Part 1 Base Information

1. Project Title	**Bowles Avenue & Federal Boulevard Intersection Improvements**
2. Project *Start/End* points or Geographic Area *Provide a map with submittal, as appropriate*	Intersection of Bowles Avenue and Federal Boulevard, 400 feet in each direction of each of the three intersection legs.
3. Project Sponsor *(entity that will construct/ complete and be financially responsible for the project)*	City of Littleton
4. Project Contact Person, Title, Phone Number, and Email	Keith Reester, Public Works Director, 303-795-3866, kreester@littletongov.org

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?

☐ DRCOG 2040 Fiscally Constrained Regional Transportation Plan (2040 FCRTP)

☒ Local plan: Design of Interim and Ultimate Improvements
Construction of Interim Safety Improvements Planned for 2019

☐ 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
- ☒ 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:

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

This project will address the following challenges identified in the 2040 Metro Vision Regional Transportation Plan (MVRTP):

Growth Challenges (2040 MVRTO, pp. 9)

Population & Economic Growth

With the Denver region expected to reach 4.3 million people by 2040, all of the subregions within the DRCOG boundary are feeling the impacts of rapid growth. As more people move to Littleton, and travel through it on

their daily commute, the Federal and Bowles intersection has become one of two pinch-points along the Bowles corridor. The other (Platte Canyon and Bowles) is being improved with a CDOT grant. This project will address at the long-term needs of the intersection to improve the flow of all users through it to accommodate population and economic growth.

Transportation Challenges (pp. 13)

Automobile Dominance & Mobility Options

The intersection of Federal and Bowles serves a waypoint for many commuting from the west headed into Littleton or those connecting with Santa Fe to head north. Cars are the highest used mode of travel through the intersection, but an estimated 80 people walk, and 120 people bike through the intersection a day based on weekday peak hour counts. Given the nearby recreation facilities like the Mary Carter Greenway (a regional trail), and downtown Littleton, the Federal and Bowles intersection is an important crossing in the local bike and ped network. Currently the traffic volumes and configuration make the intersection unpredictable to pedestrians and cyclists trying to cross it, but this project will establish safer and more predictable opportunities for non-vehicular users to traverse the intersection. Additionally, Federal Blvd acts as an alternate to Santa Fe Dr and increased safety and capacity at this intersection may provide a competitive alternative route for some users of Santa Fe.

Traffic Congestion & Crashes

Because of the limited operational capacity at the intersection, peak hour congestion is a daily occurrence that regularly stretches a mile west of the intersection and sometimes further in inclement weather. The skewed angle of the intersection also leads some drivers turning left to misjudge gaps in traffic and has led to 60 left turn accidents over the last 5 years—the most of any intersection in the City of Littleton. Additionally, this intersection is tied for 3rd highest number of bike and vehicle crashes. This project will implement the needed long-term safety and capacity improvements to ease congestion and help prevent the high frequency of crashes.

Environmental Challenges (pp. 17)

Air Quality

Because traffic congestion leads to greater vehicle emissions and more air pollution this project will improve air quality by helping to relieve congestion.

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

This project will implement safety and operational improvements to the intersection of Federal Boulevard and Bowles Avenue. Descriptions of the major improvements are below and the accompanying graphic shows the approximate location of each.

Realignment – The biggest change to the intersection will be shifting the alignment of Federal Blvd so that it meets Bowles Ave at a right angle. This will shorten the distance needed for vehicles turning left onto north bound Federal Blvd to complete the movement, and shorten the crossing distance for pedestrians traveling across Federal Blvd. In addition, the repositioned intersection will accommodate longer eastbound left turn bays along Bowles Avenue, allowing this movement to be controlled by protected turn phasing and, thus, eliminating the permissive turn conflict with westbound traffic.

New Signal – Because of the new alignment, a new signal will be required to control traffic at the intersection.

