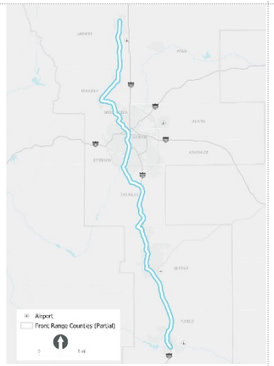
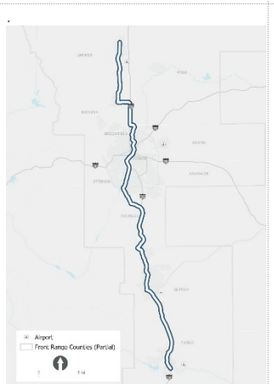
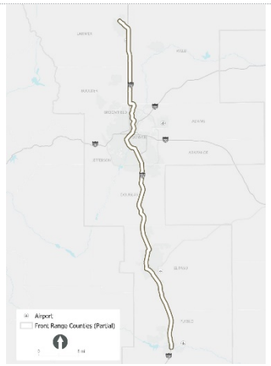
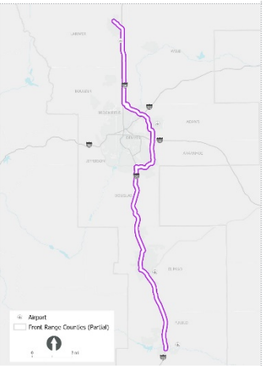
LEVEL 1 ALTERNATIVES EVALUATION MATRIX

Descriptions and depictions of the Level 1 alternatives are available in the Front Range Passenger Rail Service Development Planning and Pre-National Environmental Policy Act (Pre-NEPA) *Level 1 Alternatives Memorandum* dated March 18, 2020.

Category	Criteria	L1 – No Passenger Rail with Enhanced Bus (No Action)	L1 – BNSF Rail Corridor	L1 – Consolidated Mainline + Union Pacific/Great Western Rail Corridor	L1 – BNSF + North I-25 Commuter Rail Corridor	L1 – I-25 + RTD Southeast Corridor	L1 – I-25/E470 Highway Corridor
		Enhanced Bustang operations and other projects identified in the current Statewide Transportation Improvement Program.	Centered on the existing BNSF rail line right-of-way from Pueblo to Fort Collins.	Joint Union Pacific/BNSF right-of-way from Pueblo to downtown Denver; Union Pacific (UP) right-of-way to Greeley; Great Western Railway right-of-way to Fort Collins.	Joint Union Pacific/BNSF right-of-way from Pueblo to downtown Denver; RTD N Line to Thornton/ I-25; greenfield to Longmont; BNSF right-of-way parallel to US287 to Fort Collins	Parallel to I-25 from Pueblo to Lone Tree; RTD Southeast LRT Corridor to downtown Denver; RTD N Line to Thornton/I-25; parallel to I-25 to Fort Collins.	Parallel to I-25 from Pueblo to Lone Tree; E470 right-of-way to Thornton; parallel to I-25 to Fort Collins.
		BUSTANG					
Operational Characteristics	• Can passenger rail in this corridor serve major population centers in the Front Range, based on 2045 population projections?	**No**. Passenger rail would not be implemented. Enhanced bus service does not address the need to balance the transportation network and provide transportation options for serving the Front Range region. This alternative would rely primarily on I-25, which is at or beyond capacity and subject to slow and unreliable travel times. Portions of the Bustang route would use CDOT's Express Lane system but that system has significant gaps, especially in the most congested portions of I-25 through central Denver.	**Yes** **South Segment**. Passenger rail would serve major population centers of Pueblo and Colorado Springs and would be easily accessible to Monument and the Air Force Academy and Fort Carson military installations. **Central Segment**. Passenger rail would serve major population centers of Denver and Boulder and would be easily accessible to Castle Rock. This corridor would not be easily accessible to the Denver Tech Center (DTC) or DEN Airport but could serve these areas through transfers with RTD (although access to the DTC would be circuitous from the south, requiring a transfer from central Denver). **North Segment**. Passenger rail would serve the major population center of Fort Collins and would be easily accessible	**No** The portion of this corridor north of Denver Union Station (central Denver) is not suitable for FRPR because it does not serve 2045 population centers. The infeasible portions of the corridor are described first. **Central Segment:** The UP alignment northeast out of the Denver metro area is unsuitable as a backbone for FRPR because it bypasses the populated communities in the northern Denver area, including Westminster, Thornton, Broomfield, Boulder, and Longmont. For most of its route between Denver and Greeley, it is sparsely populated and does not align with major population or employment centers. South of central Denver, the shared UP/BNSF corridor is feasible for passenger rail and retained as components of the other freight rail corridor alternatives. **North Segment:** The Great Western Railway portion (Class III short line railroad) of this alignment north of the Denver metro area is not suitable as a backbone for serving northern Colorado communities. While it could provide an important regional	**Yes** **South Segment**. Passenger rail would serve major population centers of Pueblo and Colorado Springs and would be easily accessible to Monument and the Air Force Academy and Fort Carson military installations. **Central Segment**. Passenger rail would serve the major population center of Denver and would be easily accessible to Castle Rock. This corridor would not be easily accessible to the Denver Tech Center or DEN Airport but could serve these areas through transfers with RTD. **North Segment**. Passenger rail would serve the major population center of Fort Collins and would be easily accessible to the many communities (Longmont, Berthoud, and Loveland) between Denver and Fort Collins.	**Yes** **South Segment**. Passenger rail would serve major population centers of Pueblo and Colorado Springs and would be easily accessible to Monument and the Air Force Academy and Fort Carson military installations. **Central Segment**. Passenger rail would serve the major population center of Denver and would be easily accessible to Castle Rock and the Denver Tech Center. This corridor would not be directly accessible to DEN Airport but could be accessed with a transfer to the RTD network. **North Segment**. Passenger rail would serve the major population center of Fort Collins. The alignment would serve established communities between Denver and Fort Collins but less directly than the freight corridor along US 287 between Berthoud and Fort Collins. The I-25 corridor has the potential to serve 2045 population and employment centers well, as this is the highest projected area of growth, with Greeley and Windsor developing west, and Loveland and Fort Collins developing east.	**Yes** **South Segment**. Passenger rail would serve major population centers of Pueblo and Colorado Springs and would be easily accessible to Monument and the Air Force Academy and Fort Carson military installations. **Central Segment**. Passenger rail would serve the major population center of Denver and would be easily accessible to Castle Rock, the Denver Tech Center, and DEN Airport. This corridor would serve DEN Airport directly but would not be accessible to central Denver except through transfer to RTD. **North Segment**. Passenger rail would serve the major population center of Fort Collins. The alignment would serve communities between Denver and Fort Collins but less directly than the freight corridor along US 287 between Berthoud and

