June 10, 2006. This provides access to the Cherry Creek Trail which bisects the property. The trailhead is located one mile north of

Hidden Mesa Open Space Trail



Franktown on the west side of SH 83 (Parker Road) for hikers, bicyclists, and horseback riders. Travel one mile north of Franktown on Parker Road (SH 83). It is on the west/left side with a large Hidden Mesa Open Space sign.

Lincoln Mountain Open Space Trail



Lincoln Mountain Open Space

Of the over 876 accessible acres, approximately 13,000 users access the amenities from SH83. There is currently no west bound turn left lane from northbound SH83.

The 876-acre Lincoln Mountain Open Space is located along the upper reaches of West Cherry Creek with meadows and rolling grasslands that are backed up by forested rocky cliffs and the taller mesa of Lincoln Mountain portion of land operates as a working cattle and hay ranch. It has a high value wildlife habitat and contains riparian habitat for the federally threatened Preble's Meadow Jumping Mouse. Miles of trails are open to the public for hiking, horseback and mountain biking.

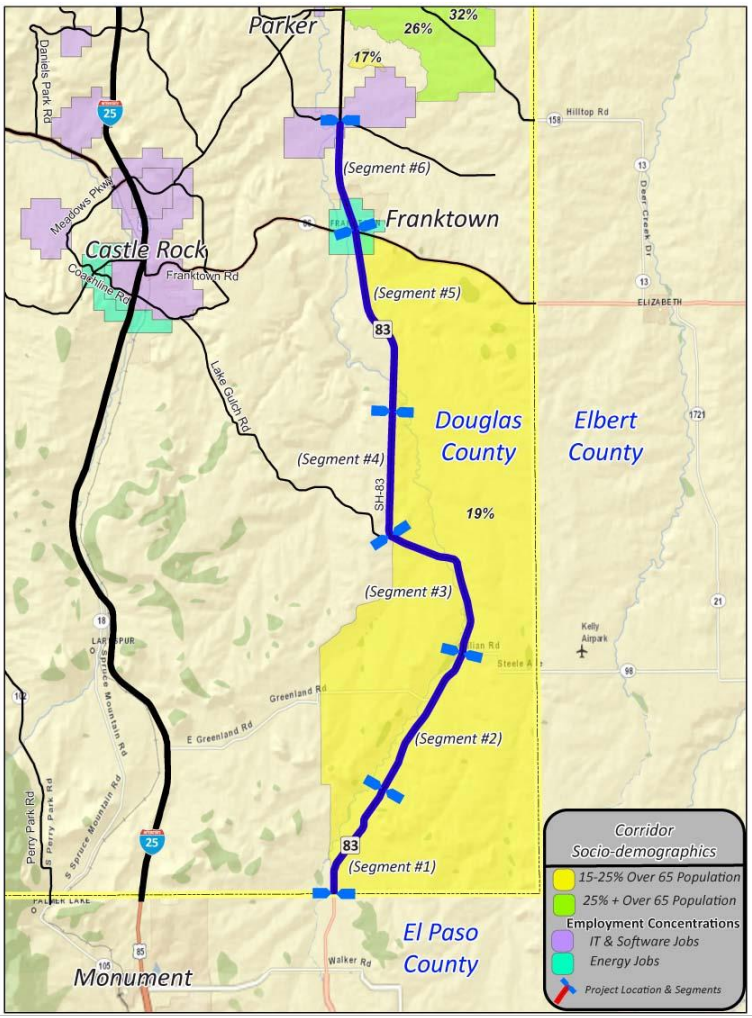
MV objective 10	**Increase access to amenities that support healthy, active choices.**

6. Will this project expand opportunities for residents to lead healthy and active lifestyles? ☒ Yes ☐ No

By enhancing the accessibility of the areas large open space resources, this project would also provide access to activities that support healthy and active lifestyles. Safety investments are likely to include shoulder improvements that could provide additional bicycling opportunities and access to additional trail systems including the Colorado Front Range Trail. The SH 83 corridor also traverses much of the county's agricultural land including access to hiking, equestrian, and other outdoor activities.

MV objective 13	**Improve access to opportunity**.

7. Will this project help reduce critical health, education, income, and opportunity disparities by promoting reliable transportation connections to key destinations and other amenities? ☒ Yes ☐ No



The SH 83 corridor traverses a portion of the county with almost 20% of the population over age 65 living in a rural portion of the DRCOG planning area. All the residents of these areas require reliable transportation facilities to access health care, emergency services, grocery and other retail, education, and the other opportunities provided in urban centers. Smaller communities like Franktown rely on the connection provided by SH 83 for services and freight deliveries.

