

4.26 MITIGATION SUMMARY

Table 4.26-1, Mitigation Summary, provides a summary of mitigation measures for the various resources analyzed for the United States Highway 36 corridor.

Table 4.26-1: Mitigation Summary

| Impact | Impact Type | Mitigation Measures |
|--|--------------|--|
| Chapter 3, Transportation Impacts and Mitigation | | |
| Delay at the Federal Boulevard and 80 th Avenue and 74 th Avenue intersections | Operations | <p>West 80th Avenue at Federal Boulevard:</p> <ul style="list-style-type: none"> A southbound lane from West 80th Avenue to the westbound US 36 on-ramp will be added. <p>West 74th Avenue at Federal Boulevard:</p> <ul style="list-style-type: none"> The eastbound approach to left-turn, left-/through-, and right-turn lanes will be re-stripped. Signal phasing will be adjusted. |
| Delay at the Wadsworth Parkway and Midway Boulevard intersection | Operations | <p>Wadsworth Parkway at Midway Boulevard:</p> <ul style="list-style-type: none"> The westbound approach to two left-turn lanes, two through-lanes, and a separate right-turn lane will be re-stripped. Signal phasing will be adjusted. |
| Delay at Dillon Road and McCaslin Boulevard | Operations | <ul style="list-style-type: none"> Dillon Road east of McCaslin Boulevard will be widened to add one westbound lane. This lane will not extend through the McCaslin Boulevard intersection. The east leg of the intersection will have two left-turn lanes, a left or through-lane, and a separate right-turn lane under Package 2 and Package 4. No intersection mitigation will be necessary under the Combined Alternative Package (Preferred Alternative). |
| Closure of local access to Broadway | Access | <ul style="list-style-type: none"> Prior to any changes to local access from the highway system to Broadway, a separate study will be undertaken. The study will evaluate local access in the area and re-evaluate the previous federal proposed action to eliminate access to Broadway. |
| Closure of local access to West 88 th Place | Access | <ul style="list-style-type: none"> Directional signage and traveler information will be provided to guide users to Yates Street and West 88th Avenue by alternate routes. |
| University of Colorado, Boulder South Campus access | Access | <ul style="list-style-type: none"> The Loop Drive access to the University of Colorado, Boulder South Campus will be retained. The Table Mesa Drive interchange will be modified to provide bus BRT access and the westbound to eastbound loop on-ramp will be eliminated. Based on an agreement with CDOT, the University of Colorado, the City of Boulder, and Boulder County, if access at Loop Drive is denied, Tantra Drive will be extended to provide access to the University of Colorado, Boulder South Campus. |
| Reduction of parking spaces at the McCaslin Station | Parking | <p>Consider the following mitigation measures during final design:</p> <ul style="list-style-type: none"> Shift the bikeway closer to the westbound US 36 on-ramp from McCaslin Boulevard. Add a retaining wall along the north side of US 36 adjacent to the current leased parking. Realign the eastbound US 36 off-ramp to be parallel to US 36. If necessary, renegotiate the leased parking agreement to add more parking to the west of the current leased area and behind the theater building. |
| Transit Priority | Operations | <ul style="list-style-type: none"> Analysis of, and if appropriate, implementation of signal priority at key intersections. The intent is to move buses quickly through intersections. The analysis that will be done will include current and projected delay at key intersections, capital and operating costs, and effects to other signals in the vicinity. |
| Section 4.2, Land Use | | |
| Compatibility and acquisitions | Construction | <ul style="list-style-type: none"> Continued coordination with local jurisdictions will occur to ensure compatibility with land use plans and to address any incompatibilities. Coordination will occur with the University of Colorado and the City and County of Boulder to evaluate access requirements for master planning efforts near Table Mesa Drive. Property acquisitions will be reimbursed at fair market value and if possible, comparable land will be provided to compensate for open space acquisition. |

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|--|--------------------------|--|
| Section 4.3, Economic Considerations Loss of customers to businesses in activity centers due to access restrictions during construction | Construction | <ul style="list-style-type: none"> The contractor will be required to maintain access to businesses during construction. Local jurisdiction or project sponsor will provide additional signage to enable customers to access businesses during construction. |
| Loss of property tax | Operations | <ul style="list-style-type: none"> Design will be refined at preliminary and final engineering to reduce ROW requirements. The contractor will consider a variety of ways of structuring ROW/acquisition needs, including securing easements and license agreements. |
| Modifications to access | Operations | <ul style="list-style-type: none"> A cooperative process will be employed during design to avoid or minimize access changes. Directional signage and traveler information, where access is substantially changed, will be provided. |
| Modifications to parking | Operations | <ul style="list-style-type: none"> A cooperative process will be employed during design to avoid or minimize disruption or displacement of business parking. |
| Section 4.4, Right-of-Way and Relocations Acquisition of private and public property, and in some circumstances, displacement of occupants | Construction | <p>Acquisition — For any person(s) whose real property interests may be impacted by this project, the acquisition of those property interests will comply fully with the Uniform Act. The Uniform Act is a federally mandated program that applies to all acquisitions of real property or displacements of persons resulting from Federal or federally-assisted programs or projects. It was created to provide for and ensure the fair and equitable treatment of all such persons. To further ensure that the provisions contained within this Act are applied "uniformly," CDOT requires Uniform Act compliance on any project for which it has oversight responsibility regardless of the funding source. Additionally, the Fifth Amendment of the United States Constitution provides that private property may not be taken for a public use without payment of "just compensation." All impacted owners will be provided notification of the acquiring agency's intent to acquire an interest in their property, including a written offer letter of just compensation specifically describing those property interests. A ROW Specialist will be assigned to each property owner to assist them with this process.</p> <p>Relocation — In certain situations, it may also be necessary to acquire improvements that are located within a proposed acquisition parcel. In those instances where the improvements are occupied, it becomes necessary to "relocate" those individuals from the subject property (residential or business) to a replacement site. The Uniform Act provides for numerous benefits to these individuals to assist them both financially and with advisory services related to relocating their residence or business operation. Although the benefits available under the Uniform Act are far too numerous and complex to discuss in detail in this document, they are available to both owner occupants and tenants of either residential or business properties.</p> <p>In some situations, only personal property must be moved from the real property, and this is also covered under the relocation program. As soon as feasible, any person scheduled to be displaced shall be furnished with a general written description of the displacing agency's relocation program which provides, at a minimum, detailed information related to eligibility requirements, advisory services and assistance, payments, and the appeal process. It shall also provide notification that the displaced person(s) will not be required to move without at least 90 days advance written notice. For residential relocatees, this notice cannot be provided until a written offer to acquire the subject property has been presented, and at least one comparable replacement dwelling has been made available.</p> <p>Relocation benefits will be provided to all eligible persons regardless of race, color, religion, sex, or national origin. Benefits under the Uniform Act, to which each eligible owner or tenant may be entitled, will be determined on an individual basis and explained to them in detail by an assigned ROW Specialist.</p> |
| Acquisition of private and public property, and in some circumstances, displacement of occupants (continued) | Construction (continued) | <ul style="list-style-type: none"> CDOT will provide the required 90-day notice for Geodetic Control Monuments impacted by this project. |
| NOAA Geodetic Control Monuments | Construction | |

