

**GENERIC SCOPE OF WORK BASIC CONTRACT
Mountain Passenger Rail Service Planning**

CONTRACT TYPE

Specific Rate of Pay

X Cost Plus Fixed Fee

Other

SOW DATE: February 6, 2024

PROJECT NUMBER: SW03-252

PROJECT LOCATION: Mountain Passenger Rail

PROJECT CODE: 25985

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Note: This Scope of Work is to serve as a template for the Colorado Department of Transportation (CDOT) to develop and negotiate solid contracts with Consultant teams on projects and tasks. The Consultant shall coordinate all activities, tasks, meetings, communications, and deliverables with the CDOT/ Project Manager (PM) (or his or her designee) for this project. All submittals will be through the CDOT/PM or a designee, who will make appropriate distribution. Upon notice to proceed, the Consultant shall be responsible and will account for all effort contained in the Final Scope of Work.

This Draft Scope of Work has been reviewed by the Department and reflects a plan of approach based on the known goals. One factor determining the selection of a Consultant is the ability of that Consultant to analyze the project goals, evaluate the work elements, and formulate a work plan. This process may produce new approaches or modification to the project work elements. Because of that, all Consultants should be aware that the Final Scope of Work for a project will be produced with input from the selected Consultant.

SECTION 1 PROJECT SPECIFIC INFORMATION

1. PROJECT BACKGROUND

The central Rocky Mountains of Colorado present a unique blend of existing rail infrastructure, growing communities and economies, a strong tourist and recreational demand, and a statewide desire to enhance and build out a diverse network of mobility. CDOT has proposed a vision for a network of passenger rail lines connecting West Slope and mountain towns with urban centers and recreational hubs, leveraging this existing rail infrastructure and a latent demand for passenger rail service, and the first phase of this vision is examining the early implementation along routes with existing rail infrastructure and service.

Created in 2023, The Mountain Rail Program is a work effort of the Division of Transit and Rail's Passenger Rail Branch within the Colorado Department of Transportation. The Passenger Rail Branch is a growing team of four dedicated professionals delivering passenger rail to the state, with focus on both Front Range and Mountain Rail as the primary program work efforts. The Mountain Rail Program was created in response to both stakeholder feedback and requests (particularly from Steamboat Springs, Winter Park, and state legislators) and a unique opportunity of rail corridors reducing in traffic as coal traffic diminishes with shifting markets. In November of 2023, the Colorado Transportation Commission approved initial funding for the service development plan and associated efforts to bring a vision of passenger rail to the mountains into fruition.

The scope of the Mountain Rail Program is to investigate, plan, design, and deliver a cost-effective and attractive passenger rail network of services to the mountains of Colorado. Intended boundaries of this program are existing and/or former railroad corridors, west of Denver, CO, serving mountain communities such as Winter Park, Steamboat Springs, Craig, and more. Additionally, the intent of this program is to investigate minimum effort requirements for a cost effective but minimal investment service package – i.e., how much service can be implemented without major investment in new track construction or without major impacts to freight host railroad operations.

2. PROJECT GOALS

This project is intended to produce the following improvements:

- A. **Enhancing regional connectivity.** The primary purpose of the project is to provide a reliable, high-quality transportation link between the urban hub of Denver and the rural, mountainous communities of the Fraser and Yampa Valleys, enabling movement via rail between each of these regional population, employment, and recreational centers.
- B. **Fostering economic development.** This project aims to stimulate economic growth and development in the Yampa and Fraser Valleys by facilitating tourism, trade, and commerce. An attractive and reliable passenger rail connection across the region is critical to enhancing the regional economy in the long term.
- C. **Environmental Sustainability.** The Mountain Passenger Rail system will offer a more environmentally conscious mode of transportation than what currently exists, reducing reliance on carbon-intensive travel and contributing to environmental conservation and sustainability efforts.
- D. **Providing a multimodal choice.** The Mountain Passenger Rail project will provide an additional modal choice across the region for recreational users, commuters, those wishing to travel without a car, or those unable to drive.
- E. **Leverage existing infrastructure.** The Moffat Tunnel, Craig, and Glenwood Springs Subdivisions are all subject to significant changes and shifts in traffic as markets have shifted and changed, particularly with the decrease in coal mining and power production. This creates an existing infrastructure primed for the addition of passenger trains and sustainable long range growth along the existing facilities.

- 3. Alternatives Analysis
 - a. Route and Service Options Analysis *
 - b. Investment Package Options *
- 4. System Planning
 - a. Existing Conditions Assessment *
 - b. Operational Conditions Assessment *
 - c. Station Area Analysis and Assessment *
 - d. Station Area Conceptual Plans
 - e. Bus Connectivity and Enhancement
 - f. Operations and Maintenance Cost Estimating *
- 5. Preliminary Engineering
 - a. Infrastructure Project Identification *
 - b. Project Portfolio *
 - c. Design of Proposed Projects (as funds and time allow)
 - d. Capital Cost Estimating *
 - e. Phasing Plan *
 - f. Implementation Plan *
 - g. Miscellaneous engineering support
- 6. Grant Preparation *

Tasks denoted with an asterisk (*) are targeted for a December 2024 completion to meet grant cycle goals.

Work is in progress currently by the CDOT team, so the Consultant will be meeting the team mid-process and assisting in delivery of any and all unfinished tasks as outlined in this scope. Consultant shall be prepared to work with separate contractors and specialists for other work that is not included in this scope of work. Expect to closely cooperate with a contractor performing financial modeling and other separate but highly related service and business development plan elements.

7. WORK PRODUCT

The Consultant work products are:

- | | | |
|----|-------------------------------------------------------------|---|
| A. | Reports (hard copy and/or digital, as required) | X |
| B. | Geographic Information Systems (GIS) Data and Layers | X |
| C. | Environmental Documents | X |
| D. | Preliminary and initial designs for proposed infrastructure | X |
| E. | Project Coordination | X |
| F. | Schedules | X |
| G. | Meeting Minutes | X |

Requirements are further described in the sections that follow. All work required to complete this Scope of Work requires the use of US Customary System.