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			to Boulder and the many communities (Longmont, Berthoud, Loveland) between Denver and Fort Collins.	connection for between Greeley and Fort Collins, including Windsor, it is located too far northeast to efficiently serve the existing Northern Colorado communities west of I-25 and the anticipated employment and population growth to the west along I-25. The I-25 North EIS considered commuter rail along the UP corridor and concluded that it was not reasonable because of the out-of-direction travel required to serve population centers to the west. **South Segment**. This portion of the corridor is viable and retained as components of the other freight rail corridor alternatives.		Additionally, the I-25 corridor would also serve the fastest-growing communities in Northern Colorado (Severance, Timnath, Johnstown, Windsor, and Milliken).	Fort Collins. The I-25 corridor has the potential to serve 2045 population and employment centers well, as this is the highest projected area of growth, with Greeley and Windsor developing west, and Loveland and Fort Collins developing east. Additionally, the I-25 corridor would also serve the fastest-growing communities in Northern Colorado (Severance, Timnath, Johnstown, Windsor, and Milliken).
Operational Characteristics	• Can passenger rail in this corridor provide connections with other modes (existing or planned transit)?	**No**. Passenger rail would not be implemented. I-25 corridor Bustang service is integrated with Bustang's Outrider service that connects to destinations across Colorado, and with other local and regional transit services at 12 of 19 planned mobility hubs along the Front Range.	**Yes** **All Segments**. Stations throughout the system would be sited to provide connections with other modes. Specific transit route connections are unknown because station locations are undetermined, and future transit operations could be coordinated to serve passenger rail station locations. **South Segment**. The Pueblo station could connect with or potentially be sited with the proposed *Southwest Chief* Amtrak station and service extension south to Trinidad and New Mexico. **North Segment**. The end-of-line station at Fort Collins would be integrated with the MAX BRT service and could be integrated with future regional service north to Cheyenne. **Central Segment**. Stations at either DUS or Burnham Yard would provide connections to other modes, though DUS would provide more connections. South of central Denver, the shared UP/BNSF corridor provides good connections to existing and planned transit, and stations would be sited to provide connections with other modes.	**No** While stations throughout the system would be sited to provide connections with other modes, the alignment of the UP/Great Western corridor does not provide these opportunities because it is located far from existing and planned systems and is oriented for east-west service rather than north-south service. Without the north-south backbone, the east-west connections are of limited value. **North Segment**. The Great Western Railway alignment focuses on east-west connections in Northern Colorado and provides opportunities to connect to other services but does not provide the backbone for higher-priority and higher-ridership north-south routes, both rail and highway. As a next-phase rail connection, the Great Western alignment could integrate well with the end-of-line station at Fort Collins would be integrated with the MAX BRT service and future regional service north to Cheyenne. **Central Segment**. The UP alignment north of Denver could connect to the RTD North Metro line and Commerce City, National Western, and DUS but since this is the extent of the UP alignment in the Denver metro area, veering from the populated areas to the east would not improve or leverage ridership on either FRPR or RTD's system. South of central Denver, the shared UP/BNSF corridor provides good connections to existing and planned transit,	**Yes** **All Segments**. Stations throughout the system would be sited to provide connections with other modes. Specific transit route connections are unknown because station locations are undetermined, and future transit operations could be coordinated to serve passenger rail station locations. **South Segment**. The Pueblo station could connect with or potentially be sited with the proposed *Southwest Chief* Amtrak station and service extension south to Trinidad and New Mexico. **North Segment**. The end-of-line station at Fort Collins would be integrated with the MAX BRT service and could be integrated with future regional service north to Cheyenne. **Central Segment**. Stations at either DUS or Burnham Yard would provide connections to other modes, though DUS would provide more connections. South of central Denver, the shared UP/BNSF corridor provides good connections to existing and planned transit, and stations would be sited to provide connections with other modes. North of central Denver,	**Yes** **All Segments**. Stations throughout the system would be sited to provide connections with other modes. Specific transit route connections are unknown because station locations are undetermined, and future transit operations could be coordinated to serve passenger rail station locations. The I-25 alignment provides good opportunities to integrate with planned mobility hubs along the interstate. **South Segment**. The Pueblo station could connect with or potentially be sited with the proposed *Southwest Chief* Amtrak station and service extension south to Trinidad and New Mexico. **North Segment**. The end-of-line station at Fort Collins would be integrated with the MAX BRT service and could be integrated with future regional service north to Cheyenne. **Central Segment**. Stations at either DUS or Burnham Yard would provide connections to other modes, though DUS would provide more connections. Because the system shares two RTD corridors – the Southeast LRT and North Metro CRT corridors – there would be connections to RTD's system at a station on each of these corridors.	