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| Section 4.5, Social Impacts and Community Facilities Reduced mobility in neighborhoods around transit stations | Construction | <ul style="list-style-type: none"> • A CMP will be developed during final engineering, in conjunction with local jurisdictions, school districts, emergency services, and affected parties. |
| Section 4.6, Environmental Justice Residential and commercial private property acquisitions | Construction | <ul style="list-style-type: none"> • Refer to Section 4.4, Right-of-Way and Relocations. • All acquisitions and relocations will fully comply with the Uniform Act (42 USC 4601 et seq.) and Uniform Relocation Assistance and Real Property Acquisition for federal and federally-assisted programs (49 CFR 24 et seq.) (Uniform Act) and other statutes. • Relocation benefits will be provided to all eligible persons regardless of race, color, religion, sex, or national origin. Benefits which eligible owners or tenants may be entitled to will be determined on an individual basis and explained in detail by an assigned ROW Specialist. • Design in engineering phases will be refined to reduce ROW requirements. • A variety of ways to structure ROW acquisition needs will be considered, including easements and license agreements. • CDOT and RTD will coordinate with Adams County, municipalities, and other agencies to engage a contractor for additional outreach to meet with affected property and business owners to provide counseling and assistance in applying for funding. This will include research to summarize loans, grants, and federal aid available, and research of demographically similar areas. • All residential units that are being displaced will be considered for an RTD program to provide ECO passes for a year. • CDOT and RTD will conduct meetings and develop a relocation mitigation and enhancement plan in collaboration with the community to address indirect social/psychological/economic impacts to communities. |
| Loss of parkland and open space | Construction | <ul style="list-style-type: none"> • CDOT and RTD will coordinate with local jurisdictions to evaluate appropriate replacements or other acceptable mitigation measures. • Compensation for parkland acquisition will be negotiated with the public land's representatives. At a minimum, compensation shall include comparable replacement of parkland and facilities within approximately 2 miles of the affected parkland or adequate compensation, based on fair market appraisals. • All acquisition mitigation measures must conform to the Uniform Act. • Compensation for resource acquisitions shall be approved by the NPS in cooperation with public entities, as appropriate. Section 6(f) of the 1965 LWCFA (16 USC 4601-4) requires that the Section 6(f) property at Rotary Park be replaced by recreation property of equal value and usefulness. This is only for Package 2 and Package 4. • Design meetings will be held with appropriate officials during final design to discuss how additions to Rotary Park could best be designed to meet the needs of the community. This is only for Package 2 and Package 4. • The design for the eastbound US 36 ramp to southbound Federal Boulevard will be revisited during subsequent design phases to identify design modifications to alleviate impacts. These design modifications will be coordinated with the local jurisdictions. • Design meetings will be held with the community during final design to determine the most context-sensitive solution. |
| Visual impacts related to larger interchanges, wider pavements, sound walls, and retaining walls | Construction/ Operations | <ul style="list-style-type: none"> • Existing sound walls will be reconstructed early in the construction schedule, where possible, to mitigate for construction noise. |
| Noise | Construction/ Operations | <ul style="list-style-type: none"> • Existing sound walls will be reconstructed early in the construction schedule, where possible, to mitigate for construction noise. |

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| General construction impacts to the community | Construction | <ul style="list-style-type: none"> Refer to the Construction Mitigation outlined in Section 4.22, Construction-Related Impacts. CDOT and RTD will implement an overall CMP to address communications, community impacts, visual protection, air quality, safety controls, noise controls, and traffic controls to minimize impacts to low-income households and minority populations and to maintain access to local businesses, residences, and emergency services. Hotel vouchers will be offered to residents in the Adams Segment should any nighttime construction be anticipated. Efforts will be made within the Adams Segment to connect contractors with local residents to fill construction jobs. During the construction contracting process, goals will be established for the use of small and disadvantaged businesses. Access to local businesses will be maintained during construction and signs will be used to enable customers to access businesses during construction. CDOT and RTD will coordinate to minimize impacts to local and regional bus routes. |
| Financial equity of managed lanes on low-income populations | Operations | <ul style="list-style-type: none"> In Package 2 and the Combined Alternative Package (Preferred Alternative), tolling costs will be set to give consideration to not exclude low-income drivers from participating. Transponders are free, but an account must be set up with a reserve balance to pay for each use. In addition, technology changes, such as License Plate Tolling being implemented on E-470, would provide options for low-income drivers that would not require setting up an account. Details of the tolling program are included in Chapter 5, Financial Analysis. During design and after implementation of the project, CDOT and RTD will conduct meetings with low-income and minority communities to assess the operations and equity of the tolling program and managed lanes. |
| Section 4.7, Historic and Archaeological Preservation | | |
| Removal or impact to structure | Permanent | <ul style="list-style-type: none"> Avoidance and minimization will be addressed first. A Programmatic Agreement with all parties will be established. Relocation of structure, if possible, will take place. |
| Impact to a portion of a parcel | Permanent | <ul style="list-style-type: none"> Avoidance and minimization will be addressed first. A Programmatic Agreement with all parties will be established. |
| Impact to archaeological resource or linear feature | Permanent | <ul style="list-style-type: none"> Avoidance and minimization will be addressed first. Data recovery and excavation will be provided. Construction monitoring will be provided, as necessary, in areas with archaeological resources. |
| Direct effects to some or all sites: dust and debris | Temporary/Construction | <ul style="list-style-type: none"> Precautionary measures, such as temporary shields to reduce the impact of dust, will be implemented. Contractor training to prevent flying debris effects will take place. |
| Indirect effects to some or all sites: visual, auditory, and decreased access | Temporary/Construction | <ul style="list-style-type: none"> Planned construction staging will be provided to avoid these effects, wherever possible. Signage and well-marked alternate routes for access will be provided. |
| Indirect impact to remaining sites: visual and noise | Indirect/Permanent | <ul style="list-style-type: none"> Case-by-case consultation will be performed. Sound walls or visual barriers will be constructed. |
| Section 4.8, Paleontology | | |
| Disturbance of paleontological resources during construction | Construction | <ul style="list-style-type: none"> Construction monitoring by a qualified paleontologist may be necessary for excavation into potentially fossiliferous Laramie, Arapahoe, and Denver Formation outcrops. |

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| Section 4.9, Parks and Open Space | | |
| Trail crossings | Construction | <ul style="list-style-type: none"> • Adequate trail detours, and advanced notice and signing prior to beginning construction will be provided. |
| Trail relocations | Construction | <ul style="list-style-type: none"> • Trails will be returned to their existing or comparable state following construction. |
| Temporary occupancy of parkland during construction | Construction | <p>In coordination with local jurisdictions, plans will be prepared and implemented defining the BMPs for the following:</p> <ul style="list-style-type: none"> • Public safety and security for the project site will be planned. This plan will include all appropriate access, signing, and public information BMPs. • A traffic, pedestrian, and bicycle access management plan will be provided for the project area during construction. |
| Loss of vegetation | Construction | <ul style="list-style-type: none"> • Disturbed areas will be seeded with native grasses and forbs. Native shrubs will be added to the mix as appropriate. Trees will be replaced at a 1:1 ratio in locations where soils support the highest probability for re-establishment of vegetation. New trees will be planted near areas that naturally receive adequate water, such as near drainage areas or wetlands. Sapling trees in riparian areas may require initial watering for establishment. |
| Spread of noxious weeds | Construction | <ul style="list-style-type: none"> • Weed control will use the principles of integrated pest management to treat target weed species efficiently and effectively by using a combination of two or more management techniques (biological, chemical, mechanical, and/or cultural). Weed control methods will be selected based on the management goal for the species, the nature of the existing environment, and methods recommended by Colorado State University, county weed boards, and other weed experts. The presence of important wildlife habitat or T&E species will be considered when choosing control methods. |
| Erosion control | Construction | <ul style="list-style-type: none"> • The following activities will take place: provision of BMPs, in accordance with the CDOT Drainage Design Manual, will be used during construction to control erosion (refer to Section 4.20, Water Resources: Water Quality and Floodplains); protect cultural resources (refer to Section 4.7, Historic and Archaeological Preservation, and Section 4.8, Paleontology); minimize visual degradation (refer to Section 4.11, Visual and Aesthetic Resources); and assure prompt revegetation (refer to Section 4.14, Biological Resources: Wildlife, Vegetation, and Threatened and Endangered Species). |
| Future planned park, trail, and open space projects | Construction | <ul style="list-style-type: none"> • During final design, coordination will occur with public land's representatives to reasonably address future park, trail, and open space projects included in adopted plans. |
| Parkland acquisition | Operations | <ul style="list-style-type: none"> • Compensation for parkland acquisition will be negotiated with the public land's representatives. At minimum, compensation will include comparable replacement of parkland and facilities within approximately 2 miles of the affected parkland or adequate compensation, based on fair market appraisals. All acquisition mitigation measures must conform to the Uniform Act. |
| Section 6(f) resources acquisition (Package 2 and Package 4) | Operations | <ul style="list-style-type: none"> • Compensation for resource acquisitions will be approved by the NPS in cooperation with public entities, as appropriate. Section 6(f) requires that any Section 6(f) property affected by this project be replaced by recreation property of equal value and usefulness. All acquisition mitigation measures must conform to the Uniform Act. |
| Open space acquisition | Operations | <ul style="list-style-type: none"> • Open space acquisition will be reimbursed at fair market value to the owner of the public lands. It should be the responsibility of the project sponsors to identify comparable lands that may be purchased to replace open space lands that are acquired. All acquisition mitigation measures must conform to the Uniform Act. |
| Impacts to wildlife habitat | Construction/ Operations | <ul style="list-style-type: none"> • See Section 4.14, Biological Resources: Wildlife, Vegetation, and Threatened and Endangered Species. |
| Trail crossings | Operations | <ul style="list-style-type: none"> • Pedestrian underpasses more than 20 feet in length will be lighted to standards for safety and security. |