8. WORK PRODUCT COMPLETION

All submittals must be accepted by the CDOT Contract Administrator or designee.

9. ADDITIONAL PROJECT INFORMATION

Additional information regarding this project is included in the following documents:

- | | | |
|----|--------------------------------------|---|
| A. | CDOT reports and preliminary studies | X |
|----|--------------------------------------|---|

Copies of these documents may be requested from CDOT.

SECTION 2 PROJECT MANAGEMENT AND COORDINATION

1. CDOT CONTACT

The Contract Administrator for this project is: Paul DesRocher, Transit and Rail Division Director.

Active day-to-day administration of the contract will be delegated to the CDOT/PM:

- | | | |
|----|---------------|---------------------------------------------|
| A. | Name: | <u>Chris Enright</u> |
| B. | Title: | <u>Professional Engineer I</u> |
| C. | Address: | <u>2829 W Howard Place, Denver CO 80204</u> |
| D. | Office phone: | <u>303-512-5985</u> |

2. PROJECT COORDINATION

Coordination will be required with the following:

- A. Cities
- B. Counties
- C. Railroads
 - a. Union Pacific,
 - b. National Railroad Passenger Corporation (Amtrak),
 - c. BNSF Railway
- D. Regional Transportation District (RTD)
- E. Denver Transit Operators
- F. Denver Regional Council of Governments (DRCOG)
- G. Metropolitan Planning Organizations (MPOs)
- H. Transportation Planning Regions (TPRs)
- I. Front Range Passenger Rail District (FRPRD)
- J. Federal Railroad Administration (FRA)
- K. Public Utilities Commission (PUC)
- L. Colorado Division of Parks & Wildlife (CPW)
- M. Division of Labor & Employment's (DLE) Office of Just Transition
- N. U.S. Forest Service (USFS)
- O. Environmental Protection Agency (EPA)
- P. Colorado State Historical Preservation Office (SHPO)
- Q. Colorado Department of Public Health and Environment (CDPHE)
- R. U.S. Fish and Wildlife Service (USFWS)
- S. Key business and partner stakeholders (ski resorts and other large "anchor" businesses)

A comprehensive list of agencies and stakeholders will be developed as a part the Coordination Plans described in Section 6B. The consultant should anticipate that a design that affects another agency has to be accepted by that agency prior to its acceptance by CDOT. Submittals to affected agencies will be coordinated with CDOT.

SECTION 3 GENERAL INFORMATION

1. NOTICE TO PROCEED

Work shall not commence until the written Notice-to-Proceed is issued by CDOT. Work may be required, night or day, and/or weekends, and/or holidays, and/or split shifts. CDOT must concur in time lost reports prior to the time lost delays being subtracted from time charges. Subject to CDOT prior approval, the time charged may exclude time lost for:

- A. Reviews and Approvals
- B. Response and Direction

2. PROJECT COORDINATION

- A. Routine Working Contact: Routine working contact shall be between the CDOT/PM and the Consultant Project Manager (C/PM) as defined in Appendix C.
- B. Project Manager Requirements: Each Project Manager shall provide the others with the following:
 - 1. A written synopsis or copy of their respective contacts by telephone and in person with others
 - 2. Copies of pertinent written communications

3. ROUTINE REPORTING AND BILLING

The Consultant shall provide the following on a routine basis:

- A. Coordination: Coordination of all contract activities by the C/PM
 - 1. Periodic Reports and Billings: The periodic reports and billings required by CDOT.
 - 2. General Reports and Submittals: In general, all reports and submittals must be approved by CDOT prior to their content being utilized in follow-up work effort.

4. PERSONNEL QUALIFICATIONS

The C/PM must be approved by the CDOT Contract Administrator. Certain tasks must be done by Licensed Professional Engineers (PE) or Professional Land Surveyors (PLS) who are registered with the Colorado State Board of Registration for Professional Engineers and Land Surveyors. National Institute for Certification in Engineering Technology (NICET) certification or other certifications may be required for project inspectors and testers.

All tasks assigned to the Consultant must be conducted by a person on the Consultant team that is qualified and has specific expertise in that task. The qualified person is a professional with the necessary education, certifications (including registrations and licenses), skills, experience, qualities, or attributes to complete a particular task. Design of any special project features must be directed, completed, and overseen by a professional engineer with significant experience in design of those special project features.

This contract requires that the prime firm or any member of its team be pre-qualified in the following disciplines for the entire length of the contract: Civil Engineering, Environmental Engineering, Transportation Engineering.

5. CDOT COMPUTER/SOFTWARE INFORMATION

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

- A. Earthwork OpenRoads/OpenRail Designer
- B. Traffic CDOT Statewide Travel Demand Model
- C. Drafting/CADD OpenRoads/OpenRail Designer w/CDOT’s configurations
- D. Survey/photogrammetry CDOT TMOSS, OpenRoads/OpenRail Designer
- E. Specifications Microsoft Word
- F. Scheduling Microsoft Project
- G. Geographic Information System (GIS) ArcGIS w/CDOT’s geodatabase, formatting configurations & standards

6. COMPUTER DATA COMPATIBILITY

The data format for submitting design computer files shall be compatible with the latest version of the adopted CDOT software as of Notice to Proceed for the contract. The Consultant shall immediately notify the CDOT/PM if the firm is unable to produce the desired format for any reason and cease work until the problem is resolved. Refer to Section 8, Table 1 – Submittals, for additional information regarding current formats and the acceptable transmittal media.

7. PROJECT DESIGN DATA AND STANDARDS

- A. General:
Appendix A provides a comprehensive list of state and federal reference material. However, Appendix A does not contain local agency reference material that may be pertinent to some projects. 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.
- B. Specific Design Criteria:
Consultant shall use appropriate railroad and other authority-having jurisdictions design criterias. Specific design criteria for individual projects shall be developed in consultation with CDOT.
- C. Construction Materials/Methods:
The materials and methods specified for construction will be selected to minimize the initial construction and long-term maintenance cost to the State of Colorado. Non-typical construction materials and methods must be approved in writing by CDOT.