**Yes** **All Segments**. Stations throughout the system would be sited to provide connections with other modes. Specific transit route connections are unknown because station locations are undetermined, and future transit operations could be coordinated to serve passenger rail station locations. The I-25 alignment provides good opportunities to integrate with planned mobility hubs along the interstate. **South Segment**. The Pueblo station could connect with or potentially be sited with the proposed *Southwest Chief* Amtrak station and service extension south to Trinidad and New Mexico**.** **North Segment**. The end-of-line station at Fort Collins would be integrated with the MAX BRT service and could be integrated with future regional service north to Cheyenne. **Central Segment**. There would be three opportunities to connect to the RTD, at the North Metro CRT line, the A Line, and the Southeast LRT line.

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				and stations would be sited to provide connections with other modes. **South Segment**. Stations would be sited to provide connections with other modes. The Pueblo station could connect with or potentially be sited with the proposed *Southwest Chief* Amtrak station and service extension south to Trinidad and New Mexico.	the system shares the RTD North Metro CRT corridor and would have an opportunity to connect to this service.		
Community and Environmental Impacts	• Can passenger rail be implemented in this corridor without causing severe community disruption?	No. Passenger rail would not be implemented. Implementation of enhanced bus service would require new mobility hubs but construction and operation of these not be expected to cause severe community disruption.	Yes **All Segments**. This corridor traverses many developed communities, would require right-of-way acquisition through communities for passenger rail operation (including grade separations at numerous roadway intersections), and would increase impacts associated with increased rail movements and speeds. However, community disruption would not be so severe as to eliminate this alternative from further study. Severe community disruption of introducing passenger rail in the corridor is not expected because the corridor follows an existing freight rail corridor, and mitigation measures, such as grade separations or quiet zones, could be implemented to reduce impacts and potentially improve existing conditions.	Yes **All Segments**. This corridor traverses many developed communities, would require right-of-way acquisition through communities for passenger rail operation (including grade separations at numerous roadway intersections), and would increase impacts associated with increased rail movements and speeds. Severe community disruption of introducing passenger rail in the corridor is not expected because the corridor follows an existing freight rail corridor, and mitigation measures, such as grade separations or quiet zones, could be implemented to reduce impacts and potentially improve existing conditions. **North Segment**. This corridor differs from the other corridors in the North Segment because the alignment does not cross major population or employment centers and therefore would have less community disruption and impact (which is also the reason that it is infeasible for passenger rail service).	Yes **All Segments**. This corridor traverses many developed communities, would require right-of-way acquisition through communities for passenger rail operation (including grade separations at numerous roadway intersections), and would increase impacts associated with increased rail movements and speeds. However, community disruption would not be so severe as to eliminate this alternative from further study. Severe community disruption of introducing passenger rail in the corridor is not expected because the corridor follows an existing freight rail corridor, and mitigation measures, such as grade separations or quiet zones, could be implemented to reduce impacts and potentially improve existing conditions.	No It is not feasible to construct new passenger rail service through the TREX/Valley Highway portion of the I-25 corridor through Denver without severe community disruption and impacts. **Central Segment**. Developing passenger rail through central Denver adjacent to I-25 or the RTD Southeast LRT Corridor between Lone Tree and DUS would substantially disrupt the most densely developed and constrained right-of-way in the state and would have severe community impacts. Substantial right-of-way acquisition and relocations of established residences and businesses would be required to build new passenger rail in this corridor. Although it could be feasible to retrofit RTD's Southeast LRT Corridor to accommodate passenger rail, this would also result in severe disruption to adjacent communities and to the existing RTD service: extensive reconstruction of the LRT guideway would be required due to the differences between LRT and commuter rail vehicle sizes and operational needs. **South and North Segments**. This corridor would require right-of-way acquisition and associated community disruption for passenger rail operation along sections of the I-25 portion of the alignment, especially in Colorado Springs and Castle Rock. However, much of the I-25 corridor follows undeveloped lands in the South and North Segments, minimizing community disruption.	Yes **All Segments**. This corridor would require right-of-way acquisition and associated community disruption for passenger rail operation along sections of the I-25 portion of the alignment, especially in Colorado Springs and Castle Rock. However, much of the I-25 corridor outside of the Denver metro area follows undeveloped lands, minimizing community disruption. Much of the I-25 and E-470 corridors follow undeveloped lands or have dedicated rail rights-of-way that provide a buffer between passenger rail and established communities, minimizing community disruption in comparison to other possible corridors.