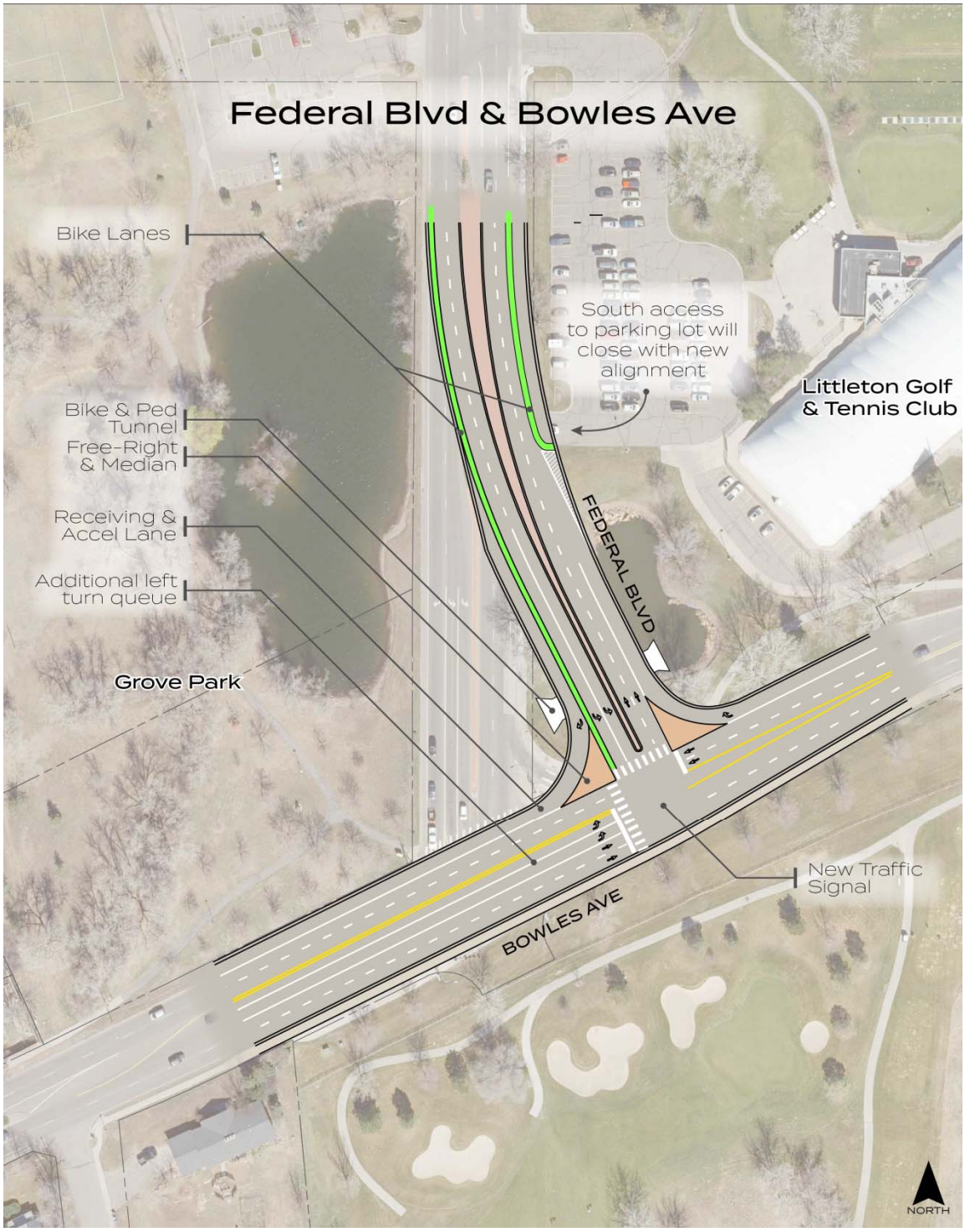
Pedestrian/Bike Tunnel – This intersection is tied for 3rd highest number of bike and vehicle crashes, and the addition of a tunnel for pedestrians and cyclists will allow them to go underneath Federal Blvd to connect to the Mary Carter Greenway or Bowles Ave sidewalk.