SECTION 4 PROJECT INITIATION AND CONTINUING REQUIREMENTS

Note: This list establishes the individual task responsibility. Those tasks identified as CDOT/Other should utilize an abbreviation system to indicate whether the task will be completed by CDOT or another agency (i.e. “C” for CDOT and abbreviations as provided below). The consultant shall maintain the ability to perform all work tasks that are indicated below by an ‘X’ in the consultant column, in accordance with the forms and conditions contained herein, and the applicable CDOT standards.

	CDOT	Consultant	Not Applicable
A. PROJECT MEETINGS The types and numbers of meetings shall be flexible and determined by an interactive process as approved by the CDOT/PM.			
1. Initial Project Kick-Off Meeting Schedule and facilitate initial project kick-off meeting. All appropriate disciplines should be included in the scoping meeting. Create an invitation list, send notices with a draft agenda prior to the meeting, and provide meeting minutes to all those invited. Whenever possible, the kick-off meeting will include an on-site inspection to familiarize the entire project team with the character and conditions of the area. The scoping meeting will also be used to clearly identify scope elements, responsibilities, and coordination necessary to complete the work.	X	X	
2. Progress Meetings CDOT and Consultant team will meet periodically as required (typically every two weeks). The meetings will review activities required to be completed since the last meeting, problems encountered/anticipated and potential solutions, project schedule update, action items, and coordination required with other agencies.		X	
3. Meeting Minutes Project meeting minutes shall be completed by the Consultant and provided to the CDOT/PM within one week of the actual meeting. When a definable task is discussed during a meeting, the minutes will identify the “Action Item”, the party responsible for accomplishing it, and the proposed completion date.		X	
4. Contact List Establish and maintain a computerized list of all appropriate interested parties for the communication process.			
a. The information on the list shall include as a minimum: ii. Name iii. Firm (if any) iv. Mailing/Email address v. Phone			X
b. The contacts will be compiled from the list below, as supplemented by the Project Team and the attendees at public meetings: i) Public Agencies ii) Elected/Appointed Officials iii) Neighborhood Groups iv) Property Owners/Tenants v) Business Interests vi) Special Interests vii) Railroads viii) Media Contacts ix) Attendees from public meetings			

	CDOT	Consultant	Not Applicable
<p>B. PROJECT MANAGEMENT At the kick-off meeting, or shortly thereafter, create and provide an approach for managing the project (i.e. involved staff, key team positions), including task orders, a schedule, document and agency reviews and other project needs. Prepare a Project Management Plan (PMP) in accordance with the most recent federal authorization guidance. The Consultant shall coordinate all the work tasks being accomplished by all parties to ensure project work completion stages are on schedule.</p>	X	X	
<p>C. DEVELOP A PROJECT SCHEDULE AND ASSIGN TASKS The Consultant is responsible for coordinating the required work schedule for tasks accomplished by CDOT and other agencies. Project schedule shall use the critical path method, with all schedule dependencies and task relationships captured in detail. Work breakdown shall be consistent with generally accepted best practices, including breakdown of tasks to a sufficiently granular level that no general work task is longer than two weeks.</p> <p>Prepare the initial project schedule for review by the CDOT/PM and consultant team, and refine to provide detail as requested. Modifications will be made as necessary in collaboration with CDOT and appropriate justification. The tasks covered by this Scope of Work are expected to take approximately twelve months to complete.</p> <p>Consultant shall maintain a detailed schedule updated on a monthly basis, which is to be shared with CDOT/PM.</p>		X	
<p>D. QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) Prepare and submit a QA/QC plan as part of the planning documents noted above and commit to adhering to the QA/QC process throughout the project.</p>		X	
<p>E. PROJECT CHARTER Perform an in-person chartering session to define the components of the project charter. In partnership with the CDOT team, complete a project charter containing:</p> <ul style="list-style-type: none"> • Definitions and meeting frequencies of teams and committees • Communication flows and decision-making processes. • Escalation ladder • Roles and responsibilities of all team members and teams/working groups • Project management approach (scheduling, cost control, quality control, change control) • Communications plan and protocols • Any other key management and control protocols for achieving timely completion of work. <p>The Project Charter shall be submitted to CDOT for review within a month of NTP.</p>	X	X	

SECTION 5 SERVICE DEVELOPMENT PLANNING WORK TASK DESCRIPTIONS

Note: Use the CDOT NEPA Manual when completing this section to assure that the level of detail and documentation included meets CDOT expectations and requirements and any other applicable state and federal laws and regulations. Nothing in this Section precludes federal, state, or local agencies or officials from fulfilling their responsibilities under federal, state, or local laws and regulations, NEPA, as codified in 42 United States Code (USC), section 4321, et. Seq., or any of NEPA’s implementing regulations.

This list establishes individual task responsibility. Those tasks identified as CDOT/Other should utilize an abbreviation system to indicate whether the task will be completed by CDOT. The consultant shall maintain the ability to perform all work tasks that are indicated below by an ‘X’ in the consultant column, in accordance with the forms and conditions contained herein, and the applicable CDOT standards.

	CDOT	Consultant	Not Applicable
A. PROJECT INITIATION			
1. Project File Maintain a Project File, set up similarly to the established process for a NEPA Administrative Record. Make available all parts of this project file to the CDOT/PM (or his or her designee), or to the Colorado Attorney General’s office (as requested) at any time during the project’s duration. All materials associated with the project file shall be delivered in the format specified by the CDOT/PM when closing the project. Final project invoice payments to the Consultant are conditional upon the professional and complete delivery of these materials to CDOT’s office. Given the extent of documentation collected for the NEPA process, the consultant shall update the record regularly and provide information to CDOT electronically. See CDOT NEPA Manual for additional guidance.		X	
2. Review Applicable Existing Documents Review project-specific documents or data related to the assessment of environmental, social, and economic resources and impacts in the project area that are determined relevant. These resources may be CDOT documents or may have been created by local planning agencies or municipalities.		X	
B. STAKEHOLDER AND PUBLIC ENGAGEMENT			
1. Railroad Stakeholder Engagement Develop and submit a Railroad Stakeholder Engagement plan that outlines the role of the host railroad(s), applicable operating railroads, and potential operators for the service area. The plan should identify involvement activities linked to the key milestones of planning and engineering, as well as the alternatives evaluation process. The Railroad Stakeholder Engagement plan should include a proposed schedule for analysis steps, and appropriate review periods with railroad stakeholders. This plan shall be submitted to the CDOT/PM no later than one month after NTP. This plan, once approved by CDOT, shall be executed in conjunction with CDOT staff.	X	X	
2. Agency Coordination Develop and submit an Agency Coordination Plan that outlines the role of public agencies in the project. The plan should identify key contacts at local, state, and federal agencies that will require consultation or information; the list in Section 2 can function as an initial starting point.	X	X	