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|---|-------------|---|
| Trail relocations | Operations | <ul style="list-style-type: none"> Trailhead and trail connections to residential and commercial developments will be preserved. Alternate trail routes accomplishing a similar connection will be provided, where trails must be adjusted. Trails that must be relocated to a public street due to property acquisition will be enhanced with signs and additional plantings (where possible) commensurate with the impact. Vegetation selection will be determined by the owner of the public land's Parks and Recreation Department. Disturbed parkland and open space areas due to construction will be returned to their previous condition. Options include seeding with native grasses and forbs. Native shrubs will be added to the mix as appropriate. Trees will be replaced at a 1:1 ratio in locations where soils support the highest probability for re-establishment of vegetation, such as near riparian resources. For the Combined Alternative Package (Preferred Alternative), visual impacts were mitigated in the Boulder Segment by using slopes instead of retaining walls. |
| Section 4.10, Public Safety and Security | | |
| Crime at transit stations | Operations | <ul style="list-style-type: none"> RTD will hire additional transit security personnel to inspect transit station areas as needed. |
| Fire at transit stations | Operations | <ul style="list-style-type: none"> RTD will provide training to local fire departments to address the special needs of transit fires as needed. |
| Crime at the Westminster Center and 116 th Avenue transit stations | Operations | <ul style="list-style-type: none"> RTD will monitor these transit stations and implement more aggressive security measures as needed. CCTV/video surveillance will be incorporated into the plans at all transit stations. Surveillance will include both personal and video surveillance. Video surveillance systems will be capable of transmitting real-time video to RTD via a fiber optic transmission backbone or other suitable transmission network. Personal surveillance will include uniformed officers who sporadically inspect transit stations. CPTED strategies will be incorporated in the entire design. The purpose of CPTED is to minimize potential threats and vulnerabilities to the transit system, facilities, and patrons, and maximize safety and security through engineering and design. CPTED strategies that will be included are: <ul style="list-style-type: none"> Maximizing the visibility of people, parking areas, patron flow areas and building/structure areas. Providing adequate lighting to minimize shadows. Installing graffiti guards and removing graffiti when discovered Using Mylar shatter guard protection for glass windows. Installing landscape plantings that maximize visibility. Installing gateway treatments, decorative fencing, perimeter control, and a minimum number of parking structures access points. Coordinating and cooperating with municipalities to promote transit friendly land uses, and avoiding land uses that have links to crime (e.g., liquor stores, taverns, pawnshops, pool halls, vacant lots, and abandoned buildings). Establishing maintenance programs that provide for the repair of broken windows, the pick up of litter, and the management streetscapes and public spaces. |
| Safety issues at transit platforms | Operations | <p>Design elements and electronic technology may be used to ensure the transit platform area is safe and free of hazards. Representative measures may include:</p> <ul style="list-style-type: none"> Active and passive warning devices that alert persons of risks and hazards. LED flashing pedestrian warning signs that warn of approaching transit vehicles. Pavement coloring and texturing to notify pedestrians of hazards and/or risk areas. On platforms with poor sight distance, installing pedestrian barriers such as swing gates, automatic pedestrian gates, or Z-crossings to prevent pedestrians from entering the transit guideway. |

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| Limiting of emergency access/egress at transit stations | Operations | <ul style="list-style-type: none"> Transit stations will be designed to meet the requirements for stations as identified in NFPA 130 guidelines. All stations will have a minimum of two access/egress points. Access/egress will be in a manner that facilitates safe and efficient evacuation from the station platform in 4 minutes or less. |
| Decrease in emergency response times due to roadway closures and detours | Construction | <ul style="list-style-type: none"> The construction phasing and sequencing will be carefully designed to minimize potential impacts to public services. The effectiveness of the phasing and sequencing plan will be monitored and adjusted as necessary. RTD will coordinate with emergency response groups regarding local closures, changes in circulation, and detour routes both during and after construction. See Section 4.22, Construction-Related Impacts, for more information. |
| Section 4.11, Visual and Aesthetic Resources | | |
| Construction staging materials | Construction | <ul style="list-style-type: none"> Staging areas along US 36 will be fenced and/or screened. |
| Construction staging areas | Construction | <ul style="list-style-type: none"> Staging areas will be rehabilitated to enhance the surrounding setting; vegetation will be replaced with native grass, forbs, shrubs, or trees, as appropriate. Staging area rehabilitation will reflect the original setting. For example, if native grass field areas are disturbed for staging, they will be replaced with similar native vegetation. |
| Construction lighting and illumination | Construction | <ul style="list-style-type: none"> Lighting will be limited to that required for safety and security. Lighting will be shielded and directed at working areas to minimize glare and ambient light conditions in nearby areas including adjacent travel lanes. |
| Removal of residences and business | Construction | <ul style="list-style-type: none"> Structure removal and area improvements will be expedited to reduce impact on remaining neighbors. The contractor will be required to adhere to the agreed-upon schedule. |
| Freeway and transit station visual nuisance to adjacent property owners | Operations | <ul style="list-style-type: none"> In coordination with local government entities, visual buffers (such as stamped patterns in sound wall, Boston ivy, trees, or other landscaping) will be provided, whenever possible. Coordination will determine which entity will maintain the improvements. |
| Retaining walls | Operations | <ul style="list-style-type: none"> Retaining walls will reflect natural appearance in textures and colors and be graffiti-resistant. Walls will be tiered, where feasible. |
| Sound walls | Operations | <ul style="list-style-type: none"> Aesthetics of sound walls will be coordinated with local jurisdictions and will be graffiti resistant. |
| Landscaping removal | Operations | <ul style="list-style-type: none"> All landscaping, such as trees, shrubs, lawn, and perennials, and in some cases native grasses, will be replaced where it was removed or where the property owner/public entity selects. Where tree diameters are greater than 10 inches measured breast height off the ground, the replacement ratio will be two trees, unless tree ordinances direct otherwise. Typical replacement materials will include 4- to 6-foot evergreens, 1.5- to 2-inch deciduous trees, or 5-gallon shrubs. CDOT Region 6 tree replacement policy will be followed. |
| Replacing or adding a new bridge structure | Operations | <ul style="list-style-type: none"> Corridor design guidelines will be applied using materials and colors similar to existing structures in the area. It is recommended that the design elements from existing bridge designs located at Interlocken Loop and other similar examples be used. When possible, widenings will match existing aesthetic materials and design elements. |
| Transit stations | Operations | <ul style="list-style-type: none"> Although BRT station designs will be reviewed and approved by the local jurisdictions, it is recommended these sites be integrated into the landscape. Parking at transit stations will adhere to local parking ordinances regarding shading, landscaping, lighting, and visibility. Entries to parking and transit stations will be designed using local materials and colors. |
| Lighting | Operations | <ul style="list-style-type: none"> Lights will be directional and shielded, and timers and sensors will be used to minimize the time that lights are on in areas where lighting is not normally needed for safety, security, or operation. Lights at the transit stations will be directional and shielded to reduce off-site light scatter and glare. |

