## Part 1 Base Information

1. Project Title
2. Project Start/End points or Geographic Area
Provide a map with submittal, as appropriate
3. Project Sponsor (entity that will construct/ complete and be financially responsible for the project)
4. Project Contact Person, Title, Phone Number, and Email

## Easter/Havana Intersection Improvements

The intersection of Easter Avenue and Havana Street in the City of Centennial. Project limits will extend several hundred feet north and south of the intersection on Havana Street and several hundred feet east of the intersection on Easter Avenue.

City of Centennial

Jim Paral, City Traffic Engineer
303-325-8036
jparal@centennialco.gov
5. Does this project touch CDOT Right-of-Way, involve a CDOT roadway, access RTD property, or request RTD involvement to operate service?

## 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.

|  | Grade Separation |
| :--- | :--- |
| $\square$ Rapid Transit Capacity (2040 FCRTP) | $\square$ Roadway |
| $\square$ Transit Other: | $\square$ Railway |
| $\square$ Bicycle Facility | $\square$ Bicycle |
| $\square$ Pedestrian Facility | $\square$ Pedestrian |
| $\square$ Safety Improvements | $\square$ Roadway Pavement Reconstruction/Rehab |
| $\square$ Roadway Capacity or Managed Lanes | $\square$ Bridge Replace/Reconstruct/Rehab |
| (2040 FCRTP) | $\square$ Study |
| $\square$ Roadway Operational | $\square$ Design |
|  | $\square$ Transportation Technology Components |
|  | $\square$ Other: |

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

The existing configuration at Easter Avenue and Havana Street is a traditional signalized intersection with heavy movements running north, south, and east of the intersection. The intersection handles significant traffic volume
as an alternative east/west route to Arapahoe Road connection the I-25/Dry Creek interchange with Broncos Parkway to the east as well as to new development along Easter Avenue. The intersection is identifed on the DRCOG 2040 Metro Vision road network as a key major arterial.

In 2014, the City of Centennial initiated a study to provide an analysis of alternatives for operational intersection improvements to improve east/west flow and overall intersection level of service.


Figure 1: Vicinity Map


Figure 2: Aerial of Existing Intersection
The 2014 study was updated in 2018 with new traffic volume and accident history data. The existing intersection currently operates at LOS C in the AM peak and a LOS D in the PM peak. As expected, the movements with the lowest LOS are the left turn movements in each of the four directions.


Figure 3: 2015 LOS of Existing Intersection
The 2018 update also showed a significant increase in projected traffic volumes, and a corresponding significant decrease in intersection LOS.
9. Define the scope and specific elements of the project.

The original study identified a displaced left turn (DLT) intersection as the preferred alternative.


Figure 4: Conceptual Layout of Proposed Project
The project will reconfigure the traditional intersection into a DLT by installing a sweeping curve for NB/EB and WB/SB traffic and replacing the single signalized intersection with three separate two-phase traffic signals. Pedestrian improvements in the form of sidewalk connections will accompany the project along with necessary ADA ramps and access points.
10. What is the status of the proposed project?

The City completed an analysis of alternatives for a variety of intersection improvement concepts in 2014. The study recommended a displaced left turn as the preferred improvement. The City has a conceptual horizontal layout for the proposed improvements.
11. Would a smaller DRCOG-allocated funding amount than requested be acceptable, while maintaining the original intent of the project?

If yes, define smaller meaningful limits, size, service level, phases, or scopes, along with the cost for each.
The scope of the project would likely not change. If less federal funding is offered, the City would evaluate ways to make up the shortfall using either local funds or other grant sources.

## A. Project Financial Information and Funding Request

## 1. Total Project Cost

\$10,000,000
2. Total amount of DRCOG Subregional Share Funding Request

50\%
of total project cost

| 3. Outside Funding Partners (other than DRCOG Subregional Share funds) | \$\$ <br> List each funding partner and contribution amount. | \% of Contribution <br> to Overall Total <br> Project Cost |
| :--- | :---: | :---: |
| City of Centennial | $\$ 5,000,000$ | 50 |
|  | $\$$ |  |
|  | $\$$ |  |
|  | $\$$ |  |
| Total amount of funding provided by other funding partners <br> (private, local, state, Regional, or federal) | $\$$ |  |


| 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 | \$ | \$ | \$ | \$5,000,000 | \$5,000,000 |
| State Funds | \$ | \$ | \$ | \$ | \$0 |
| Local Funds | \$ | \$1,650,000 | \$1,000,000 | \$2,350,000 | \$5,000,000 |
| Total Funding | \$ | \$1,650,000 | \$1,000,000 | \$7,350,000 | \$10,000,000 |
| 4. Phase to be Initiated Choose from Design, ENV, ROW, CON, Study, Service, Equip. Purchase, Other | Choose an item | ROW \& Design | Construction | 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
westr 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 Havana/Easter intersection today serves a variety of uses with Top Golf (retail entertainment) on the northeast corner, the Inova development (business/hotel/office) on the southeast corner, multi-family housing to the south on Havana, and existing commercial and retail development north of Easter. The regional draw of Top Golf along with the vehicle-intensive business use at Inova already draws signficant activity.

