

SUMMARY OF DIRECT AND INDIRECT IMPACTS 3.28 1

2 This section summarizes the social and environmental consequences that would result from

- 3 the No-Action Alternative and the two build packages (Packages A and B). Measures to
- mitigate these consequences are summarized in Section 3.29 Mitigation Summary. 4
- 5 This section focuses on impacts to the social and environmental resources discussed
- 6 earlier in this chapter. Transportation improvements and impacts are presented in
- 7 Chapter 4 Transportation Impacts.

remaining agricultural lands

No-Action Alternative Package A Package B Land Use and Zoning Growth would continue to occur Under Package A, commuter rail BRT along I-25 would provide largely on undeveloped agricultural would shift growth towards urban less incentive for transit-oriented land at the fringe of the regional centers, especially in Fort Collins development than commuter rail study area's urbanized areas Longmont would increase in Market-driven growth would Development would likely be density and size continue to be focused along I-25 pushed towards outlying areas to Feeder bus routes along east-Communities west of I-25 would avoid I-25 congestion, which would west corridors designed to serve continue to expand towards the hasten the conversion of commuter rail stations could also east agricultural land stimulate increased levels of Some concentration of growth development The more dispersed development could occur near BRT stations pattern would result in greater land along I-25 consumption and a broader potential impact to the regional study area's environmental resources Continuation of leap-frog type growth practices in southern portions of the regional study area east of I-25 would further fragment

| Social | Conditions |
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| Social Conditions | | |
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| Potential direct and indirect impacts on communities caused by traffic congestion and impaired mobility | Adverse impacts associated with Package A would include: | Adverse impacts associated with Package B would include: |
| would include: | Relocation of 59 residences | Relocation of 24 residences |
| Increased air emissions and noise Longer travel times Traffic queues at key interchanges Neighborhood traffic intrusion Deteriorating safety conditions Lengthened emergency response times | Increased noise and vibration, out-of-direction travel, and travel time delays associated with commuter rail | Increased noise, air emissions, and visual impacts to residents near frontage roads, parking lots, bus routes, transit stations, and maintenance facilities |



| No-Action Alternative | Package A | Package B |
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| | Social Conditions (Continued) | |
| Environmental Justice Adverse effects (highway noise) to minority residents of the Mountain Range Shadows subdivision would exceed those experienced by the general population. | Air emissions and visual impacts to residents near carpool lots, commuter rail, transit stations, bus stations, and maintenance facilities Exacerbated "barrier effect" in Fort Collins, Loveland, Berthoud, and Longmont Temporary construction-related impacts such as noise, dust, out-of-direction travel, and travel-time delays Potential re-distribution of population in response to highway capacity or transit improvements Beneficial impacts associated with Package A would include: Regional connections between communities Improvements in mobility, safety, and emergency response Improved mobility for transportation-disadvantaged populations Environmental Justice Adverse effects to minority and low-income residents in Longmont would exceed those experienced by the general population. These impacts would arise from the implementation of Component A-T1 (commuter rail between Fort Collins and Longmont) and would include 16 residential relocations, noise above impact levels at one receiver (after mitigation), visual impacts, and the potential for community disruption. Impacts to minority and low-income populations associated with all other components of Package A would not exceed those experienced by the general population. | Temporary construction-related impacts such as noise, dust, out-of-direction travel, travel-time delays, and access revisions Beneficial impacts associated with Package B would include: Regional connections between communities Overall improvements in safety, mobility, and emergency response, but no improvements in emergency response where toll lanes are barrier-separated Moderate improvements in mobility for transportation-disadvantaged populations Environmental Justice Beneficial impacts associated with Package B would include: Short-term and long-term employment opportunities would occur during the construction of the facilities as well as their ongoing operation and maintenance. Transit components would result in moderate improvements in mobility and would improve regional connectivity. Minority and low-income populations are concentrated around transit improvements and would benefit from the transit-related components. Impacts to minority and low-income populations associated with all other components of Package B would not exceed those experienced by the general population. |