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|---------------------------|-----------------------------|---|
| Section 4.12, Air Quality | | |
| Criteria Pollutants | Construction | <ul style="list-style-type: none"> • APEN and an air permit is required for projects over 25 acres and that last more than 6 months in length. APEN will cover APCD required mitigation measures for active construction. • CDOT will include language in the construction specifications requiring all construction equipment to be equipped to burn ultra-low sulfur diesel fuel. • Usage of water or wetting agents to manage dust. • Usage of wind barriers and wind screens to minimize the spread of dust in areas where large amounts of materials are stored. • Usage of a wheel wash station and/or large-diameter cobble apron at egress/ingress areas to minimize dirt being tracked onto public streets. • Usage of vacuum-powered street sweepers to control dirt tracked onto streets. • Coverage of all dump trucks leaving the site. • Coverage or wetting temporary excavated materials. • Usage of a binding agent for long-term excavated materials. • For winter time construction, engine pre-heater devices will be installed to eliminate unnecessary idling. • Tampering with equipment to increase horsepower or to defeat emissions control devices effectiveness will be prohibited. • Construction vehicle engines will be required to be properly tuned and maintained. • Usage of construction vehicles and equipment with the minimum practical engine size for the intended jobs. • Active grading and parking areas will be watered as required. • BMPs will be used for stockpiles. • All trucks hauling dirt, sand, or other loose material will be covered or maintain freeboard in accordance with local jurisdiction requirements. • Refer to the CMP in Section 4.22, Construction-Related Impacts. |
| Visibility/Opacity | Construction | <ul style="list-style-type: none"> • Refer to the CMP in Section 4.22, Construction-Related Impacts. |
| Ozone | Construction/ Operations | <ul style="list-style-type: none"> • Commitment to any appropriate Regional Air Quality Council adopted mitigation measures for ozone. |
| MSATs | Construction/ Operations | <ul style="list-style-type: none"> • Truck routes will be restricted to avoid sensitive receptor populations. • Pavement durability will be improved to reduce the frequency of repaving. • Ultra-low sulfur diesel will be used in non-road equipment. |

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| <p>Section 4.13, Noise</p> <p>Noise impacts to local communities during construction</p> | <p>Construction</p> | <p>The following noise control measures will be implemented during construction:</p> <ul style="list-style-type: none"> • Permanent sound walls will be constructed at the beginning of the project when feasible. • The contractor will be required to prepare a noise control plan that outlines allowable daytime and nighttime uses, projected noise levels, and locations and types of noise abatement measures that may be required to meet specified noise limits. • The contractor will comply with all applicable local sound control and noise ordinances and regulations. • The following is a list of construction noise mitigation measures that will be employed where the noise control plan specifies (note that these measures will be implemented only where feasible and needed): <ul style="list-style-type: none"> - Use low-noise equipment with mufflers, intake silencers, engine enclosures, and acoustically attenuating shields or shrouds. - Use hydraulically or electrically powered equipment. - Stage construction timing or sequencing to avoid sensitive times of the day. Combine noisy operations so they occur in the same time period. The total noise level produced will not be substantially greater than the level produced if the operations were performed separately. - Locate stationary noise sources as far from sensitive receptors as possible. - Use natural and artificial barriers, such as ground elevation and existing buildings, to shield construction noise. Staging areas should be kept as far from sensitive noise receptors as possible. - Limit pile driving and blasting to daytime working hours near land uses with sensitive receptors. - Use sonic or vibratory pile drivers instead of impact pile drivers. - Avoid placing haul routes through residential areas. • Use quieter demolition methods where possible, such as sawing bridge decks into sections that can be loaded onto trucks, resulting in lower cumulative noise levels than impact demolition by pavement breakers. |
| <p>When noise levels exceed NAC due to traffic and buses</p> | <p>Operations</p> | <ul style="list-style-type: none"> • Sound walls are the only feasible noise mitigation measure, and will be provided in the following locations (subject to refinement as part of final design): <ul style="list-style-type: none"> - All locations where existing sound walls will need to be removed to accommodate the proposed improvements. - Madison Hill homes. - Tuscany Trail. - Rock Creek Apartments. - Apache Road and Pima Court neighborhood. - Moorhead Avenue neighborhood. |

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|---|---------------------|---|
| <p>Section 4.14, Biological Resources: Wildlife, Vegetation, and Threatened and Endangered Species</p> <p>Loss of vegetation including sensitive habitats</p> | <p>Construction</p> | <ul style="list-style-type: none"> • During final design, the grading plan will be developed to minimize the removal of riparian vegetation where possible. • During construction, vehicle operation will be limited to the designated construction area, and the limits of the construction area will be fenced to exclude and protect sensitive habitats, including prairie dog towns, riparian areas, wetlands, and upland trees and shrubs. • Silt fencing, erosion logs, temporary berms, and other BMPs may be used to prevent degradation of habitats adjacent to the construction area by transport of eroded sediment. • Graded areas within the ROW will be seeded with an appropriate mixture of native grasses and forbs; shrubs will be planted where appropriate. • Restoration of disturbed riparian habitat will include planting of native trees and shrubs, as well as seeding and regrading. Native grasses, forbs, and shrubs will also be seeded in riparian areas. SB 40 requires replacement of riparian trees at a 1:1 ratio, and shrubs on a square-foot basis. • To compensate for the effects of riparian habitat loss, equivalent areas of riparian habitat will be enhanced or restored. This may include, but is not limited to the planting of native trees and shrubs, control of noxious weeds, the seeding of native species, or establishment of conservation easements on riparian areas in the vicinity of the project. • All landscaping, such as trees, shrubs, lawn, perennials, and in some cases, native grasses, will be replaced where it was removed. • CDOT Region 6 tree replacement policy will be followed. • See also landscaping removal mitigation under Section 4.11, Visual and Aesthetic Resources. • Impacts to sensitive areas will be avoided or minimized during final design, including the South Boulder Creek Natural Area, and the Colorado Tallgrass Prairie PCA. |
| <p>Loss of prairie dog colonies</p> | <p>Construction</p> | <p>CDOT has a state-wide policy on black-tailed prairie dog mitigation that will be implemented for prairie dogs located within the US 36 corridor. This policy identifies a four-step process to be used when black-tailed prairie dogs may be affected by a project:</p> <ul style="list-style-type: none"> • Avoidance of impacts • Minimization of impacts • Relocation • If relocation is impossible or impractical, impacted black-tailed prairie dogs will be humanely removed from burrows that will be directly affected by the project, and donated for feeding of captive black-footed ferrets or raptors. The remaining individuals to be affected will be humanely euthanized. <p>Additionally, each of the county or city municipalities within the study area has policies for the management of prairie dogs on their property. These policies are generally similar to CDOT's policy in the steps required: avoidance, relocation, live-trapping, or lethal control.</p> |