Improvements to the Easter/Havana intersection are vital to the subregion. The updated study shows a significant improvement to the intersection LOS for all movements, and in conjunction with a similarly planned improvement at Easter/Peoria, the Dry Creek/Havana/Easter/Peoria corridor would become a viable east/west alternative to Arapahoe Road. The alternative corridor would serve Littleton to the west, Arapahoe County and Parker to the east, and commuters from across the region using the I-25/Dry Creek interchange to access the central part of Centennial.
2. Does the proposed project cross and/or benefit multiple municipalities? If yes, which ones and how?

Arapahoe County has a similarly planned improvement at the intersection of Easter and Peoria. By improving both intersections, the Dry Creek/Havana/Easter/Peoria/Broncos corridor becomes a viable east/west alternative to Arapahoe Road. The alternative corridor would serve Littleton to the west, Arapahoe County and Parker to the east, and commuters from across the region using the I-25/Dry Creek interchange to access the central part of Centennial.
3. Does the proposed project cross and/or benefit another subregion(s)? If yes, which ones and how?

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

The updated study shows a significant improvement to the intersection LOS for all movements, and in conjunction with a similarly planned improvement at Easter/Peoria, the Dry Creek/Havana/Easter/Peoria corridor would become a viable east/west alternative to Arapahoe Road.


Figure 5: $\mathbf{2 0 4 0}$ LOS of Existing Intersection


Figure 6: $\mathbf{2 0 4 0}$ LOS of Proposed Intersection
The updated study shows opening day travel time reduction of 109 seconds at the intersection, and a reduced person hours of delay of 90.4 hours. This is significant when considering an over 40\% projected increase in ADT between 2024 and 2040.
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?

The Havana/Easter intersection today serves a variety of uses with Top Golf (retail entertainment) on the northeast corner, the Inova development (business/hotel/office) on the southeast corner, multi-family housing to
the south on Havana, and existing commercial and retail development north of Easter. The regional draw of Top Golf along with the vehicle-intensive business use at Inova already draws signficant activity.
The City of Centennial's comprehensive plan identifies the areas adjacent to the intersection as primed for even more future commercial and employment-based development. The intersection itself is identified as a key node for its development potential (greenfield and other) south and east of the intersection extending all the way to the intersection of Easter/Lima which serves as the northeast boundary of the Inverness business park.

An already busy and congested area will only get busier with future development. Improvements to key intersection and major adjacent corridors will serve existing developments well and attract high quality future development.
6. How will connectivity to different travel modes be improved by the proposed project?

There is currently a lack of transit in the immediate area, and no current plans to institute new service in the future. However, intersection improvements will improve the LOS at the intersection and provide a viable east/west alternative to Arapahoe Road which will reduce delay for micro-transit, ride share providers, and other vehicle-based services. Pedestrian connections through the area will be strengthened with the installation of sidewalks and ADA-compliant ramps.
7. Describe funding and/or project partnerships (other subregions, regional agencies, municipalities, private, etc.) established in association with this project.

In 2016, the City of Centennial secured the necessary ROW to accommodate the sweeping turn on the southeast corner of the intersection through an annexation and development agreement. Similarly, the City has agreed with the property owner on the northeast corner to reserve the necessary ROW, but the ROW has not been purchased by the City. The City of Centennial intends to use Capital Improvement Fund dollars to fund the local share.
B. DRCOG Board-approved Metro Vision TIP Focus Areas weight

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).

There are currently no health services in the immediate area, though greenfield development opportunity exists for future construction of those facilities. DRCOG data currently shows a disabled population of roughly 350 in the two adjacent tracts. By improving the intersection and providing a viable east/west alternative to Arapahoe Road, more reliable access to the Centennial Medical Plaza at Arapahoe Road/Jordan road is obtained.
2. Describe how the project will increase reliability of existing multimodal transportation network.

The intersection is located on the DRCOG 2040 Metro Vision road network. No mass transit lines are planned on this route, but Havana and Easter are key arterials that will continue to accommodate significant vehicular traffic. Intersection improvements will improve the LOS at the intersection and provide a viable east/west alternative to Arapahoe Road which will reduce delay for micro-transit, ride share providers, and other vehicle-based services. Additionally, sidewalk improvements at the intersection will strengthen area connections.
3. Describe how the project will improve transportation safety and security.