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| No-Action Alternative | Package A | Package B |
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| | Social Conditions (Continued) | |
| | Beneficial impacts associated with Package A would include: | |
| | Short-term and long-term employment opportunities would occur during the construction of the facilities as well as their ongoing operation and maintenance. | |
| | Transit components would improve access to community facilities, provide broader opportunities for employment, facilitate participation in regional social and cultural events, promote interaction between communities, and stimulate business activity | |
| | Adverse effects to minority and low-income residents in Longmont from the implementation of commuter rail would exceed those experienced by the general population. Although the commuter rail would improve regional connections and access to some community facilities, the benefits of transit would not be commensurate with the impacts experienced by minority and low-income populations. For these reasons, impacts associated with the commuter rail between Fort Collins and Longmont would be predominantly borne by minority and low-income populations in Longmont. | |
| | Impacts to minority and low- income populations associated with all other components of Package A would not exceed those experienced by the general population. | |



| No-Action Alternative | Package A | Package B |
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| | Economic Conditions | |
| Would not require relocation of any existing businesses | Adverse impacts associated with Package A would include: | Adverse impacts associated with Package B would include: |
| Would be no loss to property tax | Relocation of 33 businesses | Relocation of 16 businesses |
| base and revenues Would be increasingly difficult to access businesses | \$5,079,960 loss in the tax base and \$150,290 loss of tax revenues | \$2,814,220 loss in the tax base and \$88,720 loss of tax revenues |
| Future economic growth would most likely concentrate along the | Temporary construction-related detours, delays, and out-of- | Temporary construction-related detours, delays, and out-of- direction travel |
| I-25 corridor and in the southern end of the regional study area | direction travel Temporary impacts to existing freight operations during | Beneficial impacts associated with Package B would include: |
| | construction | Limited potential for long-term growth of property tax base and |
| | Beneficial impacts associated with Package A would include: | revenues as a result of transit- oriented development |
| | Potential for long-term growth of property tax base and revenues as a result of transit-oriented development | Creation of 9,135 temporary jobs over the six-year construction period; permanent employment created by transit operation and |
| | Some access revisions; transit would improve access to businesses and expand employment opportunities | maintenance Some access revisions; transit would improve access to businesses and expand |
| | Creation of 10,822 temporary jobs over the six-year construction period; permanent employment created by transit operation and maintenance | employment opportunities |
| | Right-of-Way | |
| Would not require acquisition of property or any relocations | Highway components would require 23 residential relocations and 12 business relocations | Highway components would require 24 residential relocations and 15 business relocations |
| | Transit components would require 36 residential relocations and 21 business relocations | Transit components would require one additional business relocation and no residential relocations |
| | All property impacts, including displacements and partial acquisitions, would total 1,068 acres, 719 acres for highway components and 349 acres for transit components | All property impacts, including displacements and partial acquisitions, would require a total of 877 acres, 859 acres for highway components and 18 acres for transit components |



| No-Action Alternative | Package A | Package B |
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| | Air Quality | |
| No substantive impacts | No substantive impacts | No substantive impacts |
| Growth and development changes would affect traffic patterns and air quality Benefits include: (1) emissions | No exceedances of standards or thresholds due to mobile sources Growth and development changes would affect traffic | No exceedances of standards or thresholds due to mobile sources Growth and development changes would affect traffic patterns and air |
| for all pollutants from mobile sources would be reduced from existing levels; and (2) continued conversion of agricultural land uses would lessen nitrogen | patterns and air quality. In areas of transit oriented development, air quality could improve due to more efficient travel patterns. This improvement would be more | development, air quality could improve due to more efficient travel patterns. |
| deposition effects to Rocky Mountain National Park. | noticeable with Package A than Package B. | Benefits include: (1) emissions for all pollutants from mobile sources would be reduced from existing |
| | Benefits include: (1) emissions for all pollutants from mobile sources would be reduced from existing levels; and (2) continued conversion of agricultural land uses would lessen nitrogen deposition effects to Rocky Mountain National Park. | levels; and (2) continued conversion of agricultural land uses would lessen nitrogen deposition effects to Rocky Mountain National Park. |
| | Noise & Vibration | |
| An estimated 505 Category B receivers and 121 Category C receivers would be impacted by traffic noise Noise levels at 85 Category B locations would be at or above 75 | An estimated 450 Category B receivers and 120 Category C receivers would be impacted by traffic noise after recommended mitigation measures Traffic noise levels at | An estimated 491 Category B receivers and 133 Category C receivers would be impacted by traffic noise after recommended mitigation measures Traffic noise levels at |
| dBA | 18 Category B locations would be at or above 75 dBA, 67 fewer locations than the No-Action Alternative | 17 Category B locations would be at or above 75 dBA, 68 fewer locations than the No-Action Alternative |
| | With the recommended mitigation actions, an estimated one receiver would be impacted by rail noise, and no receivers would be impacted by rail vibration | Construction noise impacts would be somewhat limited because the majority of the corridors do not abut residential areas. Construction noise would be subject to relevant local |
| | Construction noise impacts would be somewhat limited because the majority of the corridors do not abut residential areas. Construction noise would be subject to relevant local regulations and ordinances to minimize impacts. | regulations and ordinances to minimize impacts. |