Table 4.26-1: Mitigation Summary

| Impact | Impact Type | Mitigation Measures |
|--|--------------|--|
| Disturbance to nesting raptors that could result in nest failure | Construction | <ul style="list-style-type: none"> • Trees in the construction footprint will be cleared prior to December 1 or after August 31 to prevent raptors (and other birds) from nesting (including courtship) on-site and to avoid the take of or disturbance to active nests during the breeding and courtship season. If construction is planned to begin after December 1 or prior to August 31, nest surveys will be conducted by a qualified biologist prior to construction to determine the absence or presence of nesting migratory birds. The USFWS Colorado Field Office will be contacted for further guidance if the field surveys identify the existence of active bird nests that cannot be avoided by construction activities. • Raptor nest surveys will be conducted annually during an appropriate season (generally May 1 through June 1) to determine the presence of active raptor nests. If an active nest is located, monitoring or seasonal buffers may be established and coordinated with CDOW to prevent disturbance to nesting birds during construction. • Protective buffer zones may be established around active nests during construction to avoid disturbance while nesting, if deemed necessary. • Individual trees important for raptor perching that are to be removed in the ROW will be replaced at a 1:1 ratio or as specified by state and federal wildlife agencies to ensure raptor perch trees are replaced for future use. New trees may be planted near areas that naturally receive adequate water, such as near drainage areas or wetlands, or as determined by CDOT to ensure survival (if irrigation is available, that would be sufficient as well). Sapling trees in riparian mitigation areas may require initial watering for establishment. • Artificial perches may be erected where important large perch trees are removed to provide perches until newly planted trees have matured. |
| Potential loss of eggs or young of nesting migratory birds | Construction | <ul style="list-style-type: none"> • Destruction or disturbance of nests that results in loss of eggs or young is a violation of the MBTA. To comply with the MBTA (USFWS 2004), land-clearing activities will be timed to avoid the breeding season (primarily April 1 through August 31, but differs according to species) to avoid impacts to active bird nests, as described for raptors (see the first bullet above). In addition, any reconstruction of bridge structures may destroy or disturb swallows nesting on the underside of the bridge. Bridge reconstruction and demolition may be scheduled to avoid impacts to these birds, or actions to discourage nesting activities will be taken prior to the nesting season and will be continued through demolition. Birds that establish a nest in an active construction zone do so at their own risk and are not subject to this protection – a final determination of this status would be made by the CDOT wildlife biologist. |
| Disruption/blockage of existing wildlife corridors and habitat fragmentation | Operations | <p>Specific Recommendations —</p> <ul style="list-style-type: none"> • Big Dry Creek — the City of Westminster/Urban Drainage agreement that does not allow modification of the hydraulic capacity of the existing structures should be revisited to allow either a separate dry crossing for wildlife (preferred), or modification of the existing stream culvert to facilitate wildlife movement. • Rock Creek — replace triple box culvert with a bridge in the Combined Alternative Package (Preferred Alternative). The bridge will have an opening large enough to facilitate wildlife movement. • Davidson, Goodhue, and Marshallville ditches — the culvert openings may be enlarged to compensate for increased length, and should be modified to facilitate wildlife crossing, or a separate dry crossing provided. • Box culverts will be installed where feasible for small- to medium-sized animal crossings between the unnamed ditch on Davidson Mesa and Davidson Ditch; between South Boulder Creek and Upper Dry Creek Ditch; and west of 88th Street. • Oversize culverts and/or modified culverts or dry culverts will be installed, where feasible, to facilitate wildlife crossing at Allen Ditch, Niver Canal, Farmers Highline Canal, Equity Ditch, Community Ditch, the unnamed tributary of Rock Creek, and the unnamed ditch on Davidson Mesa. |

Table 4.26-1: Mitigation Summary

| Impact | Impact Type | Mitigation Measures |
|--|------------------------|---|
| Disruption/blockage of existing wildlife corridors and habitat fragmentation (continued) | Operations (continued) | <p>General Guidelines for Wildlife Crossings —:</p> <ul style="list-style-type: none"> • Promote the improvement of wildlife corridors and connectivity to the extent practicable. • Where feasible, box culverts will be replaced with bottomless box culverts or bridges with natural substrate to promote animal usage. • Where new culverts will be installed, bottomless box culverts or bridges will be used. Culverts will be installed in proximity to tree/shrub cover if possible, and will protect existing trees and shrubs near culverts and bridges from unnecessary encroachment and loss of habitat. Detailed final design will address protection from stormwater scour and sedimentation within proposed bottomless box culverts. • Bridge structures should span the largest amount of riparian habitat possible under a constructed bridge to limit the amount of disturbance to vegetation and to allow for dry passage along the water's edge. Riparian areas with dense vegetation are favored by many species for travel corridors. • Where feasible, large animal underpasses could be utilized to promote connectivity and movement. In general, riparian areas within the corridor would provide the most practical locations for large animal underpasses. Minimum dimensions for a large animal underpass should be 8-foot tall by 24-foot wide, with an openness ratio calculated in meters of 0.9 to 2.0 (height x width/length [meters]). As the width of the roadway increases, the height and width of the underpass structure should be increased proportionately. This openness will prevent a tunneling effect that would discourage animal use. Bridges and culverts will meet an openness ratio greater than 0.9 where it makes engineering sense. • Where feasible, if a stream or ditch conveys water, animals will be provided a shelf or a raised dry ledge on the side of the channel above ordinary high water to use as a dry walkway under the structure under normal flows. Shelves will be at least 1 foot higher than the normal water level and at least 1.3 feet wide to be effective (Forman et al. 2002). • Where feasible, vegetative debris, such as old stumps, logs, and small brush will be placed along one edge of the bottom of an underpass (approximately 1 foot wide) as cover for small mammals and amphibians when crossing. Vegetative debris will be anchored in place. • Crossing structures (i.e., culverts) should have natural bottom substrates, such as coarse sand, to facilitate wildlife use. Materials such as riprap and concrete should be avoided at culvert entrances and floors, if feasible. <p>Recommendations for Small Animal Crossings —:</p> <ul style="list-style-type: none"> • Small animals will use small-diameter culverts (less than 3 feet in diameter) more than large culverts. Reptiles prefer circular pipes, while amphibians, rabbits, and domestic animals prefer rectangular vessels. Therefore, a variety of types of small animal crossings would be most effective. • Small animal culvert size would be less than 5 feet in diameter or height. • Where feasible, vegetative debris, such as old stumps, logs, and small brush will be placed along one edge of the bottom of an underpass (approximately 1 foot wide) as cover for small mammals and amphibians when crossing. Vegetative debris will be anchored in place. |

Table 4.26-1: Mitigation Summary

| Impact | Impact Type | Mitigation Measures |
|-------------------------|--------------|---|
| Spread of noxious weeds | Construction | <p>An integrated Noxious Weed Management Plan may be developed during final design and in consultation with appropriate land management agencies where designated sensitive habitats occur and project work will extend over several years, or be handled in the plans and specifications as directed by CDOT biologists in consultation with these agencies. This plan will be implemented during construction and may include identification of noxious weeds in the area, weed management goals and objectives, and preventive and control methods. Upon completion of project construction, the area would fall under the control of a local or CDOT maintenance plan. Preventive measures may include, but are not limited to, the following:</p> <ul style="list-style-type: none"> • Contractor vehicles may be inspected before they are used for construction to ensure that they are free of soil and debris capable of transporting noxious weed seeds or roots. Heavy construction equipment may be cleaned. • Noxious weeds observed in and near the construction area at the start of construction will be treated with herbicides or physically removed to prevent seeds blowing into disturbed areas during construction. • Periodic surveys should occur during the construction period to identify and treat noxious weeds that have developed, depending on how long the project is under construction. • Potential areas of topsoil salvage will be assessed for presence and abundance of noxious weeds prior to salvage. Topsoil from heavily infested areas will either be treated by spraying, taking it off site, or burying it during construction. • Disturbed areas will be reclaimed in phases throughout the project construction and seeded using a permanent native seed mixture. If areas are completed and permanent seeding cannot occur due to the time of year, mulch and mulch tackifier will be used for temporary erosion control until seeding can occur. • Fertilizer will not be used in seeded areas because it can enhance the growth of noxious weeds at the expense of desired vegetation. • Only certified weed-free mulch and bales will be used on the project (Title 35, Article 27.5, Forage Crop Certification 35-27.5-101). • Weed control may use the principles of integrated pest management to treat target weed species efficiently and effectively by using a combination of two or more management techniques (biological, chemical, mechanical, and/or cultural). Weed control methods may be selected based on the management goal for the species, the nature of the existing environment, and methods recommended by Colorado State University, county weed boards, and other weed experts, but will keep in mind the applicability of these methods during construction and the likelihood that these methods will be used. The presence of important wildlife habitat or T&E species will be considered when choosing control methods. |

