COLORADO
Department of Transportation

REQUEST FOR PROPOSAL
Preliminary Design and Environmental Services

PROJECT LOCATION: CO 7 (64th Street to US 287), Boulder County
PROJECT NUMBER: STU 007A-028
PROJECT CODE: 23157

May 27, 2022

Colorado Department of Transportation
10601 W 10th St, Greeley, CO 80634
Greeley, CO 80634

1.0 Project Information and Scope of Work

1.1 Introduction

Colorado Department of Transportation (CDOT or the Department) is requesting consultant services to perform engineering project management, preliminary design and environmental investigations for 15% level designs for corridor-wide improvements along CO 7 between 64th Street and US 287. CDOT, in close coordination with Boulder County planning and engineering staff, will provide consultant management of this project.

The Consultant may suggest modifications to the proposed scope based on their experience with similar projects. Any proposed scope change shall have a detailed explanation regarding the rationale for the proposed change.

1.2 Description of Project Area

The project is located on CO 7 between 64th Street in the City of Boulder and US 287 located in the City of Lafayette. CO 7 within the project area is commonly known as Arapahoe Road, an arterial road and one of the City of Boulder's most heavily traveled commuter corridors to the west. Within the Project Area, final design engineering for an intersection improvement at CO 7 and 95th Street is currently underway by CDOT as a separate project, in coordination with Boulder County and the City of Lafayette. It is expected that the Consultant will coordinate and incorporate the intersection final design into the preliminary design plans for this project. Similarly, west of this project, CDOT and the City of Boulder are performing preliminary engineering design for CO 7 from 28th Street to 64th Street. This project is to be coordinated with the project west of 64th Street.

1.3 Background

CDOT, along with local partners, completed the CO 7 Corridor Development Plan (CDP) in January 2021. Building on previous planning efforts, this wholistic plan for the corridor identified several Sections of Independent Utility (SIU) including SIU B, CO 7 from 64th Street to US 287. Pursuant with the CDP, this project includes the combined completion of the proposed actions for No. 1-1 (BRT Concept Study – 64th Street to US 287) and No. 2-21 (SIU B PE – 64th Street to US 287).

Previous planning efforts for this section of CO 7 are shown in Table 1 and will provide the foundation for the preliminary engineering and environmental design of SIU B.

Table 1. Summary of Previous Planning Study Recommendations

Year	Description	General Infrastructure Recommendations (See Note)
2008	SH 7 (Cherryvale Road to 75th Street) Environmental Assessment	Two general purpose lanes with median and shoulders (to be converted to transit lanes) with transition to an expanded roadway section at Cherryvale, extending to the west, plus intersection improvements (as-completed construction).
2018	SH 7 Planning & Environmental Linkages Study (75th Street to US 287)	Two general purpose lanes with continuous shoulders for peak period transit and bicycle use and shared-use paths plus intersection improvements with the option of a directional or bi-directional managed lane (to be determined).
2018	East Arapahoe Transportation Plan (Folsom Street to 75th Street)	Four general purpose lanes west of 55th Street and transitioning to two lanes to the east combined with continuous transit lanes, signal transit priority, median, bike lanes and shared-use paths plus intersection improvements.
2018	SH 7 Bus Rapid Transit Feasibility Study	BRT operations and routing plan and station locations for regular service between Brighton and Boulder.
2020	SH 7 BRT Station Area Design	BRT station concept plans and configurations, First and Final Mile infrastructure and Transit Oriented Development guidance at 15 planned station locations.

Note: Details on the recommended multimodal improvements are available in the previous study reports.

Adopted in 2018, the City of Boulder's CO 7/East Arapahoe Transportation Plan sets out a long-range vision for safety, access, and mobility improvements for the East Arapahoe corridor. The 2040 vision concept for East Arapahoe transforms one of the City of Boulder's busiest travel corridors into a complete street with better travel options for commuters, as well as for the greater number of people who will be working and living in East Boulder. A cornerstone of this transportation investment will be high frequency, high quality regional Bus Rapid Transit service along CO 7 connecting Boulder to communities to the east and I-25. Based on this plan, CDOT and the City of Boulder are currently performing preliminary engineering and environmental design for CO 7 between 28th Street and 64th Street (SIU A). This project for SIU B will coordinate with the preliminary design for SIU A and will be based on the findings and recommendations from the East Arapahoe Transportation Plan between 64th Street and 75th Street.