Community and Environmental Impacts	• Can passenger rail be implemented in this corridor without causing severe effects on natural resources?	No. Passenger rail would not be implemented. Implementation of enhanced bus service would require new mobility hubs but construction and operation of these would not be expected	Yes **All Segments**. This alternative follows an existing freight rail corridor and would not have long sections of greenfield alignments, which limit severe impacts. However, the corridor	Yes **All Segments**. This alternative follows existing freight rail corridors and would not have long sections of greenfield alignments, which limit severe impacts. However, the corridor would traverse undeveloped areas, and sections of the alignment parallel and	Yes **All Segments**. This alternative primarily follows existing freight rail and transit corridors and would not have long sections of greenfield alignments, which limit severe impacts. However,	Yes **All Segments**. This alternative follows existing highway and transit corridors and would not have long sections of greenfield alignments, which limit severe impacts. However, the corridor would traverse undeveloped areas, and sections of the	Yes **All Segments**. This alternative follows existing highway corridors and would not have long sections of greenfield alignments, which limit severe impacts. However, the corridor

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		to cause severe effects on natural resources.	would traverse undeveloped areas, and sections of the alignment parallel and would likely impact streams, parks, open spaces, and wildlife habitat necessitating mitigation. **South Segment and southern Central Segment**. The freight corridor passes through large land areas that are actively managed to conserve sensitive natural resources, including the Air Force Academy and numerous open space and conservation properties in southern Douglas County.	would likely impact streams, parks, open spaces, and wildlife habitat necessitating mitigation. **South Segment and southern Central Segment**. The freight corridor passes through large land areas that are actively managed to conserve sensitive natural resources, including the Air Force Academy and numerous open space and conservation properties in southern Douglas County. **North Segment**. The UP/Great Western corridor differs from the other corridors in the North Segment as it passes through more open space and natural areas and would result in more natural resource impacts, but none severe enough to eliminate it from consideration.	the corridor would traverse undeveloped areas, and sections of the alignment parallel and would likely impact streams, parks, open spaces, and wildlife habitat necessitating mitigation. **South Segment and southern Central Segment**. The freight corridor passes through large land areas that are actively managed to conserve sensitive natural resources, including the Air Force Academy and numerous open space and conservation properties in southern Douglas County.	alignment parallel and would likely impact streams, parks, open spaces, and wildlife habitat necessitating mitigation. **South Segment and southern Central Segment**. The I-25 corridor passes through large land areas that are actively managed to conserve sensitive natural resources, including Fort the Air Force Academy and numerous open space and conservation properties in southern Douglas County.	would traverse undeveloped areas, and sections of the alignment parallel and would likely impact streams, parks, open spaces, and wildlife habitat necessitating mitigation. **South Segment and southern Central Segment**. The I-25 corridor passes through large land areas that are actively managed to conserve sensitive natural resources, including the Air Force Academy and numerous open space and conservation properties in southern Douglas County.
Financial and Economic Factors	• Does passenger rail in this corridor have the potential to be cost effective when considering likely capital and operating costs against likely benefits and revenues?	**N/A**. Passenger rail would not be implemented. Enhanced bus service would be lower cost than implementing a new rail system, with approximately $200 million capital investment for stations and buses. Based on fare recovery projections, enhanced bus service would require an increased operating budget of approximately $4 million annually. Cost effectiveness will be evaluated when ridership modeling is completed.	**N/A**. The alternative follows an existing transportation corridor with potential to share right-of-way in locations. It is expected to be similar in cost to other passenger rail alignments. Cost effectiveness will be evaluated when ridership modeling is completed and revenue from fare recovery is known.	**N/A**. The alternative follows an existing transportation corridor with potential to share right-of-way in locations. It is expected to be similar in cost to other passenger rail alignments. Cost effectiveness will be evaluated when ridership modeling is completed and revenue from fare recovery is known.	**N/A**. The alternative follows an existing transportation corridor with potential to share right-of-way in locations. It is expected to be similar in cost to other passenger rail alignments. Cost effectiveness will be evaluated when ridership modeling is completed and revenue from fare recovery is known.	**N/A**. The alternative follows an existing transportation corridor with potential to share right-of-way in locations. It is expected to be similar in cost to other passenger rail alignments. Cost effectiveness will be evaluated when ridership modeling is completed and revenue from fare recovery is known.	**N/A**. The alternative follows an existing transportation corridor with potential to share right-of-way in locations. It is expected to be similar in cost to other passenger rail alignments. Cost effectiveness will be evaluated when ridership modeling is completed and revenue from fare recovery is known.