Reports from the Arapahoe County Sheriff's Office show 44 accidents since January, 2014. These crashes have a low severity with very few injuries. Roughly half are related to turning movements and half are rear-end crashes. The proposed intersection improvements will remedy this pattern by reconfiguring turning movements
to reduce conflict potential and reducing the chance for rear-end crashes by reducing delay and congestion through the intersection.

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

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?
Describe, including supporting quantitative analysis
The intersection falls in the I- 25 corridor zone identified in the DRCOG urban center map, a focus area for development for Centennial and the south metro area. Employment population in the entire corridor is expected to reach 142,000 in 2040 with roughly 9,000 projected to be immediately adjacent to the intersection. As new development, redevelopment, and densification continues along the l-25 corridor, traffic congestion will increase. Intersection improvements at Havana/Easter will improve traffic operations in and through the I-25 corridor zone.

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?

## Describe, including supporting quantitative analysis

The intersection falls in the I- 25 corridor zone identified in the DRCOG urban center map. Employment population in the entire corridor is expected to reach 142,000 in 2040 with roughly 9,000 projected to be immediately adjacent to the intersection. The intersection improvements will better traffic operations within the zone and as a vital node on the Dry Creek/Havana/Easter/Peoria corridor, will connect I- 25 to employment, commercial, retail, and residential destinations to the east.

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 $\square$ No

Describe, including supporting quantitative analysis
The intersection is located on the DRCOG 2040 Metro Vision road network. No mass transit lines are planned on this route, but Havana and Easter are key arterials that will continue to accommodate significant vehicular traffic. Intersection improvements will improve the LOS at the intersection and provide a viable east/west alternative to Arapahoe Road which will reduce delay for micro-transit, ride share providers, and other vehicle-based services. Additionally, sidewalk improvements at the intersection will strengthen area connections.
4. Will this project help reduce ground-level ozone, greenhouse gas emissions, carbon monoxide, particulate matter, or other air pollutants?

No

Describe, including supporting quantitative analysis
Increased efficiency of the intersection and reduction of delays will provide a reduction in the increase of greenhouse gas emissions and other pollutants. While no mass transit lines are planned on this route, increasing the efficiency of a key arterial intersection will reduce delays and increase efficiencies for micro-transit, ride share providers, and other vehicle-based services. Providing more efficient, alternative routes for non-transit based vehicles eases pressure on existing transit lines, leading to further increases in efficiency.

## 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 $\quad$ Y Yes $\square$ No assets?
Describe, including supporting quantitative analysis
The intersection is within 3 miles of several regional recreational areas: the Dove Valley Regional Park, the South Suburban Family Center, Centennial Civic Center Park, and the Broncos facility. Improvements to the intersection will improve vehicle-based and pedestrian connections from I-25/Dry Creek to these destinations.

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?

Describe, including supporting quantitative analysis
The intersection is within 3 miles of several regional recreational areas: the Dove Valley Regional Park, the South Suburban Family Center, and Centennial Civic Center Park. Improvements to the intersection will improve vehicle-based and pedestrian connections from I-25/Dry Creek to these destinations.

## 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? No

Describe, including supporting quantitative analysis
The intersection falls in the I-25 corridor zone identified in the DRCOG urban center map. Employment population in the entire corridor is expected to reach 142,000 in 2040 with roughly 9,000 projected to be immediately adjacent to the intersection. Further, the City of Centennial's comprehensive plan identifies the areas adjacent to the intersection as primed for even more future commercial and employment-based development. The intersection itself is identified as a key node for its development potential (greenfield and other) south and east of the intersection extending all the way to the intersection of Easter/Lima which serves as the northeast boundary of the Inverness business park.

The intersection improvements will better traffic operations within the zone and as a vital node on the Dry Creek/Havana/Easter/Peoria corridor, will connect l-25 to employment, commercial, retail, and residential destinations to the east.

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?
Describe, including supporting quantitative analysis

As described in the answers above, the intersection lies within an important area for the City and the subregion. Development activity will continue for years and having a solid transportation network in place will facilitate that development and attract high quality employers and businesses.

| D. Project Leveraging | WEIGHT $\mathbf{1 0 \%} \mathbf{0}$ |
| :--- | :--- |
| 9. What percent of outside funding sources |  |
| (non-DRCOG-allocated Subregional Share | $50 \%$ |
| funding) does this project have? |  |

## Part 3 <br> Project Data Worksheet - Calculations and Estimates <br> (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 | 0 | 0 | 0 |
| 2040 | 0 | 142,000 | 142,000 |


\section*{Transit Use Calculations <br> | Year <br> of <br> Opening | 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
$0 \quad 0$
$0 \quad 0$
$0 \quad 0$

0 0
$0 \quad 0$
(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)
8. = Number of pounds GHG emissions reduced ( $\# 7 \times 0.95 \mathrm{lbs}$.)