1.4 Stakeholders

The following is an intial list of anticipated stakeholders and/or interested parities in this project:

Agency/Stakeholder	Role or Involvement
Colorado Department of Transporation (CDOT)	Project oversight
Boulder County	Project within the County
City of Boulder	Segments of the project within the City

City of Lafayette	Segments of project within the City
CO 7 Corridor Coalition and Technical Advisory Committee (TAC)	General oversight and promotion of the CO 7 Corridor between Brighton and Boulder
Regional Transportation District (RTD)	Involved with BRT and transit stop components
Colorado Parks and Wildlife (CPW)	Involved with the evaluation of Threatened & Endangered, Candidate and Colorado State Sensitive Species
United States Forest Service (USFS)	Ensure that project actions do not impact or jeopardize existence of any listed species or critical habitat
US Fish and Wildlife Service (USFWS)	Involved with the evaluation of Threatened & Endangered, Candidate and Colorado State Sensitive Species
Mile High Flood District	Oversees drainage
Utilities	Could be directly affected by the project
Traveling public	Roadway safety/trip reliability input
Property owners, businesses, and residents along the corridor	Could be directly affected by the project
Emergency responders	Emergency response/access input
City of Boulder Open Space	Could be directly affected by the project
Boulder County Parks and Open Space	Could be directly affected by the project

The Consultant should anticipate that a design which affects an agency will have to be accepted by that agency prior to its acceptance by CDOT. Submittals to affected agencies will be coordinated with CDOT.

1.5 Technical Team

There will be a small technical team that will hold regular meetings throughout the corridor design project. The goal of the Technical Team is to ensure that the design is consistent with local agency corridor and community plans and integrates seamlessly into the surrounding transportation and land use context. The team members will include staff from CDOT, RTD, Boulder County, the City of Boulder, and the City of Lafayette. The Consultant shall indicate when these meetings will occur in the project schedule. The consultant will be responsible for coordinataing, collecting, distributing and publishing meeting minutes for these meetings.

1.6 Scope of Work Overview

The scope of work will advance previous planning efforts, including the East Arapahoe Transportation Plan, the SH 7 Planning & Environmental Linkages Study (75th Street to US 287), and other past planning efforts included in Table 1, into preliminary engineering (15% design) and environmental review, as follows.

- **Phase I (Multimodal Concept Study)** – Perform a feasibility analysis, operational evaluation, and concept plan for multimodal improvements within the Project Area to advance the recommendations and address unresolved scope and concept issues from

the previous studies. This will include conceptual recommendations for bicycle, pedestrian, and transit facilities and configurations within the Project Area. Previous plans and studies recommended one general purpose lane in both directions through the Project Area, extending from SIU A to US 287. Previous studies recommended transit lane provisions but did not identify a recommended configuration – exclusive bus lanes, bus on shoulders, or a combination. In addition, continuous bicycle and pedestrian facilities along the Project Area were recommended; however, design configurations were not identified. Potential concepts include bike lanes, shared shoulders, an attached multiuse path, and/or a separated multiuse path. A final recommendation for the multimodal components and configurations within the corridor typical section is needed before advancing into preliminary design and plans. A conceptual feasibility analysis of the multimodal elements and their combinations is needed considering limits of construction, operational considerations, safety, right-of-way impacts, environmental impacts, impacts to adjacent Boulder County Open Space, and construction costs. Considerations will need to include coordination and compatibility with: 1) Multimodal improvements currently under design at the CO 7 and 95th Street Intersection, 2) Improvements recently constructed along CO 7 between Cherryvale Road and 75th Street pursuant with the SH 7 (Cherryvale Road to 75th Street) Environmental Assessment, and 3) the CO 7 Corridor (Brighton to Boulder) Bike Treatment Plan (currently in progress by CDOT).