| No-Action Alternative | Package A | Package B |
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| | Water Resources | |
| Highway Impacts: | Highway Impacts: | Highway Impacts: |
| Would result in 1,257 acres of impervious surface area Direct effects on surface water guality from increases in | Would result in 1,946 acres of impervious surface area, with the greatest impacts expected between SH 14 and SH 60 | Would result in 2,001 acres of impervious surface area, with the greatest increase between SH 14 and SH 60 |
| stormwater runoff velocity and volume would be negligible. The majority of stormwater runoff from | Would require relocation of as many as 105 wells within the right-of-way. | Would require relocation of as many as 111 wells within the right-of-way |
| I-25 would continue not to be treated prior to discharging to water bodies. | Modifications to the existing drainage system or a new system could improve drainage compared to the No-Action Alternative | Modifications to the existing drainage system or a new system could improve drainage compared to the No-Action Alternative |
| Groundwater impacts are not expected as a result of major and minor structure maintenance activities associated with this alternative. | | |
| Drainage improvements may occur in areas where roadway improvements are currently planned. | | |
| | Wetlands | |
| Would generally not affect existing wetland resources, | Would result in total direct impacts of: | Would result in total direct impacts of: |
| except those associated with development activities and | 17.48 acres for wetlands | 18.11 acres for wetlands |
| rehabilitation of major and minor structures. | 1.86 acres of jurisdictional open water | 2.27 acres of jurisdictional open water |
| With continuing development in the project area, some affects to wetlands would be expected | Indirect wetland effects would include increased roadway runoff, surface flows in adjacent streams, sediment from winter sanding operations, erosion, creation of channels in wetlands that were previously free of channelization, and decrease or elimination of upland tree and/or shrub buffers. De-icers, petroleum products, and other chemicals would also likely reduce water quality. | Indirect wetland effects would include increased roadway runoff, surface flows in adjacent streams, sediment from winter sanding operations, erosion, creation of channels in wetlands that were previously free of channelization, and decrease or elimination of upland tree and/or shrub buffers. De-icers, petroleum products, and other chemicals would also likely reduce water quality. |