Feasibility and Implementation	• Is passenger rail constructible in this corridor?	**No**. Passenger rail would not be implemented. New Bustang stations/mobility hubs are constructible, and operation of Bustang on the existing I-25 highway remains feasible.	**Yes** **All Segments**. Passenger rail is constructible within freight right-of-way with additional adjacent right-of-way acquisition where needed. The freight right-of-way generally ranges from 100 feet in urban areas to 200 feet in rural areas along the corridor, although locations of narrower and wider right-of-way are present throughout the corridor. Existing freight rail is occasionally doubletracked within their right-of-way,	**Yes** **All Segments**. Passenger rail is constructible within freight right-of-way with additional adjacent right-of-way acquisition where needed. The freight right-of-way generally ranges from 100 feet in urban areas to 200 feet in rural areas along the corridor, although locations of narrower and wider right-of-way are present throughout the corridor. Existing freight rail is occasionally doubletracked within their right-of-way, reducing the right-of-way that could be available for passenger rail. Many of the locations where freight right-of-way is constrained, and adjacent right-of-way may	**Yes** **All Segments**. Passenger rail is constructible within freight right-of-way with additional adjacent right-of-way acquisition where needed. The freight right-of-way generally ranges from 100 feet in urban areas to 200 feet in rural areas along the corridor, although locations of narrower and wider right-of-way are present throughout the corridor. Existing freight rail is occasionally doubletracked within their right-of-way,	**No** It is not feasible to construct new passenger rail service through the TREX/Valley Highway portion of the I-25 corridor through Denver due to operational challenges and disruption to RTD service on the LRT corridor. This section is described first, followed by discussion of the I-25 corridor outside of central Denver, which is feasible and remains viable for passenger rail as also described in the I-25/E470 Corridor. **Central Segment**. I-25 through Denver from the DTC to downtown is highly constrained. There is no excess right-of-way, and the highway is over	**Yes** Passenger rail is constructible along other portions of the I-25 corridor, although most of the corridor lacks enough right-of-way to fully accommodate passenger rail, and new right-of-way would be needed adjacent to the corridor. The I-25 corridor is generally straight with large-radii horizontal curves and is generally conducive to high-speed passenger rail operation. However, the corridor contains

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			reducing the right-of-way that could be available for passenger rail. Many of the locations where freight right-of-way is constrained, and adjacent right-of-way may be needed is in the more densely developed communities where impacts would be higher and land use and roadway conflicts would be greater. Additionally, horizontal curves in some locations are too tight for effective passenger rail operation and speeds without veering away from the right-of-way. The freight corridor is designed with gentle vertical grades compatible with the needs of high-speed passenger rail. Numerous roadway crossings would need to be grade separated for higher passenger rail speeds. **South Segment.** Access into and through Colorado Springs is challenging due to constrained freight right-of-way adjacent to developed private rights-of-way. Tight horizontal curves in the Monument Hill area north of the Air Force Academy and town of Monument create a potential bottleneck for efficient passenger rail speeds. **Central Segment**. With the acquisition of Burnham Yard, passenger rail is constructible along the BNSF Rail Corridor. Without the acquisition of Burnham Yard, this alternative would be more difficult to implement due to the physical and capacity constraints of the rail corridor through central Denver. Constructing a passenger rail connection to DUS (with or without Burnham Yard) is technically challenging but is feasible through a dead-end	be needed is in the more densely developed communities where impacts would be higher and land use and roadway conflicts would be greater. Additionally, horizontal curves in some locations are too tight for effective passenger rail operation and speeds without veering away from the right-of-way. The freight corridor is designed with gentle vertical grades compatible with the needs of high-speed passenger rail. Numerous roadway crossings would need to be grade separated for higher passenger rail speeds. **South Segment.** Access into and through Colorado Springs is challenging due to constrained freight right-of-way adjacent to developed private rights-of-way. Tight horizontal curves in the Monument Hill area north of the Air Force Academy and town of Monument create a potential bottleneck for efficient passenger rail speeds. **Central Segment**. With the acquisition of Burnham Yard, passenger rail is constructible along the BNSF Rail Corridor. Without the acquisition of Burnham Yard, this alternative would be difficult to implement due to the physical constraints of the rail corridor in this area. Constructing a passenger rail connection to DUS is technically challenging but is feasible through a dead-end stub or substantial fly-over structure. Between DUS and 96th Avenue, a long aerial structure would be required for additional track. North of Denver, the corridor follows RTD's N Line. There are physical constraints through Commerce City around the Suncor Refinery and Riverside Cemetery that make it difficult to construct additional passenger rail tracks adjacent to the N Line tracks. **North Segment**. The UP / Great Western alignment east of I-25 through Greeley into Fort Collins is constructible, with vertical and horizontal geometry favorable to passenger rail operations.	