- **Phase II (Preliminary 15% Design and Plans)** – Based on the recommendations from Phase I including a composite roadway typical section with multimodal (bicycle, pedestrian, and transit) components, perform preliminary 15% engineering roadway and bridge design and plans showing limits of construction, right-of-way (conceptual), and utilities. Supporting environmental investigations (pre-NEPA) will be performed. Provide preliminary construction cost estimates.

1.7 Cost

The 15% corridor design is estimated at approximately $1.28M. Project will be designed to budget.

1.8 Work Duration

15% corridor design is expected to be completed within 12 -18 months.

1.9 Milestones and Proposed Schedule

The Consultant shall develop a preliminary schedule as part of its proposal. CDOT has assumed an overall schedule of 12 to 18 months to complete the project. The schedule will include the following:

- All project activities and deliverables shall be incorporated.
- Steps necessary to identify Federal NEPA requirements

- A timeline outlining amount of time required to complete each task.
- Proposed project outreach plan and calendar (open house meetings, etc.)
- Preparation of public notices and required notices for required public comment periods.

The Consultant shall provide a schedule which addresses the items above over a 12 to 18 month period. If the Consultant determines that it cannot accomplish the schedule in the proposed 12 to 18 month period then the Consultant will be required to provide the reasons as to why it is not feasible.

1.10 Consultant Responsibility and Duties

The Consultant is responsible for:

- Project Management
- Data Collection
- Project Coordination
- Preliminary Design Coordination with CDOT Design Team
- Right-of-Way/Survey
  Note on Survey: Aerial and Mobile LiDAR is being conducted across this section. This is expected to be completed by March 2022. The contractor should use available mapping provided by CDOT. Right-of-way limites are to defined and presented on the plans using currently available information with supporting research and right-of-way as needed.
- All other efforts and deliverables as indicated in this contract

1.11 Coordination with other projects

Ongoing efforts related to the CO 7 Corridor Development Plan shall be coordinated with this project as follows:

- Public & Stakeholder Involvement - Coordination and integration of project communications and engagement with the overall CO 7 Communications Manager.
- Traffic Volumes - Traffic operational analyses and simulations shall be integrated and coordinated with the Corridor Systems Planning Tool. Traffic forecasts (design year peak-hour traffic volumes for CO 7 and major intersection turning movements) will be provided by CDOT from the Corridor Systems Planning Tool.
- Current design projects:
  - CDOT intersection design at CO 7 and 95th Street in the City of Lafayette (currently in design).
  - CDOT and the City of Boulder prelimary engineering of SIU A (28th Street to 64th Street).
- Other corridor-wide projects identified in the CDP, including:

- Corridor Bike/Pedestrian Treatment Plan – General guidance and recommendations for bike and pedestrian facility features, standards, configurations, and connections corridor-wide to be incorporated into each SIU.
- Technology Deployment Plan – General guidance and recommendations for technology applications within the corridor such as signal coordination, communications backbone infrastructure, and Automated Vehicle/Connected Vehicle design provisions to be incorporated into each SIU.

2.0 Project Management

The Consultant will be required to work closely and coordinate with CDOT design staff and other CDOT consultants throughout the project. In general, Project Management activities will include, but not limited, to the following:

- Conduct and document with agenda and meeting minutes project coordination and progress meetings with the Technical Team.
- Provide materials, attend and participate in up to 3 TAC meetings to present the project. TAC meeting agenda and minutes will be documented by CDOT.
- The Consultant shall prepare monthly project progress reports, billings, establish and maintain the project schedule with key milestones, a contact reporting system, an issues tracking system, and a schedule for bi-weekly progress meetings.
- The Consultant Project Manager will be required to attend all corridor public meetings held throughout the environmental and engineering design process, unless otherwise specified by CDOT. The Consultant will be responsible for preparing appropriate presentation materials for all meetings.
- The Consultant shall be expected to take minutes at all meetings and provide the CDOT Project Manager with a completed copy within five (5) working days after each meeting. When a definable task is discussed during a meeting, the minutes will identify the “Action Items”, the agency responsible for accomplishing them, and the proposed completion date.
- The monthly progress reports will include summaries of work accomplished, task percent complete, task percent expended, work planned in the upcoming month and problems identified and solutions to the problems. The monthly progress report shall also include a schedule status, and, if behind schedule, a schedule recovery plan.