| No-Action Alternative | Package A | Package B |
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| | Floodplains | · |
| Existing conditions would continue. Floodplain impacts would be addressed during the final design phases of each | Would impact a total of 12.8 acres of floodplains, 10.8 acres from highway components and 2.0 acres from transit components | Would impact a total of 13.5 acres of floodplains, all from highway components |
| CDOT project along I-25 within the regional study area, such as rehabilitation of various drainage structures. | Would result in seven I-25 crossings of floodplains and ten drainage structure replacements | Would result in twelve I-25 crossings of floodplains and 16 drainage structure replacements |
| | Would result in 11 commuter rail crossings of floodplains Would result in two floodplains | Would not have any floodplain impacts beyond those for the highway components |
| | impacted by queue jumps for commuter buses | None of the bus facilities would impact a floodplain |
| | Vegetation | |
| Would only have a minimal effect on existing vegetation resources. Effects from increasing development on vegetation could | Safety improvements between SH 1 and SH 14 would result in impacts not to extend beyond the existing I-25 right- of-way. | Safety improvements impacts would be the same as those associated with Package A. |
| include population fragmentation, reductions in riparian zones, and ground and soil disturbance which could promote increased germination of noxious weed populations. | General purpose and auxiliary lanes would include the removal of approximately 860 acres of riparian woodland, agricultural, urban landscape, and various wetland vegetation communities. Impacts would be expected from fill placement and damage by construction equipment. Soil disturbance from construction equipment could allow weedy species to establish. Other indirect impacts would include the reduction or elimination of upland tree and/or shrub buffers. | Express lanes would remove 774 acres of riparian woodland, agricultural, urban landscape, and various wetland communities Bus rapid transit would not result in direct or indirect impacts on existing vegetation communities. |
| | Upgrading structures could have minor impacts on existing vegetation located adjacent to and beneath existing structures. | |
| | Commuter rail would result in the removal of 107 acres of vegetation in fragmented parcels of native prairie. | |
| | Addition of a highway lane on either side of the roadway would increase impervious surfaces, thereby increasing runoff and exposing the surrounding vegetation to higher levels of pollutants. Other indirect impacts would include the reduction or elimination of upland tree and/or shrub buffers. | |



| No-Action Alternative | Package A | Package B |
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| | Noxious Weeds | |
| Would not contribute to the spread of noxious weeds. | Safety improvements might increase the spread of Canada thistle and Leafy spurge into open or disturbed areas. | Safety improvements impacts would be the same as those associated with Package A. |
| | Construction of general purpose and auxiliary lanes would cause soil disturbance (approximately 287 acres) that could increase the spread of noxious weeds on roadsides, possibly introduce new noxious weed species, and prevent the establishment of native vegetation. | Construction of general purpose and tolled lanes would cause soil disturbance (approximately 258 acres) that could increase the spread of noxious weeds on |
| | Soil disturbance along the banks of streams could increase the invasion and establishment of Tamarisk, which threatens native riparian trees and shrubs. | roadsides, possibly introduce new noxious weed species, and prevent the establishment of native vegetation. Soil disturbance along the banks of streams |
| | Construction of commuter rail would cause soil disturbance (approximately 36 acres) that could increase the | could increase the invasio and establishment of Tamarisk. |
| | spread of Leafy spurge and Canada thistle into open and residential areas, as well as patches of native prairie that lie within the rail alignment. | Construction of bus rapid transit stations and park- and-ride facilities could cause minor impacts that |
| | Proposed bus routes would not contribute to the spread of noxious weeds. | would increase the spread of Leafy spurge and Canada thistle into open and residential areas. |
| | Both temporary roads and work areas would be susceptible to potential new weed population invasions. | Both temporary roads and work areas would be susceptible to potential new weed population invasions. |
| | Wildlife | · |
| Existing conditions would continue. Increased traffic on | Would impact 2.01 acres of sensitive wildlife habitat | Would impact 2.35 acres of sensitive wildlife habitat |
| secondary roads would increase mortality of wildlife from collisions. | Would impact 1.82 acres of aquatic habitat | Would impact 2.25 acres of aquatic habitat |
| | Would impact 10 wildlife movement corridors and 9 raptor nests | Would impact 5 wildlife movement corridors and 11 raptor nests |