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

0
2. Population and Employment

| Year | Population within 1 mile | Employment within 1 mile | Total Pop and Employ within 1 mile |
| :---: | :---: | ---: | ---: |
| 2020 | 0 | 0 | 0 |
| 2040 | 0 | 142,000 | 142,000 |

Year
of Opening

2040 Weekday Estimate
3. Enter estimated additional weekday one-way bicycle trips on the facility after project is completed.
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)
5. = Initial number of new bicycle trips from project (\#3-\#4)
6. Enter number of the new trips produced (from \#5 above) that are replacing an SOV trip.

0
(Example: \{\#5 X 30\%\} (or other percent, if justified)
7. = Number of SOV trips reduced per day (\#5-\#6)
8. Enter the value of $\{\# 7 \times \mathbf{2}$ miles $\}$. (= the VMT reduced per day)
(Values other than 2 miles must be justified by sponsor)
$0 \quad 0$

0
0
$\square$
$0 \quad 0$

0
$0 \quad 0$
$0 \quad 0$

0
9. = Number of pounds GHG emissions reduced ( $\# 8 \times 0.95 \mathrm{lbs}$.)
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)
2. Population and Employment

| Year | Population within 1 mile | Employment within 1 mile | Total Pop and Employ within 1 mile |
| :---: | :---: | :---: | :---: |
| 2020 | 0 | 0 | 0 |
| 2040 | 0 | 142,000 | 142,000 |

## Pedestrian Use Calculations

3. Enter estimated additional weekday pedestrian one-way trips on the facility after project is completed
4. Enter number of the new pedestrian trips (in \#3 above) that will be diverting from a different walking route

| Year | 2040 |
| :---: | :---: |
| of Opening | Weekday Estimate | (Example: \{\#3 X 50\%\} or other percent, if justified)

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.

0
0
(Example: \{\#5 X 30\%\} or other percent, if justified)
7. = Number of SOV trips reduced per day (\#5-\#6)

0
0
12. Enter the value of $\{\# 7 \times .4$ miles $\}$. (= the VMT reduced per day)
(Values other than 4 miles must be justified by sponsor)
0
8. $=$ Number of pounds GHG emissions reduced ( $\# 8 \times 0.95 \mathrm{lbs}$.)

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

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

## 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
2. 2040 ADT estimate

52,000/51,000
3. Current weekday vehicle hours of delay (VHD) (before project)

Travel Delay Calculations
Year
of Opening
5. Enter value of $\{\# 3-\# 4\}=$ Reduced VHD64.6
6. Enter value of $\{\# 5 \times 1.4\}=$ Reduced person hours of delay
(Value higher than 1.4 due to high transit ridership must be justified by sponsor)
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
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)

| Fatal crashes | 0 |
| :--- | ---: |
| Serious Injury crashes | 0 |
| Other Injury crashes | 2 |
| Property Damage Only crashes | 42 |

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 | 0 |
| Other Injury crashes reduced | 1 |
| Property Damage Only crashes reduced | 15 |

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).

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

The current pavement is in fair condition. The City's Pavement Management System utilizes a 0-100 scale, Pavement Condition Index (PCI) based evaluation of pavement conditions throughout the system. Currently, Havana Street is rated 58 and Easter Avenue is rated 53. Both of these roads would be recommended for a structural overlay in the next 2-4 years.
3. Average Daily User Volume

60,000 vpd

## Bicycle/Pedestrian/Other Facility

4. Current bicycle/pedestrian/other facility condition
5. Describe current condition issues and how the project will address them.

Currently, this intersection has basic pedestrian facilities and limited bicycle facilities. The proposed improvements, in conjunction with development led improvements in the area, will complete missing sections of sidewalk, add in bicycle lanes, and provide for two-phase signalization which would allow for reduced conflicts between vehicles and pedestrians.
6. Average Daily User Volume
H. Bridge Improvements

1. Current bridge structural condition from CDOT

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

There are no bridge facilities affected by this project.
3. Other functional obsolescence issues to be addressed by project

N/A
4. Average Daily User Volume over bridge
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 increaseYes $\boxtimes$ No

NA
2. Negative impact on vulnerable populations

NA
3. Other:

NA