2.1 CDOT Oversight

CDOT will conduct reviews of contract submittals to determine the extent to which contract requirements are being met by the work products, and ultimately to provide CDOT with the necessary confidence for acceptance. The Consultant shall review CDOT’s comments on submitted work products, provide a written response utilizing the medium in which these comments were provided, and implement corrective actions as required. CDOT design review

comments will be recorded. However, these reviews are not intended to replace the Consultant's own quality assurance/quality control activities.

2.2 Document Control / Information Management

To ensure efficient information management on the project, CDOT will use Cloud ProjectWise, a web-based information management system. An overall ProjectWise file management structure, organization, and protocol will be provided by CDOT for active file sharing, retrieval, and archiving for the project.

The Consultant's proposal must include agreement to use the Cloud ProjectWise when communicating with CDOT on its respective projects. This includes use for all Document Control related for the duration of the project. Cloud ProjectWise will be used by all participants engaged on this project, including contractors, subcontractors, and their subsequent legal successors in title. It is the Consultant's responsibility to ensure this is the case.

Access to the Cloud ProjectWise system for the respective CDOT project will be provided to all contractors, subcontractors and subconsultants free of charge for the duration of the project.

3.0 Public Information/Public Involvement

The proposal shall include a process for engaging agencies, stakeholders and the public in the project. This is a diverse group of stakeholders and proposed solutions may not align with "their" individual solutions for the corridor. Context Sensitive Solutions and consensus-building will be paramount in facilitating conversations with stakeholders, local agencies, and the public.

3.1 Public Involvement Plan

The Consultant shall develop a public involvement plan for the project.

Pursuant with the CO 7 Corridor Development Plan, an overall Communications Manager will provide and coordinate corridor-wide communication activities and will provide oversight and corridor-related communication materials and stakeholder coordination for the project. The project public involvement plan will reflect and integrate with the overall communications roles and responsibilities framework as follows:

Communications Activities	Roles and Responsibilities	
	Communications Manager	Proposed Action Team Specialist
Branding		
Regional Partners Coordination and Media Relations		
Messaging and Engagement		
Regional and Corridor-wide Messages		
Local Design, Property and Environmental information		
Project Website		
Corridor Contact List	Regional	Local
Social Media	Regional	Local
Public Involvement (Townhalls, Open Houses)		
Community Briefings and Events	Regional	Local

The Consultant will conduct public, agency, neighborhood and business association and special interest meetings throughout the project. The Consultant will prepare all project-specific graphic, presentation and technical materials required by CDOT. Interested people shall be notified of project activities through e-mail blasts, social media announcements and organizational newsletters. In addition, a project page will be established on the CDOT web site that shall be updated throughout the project. All public information documents will be ADA compliant and shall be translated to Spanish to accommodate Spanish-speaking residents.

CDOT's goal is to have three public meetings throughout the duration of the project. It is proposed that the first public meeting occur during Phase I as optional multimodal concepts and configurations are being evaluated. The second public meeting should occur after the Phase I has been completed and Phase II designs are commencing. Both of these initial two meetings are intended to solicit public feedback on the initial concepts evaluations and designs. The final public meeting will be as the preliminary designs are in progress and before completion. This meeting will focus on collecting feedback on any design options being considered to include input into the 15% design.

CDOT will rely on the Consultant to develop a public involvement approach which responds to the unique characteristics of the project area and to the unique challenges posed by COVID-19 and its varients. To that end, CDOT will not prescribe a specific public involvement strategy, but will expect the Consultant to develop an innovative approach that expands outreach beyond just a project website, public meetings, newsletters and mailings. Such approaches might include virtual meetings, text-based survey tools and the use of social media as a way to most effectively reach interested parties. Special consideration should be given to reaching

underserved and low-income populations that are more difficult to reach through traditional public involvement processes.