| No-Action Alternative | Package A | Package B |
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| Ĺ | Threatened & Endangered Species | |
| Would not affect threatened and endangered species. Existing | Direct impact to 0.8 acres of potential Preble's habitat | Direct impact to 0.8 acres of potential Preble's habitat |
| conditions would continue. | Direct impact to 204 acres of bald eagle foraging habitat | Direct impact to 231 acres of bald eagle foraging habitat |
| | Direct impact to 51 acres of black-tailed prairie dog colonies Direct impact to 20 acres of habitat for northern leopard frogs and common gartersnakes Direct impact to 0.4 acres of habitat for state threatened, endangered, or sensitive aquatic species Direct impact to 7 acres of habitat for bald eagle roost sites Direct impact to a total of 283 acres of sensitive habitat | Direct impact to 104 acres of black-tailed prairie dog colonies Direct impact to 21 acres of habitat for northern leopard frogs and common gartersnakes Direct impact to 0.4 acres of habitat for state threatened, endangered, of sensitive aquatic species Direct impact to 2 acres of habitat for bald eagle roost |
| | Visual Quality | sites Direct impact to a total of 359 acres of sensitive habitat |
| Would generally have minimal effect on visual resources. Growth would continue to occur on undeveloped agricultural land. This would change the landscape character along the I-25, BNSF, and US 287 corridors, and alter views and perception of visual character. | Most of the proposed improvements would not have a substantial effect to the visual quality of the corridors. Long-term impacts would include relocation of businesses and residences, rebuilt interchanges, increased right-of-way, additions of station amenities, and changes to the surrounding landscape through the use of overpasses, bridges, retaining walls, medians, as well as alterations to the existing roadway grade. Indirect impacts of the proposed improvements could encourage development that is more compact and denser, especially within walking distance of a commuter rail station. | Most of the proposed improvements would not have a substantial effect to the visual quality of the corridors. Package B would have the same basic visual impacts as described for Package A, except that BRT elements would occur along I-25 instead of the commuter rail and bus elements along other rights of-way. |



| No-Action Alternative | Package A | Package B |
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| | Visual Quality (Continued) | |
| | The addition of stations and a maintenance facility would generate lighting that would be seen by motorists, as well as from adjacent businesses and residences. Short-term impacts would include detours, increased roadway | |
| | congestion in and around the area, the presence of large equipment, and dust from construction. | |
| | Historic Preservation | |
| Would generally not affect | Direct Impacts: | Direct Impacts: |
| significant (NRHP-eligible) historic resources. The present trend of conversion of much of the remaining farmsteads (many of which are historic) into residential, industrial and commercial development would continue. No significant (NRHP-eligible) archaeological resources would be affected within the Area of Potential Effect. | Five adverse effects from direct impacts, including: Total takes of two NRHP-eligible buildings, and removal of contributing farmhouse on NRHP- eligible farm; One NRHP-eligible ditch requiring extensive burial in culvert(s); and One NRHP-eligible railroad with extensive alterations and removal of two contributing historic railroad bridges | One adverse effect from direct impacts: One NRHP-eligible ditch/canal requiring extensive burial in culverts. Section 4(f) Use: One individual 4(f) use and 22 de minimis uses No NRHP-eligible archaeological resources would be affected within the Area of Potential Effect |
| | railroad bridges | |
| | Section 4(f) Use: | |
| | Five individual 4(f) uses and 32 de minimis uses | |
| | No NRHP-eligible archaeological resources would be affected within the Area of Potential Effect | |
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No-Action Alternative Package A Package B **Paleontological Resources** No impacts Construction along the existing Construction along I-25 between **BNSF** rail-line between Fort US 36 and SH 7, especially Collins and Longmont, and along where cuts are necessary to I-25 between US 36 and SH 7, expand highways and especially where cuts are interchanges, has the highest necessary to expand rail likelihood of adversely impacting alignments, highways, and paleontological resources. interchanges, has the highest Because Package B would likelihood of adversely impacting generally require less ground paleontological resources. disturbance than Package A, Package B has a lower potential Ground disturbance associated for impacts on paleontological with the construction of commuter rail lines and facilities is resources. anticipated to be significantly greater than that required for bus rapid transit facilities. **Hazardous Materials** No direct impacts 38 parcels with potential 41 parcels with potential environmental conditions and 16 environmental conditions and 16 Indirect impacts include the parcels with recognized parcels with recognized potential to encounter environmental conditions are environmental conditions are contaminated soil and/or associated with the highway associated with the highway groundwater during structure components. components. maintenance activities or during safety improvements that require 58 parcels with potential ramp terminal widening. environmental conditions and 2 parcels with recognized environmental conditions are associated with the transit components. **Parks and Recreation** Portions of three parks, a wildlife Direct use of seven properties, six Direct use of eight properties, seven having minor impacts. area, and one golf course would having minor impacts. McWhinney Hahn Sculpture Park McWhinney Hahn Sculpture Park receive noise impacts. would likely have to be acquired. would have a trail impacted. Indirect effects would include Indirect effects would include visual impacts at the sculpture visual impacts at the sculpture park, change in access at one park, change in access at one location, and noise impacts at five location, and noise impacts at four properties. properties. Benefits would include improved Benefits would include improved access and mobility to and from access and mobility to and from these recreational resources. these recreational resources.