Table 4.26-1: Mitigation Summary

| Impact | Impact Type | Mitigation Measures |
|---|-----------------------------|---|
| Potential loss of fisheries and aquatic habitat | Construction/ Operations | <ul style="list-style-type: none"> BMPs will be used to control erosion and sedimentation during construction and to protect water quality in streams. BMPs may include berms, brush barriers, check dams, erosion control blankets, filter strips, sandbag barriers, sediment basins, sheet mulching, silt fences, straw-bale barriers, surface roughening, and/or diversion channels. A spill prevention and emergency response plan will be prepared and used during construction for storage, handling and use of chemicals, fuels, and similar products. Under Colorado SB 40, any project affecting SB 40 jurisdictional streams, their banks, or tributaries is required to consult with CDOW. Following final design, an application for SB 40 Wildlife Certification may be required if the project does not fall within CDOT's Programmatic Agreement with CDOW, including detailed plans and specifications. CDOW will review the plans to ensure that they are technically adequate to protect and preserve fish and wildlife resources, and provide recommendations or alternative plans if the project would adversely affect a stream. Streams requiring channelization, realignment, or diversion will be restored equal to or better than pre-construction conditions, and restoration will be addressed in the Section 404 Permit. Stream restoration should create a meandering channel with varying side slopes rather than a straight, trapezoidal channel, and should include pools and other habitat features. To control erosion, bioengineering or the use of plants to control erosion may be used instead of riprap or other unnatural bank stabilization techniques. Banks will be planted with native plant species. Also refer to Section 4.20, Water Resources; Water Quality and Floodplains, and Section 4.22, Construction-Related Impacts. |
| Loss of listed FT and FE species or their habitat | Construction/ Operations | <p>FHWA and FTA have initiated consultation with the USFWS. A PBA will be released with the FEIS for public comment. Conservation measures for impacts to federally-listed species were developed as part of the PBA. During final design, detailed mitigation measures related to T&E species will be developed in consultation with the USFWS. The following mitigation measures are proposed:</p> <p>Preble's meadow jumping mouse —</p> <ul style="list-style-type: none"> Direct impacts (death) will be avoided or minimized by use of silt fencing or similar visible barriers, restrictions in the area of disturbance, and construction limited to the non-active season (November 1 through April 30) in occupied habitat. Occupied habitat removed for project construction will be replaced through creation or enhancement of suitable habitat. Mitigation areas should link fragmented habitat patches by restoring areas of non-habitat between zones of occupied habitat. Mitigation for Preble's meadow jumping mouse could be coordinated with wetlands and riparian mitigation, where possible. A complete list of conservation measures will be developed through formal consultation with the USFWS. Small mammal ledges should be used in culverts to enhance mouse mobility. |

Table 4.26-1: Mitigation Summary

| Impact | Impact Type | Mitigation Measures |
|---|--|---|
| Loss of listed FT and FE species or their habitat (continued) | Construction/ Operations (continued) | <p>Ute ladies'-tresses orchid —</p> <ul style="list-style-type: none"> • Surveys will be conducted to identify and map Ute ladies'-tresses orchid habitat within and adjacent to the construction footprint in the area from Davidson Ditch to the west edge of Van Vleet open space. Surveys should be conducted for 3 years, when feasible, because the number of flowering plants varies widely from year, and would be done prior to final design. Surveys will be done during the flowering season by qualified botanists. • Impacts will be avoided or minimized, where possible, by relocation of project components, such as detention ponds, by use of roadside ditches instead of ponds for water quality control, and/or by narrowing of the construction footprint. • Project components within Ute ladies'-tresses orchid habitat will be designed to not adversely affect the hydrology of adjacent Ute ladies'-tresses orchid habitat. Monitoring wells may be needed to assess pre-construction water levels and to monitor changes during and after construction. • In Colorado, the primary mitigation for unavoidable impacts to plants and habitat will be protection or enhancement of other existing populations. The conservation requirements will be commensurate with the level of impact, and will be determined in consultation with the USFWS. • Ute ladies'-tresses orchids that cannot be avoided will be transplanted to a mitigation site or to a botanical garden. Removal and transplant of Ute ladies'-tresses orchids or the topsoil of their habitat will be conducted by botanists after tubers have formed in the fall. Detention ponds may be designed to provide suitable habitat for Ute ladies'-tresses orchids and may serve as transplant sites. Selection of a mitigation site will be coordinated with the mitigation for the Preble's meadow jumping mouse and wetlands, and will consider habitat suitability, benefits to the species, and provisions for long-term management and protection. <p>Colorado Butterfly Plant —</p> <ul style="list-style-type: none"> • Surveys will be conducted within and adjacent to the construction footprint at Dry Creek and Walnut Creek. If Colorado butterfly plants are found, CDOT will consult with the USFWS regarding appropriate conservation measures. |
| Potential loss of state-listed threatened or endangered species and other sensitive species | Construction | <p>Burrowing Owl —</p> <ul style="list-style-type: none"> • Surveys will be conducted between April 1 and July 31 of the construction year to determine the presence of burrowing owls and the locations of occupied nests. • If nests are identified, construction will be avoided within 50 yards (150 feet) of an active nest site from April 1 to July 31 or as determined necessary by a CDOT wildlife biologist. • If a nest becomes occupied after the start of active construction, a seasonal buffer zone will be required to prevent violation of the MBTA. |

Table 4.26-1: Mitigation Summary

| Impact | Impact Type | Mitigation Measures |
|---|-----------------------------|--|
| Potential loss of state-listed threatened or endangered species and other sensitive species (continued) | Construction (continued) | <p>Other Sensitive Animal Species —</p> <ul style="list-style-type: none"> • Mitigation for nesting ospreys will be the same as for raptors (see above). • Pre-construction nest surveys will be conducted for barn owls in dirt cutbanks in suitable riparian habitat (such as Walnut Creek) prior to construction if land clearing occurs between April 1 and September 30. • Land-clearing activities will be avoided in known bobolink nesting habitat in the Boulder Segment during their nesting season (May 15 through July 30) unless the habitat has been surveyed by a qualified biologist and no nests were found to be present. • To mitigate for impacts to common garter snakes in areas where BMPs will control erosion, coconut-straw erosion blankets with a biodegradable thread will be used rather than TRMs, which can harm snakes. The framework will be manufactured with openings of sufficient size and "give" to allow for safe passage of snakes through the blanket. Use of a netless excelsior blanket (Curlex Net-Free brand) combined with a heavy woven coir mat has been found successful (install the coir mat on top of the netless excelsior and anchor down). <p>Other Sensitive Plant Species —</p> <ul style="list-style-type: none"> • Prior to construction, presence/absence surveys will be conducted for all areas that would be affected by project activities within designated sensitive habitats, including the South Boulder Creek Natural Area, Colorado Tallgrass Prairie Natural Area, and Colorado Tallgrass Prairie PCA. The survey(s) will be conducted by qualified botanists during an appropriate season for best observation and identification of the sensitive species. If found, mitigation for impacts to these sensitive habitats (which includes mesic and xeric tallgrass communities) will be developed based on the relative numbers of plants that would be affected, the potential for avoidance or minimization of impacts, and the potential for transplanting of individuals and seedbeds to suitable habitat on adjoining property. Mitigation measures will be developed in consultation with the land management agencies where the impacts will occur. |
| Section 4.15, Mineral Resources, Geology, and Soils | | |
| Expansive soils | Construction | <ul style="list-style-type: none"> • Engineering measures, such as installation of deep foundation systems, raft foundations, and floating floor slabs will be considered during preliminary and final design. |
| Unstable slopes | Construction | <ul style="list-style-type: none"> • Engineering measures, such as cantilevered retaining walls, soil nail walls, ground anchors, and MSE walls will be considered during preliminary and final design. |
| Expansive subgrade soils | Construction | <ul style="list-style-type: none"> • Engineering measures, such as soil stabilization with lime treatment, removal and recompaction, or removal and replacement with imported fill material will all be considered during preliminary and final design. |
| Collapsible subgrade soils | Construction | <ul style="list-style-type: none"> • Engineering measures, such as stabilization by flooding, deep dynamic compaction, over-excavation, and pre-loading prior to construction will be considered during preliminary and final design. |
| Steeply dipping bedrock | Construction | <ul style="list-style-type: none"> • Engineering measures, such as stabilization by over-excavation and replacement with imported fill materials will be considered during preliminary and final design. |
| Soil erosion | Construction/ Operations | <ul style="list-style-type: none"> • Refer to Section 4.20, Water Resources; Water Quality and Floodplains, and the CMP discussion in Section 4.22, Construction-Related Impacts. |