All public facing materials, including Power Point presentations, reports, graphic materials and other documents, that are shared with the general public shall be made accessible for the visually impaired. This shall be the responsibility of the Consultants and not CDOT staff.

Deliverables

- Public involvement plan
- Accurate and timely Website updates (the Website setup and administration will be provided by CDOT)
- Electronic copies of all outreach materials created (including maps, posters, etc.)
- Public involvement report, including public comments received
- Public Meeting(s) transcripts and appropriate responses.

4.0 Design

4.1 Identification of Design Criteria

Preliminary Design Criteria will be developed by the Consultant and coordinated with the CDOT/PM prior to starting the design. An overall CO 7 Design Manual will be provided by CDOT as guidance for the project-specific design criteria. The Consultant shall develop the CDOT Form 463 and insert a copy upon completion. The design criteria will successfully include all State and Federal standards used on CDOT projects.

4.2 Project Design Data and Standards

The consultant is responsible for obtaining and ensuring compliance with the most recent CDOT adopted version of the listed references including standards and specifications, manuals, and software or as directed by the CDOT/PM. Conflicts in criteria shall be resolved by the CDOT/PM. The Consultant shall submit any proposed changes to the pertinent criteria to the CDOT/PM at one of the periodic progress meetings prior to initiating design.

4.3 Project Computer Software Requirements

The consultant shall utilize the most recent CDOT adopted software with the current CDOT workspace. The primary software used by CDOT is as follows:

A. Earthwork	OpenRoadsDesigner
B. Drafting/CADD Configurations	OpenRoadsDesigner (CDOT Format & Standards)

C. Survey/photogrammetry	CDOT TMOSS, OpenRoadsDesigner
D. Bridge	CDOT Staff Bridge Software Design/Design Check
E. Estimating	AASHTOWare Project Applications and P70 Tools
F. Specifications	Microsoft Word
G. Scheduling	Microsoft Project
H. Traffic Modeling	VISSM
I. Pavement Design	AASHTOWARE Pavement ME (Adopted Version)

5.0 Affected Environment and Mitigation Measure

As described in the CO 7 Corridor Development Plan, because this project does not include the initiation of NEPA, the environmental approach is to provide the necessary and supporting environmental analyses for the preliminary engineering and design in compliance with NEPA processes to streamline the subsequent environmental documentation to be conducted later for FIR/FOR design plans and construction. It is anticipated that the subsequent NEPA analyses, in whole or in phases, would be a CatEx level of review. The analyses for this project will therefore entail appropriate study and assessment for those key resources that could affect the preliminary design. Additional environmental analysis will then be required as part of any future NEPA analysis and documentation (not included in this RFP).

Accordingly, the Consultant will work with CDOT to determine the appropriate level of NEPA-like analysis for this project. CDOT's expectation is that the project's limits and areas of direct impact will be within and immediately adjacent to the existing transportation right-of-way (TBD) and may consequently require a lower level of environmental review, as per the environmental approach.

The following environmental analyses, as appropriate, are to be included with the project to support the preliminary engineering design and to facilitate future NEPA analyses and documentation:

- **Traffic Noise** – As appropriate, conduct a Type I noise analysis to identify noise mitigation requirements for inclusion into preliminary engineering due to the addition of a through-lane (if any). This includes the addition of a through-traffic lane that functions as a bus lane. Type I projects are defined by 23 CFR 772.5, and CDOT guidance is provided in the 2020 Noise Analysis and Abatement Guidelines. The Type I noise analysis will identify existing and future noise conditions and noise sensitive receptors

and will evaluate impacts and potential noise mitigation for inclusion in preliminary and final engineering design and construction cost estimates.

- **Historic Survey** – As appropriate, prepare an area of potential affect (APE) based on conceptual design project area and conduct a survey of properties within the APE that include structures greater than 40 years of age for the Corridor to identify eligible and potentially-eligible properties for the NRHP. Consultation with SHPO in accordance with Section 106 will be conducted by CDOT.
- **Parks, Trails and Open Space** – Review parks, open space, and trails along the Corridor to identify Section 4(f) and Section 6(f) properties; coordinate with the preliminary design for any necessary design alternatives analyses to avoid and minimize impacts; and develop a potential mitigation strategy, as needed, for potentially impacted sites.