	CDOT	Consultant	Not Applicable
<p>The plan should identify involvement activities linked to the key milestones in the planning, alternatives analysis, and engineering tasks. Involvement can include specific consultation meetings, leveraging existing coordination efforts or programs, or developing topic-specific working groups. The Agency Coordination Plan shall include a schedule that is integrated into the project schedule.</p> <p>This plan shall be submitted to the CDOT/PM no later than one month after NTP.</p> <p>This plan, once approved by CDOT, shall be executed in conjunction with CDOT staff.</p>			
<p>3. Public Engagement Develop and submit a Public Engagement Plan that outlines the role of the public in the project. The plan should identify key civic or business groups, public officials, relevant interest groups, potential riders, potential service providers and shippers, communities with environmental justice concerns, and the public. If not already identified in the previous two subtasks, the Public Engagement Plan will identify all relevant entities required to be consulted in the preparation of the SDP as identified under 49 U.S.C. § 25101©.</p> <p>The plan should identify involvement activities linked to the key milestones in the planning, alternatives analysis, and engineering tasks. Engagement activities can include public meetings, virtual engagement opportunities, consultation meetings, existing agency, or stakeholder engagement processes, or developing topic-specific working groups. The Public Engagement Plan shall include a schedule that is integrated into the project schedule.</p> <p>This plan shall be submitted to the CDOT/PM no later than one month after NTP.</p> <p>This plan, once approved by CDOT, shall be executed in conjunction with CDOT staff.</p> <p>A project website is an expected component of this public engagement plan, and shall be hosted within the CDOT website system and be conformant with CDOT requirements.</p>	X	X	

	CDOT	Consultant	Not Applicable
<p>C. ALTERNATIVES ANALYSIS</p> <p>The objective of this task is to conduct an alternatives analysis to identify preliminary alternatives of route, service, and investment to achieve the outcomes outlined in the project’s preliminary draft Purpose and Need (prepared by CDOT staff prior to contract NTP).</p> <p>Each component (section below) of the Alternatives Analysis shall include a detailed description of methodology, the options considered, and a recommended option to advance. These components shall be prepared as memorandums, and then assembled into a final alternatives analysis report.</p> <p>Methodology should include:</p> <ul style="list-style-type: none"> a) Methods used to develop and refine options. b) Criteria used to evaluate options, including: <ul style="list-style-type: none"> i. Metrics (both qualitative and quantitative) to be used ii. Method of evaluating options against those metrics (methods of measurement) iii. Intended performance outcomes, or standards for which options are evaluated against for advancement. c) Means for incorporating analytical outcomes from subsequent steps d) Means for incorporating stakeholder input from coordination plans as outlined above. <p>Analysis steps and particularly the methodology components shall be completed and prepared in close coordination with CDOT and stakeholders. Consultant should expect a review and approval of methodology steps prior to proceeding with analysis.</p> <p>Reports should be prepared with ample time allowed for review, comment, and revision by CDOT. No fewer than two review cycles should be expected.</p>			
<p>1. Route Options Analysis</p> <p>Develop and assess potential routes for passenger rail service over the proposed area. Routes shall consider market needs and anticipated operating requirements.</p> <p>Task in progress with CDOT team and expected to be substantially complete by NTP.</p>	X	X	

	CDOT	Consultant	Not Applicable
<p>2. Service Options Analysis For the route options selected, develop, and assess potential viable service and operating options. In conducting the Service Options Analysis, consider the anticipated operating requirements from both the Purpose and Need and as obtained from consideration of market factors. Identify recommended service options to advance to analysis for infrastructure and design requirements in subsequent steps.</p> <p>Service options analysis shall be done in coordination with the UPRR and other stakeholders.</p> <p>The Service Options Analysis should include (at a minimum):</p> <ul style="list-style-type: none"> a) A preliminary analysis of fleet options that identify type and quantity of preferred train equipment, including basic technical specifications such as maximum speed, passenger capacity, energy consumption profile, acceleration, and deceleration rates (consistent with 49 U.S.C. 25101(d)(7)) b) Signal systems required or beneficial, including Positive Train Control (PTC) c) Service frequency, operating speeds, and trip times (consistent with 49 U.S.C. 25101(d)(1)) d) Fares and fare structure comparisons among proposed services e) Description of potential service with existing and planned intermodal connections (consistent with 49 U.S.C. 25101(d)(10)) f) Station locations and maintenance facility locations and, for each, whether it is existing or new and how it maximizes the use of existing infrastructure (consistent with 49 U.S.C. 25101(d)(6)) <p>A majority of this task is intended to be completed and a refined set of service alternatives will be prepared for analysis by the start of this contract.</p>	X	X	
<p>3. Investment Package Options For the service options carried forward from the previous analysis, develop and assess investment packages required to implement the proposed service. This should include identification of individual components to make up a proposed package of investments. These investment packages may be phased across the corridor to support a phased or incremental implementation.</p>		X	