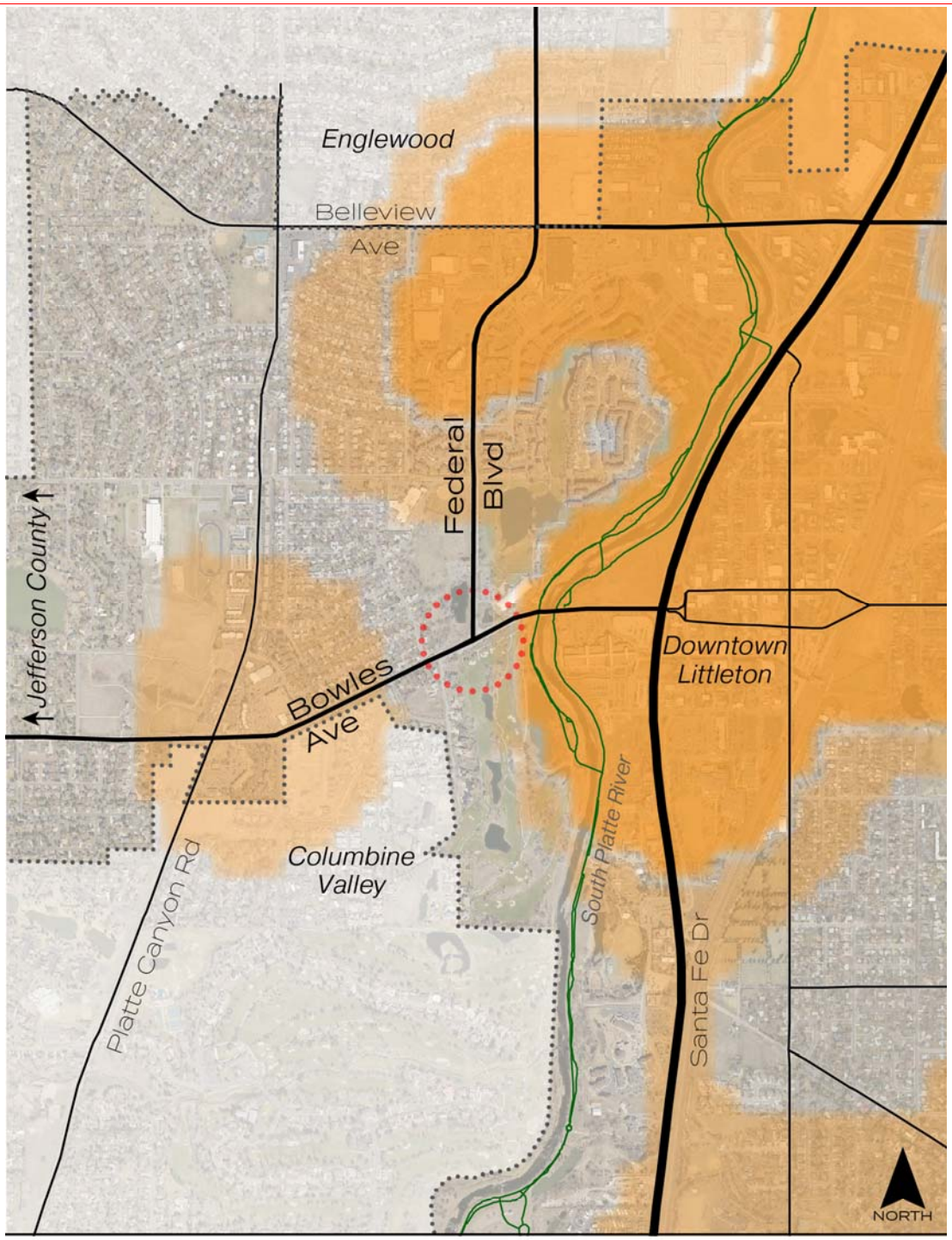
Trail Connections – Where the Bowles Grove Park Trail meets the intersection (northwest corner) the trail

would be reconfigured to meet the new intersection alignment, and this project will provide a transition into Bowles Grove Park for cyclists using the south bound Federal Blvd bike lane who wish to transition into the tunnel.

Bike Infrastructure – This project will also reconfigure the Federal Blvd bike lanes and provide a proper mixing zone and transition to help prevent conflicts between cyclists and south vehicles. The accompanying graphic shows approximate locations of bike lanes, but details on how they interact with traffic lanes, intersect with trails, and specifics of intersection treatments will be determined in final design.

Conceptual Project Design & Regional Context





FEDERAL & BOWLES
CONTEXT MAP

High Employment Concentration
Medium Employment Concentration
Littleton Boundary
Project Area
Mary Carter Greenway Trail
Roadway

10. What is the status of the proposed project?

The interim solution for this project is currently being designed, and once funding is secured the City of Littleton is ready to move forward with the design of the long-term reconfiguration. A rough project timeline is below.

Fall 2018: Study Completed

Winter 2018/2019: Interim and Long-term Concepts Identified

Winter 2018/2019: Begin Interim Design

Summer 2019: Begin Construction on Interim Improvements

2020: Complete Long-Term Design and Begin ROW Acquisition

2021: Finish ROW Acquisition and Begin Construction

2022: Finish Construction

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.