MV objective 14	**Improve the region's competitive position**.	

8. Will this project help support and contribute to the growth of the subregion's economic health and vitality? ☒ Yes ☐ No

Describe, *including supporting quantitative analysis*

Improving the safety and resiliency of SH 83 will positively impact the health and vitality of the subregion by providing:

- Stronger and safer connection between the communities within this segment of the corridor and those to the north and south to better connect these smaller economies into a larger, more vibrant whole.
- Better and safer access to the natural resource areas and amenities that are a significant asset for attracting business and jobs
- More reliable travel for area residents accessing the schools, businesses, and health care providers
- Providing an all weather alternative during incidents on I-25 which increases reliability for commuters, tourism, and freight mobility.

D. Project Leveraging

WEIGHT 15%

9. What percent of outside funding sources (non-DRCOG-allocated Subregional Share funding) does this project have?	50%	60%+ outside funding sources .....High 30-59% .....Medium 29% and below .....Low

Part 3 Project Data Worksheet – Calculations and Estimates

(Complete all subsections applicable to the project)

A. Transit Use

1. Current ridership weekday boardings	0
2. Population and Employment	

Year	Population within 1 mile	Employment within 1 mile	Total Pop and Employ within 1 mile
2020	9,902	506	**5,409**
2040	7,094	1,809	**8,903**

Transit Use Calculations	Year of Opening	2040 Weekday Estimate
3. Enter estimated additional daily transit boardings after project is completed. *(Using 50% growth above year of opening for 2040 value, unless justified)* *Provide supporting documentation as part of application submittal*	0	0
4. Enter number of the additional transit boardings (from #3 above) that were previously using a different transit route. (Example: **{#3 X 25%}** *or other percent, if justified)*	0	0
5. Enter number of the new transit boardings (from #3 above) that were previously using other non-SOV modes (walk, bicycle, HOV, etc.) (Example: **{#3 X 25%}** *or other percent, if justified)*	0	0
6. = Number of SOV one-way trips reduced per day (#3 – #4 – #5)	**0**	**0**
7. Enter the value of **{#6 x 9 miles}**. (= **the VMT reduced per day**) *(Values other than the default 9 miles must be justified by sponsor; e.g., 15 miles for regional service or 6 miles for local service)*	0	0
8. = Number of pounds GHG emissions reduced (#7 x 0.95 lbs.)	**0**	**0**
9. If values would be distinctly greater for weekends, describe the magnitude of difference:		
10. If different values other than the suggested are used, please explain here:		

B. Bicycle Use

1. Current weekday bicyclists	3
2. Population and Employment	

Year	Population within 1 mile	Employment within 1 mile	Total Pop and Employ within 1 mile
2020	10,475	8,547	**19,022**
2040	12,702	14,622	**27,324**

Bicycle Use Calculations	Year of Opening	2040 Weekday Estimate
3. Enter estimated additional weekday one-way bicycle trips on the facility after project is completed.	0	0
4. Enter number of the bicycle trips (in #3 above) that will be diverting from a different bicycling route. (Example: **{#3 X 50%}** *or other percent, if justified)*	0	0
5. = Initial number of new bicycle trips from project (#3 – #4)	0	0
6. Enter number of the new trips produced (from #5 above) that are replacing an SOV trip. (Example: **{#5 X 30%}** *(or other percent, if justified)*	0	**0**
7. = Number of SOV trips reduced per day (#5 - #6)	0	0
8. Enter the value of **{#7 x 2 miles}**. (= the VMT reduced per day) *(Values other than 2 miles must be justified by sponsor)*	0	0
9. = Number of pounds GHG emissions reduced (#8 x 0.95 lbs.)	0	0
10. If values would be distinctly greater for weekends, describe the magnitude of difference:		
11. If different values other than the suggested are used, please explain here:		

C. Pedestrian Use

1. Current weekday pedestrians (include users of all non-pedaled devices)	0
2. Population and Employment	

Year	Population within 1 mile	Employment within 1 mile	Total Pop and Employ within 1 mile
2020	9,902	506	**5,409**
2040	7,094	1,809	**8,903**