In addition, the following resources are to be identified, mapped, and characterized which could potentially affect the project design and/or facilitate the future NEPA analyses. If impacts are found and are relevant to the preliminary design, appropriate mitigation measures will be determined and incorporated into the design. Those resources not present within the limits of the project should be noted. Additionally, those resources present, but not impacted, should be discussed. Collection and identification of resources will be performed in ArcGIS, as appropriate, and coordinated with the overall CO 7 ArcGIS database pursuant with the CDOT-provided structure and organization.

a. Land Use – not anticipated to be included
b. Economic Considerations – not anticipated to be included
c. Right-of-Way and Relocations
d. Social Impacts and Community Facilities – not anticipated to be included
e. Environmental Justice – not anticipated to be included
f. Cultural and Section 106 (Historic listed above)
g. Parklands, Recreation Resources and 4(f) / 6(f) Evaluation (listed above)
h. Public Safety and Security
i. Visual and Aesthetic Resources – not anticipated to be included
j. Air Quality – not anticipated to be included
k. Noise and Vibration (listed above)
l. Biological Assessment
m. Mineral Resources / Geology / Soils
n. Farmlands
o. Hazardous Materials
p. Utilities
q. Energy – not anticipated to be included

r. Water Resources and Water Quality
s. Wetlands / Waters of the U. S.

Deliverables:

- Documentation for each resource.
- ArcGIS data of resources coordinated with the overall CO 7 dataset

6.0 Design Process

The goal of the design process is to determine the multimodal composition and configurations for the CO 7 corridor improvements within the Project Area and to prepare preliminary 15% engineering design plans to help establish budget and right-of-way needed, to conduct sufficient environmental review and analysis to document environmental impacts, and to prepare the corridor to enter into Field Inspection Review (FIR) plans.

6.1 Survey and Right-of-way

Use available Mobile and Aerial LiDAR digital orthophoto mosaic mapping and topography Digital Terrain Model (to be provided by CDOT). Additional design surveys to support the 15% design will be provided by the Consultant, as needed. Consultant shall collect and map available right-of-way information from assessors and other available sources to map within the ArcGIS database and show on the preliminary design plans.

6.2 Utilities

Determine existing utility relocations, abandonments, and proposed utilities. Existing and proposed utilities are to be shown including water, sanitation, fiber, and electrical and provided in the ArcGIS dataset and 15% plans. A Subsurface Utility Engineering (SUE) investigation is not anticipated. The utilities investigation will include:

- **Location Maps** - Obtain utility location maps from the Utility Companies which identify utility features in the project area. Requests and receipt of maps will be coordinated with the Region Utility Engineer via copies of request and transmittal letters.
- **Reviews and Investigations** - Conduct field reviews and utility investigations with the Region Utility Engineer and Utility companies, as required, to ensure correct horizontal and vertical utility data. When possible this will be done utilizing non-destructive investigative techniques. The horizontal and vertical locations will be shown in the 15% plans and cross sections.
- **Design Plans** - Incorporate utility locations in plans from utility survey/mapping.
- **Relocation Recommendations** – Provide utility relocation preliminary designs as necessary in the plans.

- **Ditch Company Coordination** - Contact ditch companies through the Region Utility Engineer to coordinate ditch requirements and restrictions. Develop the plans for the necessary irrigation structures and submit to the Region Utility Engineer for Ditch Company review.

6.3 Hydraulics

Preliminary drainage study shall be conducted using the methodology found in the CDOT Drainage Manual pursuant with the 15% design level. Where existing drainage, hydraulic and hydrology information is provided from other studies within the project limits, this information shall be used in lieu of conducting a new drainage study.

6.4 Geotech

Existing soils information from within the study area shall be obtained and included in the information provided. Additional soil boring shall not be required for design process. Initial geotech design recommendations shall be provided and coordinated based on readily available information for slope stability, etc., as needed.