	CDOT	Consultant	Not Applicable
<p>D. SYSTEM PLANNING ANALYSIS</p>			
<p>1. Existing Conditions and Operational Requirements Collect relevant existing physical and operating conditions and other relevant data to the selected route to appropriately inform the service planning and analysis process.</p> <p>Translate the existing conditions and operational requirements gathered, using professional judgment, into a set of detailed operating requirements, captured in a technical memorandum.</p> <p>Data collected may include (but is not limited to):</p> <ul style="list-style-type: none"> a) Existing train volumes b) Existing train characteristics c) Existing train routings, particularly at entry and exit points as well as unusual or atypical movements d) Specific operating timetables for scheduled services and planned operating windows for unscheduled service e) Maintenance-of-way window requirements f) Abandoned rail lines and/or connections between rail lines, and/or abandoned/removed track(s) on existing lines g) Track charts, including yards, industrial leads, etc. h) Existing track conditions, including FRA track class i) Existing junctions, including turnout speeds and parallel diverging moves j) Existing and proposed locations of intercity and commuter platforms k) Location of highway grade crossings and number of lanes l) Aerial photography m) Public and employee timetables n) Existing signal system design and PTC implementation status o) Specific safety features, including wayside detectors, derails, slide fences, and other safety appurtenances p) Existing operating practices q) Existing documented survey information, which is readily available in either printed, archived or digital format. r) Route information including routes operating over-dimensional loads s) Railroad property records including existing right-of-way limits, including demarcation between owners/controllers of different sections of rail line and long-term operating leases t) Aboveground and underground rights lease to utility companies for communications or power facilities along rail lines u) Historical employee and public timetables for operations/services v) National Register of Historic Places-listed, eligible, and potential eligible rail facilities w) Railroad structures, particularly limiting clearances, or weights x) Design documentation for adjacent highway structures y) Locations where local freight activity or freight yard operations may foul main line activities for extended periods of time z) Documentation for other projects under development within the Study Area 			X

	CDOT	Consultant	Not Applicable
<p>2. Operations Analysis Assess current physical conditions, proposed service characteristics, and other operating characteristics as identified earlier as inputs into an operations analysis that will identify the potential infrastructure and operational needs required to operate the proposed service. Consultant shall use appropriate tools, including train performance calculators and railroad operations simulation software to perform the operations analysis. This will require integration of data from existing infrastructure, freight operations, and other passenger operations. Thorough and robust documentation of the operations analysis, particularly the methodology employed, and the calibration of models will be required.</p> <p>It is intended that coordination with host railroads will result in the development of service alternatives that are sufficiently low impact to preclude the need for complex rail traffic simulation modeling.</p> <p>Operations analysis, in partnership with engineering and alternatives analysis, should consider opportunities and options to decrease travel times both end-to-end and between key commuter destinations. Evaluate feasible improvements to track class or superelevation (options that do not reconstruct track) and more considerable geometric improvements and realignment or shifting of track (options considering reconstruction or modification).</p>		X	
<p>3. Ridership Modeling Ridership modeling will be conducted with CDOT staff using the Statewide Transportation Model. However, teams will be needed to provide ridership modeling expertise when developing assumptions for service and the unique corridor characteristics.</p>	X	X	
<p>4. Revenue Evaluation Farebox recovery revenue modeling will be conducted with CDOT staff using the Ridership Results. However, teams will be needed to provide revenue modeling expertise when developing assumptions for service and the unique corridor characteristics.</p>	X	X	
<p>5. Station Area and Access Analysis Identify locations of stations to be served by the proposed passenger rail service options. Determine how stations will be served by proposed infrastructure, how the stations will accommodate the trains and passengers, how passengers will access the stations, and how stations will be integrated and connected with other modes of transportation (consistent with 49 U.S.C. 25101(d)(6)). The assessment of the operations for each alternative should be performed at a level sufficient to identify key characteristics, challenges, or impacts to existing and future passenger rail service.</p> <p>Station area analysis shall be done in close coordination with the local and regional stakeholders at each city location. This includes cities, counties, transit authorities, airports, chambers of commerce, primary commercial destinations (ski resorts), CDOT DTR Bustang Program and CDOT Regions. Use Amtrak and other industry best practices and standards as a guide for developing criteria and evaluating sites.</p> <p>The analysis should include, at a minimum:</p> <p>a) Determine the operational requirements of stations and station access</p>		X	

	CDOT	Consultant	Not Applicable
<p>b) Maximizing connectivity to existing transit services where available and to future, planned or likely potential services</p> <p>c) Designing to include pedestrian, bicycle, micromobility, and other transportation options with efficient access</p> <p>d) Consideration of economic potential at each station location</p> <p>e) Developing conceptual engineering layouts of each station location, including:</p> <ul style="list-style-type: none"> i. Track design ii. General structural layouts and footprints iii. Access and circulation features iv. Parking and transportation network connections <p>Final deliverables shall be packaged independently for each station into a narrative evaluation and conceptual plans package for streamlined implementation in subsequent steps.</p>			
<p>6. Bus Network Connectivity and Expansion Analysis</p> <p>In conjunction with the station area and access analysis, evaluate existing Bustang and other regional bus service providers, and propose potential modifications and improvements to regional bus networks to enhance connection to the proposed passenger rail service.</p> <p>Perform analysis for a reasonable range of geographic and service options to best enhance the connectivity and functionality of the network. Perform analysis of options and considerations in close coordination with regional transit providers and the CDOT DTR Bustang team. Investigation should include connectivity to key markets and destinations along the Interstate 70 corridor as well as connection to transit providers in those communities.</p>		X	
<p>7. Operations and Maintenance Cost Estimation</p> <p>Identify required operating resources, such as labor, materials, and services needed to operate the proposed passenger service. Convert the identified resources into an annual projected cost estimate. Prepare general estimates of operating, maintenance, and capital renewal costs for a 40-year period (consistent with 49 U.S.C. 25101(d)(8)©). Operating cost estimates will also include analysis of labor planning needs.</p> <p>Operations and maintenance cost estimates should be prepared for multiple scenarios of ownership, operation, and based on agreements and negotiation outcomes with the host railroad.</p> <p>Prepare this cost estimate in a manner consistent with FRA Estimating practices and procedures.</p>		X	
<p>8. Environmental Planning and Scoping</p> <p>Identify key environmental considerations in the development of the alternatives to support future lifecycle stages of the corridor’s development, including project-level environmental analysis. Perform a high-level qualitative socioeconomic, cultural, human environment, and natural environmental resource inventory and preliminary effects analysis as part of the development and screening of options concurrently with the alternatives analysis steps above.</p>			X