Pedestrian Use Calculations	Year of Opening	2040 Weekday Estimate
3. Enter estimated additional weekday pedestrian one-way trips on the facility after project is completed	0	0
4. Enter number of the new pedestrian trips (in #3 above) that will be diverting from a different walking route (Example: **{#3 X 50%}** *or other percent, if justified)*	0	0
5. = Number of new trips from project (#3 – #4)	0	0
6. Enter number of the new trips produced (from #5 above) that are replacing an SOV trip. (Example: **{#5 X 30%}** *or other percent, if justified)*	0	0
7. = Number of SOV trips reduced per day (#5 - #6)	0	0

12. Enter the value of **{#7 x .4 miles}**. (**= the VMT reduced per day**) *(Values other than .4 miles must be justified by sponsor)*	0	0
8. = Number of pounds GHG emissions reduced (#8 x 0.95 lbs.)	0	0
9. If values would be distinctly greater for weekends, describe the magnitude of difference:		
10. If different values other than the suggested are used, please explain here:		

D. Vulnerable Populations

	Vulnerable Populations	Population within 1 mile
Use Current Census Data	**1.** Persons over age 65	676
	2. Minority persons	713
	3. Low-Income households	53
	4. Linguistically-challenged persons	0
	5. Individuals with disabilities	243 households with 1 or more persons with a disability
	6. Households without a motor vehicle	1
	7. Children ages 6-17	1,126
	8. Health service facilities served by project	6

E. Travel Delay *(Operational and Congestion Reduction)*

Sponsor must use industry standard Highway Capacity Manual (HCM) based software programs and procedures as a basis to calculate estimated weekday travel delay benefits. *DRCOG staff may be able to use the Regional Travel Model to develop estimates for certain types of large-scale projects.*

1. Current ADT (average daily traffic volume) on applicable segments	0
2. 2040 ADT estimate	0
3. Current weekday vehicle hours of delay (VHD) (before project)	0

Travel Delay Calculations	Year of Opening
4. Enter calculated future weekday VHD (after project)	0
5. Enter value of **{#3 - #4} =** Reduced VHD	0
6. Enter value of **{#5 X 1.4}** = **Reduced person hours of delay** *(Value higher than 1.4 due to high transit ridership must be justified by sponsor)*	0
7. **After project peak hour congested average travel time reduction** per vehicle (includes persons, transit passengers, freight, and service equipment carried by vehicles). *If applicable, denote unique travel time reduction for certain types of vehicles*	0

8. If values would be distinctly different for weekend days or special events, describe the magnitude of difference.	
9. If different values other than the suggested are used, please explain here:	

F. Traffic Crash Reduction

1. Provide the current number of crashes involving motor vehicles, bicyclists, and pedestrians *(most recent **5-year** period of data)*		Sponsor must use industry accepted crash reduction factors (CRF) or accident modification factor (AMF) practices *(e.g., NCHRP Project 17-25, NCHRP Report 617, or DiExSys methodology).*
Fatal crashes	11	
Serious Injury crashes	0	
Other Injury crashes	229	
Property Damage Only crashes	198	
2. Estimated reduction in crashes <u>applicable to the project scope</u> *(per the five-year period used above)*		
Fatal crashes reduced	TBD in future based on recommendations to be carried forward into construction	
Serious Injury crashes reduced		
Other Injury crashes reduced		
Property Damage Only crashes reduced		

G. Facility Condition

Sponsor must use a current industry-accepted pavement condition method or system and calculate the average condition across all sections of pavement being replaced or modified.
Applicants will rate as: Excellent, Good, Fair, or Poor

Roadway Pavement

1. Current roadway pavement condition	Choose an item
2. Describe current pavement issues and how the project will address them.	
3. Average Daily User Volume	0

Bicycle/Pedestrian/Other Facility

4. Current bicycle/pedestrian/other facility condition	Choose an item
5. Describe current condition issues and how the project will address them.	
6. Average Daily User Volume	0

H. Bridge Improvements

1. Current bridge structural condition from CDOT

2. Describe current condition issues and how the project will address them.	
3. Other functional obsolescence issues to be addressed by project This will be determined in the planning phase prior to design and construction. There are multiple bridges on the corridor that are functionally obsolete with widths to narrow to accommodate appropriate shy distances or shoulders.	
4. Average Daily User Volume over bridge	0

I. Other Beneficial Variables *(identified and calculated by the sponsor)*

1.	
2.	
3.	

J. Disbenefits or Negative Impacts *(identified and calculated by the sponsor)*

1. Increase in VMT? *If yes, describe scale of expected increase*	☐ Yes ☒ No
This project is not a capacity increasing project and is focused on safety and resiliency of the existing travel lanes.	
2. Negative impact on vulnerable populations None	
3. Other:	