6.5 Traffic

Modifications of intersections and surrounding traffic signals shall be analyzed and documented to accommodate proposed improvements or any other signal modifications as identified from the transportation operations analysis (i.e. signal cabinets and software). Mainline traffic volumes (to be provided by CDOT), lane utilization, corridor operations and intersection performance shall be modeled and evaluated in VISSM, including transit, to determine ideal configurations.

6.6 Phase I – Multimodal Concept Study (PA No. 1-1 BRT Concept Study)

Perform a feasibility analysis, operational evaluation, and concept plan for multimodal improvements within the Project Area to define a final recommendation for the multimodal components and configurations within the corridor typical section.

6.6.1 Bicycle and Pedestrian Facilities – Currently there are no continuous bike facilities on CO 7 within the Project Area (isolated and discontinuous facilities exist at the 75th Street intersection and to the west). The distance between the vehicle lane and edge of pavement varies and is less than one feet for most of the corridor. Other than 75th Street, there is no bicycle infrastructure at any of the intersections. The SH 7 PEL identified three options for bicycle facilities within the Project Area: bikeable shoulders adjacent to the vehicle travel lanes; a multiuse path adjacent to a vehicle travel lane; and a spatially separated multiuse path that would be located primarily outside of the existing

CDOT right-of-way. It was generally concluded that bikeable shoulders would be implemented on both sides of CO 7 but that a multiuse path would be bi-directional and thus only on one side of CO 7.

- **Feasibility of Separated Multiuse Path** – The US 36 corridor has a hard surface, spatially separated bikeway and SH 119 has one in currently in design. As the third NAMS corridor to be implemented, it has long been a desire of CO 7 stakeholders to evaluate a similar facility for this corridor. This would continue the ethos that Boulder County regional corridors provide exceptional facilities for all modes. Unfortunately, this corridor has two major impediments: constrained right-of-way and adjacent Boulder County Open Space. A determination of the short-term and long-term (25+ years) feasibility of a separated multiuse path is needed. Tasks include:
  - Determine if OSMP will allow hard-surface trails on their property. There has been some discussions and coordination about this topic, but nothing documented or concluded.
  - Determine if a soft-surface path would accomplish the stakeholder goals for a regional bikeway.
  - Determine what maintenance (if any) CDOT would conduct on a path outside of their right-of-way. This includes seasonal maintenance (debris sweeping and snow removal) but also longer-term reconstruction for cracks, shifting and swelling.
  - Develop a concept design for where the path would be located. Note that on the western approach to 95th Street it has been assumed that the path would be on the south side of the road. There has not be any discussions about where the path would be for other locations.
  - Highlight locations where the new trail would need to cross ditches, drainages and other topological features. Unlike bike facilities that are inside CDOT right-of-way and adjacent to the roadway, these facilities could – and mostly would – be designed and constructed separately.

- **Feasibility of an Attached Multiuse Path** – A curb-height, multiuse path adjacent to the travel lanes could provide both real and perceived safety and comfort for cyclists. While such facilities are more common in urban areas, the treatment could be applied within the Project Area. A determination of the short-term and long-term (25+ years) feasibility of an attached multiuse path is needed. Tasks include:
  - Develop typical cross sections or graphical renderings so that all stakeholders are on the same page as to this type of facility.
  - Develop pros and cons of an attached multiuse path. This should be from bicyclist, pedestrian and driver perspectives.

- Identify concerns and opportunities with maintenance of this facility.
- Determine how cyclists flow through intersections, including left turns.

- **Feasibility of Bikeable Shoulders or Bike Lanes** – A determination of the short-term and long-term (25+ years) feasibility of bikeable shoulders, considering possible shared use by buses, and bike lanes is needed. Tasks include:
  - Determine configurations of the optimal and minimal facilities. This should include an evaluation of buffered bike lanes.
  - Develop a concept design for bikeable shoulders. Include the treatments at the intersections.
  - Similar to the attached multiuse path, develop a set of pros and cons for the bikeable shoulder treatment.