	CDOT	Consultant	Not Applicable
<p>Build upon the findings from environmental effect analysis to assess potential environmental effects of the preliminary route, service, investment, and design options, and employ the outputs of this environmental effect analysis to support the screening of those options. Where environmental documentation is not available, perform additional desktop analysis to inventory existing conditions and identify key social, cultural, natural, and physical project concerns. Review the environmental resources and determine, with input from agencies and the public, the extent of analysis needed for each resource for the subsequent NEPA process.</p> <p>Prepare an Environmental Concerns Analysis Report that will document the potential significant socioeconomic, cultural, human environment, and natural environmental effects of the Preliminary Alternatives identified earlier. The Report will document the anticipated benefits of the corridor’s impacts as it relates to other transportation modes, energy consumption, land use, and economic development (consistent with 49 U.S.C. 25101(d) (11 and 12). The Report will also address possible approaches to completing the environmental review of those alternatives, including the potential NEPA class(es) of action for subsequent environmental document(s). This report will identify potential programmatic mitigation strategies and anticipated permits and agency clearance requirements that will be needed for the alternatives moving forward for additional consideration during NEPA. An agency coordination plan for NEPA will also be developed to streamline any subsequent NEPA action and pipeline of projects.</p>			

SECTION 6 PRELIMINARY DESIGN WORK TASK DESCRIPTIONS

Note: The following activities of communication, consensus building, project team reviews, conceptual design, data gathering, documentation, and formal public notice shall be planned by the Consultant and coordinated with the CDOT PM. The time of their accomplishment may overlap and parallel paths of activity that should be planned to finish the development phase in accordance with the shortest possible schedule. A project plan shall be developed by the Consultant that satisfies the requirements of the project development. This plan must be approved by the Contract Administrator before starting the work. Deliverables can be static reports and products, digital reports, and products, and/or GIS data layers. The scope should be specific as to what type of deliverable is expected.

This list establishes the individual task responsibility. Those tasks identified as CDOT/Other should utilize an abbreviation system to indicate whether the task will be completed by CDOT. The consultant shall maintain the ability to perform all work tasks indicated below by an 'X' in the consultant column, in accordance with the forms and conditions contained herein, and the applicable CDOT standards.

	CDOT	Consultant	Not Applicable
A. PROJECT INITIATION			
1. Basis of Design Build a basis of design document and detailed design criteria for each project advanced into preliminary engineering.		X	
B. PROJECT DEFINITION			
1. Infrastructure Requirement Identification Using results of the operations and infrastructure options analyses in the Alternatives Analysis, perform a detailed assessment of specific project needs and requirements, preparing an infrastructure projects list in prioritized order to implement proposed service.		X	
2. Define Projects Define the projects identified in the list above, providing detailed objectives, scope of work proposed, limits/termini, and other details required to proceed with conceptual design on each identified project. Project definitions should include a nominal and preliminary cost estimate for construction and other costs associated with delivery.		X	
C. SURVEY			
1. Preliminary Engineering Survey For specifically defined projects (as identified in Section D), perform a preliminary survey to identify and map topography, key features, major utilities, and other notable features at a level of detail sufficient for preliminary design and engineering. Develop a plan outlining means and methods, control, proposed scope and extent, and a cost and time estimate prior to proceeding. This plan shall be submitted to the CDOT/PM prior to proceeding. Survey should be performed consistent with CDOT and industry practices and standards.		X	
2. Detailed Survey As required by the design process below, perform a detailed/final topographic survey for project areas as needed. Survey shall include all required features to perform final design, including topography, railroad features, structures, terrain features, and other required components per CDOT and railroad standards and practices.		X	

Develop a plan outlining means and methods, control, proposed scope and extent, and a cost and time estimate prior to proceeding. This plan shall be submitted to the CDOT/PM prior to proceeding.			
D. PRELIMINARY ENGINEERING As allowed by schedule, funding, and as directed by the CDOT/PM, develop plans and designs in the order specified above under project definition, beginning with the highest priority and most feasible project of all proposed projects in the portfolio required for service implementation. This portion may extend beyond the end-2024 timeline as allowed by funding and other constraints.			
1. Conceptual (10%) Design Following Union Pacific Railroad (UPRR) standards and practices, develop a 10% design package for each proposed project. This design package should include detailed horizontal geometry and layout of proposed track and other improvements.		X	
2. Railroad Review and Revision Submit plans to the UPRR for review and approval. Make revisions as requested by UPRR in coordination with CDOT and resubmit to complete the 10% milestone.		X	
3. Preliminary (30%) Design Based on revisions and guidance from UPRR and CDOT, perform preliminary design for the proposed projects. This phase of design should include the horizontal and vertical geometry evaluated against a terrain model to develop a three-dimensional model of proposed earthwork and track construction.		X	
4. Plans Package Production Using the completed design model at the 30% level, develop a plans, specification, and estimate package for the proposed project. Plans should include horizontal and vertical alignments, typical sections, nominal grading limits, phasing plans, cross sections, and a detailed quantities summary. Plans shall be prepared following UPRR standards and be submitted to CDOT prior to finalization.		X	
5. Railroad Review and Revision Submit plans to the UPRR for review and approval. Make revisions as requested by UPRR in coordination with CDOT and resubmit to complete the 30% milestone.		X	
6. Maintenance Facility Design Perform these steps in collaboration with CDOT and local stakeholders and partner agencies/host railroads.			
a. Develop Criteria Based on the operations analysis and fleet requirements (by others), develop criteria for maintenance facilities as required for system operation. Criteria should include provisions for fleet and traction maintenance, restock and commissary for onboard vending/service, and any maintenance of way as required or proposed.		X	
b. Propose Site Perform an analysis of potential maintenance facility locations. Identify possible locations, perform analysis and screening against the criteria developed and consider local factors and operational factors to select a single preferred and one alternate maintenance facility site.		X	
c. Preliminary Engineering For the proposed preferred site location, perform preliminary engineering, particularly track and building location layouts, and key access/circulation requirements. Sufficient detail should be provided to be able to estimate facility cost and to streamline subsequent design steps.		X	