Table 4.26-1: Mitigation Summary

| Impact | Impact Type | Mitigation Measures |
|---|--|---|
| Section 4.16, Farmlands Impacts to irrigation pipes and ditches | Construction | <ul style="list-style-type: none"> All irrigation pipes and ditches will be replaced in-kind. Irrigation will not be interrupted during construction. |
| New ROW required | Construction/ Operations | <ul style="list-style-type: none"> Mitigation will be provided to agricultural properties, consistent with the ROW policies described in Section 4.4, Right-of-Way and Relocations. |
| Access to property | Construction/ Operations | <ul style="list-style-type: none"> Existing, legal access to farm properties will remain available during and after construction. Typically, access rights are demonstrated by easements, license agreements, or other legal permits, etc. |
| Section 4.17, Hazardous Materials | | |
| Existing hazardous material sites adjacent to or within the corridor | Construction/ Long-term Management | <ul style="list-style-type: none"> Site-specific Phase II ESAs will be conducted with subsurface investigation (soil and groundwater) for sites that may affect final design. A Materials Handling Plan will be prepared to address contaminated soil and groundwater, and a Health and Safety Plan will be developed as required by Section 250.03 of the CDOT Standard Specifications for Road and Bridge Construction (CDOT 2005). Engineering controls will be determined to minimize quantity of contaminated materials. Responsible parties will be identified for design, build, and operation of remediation systems. Cost recovery of hazardous material sites where removal actions and long-term maintenance is required will be determined. A heavy-metal-based paint survey will be prepared for bridges in the project area. An asbestos survey will be prepared in the event of building and/or bridge acquisition or demolition, or if asbestos is known to be present. Soil Characterization and Management Plans will be prepared according to CDPHE HMWMD if construction debris is encountered during construction activities and is suspected to contain asbestos. |
| Acquisition of additional ROW or new property | Construction/ Long-term Management | <ul style="list-style-type: none"> An individual site-specific Phase I ESA will be conducted on properties before acquiring any ROW. Site-specific Phase II ESAs will be conducted with subsurface investigation (soil and groundwater) for sites that may affect final design. A Materials Handling Plan will be prepared to address contaminated soil and groundwater and a Health and Safety Plan will be developed as required by Section 250.03 of the CDOT Standard Specifications for Road and Bridge Construction (CDOT 2005). Engineering controls will be determined to minimize the quantity of contaminated materials. Responsible parties will be identified for design, build, and operation of remediation systems, and to ensure CDOT and RTD are not liable for future operations. Cost recovery of hazardous material sites where removal actions and long-term maintenance is required will be determined. A heavy-metal-based paint survey of bridges in the project area will be prepared. An asbestos survey for any building acquisition or demolition, if asbestos is known to be present, will be prepared. Soil Characterization and Management Plans will be prepared according to CDPHE HMWMD if construction debris is encountered during construction activities and is suspected to contain asbestos. |

Table 4.26-1: Mitigation Summary

| Impact | Impact Type | Mitigation Measures |
|---|--------------|---|
| Section 4.18, Utilities | | |
| Adjustment or relocation of irrigation ditches | Construction | <ul style="list-style-type: none"> Construction will be scheduled during periods of non-use (November through March), wherever possible. Design will be modified to avoid/minimize conflict wherever possible. |
| Relocation of electric transmission towers | Construction | <ul style="list-style-type: none"> Construction will be scheduled during periods of low demand (October through April), wherever possible. Design will be modified to avoid/minimize conflict wherever possible. |
| Adjustment or relocation of high-pressure gas lines | Construction | <ul style="list-style-type: none"> Construction will be scheduled during periods of low demand (May through September), wherever possible. Design will be modified to avoid/minimize conflict wherever possible. |
| Adjustment or relocation of buried fiber optic | Construction | <ul style="list-style-type: none"> Early coordination with utility owners will take place wherever possible. Design will be modified to avoid/minimize conflict wherever possible. |
| Adjustment or relocation of water lines and sanitary sewers | Construction | <ul style="list-style-type: none"> Design will be modified to avoid conflict wherever possible. Disruption of service for low-use period will be scheduled. Disruption of service will be minimized with wet tie-in wherever possible. Design will be modified to avoid conflict wherever possible. |
| Relocation of storm sewers | Construction | <ul style="list-style-type: none"> Design will be modified to avoid conflict wherever possible. |
| New roadway or reduced cover on buried utilities | Construction | <ul style="list-style-type: none"> Encasement or protective covers over utilities will be added as appropriate. |
| Section 4.19, Energy | | |
| Increases in bus VMT | Operations | <ul style="list-style-type: none"> RTD's policy on sustainability will be implemented. |
| Use of energy resources during construction | Construction | <ul style="list-style-type: none"> CDOT and RTD sustainable practices will be incorporated into the project planning, construction, and maintenance to minimize impacts. |
| Section 4.20, Water Resources: Water Quality and Floodplains | | |
| Destruction of riparian vegetation | Construction | <ul style="list-style-type: none"> Temporary BMPs for construction, including re-establishment of native vegetation, will be installed and implemented. |
| Untreated stormwater runoff entering surface waterway during construction | Construction | <ul style="list-style-type: none"> NPDES guidelines for stormwater quality, including obtaining a CDPS stormwater construction permit, will be followed. All work performed on the project within CDOT ROW will conform to Section 107.25 (Water Quality), and Section 208 (Erosion Control) of the CDOT Standard Specifications for Road and Bridge Construction (CDOT 2005). A Stormwater Management Plan will be developed that will detail the BMPs to be used for construction. Practices from the Erosion Control and Stormwater Guide (ECSQG) (CDOT 2002 or most current volume) will be followed. park-n-Ride areas for transit stations will follow local water quality ordinances of the local jurisdiction where the transit stations are located. Local requirements will require the permanent BMPs to treat runoff from developed areas. Adequate storm drainage systems for the existing and proposed improvements near the interchanges will be developed to prevent high levels of sediment and pollutants from being carried into the wetlands, natural drainageways, and irrigation ditches. Non-structural BMPs, such as pesticide and fertilizer application guidelines and anti-icing and de-icing guidelines, will be employed to improve water quality in conjunction with BMP implementation. Other non-structural BMPs, such as water quality signage adjacent to the receiving streams and irrigation ditches, are examples of other tools that will be considered for implementation. A construction dewatering discharge permit may be required for groundwater dewatering activities. A Section 404 Permit will be obtained for instream work performed to retrofit any bridge and channel improvements, and 401 certification will be required to ensure that water quality standards will not be violated. |