The design of the long-term improvements for the intersection entail changing the alignment of Federal Blvd so that it intersects with Bowles at a right angle with the aim of the making the intersection safer for all users. The interim solution uses low cost and temporary methods to address some of these same safety issues, albeit without improving capacity as much as the long-term solution would.

$1,379,000 will allow the City of Littleton to make the needed temporary improvements permanent and relocate or replace the existing signal to better align with new striping, but would not include reconfiguring the intersection. For example, in establishing a larger right-turn island in the northeast corner of the intersection, the temporary solution involves using plastic delineators and c-curb to shorten the crossing distance and create a larger pedestrian refuge. Making this permanent would mean constructing a new larger median in the northwest corner.

A. Project Financial Information and Funding Request

1. Total Project Cost		**$4,250,000**
2. Total amount of DRCOG Subregional Share Funding Request	**$3,400,000**	**80%** 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**
City of Littleton	$850,000	20%
	$	
	$	
	$	

	$	
	$	
Total amount of funding provided by other funding partners *(private, local, state, Regional, or federal)*	**$850,000**	

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	$400,000	$1,600,000	$1,400,000	$0	**$3,400,000**
State Funds	$	$	$	$	**$0**
Local Funds	$100,000	$400,000	$350,000	$0	**$850,000**
Total Funding	$500,000	$2,000,000	$1,750,000	$0	**$4,250,000**
4. Phase to be Initiated *Choose from Design, ENV, ROW, CON, Study, Service, Equip. Purchase, Other*	Design, ROW	ROW, CON	CON		

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?

The Federal and Bowles intersection serves as a waypoint for accessing several amenities throughout the Arapahoe County Subregion including arterials, expressways, urban centers, and employment concentrations. For cyclists and pedestrians, the intersection provides access to and from a local park, public golf course, regional trail, and the downtown Littleton commercial district.

Because the two roads intersect at a skewed angel and serve a relatively high traffic volume, the intersection ranked in Littleton's top 10 most accident-prone intersections in 2014, and 2015, and in the top 5 in 2016, 2017, and 2018. This high number of accidents impacts not only people in Littleton, but in the subregion and nearby subregions that travel through the intersection regularly. The high volumes and skewed configuration also make this intersection the most accident prone for left turns based on crashes from 2014 - 2018. Nearby recreation amenities draw cyclists and pedestrians through the intersection, but volumes and configuration make this one of the most accident-prone intersections for cyclists in Littleton. Recent public engagement feedback has also shed light on a number of near-misses between left turning vehicles and pedestrians on two legs of the intersection.

In addition to the safety issues, this intersection is 1 of 2 in Littleton that lead to morning traffic congestion on Bowles that regularly extends beyond a mile to the west. Because there are only a few major east/west arterials in this part of the subregion (Belleview to the north, and Mineral to the south) the congestion issues affect several people in both Arapahoe and Jefferson county.

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

Given the intersection's location it most directly benefits the City of Littleton, but because both Federal and Bowles are vital arteries for vehicle travel it will benefit several nearby municipalities:

Littleton – Bowles Ave provides access to Santa Fe Dr for those who rely on it to commute. In addition, Bowles provides direct access to Downtown Littleton where several small and local businesses are located.

Englewood – Federal Blvd provides direct access to Englewood and to the commercial hub located on Belleview between Federal Blvd and Santa Fe Dr. Improving this intersection will provide better access to this commercial hub and to Englewood from the southwest.

Sheridan – Federal Blvd provides access to Sheridan and is 1 of 2 north/south arterials running through the City. People using Federal Blvd to reach the City of Sheridan are impacted by the congestion and safety at the Federal and Bowles intersection. This project will help people access the City of Sheridan more quickly and safely.

Town of Columbine Valley – Bowles Ave is the only east/west arterial that goes through the Town of Columbine Valley, and for residents of the town who want to access Santa Fe Dr, they will likely go through this intersection. In addition, many of the residents of the Town must use Bowles Ave to leave their neighborhood so congestion stemming from the Federal and Bowles intersection impacts them regardless of their destination. This project will aim to lessen congestion and its impacts on residents of Columbine Valley.

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

Jefferson County – Because the intersection is in the far western part of the subregion, many people from eastern Jefferson County use Bowles Ave to travel east into Arapahoe County and to reach to Santa Fe Dr. Congestion from Federal and Bowles is exacerbated by the Platte Canyon and Bowles intersection and backups often extend 1 to 1.5 miles to the west during the morning commute. Platte Canyon and Bowles is being

addressed simultaneously through a separate effort. This project will address issues at Federal and Bowles and benefit those traveling to and from east Jefferson County through the intersection.