6.6.2 Bus Lanes Configuration and Operations – The SH 7 PEL Study did not recommend a final cross section for vehicle lanes within the Project Area. Instead it provided three options to be further evaluated. These three options include: 1) One GP lane in each direction (mixed use with buses); 2) One GP lane in each direction, plus one reversable center bus lane (AM westbound and PM eastbound); and 3) One GP lane in each direction, plus one full pavement depth shoulder to be used by transit vehicles. A determination of the preferred composite lanes configuration including considerations for bicyclist and pedestrian facilities (separated or attached multiuse path, bikeable shouldes, and/or bike lanes) is needed. Task include:

- Determine the feasibility of center reversible bus lanes. Very little research was conducted during the development of the PEL Study to understand the feasibility of a center reversable lane. For example, has this been implemented in Colorado? If so, what were some lessons learned? What are the infrastructure requirements to sign and mark a reversable lane? How do vehicles turning onto CO 7 from side streets (e.g. private home driveways) know which direction traffic is moving? How do the center lanes transition into the signalized intersections in the corridor? What additional maintenance will be required?
- Determine the feasibility of shoulder-running transit. To what extent would the buses utilize this investment? Would traffic congestion at the intersections and along the GP lanes provide the need and benefit of bus-on-shoulder operations? How do right turning vehicles interact with transit vehicles using these lanes? What are the right-of-way impacts of implementing a full-width shoulder? Would sharing the shoulder with bicyclists create dangerous conflicts with transit vehicles? Provide research and conceptual operational analysis to address these issues.

6.6.3 Composite Corridor Multimodal Typical Section – Provide a final recommendation for the multimodal components and configurations within the corridor typical section to advance into the preliminary design and plans. Perform a conceptual feasibility analysis and comparative evaluation (matix) of the multimodal elements and their various combinations. Conceptual considerations should include limits of construction, operational considerations, safety, right-of-way impacts, environmental impacts, impacts to adjacent Boulder County Open Space, and construction costs. Provide a final recommended typical section for the corridor or segments of the corridor including all multimodal elements.

6.7 Phase II – Preliminary 15% Design and Plans (PA No. 2-21 SIU B PE)

6.7.1 Typical Sections – Include in the preliminary design plans the typical sections showing existing and proposed sections for the roadway, all bicycle and pedestrian facilities, landscaping, and bus treatments.

6.7.2 Design, Plans and Profiles – Preliminary design and plan and profile sheets shall include at a minimum:

- Existing and proposed roadways including all transit, bike and pedestrian facilities, striping, intersections, bridges, right-of-way, storm drainage and culverts, ditches, direction of flow, structures, utilities (location, type, size, buried or aerial), bus treatments, access roads, railroad tracks, additional topography (i.e. trees, fences, sidewalks, bike paths, signals, other significant features).
- Proposed roadway geometry shall be shown on the plan sheets.
- Profile grades shall be shown for any roadway, bus lanes, and intersection improvements.
- Proposed drainage improvements shall be shown on the plan and profile sheets and shall include culverts, storm sewers, inlets, drainage ditches, and detention/retention ponds.
- Proposed structures shall be shown on the plan and profile sheets.
- Proposed utility improvements shall be shown on the plan and profile sheets (i.e. power, communication conduit, lighting, water, sanitary).
- Property ownerships and utility ownerships and contacts shall be indicated.
- Horizontal and vertical control line shall be located between the inside travel lane and inside shoulder or center line of arterial streets.

6.7.3 Cross Sections – Along CO 7, cross sections shall be cut every 100 feet showing proposed roadway, drainage, utilities, structures, and other predominant features.

6.7.4 Cost Estimates – Cost estimates shall be developed based on the design plans specified above. CDOT's P70 tool shall be used throughout the design process and at the various stages of design from scoping to final.

6.7.5 Deliverables – Deliverables will include:

- Design plan sets, specifications, and estimates.
- Identify technical challenges to implementation.
- Identify approvals needed from local and other agencies.
- Identify neighborhood groups affected by proposed construction plans.
- Cost estimates for scope items.
- Phasing plan
- Traffic Operations Report