reducing the right-of-way that could be available for passenger rail. Many of the locations where freight right-of-way is constrained, and adjacent right-of-way may be needed is in the more densely developed communities where impacts would be higher and land use and roadway conflicts would be greater. Additionally, horizontal curves in some locations are too tight for effective passenger rail operation and speeds without veering away from the right-of-way. The freight corridor is designed with gentle vertical grades compatible with the needs of high-speed passenger rail. Numerous roadway crossings would need to be grade separated for higher passenger rail speeds. **South Segment.** Access into and through Colorado Springs is challenging due to constrained freight right-of-way adjacent to developed private rights-of-way. Tight horizontal curves in the Monument Hill area north of the Air Force Academy and town of Monument create a potential bottleneck for efficient passenger rail speeds. **Central Segment**. With the acquisition of Burnham Yard, passenger rail is constructible along the BNSF Rail Corridor. Without the acquisition of Burnham Yard, this alternative would be more difficult to implement due to the physical and capacity constraints of the rail corridor through central Denver. Constructing a passenger rail connection to DUS (with or without Burnham Yard) is technically challenging but is feasible through a dead-end	capacity with no opportunity to convert any of the right-of-way to rail operations. The RTD Southeast LRT Corridor also runs through this area and presents a better opportunity to convert and share operations with regional passenger rail. However, substantial work would be needed to retrofit the LRT guideway to allow shared passenger rail operations. The LRT alignment has numerous geometric challenges including steep grades, inadequate clearances, and tight curves that are incompatible with heavier passenger rail operations (such as RTD's commuter rail operations). The most substantial impact is the need to flatten vertical grades at 12 locations along the LRT corridor where grades are greater than 3 percent. Passenger rail vehicles are also wider and longer so each station would require modifications to platforms. Five LRT lines operate between Broadway and Colfax and there is no room for expansion or shared service through this area; thus, an additional 3.3 miles of track would be needed to accommodate passenger rail service (this capacity could potentially be accommodated by the Burnham Yard acquisition). Constructing a passenger rail connection to DUS (with or without Burnham Yard) is technically challenging but is feasible through a dead-end stub or substantial fly-over structure. From DUS north, sharing right-of-way and potentially operations with RTD commuter rail on the North Metro line is feasible and retained as part of other corridor alternatives. Likewise, to the south in the central segment through Douglas County, I-25 right-of-way is constrained through Castle Rock, and vertical grades are challenging between Castle Pines and Lone Tree, but passenger rail construction is feasible. **All Other Segments**. Passenger rail is constructible along other portions of the I-25 corridor, although most of the corridor lacks enough right-of-way to fully accommodate passenger rail, and new right-of-way would be needed adjacent to the corridor.	several locations where vertical grades of greater than 3 percent are present in both short and relatively long (several mile) segments. These areas present challenges for efficient passenger rail operations and would need to be flattened by building on retained fill, elevated structures, or tunnels. I-25 is fully grade separated from intersecting roadways. Passenger rail would need to go around, over, or under the I-25 interchanges, which are generally spaced a mile or farther apart, but would not generally interact with at-grade roadways. **South Segment**. The I-25 corridor is highly constrained through the downtown Colorado Springs area, particularly around the Cimarron/US 24 interchange and north through downtown where noise walls line both sides of the highway and established neighborhoods. Through the Air Force Academy property, CDOT does not own right-of-way, and I-25 is on an easement; passenger rail in the I-25 corridor would either also require an easement or need to be realigned east and acquire private right-of-way. Vertical grades are challenging on Monument Hill, north of the Air Force Academy. **Central Segment**. I-25 right-of-way is constrained through Castle Rock, and vertical grades are challenging between Castle Pines and Lone Tree. Passenger rail is constructible along the E470 corridor, which has right-of-way reserved for future transit and rail. **North Segment**. The straight I-25 alignment through the North

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			stub or substantial fly-over structure. Between Denver and Boulder, numerous horizontal curves on the BNSF right-of-way create challenges for effective passenger rail operation. **North Segment**. Between Longmont and Fort Collins, existing freight right-of-way is narrow and constrained through sections of the communities of Longmont, Berthoud, and especially Loveland where development, including downtown areas, abuts the freight right-of-way. For the most part, the horizontal and vertical geometry is conducive to passenger rail operations, although there are a couple of small areas where horizontal curves could be flattened for improved operations.		stub or substantial fly-over structure. Between DUS and 96th Avenue, a long aerial structure would be required for additional track. North of Denver, the corridor follows RTD's N Line. There are physical constraints through Commerce City around the Suncor Refinery and Riverside Cemetery that make it difficult to construct additional passenger rail tracks adjacent to the N Line tracks. **North Segment**. Between Longmont and Fort Collins, existing freight right-of-way is narrow constrained through sections of the communities of Longmont, Berthoud, and especially Loveland where development, including downtown areas, abuts the freight right-of-way. For the most part, the horizontal and vertical geometry is conducive to passenger rail operations, although there are a couple of small areas where horizontal curves could be flattened for improved operations.	