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

Growth Challenges (2040 MVRTO, pp. 9)

Population & Economic Growth

This project has taking into consideration current transportation needs at the Federal and Bowles intersection, as well as future capacity needs based on nearby and regional growth estimates.

Transportation Challenges (pp. 13)

Automobile Dominance & Mobility Options

As is the case with most of the Denver area, Littleton and most of its major roads are seeing an increase in traffic volumes. This project incorporates the current needs at the intersection and evaluates future needs based on expected growth. In addition, this project will help pedestrians and cyclists move through the intersection by providing dedicated infrastructure to navigate through or around this intersection and will provide greater mobility choice.

Traffic Congestion & Crashes

Because there is such a heavy left turn volume from east bound Bowles to north bound Federal, the left turn queue often backs up into the through lanes and causes congestion. In addition, the skew of the intersection makes it hard for these left turning drivers to correctly judge if gaps in traffic are sufficient during the permissive left turn phase. This has led to the highest number of left turn accidents for an intersection in Littleton. By realigning the intersection there will be additional left turn queue length added to the intersection and the problematic left turn movement can be changed from permissive/protected to protected only during the peak hour without causing more congestion from queue backups in the through lanes.

Environmental Challenges (pp. 17)

Air Quality

Because congestion leads to more air pollution, addressing congestion issues will lead to improved air quality. By implementing the aforementioned changes, there will be less anticipated congestion which will have a positive impact on the air quality.

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?

Employment Concentrations – The Federal and Bowles intersection is nestled between two high concentration employment centers to the east and north, and a medium concentration employment center to the west (see associated graphic). Immediately surrounding the intersection are residential neighborhoods that are dependent on both Federal Blvd and Bowles Ave to access the larger regional transportation network. By addressing issues of safety and congestion at this intersection we will be providing better access to employment for people in these neighborhoods.

Mobility Choice – As roads become more congested and residents desire better access to alternative transportation, mobility choice is becoming an increasingly important issue in metro Denver. This project addresses bike and pedestrian safety issues by providing dedicated facilities to cross and use the intersection. This will provide greater access for pedestrians and cyclists to nearby employment concentrations, urban centers, and recreational facilities. This project will also provide greater access to employment for nearby residents by providing a safer route to bike or walk to employment centers.

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

Connectivity Through Safety – The Bowles Grove Park Trail meets the intersection from the northwest, crosses Federal Blvd, and connects with the Mary Carter Greenway—a regional trail. Because the Bowles Grove Park Trail provides access to the Mary Carter Greenway and Downtown Littleton this intersection is heavily used by both pedestrians and cyclists. By providing a safer way to traverse the intersection this project will remove a potential barrier to cyclists and pedestrians and increase the number of potential users who feel comfortable crossing the intersection.

This will be accomplished with the addition of a bike and pedestrian tunnel under Federal Blvd that connects to the Bowles Grove Park Trail and proves access to the Mary Cater Greenway. In addition, cyclists using the bike lane on south bound Federal Blvd will be separated from right turning vehicles well before the intersection. Pedestrians who need to cross the intersection to the south will be provided a refuge via a right turn island that makes them more visible to motorists and shortens the crossing distance from Bowles Grove Park to the sidewalk on the south side of Bowles. Because transit users are typically pedestrians before they step on a bus, the improvements that benefit pedestrians will also benefit users of transit who need to access a nearby bus stop.

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

Currently the City of Littleton is seeking a partnership with Arapahoe County, but no formal agreement has been reached.

B. DRCOG Board-approved Metro Vision TIP Focus Areas

WEIGHT **25%**

*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).**

Environmental Justice Analysis Zones – There are 5 Environmental Justice (EJ) Analysis Zones within 1 mile of this project—all of which are low income. By providing safety and capacity improvements at this intersection, low income persons in these zones who use this intersection will benefit from better access to nearby employment concentrations, urban centers, and healthcare facilities.