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| No-Action Alternative | Package A | Package B |
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| | Section 6(f) | |
| Would have no impacts on any of the 6(f) properties | Would have no impacts on any of the 6(f) properties | Total impacted area in Grant Parl for two water quality ponds would be 0.17 acres |
| | | Conversion of that area would no impact the remaining park |
| | Farmlands | |
| Would not directly impact prime farmland, farmland of statewide importance, or farmland of local importance. The more dispersed development pattern would further fragment remaining agricultural lands, reducing their long-term viability. | Package A would result in the direct conversion of 982.3 total acres, if certain farming conditions are present. This would include: 1.8 acres of farmland of local importance 44.4 acres of farmland of statewide importance 936.1 acres of farmland that would be considered prime if four certain conditions are present | Package B would result in the direct conversion of 926.8 total acres, if certain farming conditions are present. This would include: 1.7 acres of farmland of local importance 35.7 acres of farmland of statewide importance 889.4 acres of farmland that would be considered prime if four certain conditions are present |
| | No farms would be severed or lose access. As a result of commuter rail, the rate at which environmental resources (including farmlands) would be affected in undeveloped and suburban areas within the regional study area would likely be slowed, especially near I-25. | No farms would be severed or lose access. Most of the farmland impact is associated with the widening of I-25 to accommodate additional buffer or barrier separated express lanes in each direction. |
| | Energy | |
| Annual energy consumption from operations would be 403,220 million BTUs Energy demand would be directly proportionate to the increase in population as land development occurs Population is anticipated to | Would use approximately 1.0 percent more energy than the No-Action Alternative, as a result of increase in annual vehicle miles of travel within the project area | Would use approximately 0.9 percent more energy than the No-Action Alternative, as a result of increase in annual vehicle miles of travel within the project area |
| increase at the same rate for all three alternative | | |

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information. cooperation. transportation.

| No-Action Alternative | Package A | Package B |
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| | Energy (cont'd) | |
| | Public Safety and Security | |
| As congestion increases, there would be a greater likelihood of both highway and railway crashes; and emergency response times would be negatively affected The likely higher number of crashes also could affect the likelihood of a crash involving a transporter of hazardous materials | A 70 percent reduction in accidents associated with trains and other vehicles is predicted An increased security presence would be needed on trains, buses, and at existing and proposed stations There is a potential for modest increases to police services in response to increases in crime There is a potential for increased theft during the construction phase (a temporary impact) | An increased security presence would be needed on trains, buses, and at existing and proposed stations There is a potential for modest increases to police services in response to increases in crime There is a potential for increased theft during the construction phase(a temporary impact) |
| | Construction | |
| Would result in no construction or utility impacts aside from those associated with the currently programmed projects | Would have the greatest construction impacts (noise, air quality, transportation) to residential areas since construction of the double-track commuter rail would extend through residential areas. The double-track commuter rail would use the existing BNSF railroad track plus one new track from Fort Collins to downtown Longmont, and a new double-track commuter rail line would connect Longmont to the FasTracks North Metro end-of-line station in Thornton. Construction of either build package would cause varying temporary impacts to traffic patterns and congestion, noise and vibration, air quality, and visual presence Construction impacts would be short-term and isolated in extent depending upon the types and location of construction | Would have fewer impacts than Package A because there is no rail component, and I-25 consists primarily of commercial, industrial, and agricultural development Construction of either build package would cause varying temporary impacts to traffic patterns and congestion, noise and vibration, air quality, and visual presence Construction impacts would be short-term and isolated in extent depending upon the types and location of construction |



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