Table 4.26-1: Mitigation Summary

| Impact | Impact Type | Mitigation Measures |
|---|-----------------------------|---|
| Control of storm runoff from new and existing impervious surfaces within CDOT ROW | Construction/ Operations | <ul style="list-style-type: none"> Permanent BMPs will be constructed in compliance with the Urban Drainage Criteria Manual (UDFCD 2004) and the CDOT New Development and Redevelopment Program, where practical, for use during the construction phase to improve the water quality control at the site. In the tributary to Big Dry Creek, operational BMPs such as alternative de-icing measures that minimize the use of salts or operational guidelines that more closely manage the application of salts, will be considered. Permanent BMPs will be designed and constructed in compliance with the CDOT New Development and Redevelopment Program for all highway improvements. <ul style="list-style-type: none"> All highway runoff will be collected and treated to the level required by the CDOT New Development and Redevelopment Program. The US 36 corridor improvements fall into Tier 1 BMP requirements under this program. BMPs within the project corridor will need to provide 100% of the required water quality capture volume, or the project needs to provide BMPs designed to remove at least 80% of the average annual total suspended solids loading from the average storm event. All proposed new connections to CDOT's storm sewer system will be inspected and verified during the construction phase to ensure the connections are constructed as designed and improper connections are avoided. Up to four domestic wells will be replaced. If a CLOMR is required for Big Dry Creek, a LOMR will be prepared by the project sponsors at the completion of project construction. |
| Control of industrial wastes | Operations | |
| Replacement and relocation of domestic wells | Groundwater | |
| Floodplain encroachment | Construction | |
| Section 4.21, Wetlands and Other Waters | | |
| Loss of wetlands due to the placement of dredged or fill material | Construction | <ul style="list-style-type: none"> Wetland mitigation to include banking, establishment, restoration, enhancement, and/or preservation. Banking, establishment and restoration is typically at a 1:1 ratio. |
| Sedimentation and erosion of wetlands and other water features | Construction | <ul style="list-style-type: none"> BMPs will be implemented during all phases of construction to reduce impacts from sedimentation and erosion, including the use of berms, brush barriers, check dams, erosion control blankets, filter strips, sandbag barriers, sediment basins, silt fences, straw-bale barriers, surface roughening, and/or diversion channels. When practicable, construction in waterways will be performed during low-flow or dry periods. Flowing water will be diverted around active construction areas. No fill material will be stored in wetlands or other water features. No unpermitted discharges will be allowed. |

Table 4.26-1: Mitigation Summary

| Impact | Impact Type | Mitigation Measures |
|--|---------------------|--|
| <p>Section 4.22, Construction-Related Impacts</p> | <p>Construction</p> | <p>A CMP will be developed during final design as the key mitigation measure for offsetting the construction impacts. The plan will be developed in cooperation with the affected communities, CDOT, and RTD. The CMP will include the following key elements:</p> <p>Communications Plan — to address:</p> <ul style="list-style-type: none"> • Construction safety issues. • Road closures. • Operating protocols. • Disruption of utility service. • Signage plan to inform the public of lane changes, temporary interchange closures, etc. <p>Community Impact Plan — to address:</p> <ul style="list-style-type: none"> • Reduction of construction dust, noise, visual degradation, and traffic impacts. • Maintenance of access to local businesses during construction. • Reduction of the duration of construction in residential areas. <p>Visual Protection — to address:</p> <ul style="list-style-type: none"> • Screening construction staging and storage areas. • Replacement of ground cover over exposed areas in a timely manner. • Removal of unused detour pavements or signage. <p>Air Quality Protection — to address:</p> <ul style="list-style-type: none"> • Control of dust through watering or dust palliatives. • Revegetation of exposed soils. • Stabilization of stockpiles. • Control of off-site tracking of mud and debris. • Usage of clean fuels to bio fuels in equipment to reduce emissions. <p>Noise Control — to address:</p> <ul style="list-style-type: none"> • Construction of sound walls prior to construction. • Use of noise-mitigated equipment. • Minimization of the duration of construction in residential areas to the extent possible. • Minimization of night construction in residential areas to the extent possible. • Re-routing construction traffic away from residential areas where possible. • Usage of alternative construction methods, such as sonic or vibratory pile driving. • Performance of high-noise activities during daytime hours when possible (e.g., pile driving). • Providing hotel vouchers for those residents within 300 feet of the source when high-noise activities must be completed during evening or early morning hours. |

Table 4.26-1: Mitigation Summary

| Impact | Impact Type | Mitigation Measures |
|--|--------------------------|--|
| Direct construction impacts on all resources (continued) | Construction (continued) | <p>Biological Resource Protection — BMPs and other practices will be reviewed and adopted to address:</p> <ul style="list-style-type: none"> • Reduction of loss of vegetation in sensitive habitats. • Reduction of loss of prairie dog colonies. • Minimization of disturbances to nesting raptors and songbirds. • Reduction of disruption of wildlife corridors. • Reduction of the amount of road kill. • Minimization and avoidance of habitat fragmentation. • Reduction of the loss of fisheries and aquatic habitat. • Reduction of the loss of T&E habitat and species. • Reduction of the spread of noxious weeds. <p>Hazardous Waste Control — to address:</p> <ul style="list-style-type: none"> • Identification of hazardous wastes prior to construction through conducting Phase II Site Assessments. • Preparation of a Hazardous Materials Management Plan prior to construction. • Compliance with Occupational, Safety, and Health Administration requirements, including preparation of Health and Safety Plans prior to construction (if not included above). |

Table 4.26-1: Mitigation Summary

| Impact | Impact Type | Mitigation Measures |
|--|--------------------------|--|
| Direct construction impacts on all resources (continued) | Construction (continued) | <p>Utilities Relocation — to address:</p> <ul style="list-style-type: none"> • Notification of citizens of possible utility outages. • Scheduling of construction to reduce outages. • Coordination with local utilities. <p>Water Quality and Wetlands Protection — to address:</p> <ul style="list-style-type: none"> • Implementation of BMPs for erosion control. • Treatment of contaminated dewatering effluents. • Fulfilling municipal Separate Stormwater System requirements. • Minimization of impacts to wetlands and riparian areas. • Identification of locations for replacement wetlands. • Usage of wetland replacement to help mitigate wildlife habitat fragmentation. <p>Traffic Control — to address:</p> <ul style="list-style-type: none"> • Minimization of impacts to emergency services. • Reduction of congestion through development of traffic management plans. • Coordination of bridge demolition and detour routes to avoid overloading local streets with detour traffic. • Limiting ramp closures to low-volume ramps. • Limiting high-volume ramp closures to nights and weekends. • Maintenance of access to local businesses and residences. <p>The detailed elements of the CMP will be developed as a part of the preliminary engineering design and FEIS for the Preferred Alternative.</p> |

Source: US 36 Mobility Partnership, 2009.

Notes:

- % = percent
- APCD = Air Pollution Control District
- APEN = Air Pollution Emissions Notice
- BMP = best management practice
- BRT = bus rapid transit
- CCTV = closed circuit television
- CDOT = Colorado Department of Transportation
- CDOW = Colorado Department of Wildlife
- CDPHE = Colorado Department of Public Health and Environment
- CDPS = Colorado Discharge Permit System
- CFR = Code of Federal Regulations
- CLOMR = Conditional Letter of Map Revision
- CMP = Construction Management Plan
- CPTED = Crime Prevention through Environmental Design
- ECSSQG = Erosion Control and Stormwater Quality Guide
- ESA = Environmental Site Assessment
- FE = federally endangered
- FEIS = Final Environmental Impact Statement
- FHWA = Federal Highway Administration
- FT = federally threatened
- FTA = Federal Transit Administration
- HMMWMD = Hazardous Materials and Waste Management Division
- LED = light emitting diode
- LOMR = Letter of Map Revision
- LWCF = Land and Water Conservation Fund
- MBTA = Migratory Bird Treaty Act
- MSAT = mobile source air toxics
- MSE = mechanically stabilized earth
- NAC = noise abatement criteria
- NFPA = National Fire Protection Agency
- NOAA = National Oceanic and Atmospheric Administration
- NPDES = National Pollutant Discharge Elimination System
- NPS = National Park Service
- PBA = Programmatic Biological Assessment
- PCA = Potential Conservation Area
- ROW = right-of-way
- RTD = Regional Transportation District
- SB = Senate Bill
- T&E = threatened and endangered
- TRM = turf reinforcement mats
- Uniform Act = Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended
- US # = United States Highway Number
- USC = United States Code
- USFWS = U.S. Fish and Wildlife Service
- VMT = vehicle miles traveled