Vulnerable Populations – Within a 1-mile radius of this project there are several segments of the population that are considered vulnerable, and may be dependent on access to transit, bike facilities, and pedestrian facilities for transportation. By Improving safety and capacity at this intersection these individuals will have improved access to employment concentrations, recreation facilities, healthcare facilities, and commercial areas. Those potentially dependent on alternative transportation include:

Persons over age 65:	1,925
Individuals with disabilities:	479
Households without a motor vehicle:	411
Children ages 6-17:	1,087

Healthcare Facilities – There are 5 healthcare facilities within a 1-mile radius of the project. For those who use this intersection to access these facilities, the safety and capacity improvements will provide safer and more convenient access regardless of travel mode.

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

Reliability Through Safety – This project will increase the reliability of the multimodal transportation network by

creating a safer intersection for pedestrians and cyclists to travel through. By removing a potential barrier to multimodal travel (crossing an accident-prone intersection) this project will increase reliability of the multimodal transportation network. The improvements that benefit pedestrians will also benefit users of transit as they walk to, or transfer between, stops.

3. Describe how the project will **improve transportation safety and security.**
-Ex: Issue: Solutions

Left Turn Accidents – Federal and Bowles has the highest total number of left turn accidents in Littleton for 2014 – 2018. Part of this is due to the skew in the intersection, which makes makes the turn from east bound Bowles to north bound Federal espcially wide and lengthy. This can sometimes make it hard to judge gaps in oncoming traffic when drivers have a permissive left turn. The other factor leading to accidents is the high number of these left turns during the peak hour which are controlled by a protective/permissive green light in order to clear more vehicles out of the left turn queue lanes and prevent congestion in the through lanes.

This project will address both of these problems by squaring up the intersection and moving it about 300' to the east. This will make it easier for drivers to sufficiently judge gaps in traffic and will add a significant amount of capacity to the left turn queue lanes. From an operations standpoint, this will allow left turns onto Federal to be permissive only in the peak hour and help relieve congestion from left turn queues backing up into through lanes. This should significantly reduce the number of left turn accidents at the intersection and reduce the number of rear-end accidents near the intersection that typically result from congestion.

Bike and Pedestrians vs. Vehicle Accidents – Federal and Bowles has the 3rd highest number of crashes involving cyclists and cars. The contributing factors for this include (1) a south bound bike lane on Federal that suddenly ends with little warning to cyclists or motorists, (2) a shared use trail that enters the intersection from an odd angle, and (3) a south bound right turn lane on Federal without a receiving/acceleration lane onto west bound Bowles which makes drivers simultaneously judge gaps in traffic coming from their left while watching for pedestrians and cyclists coming from their right.

This project will address all three issues by (1) creating an appropriate mixing zone and transition to separate south bound cyclists from right turning vehicles in advance of the intersection, (2) providing a tunnel for pedestrians and cyclists coming off the trail from the northwest to avoid the intersection all together, and (3) providing a right turn slip lane and island, and receiving/acceleration lane which will allow south bound vehicles turning right to first yield to pedestrians and cyclists, then turn right, and finally find a gap to merge into traffic separately, rather than all at once.

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

Describe, *including supporting quantitative analysis*

This project does not have a direct impact on growth and development. However, throughout the project the City of Littleton has taken into account the current safety and capacity needs at the intersection as well as the future needs based on planned development in the area and projected regional growth. Currently the Federal and Bowles intersection handles about 50,000 trips/day and that number is expected to increase to about 52,400 trips/day in 2040. The final design has taken this into account.

	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

Describe, *including supporting quantitative analysis*

Connectivity Through Safety – As described above, the safety improvements at this intersection are expected to encourage more multimodal use of it, and, by doing so, will help build a stronger multimodal network and stronger connection between pieces of multimodal infrastructure. Current estimates put 120 cyclists and 80 pedestrians going through this intersection on an average weekday, and we think this number will increase after the project is complete as it will make nearby amenities like the Mary Carter Greenway and Downtown Littleton more accessible.

Nearby Urban Centers & Employment Concentrations – This intersection is in the middle of 3 employment concentrations: Platte Canyon and Bowles to the west, Federal and Belleview to the north, and Downtown Littleton to the east which is also an urban center. By improving safety at this intersection, this project is helping establish stronger multimodal connections to these destinations. We expect that making this intersection safer for cyclists, pedestrians, and those walking to transit stops will increase the number pedestrians and cyclists that use it.

	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

Describe, *including supporting quantitative analysis*

Removing Multimodal Barriers – This project is not providing a large amount of additional multimodal infrastructure, but because this intersection is so accident-prone (most left turn accidents, third most bicycle-car accidents, and in the top five most accident-prone intersections in Littleton), fixing the safety issues will likely remove a barrier to walking or biking for nearby residents. Studies have shown that improved pedestrian and bike infrastructure can lead to an increase in walking and biking.