The I-25 corridor is generally straight with large-radii horizontal curves and is generally conducive to high-speed passenger rail operation. However, the corridor contains several locations where vertical grades of greater than 3 percent are present in both short and relatively long (several mile) segments. These areas present challenges for efficient passenger rail operations and would need to be flattened by building on retained fill, elevated structures, or tunnels. I-25 is fully grade separated from intersecting roadways. Passenger rail would need to go around, over, or under the I-25 interchanges, which are generally spaced a mile or farther apart, but would not generally interact with at-grade roadways. **South Segment**. The I-25 corridor is highly constrained through the downtown Colorado Springs area, particularly around the Cimarron/US 24 interchange and north through downtown where noise walls line both sides of the highway and established neighborhoods. Through the Air Force Academy property, CDOT does not own right-of-way, and I-25 is on an easement; passenger rail in the I-25 corridor would either also require an easement or need to be realigned east and acquire private right-of-way. Vertical grades are challenging on Monument Hill, north of the Air Force Academy. **North Segment**. The straight I-25 alignment through the North Segment is conducive to effective passenger rail operation, and much of the I-25 corridor through the north segment has some available right-of-way that may be appropriate for passenger rail. Through the Loveland area, right-of-way is more constrained, and there is a short section of vertical grade almost 3 percent.	Segment is conducive to effective passenger rail operation, and much of the I-25 corridor through the north segment has some available right-of-way that may be appropriate for passenger rail. Through the Loveland area, right-of-way is more constrained, and there is a short section of vertical grade almost 3 percent.
Feasibility and Implementation	• Is passenger rail in this corridor compatible with existing freight rail or highway operations?	**No**. Passenger rail would not be implemented. Increased bus service frequency and Bustang use of Express Lanes would be compatible with existing highway operations.	**Yes** **All Segments**. Passenger rail operation is compatible with existing BNSF freight rail operation. In areas where passenger rail would operate on its own dedicated track, it would adhere to physical separation	**Yes** **All Segments**. Passenger rail operation is compatible with existing UP and Great Western Railway freight operation. Passenger rail would adhere to physical separation requirements from freight rail. **North and north Central Segments**. The UP portion of the corridor has less capacity	**Yes** **All Segments**. Following BNSF physical separation requirements, passenger rail operation is compatible with existing BNSF freight rail operations.	**No** Operating passenger rail service with RTD on the Southeast Corridor is incompatible with RTD service and not feasible, although other portions of the corridor are feasible and retained for further consideration as also described in the I-25/E470 Corridor.	**Yes** **All Segments**. Passenger rail would operate parallel to the I-25 and E470 highways and would be compatible with existing highway operations.

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			requirements from freight rail. In some locations, passenger rail may be able to operate on the freight system. **South Segment.** Most of the freight corridor between Pueblo and Monument is double-tracked, and freight volumes may be low enough (approximately 20 trains/day), for passenger rail interoperation on portions of these tracks to be possible in some locations. **North Segment**. Some locations along the north segment of the corridor, especially through Loveland, would require additional right-of-way to add passenger rail tracks. However, in some locations shared track use may be possible depending on freight rail operational needs. Existing freight traffic on this portion of the BNSF is 6 trains per day.	to accommodate passenger rail due to higher freight traffic of 17 trains per day compared to the lower 6 trains per day volume on the BNSF corridor. The UP corridor generally parallels US 85 through much of the north and northcentral segments of the rail corridor, and CODT's US 85 PEL Study identified numerous conflicts with US 85 operations from the railroad proximity. Passenger rail in this corridor may further those conflicts or present an opportunity to ameliorate those conflicts. The Class III Great Western Railway provides regional freight services to customers in Colorado and provides long-haul transfers to with intersect with the Class I UP an BNSF railroads and has potential for regional passenger rail that, if developed, could enhance regional rail mobility.	**Central Segment**. Although the ultimate configuration of passenger rail in RTD's N Line corridor would entail separate tracks for passenger rail and RTD commuter rail, interim phasing with interoperability on the N Line is feasible. With construction of the second track on RTD's N Line (previously approved in the North Metro EIS[1]), and/or with a third additional track, passenger rail operation is compatible with RTD's N Line operations. **North Segment**. The BNSF Rail Corridor north of Denver is a secondary freight line, and through traffic on this line can be relocated to a parallel freight route to provide additional capacity if shared track use is needed in some locations.	**Central Segment**. While retrofitting the RTD Southeast LRT Corridor to accommodate passenger rail operations is possible, RTD service would be severely disrupted for an estimated 3 to 5 years. The 19-mile-long LRT corridor has RTD's highest rail ridership annual ridership of more 12.7 million **All Other Segments**. Passenger rail could operate parallel to the I-25 highway corridor and be compatible with existing highway operation.	