<p>Prepare a technical report for maintenance site selection, including criteria used, details of the proposed site, alternative site option, and the preliminary engineering drawings and estimate of the proposed site.</p>			
<p>E. CAPITAL COST ESTIMATING</p>			
<p>1. Capital Cost Estimation Methodology Develop a cost estimating methodology for determining probable infrastructure costs. Use the latest FRA Cost Estimating Methodology and Guidance in developing the methodology. Include discussion of data sources, required inputs, and contingency and escalation as appropriate for the level of design at each phase.</p>		<p>X</p>	
<p>2. Capital Cost Estimation Prepare capital cost estimates for each preliminary alternative including unit cost and quantities relating to core track structures and other components, fleet, management, design and construction management allowances, and contingencies (consistent with 49 U.S.C. 25101(d)(8)(C and D)).</p> <p>Estimates should be broken out by project phases as defined below in the Phasing Plan.</p>		<p>X</p>	
<p>F. PHASING AND IMPLEMENTATION PLAN</p>			
<p>1. Phasing Plan Develop a phased implementation plan that identifies the implementation sequencing of the capital project inventory (consistent with 49 U.S.C. 25101(d)(2)) as defined above. The Phased Implementation Plan will identify implementation years and desired service levels for those years based on ridership demand for proposed service. The Phased Implementation Plan will identify a schedule of the capital projects required to support the service levels for each of the corresponding service years (consistent with 49 U.S.C. 25101(d)(3)). The Phased Implementation Plan will also include consideration of phasing the project lifecycle stages for each capital project – project development (PE/NEPA), final design, and construction, and the appropriate time to initiate each lifecycle stage for a capital project.</p>		<p>X</p>	
<p>2. Implementation Plan Develop a specific guidance document for CDOT and partners to outline the exact required remaining steps to complete between the conclusion of the service planning project and the opening day of the service. Include discussions of timing, acceleration opportunities, and which phases may be delayed or how sequencing of projects may be modified to hasten initial startup.</p>		<p>X</p>	
<p>G. MISCELLANEOUS ENGINEERING SUPPORT</p>			
<p>As directed by the CDOT/PM, deliver professional advice and recommendations relating to railroad engineering, railroad operations, the Moffat Tunnel, passenger rail systems, and other matters related to (but not directly included in) this contract.</p>		<p>X</p>	
<p>H. GRANT PREPARATION</p>			
<p>Service development planning is expected to be followed by the preparation of several Federal grant applications under the Infrastructure Investment and Jobs Act (IIJA) and similar USDOT discretionary grant programs.</p> <p>As directed by the CDOT/PM, prepare grant applications as described in the steps below for the specific targeted and identified projects from 6.B – Project Definition.</p>			
<p>1. Grant Application Coordination</p>			
<p>The delivery of this grant application will require sustained coordination between CDOT and the Consultant. At a minimum, a weekly coordination call between CDOT and the Consultant, and any other project partners (if needed) is expected during this project phase. The Consultant will further coordinate with</p>		<p>X</p>	

<p>CDOT on an ad-hoc basis throughout the entire grant application development process as needed.</p>			
<p>2. Narrative and Application Development The Consultant will draft the project narrative including description, project parties, project budget, and description of how the project’s qualities align with the selection criteria. The draft will include a schedule, introductions, transitions, and concluding statements. The Consultant will also create a map of the project and surrounding area. The Consultant will take care to provide text, maps, and graphics convey the suitability of the project for the discretionary funding program being pursued. The Consultant will deliver a draft version of the application in Word format to CDOT. Following the receipt of comments from CDOT, the Consultant will make necessary revisions and have the document graphically designed using InDesign, with a final draft PDF copy provided to the client before submission for final review. A final draft PDF of the application with all supporting appendices will be delivered to the client before the submission deadline.</p>		<p>X</p>	
<p>3. Benefit-Cost Analysis</p> <p>The BCA represents the principal quantitative justification upon which the grant applications will be accessed. Its aim is to show that the candidate project is economically feasible and will deliver a multifaceted basket of benefits which outstrip the costs associated with planning, constructing, and operating the candidate project. To assess the various project alternatives, so that a preferred project mix can be identified, the Consultant will need to construct a BCA model to which the project alternatives can be applied. The Consultant will develop a BCA model which directly addresses the grant assessment criteria, as consistent with DOT guidelines.</p> <p>The BCA Analysis will comprise of:</p> <ul style="list-style-type: none"> • Development of a BCA model which directly addresses the grant assessment criteria, as consistent with DOT guidelines. • Incorporation of cost estimates, schedules, and technical data for operations of the subject corridor in which the candidate bridges are located. • Calculation and valuation of all benefits which the project will deliver within the study area over the assessment period (construction +20 years of operation, possibly 30 if necessary); and • Determination of benefit-cost ratio for the project at a 7% discount, as consistent with DOT guidelines. <p>The team will also identify any innovations as highlighted in the Notice of Funding Opportunity (NOFO). In addition, the NOFO identifies innovation and any impacts which can positively benefit overburdened communities (those characterized by persistent poverty, located in non-attainment zones or other areas of environmental justice, majority minority populations, etc).</p>		<p>X</p>	

<p>4. Graphic Design of Application Following the receipt of the CDOT comments on the Word version of the draft application, the Consultant will make necessary revisions and have the document graphically designed using InDesign with a final draft PDF copy provided to the client in the days before submission for final review. A final draft PDF of the application with all supporting appendices will be delivered to the client on the agreed upon schedule.</p> <p>CDOT will retain ownership and all rights to the completed and draft work products, particularly including the final application and any branding or collateral developed with project funds.</p>			
<p>5. Quality Control and Quality Assurance In advance of every submittal, the Consultant will perform internal QA/QC of project deliverables in accordance with the Consultant’s QA/QC policies and procedures.</p> <p>All work products shall be submitted to the CDO/PM with ample time for review and revision. CDOT will retain final authority over all quality, aesthetic, artistic, and narrative materials.</p>			

TABLE 1 – SUBMITTALS

Note: This list establishes the individual task responsibility. Those tasks identified as CDOT/Other should utilize an abbreviation system to indicate whether the task will be completed by CDOT. The consultant shall maintain the ability to perform all work tasks which are indicated below by an ‘X’ in the consultant column, in accordance with the forms and conditions contained herein, and the applicable CDOT standards.