	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

Describe, *including supporting quantitative analysis*

Air Quality & Congestion – Currently it is unclear how much this project may reduce delay at the intersection, but as the design of the interim solution is developed these numbers will be determined. That being said, one of the stated goals of this project is to reduce congestion at the intersection, and because congestion leads to more air pollution one of the anticipated benefits of this project will be reduced air pollution.

	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

Describe, *including supporting quantitative analysis*

Connection To Regional Trail – Though this project will not complete a missing link in the regional trail network, it will provide safer access to the Mary Carter Greenway (a regional trail) for people coming from the west of this intersection. The new alignment will put the intersection less than 450' from the Mary Carter Greenway.

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

Describe, *including supporting quantitative analysis*

Access to Recreational Facilities – Though this project will not provide additional facilities for a healthy and active lifestyle, it will make accessing the surrounding recreational facilities safer for people who use this intersection, regardless of travel mode. This intersection is adjacent a park, golf course, indoor tennis court, and regional trail.

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

Describe, *including supporting quantitative analysis*

Safer Access – Though his project will not impact opportunity disparities directly, it will provide safer travel to places that provide these opportunities such as employment concentrations, urban centers, and retail hubs for people who use the intersection, regardless of travel mode.

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*

Safe and Convenient Access – Though his project will not impact the subregion's economic health and vitality directly, it will provide safer and less congested travel for commuters and companies who use the intersection and do impact the subregional economy. In 2018, INRIX estimated that each driver in the Denver area spent 83 hours in congestion which cost him or her $1,152 for the year. Since one of the stated goals of this project is to reduce congestion, it's anticipated it will have a positive impact on the commuters and businesses that rely on the intersection.

Multimodal Employment Access—As mentioned above, this intersection is centered between three employment concentrations to the north, east, and west with residential neighborhoods immediately adjacent the intersection. The multimodal upgrades in this project will help provide greater access to employment for nearby residents—especially those who do not have access to a motor vehicle.

D. Project Leveraging

WEIGHT 20%

9.	What percent of outside funding sources (non-DRCOG-allocated Subregional Share funding) does this project have?	20%	41%+ outside funding sources ..... High 31-40% ..... Medium 30% 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	10
2. Population and Employment	

Year	Population within 1 mile	Employment within 1 mile	Total Pop and Employ within 1 mile
2020	12,813	10,636	**23,449**
2040	14,470	10,974	**25,444**

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*	5	8
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)*	1	2
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)*	1	2
6. = Number of SOV one-way trips reduced per day (#3 – #4 – #5)	**3**	**4**
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)*	27	36
8. = Number of pounds GHG emissions reduced (#7 x 0.95 lbs.)	**25**	**34**
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	120
2. Population and Employment	

Year	Population within 1 mile	Employment within 1 mile	Total Pop and Employ within 1 mile
2020	12,813	10,636	**23,449**
2040	14,470	10,974	**25,444**

Bicycle Use Calculations	Year	2040

	of Opening	Weekday Estimate
3. Enter estimated additional weekday one-way bicycle trips on the facility after project is completed.	15	23
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)*	8	12
5. = Initial number of new bicycle trips from project (#3 – #4)	7	11
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)*	2	**3**
7. = Number of SOV trips reduced per day (#5 - #6)	5	8
8. Enter the value of **{#7 x 2 miles}**. (= the VMT reduced per day) *(Values other than 2 miles must be justified by sponsor)*	10	16
9. = Number of pounds GHG emissions reduced (#8 x 0.95 lbs.)	9	15
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)	80
2. Population and Employment	

Year	Population within 1 mile	Employment within 1 mile	Total Pop and Employ within 1 mile
2020	12,813	10,636	**23,449**
2040	14,470	10,974	**25,444**

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	10	15
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)*	5	8
5. = Number of new trips from project (#3 – #4)	5	7
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)*	2	2
7. = Number of SOV trips reduced per day (#5 - #6)	3	5
12. Enter the value of **{#7 x .4 miles}**. (**= the VMT reduced per day**) *(Values other than .4 miles must be justified by sponsor)*	1	2

8. = Number of pounds GHG emissions reduced (#8 x 0.95 lbs.)	0	1
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	1,925
	2. Minority persons	2,080
	3. Low-Income households	476
	4. Linguistically-challenged persons	162
	5. Individuals with disabilities	479
	6. Households without a motor vehicle	411
	7. Children ages 6-17	1087
	8. Health service facilities served by project	8