Feasibility and Implementation	• Does public input indicate some level of support for passenger rail in this corridor?	**No**. Passenger rail would not be implemented. Statewide transportation planning and outreach documents public support for increased transit and mode choices, including bus service. Bustang ridership is consistently increasing and would be expected to increase substantially with enhanced service.	**Yes** **All Segments**. Statewide transportation planning and outreach, surveys, and scoping for this project indicate high level of public support for passenger rail service and general support for options that leverage existing freight rail corridors. Past studies and input received through this project development have indicated public support for this corridor. **Central Segment**. Stakeholders have indicated support for considering how the RTD Northwest Rail alignment through Boulder could be integrated with FRPR. Both the I-25 North and Northwest Rail corridors are supported for commuter rail operations that would focus on serving local communities along those routes. **North Segment**. Past studies and input received through this	**No**. **North Segment**. Public support and interest favor FRPR alignments from along I-25 and west on the BNSF freight corridor considerably over the UP/Great Western corridor. The UP/Great Western corridor was evaluated and set aside by the I-25 North EIS, RMRA Study, and ICS because of its inability to serve major population and employment centers and resulting lack of community support. Scoping for this effort has shown similar lack of interest in this portion of the freight corridor. The North Front Range Metropolitan Planning Organization (NFRMPO) 2045 Regional Transit Element considered the Great Western right-of-way for regional rail (Greeley-Fort Collins and Greeley-Windsor) for its potential to integrate with other local transit services and travel modes in the Northern Colorado region. Considering the costs, ridership estimates, and public demand for services, regional rail using the Great Western Railway is a low priority compared to other bus transit investments in the region.	**Yes** **All Segments**. Statewide transportation planning and outreach, surveys, and scoping for this project indicate high level of public support for passenger rail service and general support for options that leverage existing freight rail corridors. Past studies and input received through this project development have indicated public support for this corridor. **North Segment**. Past studies and input received through this project development have indicated public support particularly for the portion that follows the North I-25 EIS commuter rail corridor (and commuter rail operations that serve communities along that route).	**Yes** **All Segments**. Statewide transportation planning and outreach, surveys, and scoping for this project indicate high level of public support for passenger rail service overall and for operating this service along the I-25 corridor. **Central Segment**. This corridor is favored by stakeholders that view it as providing the most direct access to destinations throughout Denver, including the Denver Tech Center and DUS. However, stakeholders in past studies and in current project development also express concerns regarding the impacts of and difficulty in gaining approvals to develop passenger rail in this corridor, as well as long travel times through Denver that affect system efficiency and ridership.	**Yes** **All Segments**. Statewide transportation planning and outreach, surveys, and scoping for this project indicate high level of public support for passenger rail service overall and for operating this service along the I-25 corridor. **Central Segment**. The E470 corridor is favored by stakeholders that see advantages of the alignment around Denver reducing community impacts, avoiding potential opposition to alignments along densely populated highway and rail alignments through Denver, and increasing speeds and travel times that improve regional ridership. Although direct access to DEN Airport is seen by many as a benefit of this corridor, access to destinations in central Denver and DUS is a concern.

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			project development have indicated public support for passenger rail in this corridor, particularly for the portion of this corridor that follows the North I-25 EIS commuter rail corridor. (This corridor was not supported for high-speed rail.)	**Other Segments**. Outside of the UP/Great Western portion of the corridor, there is a high level of public support for passenger rail service and general support for options that leverage existing freight rail corridors.			
RECOMMENDATIONS		**Carry forward** for evaluation in Level 2 as a baseline for comparison against the action alternatives.	**Carry forward** for evaluation in Level 2.	**Eliminate.** The UP/ Great Western portion of the corridor north of Denver is eliminated because it does not serve major population centers well and has limited public support. The portion of the freight corridor south of DUS is feasible and carried forward as part of other freight rail corridors.	**Carry forward** for evaluation in Level 2.	**Eliminate**. The severe community disruption along the RTD Southeast LRT / I-25 corridor between Lone Tree and downtown Denver makes this alternative infeasible to implement. Other portions of the corridor are retained for consideration in the I-25/E470 Highway Corridor and the RTD interoperability north of DUS in the freight rail alignments.	**Carry forward** for evaluation in Level 2.

Acronyms:

BNSF	BNSF Railway
DEN Airport	Denver International Airport
DTC	Denver Tech Center
EIS	Environmental Impact Statement
ICS	Interregional Connectivity Study
LRT	Light rail transit
N/A	Not Applicable (not rated/evaluated at this level)
RMRA	Rocky Mountain Rail Authority
RTD	Regional Transportation District
UP	Union Pacific Railroad

[1] RTD. 2011. North Metro Corridor Project EIS and ROD.