Deliverable #	Work Tasks	CDOT	Consultant	Not Applicable
Project Initiation, Management, Continuing Requirements				
	Periodic Reports		X	
	Billings		X	
	Meeting Minutes		X	
1.1	Project Management Plan		X	
1.2	Project Schedule		X	
1.3	QA/QC Plan		X	
1.4	Project Charter		X	
Stakeholder and Public Engagement				
2.1	Railroad Stakeholder Engagement Plan		X	
2.2	Agency Coordination Plan		X	
2.3	Public Engagement Plan		X	
Alternatives Analysis				
3.1	Route Options Analysis Report	X	X	
3.2	Service Options Analysis Report	X	X	
3.3	Investment Package Options Report		X	
3.4	Alternatives Analysis Report		X	
System Planning Analysis				
4.1	Existing Conditions Report		X	
4.2	Operations Analysis Report		X	
4.3	Station Area Reports (one per station)		X	
4.4	Station Conceptual Plans (one per station)		X	
4.5	Bus Connectivity and Enhancement Plans		X	
4.6	Operations and Maintenance Cost Estimate		X	
4.7	Environmental Concerns Analysis Report		X	
Preliminary Engineering				
5.1	Infrastructure Project List		X	
5.2	Project Portfolio List and Definitions		X	
5.3	10% Design Package(s)		X	
5.4	30% Design Package(s)		X	
5.5	Maintenance Facility Criteria		X	
5.6	Maintenance Facility Site Proposal		X	
5.7	Maintenance Facility Preliminary Design		X	
5.8	Capital Cost Estimating Methodology		X	
5.9	Capital Cost Estimates		X	
5.10	Phasing Plan		X	
5.11	Implementation Plan			
Grant Preparation				
6.1	Prepared Grant Applications		X	

APPENDIX A REFERENCES

1. **COLORADO DEPARTMENT OF TRANSPORTATION PUBLICATIONS** (using latest approved versions):
 - A. Design Guide (all volumes)
 - B. Project Development Manual
 - C. Cost Data Book
 - D. CDOT Traffic Analysis and Forecasting Guidelines
 - E. Drainage Design Manual
 - F. Landscape Architecture Manual
 - G. NEPA Manual
 - H. Environmental Stewardship Guide
 - I. Various CDOT Environmental Resource Guidance (i.e Air Quality, Hazardous Materials, Noise, Visual)
 - J. Standard Plans, M & S Standards
 - K. Standard Specifications for Road and Bridge Construction and Supplemental Specifications
 - L. Item Description and Abbreviations (with code number) compiled by Engineering Estimates and Market Analysis Unit (“Item Book”)
 - M. Right-of-Way Manual
 - N. Utility Manual
 - O. Interactive Graphics System Symbol Table

2. **CDOT PROCEDURAL DIRECTIVES** (using latest approved versions):
 - A. No. 27.1 Social Marketing – Use of Web 2.0 and Similar Applications
 - B. No. 31.1 Web Site Development

3. **RAILROAD PUBLICATIONS**
 - A. Union Pacific Public Projects Manual
 - B. Union Pacific Public Projects Checklist
 - C. Union Pacific Track Design Standards and Standard Drawings
 - D. Amtrak Station Planning Guidelines

4. **FEDERAL PUBLICATIONS** (using latest approved versions):
 - A. Manual on Uniform Traffic Control Devices
 - B. U.S. Department of Transportation Order 5610.1E
 - C. ADAAG Americans With Disabilities Act Accessibility Guidelines

5. **AREMA:**
 - A. Manual for Railway Engineering

APPENDIX B DEFINITIONS

Note: For other definitions and terms, refer to Section 101 of the CDOT Standard Specifications for Road and Bridge Construction and the CDOT Design Guide.

ATSSA	American Traffic Safety Services Association
ADAAG	Americans with Disabilities Accessibility Act Guidelines
BLM	Bureau of Land Management
CA	Contract Administrator – The CDOT Manager responsible for the satisfactory completion of the contract by the consultant
CDOT	Colorado Department of Transportation
CDOT/PM	Colorado Department of Transportation Project Manager – The CDOT Engineer responsible for the day-to-day direction and CDOT Consultant coordination of the design effort (as defined in Section 2 of this document)
CEQ	Council on Environmental Quality
CONSULTANT	Consultant for the project
CONTRACT ADMINISTRATOR	Typically, a Region Engineer or Branch Head. The CDOT employee directly responsible for the satisfactory completion of the contract by the Consultant. The contract administration is usually delegated to a CDOT Project Manager (as defined in Section 2 of this document).
C/PM	Consultant Project Manager – The Consultant Engineer responsible for combining the various inputs in the process of completing the project plans and managing the Consultant design effort.
DRCOG	Denver Regional Council of Governments
EA	Environmental Assessment
EIS	Environmental Impact Statement
GIS	Geographic Information Systems
GPS	Global Positioning System
MAJOR STRUCTURES	Bridges and culverts with a total clear span length greater than twenty feet. This length is measured along the centerline of roadway for bridges and culverts, from abutment face to abutment face. Retaining structures are measured along the horizontal distance along the top of the wall. Structures with exposed heights at any section over five feet and total lengths greater than a hundred feet as well as overhead structures including (bridge signs, cantilevers and butterflies extending over traffic) are also considered major structures.
MPO	Metropolitan Planning Organization (i.e. Denver Regional Council of Governments, Pikes Peak Area Council of Governments, Grand Junction MPO, Pueblo MPO, and North Front Range Council of Governments).
NEPA	National Environmental Policy Act
NGS	National Geodetic Survey
PE	Professional Engineer registered in Colorado
PM	Program Manager
PLS	Professional Land Surveyor registered in Colorado
PS&E	Plans, Specifications and Estimate
PROJECT	The work defined by this scope
ROW	Right-of-Way: A general term denoting land, property, or interest therein, usually in a strip acquired for or devoted to a highway
TMOSS	Terrain Modeling Survey System
TOPOGRAPHY	In the context of CDOT plans, topography normally refers to existing cultural or manmade details.