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	50,000
2. 2040 ADT estimate	52,400
3. Current weekday vehicle hours of delay (VHD) (before project)	TBD

Travel Delay Calculations	Year of Opening
4. Enter calculated future weekday VHD (after project)	TBD
5. Enter value of **{#3 - #4} =** Reduced VHD	TBD
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)*	TBD
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*	TBD
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: Currently delay statistics are being calculated as part of the ongoing effort by the City of Littleton. The City of Littleton is happy to provide these numbers upon request when they are available.	

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	0	
Serious Injury crashes	14	
Other Injury crashes	0	
Property Damage Only crashes	131	
2. Estimated reduction in crashes applicable to the project scope *(per the five-year period used above)*		
Fatal crashes reduced	0	
Serious Injury crashes reduced	6	
Other Injury crashes reduced	0	
Property Damage Only crashes reduced	27	

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	Fair

2. Describe current pavement issues and how the project will address them.

The pavement has standard wear and tear for being 10+ years old. This project will replace the pavement because the intersection will be realigned.

3. Average Daily User Volume	50,000

Bicycle/Pedestrian/Other Facility

4. Current bicycle/pedestrian/other facility condition	Fair

5. Describe current condition issues and how the project will address them.

Standard wear and tear for a facility that are 10+ years old, however, not all facilities meet ADA standards. This project would realign intersection and provide new and upgraded facilities when practicable.

6. Average Daily User Volume	200

H. Bridge Improvements

1. Current bridge structural condition from CDOT

N/A

2. Describe current condition issues and how the project will address them.

N/A

3. Other functional obsolescence issues to be addressed by project N/A	
4. Average Daily User Volume over bridge	0

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

1.	N/A
2.	N/A
3.	N/A

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

1. Increase in VMT? *If yes, describe scale of expected increase*	☐ Yes ☒ No
N/A	
2. Negative impact on vulnerable populations N/A	
3. Other: N/A	

Part 4 — Special Considerations

Complete all answers with a YES/NO/UNSURE, and an explanation as warranted. Part 4 is not scored but will assist in project recommendation.

1. **Is the project a construction- or implementable- ready project?**
   Yes, the interim solution is being designed now, and, upon funding approval, the City of Littleton is ready to begin final design on the reconfiguration.

2. **Are there challenges with the project (right-of-way, environmental, utilities, etc.)?**
   a. **If yes, explain the challenge and how agency plan to address.**
   None, outside of the standard roadway construction concerns. Property acquisition needed for the project has already been discussed with South Suburban Parks and Recreation District, who is the only owner of land adjacent to the intersection other than the city.

3. **Are there other environmental or controversial issues associated with the project?**
   Yes, with the inclusion of a pedestrian tunnel there will need to be engineering done regarding ground water levels and drainage in the project area.

4. **Does the project or program benefit more than just the sponsoring agency and considered subregionally significant/transformative?**
   Yes, both Federal Blvd and Bowles Ave are significant arterials for the City of Littleton and Arapahoe County so improving this intersection will benefit many throughout the subregion. It will also benefit people from nearby jurisdictions such as Jefferson County, Englewood, Columbine Valley, Bow Mar, and Sheridan that regularly use the intersection.

5. **Does the agency have capacity and expertise to manage a federal project?**
   a. **Explain experience, approach, etc.**
   Yes, the City of Littleton has managed federally funded transportation projects successfully in the past. The most recent example is the Broadway and County Line Road Intersection, and, in addition, four other projects are currently underway.
   There will be both a Project Manager to ensure the project is completed correctly and on time, and a Grant Manager to ensure project expenditures, timelines, and documentations meet the standards required by the TIP Program.

6. **Is the project a next logical phase of a project funded in previous TIP cycles?**
   No

7. **Of the partnerships described in Section A, Question 7, are the partnerships providing funding?**
   a. **Describe the partnerships and funding of such.**
   No

8. **Are there any other "special considerations" the committee should consider in evaluating the application?**
   Yes, the Federal and Bowles intersection has the highest number of left turn accidents within the City of Littleton, 3rd highest number of bicycle and vehicle accidents, and is consistently in the top 5 most accident-

prone intersections. This project will dramatically impact safety at the intersection for drivers, cyclists, and pedestrians.